6.2 WATER DEMAND PROJECTION

6.2.1 Scope

The water demand projection for the water supply system of MWSS is done to determine the domestic, commercial, and industrial water demand in MSA, from the city/municipal level down to the barangay level especially for the specified Antipolo Study Area, and also, to update the projection that was made through the previous projects conducted by the MWSS. The present projection was arrived at through calculations using updated data on present water consumption, population, income growth, change of water tariff, economic growth, etc.

From the menu of available projection methods, such as time-series trend analysis, regression analysis, factorial analysis, piling up of detailed water use, etc., this study opted for a kind of multiple regression analysis, which was also adopted in the Manila Water Supply Project III (MWSP III) and the Angat Water Supply Optimization Project (AWSOP).

So that planning for the respective areas may be unified, a general adoption of the methods and data used in the Fringe Area Water Supply Project (FAWSP) and the Rizal Province Water Supply Improvement Project (RPWSIP, now RPWSP) was made, to the extent warranted in the areas covered by both projects.

6.2.2 Water Demand Projection

(1) Present Condition

a) Domestic Water Consumption

The derivation of the figure for the equivalent served population rests on these assumptions: for house service connections, the average number of users per connection is 8.1 (MWSS Consumer Survey, 1981); and for public faucets, the average number of users is 486 (60 times of H.S.C.), the same figure being used for projection by Corporate Planning Group of MWSS (CORPLAN). A different assumption, however, was applied to some areas under FAWSP, e.g., Imus, Antipolo, Montalban and San Mateo -- an assumption resulting from the detailed investigation of each area by

FAWSP.

The data on billed water consumption and number of house service connections are shown in Table 6.2.1. These were prepared by the Computer Service Center of the MWSS.

Of the billed domestic water, metering losses accounted for about 9.57 percent. This ratio was estimated from the results of a field survey conducted under the Manila Water Supply Rehabilitation Project II (MWSRP II).

Calculations on present per capita water consumption were made based on recorded water consumption and the estimated served population (Table 6.2.2). For house service connections, the average per capita water consumption is 170 liter per capita per day (lpcd). This consumption type recorded a low of 51 lpcd in Las Piñas and a high of 324 lpcd in Parañaque.

Average per capita water consumption from public faucets is 19 lpcd, ranging from 9 lpcd in Makati to 79 lpcd in Antipolo. For purposes of statistical analysis, however, using these figures raises questions as they are much influenced by the accuracy of assumptions. The number of public faucets is very limited for this kind of statistical analysis. The estimated per capita consumption from public faucets is thus not suitable for the projection of future water consumption.

Municipalities with low per capita consumption are generally found in areas experiencing water supply constraints, e.g., Caloocan City, Las Piñas, Malabon, Muntinlupa, Navotas, Pateros, Taguig, Valenzuela, and some municipalities in the provinces of Cavite and Rizal. Because of insufficient water supply, water consumption in these areas is suppressed. Considering their potential demand to be higher, a rapid increase in water consumption will be seen after improvement of water supply situation is effected by MWSS through several ongoing projects such as AWSOP, Manila South Water Distribution Project (MSWDP), and FAWSP. This improvement is factored into the demand projection for these areas.

For the BP799 area in Rizal Province, no useful data on water consump-

tion was obtained. The data prepared by RPWSIP were utilized for the projection of future water consumption.

b) Commercial Water Consumption

The total billed commercial consumption in 1990 averaged 303,732 m^3/day as shown in Table 6.2.3. The larger part of this consumption was taken up by the NCR, amounting to 99.2% of the total. In particular, Manila, Quezon City and Makati combined to share of 97.1% of the total. The commercial sector of Cavite and Rizal consumed only 0.4% and 0.5%, respectively, of the total commercial consumption.

After adjustment for meter error, the average consumption per meter connection was placed at 8.119 m^3/day, ranging from 0.734 m^3/day in Muntinlupa to 14.910 m^3/day for Makati. The correction factor used for adjustment was based on the survey result conducted by the Manila Water Supply Rehabilitation Project I (MWSRP I) and was calculated at +13.33%.

Thus, the recorded billed consumption of large meters such as commercial and industrial sector was increased by 13.33% for data processing.

For the BP799 area, no useful data on water consumption of commercial sector were available.

c) Industrial Water Consumption

The total billed industrial consumption in 1990 averaged 74,552 m^3/day as shown in Table 6.2.4. Most of this was also consumed in the NCR, amounting to 96.3% of the total, almost the same figure for its commercial consumption. Of this percentage, more than half was also accounted for by Manila, Quezon City and Makati which combined to a total share of 54.8% of total consumption. In the case of Mandaluyong and Pasig, the parity between commercial and industrial consumption breaks as the figure for industrial consumption share is higher, i.e., 3.3% for commercial and 9.2% for industrial in Mandaluyong, and 2.7% and 9.6% in Pasig. The industrial sector of Cavite and Rizal consumed only 1.4% and 2.3% respectively, of the total industrial consumption. After making the same adjustment for meter error as that done for the commercial sector, the average consumption per meter connection became 10.788

m^3/day, ranging from 0.756 m^3/day in Muntinlupa to 29,897 m^3/day in Mandaluyong. For the BP799 area, no useful data on the water consumption of the industrial sector were available.

d) Groundwater Consumption

As discussed in Subsection 2.2.2, MWSS has been pumping up a yearly average of about 29,922,000 m^3 of groundwater for the last 6 years. This volume is equivalent to about 82,000 m^3/day or 3.4% of all MWSS water production for the same period.

In addition to the pumpage by MWSS, groundwater pumpage of the private sector in 1990 amounted to a daily average of about 840,700 m^3. Around 45% or about 379,000 m^3 of pumpage by the private sector was used for domestic use. This volume is equivalent to 44% of served water by MWSS. The population with private water supply systems was estimated to be about 38% of the population with MWSS water supply system, in consideration of said per capita water consumption and private pumpage for domestic use (Table 6.2.2). Thus, about 31% of the water demand in domestic use was supplied from the private groundwater pumpage.

As shown in Table 6.2.3, it is estimated that about 106,800 m^3/day or 24% of total water demand for commercial use was supplied by the private sector.

In contrast to the commercial water consumption, about 81% of the total water demand for industrial use amounting to about 354,900 m^3/day was supplied by the private sector (Table 6.2.4).

(2) Water Consumption Projection

a) Domestic Water Consumption

Projections of domestic consumption were computed separately for general and blighted populations. Population and per capita water consumption were determined for each group.

Per Capita Water Consumption

Domestic water consumption is affected by income growth and water tariff change with some extent of elasticity for both factors. The projection for a given year is done by first determining the per capita domestic water consumption in that year. This may be given by the following formula:

$$PCC(I) = PCC(I-1) \times [1+(PCIG(I-1)+(TI(I-1)xPED)]$$

where:

I	=	year
PCC(I)	=	per capita consumption for year I
PCIG(I)	=	per capita income growth in real terms in year I
IED	=	income elasticity consumption
TI(I)	=	tariff increase in real terms in year I
PED	=	price elasticity of consumption

Data on per capita income growth, water tariff increases, income elasticity, and price elasticity are assumed by CORPLAN as shown in Table 6.2.5. For the general population, CORPLAN assumed a continuous decrease of per capita income up to the year 2010. Tariff was assumed to increase continuously starting year 1993, by 1.38% annually. Income elasticity and price elasticity computed by CORPLAN are 0.30 and -0.20 respectively. Per capita consumption in the year 2010, therefore, was computed to decrease to about 87% of that in 1990.

Projected per capita consumption of the blighted population in the year 2010 was also computed to decrease slightly due to tariff increase, even with the assumption of stability in their per capita income. Table 6.2.5 also shows the computation results for both groups.

Computation results show rather low per capita consumption relative to those in foreign countries. In previous studies, i.e., FAWSP and RPWSIP, increasing per capita consumption were assumed in projecting future water consumption.

This Study, therefore, set the per capita consumption of the general population at 180 lpcd for the year 1995 and 200 lpcd for 2010. Said settings are in harmony with the per capita consumption in typically

developed areas such as Manila and Quezon City. For the years between 1995 and 2010, per capita consumptions were interpolated. For some municipalities with present high per capita consumption, that is, those with more than 200 lpcd, per capita consumption in the year 2010 was set in consideration of present consumption.

The per capita consumption in some areas which presently lack water, but which are expected to benefit from AWSOP and MSWDP, was assumed to substantially increase by the year 1995. The per capita consumption in those areas was also set at 180 lpcd, considering the present water consumption amount and the distance from the central distribution system.

For municipalities located in the outlying areas but which are covered by the ongoing projects, i.e., FAWSP and RPWSP, the per capita consumption applied in each project was also adopted in this Study for consistency. For areas in Cavite, however, the same per capita consumption as the one for NCR was adopted.

Table 6.2.6 presents the adopted per capita consumption of each city/municipality for selected years.

Per capita consumption of the blighted population is limited by the water supply capacity of faucets. Their consumption was calculated to be 30 lpcd, on the assumption that they get their water from public faucets having a 24-hour flow rate of 10 liter/min. and a service rate of 486 persons per faucet. In projecting their consumption, setting the per capita consumption at 35 lpcd seems to be appropriate, considering the estimated present per capita consumption from public faucets was that presented in Table 6.2.2. This per capita consumption is held to be constant up to the year 2010.

Projected Population

The population of each city/municipality in the future that was projected in Section 6.1 contains general and blighted population categories. The projected population under such categories were adopted for the projection of water consumption.

For some areas, the estimated year-1990 general population is smaller than the estimated equivalent number of population for house service connections. This means that a part of the blighted population have house service connections instead of public faucets. For those areas, therefore, corrections were made on the ratio of blighted population to total population, with the assumption that the estimated equivalent number of population for house service connections is equal to the general population of the area.

Moreover, since beneficiaries of private sector supply systems may also be categorized under general population, around 80% of the NCR population was estimated to fall under this category as shown in Table 3.2.3. Therefore, the ratio of the total blighted population was adjusted at 20% of total population in accordance with the respective shares of the estimated blighted population in each municipality in year-1990 as shown in Table 6.2.7.

Assuming these blighted population ratios will be constant in the future, the future populations were projected for both groups.

The ratio of population served by MWSS was determined by city/municipality for each projection year in view of the estimated present served population by MWSS and private water supply systems presented in Table 6.2.2.

For the areas covered by FAWSP and RPWSP, the served population projected in the reports of these projects were adopted after adjusting the projected population of each area.

Domestic Consumption

Total domestic consumption is obtained by multiplying per capita consumption and population over all cities and municipalities for each projection year. Computation results at 5-year intervals for years 1995-2010 are presented in Tables 6.2.8 to 6.2.11.

b) Commercial Water Consumption

Commercial water consumption is similarly influenced by economic growth

and tariff changes in real terms, with some extent of elasticity on both factors.

The annual commercial consumption in a given year may be given by the following formula:

$$CD(I) = CD(I-1) \times [1+(CG(I-1) \times COED)+(CTI(I-1) \times CPED)]$$

where:

- I = Year
- CD(I) = Total commercial consumption in year I
- CG(I) = GDP growth rate in service sector in year I
- COED = output elasticity of consumption in service sector
- CTI(I) = tariff increase in real terms in year I
- CPED = price elasticity of consumption

Data on GDP growth in the service sector discussed in Section 6.1 were applied for this projection. Data on tariff increases, output elasticity, and price elasticity were assumed by CORPLAN as shown in Table 6.2.12. As computed, commercial consumption in the year 2010 in the MSA, excluding the BP799 area, will be more than double the estimated present demand.

The share of MWSS water supply to the total commercial consumption was calculated at 76.3% based on the actual billed water consumption and the estimated total commercial consumption (Table 6.2.3). The amount of privately supplied water for commercial consumption was about 106,800 m^3/day based on the groundwater use survey. Assuming that the share of private supply and the share of the consumption of each city/municipality will be stable in the future, the commercial consumption in the future was projected as shown in Table 6.2.13. For the areas under BP799, commercial consumption was computed using the methods adopted in RPWSP.

It is estimated that MWSS shall supply 801,100 m^3/day for commercial consumption in the year 2010. This amount is equivalent to 2.3 times of the presently supplied amount for commercial use.

c) Industrial Water Consumption

Industrial water consumption in the future is projected in the same way as commercial water consumption.

The projected growth of the GDP for the industrial sector as discussed in Section 6.1 was applied for the projection of industrial consumption. Data on tariff increases, output elasticity, and price elasticity that were assumed by CORPLAN were also adopted for the Study and are shown in Table 6.2.14.

Industrial consumption in the year 2010 is estimated to be about 1.8 times of estimated present demand.

The share of MWSS water supply to the total industrial consumption is calculated at 19.2% based on the actual billed water consumption and the results of the groundwater use survey (Table 6.2.4). The private supply for industrial consumption in 1990 was about 354,900 m^3/day. Assuming that the share of the private supply and the share of the consumption by each city/municipality will be stable in the future, the industrial consumption in the future was projected as shown in Table 6.2.15. For the areas covered by RPWSP, industrial consumptions were computed using the respective methods adopted in RPWSP.

It is estimated that MWSS shall supply 223,700 m^3/day for industrial consumption in the year 2010. This amount is equivalent to 2.6 times of present MWSS industrial consumption.

(3) Total Water Demand

The total water demand is obtained by summing up the domestic, commercial, and industrial consumption that are projected for each year. Also added to this demand are the water losses during distribution.

Present Non-Revenue Water of MWSS exceeds 50% of total distributed amount, and it includes various components e.g., meter error, illegal connections, leakage, and so on. The projected future consumption, however, excludes leakage. The MWSS water demand thus involves adding the amount of leakage.

The size of projected water demand, given the currently high NRW ratios, will be affected substantially by the leakage ratios that are adopted. MWSS aims to reduce the NRW ratio to 25% in its reduction program under MWSRP I and II which are under current implementation.

Reducing the NRW ratios to such levels may, however, be difficult to achieve as present ratios are still high. Even AWSOP already adopted higher NRW ratios in its feasibility stage. But even these higher ratios were revised for higher ones at AWSOP's detailed design stage.

For reasons of comparison, three cases were presented for the above said ratios, from which the leakage ratios to be used in water demand projection in this study was determined.

The first case (Case 1) is based on the projection by CORPLAN. Leakage amount will be reduced to 25.2% of total demand in year 1995, to 21% in years 2000, 2005, and 2010.

The second case (Case 2) is based on the ratios used in AWSOP's feasibility study stage. These NRW ratios, 30% in year 1995 and 25% in years 2000, 2005 and 2010, are higher than those CORPLAN.

In the ongoing detailed design stage of AWSOP, leakage ratios higher than those in Case 2 were adopted: 35% for year 1996. The third case (Case 3) had this considered such that the ratio for 1995 is 35%, that for 2000 is 30%, and 25% for years 2005 and 2010.

All three cases are tabulated below. The ratios applied in Case 3 are the ones adopted by this Study for the projection of water demand.

ADOPTED LOSS RATIO (% to Total Supply)

	1995	2000	2005	2010
CASE 1	25.2	21.0	21.0	21.0
CASE 2	30.0	25.0	25.0	25.0
CASE 3	35.0	30.0	25.0	25.0

The computation results for years 1995, 2000, 2005, and 2010 are summarized in Tables 6.2.16 to 6.2.18 and Figures 6.2.1 to 6.2.3.

6.2.3 Supply Capacity Against Demand

A yearly water demand and supply analysis for the period 1995 to 2000 and for years 2005 and 2010 was made considering the projected water demand and the planned water supply capacity.

The projected water demand was allocated by expected water source, assuming the ratio of supplied water by source as shown in Tables 6.2.19 to 6.2.22. The location of respective area, the present coverage of the Central Distribution System (CDS) and existing groundwater pumping capacity were considered for this assumption. In this assumption, Bacoor and Kawit in Cavite will be served through CDS. Areas in Rizal, however, are generally supplied with groundwater except some areas which are close to existing CDS.

Taking the assumption that the planned and ongoing projects to augment the water source and treatment capacity will be implemented on schedule, a comparison of surface water supply capacity and water demand for each particular year was done (Table 6.2.23 and Figure 6.2.4). From this comparison, the following were noted:

a. AWSOP is indispensable to meet demand.

b. The surface water supply capacity will not be critical to meet demand until 2010 even if produced water is supplied to NCR and a part of Cavite and Rizal, and the augmentation of water source is conducted on schedule.

c. If implementation of UATP and MNEWSP is delayed, water supply situation will be critical by the year 2005.

d. Required groundwater pumpage will increase to about 1,278,000 m^3/day in 2010 including discharge by private sector.

e. The share of groundwater in total water supply will decrease down to about 24.6% in 2010.

f. If the Bulacan Bulk Water Supply Project is implemented, implementation of MWSP III shall be advanced as early as possible.

Otherwise supply situation will be critical soon after year 2005. Though water amount to be allotted for the Bulacan project shall be decided based on the probable implementation schedule of MNEWSP, UATP, and MWSP III, the proposed amount for its Phase I (1996; 100,200 m^3/day, 2000; 131,100 m^3/day) can be secured if UATP is executed on schedule. However, supply of all

proposed amount for Phase II (2010; 398,400 m^3/day) before completion of MWSP III will make MWSS water supply situation critical.

6.2.4 Groundwater Discharge Projection

(1) Outline of Scenarios

For preparation of data to be used in the simulation of future groundwater level in Metro Manila, projection of groundwater discharge was done using the projected groundwater demand in the study area. For that purpose, the following four scenarios were prepared considering the probability of assumptions stated in each case.

Basic Assumptions:

a. AWSOP will be completed in 1996.

b. UATP will be completed in 1998.

c. MNEWSP will be completed in 1997. Water source for the whole area of Montalban, San Mateo, and a part of Marikina will be converted to the Wawa Dam the next year. Groundwater utilization facilities to be constructed to meet demand by that year will be operated continuously from that year onward.

d. MSWDP will be completed in 1995.

Scenario 1 (Basic Scenario):

The increase of commercial and industrial water demand will be in pro-

portion to the estimated present share of the MWSS and the Private sector, except in some areas within CDS such as Manila, Pasay, Quezon, Caloocan, Makati, Malabon, Mandaluyong, Navotas, and San Juan. In these areas, said increase will be covered by MWSS only. In Cavite area, only Bacoor and Kawit will be supplied by CDS.

The calculations done in Subsections 6.2.2 and 6.2.3 were based on this scenario.

Scenario 2 (Optimistic Scenario):

The same assumption on commercial and industrial water demand in Scenario 1. However, commercial and industrial water demand increase in the private sector from year 2001 is converted to MWSS. Municipalities in the Cavite area will be supplied by CDS.

Scenario 3 (Most Optimistic Scenario):

The same assumption on commercial and industrial water demand in Scenario 1. However, commercial and industrial water demand increase in the private sector from year 1996 is converted to MWSS. Municipalities in the Cavite area will be supplied by CDS.

Scenario 4 (Pessimistic Scenario):

The same assumption on commercial and industrial water demand in Scenario 1. However, implementation of projects mentioned in Basic Assumptions is delayed for 2 years. In the Cavite area, only Bacoor and Kawit will be supplied by CDS.

Difference between assumptions in each scenario can be summarized briefly as shown in Table 7.3.1.

(2) Projected Groundwater Discharge

In accordance with the just said scenarios, the future groundwater demand was projected.

Using the future groundwater demand projection results, the distribution

of groundwater discharge was projected for each scenario. To increase the probability of the projection, adjustment including interpolation was done on the projected discharge between the years 1991 to 1999 for several areas in Cavite and Rizal so as to moderate the rate of increase of discharge. Projections for each scenario are summarized in Tables 6.2.24 to 6.2.27.

In Scenario 1, groundwater discharge will increase to 1,278,000 m^3/day, which is equivalent to 1.37 times of estimated present discharge.

In Scenario 2, total discharge will increase to 1,139,000 m^3/day or 1.22 times of present level, and 1,064,000 m^3/day or 1.14 times in the Scenario 3.

In the Scenario 4, which is pessimistic but has a high probability, total discharge will be 1,295,000 m^3/day or 1.39 times of present discharge amount.

For all scenarios, areas in Cavite and Rizal require much increase of groundwater discharge.

6.2.5 Water Demand Projection in Antipolo Basin

(1) Present Situation

a) Existing System

The Poblacion area of Antipolo which occupies the center of the Antipolo Basin was initially served by the water supply system constructed by the then Bureau of Public Works. The system includes 6 deepwells and about 20 km of distribution pipelines. When Antipolo became a part of the MWSS service area in 1976, the system was turned over to MWSS.

To meet the water demand, MWSS constructed an additional 4 deepwells for the system: 2 wells in 1981; 1 well in 1982; and 1 well in 1983. A total of 10 deepwells have therefore been operational since those times. All of these wells are currently operated on 24-hour basis. Their various capacities range from 210 liter/min. to 1,400 liter/min. Due to limited water source and rugged terrain of the area, rationing is

done in the system via control of valves.

At present, the system has about 33.59 km of distribution pipelines. A distribution reservoir is not provided in the system so that the pumped groundwater is directly injected into the distribution pipes after some extent of chlorination.

b) Water Consumption

The Computer Service Center of MWSS summarized as shown in Table 6.2.28 the existing number of connections and water consumption in 1990 of the MWSS water supply system in the Antipolo Basin.

Observations regarding this table are summarized below:

a. Total water consumption in the basin is rather small in comparison with the share of no. of connections due to small water consumption in industrial sector.

b. The share of domestic consumption is in accord with the share of no. of connections.

c. The character of the area in the basin may be categorized as a residential area with small scale commercial enterprises.

d. Per capita domestic consumption may be estimated as follows:
2,962 m^3/day / (3,535 conn. x 8.1 person/conn.)
= 103.4 lpcd

According to the groundwater use survey conducted in this study, 26 deepwells are operated in the basin in addition to the 10 deepwells of MWSS. The discharge and water consumption by use obtained by the survey is summarized in Table 6.2.29.

Thus, the MWSS system discharged about half of the total groundwater discharge in the basin. Only 33.5% of MWSS discharge was billed as revenue water in 1990. Though a part of NRW seems to be consumed by illegal connections, most of it is considered to be leakage in view of the rather low per capita consumption estimated for the area. Survey on

this matter was conducted by FAWSP in 1989. As a result of that survey, ratios for leakage and unbilled consumption during that time were estimated at 68.2% and 0.2% of production amount, respectively.

(2) Water Demand Projection

a) Domestic Water Consumption

The population projected in Section 6.1 was adopted for the projection of water demand in the basin. MWSS service ratio was determined in accordance with the planned service coverage of the MWSS system and the extent of urbanization. MWSS service coverage was determined under the following assumptions:

a. The service area within the basin boundary will be limited by the year 2000, except for the present service area that is out of the basin.

b. The service area will continuously expand outward from the central area (poblacion).

c. The priority of service will be laid on the present developed area, and it will be covered by the year 2000.

d. Present developed area closely located outside the basin will be covered after the year 2001.

e. The basin will be fully covered by the system by the year 2010.

Figures 6.2.5 and 6.2.6 present the service coverage in selected years.

Population in the service area can be derived by multiplication of population and service ratio. In 1995, it will be about 71,000, including those in the present service area outside of the basin, and which is about 67% of the population in the basin. It will increase to about 195,000 or about 110% of basin population in the year 2010. Since the estimated present served population is about 29,000 (3,535 conn. x 8.1), the served population in 2010 will be about 6.8 times of present served population (Table 6.2.30).

The domestic water demand in the MWSS's system in the basin were computed as shown in Table 6.2.31 adopting the same per capita consumption as those applied in the previous projection in FAWSP.

b) Commercial Water Consumption

The water consumption of the commercial sector computed in Subsection 6.2.2 was adopted in projecting commercial water consumption.

Based on the data presented in Table 6.2.28, 51% of the MWSS commercial consumption projected for the Antipolo municipality is considered to be consumed in the basin.

Allocation to each barangay was done in accordance with the domestic consumption share of each barangay. The computation results for the entire basin and the MWSS system are presented in Tables 6.2.32 and 6.2.33.

c) Industrial Water Consumption

The water consumption in industrial sector computed in Subsection 6.2.2 was adopted in the projection of industrial water consumption.

Based on the data presented in Table 6.2.28, 3% of the MWSS industrial consumption projected for Antipolo municipality is considered to be consumed in the basin. The present private industrial consumption, in addition to the MWSS industrial consumption, was added to the total demand, considering that the bulk of it was consumed by a few poultry farms.

Allocation to each barangay was executed in accordance with the share of the domestic consumption. The computation results for the entire basin and the MWSS system are presented in Tables 6.2.32 and 6.2.33.

d) Distribution Loss

Losses during water distribution are mainly caused by leakage. Though the present leakage ratio is considerably high, probably amounting to more than 50%, a ratio of 30% was applied for the projection up to the

year 2000, and 25% after that, in anticipation of the benefits of the NRW reduction program and of new projects to be implemented in the basin, including the high rate replacement of old distribution pipes.

e) Total Demand

Total water demand in the basin and in the MWSS service area are summarized in Tables 6.2.32 and 6.2.33.

(3) Analysis on Supply Capacity and Projected Demand

Projected water demand for the Antipolo basin is summarized as shown in Table 6.2.34. Because of the limited yield of the groundwater resource in the basin, additional water sources in the future shall be mainly obtained from surface water resources. Based on the computer simulation of the groundwater condition in the basin, a groundwater discharge of about 27,800 m^3/day is considered to be the maximum limit of discharge in the basin. Augmentation of water source, as implied in the table, is a course that should be immediately pursued.

Due to the pumpage of existing groundwater pumping facilities, the water source augmentation by groundwater resource is limited up to 8,300 m^3/day. Of this figure, 2,070 m^3/day will be obtained through rehabilitation of existing MWSS's deepwells. Therefore, the additional pumpage resulting from the development of new wells shall be limited to a total of 6,274 m^3/day.

After augmentation of the groundwater resource, supply capacity will be able to meet the demand until the year 1998, on a daily average basis. On a daily maximum basis, however, supply capacity will not be able to satisfy the demand from 1995 onward.

Further augmentation is thus required, and at an average of about 1,800 m^3/day in the year 2000 and about 18,100 m^3/day in the year 2010, assuming maximum groundwater production capacity is about 27,400 m^3/day (Table 6.2.34 and Figure 6.2.7). On a daily maximum basis, amount of augmentation is 15,500 m^3/day in 2000 and 40,900m^3/day in 2010.

TABLE 6.1.1 TOTAL POPULATION, HOUSEHOLD POPULATION AND NUMBER OF HOUSEHOLDS IN THE STUDY AREA (1990)

CITY/MUNICIPALITY	TOTAL POPULATION	HOUSEHOLD POPULATION	NUMBER OF HOUSEHOLDS
METRO MANILA	7,928,867	7,887,861	1,567,665
1. Manila	1,598,918	1,585,887	308,874
2. Pasay City	366,623	364,959	73,642
3. Quezon City	1,666,766	1,659,940	331,760
4. Calookan City	761,011	759,420	150,972
5. Las Pinas	296,851	296,645	57,774
6. Makati	452,734	450,163	89,310
7. Malabon	278,380	278,161	58,051
8. Mandaluyong	244,538	242,526	49,065
9. Marikina	310,010	309,103	60,090
10. Muntinlupa	276,972	268,960	53,449
11. Navotas	186,799	186,642	38,864
12. Parañaque	307,717	306,865	61,252
13. Pasig	397,309	396,764	77,621
14. Pateros	51,401	51,359	9,808
15. San Juan	126,708	125,815	24,338
16. Taguig	266,080	265,043	53,153
17. Valenzuela	340,050	339,609	69,642
CAVITE	457,020	456,569	91,396
1. Bacoor	159,685	159,663	30,928
2. Cavite City	91,641	91,480	19,040
3. Imus	92,125	91,875	18,648
4. Kawit	47,755	47,755	9,767
5. Noveleta	20,409	20,409	4,012
6. Rosario	45,405	45,387	9,001
RIZAL	980,194	978,596	189,712
1. Angono	46,014	45,439	8,941
2. Antipolo	207,842	207,665	40,852
3. Baras	16,880	16,880	3,163
4. Binangonan	127,561	127,421	24,378
5. Cainta	126,839	126,680	24,775
6. Cardona	32,962	32,958	6,264
7. Jala-Jala	16,318	16,318	3,035
8. Morong	32,165	32,165	6,255
9. Pililla	32,771	32,771	6,131
10. Montalban	67,074	67,011	12,891
11. San Mateo	82,310	82,289	16,079
12. Tanay	58,410	58,196	11,089
13. Taytay	112,403	112,163	21,881
14. Teresa	20,645	20,640	3,978
T O T A L	9,366,081	9,323,026	1,848,773

Source: National Statistics Office
1990 Census of Population and Housing

TABLE 6.1.2 POPULATION DISTRIBUTION IN ANTIPOLO (1990)

MUNICIPALITY/ BARANGAY	TOTAL POPULATION	HOUSEHOLD POPULATION	NUMBER OF HOUSEHOLDS
ANTIPOLO	207,842	207,665	40,852
1. Bagong Nayon	18,002	18,002	3,472
2. Beverly Hills	1,034	1,034	191
3. Calawis	1,662	1,662	353
4. Cupang	25,696	25,690	5,005
5. Dalig	20,334	20,334	3,964
6. De La Paz	21,033	21,033	4,158
7. Inarawan	4,965	4,965	1,023
8. Mambugan	15,636	15,611	2,970
9. Mayamot	15,887	15,887	3,142
10. San Isidro	19,260	19,248	3,776
11. San Jose	26,121	26,049	5,067
12. San Juan	1,394	1,394	298
13. San Luis	6,241	6,241	1,340
14. San Roque	17,227	17,165	3,287
15. Sta. Cruz	13,340	13,340	2,806

Source: National Statistics Office
1990 Census of Population and Housing (Report No. 2-A)

TABLE 6.1.3 POPULATION DISTRIBUTION, LAND AREA AND POPULATION DENSITY: ANTIPOLO AREA (1990, 2000 AND 2010)

BARANGAY/ MUNICIPALITY	POPULATION						LAND AREA (Ha.)		DENSITY S.A. (Person per Ha.)		
	1990		2000		2010		Total				
	Barangay	Study Area	Barangay	Study Area	Baragay	Study Area	Barangay	Study Area	1990	2000	2010
1. Bagong Nayon	18,002	14,402	27,647	22,117	37,637	30,110	648.0	319.2	45	69	94
2. Santa Cruz	13,340	9,338	20,539	14,377	27,995	19,597	1,108.0	776.4	12	18	25
3. De La Paz	21,033	21,033	32,269	32,269	43,906	43,906	420.6	420.6	50	77	104
4. Beverly Hills	1,034	1,034	1,767	1,767	2,532	2,532	31.4	31.4	33	56	81
5. San Roque	17,227	17,227	26,465	26,465	36,034	36,034	380.4	380.4	45	70	95
6. Dalig	20,344	14,241	31,204	21,843	42,461	29,723	556.5	332.6	43	66	89
7. San Jose	26,121	13,061	40,028	20,014	54,428	27,214	5,640.1	270.0	48	74	101
8. San Isidro	19,260	19,260	29,566	29,566	40,240	40,240	360.8	360.8	53	82	112
9. San Luis	6,241	3,121	9,712	4,856	13,311	6,656	697.2	233.6	13	21	28
SUB-TOTAL	142,602	112,717	219,196	173,274	298,544	236,012	9,843.0	3,127.0	36	55	75
10. Taytay	-----	7,970	------	10,517	------	13,978	------	764.8	10	14	18
11. Angono	-----	1,750	------	2,705	------	4,189	------	935.0	2	3	4
12. Binangonan	-----	700	------	958	------	1,334	------	141.0	5	7	9
13. Teresa	-----	210	------	256	------	318	------	120.0	2	2	3
SUB-TOTAL	-----	10,630	------	14,436	------	19,819	------	1,960.8	5	7	10
TOTAL		123,347		187,710		255,831		5,087.8	24	37	50

TABLE 6.1.4 POPULATION DISTRIBUTION, LAND AREA AND POPULATION DENSITY: AQUIFER BASIN ZONE (1990, 2000 AND 2010)

BARANGAY/ MUNICIPALITY	POPULATION						LAND AREA (Ha.)		DENSITY S.A. (Person per Ha.)		
	1990		2000		2010		Total				
	Barangay	Study Area	Barangay	Study Area	Baragay	Study Area	Barangay	Study Area	1990	2000	2010
BARANGAY											
Santa Cruz	13,340	4,002	20,538	6,161	27,995	8,399	1,108.0	123.6	32	50	68
De La Paz	21,033	16,826	32,269	25,815	43,906	35,125	420.6	159.4	106	162	220
San Roque	17,227	15,504	26,465	23,819	36,034	32,431	380.4	308.4	50	77	105
Dalig	20,344	14,241	31,204	21,843	42,461	29,723	556.5	332.6	43	66	89
San Jose	26,121	13,061	40,028	20,014	54,428	27,214	5,640.1	270.0	48	74	101
San Isidro	19,260	15,408	29,566	23,653	40,240	32,192	360.8	169.0	91	140	190
San Luis	6,241	3,121	9,712	4,856	13,311	6,656	697.2	233.6	13	21	28
MUNICIPALITY											
Angono	——	1,750	——	2,705	——	4,189	——	572.4	3	5	7
Binangonan	——	700	——	958	——	1,334	——	141.0	5	7	9
Teresa	——	210	——	256	——	318	——	120.0	2	2	3
TOTAL	123,566	84,823	189,782	130,080	258,375	177,581	9,163.6	2,430.0	35	54	73

TABLE 6.1.5 GROWTH RATE OF THE STUDY AREA'S POPULATION (1990-2010)

CITY/MUNICIPALITY	ANNUAL GROWTH RATE				
	1990/ 1980	1995/ 1990	2000/ 1995	2005/ 2000	2010/ 2005
I. METRO MANILA	2.83	2.47	2.07	1.73	1.42
1. Manila	-0.27	0.82	0.47	0.20	0.00
2. Pasay City	2.34	2.28	1.98	1.86	1.59
3. Quezon City	3.50	3.15	2.96	2.76	2.47
4. Calookan City	4.79	2.74	2.31	1.89	1.56
5. Las Pinas	7.69	6.63	5.77	5.00	4.28
6. Makati	3.68	1.55	1.14	0.81	0.53
7. Malabon	3.69	1.88	1.43	1.08	0.77
8. Mandaluyong	1.67	1.67	1.24	0.91	0.62
9. Marikina	3.74	2.95	2.41	1.96	1.56
10. Muntinlupa	6.99	4.50	3.82	3.24	2.70
11. Navotas	3.85	2.11	1.64	1.26	0.94
12. Parañaque	3.81	3.65	3.05	2.54	2.08
13. Pasig	3.84	3.21	2.65	2.17	1.75
14. Pateros	2.36	2.56	2.06	1.64	1.27
15. San Juan	-0.33	1.01	0.64	0.36	0.13
16. Taguig	6.77	3.12	2.57	2.10	1.68
17. Valenzuela	4.63	4.63	4.10	3.49	2.93
II. CAVITE	3.43	3.11	2.69	2.33	1.92
1. Bacoor	5.69	4.16	3.61	3.11	2.63
2. Cavite City	0.44	1.46	1.14	1.03	0.49
3. Imus	4.43	3.02	2.57	2.17	1.79
4. Kawit	1.93	2.90	2.46	2.07	1.70
5. Noveleta	3.44	2.67	2.25	1.88	1.53
6. Rosario	3.09	3.14	2.68	2.26	1.88
III. RIZAL	5.46	3.20	2.84	2.52	2.07
1. Angono	5.28	3.59	3.07	2.56	2.03
2. Antipolo	10.83	4.61	4.01	3.40	2.79
3. Baras	3.89	2.42	2.01	1.59	1.17
4. Binangonan	4.33	1.97	1.60	1.22	0.84
5. Cainta	7.44	5.22	4.56	3.90	3.24
6. Cardona	2.75	1.31	1.00	0.68	0.35
7. Jala-Jala	2.91	1.75	1.40	1.04	0.68
8. Montalban	4.50	2.44	2.02	1.61	1.17
9. Morong	2.36	1.42	1.36	1.69	1.47
10. Pililla	3.23	1.96	1.58	1.21	0.83
11. San Mateo	4.52	2.31	1.91	1.50	1.09
12. Tanay	3.46	2.42	2.01	1.59	1.17
13. Taytay	3.79	2.83	2.72	3.08	2.61
14. Teresa	3.13	0.82	0.55	0.27	0.03

TABLE 6.1.6 POPULATION PROJECTION FOR THE STUDY AREA, 1990-2010

CITY/MUNICIPALITY	1980 (CENSUS)	1990 (CENSUS)	1995	2000	2005	2010
I. NCR	5,970,307	7,928,867	8,971,800	9,948,977	10,847,652	11,649,609
1. Manila	1,642,708	1,598,918	1,666,014	1,705,567	1,723,126	1,723,147
2. Pasay City	289,927	366,623	402,932	433,048	457,147	475,225
3. Quezon City	1,174,605	1,666,766	1,870,519	2,049,017	2,200,635	2,323,154
4. Caloocan City	471,323	761,011	872,801	979,527	1,076,883	1,164,630
5. Las Pinas	137,537	296,851	413,469	551,808	708,704	878,109
6. Makati	375,424	452,734	489,333	517,961	539,315	553,794
7. Malabon	192,433	278,380	305,870	328,653	346,868	360,515
8. Mandaluyong	206,906	244,538	265,870	282,944	296,044	305,315
9. Marikina	213,199	310,010	359,368	405,480	447,289	483,621
10. Muntinlupa	137,704	276,972	346,829	419,918	493,739	565,215
11. Navotas	127,092	186,799	207,567	225,328	240,031	251,550
12. Paranaque	210,115	307,717	369,370	430,253	488,493	541,964
13. Pasig	270,583	397,309	466,552	532,663	593,888	648,283
14. Pateros	40,590	51,401	58,438	64,776	70,318	74,945
15. San Juan	131,063	126,708	133,478	137,583	140,304	141,007
16. Taguig	135,143	266,080	311,031	353,627	392,792	427,323
17. Valenzuela	213,955	340,050	432,359	530,824	632,076	731,811
II. CAVITE	324,273	457,020	534,043	611,062	686,825	756,085
1. Bacoor	90,364	159,685	196,636	235,538	275,150	313,838
2. Cavite City	87,666	91,641	98,576	104,379	109,908	112,628
3. Imus	59,103	92,125	107,162	121,860	135,818	148,542
4. Kawit	39,368	47,755	55,217	62,446	69,254	75,407
5. Noveleta	14,460	20,409	23,325	26,102	28,673	30,955
6. Rosario	33,312	45,405	53,127	60,737	68,022	74,715
III. RIZAL	567,346	980,194	1,150,043	1,325,537	1,503,547	1,667,350
1. Angono	27,136	46,014	55,062	64,219	72,979	80,788
2. Antipolo	70,377	207,842	261,738	319,849	379,154	435,886
3. Baras	11,434	16,880	19,051	21,063	22,808	24,182
4. Binangonan	82,702	127,561	140,791	152,533	162,155	169,117
5. Cainta	60,280	126,839	164,650	206,860	251,447	295,646
6. Cardona	25,024	32,962	35,194	36,995	38,270	38,952
7. Jala-Jala	12,199	16,318	17,814	19,109	20,131	20,826
8. Montalban	42,749	67,074	75,766	83,837	90,845	96,318
9. Morong	25,387	32,165	34,528	36,957	40,222	43,304
10. Pililla	23,716	32,771	36,137	39,119	41,556	43,312
11. San Mateo	53,014	82,310	92,401	101,679	109,620	115,769
12. Tanay	41,303	58,410	65,923	72,889	78,925	83,678
13. Taytay	76,930	112,403	129,481	148,322	173,025	197,131
14. Teresa	15,095	20,645	21,507	22,106	22,410	22,441
T O T A L	6,861,926	9,366,081	10,655,886	11,885,576	13,038,024	14,073,043

Source: Estimation made by the Study Team based on NSO data

TABLE 6.1.7 POPULATION PROJECTIONS FOR THE MUNICIPALITY OF ANTIPOLO, 1990-2010

MUNICIPALITY/ BARANGAY	1990	1995	2000	2005	2010
ANTIPOLO	207,842	261,738	319,849	379,154	435,886
1. Bagong Nayon	18,002	22,644	27,647	32,752	37,637
2. Beverly Hills	1,034	1,385	1,767	2,161	2,532
3. Calawis	1,662	2,172	2,725	3,293	3,831
4. Cupang	25,696	32,283	39,380	46,620	53,551
5. Dalig	20,344	25,566	31,204	36,956	42,461
6. De La Paz (Pob.)	21,033	26,441	32,269	38,215	43,906
7. Inarawan	4,965	6,312	7,767	9,254	10,673
8. Mambugan	15,636	19,680	24,039	28,487	32,743
9. Mayamot	15,887	19,995	24,423	28,941	33,264
10. San Isidro	19,260	24,220	29,566	35,020	40,240
11. San Jose	26,121	32,815	40,028	47,385	54,428
12. San Juan	1,394	1,838	2,319	2,813	3,280
13. San Luis	6,241	7,910	9,712	11,553	13,311
14. San Roque	17,227	21,673	26,465	31,355	36,034
15. Sta. Cruz	13,340	16,804	20,538	24,349	27,995

Source: Estimation made by the Study Team based on NSO data. Due to the absence of population data at barangay level prior to 1990, population projections at barangay level were based on the growth rate of the whole Antipolo municipality.

TABLE 6.1.8 BLIGHTED POPULATION BY CITY/MUNICIPALITY, NATIONAL CAPITAL REGION

CITY/ MUNICIPALITY	1982			1985			1990		
	NHA BLIGHTED POPULATION ESTIMATES	TOTAL POPULATION	%	NHA BLIGHTED POPULATION ESTIMATES	TOTAL POPULATION	%	BLIGHTED POPULATION ESTIMATES	TOTAL POPULATION	%
1. MANILA	545,496	1,723,044	32	470,237	1,765,903	26.6	425,312	1,598,918	26.6
2. CALOOCAN CITY	130,080	492,549	26	196,507	543,903	36.2	304,404	761,011	40.0
3. PASAY CITY	76,902	294,709	26	289,490	331,861	87.2	319,695	366,623	87.2
4. QUEZON CITY	371,904	1,296,099	29	566,415	1,377,927	41.1	755,045	1,666,766	45.3
5. LAS PINAS	29,592	98,655	30	35,235	207,770	17.0	53,433	296,851	18.0
6. MAKATI	81,612	393,537	21	77,033	421,367	18.3	82,850	452,734	18.3
7. MALABON	48,883	203,313	24	51,092	220,198	23.2	79,617	278,380	28.6
8. MANDALUYONG	63,570	217,505	29	68,629	233,844	29.3	86,811	244,538	35.5
9. MARIKINA	32,484	204,995	16	80,000	259,807	30.8	105,035	310,010	33.9
10. MUNTINLUPA	39,594	116,754	34	47,200	183,694	25.7	79,491	276,972	28.7
11. NAVOTAS	56,020	129,314	43	73,683	147,365	50.0	93,399	186,799	50.0
12. PARANAQUE	36,180	156,955	23	22,580	266,741	8.5	32,310	307,717	10.5
13. PASIG	37,898	309,337	12	78,348	334,771	23.4	112,836	397,309	28.4
14. PATEROS	2,946	45,277	7	8,000	48,347	16.5	8,481	51,401	16.5
15. SAN JUAN	21,972	135,590	16	15,000	142,444	10.5	13,304	126,708	10.5
16. TAGUIG	49,614	134,238	37	38,231	166,308	23.0	66,529	266,080	25.0
17. VALENZUELA	21,060	160,841	13	157,500	290,552	54.2	187,027	340,050	55.0
TOTAL	1,645,807	6,112,712	27	2,275,180	6,942,207	32.8	2,805,579	7,928,867	35.4

TABLE 6.1.9 BLIGHTED POPULATION PROJECTION, NCR

YEAR	TOTAL POPULATION (Thousands)	GROSS BLIGHTED POPULATION (Thousands)	% OF THE TOTAL POPULATION
1985	6,942.21	2,275.18	32.8
1986	7,036.55	2,305.09	32.7
1987	7,244.38	2,414.25	33.3
1988	7,462.03	2,533.21	33.9
1989	7,690.01	2,663.38	34.6
1990	7,928.87	2,805.57	35.4
1995	8,971.80	3,172.40	35.4
2000	9,948.98	3,512.38	35.3
2005	10,847.65	3,820.59	35.2
2010	11,649.61	4,091.27	35.1

Source: NHA-CORPLAN (1985-1990)
STUDY TEAM (1995-2010)

TABLE 6.1.10 PER CAPITA INCOME GROWTH (%)

YEAR	PER CAPITA INCOME GROWTH (%) SECTOR		
	1	2	3
1987	-1.37	-1.37	0.00
1988	-3.95	-3.95	0.00
1989	-7.37	-7.37	0.00
1990	-9.17	-9.17	0.00
1991	14.72	14.72	0.00
1992	-17.64	-17.64	0.00
1993	-1.22	-1.22	0.00
1994	-1.43	-1.43	0.00
1995	1.49	1.49	0.00
1996	3.11	3.11	0.00
1997	-3.01	-3.01	0.00
1998	-2.92	-2.92	0.00
1999	-3.00	-3.00	0.00
2000	-12.31	-12.31	0.00
2001	-1.28	-1.28	0.00
2002	-1.18	-1.18	0.00
2003	-1.08	-1.08	0.00
2004	-1.00	-1.00	0.00
2005	-0.91	-0.91	0.00
2006	-0.84	-0.84	0.00
2010	-0.56	-0.56	0.00

1. General Population
2. Urban Development Beneficiaries
3. Blighted Population

Source: MWSS (CORPLAN)

TABLE 6.1.11 GROSS DOMESTIC PROJECT (GDP), NATIONAL CAPITAL REGION

	INDUSTRIAL		SERVICE	
YEAR	GDP (M)	GROWTH RATE	GDP (M)	GROWTH RATE
1983	16645		15586	
1984	15022	-9.75	13901	-10.81
1985	13840	-7.87	13185	-5.15
1986	13640	-1.45	13093	-0.70
1987	14669	7.54	13539	3.41
1988	15431	5.19	14663	8.30
1989	16430	6.47	15480	5.57
1990	17844	8.61	16405	5.98
1991	18605	4.23	17340	5.70
1992	19651	5.62	17956	3.55
1993	20653	5.10	18767	4.51
1994	21650	4.83	19638	4.64
1995	22687	4.79	20467	4.22
1996	26729	4.60	21298	4.06
1997	24710	4.13	22114	3.83
1998	25728	4.12	22909	3.60
1999	26741	3.94	23735	3.60
2000	27755	3.79	24563	3.49
2001	28773	3.67	25383	3.34
2002	29787	3.53	26203	3.23
2003	30797	3.39	27020	3.12
2004	31811	3.29	27838	3.03
2005	32825	3.19	28660	2.95
2006	33839	3.09	29481	2.86
2007	34853	3.00	30300	2.78
2008	35867	2.91	31120	2.70
2009	36880	2.83	31939	2.63
2010	37894	2.75	32759	2.57

Note:

(1) Data for 1983 to 1985 were estimates as of June 1986 and were taken from NEDA.

(2) Projections for 1987 to 1992 were obtained from Projections of Regional Development Plans 1987-1992.

(3) Projection for 1993 to 2010 were estimates made by the Study Team.

TABLE 6.1.12 ESTIMATED AREA BY LAND CATEGORY, ANTIPOLO AREA, 1991

BARANGAY/ MUNICIPALITY	LAND USE							LAND AREA (Ha.)
	BUILT-UP Residential Institutional Facilities	COMMERCIAL	INDUSTRIAL	OPEN SPACE	AGRICULTURAL Ricefield Cropland Plantation	FOREST/ GRASSLAND Forest Grassland Shrubland Pasture	OTHERS Wetland Quarry	
Bagong Nayon	69.1	2.8	-	36.2	44.0	157.1	10.0	319.2
Sta. Cruz	115.0	1.0	-	147.6	85.0	385.0	44.8	778.4
De la Paz	56.0	1.8	-	134.6	72.0	156.2	-	420.6
Beverly Hills	20.0	-	-	7.0	4.4	-	-	31.4
San Roque	95.0	2.0	5.0	74.4	87.0	117.0	-	380.4
Dalig	85.0	0.8	6.0	75.0	100.5	65.3	-	332.6
San Jose	58.0	2.0	3.6	47.0	90.5	68.9	-	270.0
San Isidro	43.4	2.0	0.4	82.0	57.0	176.0	-	360.8
San Luis	10.0	-	-	13.6	30.0	180.0	-	233.6
Taytay	115.2	-	5.2	122.6	41.8	477.0	-	764.8
Angono	45.0	-	10.8	35.0	149.0	665.2	30.0	935.0
Binangonan	6.8	-	6.4	-	10.6	117.2	-	141.0
Teresa	-	-	-	0.8	24.2	95.0	-	120.0
TOTAL	721.5	12.4	37.4	775.8	796.0	2,659.9	84.8	5087.8

TABLE 6.1.13 ESTIMATED AREA BY LAND CATEGORY, ANTIPOLO AREA, 2020

BARANGAY/ MUNICIPALITY	LAND USE							LAND AREA (Ha.)
	BUILT-UP Residential Institutional Facilities	COMMERCIAL	INDUSTRIAL	OPEN SPACE	AGRICULTURAL Ricefield Cropland Plantation	FOREST/ GRASSLAND Forest Grassland Shrubland Pasture	OTHERS	
Bagong Nayon	118.0	3.9	-	20.1	29.2	135.6	12.4	319.2
Sta. Cruz	298.5	2.0	-	134.0	58.6	285.3	-	778.4
De la Paz	151.2	3.6	-	95.8	35.0	135.0	-	420.6
Beverly Hills	29.6	-	-	-	1.8	-	-	31.4
San Roque	168.6	4.0	6.0	61.8	42.8	97.2	-	380.4
Dalig	155.5	3.2	6.0	28.2	88.5	51.2	-	332.6
San Jose	114.0	3.8	6.5	15.4	66.5	63.8	-	270.0
San Isidro	108.4	3.5	1.0	54.2	38.4	155.3	-	360.8
San Luis	32.7	-	-	8.8	26.5	165.6	-	233.6
Taytay	224.4	-	7.0	63.4	49.2	420.8	-	764.8
Angono	130.5	-	15.2	20.0	145.2	597.7	26.4	935.0
Binangonan	10.5	-	6.4	-	10.6	113.5	-	141.0
Teresa	2.0	-	-	-	24.0	94.0	-	120.0
TOTAL	1,543.9	24.0	48.1	501.7	616.3	2,315.0	38.8	5,087.8

TABLE 6.2.1 NUMBER OF CONNECTIONS AND BILLED CONSUMPTION IN 1990

CITY /MUNICIPALITY	NUMBER OF SERVICE CONNECTIONS					WATER CONSUMPTION IN 1990 (CUBIC METER)						% TO TOTAL
	DOM	P.F.	COM.	IND.	OTHERS	DOM	P.F.	COM.	IND.	OTHERS	TOTAL	
I. NCR	587,778	462	41,010	5,763	528	275,826,999	1,430,279	109,937,991	24,761,109	1,442,796	413,399,174	97.4
CITY OF MANILA	155,052	86	14,452	707	88	75,898,348	354,831	42,357,707	4,760,534	913,457	124,284,877	29.3
PASAY CITY	25,087	33	1,907	151	8	10,198,494	62,164	5,327,980	292,085	3,565	15,884,288	3.7
QUEZON CITY	147,326	167	10,895	1,712	276	73,012,881	498,558	27,807,459	5,762,759	466,346	107,548,003	25.3
CALOOCAN CITY	44,673	41	2,535	718	5	16,102,242	118,420	3,675,980	2,973,311	8,600	22,878,553	5.4
LAS PINAS	7,939	8	315	32	19	1,082,472	13,573	199,821	38,095	12,195	1,345,156	0.3
MAKATI	40,210	5	3,189	294	8	22,351,210	7,495	15,313,713	1,494,580	5,532	39,172,530	9.2
MALABON	18,012	19	989	368	1	6,246,013	58,209	1,033,252	1,923,024	360	9,254,858	2.2
MANDALUYONG	21,345	19	1,123	257	4	9,453,861	51,006	3,610,376	2,508,080	3,570	15,626,893	3.7
MARIKINA	28,315	23	1,288	503	3	13,818,472	95,034	1,248,818	452,522	356	15,615,202	3.7
MUNTINLUPA	5,505	0	106	11	95	1,315,447	0	25,061	1,704	24,090	1,366,302	0.3
NAVOTAS	13,795	6	471	126	3	3,214,442	19,807	855,258	650,139	1,343	4,540,989	1.1
PARANAQUE	13,552	17	1,045	168	3	11,830,787	42,757	2,160,859	539,614	1,254	14,575,271	3.4
PASIG	32,630	21	1,105	266	11	15,810,304	45,118	3,010,142	2,600,769	1,088	21,467,421	5.1
PATEROS	2,349	0	34	3	0	628,561	0	17,946	1,135	0	647,642	0.2
SAN JUAN	12,651	8	920	146	1	8,633,477	45,615	2,641,428	386,174	205	11,706,899	2.8
TAGUIG	4,060	3	61	8	1	1,188,990	7,620	116,262	2,771	270	1,315,913	0.3
VALENZUELA	15,077	6	775	283	2	5,046,998	10,072	734,929	373,813	565	6,166,377	1.5
II. CAVITE	16,879	17	731	53	1,293	4,304,555	43,328	394,069	33,818	336,131	5,111,901	1.2
BACOOR	3,881	5	132	3	58	941,683	19,813	86,403	585	21,983	1,070,467	0.3
CAVITE CITY	7,807	8	398	32	218	1,982,973	17,099	234,181	19,886	56,740	2,310,879	0.5
IMUS	978	0	54	6	1	284,472	0	20,855	1,779	536	307,642	0.1
KAWIT	3,055	4	119	9	663	825,494	6,416	39,294	10,754	174,127	1,056,085	0.2
NOVELETA	507	0	5	1	104	117,848	0	1,592	300	28,112	147,852	0.0
ROSARIO	651	0	23	2	249	152,085	0	11,744	514	54,633	218,976	0.1
III. RIZAL	17,116	9	654	180	15	4,892,593	27,582	530,031	635,331	2,307	6,087,844	1.4
ANGONO	-	-	-	-	-	-	-	-	-	-	-	-
ANTIPOLO	4,445	1	223	41	3	1,316,107	1,416	194,554	570,630	481	2,083,188	0.5
BARAS	-	-	-	-	-	-	-	-	-	-	-	-
BINANGONAN	-	-	-	-	-	-	-	-	-	-	-	-
CAINTA	3,003	2	134	26	8	995,141	4,142	144,691	14,206	1,275	1,160,061	0.3
CARDONA	-	-	-	-	-	-	-	-	-	-	-	-
JARA-JARA	-	-	-	-	-	-	-	-	-	-	-	-
MONTALBAN	2,039	0	36	10	3	546,574	0	13,395	5,022	440	565,531	0.1
MORONG	-	-	-	-	-	-	-	-	-	-	-	-
PILILLA	-	-	-	-	-	-	-	-	-	-	-	-
SAN MATEO	3,678	4	107	47	0	841,283	12,224	59,772	17,650	0	930,929	0.2
TANAY	-	-	-	-	-	-	-	-	-	-	-	-
TAYTAY	3,951	2	154	56	1	1,192,782	9,800	117,619	27,823	111	1,348,135	0.3
TERESA	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	621,773	488	42,395	5,996	1,836	285,024,147	1,501,189	110,862,091	25,430,258	1,781,234	424,598,919	100.0

SOURCE : COMPUTER SERVICE CENTER, MWSS

TABLE 6.2.2 STATUS OF DOMESTIC WATER SUPPLY BY MWSS AND PRIVATE SYSTEMS

CITY/MUNICIPALITY	1990 CENSUS POPULATION	MWSS HOUSE SERVICE CONNECTION							MWSS PUBLIC FAUCETS						EQUIVALENT NO. OF POPULATION SERVED BY MWSS		PRIVATE WELL			EQUIVALENT NO. OF POPULATION SERVED BY MWSS & PRIVATE SYSTEM	
		AVG. DAILY CONSUMPTION		CONNECTIONS			AVERAGE PER CAPITA CONS. (LPCD)	CORR'D PER CAPITA CONS. (LPCD)	AVERAGE DAILY CONSUMP.	PUBLIC FAUCETS			AVERAGE PER CAPITA CONS. (LPCD)	CORR'D PER CAPITA CONS. (LPCD)			DOMESTIC SUPPLY AMOUNT	ESTIMATED SERVED POPULATION	SHARE IN SUPPLY AMOUNT		
		AMOUNT (M3/D)	% TO TOTAL	NUMBER	EQUIVALENT NO. OF POPULATION	% TO TOTAL POP.				NUMBER	EQUIVALENT NO. OF POP.	% TO TOTAL POP.			TOTAL (ESCAPP)	% TO TOTAL POP.	(M3/D)	*	(%)	TOTAL	% TO TOTAL
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
I. NCR	7,928,867	755,690	96.8	587,778	4,761,002	60.0	158.7	174	3,919	462	224,532	2.8	17.5	19	4,985,534	62.9	266,935	1,355,526	26.3	6,341,059	80.0
1. Manila	1,598,918	207,941	26.6	155,052	1,255,921	78.5	165.6	181	972	86	41,796	2.6	23.3	25	1,297,717	81.2	2,214	12,204	1.0	1,309,921	81.9
2. Pasay City	366,623	27,941	3.6	25,087	203,205	55.4	137.5	151	170	33	16,038	4.4	10.6	12	219,243	59.8	5,827	32,372 *	15.9	251,615	68.6
3. Quezon City	1,655,766	200,035	25.6	147,326	1,193,341	71.6	167.6	184	1,366	167	81,162	4.9	16.8	18	1,274,503	76.6	31,316	170,503	12.4	1,445,006	86.7
4. Caloocan City	761,011	44,116	5.5	44,673	361,851	47.5	121.9	134	324	41	19,926	2.6	16.3	18	381,777	50.2	19,137	106,317 *	28.2	488,094	64.1
5. Las Pinas	295,851	2,966	0.4	7,939	64,306	21.7	46.1	51	37	8	3,888	1.3	9.6	10	68,194	23.0	57,141	317,450 *	94.6	385,644	129.9
6. Makati	452,734	61,236	7.8	40,210	325,701	71.9	188.0	208	21	5	2,430	0.5	8.5	9	328,131	72.5	10,075	48,906	13.1	377,037	83.3
7. Malabon	278,380	17,096	2.2	18,012	145,897	52.4	117.2	128	159	19	9,234	3.3	17.3	19	155,131	55.7	1,892	10,511 *	9.1	165,642	59.5
8. Mandaluyong	244,538	25,901	3.3	21,345	172,895	70.7	149.8	164	140	19	9,234	3.8	15.1	17	182,129	74.5	1,495	9,108	5.0	191,236	78.2
9. Marikina	310,010	37,859	4.8	28,315	228,352	74.0	165.1	181	250	23	11,178	3.6	23.3	26	240,530	77.6	5,340	29,525	11.3	270,054	87.1
10. Muntinlupa	276,972	3,804	0.5	5,505	44,591	16.1	80.8	89	-	-	0	-	-	-	44,591	16.1	49,108	272,822 *	92.5	317,413	114.6
11. Navotas	186,799	8,807	1.1	13,795	111,740	59.8	78.8	86	54	6	2,916	1.6	18.6	20	114,656	61.4	1,691	9,394 *	14.8	124,050	66.4
12. Parañaque	307,717	32,413	4.2	13,552	109,771	35.7	295.3	324	117	17	8,352	2.7	16.2	16	118,033	38.4	47,553	146,979	57.2	265,012	86.1
13. Pasig	397,309	43,316	5.5	32,830	264,303	66.5	163.9	180	124	21	10,206	2.6	12.1	13	274,509	69.1	9,223	51,361	16.2	325,870	82.0
14. Pateros	51,401	1,722	0.2	2,349	19,027	37.0	90.5	99	-	-	0	-	-	-	19,027	37.0	0	0 *	0.0	19,027	37.0
15. San Juan	126,708	23,653	3.0	12,851	104,093	82.2	227.2	249	125	6	3,888	3.1	32.1	35	107,981	85.2	252	1,012	1.0	108,993	86.0
16. Taguig	265,080	3,258	0.4	4,060	32,886	12.4	98.1	109	21	3	1,458	0.5	14.3	16	34,344	12.9	21,514	119,522 *	85.7	153,866	57.8
17. Valenzuela	340,050	13,827	1.8	15,027	122,124	35.9	113.2	124	28	6	2,916	0.9	9.5	10	125,040	36.8	3,157	17,539 *	17.2	142,579	41.9
II. CAVITE	457,020	11,793	1.5	16,879	136,133	29.8	86.6	95	119	17	8,262	1.8	14.4	16	144,395	31.6	46,864	260,354	78.2	404,749	88.6
1. Bacoor	159,685	2,580	0.3	3,881	31,436	19.7	82.1	90	54	5	2,430	1.5	22.3	24	33,866	21.2	31,507	175,039 *	91.6	208,905	130.8
2. Cavite City	91,641	5,433	0.7	7,807	63,237	69.0	85.9	94	47	8	3,888	4.2	12.0	13	67,125	73.2	849	4,717 *	12.4	71,841	78.4
3. Imus	92,125	779	0.1	978	7,335	8.0	106.3	116	-	0	0	0.0	-	-	7,335	8.0	3,258	18,156 *	79.3	25,491	27.7
4. Kawit	47,755	2,262	0.3	3,055	24,746	51.8	91.4	100	18	4	1,944	4.1	9.0	10	26,690	55.9	2,830	15,722 *	59.1	42,412	88.8
5. Noveleta	20,409	323	0.0	507	4,107	20.1	78.6	86	-	0	0	0.0	-	-	4,107	20.1	5,659	31,435 *	94.1	35,542	174.2
6. Rosario	45,405	417	0.1	651	5,273	11.6	79.0	87	-	0	0	0.0	-	-	5,273	11.6	2,751	15,282 *	85.8	20,555	45.3
III. RIZAL	980,194	13,494	1.7	17,116	139,499	14.2	96.1	105	76	9	3,216	0.3	23.5	26	142,715	14.6	65,191	362,061	81.5	504,776	51.5
1. Angono	45,014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Antipolo	207,842	3,606	0.5	4,445	38,005	17.3	100.1	110	4	1	54	0.0	71.8	79	38,059	17.3	23,367	163,150 *	88.1	199,209	95.8
3. Baras	15,880	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Binangonan	127,561	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Cainta	126,839	2,728	0.3	3,003	24,324	19.2	112.2	123	11	2	972	0.8	11.7	13	25,296	19.9	9,273	51,517 *	75.5	76,813	60.6
6. Cardona	32,952	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7. Jala-Jala	16,318	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8. Montalban	67,074	1,498	0.2	2,039	15,904	23.7	94.2	103	0	0	0	0.0	-	-	15,904	23.7	4,244	23,578 *	72.1	39,482	58.9
9. Morong	32,165	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Pililla	32,771	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11. San Mateo	82,310	2,305	0.3	3,678	31,263	38.0	93.7	81	33	4	1,218	1.5	27.5	30	32,481	39.5	2,647	14,706 *	50.2	47,187	57.3
12. Tanay	58,410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13. Taytay	112,403	3,268	0.4	3,951	32,003	28.5	102.1	112	27	2	972	0.9	27.6	30	32,975	29.3	19,640	109,111 *	84.5	142,086	126.4
14. Teresa	20,645	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	9,366,081	780,888	100.0	621,773	5,036,634	53.8	155.0	170	4,113	488	236,010	2.5	17.4	19	5,272,644	56.3	378,970	1,977,941	30.6	7,250,585	77.4

(5)=(4)x8.1 (7)=(2)/(5)x1000 (8)=(7)x1.0557 (11)=(10)x486 (13)=(9)/(11)x1000 (14)=(13)x1.0557 (15)=(5)+(11) (18)=(17)/(8)x1000 (19)=(17)/{{(2)+(9)}*1.0957+(17)}*100 (20)=(15)+(18)

* Assumed per capita consumption of 180 lpcd was used instead of estimated per capita consumption considering suppressed water supply condition.

TABLE 6.2.3 STATUS OF COMMERCIAL CONSUMPTION IN 1990

CITY/MUNICIPALITY	AVG. DAILY BILLED MWSS COMMERCIAL CONSUM.			NUMBER OF MWSS METER CONNECTION	CONSUMPTION PER METER CONNECTION		PRIVATE WELL COMM'L PUMPAGE (M3/DAY)	ESTIMATED TOTAL COMM'L CONSUM. (M3/DAY)	% TO TOTAL (%)	SHARE OF PRIVATE WELL (%)
	AMOUNT (M3/DAY)	CORRECTED (M3/DAY)	% TO TOTAL		BILLED (M3/DAY)	CORRECTED (M3/DAY)				
I. NCR	301,200	341,350	99.2	41,010	7.345	8.324	93,315	434,665	96.4	21.5
1. Manila	116,049	131,518	38.2	14,452	8.030	9.100	4,665	136,183	30.2	3.4
2. Pasay City	14,597	16,543	4.8	1,907	7.655	8.675	8,795	25,338	5.6	34.7
3. Quezon City	76,185	86,340	25.1	10,695	7.123	8.073	27,641	113,981	25.3	24.3
4. Calookan City	10,071	11,414	3.3	2,535	3.973	4.502	3,674	15,088	3.3	24.4
5. Las Pinas	547	620	0.2	315	1.738	1.970	3,678	4,299	1.0	85.6
6. Makati	41,955	47,548	13.8	3,189	13.156	14.910	11,721	59,269	13.1	19.8
7. Malabon	2,831	3,208	0.9	989	2.862	3.244	2,016	5,224	1.2	38.6
8. Mandaluyong	9,891	11,210	3.3	1,123	8.808	9.982	2,128	13,338	3.0	16.0
9. Marikina	3,424	3,881	1.1	1,288	2.659	3.013	1,400	5,280	1.2	26.5
10. Muntinlupa	69	78	0.0	106	0.648	0.734	8,230	8,308	1.8	99.1
11. Navotas	1,795	2,035	0.6	471	3.812	4.320	621	2,655	0.6	23.4
12. Paranaque	5,920	6,709	1.9	1,045	5.665	6.420	4,914	11,624	2.6	42.3
13. Pasig	8,247	9,346	2.7	1,105	7.463	8.458	6,658	16,004	3.5	41.6
14. Pateros	49	56	0.0	34	1.446	1.639	0	56	0.0	0.0
15. San Juan	7,237	8,201	2.4	920	7.866	8.915	97	8,299	1.8	1.2
16. Taguig	319	361	0.1	61	5.222	5.918	3,655	4,016	0.9	91.0
17. Valenzuela	2,014	2,282	0.7	775	2.598	2.944	3,423	5,705	1.3	60.0
II. CAVITE	1,080	1,224	0.4	731	1.477	1.674	5,175	6,399	1.4	80.9
1. Bacoor	237	268	0.1	132	1.793	2.032	703	971	0.2	72.4
2. Cavite City	642	727	0.2	398	1.612	1.827	3,480	4,207	0.9	82.7
3. Imus	57	65	0.0	54	1.058	1.199	644	709	0.2	90.9
4. Kawit	108	122	0.0	119	0.905	1.025	0	122	0.0	0.0
5. Noveleta	4	5	0.0	5	0.872	0.989	0	5	0.0	0.0
6. Rosario	32	36	0.0	23	1.399	1.585	348	385	0.1	90.5
III. RIZAL	1,452	1,646	0.5	654	2.220	2.516	8,338	9,983	2.2	83.5
1. Angono	-	-	-	-	-	-	-	-	-	-
2. Antipolo	533	604	0.2	223	2.390	2.709	2,763	3,367	0.7	82.1
3. Baras	-	-	-	-	-	-	-	-	-	-
4. Binangonan	-	-	-	-	-	-	-	-	-	-
5. Cainta	396	449	0.1	134	2.958	3.353	3,173	3,622	0.8	87.6
6. Cardona	-	-	-	-	-	-	-	-	-	-
7. Jala-Jala	-	-	-	-	-	-	-	-	-	-
8. Montalban	37	42	0.0	36	1.019	1.155	844	886	0.2	95.3
9. Morong	-	-	-	-	-	-	-	-	-	-
10. Pililla	-	-	-	-	-	-	-	-	-	-
11. San Mateo	164	186	0.1	107	1.530	1.734	390	576	0.1	67.8
12. Tanay	-	-	-	-	-	-	-	-	-	-
13. Taytay	322	365	0.1	154	2.092	2.371	1,167	1,532	0.3	76.2
14. Teresa	-	-	-	-	-	-	-	-	-	-
TOTAL	303,732	344,219	100.0	42,395	7.164	8.119	106,828	451,047	100.0	23.7

TABLE 6.2.4 STATUS OF INDUSTRIAL CONSUMPTION IN 1990

CITY/MUNICIPALITY	AVG. DAILY BILLED MWSS INDUSTRIAL CONSUM.			NUMBER OF MWSS METER CONNECTION	CONSUMPTION PER METER CONNECTION		PRIVATE WELL IND'L PUMPAGE (M3/DAY)	ESTIMATED TOTAL IND'L CONS. (M3/DAY)	% TO TOTAL	SHARE OF PRIVATE WELL (%)
	BILLED (M3/DAY)	CORRECTED (M3/DAY)	% TO TOTAL		BILLED (M3/DAY)	CORRECTED (M3/DAY)				
I. NCR	71,792	81,361	96.3	6,291	11.412	12.933	280,687	362,048	82.4	77.5
1. Manila	15,545	17,617	20.9	795	19.554	22.160	5,786	23,403	5.3	24.7
2. Pasay City	810	918	1.1	169	4.793	5.432	3,375	4,293	1.0	78.6
3. Quezon City	17,066	19,341	22.9	1,988	8.585	9.729	32,368	51,708	11.8	62.6
4. Calookan City	8,170	9,259	11.0	723	11.300	12.806	4,665	13,923	3.2	33.5
5. Las Pinas	138	156	0.2	51	2.702	3.062	20,959	21,115	4.8	99.3
6. Makati	4,110	4,658	5.5	302	13.609	15.423	3,383	8,041	1.8	42.1
7. Malabon	5,270	5,972	7.1	369	14.281	16.184	14,565	20,537	4.7	70.9
8. Mandaluyong	6,881	7,799	9.2	261	26.365	29.879	5,353	13,151	3.0	40.7
9. Marikina	1,241	1,406	1.7	506	2.452	2.779	6,833	8,239	1.9	82.9
10. Muntinlupa	71	80	0.1	106	0.667	0.756	34,280	34,360	7.8	99.8
11. Navotas	1,785	2,023	2.4	129	13.836	15.681	1,739	3,762	0.9	46.2
12. Paranaque	1,482	1,679	2.0	171	8.666	9.821	17,691	19,370	4.4	91.3
13. Pasig	7,128	8,079	9.6	277	25.734	29.165	60,077	68,156	15.5	88.1
14. Pateros	3	4	0.0	3	1.037	1.175	1,756	1,760	0.4	99.8
15. San Juan	1,059	1,200	1.4	147	7.201	8.161	59	1,259	0.3	4.7
16. Taguig	8	9	0.0	9	0.926	1.049	41,198	41,208	9.4	100.0
17. Valenzuela	1,026	1,162	1.4	285	3.599	4.079	26,600	27,763	6.3	95.8
II. CAVITE	1,014	1,149	1.4	1,346	0.753	0.853	5,889	7,037	1.6	83.7
1. Bacoor	62	70	0.1	61	1.014	1.149	0	70	0.0	0.0
2. Cavite City	210	238	0.3	250	0.840	0.952	0	238	0.1	0.0
3. Imus	6	7	0.0	7	0.906	1.027	530	538	0.1	98.7
4. Kawit	507	574	0.7	672	0.754	0.854	0	574	0.1	0.0
5. Noveleta	78	88	0.1	105	0.741	0.840	0	88	0.0	0.0
6. Rosario	151	171	0.2	251	0.602	0.682	5,358	5,530	1.3	96.9
III. RIZAL	1,747	1,980	2.3	195	8.959	10.153	68,328	70,308	16.0	97.2
1. Angono	-	-	-	-	-	-	-	-	-	-
2. Antipolo	1,565	1,773	2.1	44	35.561	40.301	12,025	13,798	3.1	87.1
3. Baras	-	-	-	-	-	-	-	-	-	-
4. Binangonan	-	-	-	-	-	-	-	-	-	-
5. Cainta	42	48	0.1	34	1.247	1.414	36,173	36,221	8.2	99.9
6. Cardona	-	-	-	-	-	-	-	-	-	-
7. Jala-Jala	-	-	-	-	-	-	-	-	-	-
8. Montalban	15	17	0.0	13	1.151	1.305	2,941	2,958	0.7	99.4
9. Morong	-	-	-	-	-	-	-	-	-	-
10. Pililla	-	-	-	-	-	-	-	-	-	-
11. San Mateo	48	55	0.1	47	1.029	1.166	604	658	0.1	91.7
12. Tanay	-	-	-	-	-	-	-	-	-	-
13. Taytay	77	87	0.1	57	1.343	1.522	16,586	16,672	3.8	99.5
14. Teresa	-	-	-	-	-	-	-	-	-	-
TOTAL	74,552	84,490	100.0	7,832	9.519	10.788	354,904	439,394	100.0	80.8

Billed Water Consumption categorized in Others are included in Industrial Consumption

TABLE 6.2.5 PER CAPITA DOMESTIC WATER DEMAND GROWTH

FOR GENERAL POPULATION

YEAR	PCIG(I) (1)	IED (2)	IR1(I) (3)	TI(I) (4)	PED (5)	IR2(I) (6)	IR(I) (7)	II(I) (8)
1990	-9.17	0.30	-2.75	-0.77	-0.20	0.15	-2.60	1.0000
1991	14.72	0.30	4.42	-2.53	-0.20	0.51	4.92	1.0492
1992	-17.64	0.30	-5.29	-0.31	-0.20	0.06	-5.23	0.9943
1993	-1.22	0.30	-0.37	1.38	-0.20	-0.28	-0.64	0.9880
1994	-1.43	0.30	-0.43	1.38	-0.20	-0.28	-0.71	0.9810
1995	1.49	0.30	0.45	1.38	-0.20	-0.28	0.17	0.9827
1996	3.11	0.30	0.93	1.38	-0.20	-0.28	0.66	0.9891
1997	-3.01	0.30	-0.90	1.38	-0.20	-0.28	-1.18	0.9775
1998	-2.92	0.30	-0.88	1.38	-0.20	-0.28	-1.15	0.9662
1999	-3.00	0.30	-0.90	1.38	-0.20	-0.28	-1.18	0.9548
2000	-12.31	0.30	-3.69	1.38	-0.20	-0.28	-3.97	0.9169
2001	-1.28	0.30	-0.38	1.38	-0.20	-0.28	-0.66	0.9109
2002	-1.18	0.30	-0.35	1.38	-0.20	-0.28	-0.63	0.9052
2003	-1.08	0.30	-0.32	1.38	-0.20	-0.28	-0.60	0.8997
2004	-1.00	0.30	-0.30	1.38	-0.20	-0.28	-0.58	0.8945
2005	-0.91	0.30	-0.27	1.38	-0.20	-0.28	-0.55	0.8896
2006	-0.84	0.30	-0.25	1.38	-0.20	-0.28	-0.53	0.8849
2007	-0.77	0.30	-0.23	1.38	-0.20	-0.28	-0.51	0.8804
2008	-0.70	0.30	-0.21	1.38	-0.20	-0.28	-0.49	0.8762
2009	-0.63	0.30	-0.19	1.38	-0.20	-0.28	-0.46	0.8721
2010	-0.56	0.30	-0.17	1.38	-0.20	-0.28	-0.44	0.8682

FOR BLIGHTED POPULATION

YEAR	PCIG(I) (1)	IED (2)	IR1(I) (3)	TI(I) (4)	PED (5)	IR2(I) (6)	IR(I) (7)	II(I) (8)
1990	0.00	0.11	0.00	-0.77	-0.06	0.05	0.05	1.0000
1991	0.00	0.11	0.00	-2.53	-0.06	0.15	0.15	1.0015
1992	0.00	0.11	0.00	-0.31	-0.06	0.02	0.02	1.0017
1993	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	1.0009
1994	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	1.0000
1995	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9992
1996	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9984
1997	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9976
1998	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9967
1999	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9959
2000	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9951
2001	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9943
2002	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9934
2003	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9926
2004	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9918
2005	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9910
2006	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9902
2007	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9893
2008	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9885
2009	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9877
2010	0.00	0.11	0.00	1.38	-0.06	-0.08	-0.08	0.9869

SOURCE: CORPLAN

(1) Per capita income growth in real terms in year I (%)
(2) Income elasticity of consumption
(3) Increase rate by income growth in year I (1) * (2) (%)
(4) Tariff increase in real terms in year I (%)
(5) Price elasticity of consumption
(6) Increase rate by tariff increase in year I (4) * (5) (%)
(7) Increase rate in year I (%)
(8) Increase index in year I, 1.0000 in base year 1990

TABLE 6.2.6 PER CAPITA DOMESTIC CONSUMPTION PROJECTION

CITY/MUNICIPALITY	1990	1995	2000	2005	2010
I. NCR	174				
CITY OF MANILA	181	186	191	195	200
PASAY CITY *a	151	180	187	193	200
QUEZON CITY	184	188	192	196	200
CALOOCAN CITY *a	134	180	187	193	200
LAS PINAS *s	51	180	187	193	200
MAKATI	206	210	213	217	220
MALABON *a	128	180	187	193	200
MANDALUYONG	164	180	187	193	200
MARIKINA	181	186	190	195	200
MUNTINLUPA *s	89	180	187	193	200
NAVOTAS *a	86	180	187	193	200
PARANAQUE	324	305	287	268	250
PASIG	180	185	190	195	200
PATEROS *a	99	180	187	193	200
SAN JUAN	249	249	249	250	250
TAGUIG *a	109	180	187	193	200
VALENZUELA *a	124	180	187	193	200
II. CAVITE	95				
BACOOR *s, f	90	180	187	193	200
CAVITE CITY *f	94	180	187	193	200
IMUS *f	116	180	187	193	200
KAWIT *f	100	180	187	193	200
NOVELETA **	86	180	187	193	200
ROSARIO *f	87	180	187	193	200
III. RIZAL	105				
ANGONO *r	-	141	160	181	205
ANTIPOLO *f	110	138	149	155	162
BARAS *r	-	141	160	181	205
BINANGONAN *r	-	141	160	181	205
CAINTA *a	123	180	187	193	200
CARDONA *r	-	141	160	181	205
JARA-JARA *r	-	141	160	181	205
MONTALBAN *f	103	111	118	124	129
MORONG *r	-	141	160	181	205
PILILLA *r	-	141	160	181	205
SAN MATEO *f	81	178	190	204	219
TANAY *r	-	141	160	181	205
TAYTAY *a	112	180	187	193	200
TERESA *r	-	141	160	181	205

1. Areas with <*a> have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with <*s> also have suppressed demand due to low water pressure, and be expected to be improved by MSWDP.
3. Areas with <*f> have suppressed demand due to limited water sources, and be expected to be improved by FAWSP.
4. Areas with <*r> are merged area under BP799, and be expected to be improved by RPWSIP.
5. Per capita water demand in Noveleta was assumed to be same as the one in Kawit

TABLE 6.2.7 MODIFIED WATER-BLIGHTED POPULATION IN THE NCR, BY CITY/MUNICIPALITY

CITY/ MUNICIPALITY	1990			1995		2000		2005		2010	
	TOTAL POPULATION	BLIGHTED POPULATION	%	TOTAL POPULATION	WATER BLIGHTED POPULATION	TOTAL POPULATION	WATER BLIGHTED POPULATION	TOTAL POPULATION	WATER BLIGHTED POPULATION	TOTAL POPULATION	WATER BLIGHTED POPULATION
1. Manila City	1,598,918	244,184	15.3	1,666,014	253,102	1,705,567	257,958	1,723,126	259,690	1,723,147	258,959
2. Pasay City	366,623	116,339	31.7	402,932	127,193	433,048	136,092	457,147	143,156	475,225	148,397
3. Quezon City	1,666,766	337,037	20.2	1,870,519	376,263	2,049,017	410,335	2,200,635	439,136	2,323,154	462,274
4. Caloocan City	761,011	216,709	28.5	872,801	247,245	979,527	276,244	1,076,883	302,624	1,164,630	326,356
5. Las Pinas	296,851	38,040	12.8	413,469	52,707	551,808	70,029	708,704	89,621	878,109	110,730
6. Makati	452,734	58,982	13.0	489,333	63,417	517,961	66,829	539,315	69,337	553,794	70,997
7. Malabon	278,380	56,680	20.4	305,870	61,952	328,653	66,271	346,868	69,696	360,515	72,233
8. Mandaluyong	244,538	51,004	20.9	265,870	55,164	282,944	58,445	296,044	60,935	305,315	62,665
9. Marikina	310,010	57,422	18.5	359,368	66,217	405,480	74,381	447,289	81,760	483,621	88,151
10. Muntinlupa	276,972	56,591	20.4	346,829	70,494	419,918	84,969	493,739	99,553	565,215	113,642
11. Navotas	186,799	53,436	28.6	207,567	59,067	225,328	63,836	240,031	67,760	251,550	70,811
12. Paranaque	307,717	23,002	7.5	369,370	27,466	430,253	31,851	488,493	36,035	541,964	39,866
13. Pasig	397,309	80,329	20.2	466,552	93,837	532,663	106,657	593,888	118,495	648,283	128,982
14. Pateros	51,401	6,038	11.7	58,438	6,828	64,776	7,535	70,318	8,151	74,945	8,563
15. San Juan	126,708	9,471	7.5	133,478	9,925	137,583	10,185	140,304	10,350	141,007	10,372
16. Taguig	266,080	47,363	17.8	311,031	55,075	353,627	62,339	392,792	68,998	427,323	74,851
17. Valenzuela	340,050	133,147	39.2	432,359	168,407	530,824	205,839	632,076	244,234	731,811	281,971
T O T A L	7,928,867	1,585,773	20.0	8,971,800	1,794,360	9,948,977	1,989,795	10,847,652	2,169,530	11,649,608	2,329,922

TABLE 6.2.8 PROJECTED DOMESTIC WATER CONSUMPTION IN 1995, BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (1995)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (1995)			MWSS CONNECTED *			MWSS CONNECTED POPULATION			MWSS DOMESTIC CONSUMPTION			PRIVATE DOM. CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	MWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	8,971,800	7,177,440	1,794,360	192	35	1,379,394	62,803	1,442,197	80	30	70	5,777,280	542,543	6,319,823	1,107,301	18,989	1,126,290	272,094	43,814	315,907
CITY OF MANILA	1,666,014	1,412,912	253,102	186	35	262,886	8,859	271,745	95	30	85	1,342,266	75,931	1,418,197	249,742	2,658	252,399	13,144	6,201	19,345
PASAY CITY *a	402,932	275,739	127,193	180	35	49,633	4,452	54,085	85	30	68	234,378	38,158	272,536	42,188	1,336	43,524	7,445	3,116	10,561
QUEZON CITY	1,870,519	1,494,256	376,263	188	35	280,548	13,169	293,717	95	30	82	1,419,543	112,879	1,532,422	266,521	3,951	270,472	14,027	9,218	23,246
CALOOCAN CITY *a	872,801	625,556	247,245	180	35	112,600	8,654	121,254	70	30	59	437,883	74,174	512,053	78,820	2,596	81,416	33,780	6,058	39,838
LAS PINAS *s	413,469	360,762	52,707	180	35	64,937	1,845	66,782	45	30	43	162,343	15,812	178,155	29,222	553	29,775	35,715	1,291	37,007
MAKATI	489,333	425,916	63,417	210	35	89,231	2,220	91,451	90	30	82	383,324	19,025	402,349	80,308	656	80,974	8,923	1,554	10,477
MALABON *a	305,870	243,918	61,952	180	35	43,905	2,168	46,074	70	30	62	170,742	18,586	189,328	30,734	650	31,384	13,172	1,518	14,689
MANDALUYONG	265,870	210,706	55,164	180	35	37,927	1,931	39,858	95	30	82	200,171	16,549	216,720	36,031	579	36,610	1,896	1,352	3,248
MARIKINA	359,368	293,151	66,217	186	35	54,423	2,318	56,741	95	30	83	278,493	19,865	298,359	51,702	695	52,397	2,721	1,622	4,343
MUNTINLUPA *s	346,829	276,335	70,494	180	35	49,740	2,467	52,208	40	30	38	110,534	21,148	131,682	19,896	740	20,636	29,844	1,727	31,571
NAVOTAS *a	207,567	148,500	59,067	180	35	26,730	2,067	28,797	90	30	73	133,650	17,720	151,370	24,057	620	24,677	2,673	1,447	4,120
PARANAQUE *s	369,370	341,904	27,466	305	35	104,333	961	105,294	60	40	59	205,142	10,987	216,129	62,600	385	62,984	41,733	577	42,310
PASIG	466,552	372,715	93,837	185	35	68,833	3,284	72,117	90	30	78	335,444	28,151	363,595	61,949	985	62,935	6,883	2,299	9,182
PATEROS *a	58,438	51,610	6,828	180	35	9,290	239	9,529	45	30	43	23,224	2,049	25,273	4,180	72	4,252	5,109	167	5,277
SAN JUAN	133,478	123,553	9,925	249	35	30,794	347	31,141	95	45	91	117,375	4,466	121,841	29,254	156	29,410	1,540	191	1,731
TAGUIG *a	311,031	255,956	55,075	180	35	46,072	1,928	48,000	20	30	22	51,191	16,523	67,714	9,214	578	9,793	36,858	1,349	38,207
VALENZUELA *a	432,359	263,952	168,407	180	35	47,511	5,894	53,406	65	30	51	171,569	50,522	222,091	30,882	1,768	32,651	16,629	4,126	20,755
II. CAVITE	534,043	515,406	18,637	180	35	92,773	652	93,425	48	30	47	245,186	5,667	250,853	44,133	198	44,332	48,640	454	49,094
BACOOR *f,s	196,636	189,262	7,374	180	35	34,067	258	34,325	45	30	44	85,168	2,212	87,380	15,330	77	15,408	18,737	181	18,918
CAVITE CITY *f	98,576	96,654	1,922	180	35	17,398	67	17,465	63	54	63	60,654	1,035	61,689	10,918	36	10,954	6,480	31	6,511
IMUS *f	107,162	103,813	3,349	180	35	18,686	117	18,804	41	28	41	43,045	937	43,982	7,748	33	7,781	10,938	84	11,023
KAWIT *f	55,217	54,555	662	180	35	9,820	23	9,843	69	67	69	37,702	442	38,144	6,786	15	6,802	3,034	8	3,041
NOVELETA	23,325	22,511	814	180	35	4,052	28	4,080	25	30	25	5,628	244	5,872	1,013	9	1,022	3,039	20	3,059
ROSARIO *f	53,127	48,611	4,516	180	35	8,750	158	8,908	27	18	26	12,989	797	13,786	2,338	28	2,366	6,412	130	6,542
III. RIZAL	1,149,930	660,355	489,575	154	34	101,805	16,835	118,640	47	10	31	308,031	46,718	354,749	45,785	1,752	47,536	56,021	15,083	71,104
ANGONO *r	55,062	22,025	33,037	141	35	3,115	1,156	4,271	100	0	40	22,025	0	22,025	3,115	0	3,115	0	1,156	1,156
ANTIPOLO *f	261,728	208,674	53,054	138	39	28,796	2,068	30,864	37	23	34	76,871	12,370	89,241	10,608	482	11,090	18,188	1,586	19,774
BARAS *r	19,051	898	18,153	141	31	127	558	685	100	0	5	898	0	898	127	0	127	0	558	558
BINANGONAN *r	140,791	49,553	91,238	141	34	7,008	3,109	10,117	100	0	35	49,553	0	49,553	7,008	0	7,008	0	3,109	3,109
CAINTA *a	164,650	131,720	32,930	180	35	23,710	1,153	24,862	25	30	26	32,930	9,879	42,809	5,927	346	6,273	17,782	807	18,589
CARDONA *r	35,194	3,465	31,729	141	30	490	966	1,456	100	0	10	3,465	0	3,465	490	0	490	0	966	966
JALA-JALA *r	17,814	517	17,297	141	31	73	542	615	100	0	3	517	0	517	73	0	73	0	542	542
MONTALBAN *f	75,766	58,944	16,822	111	39	6,538	657	7,195	56	41	52	32,779	6,841	39,620	3,636	267	3,903	2,902	390	3,292
MORONG *r	34,528	6,750	27,778	141	31	955	861	1,816	100	0	20	6,750	0	6,750	955	0	955	0	861	861
PILILLA *r	36,137	4,968	31,169	141	32	703	993	1,696	100	0	14	4,968	0	4,968	703	0	703	0	993	993
SAN MATEO *f	92,401	50,515	41,886	178	39	8,995	1,636	10,630	44	24	35	22,279	9,859	32,138	3,967	385	4,352	5,028	1,251	6,278
TANAY *r	65,810	15,347	50,463	141	33	2,170	1,656	3,826	100	0	23	15,347	0	15,347	2,170	0	2,170	0	1,656	1,656
TAYTAY *a	129,481	103,585	25,896	180	35	18,645	906	19,552	35	30	34	36,255	7,769	44,024	6,526	272	6,798	12,119	634	12,754
TERESA *r	21,507	3,394	18,113	141	32	480	575	1,055	100	0	16	3,394	0	3,394	480	0	480	0	575	575
TOTAL	10,655,773	8,353,201	2,302,572	188	35	1,573,973	80,290	1,654,262	76	26	65	6,330,496	594,928	6,925,425	1,197,219	20,939	1,218,158	376,754	59,351	436,105

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by MSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by FAWSP.
4. Areas with (*r) are merged area under BP799, and be expected to be improved by RPWSIP.

TABLE 6.2.9 PROJECTED DOMESTIC WATER CONSUMPTION BY CITY/MUNICIPALITY IN 2000

CITY/MUNICIPALITY	TOTAL POPULATION (2000)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (2000)			MWSS CONNECTED %			MWSS CONNECTED POPULATION			MWSS DOMESTIC CONSUMPTION			PRIVATE DOMESTIC CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	MWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	9,948,977	7,959,182	1,989,795	196	35	1,562,371	69,643	1,632,014	88	60	83	7,026,290	1,193,877	8,220,167	1,378,418	41,786	1,420,202	183,955	27,857	211,812
CITY OF MANILA	1,705,567	1,447,609	257,958	191	35	276,069	9,029	285,097	95	60	90	1,375,228	154,775	1,530,003	262,265	5,419	267,682	13,803	3,611	17,415
PASAY CITY *s	433,048	295,956	136,092	187	35	55,432	4,763	60,195	90	60	81	267,260	81,655	348,916	49,889	2,858	52,747	5,543	1,905	7,448
QUEZON CITY	2,049,017	1,638,682	410,335	192	35	314,355	14,362	328,717	95	60	88	1,556,748	246,201	1,802,949	298,637	8,617	307,254	15,718	5,745	21,462
CALOOCAN CITY *s	979,527	703,283	276,244	187	35	131,280	9,669	140,948	80	60	74	562,627	165,746	728,373	105,024	5,801	110,825	26,256	3,867	30,123
LAS PINAS *s	551,808	481,779	70,029	187	35	89,932	2,451	92,383	75	60	72	361,335	42,017	403,352	67,449	1,471	68,920	22,483	980	23,463
MAKATI	517,961	451,132	66,829	213	35	96,093	2,339	98,432	95	60	90	428,576	40,097	468,673	91,288	1,403	92,691	4,805	936	5,740
MALABON *s	328,653	262,382	66,271	187	35	48,978	2,319	51,297	80	60	76	209,906	39,762	249,668	39,182	1,392	40,574	9,796	928	10,723
MANDALUYONG	282,944	224,499	58,445	187	35	41,986	2,046	43,952	95	60	88	213,274	35,067	248,341	39,811	1,227	41,038	2,095	818	2,914
MARIKINA	405,480	331,099	74,381	190	35	62,952	2,603	65,556	95	60	89	314,544	44,629	359,173	59,800	1,562	61,462	3,153	1,041	4,194
MUNTINLUPA *s	419,918	334,949	84,969	187	35	62,524	2,974	65,498	75	60	72	251,211	50,982	302,193	46,893	1,784	48,677	15,631	1,190	16,821
NAVOTAS *s	225,328	161,492	63,836	187	35	30,145	2,234	32,379	95	60	85	153,417	38,302	191,719	28,638	1,341	29,978	1,507	894	2,401
PARANAQUE *s	430,253	398,402	31,851	287	35	114,249	1,115	115,364	80	60	79	318,721	19,111	337,832	91,399	669	92,068	22,850	446	23,296
PASIG	532,663	425,006	106,657	190	35	80,850	3,733	84,583	95	60	88	404,706	63,994	468,700	76,807	2,240	79,047	4,042	1,493	5,536
PATEROS *s	64,776	57,241	7,535	187	35	10,685	264	10,949	70	60	69	40,068	4,521	44,590	7,479	158	7,638	3,205	105	3,311
SAN JUAN	137,583	127,398	10,185	249	35	31,784	356	32,141	95	60	92	121,028	6,111	127,139	30,135	214	30,409	1,588	143	1,732
TAGUIG *s	353,627	291,288	62,339	187	35	54,374	2,182	56,556	70	60	68	203,902	37,403	241,305	38,062	1,309	39,371	16,312	873	17,185
VALENZUELA *s	530,824	324,985	205,839	187	35	60,664	7,204	67,868	75	60	69	243,738	123,504	367,242	45,498	4,323	49,820	15,166	2,882	18,048
II. CAVITE	611,932	593,551	17,511	187	35	110,796	613	111,409	71	45	70	420,474	7,997	428,471	78,488	280	78,768	32,308	333	32,641
BACOOR *f,s	235,538	228,354	7,184	187	35	42,626	251	42,878	80	60	79	182,683	4,310	186,994	34,101	151	34,252	8,525	101	8,626
CAVITE CITY *f	104,379	102,876	1,503	187	35	19,204	53	19,256	78	58	78	80,121	877	80,998	14,956	31	14,987	4,248	22	4,270
IMUS *f	121,860	118,797	3,063	187	35	22,175	107	22,283	57	39	57	67,721	1,207	68,928	12,641	42	12,683	9,534	65	9,599
KAWIT *f	62,446	61,928	518	187	35	11,560	18	11,578	84	76	84	52,015	393	52,408	9,709	14	9,723	1,850	4	1,855
NOVELETA	26,102	25,354	748	187	35	4,733	26	4,759	64	48	64	16,311	360	16,671	3,045	13	3,057	1,688	14	1,702
ROSARIO *f	60,737	56,242	4,495	187	35	10,499	157	10,656	38	19	37	21,623	850	22,473	4,036	30	4,066	6,462	128	6,590
III. RIZAL	1,325,412	863,057	462,355	165	35	142,705	16,187	158,891	66	11	47	569,460	52,168	621,628	94,949	2,042	96,991	47,755	14,145	61,900
ANGONO *r	64,219	32,110	32,109	160	35	5,138	1,124	6,262	100	0	50	32,110	0	32,110	5,138	0	5,138	0	1,124	1,124
ANTIPOLO *f	319,849	263,155	56,694	149	42	39,186	2,381	41,567	44	24	40	115,023	13,380	128,403	17,128	562	17,690	22,058	1,819	23,877
BARAS *r	21,063	1,183	19,880	160	31	189	610	799	100	0	6	1,183	0	1,183	189	0	189	0	610	610
BINANGONAN *r	152,533	68,131	84,402	160	34	10,902	2,873	13,775	100	0	45	68,131	0	68,131	10,902	0	10,902	0	2,873	2,873
CAINTA *s	208,860	186,174	20,686	187	35	34,752	724	35,476	70	60	69	130,322	12,412	142,733	24,327	434	24,761	10,426	290	10,715
CARDONA *r	36,995	3,945	33,050	160	30	631	1,005	1,636	100	0	11	3,945	0	3,945	631	0	631	0	1,005	1,005
JALA-JALA *r	19,109	1,681	17,428	160	31	269	542	811	100	0	9	1,681	0	1,681	269	0	269	0	542	542
MONTALBAN *f	83,837	68,024	15,813	118	42	8,050	664	8,714	67	44	62	45,243	6,902	52,145	5,354	250	5,644	2,696	374	3,070
MORONG *r	36,957	7,832	29,125	160	31	1,253	900	2,153	100	0	21	7,832	0	7,832	1,253	0	1,253	0	900	900
PILILLA *r	39,119	7,254	31,865	160	32	1,161	1,010	2,171	100	0	19	7,254	0	7,254	1,161	0	1,161	0	1,010	1,010
SAN MATEO *f	101,679	50,602	41,077	190	42	11,539	1,725	13,264	56	26	44	33,817	10,575	44,392	6,439	444	6,883	5,100	1,281	6,381
TANAY *r	72,764	24,525	48,239	160	33	3,924	1,570	5,494	100	0	34	24,525	0	24,525	3,924	0	3,924	0	1,570	1,570
TAYTAY *s	148,322	122,490	14,832	187	35	24,918	519	25,437	70	60	69	93,443	8,899	102,342	17,443	311	17,754	7,475	208	7,683
TERESA *r	22,106	4,951	17,155	160	31	792	539	1,331	100	0	22	4,951	0	4,951	792	0	792	0	539	539
TOTAL	11,885,451	9,415,790	2,469,661	193	35	1,815,872	86,442	1,902,314	85	51	78	8,016,224	1,254,042	9,270,266	1,551,854	44,107	1,595,962	264,018	42,335	306,353

NOTE: 1. Areas with (*s) have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by NSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by PAWSP.
4. Areas with (*r) are merged area under RP'99, and be expected to be improved by RPWSIP.

TABLE 6.2.10 PROJECTED DOMESTIC WATER CONSUMPTION IN 2005, BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (2005)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (2005)			NWSS CONNECTED %			NWSS CONNECTED POPULATION			NWSS DOMESTIC CONSUMPTION			PRIVATE DOMESTIC CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	NWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	10,847,662	8,678,122	2,169,530	200	35	1,738,884	75,934	1,814,818	91	70	87	7,895,821	1,518,671	9,414,493	1,581,188	53,153	1,634,341	157,696	22,780	180,476
CITY OF MANILA	1,723,126	1,463,436	259,690	195	35	285,887	9,089	294,976	95	70	91	1,390,264	181,783	1,572,047	271,593	6,362	277,955	14,294	2,727	17,021
PASAY CITY *a	457,147	313,991	143,156	193	35	60,705	5,010	65,715	95	70	87	298,291	100,209	398,501	57,670	3,507	61,177	3,035	1,503	4,538
QUEZON CITY	2,200,635	1,761,499	439,136	196	35	345,106	15,370	360,477	95	70	90	1,673,424	307,395	1,980,819	327,852	10,759	338,611	17,255	4,611	21,866
CALOOCAN CITY *a	1,076,883	774,259	302,624	193	35	149,690	10,592	160,282	85	70	81	658,121	211,836	869,957	127,237	7,414	134,651	22,454	3,178	25,631
LAS PINAS *s	708,704	619,083	89,621	193	35	119,589	3,137	122,826	85	70	83	526,220	62,735	588,955	101,736	2,195	103,932	17,853	941	18,894
MAKATI	539,315	469,978	69,337	217	35	101,751	2,427	104,178	95	70	92	446,479	48,536	495,015	96,663	1,699	98,362	5,088	728	5,816
MALABON *a	346,868	277,172	69,696	193	35	53,587	2,439	56,026	85	70	82	235,596	48,787	284,383	45,549	1,708	47,256	8,038	732	8,770
MANDALUYONG	296,044	235,109	60,935	193	35	45,454	2,133	47,587	95	70	90	223,354	42,654	266,008	43,182	1,493	44,675	2,273	640	2,913
MARIKINA	447,289	365,529	81,760	195	35	71,357	2,862	74,219	95	70	90	347,253	57,232	404,485	67,789	2,003	69,793	3,568	858	4,426
MUNTINLUPA *s	493,739	394,186	99,553	193	35	76,209	3,494	79,694	85	70	82	335,058	69,687	404,745	64,778	2,433	67,211	11,431	1,045	12,477
NAVOTAS *a	240,031	172,271	67,760	193	35	33,306	2,372	35,677	95	70	88	163,657	47,432	211,089	31,640	1,660	33,300	1,665	711	2,377
PARANAQUE *s	488,493	452,458	36,035	268	35	121,433	1,261	122,694	85	70	84	384,590	25,224	409,814	103,218	883	104,101	18,215	378	18,593
PASIG	593,888	475,393	118,495	195	35	92,651	4,147	96,798	95	70	90	451,624	82,946	534,570	88,018	2,903	90,921	4,633	1,244	5,877
PATEROS *a	70,318	62,167	8,151	193	35	12,019	285	12,304	80	70	79	49,734	5,706	55,439	9,615	200	9,815	2,404	85	2,489
SAN JUAN	140,304	129,954	10,350	250	35	32,455	362	32,818	95	70	93	123,457	7,245	130,701	30,833	254	31,086	1,622	109	1,731
TAGUIG *a	392,792	323,794	68,998	193	35	62,600	2,415	65,015	80	70	78	259,035	48,299	307,334	50,086	1,690	51,771	12,520	724	13,245
VALENZUELA *a	632,076	387,842	244,234	193	35	74,983	8,548	83,531	85	70	79	329,666	170,964	500,630	63,735	5,984	69,719	11,247	2,564	13,812
II. CAVITE	686,825	670,951	15,874	193	35	129,717	556	130,273	80	54	80	538,520	8,520	547,040	104,114	298	104,412	25,603	258	25,861
BACOOR *f,s	275,150	268,616	6,534	193	35	51,932	229	52,161	85	70	85	228,324	4,574	232,897	44,143	160	44,303	7,790	69	7,858
CAVITE CITY *f	109,908	108,804	1,104	193	35	21,035	39	21,074	93	85	93	101,384	940	102,324	19,601	33	19,634	1,435	6	1,440
IMUS *f	135,818	133,081	2,737	193	35	25,729	96	25,825	58	42	57	90,389	1,155	91,544	17,475	40	17,516	8,254	55	8,309
KAWIT *f	69,254	68,838	416	193	35	13,309	15	13,323	95	100	96	65,722	416	66,138	12,706	15	12,721	603	0	603
NOVELETA	28,673	28,010	663	193	35	5,415	23	5,439	76	63	76	21,412	415	21,827	4,140	15	4,154	1,276	9	1,284
ROSARIO *f	68,022	63,601	4,421	193	35	12,296	155	12,451	49	23	47	31,290	1,020	32,310	6,049	36	6,085	6,247	119	6,366
III. RIZAL	1,503,411	1,052,571	450,840	175	35	184,124	15,968	200,092	74	13	56	775,195	59,481	834,586	137,601	2,350	139,950	46,523	13,618	60,142
ANGONO *r	12,979	43,787	29,192	181	35	7,927	1,022	8,949	100	0	60	43,787	0	43,787	7,927	0	7,927	0	1,022	1,022
ANTIPOLO *f	379,154	319,179	59,975	155	44	49,458	2,639	52,097	50	22	45	160,880	13,295	174,175	24,929	585	25,514	24,529	2,054	26,583
BARAS *r	22,808	2,215	20,593	181	31	401	629	1,030	100	0	10	2,215	0	2,215	401	0	401	0	629	629
BINANGONAN *r	162,155	87,908	74,247	181	34	15,915	2,520	18,435	100	0	54	87,908	0	87,908	15,915	0	15,915	0	2,520	2,520
CAINTA *a	251,447	225,303	25,145	193	35	43,752	880	44,632	80	70	79	181,042	12,601	198,643	35,001	616	35,617	8,750	264	9,014
CARDONA *r	38,270	4,645	33,625	181	30	841	1,021	1,862	100	0	12	4,645	0	4,645	841	0	841	0	1,021	1,021
JALA-JALA *r	20,131	3,137	16,994	181	31	568	526	1,094	100	0	16	3,137	0	3,137	568	0	568	0	526	526
MONTALBAN *f	90,845	77,407	13,438	124	44	9,560	591	10,152	76	43	72	58,758	6,387	65,145	7,257	281	7,538	2,303	310	2,614
MORONG *r	40,222	9,763	30,459	181	31	1,768	940	2,708	100	0	24	9,763	0	9,763	1,768	0	1,768	0	940	940
PILILLA *r	41,556	11,935	29,621	181	31	2,161	928	3,089	100	0	29	11,935	0	11,935	2,161	0	2,161	0	928	928
SAN MATEO *f	109,620	71,766	37,854	204	44	14,641	1,666	16,307	66	27	53	47,653	10,086	57,739	9,722	444	10,166	4,919	1,222	6,141
TANAY *r	78,789	32,489	46,300	181	32	5,882	1,497	7,379	100	0	41	32,489	0	32,489	5,882	0	5,882	0	1,497	1,497
TAYTAY *a	313,025	155,723	17,302	193	35	30,106	606	30,712	80	70	79	124,578	12,112	136,690	24,085	424	24,509	6,021	182	6,203
TERESA *r	22,410	6,315	16,095	181	31	1,143	504	1,647	100	0	28	6,315	0	6,315	1,143	0	1,143	0	504	504
TOTAL	13,037,898	10,401,643	2,636,245	197	35	2,052,725	92,458	2,145,183	89	60	83	9,209,447	1,586,672	10,796,119	1,822,902	55,802	1,878,704	229,823	36,656	266,479

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by ANSOP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by MSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by PANSP.
4. Areas with (*r) are merged area under BP799, and be expected to be improved by RPWSIP.

TABLE 6.2.11 PROJECTED DOMESTIC WATER CONSUMPTION in 2010, BY CITY/MUNICIPALITY

CITY/MUNICIPALITY	TOTAL POPULATION (2010)			PER CAPITA CONSUMPTION		DOMESTIC CONSUMPTION (2010)			MWSS CONNECTED %			MWSS CONNECTED POPULATION			MWSS DOMESTIC CONSUMPTION			PRIVATE DOM. CONSUMPTION		
	TOTAL	GENERAL	WATER BLIGHTED	GEN'L (LPCD)	BL'D (LPCD)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GEN'L POP.	WATER BL'D POP.	MWSS TOTAL POP.	GENERAL POP.	WATER BLIGHTED POP.	TOTAL POP.	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)	GENERAL (M3/D)	WATER BLIGHTED (M3/D)	TOTAL (M3/D)
I. NCR	11,549,698	9,319,686	2,329,922	204	35	1,905,230	81,547	1,986,777	92	75	89	8,581,840	1,747,441	10,329,281	1,753,085	61,160	1,814,246	152,144	20,387	172,531
CITY OF MANILA	1,723,147	1,464,188	258,959	200	35	292,838	9,064	301,901	95	75	92	1,390,978	194,219	1,585,198	278,196	6,798	284,993	14,642	2,266	16,908
PASAY CITY *a	475,225	326,828	148,397	200	35	65,366	5,194	70,560	95	75	89	310,487	111,298	421,784	62,097	3,895	65,993	3,268	1,298	4,567
QUEZON CITY	2,323,154	1,860,880	462,274	200	35	372,176	16,180	388,356	95	75	91	1,767,836	346,705	2,114,542	353,567	12,135	365,702	18,609	4,045	22,654
CALOOCAN CITY *a	1,164,630	838,274	326,356	200	35	167,655	11,422	179,077	90	75	86	754,446	244,767	999,214	150,889	8,567	159,456	15,765	2,856	18,621
LAS PINAS *a	878,109	767,379	110,730	200	35	153,476	3,876	157,351	85	75	84	652,272	83,047	735,320	130,454	2,907	133,361	23,021	969	23,990
MAKATI	553,794	482,797	70,997	220	35	106,215	2,485	108,700	95	75	92	458,657	53,248	511,905	100,904	1,864	102,768	5,311	621	5,932
MALABON *a	380,515	288,282	72,233	200	35	57,656	2,528	60,185	90	75	87	259,454	54,175	313,629	51,891	1,896	53,787	5,766	632	6,398
MANDALUYONG	305,315	242,650	62,665	200	35	48,530	2,193	50,723	95	75	91	230,517	46,998	277,516	46,103	1,645	47,748	2,426	548	2,975
MARIKINA	483,621	395,470	88,151	200	35	79,094	3,085	82,179	95	75	91	375,697	66,113	441,810	75,139	2,314	77,453	3,955	771	4,726
MUNTINLUPA *a	565,215	451,573	113,642	200	35	90,315	3,977	94,292	85	75	83	383,837	85,232	469,069	76,767	2,983	79,750	13,547	994	14,542
NAVOTAS *a	251,550	180,739	70,811	200	35	36,148	2,478	38,626	95	75	89	171,702	53,109	224,810	34,340	1,859	36,199	1,807	620	2,427
PARANAQUE *a	541,964	502,098	39,866	250	35	125,525	1,395	126,920	85	75	84	426,783	29,899	456,683	106,696	1,046	107,742	18,829	349	19,178
PASIG	648,283	519,301	128,982	200	35	103,860	4,514	108,375	95	75	91	493,336	96,736	590,072	98,667	3,386	102,053	5,193	1,129	6,322
PATEROS *a	74,945	66,282	8,663	200	35	13,256	303	13,560	90	75	88	59,654	6,497	66,151	11,931	227	12,158	1,326	76	1,401
SAN JUAN	141,007	130,635	10,372	250	35	32,659	363	33,022	95	75	94	124,103	7,779	131,882	31,026	272	31,298	1,633	91	1,724
TAGUIG *a	427,323	352,472	74,851	200	35	70,494	2,620	73,114	90	75	87	317,224	56,139	373,363	63,445	1,965	65,410	7,049	655	7,704
VALENZUELA *a	731,811	449,840	281,971	200	35	89,968	9,869	99,837	90	75	84	404,856	211,479	616,334	80,971	7,402	88,373	8,997	2,467	11,464
II. CAVITE	756,085	744,187	11,898	200	35	148,877	409	149,287	87	56	86	644,697	6,494	651,190	128,939	227	129,167	19,938	182	20,120
BACOOR *f,s	313,838	309,444	4,394	200	35	61,889	154	62,043	85	75	85	263,027	3,296	266,323	52,605	115	52,721	9,283	38	9,322
CAVITE CITY *f	112,528	111,952	576	200	35	22,390	24	22,414	100	100	100	111,952	676	112,628	22,390	24	22,414	0	0	0
IMUS *f	148,542	146,579	1,963	200	35	29,316	69	29,385	85	51	84	124,258	995	125,253	24,852	35	24,886	4,464	34	4,498
KAVIT *f	75,407	75,105	301	200	35	15,021	11	15,032	100	100	100	75,105	302	75,407	15,021	11	15,032	0	0	0
NOVELETA	30,955	30,476	479	200	35	6,095	17	6,112	87	69	86	26,422	328	26,751	5,284	11	5,296	811	5	816
ROSARIO *f	74,715	70,830	3,885	200	35	14,166	136	14,302	62	23	60	43,932	897	44,829	8,786	31	8,818	5,380	105	5,484
III. RIZAL	1,567,207	1,242,272	424,938	186	36	230,791	15,185	245,976	81	14	64	1,006,835	61,112	1,067,947	190,411	2,405	192,815	40,381	12,780	53,161
ANGONO *r	80,738	56,552	24,236	205	35	11,583	848	12,431	100	0	70	56,552	0	56,552	11,583	0	11,583	0	848	848
ANTIPOLO *f	435,886	376,317	59,569	162	46	60,883	2,740	63,623	58	19	53	218,993	11,261	230,254	35,430	518	35,948	25,453	2,222	27,675
BARAS *r	24,182	3,412	20,770	205	30	699	630	1,329	100	0	18	3,412	0	3,412	699	0	699	0	630	630
BINANGONAN *r	169,117	108,067	61,050	205	34	22,135	2,063	24,198	100	0	64	108,067	0	108,067	22,135	0	22,135	0	2,063	2,063
CAINTA *a	295,646	256,082	39,565	200	35	51,216	1,035	54,251	90	75	89	239,413	22,173	261,647	47,895	776	48,671	3,322	259	3,580
CARDONA *r	38,952	5,348	33,604	205	30	1,095	1,020	2,115	100	0	14	5,348	0	5,348	1,095	0	1,095	0	1,020	1,020
JALA-JALA *r	20,826	4,821	16,005	205	31	988	490	1,478	100	0	23	4,821	0	4,821	988	0	988	0	490	490
MONTALBAN *f	96,318	85,317	11,001	129	46	10,969	506	11,475	83	44	78	70,530	4,788	75,318	9,068	220	9,288	1,901	286	2,187
MORONG *r	43,304	11,947	31,357	205	31	2,447	966	3,413	100	0	23	11,947	0	11,947	2,447	0	2,447	0	966	966
PILILLA *r	43,312	14,971	28,341	205	31	3,067	882	3,949	100	0	35	14,971	0	14,971	3,067	0	3,067	0	882	882
SAN MATEO *f	115,759	83,260	32,499	219	46	18,260	1,491	19,750	77	25	63	64,384	8,105	72,489	14,103	373	14,476	4,157	1,118	5,274
TANAY *r	83,535	40,939	42,596	205	32	8,385	1,366	9,751	100	0	49	40,939	0	40,939	8,385	0	8,385	0	1,366	1,366
TAYTAY *a	197,131	177,418	19,713	200	35	35,484	690	36,174	90	75	89	159,676	14,785	174,461	31,935	517	32,453	3,548	172	3,721
TERESA *r	22,441	7,721	14,720	205	31	1,581	458	2,039	100	0	34	7,721	0	7,721	1,581	0	1,581	0	458	458
TOTAL	14,072,900	11,306,345	2,766,555	202	35	2,284,899	97,141	2,382,040	91	66	86	10,233,371	1,815,047	12,048,418	2,072,436	63,792	2,136,228	212,463	33,349	245,812

NOTE: 1. Areas with (*a) have suppressed demand due to low water pressure, and be expected to be improved by AWSOP.
2. Areas with (*s) also have suppressed demand due to low water pressure, and be expected to be improved by MSWDP.
3. Areas with (*f) have suppressed demand due to limited water sources, and be expected to be improved by PAWSP.
4. Areas with (*r) are merged area under BP799, and be expected to be improved by RPWSIP.

TABLE 6.2.12 COMMERCIAL WATER DEMAND GROWTH PROJECTION

YEAR	CG(I) (1)	COED(I) (2)	IR1(I) (3)	CTI(I) (4)	CPED(I) (5)	IR2(I) (6)	IR(I) (7)	II(I) (8)	DEMAND (9)
1990	5.98	1.06	6.34	-3.34	-0.11	0.37	6.71	1.0000	451,047
1991	5.70	1.06	6.04	-1.77	-0.11	0.19	6.24	1.0624	479,177
1992	3.55	1.06	3.76	-0.61	-0.11	0.07	3.83	1.1031	497,530
1993	4.51	1.06	4.78	-0.54	-0.11	0.06	4.84	1.1564	521,611
1994	4.64	1.06	4.92	1.01	-0.11	-0.11	4.81	1.2120	546,686
1995	4.22	1.06	4.47	-0.11	-0.11	0.01	4.49	1.2664	571,207
1996	4.06	1.06	4.30	-0.52	-0.11	0.06	4.36	1.3216	596,116
1997	3.83	1.06	4.06	-0.62	-0.11	0.07	4.13	1.3762	620,724
1998	3.60	1.06	3.82	-0.58	-0.11	0.06	3.88	1.4296	644,807
1999	3.60	1.06	3.82	-0.22	-0.11	0.02	3.84	1.4845	669,568
2000	3.49	1.06	3.70	-3.99	-0.11	0.44	4.14	1.5459	697,277
2001	3.34	1.06	3.54	-0.22	-0.11	0.02	3.56	1.6010	722,132
2002	3.23	1.06	3.42	-0.21	-0.11	0.02	3.45	1.6562	747,023
2003	3.12	1.06	3.31	-0.20	-0.11	0.02	3.33	1.7113	771,893
2004	3.03	1.06	3.21	-0.19	-0.11	0.02	3.23	1.7667	796,846
2005	2.95	1.06	3.13	-0.18	-0.11	0.02	3.15	1.8223	821,921
2006	2.86	1.06	3.03	-0.17	-0.11	0.02	3.05	1.8778	846,993
2007	2.78	1.06	2.95	-0.16	-0.11	0.02	2.96	1.9335	872,101
2008	2.70	1.06	2.86	-0.15	-0.11	0.02	2.88	1.9892	897,204
2009	2.63	1.06	2.79	-0.14	-0.11	0.02	2.80	2.0449	922,355
2010	2.57	1.06	2.72	-0.13	-0.11	0.01	2.74	2.1009	947,613

SOURCE: (1) Studt Team, (2, 4, 5) CORPLAN

(1) GDP growth rate in service sector in real terms in year I (%)
(2) Output elasticity of consumption in service sector
(3) Increase rate by GDP growth in year I (1)x(2) (%)
(4) Tariff increase in real terms in year I (%)
(5) Price elasticity of consumption
(6) Increase rate by tariff increase in year I (4)x(5) (%)
(7) Increase rate in year I (%)
(8) Increase index in year I. (1.0000 in base year 1990)
(9) Projected total commercial demand (M3/D) (8) x 451,047

TABLE 6.2.13 MWSS COMMERCIAL CONSUMPTION PROJECTION

CITY/MUNICIPALITY	1990 ESTIMATED CONSUMPTION				1995			2000			2005			2010		
	TOTAL QT'TY (M3/DAY)	% IN TOTAL	MWSS SHARE (%)	PRIV. SHARE (%)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)
I. NCR	434,665	96.4	78.5	21.5	550,461	448,632	101,829	671,952	561,191	110,761	792,069	672,476	119,593	913,196	784,697	128,498
1. Manila *	136,183	30.2	96.6	3.4	172,462	167,797	4,665	210,526	205,861	4,665	248,160	243,494	4,665	286,109	281,444	4,665
2. Pasay City *	25,338	5.6	65.3	34.7	32,088	23,293	8,795	39,170	30,375	8,795	46,172	37,377	8,795	53,233	44,438	8,795
3. Quezon City *	113,981	25.1	75.7	24.3	144,346	116,705	27,641	176,204	148,563	27,641	207,702	180,061	27,641	239,464	211,824	27,641
4. Caloocan City *	15,088	3.3	75.6	24.4	19,107	15,433	3,674	23,324	19,650	3,674	27,494	23,820	3,674	31,698	28,024	3,674
5. Las Pinas	4,299	1.0	14.4	85.6	5,444	786	4,658	6,646	959	5,686	7,833	1,131	6,703	9,031	1,303	7,728
6. Makati *	59,269	13.1	80.2	19.8	75,058	63,337	11,721	91,624	79,903	11,721	108,003	96,282	11,721	124,519	112,798	11,721
7. Malabon *	5,224	1.2	61.4	38.6	6,616	4,600	2,016	8,076	6,060	2,016	9,519	7,504	2,016	10,975	8,959	2,016
8. Mandaluyong *	13,338	3.0	84.0	16.0	16,891	14,763	2,128	20,620	18,491	2,128	24,305	22,177	2,128	28,022	25,894	2,128
9. Marikina	5,280	1.2	73.5	26.5	6,687	4,914	1,773	8,163	5,999	2,164	9,622	7,071	2,551	11,094	8,153	2,941
10. Muntinlupa	8,308	1.8	0.9	99.1	10,521	99	10,423	12,843	120	12,723	15,139	142	14,997	17,454	163	17,291
11. Navotas *	2,655	0.6	76.6	23.4	3,363	2,742	621	4,105	3,484	621	4,839	4,218	621	5,578	4,958	621
12. Paranaque	11,624	2.6	57.7	42.3	14,720	8,497	6,223	17,969	10,372	7,597	21,181	12,226	8,955	24,420	14,096	10,324
13. Pasig	16,004	3.5	58.4	41.6	20,268	11,836	8,431	24,741	14,448	10,292	29,163	17,031	12,132	33,623	19,636	13,987
14. Pateros	56	0.0	100.0	0.0	71	71	0	86	86	0	102	102	0	117	117	0
15. San Juan *	8,299	1.8	98.8	1.2	10,510	10,412	97	12,829	12,732	97	15,122	15,025	97	17,435	17,338	97
16. Taguig	4,016	0.9	9.0	91.0	5,086	457	4,629	6,208	558	5,650	7,318	658	6,660	8,437	758	7,679
17. Valenzuela	5,705	1.3	40.0	60.0	7,224	2,890	4,335	8,819	3,528	5,291	10,395	4,158	6,237	11,985	4,794	7,191
II. CAVITE	6,399	1.4	19.1	80.9	8,103	1,550	6,554	9,892	1,892	8,000	11,660	2,230	9,430	13,443	2,571	10,873
1. Bacoor	971	0.2	27.6	72.4	1,230	340	890	1,502	415	1,087	1,770	489	1,281	2,041	564	1,477
2. Cavite City	4,207	0.9	17.3	82.7	5,327	921	4,406	6,503	1,124	5,379	7,666	1,325	6,341	8,838	1,528	7,310
3. Imus	709	0.2	9.1	90.9	898	82	816	1,096	100	996	1,292	118	1,174	1,490	136	1,354
4. Kawit	122	0.0	100.0	0.0	155	155	0	189	189	0	222	222	0	256	256	0
5. Noveleta	5	0.0	100.0	0.0	6	6	0	8	8	0	9	9	0	10	10	0
6. Rosario	385	0.1	9.5	90.5	487	46	441	595	56	538	701	66	635	808	77	732
XII. RIZAL	9,983	2.2	16.5	83.5	15,668	5,109	10,559	20,285	7,396	12,889	25,513	10,320	15,193	31,370	13,854	17,517
1. Angono	-	-	-	-	523	523	0	1,028	1,028	0	1,585	1,585	0	2,317	2,317	0
2. Antipolo	3,367	0.7	17.9	82.1	4,264	765	3,499	5,205	934	4,271	6,136	1,101	5,035	7,074	1,269	5,805
3. Baras	-	-	-	-	25	25	0	38	38	0	80	80	0	140	140	0
4. Binangonan	-	-	-	-	1,402	1,402	0	2,180	2,180	0	3,183	3,183	0	4,427	4,427	0
5. Cainta	3,622	0.8	12.4	87.6	4,587	569	4,018	5,600	695	4,905	6,601	819	5,782	7,610	944	6,667
6. Cardona	-	-	-	-	98	98	0	126	126	0	168	168	0	219	219	0
7. Jala-Jala	-	-	-	-	15	15	0	54	54	0	114	114	0	198	198	0
8. Montalban	886	0.2	4.7	95.3	1,122	53	1,069	1,370	64	1,305	1,614	76	1,539	1,861	87	1,774
9. Morong	-	-	-	-	191	191	0	251	251	0	354	354	0	489	489	0
10. Pililla	-	-	-	-	141	141	0	232	232	0	432	432	0	613	613	0
11. San Mateo	576	0.1	32.2	67.8	729	235	494	890	287	603	1,049	338	711	1,209	390	819
12. Tanay	-	-	-	-	434	434	0	785	785	0	1,176	1,176	0	1,677	1,677	0
13. Taytay	1,532	0.3	23.8	76.2	1,941	462	1,478	2,369	565	1,804	2,792	665	2,127	3,219	767	2,452
14. Teresa	-	-	-	-	96	96	0	158	158	0	229	229	0	316	316	0
TOTAL	451,047	100.0	76.3	23.7	574,232	455,291	118,941	702,129	570,478	131,651	829,242	685,026	144,216	958,009	801,121	156,888

TABLE 6.2.14 INDUSTRIAL WATER DEMAND GROWTH PROJECTION

YEAR	IG(I) (1)	IOED(I) (2)	IR1(I) (3)	ITI(I) (4)	IPED(I) (5)	IR2(I) (6)	IR(I) (7)	II(I) (8)	DEMAND (9)
1990	8.61	0.78	6.72	-2.81	-0.11	0.31	7.02	1.0000	439,394
1991	4.23	0.78	3.30	-1.77	-0.11	0.19	3.49	1.0349	454,747
1992	5.62	0.78	4.38	-0.52	-0.11	0.06	4.44	1.0809	474,941
1993	5.10	0.78	3.98	-0.45	-0.11	0.05	4.03	1.1244	494,070
1994	4.83	0.78	3.77	0.84	-0.11	-0.09	3.68	1.1658	512,227
1995	4.79	0.78	3.74	-0.09	-0.11	0.01	3.75	1.2094	531,415
1996	4.60	0.78	3.59	-0.42	-0.11	0.05	3.63	1.2534	550,728
1997	4.13	0.78	3.22	-0.52	-0.11	0.06	3.28	1.2945	568,784
1998	4.12	0.78	3.21	-0.49	-0.11	0.05	3.27	1.3368	587,369
1999	3.94	0.78	3.07	-0.17	-0.11	0.02	3.09	1.3781	605,530
2000	3.79	0.78	2.96	-3.97	-0.11	0.44	3.39	1.4249	626,075
2001	3.67	0.78	2.86	-0.19	-0.11	0.02	2.88	1.4659	644,128
2002	3.53	0.78	2.75	-0.17	-0.11	0.02	2.77	1.5066	661,984
2003	3.39	0.78	2.64	-0.16	-0.11	0.02	2.66	1.5467	679,604
2004	3.29	0.78	2.57	-0.15	-0.11	0.02	2.58	1.5866	697,156
2005	3.19	0.78	2.49	-0.15	-0.11	0.02	2.50	1.6264	714,618
2006	3.09	0.78	2.41	-0.14	-0.11	0.02	2.43	1.6658	731,952
2007	3.00	0.78	2.34	-0.14	-0.11	0.02	2.36	1.7051	749,192
2008	2.91	0.78	2.27	-0.14	-0.11	0.02	2.29	1.7440	766,313
2009	2.83	0.78	2.21	-0.13	-0.11	0.01	2.22	1.7828	783,338
2010	2.75	0.78	2.15	-0.13	-0.11	0.01	2.16	1.8213	800,253

SOURCE: (1) Study Team, (2, 4, 5) CORPLAN

(1) GDP growth rate in industrial sector in real terms in year I (%)
(2) Output elasticity of consumption in industrial sector
(3) Increase rate by GDP growth in year I (1) * (2) (%)
(4) Tariff increase in real terms in year I (%)
(5) Price elasticity of consumption
(6) Increase rate by tariff increase in year I (4) * (5) (%)
(7) Increase rate in year I (%)
(8) Increase index in year I. (1.0000 in base year 1990)
(9) Projected total industrial demand (M3/D) (8) x 439,394

TABLE 6.2.15 MWSS INDUSTRIAL CONSUMPTION PROJECTION

CITY/MUNICIPALITY	1990 ESTIMATED CONSUMPTION				1995			2000			2005			2010		
	TOTAL QT'TY (M3/DAY)	% IN TOTAL	MWSS SHARE (%)	PRIV. SHARE (%)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)	TOTAL QT'TY (M3/D)	MWSS QT'TY (M3/D)	PRIVATE QT'TY (M3/D)
I. NCR	362,048	82.4	22.5	77.5	437,871	113,331	324,540	515,868	146,218	369,650	588,825	176,980	411,846	659,386	206,731	452,655
1. Manila *	23,403	5.3	75.3	24.7	28,304	22,519	5,786	33,346	27,560	5,786	38,062	32,276	5,786	42,623	36,837	5,786
2. Pasay City *	4,293	1.0	21.4	78.6	5,192	1,817	3,375	6,116	2,742	3,375	6,981	3,607	3,375	7,818	4,443	3,375
3. Quezon City *	51,708	11.8	37.4	62.6	62,538	30,170	32,368	73,677	41,310	32,368	84,097	51,730	32,368	94,175	61,807	32,368
4. Caloocan City *	13,923	3.2	66.5	33.5	16,839	12,175	4,665	19,839	15,174	4,665	22,644	17,980	4,665	25,358	20,693	4,665
5. Las Pinas	21,115	4.8	0.7	99.3	25,537	189	25,348	30,086	222	29,863	34,341	254	34,087	38,456	284	38,171
6. Makati *	8,041	1.8	57.9	42.1	9,725	5,342	3,383	11,458	8,074	3,383	13,078	9,694	3,383	14,645	11,262	3,383
7. Malabon *	20,537	4.7	29.1	70.9	24,838	10,273	14,565	29,263	14,698	14,565	33,401	18,836	14,565	37,404	22,839	14,565
8. Mandaluyong *	13,151	3.0	59.3	40.7	15,906	10,553	5,353	18,739	13,386	5,353	21,389	16,036	5,353	23,952	18,599	5,353
9. Marikina	8,239	1.9	17.1	82.9	9,965	1,701	8,264	11,739	2,004	9,736	13,400	2,287	11,113	15,005	2,561	12,444
10. Muntinlupa	34,360	7.8	0.2	99.8	41,556	97	41,459	48,958	114	48,844	55,882	130	55,751	62,578	146	62,432
11. Navotas *	3,762	0.9	53.8	46.2	4,550	2,811	1,739	5,360	3,621	1,739	6,118	4,379	1,739	6,852	5,112	1,739
12. Paranaque	19,370	4.4	8.7	91.3	23,427	2,031	21,396	27,600	2,393	25,207	31,503	2,731	28,772	35,278	3,059	32,220
13. Pasig	68,156	15.5	11.9	88.1	82,430	9,770	72,659	97,113	11,511	85,602	110,847	13,139	97,708	124,130	14,713	109,417
14. Pateros	1,760	0.4	0.2	99.8	2,128	4	2,124	2,501	5	2,502	2,862	6	2,856	3,205	6	3,198
15. San Juan *	1,259	0.3	95.3	4.7	1,522	1,463	59	1,794	1,735	59	2,047	1,988	59	2,293	2,234	59
16. Taguig	41,206	9.4	0.0	100.0	49,838	11	49,825	58,715	13	58,702	67,019	15	67,004	75,050	17	75,033
17. Valenzuela	27,763	6.3	4.2	95.8	33,577	1,406	32,171	39,558	1,656	37,902	45,153	1,891	43,262	50,564	2,117	48,446
II. CAVITE	7,037	1.6	16.3	83.7	8,511	1,389	7,122	10,027	1,537	8,491	11,445	1,868	9,577	12,817	2,092	10,725
1. Bacoor	70	0.0	100.0	0.0	85	85	0	100	100	0	114	114	0	128	128	0
2. Cavite City	238	0.1	100.0	0.0	288	288	0	339	339	0	387	387	0	433	433	0
3. Imus	538	0.1	1.3	98.7	650	9	641	766	10	756	874	12	863	979	13	966
4. Kawit	574	0.1	100.0	0.0	694	694	0	818	818	0	934	934	0	1,045	1,045	0
5. Noveleta	88	0.0	100.0	0.0	107	107	0	126	126	0	143	143	0	161	161	0
6. Rosario	5,530	1.3	3.1	96.9	6,688	207	6,481	7,879	244	7,635	8,993	278	8,715	10,071	312	9,759
III. RIZAL	78,308	18.0	2.8	97.2	90,479	3,347	87,131	108,913	5,440	103,472	121,524	9,149	112,375	136,764	14,834	121,930
1. Angono	-	-	-	-	1,121	196	925	1,850	555	1,295	2,854	1,284	1,570	4,170	2,502	1,668
2. Antipolo	13,798	3.1	12.9	87.1	16,688	2,145	14,543	19,661	2,527	17,134	22,441	2,884	19,557	25,130	3,230	21,901
3. Baras	-	-	-	-	46	8	38	68	20	48	144	65	79	252	151	101
4. Binangonan	-	-	-	-	2,523	442	2,081	3,924	1,177	2,747	5,729	2,578	3,151	7,968	4,781	3,187
5. Cainta	36,221	8.2	0.1	99.9	43,801	58	43,743	51,610	68	51,541	58,909	78	58,831	65,968	88	65,880
6. Cardona	-	-	-	-	171	31	140	227	68	159	303	136	167	395	237	158
7. Jala-Jala	-	-	-	-	27	5	22	97	29	68	204	92	112	355	213	142
8. Montalban	2,958	0.1	0.6	99.4	3,578	21	3,557	4,215	24	4,191	4,811	28	4,784	5,388	31	5,357
9. Morong	-	-	-	-	344	60	284	451	135	316	636	286	350	881	529	352
10. Pililla	-	-	-	-	253	44	209	417	125	292	778	350	428	1,104	662	442
11. San Mateo	558	0.1	8.3	91.7	796	66	730	938	78	860	1,071	89	982	1,199	100	1,099
12. Tanay	-	-	-	-	782	137	645	1,413	424	989	2,118	953	1,165	3,019	1,811	1,208
13. Taytay	16,672	3.8	0.5	99.5	20,164	105	20,059	23,756	124	23,632	27,116	141	26,975	30,365	158	30,207
14. Teresa	-	-	-	-	173	30	143	286	86	200	411	185	226	570	342	228
TOTAL	439,394	100.0	19.2	80.8	536,861	118,068	418,793	634,808	153,295	481,513	727,795	187,997	539,798	818,967	223,657	595,310

* Future demand increase was assumed to be shouldered by MWSS only.

TABLE 6.2.16 SUMMARY OF PROJECTED WATER DEMAND (CASE 1)

YEAR	MWSS SERVED WATER DEMAND (M3/D)					LOSS RATIO	MWSS SERVICE SHARE (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	%	DOM.	COM.	IND.	TOTAL
1995	1,218,158	455,291	118,068	606,903	2,398,420	25.3	73.6	79.3	22.0	71.1
1996	1,293,719	478,328	125,113	612,073	2,509,233	24.4	75.9	79.7	22.5	72.3
1997	1,369,280	501,366	132,159	617,243	2,620,047	23.6	78.1	80.2	22.9	73.3
1998	1,444,840	524,403	139,204	622,412	2,730,860	22.8	80.1	80.6	23.4	74.4
1999	1,520,401	547,441	146,250	627,582	2,841,674	22.1	82.1	80.9	23.8	75.3
2000	1,595,962	570,478	153,295	632,752	2,952,487	21.4	83.9	81.2	24.1	76.3
2005	1,878,704	685,026	187,997	737,565	3,489,292	21.1	87.6	82.6	25.8	78.6
2010	2,136,228	801,121	223,657	847,102	4,008,108	21.1	89.7	83.6	27.3	80.1

YEAR	PRIVATELY SERVED WATER DEMAND (M3/D)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL
1995	436,105	118,941	418,793	973,839
1996	410,155	121,483	431,337	962,975
1997	384,204	124,025	443,881	952,110
1998	358,254	126,567	456,425	941,246
1999	332,303	129,109	468,969	930,381
2000	306,353	131,651	481,513	919,517
2005	266,479	144,216	539,798	950,493
2010	245,812	156,888	595,310	998,010

YEAR	TOTAL WATER DEMAND (M3/D)				
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL
1995	1,654,263	574,232	536,861	606,903	3,372,259
1996	1,703,873	599,811	556,450	612,073	3,472,208
1997	1,753,484	625,391	576,040	617,243	3,572,157
1998	1,803,094	650,970	595,629	622,412	3,672,106
1999	1,852,705	676,550	615,219	627,582	3,772,055
2000	1,902,315	702,129	634,808	632,752	3,872,004
2005	2,145,183	829,242	727,795	737,565	4,439,785
2010	2,382,040	958,009	818,967	847,102	5,006,118

TABLE 6.2.17 SUMMARY OF PROJECTED WATER DEMAND (CASE 2)

YEAR	MWSS SERVED WATER DEMAND (M3/D)					LOSS RATIO	MWSS SERVICE SHARE (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	%	DOM.	COM.	IND.	TOTAL
1995	1,218,158	455,291	118,068	762,978	2,554,495	29.9	73.6	79.3	22.0	72.4
1996	1,293,719	478,328	125,113	766,254	2,663,414	28.8	75.9	79.7	22.5	73.4
1997	1,369,280	501,366	132,159	769,529	2,772,333	27.8	78.1	80.2	22.9	74.4
1998	1,444,840	524,403	139,204	772,805	2,881,253	26.8	80.1	80.6	23.4	75.4
1999	1,520,401	547,441	146,250	776,080	2,990,172	26.0	82.1	80.9	23.8	76.3
2000	1,595,962	570,478	153,295	779,356	3,099,091	25.1	83.9	81.2	24.1	77.1
2005	1,878,704	685,026	187,997	909,422	3,661,149	24.8	87.6	82.6	25.8	79.4
2010	2,136,228	801,121	223,657	1,042,123	4,203,129	24.8	89.7	83.6	27.3	80.8

YEAR	PRIVATELY SERVED WATER DEMAND (M3/D)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL
1995	436,105	118,941	418,793	973,839
1996	410,155	121,483	431,337	962,975
1997	384,204	124,025	443,881	952,110
1998	358,254	126,567	456,425	941,246
1999	332,303	129,109	468,969	930,381
2000	306,353	131,651	481,513	919,517
2005	266,479	144,216	539,798	950,493
2010	245,812	156,888	595,310	998,010

YEAR	TOTAL WATER DEMAND (M3/D)				
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL
1995	1,654,263	574,232	536,861	762,978	3,528,334
1996	1,703,873	599,811	556,450	766,254	3,626,389
1997	1,753,484	625,391	576,040	769,529	3,724,444
1998	1,803,094	650,970	595,629	772,805	3,822,498
1999	1,852,705	676,550	615,219	776,080	3,920,553
2000	1,902,315	702,129	634,808	779,356	4,018,608
2005	2,145,183	829,242	727,795	909,422	4,611,642
2010	2,382,040	958,009	818,967	1,042,123	5,201,139

TABLE 6.2.18 SUMMARY OF PROJECTED WATER DEMAND (CASE 3)

YEAR	MWSS SERVED WATER DEMAND (M3/D)					LOSS RATIO	MWSS SERVICE SHARE (%)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL	%	DOM.	COM.	IND.	TOTAL
1995	1,218,158	455,291	118,068	950,068	2,741,585	34.7	73.6	79.3	22.0	73.8
1996	1,293,719	478,328	125,113	957,289	2,854,450	33.5	75.9	79.7	22.5	74.8
1997	1,369,280	501,366	132,159	964,510	2,967,314	32.5	78.1	80.2	22.9	75.7
1998	1,444,840	524,403	139,204	971,731	3,080,179	31.5	80.1	80.6	23.4	76.6
1999	1,520,401	547,441	146,250	978,952	3,193,043	30.7	82.1	80.9	23.8	77.4
2000	1,595,962	570,478	153,295	986,173	3,305,908	29.8	83.9	81.2	24.1	78.2
2005	1,878,704	685,026	187,997	909,422	3,661,149	24.8	87.6	82.6	25.8	79.4
2010	2,136,228	801,121	223,657	1,042,123	4,203,129	24.8	89.7	83.6	27.3	80.8

YEAR	PRIVATELY SERVED WATER DEMAND (M3/D)			
	DOMESTIC	COMMERCIAL	INDUSTRIAL	TOTAL
1995	436,105	118,941	418,793	973,839
1996	410,155	121,483	431,337	962,975
1997	384,204	124,025	443,881	952,110
1998	358,254	126,567	456,425	941,246
1999	332,303	129,109	468,969	930,381
2000	306,353	131,651	481,513	919,517
2005	266,479	144,216	539,798	950,493
2010	245,812	156,888	595,310	998,010

YEAR	TOTAL WATER DEMAND (M3/D)				
	DOMESTIC	COMMERCIAL	INDUSTRIAL	LOSS	TOTAL
1995	1,654,263	574,232	536,861	950,068	3,715,424
1996	1,703,873	599,811	556,450	957,289	3,817,424
1997	1,753,484	625,391	576,040	964,510	3,919,424
1998	1,803,094	650,970	595,629	971,731	4,021,425
1999	1,852,705	676,550	615,219	978,952	4,123,425
2000	1,902,315	702,129	634,808	986,173	4,225,425
2005	2,145,183	829,242	727,795	909,422	4,611,642
2010	2,382,040	958,009	818,967	1,042,123	5,201,139

TABLE 6.2.19 DISTRIBUTION OF WATER DEMAND IN 1995, BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	2,597,312	742,276	3,339,588	98.3	1.7	2,552,414	44,898	742,276	787,174	23.6
1. Manila	681,100	29,796	710,897	100.0	0.0	681,100	0	29,796	29,796	4.2
2. Pasay City	105,590	22,731	128,321	95.2	4.8	100,508	5,082	22,731	27,813	21.7
3. Quezon City	642,072	83,254	725,326	97.1	2.9	623,746	18,326	83,254	101,580	14.0
4. Caloocan City	167,729	48,176	215,905	100.0	0.0	167,729	0	48,176	48,176	22.3
5. Las Pinas	47,307	67,013	114,320	96.3	3.7	45,573	1,734	67,013	68,747	60.1
6. Makati	231,774	25,581	257,355	96.8	3.2	224,414	7,360	25,581	32,941	12.8
7. Malabon	71,165	31,270	102,435	98.3	1.7	69,921	1,244	31,270	32,514	31.7
8. Mandaluyong	95,271	10,729	106,000	100.0	0.0	95,271	0	10,729	10,729	10.1
9. Marikina	90,788	14,380	105,169	100.0	0.0	90,788	0	14,380	14,380	13.7
10. Muntinlupa	32,049	83,453	115,501	78.1	21.9	25,030	7,019	83,453	90,472	78.3
11. Navotas	46,507	6,480	52,987	99.3	0.7	46,194	313	6,480	6,793	12.8
12. Paranaque	113,095	69,929	183,025	98.4	1.6	111,327	1,768	69,929	71,697	39.2
13. Pasig	130,063	90,273	220,336	99.8	0.2	129,807	256	90,273	90,529	41.1
14. Pateros	6,657	7,401	14,057	100.0	0.0	6,657	0	7,401	7,401	52.6
15. San Juan	63,517	1,887	65,404	100.0	0.0	63,517	0	1,887	1,887	2.9
16. Taguig	15,787	92,662	108,449	94.6	5.4	14,940	847	92,662	93,509	86.2
17. Valenzuela	56,841	57,261	114,101	98.3	1.7	55,892	949	57,261	58,210	51.0
II. CAVITE	67,529	62,769	130,299	22.3	77.7	15,061	52,468	62,769	115,237	88.4
1. Bacoor	22,617	19,808	42,425	66.6	33.4	15,061	7,556	19,808	27,364	64.5
2. Cavite City	17,375	10,917	28,293	0.0	100.0	0	17,375	10,917	28,293	100.0
3. Imus	11,245	12,480	23,725	0.0	100.0	0	11,245	12,480	23,725	100.0
4. Kawit	10,929	3,041	13,971	0.0	100.0	0	10,929	3,041	13,971	100.0
5. Noveleta	1,621	3,059	4,680	0.0	100.0	0	1,621	3,059	4,680	100.0
6. Rosario	3,742	13,464	17,205	0.0	100.0	0	3,742	13,464	17,205	100.0
III. RIZAL	76,743	168,794	245,537	17.1	82.9	13,094	63,649	168,794	232,443	94.7
1. Angono	4,628	2,081	6,709	100.0	0.0	4,628	0	2,081	2,081	31.0
2. Antipolo	19,999	37,816	57,816	0.0	100.0	0	19,999	37,816	57,816	100.0
3. Baras	188	596	784	0.0	100.0	0	188	596	784	100.0
4. Binangonan	10,414	5,190	15,604	0.0	100.0	0	10,414	5,190	15,604	100.0
5. Cainta	10,616	66,356	76,972	45.5	54.5	4,830	5,786	66,356	72,142	93.7
6. Cardona	728	1,112	1,840	0.0	100.0	0	728	1,112	1,840	100.0
7. Jala-Jala	109	564	673	0.0	100.0	0	109	564	673	100.0
8. Montalban	5,680	7,918	13,599	0.0	100.0	0	5,680	7,918	13,599	100.0
9. Morong	1,419	1,145	2,564	0.0	100.0	0	1,419	1,145	2,564	100.0
10. Pililla	1,045	1,202	2,247	0.0	100.0	0	1,045	1,202	2,247	100.0
11. San Mateo	6,648	7,502	14,150	0.0	100.0	0	6,648	7,502	14,150	100.0
12. Tanay	3,225	2,301	5,526	0.0	100.0	0	3,225	2,301	5,526	100.0
13. Taytay	11,331	34,291	45,622	32.1	67.9	3,636	7,695	34,291	41,986	92.0
14. Teresa	713	718	1,431	0.0	100.0	0	713	718	1,431	100.0
TOTAL	2,741,584	973,839	3,715,423	94.1	5.9	2,580,569	161,015	973,839	1,134,854	30.5

TABLE 6.2.20 DISTRIBUTION OF WATER DEMAND IN 2000, BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE	GROUND-	G.W.
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER	GROUND-WATER	WATER TOTAL	SHARE (%)
I. NCR	3,039,444	692,223	3,731,667	98.5	1.5	2,994,546	44,898	692,223	737,121	19.8
1. Manila	715,862	27,866	743,728	100.0	0.0	715,862	0	27,866	27,866	3.7
2. Pasay City	122,662	19,618	142,280	95.9	4.1	117,580	5,082	19,618	24,700	17.4
3. Quezon City	710,182	81,471	791,653	97.4	2.6	691,856	18,326	81,471	99,797	12.6
4. Caloocan City	208,070	38,462	246,532	100.0	0.0	208,070	0	38,462	38,462	15.6
5. Las Pinas	100,145	59,013	159,158	98.3	1.7	98,411	1,734	59,013	60,747	38.2
6. Makati	258,098	20,844	278,943	97.1	2.9	250,738	7,360	20,844	28,204	10.1
7. Malabon	87,616	27,304	114,921	98.6	1.4	86,372	1,244	27,304	28,548	24.8
8. Mandaluyong	104,166	10,395	114,560	100.0	0.0	104,166	0	10,395	10,395	9.1
9. Marikina	99,235	16,094	115,328	100.0	0.0	99,235	0	16,094	16,094	14.0
10. Muntinlupa	69,874	78,387	148,261	90.0	10.0	62,855	7,019	78,387	85,406	57.6
11. Navotas	52,977	4,761	57,737	99.4	0.6	52,664	313	4,761	5,074	8.8
12. Paranaque	149,761	56,100	205,861	98.8	1.2	147,993	1,768	56,100	57,868	28.1
13. Pasig	150,009	101,430	251,439	99.8	0.2	149,753	256	101,430	101,686	40.4
14. Pateros	11,041	5,813	16,854	100.0	0.0	11,041	0	5,813	5,813	34.5
15. San Juan	64,108	1,888	65,996	100.0	0.0	64,108	0	1,888	1,888	2.9
16. Taguig	57,060	81,537	138,597	98.5	1.5	56,213	847	81,537	82,384	59.4
17. Valenzuela	78,578	61,241	139,818	98.8	1.2	77,629	949	61,241	62,190	44.5
II. CAVITE	117,566	49,032	166,598	39.7	60.3	46,709	70,858	49,032	119,890	72.0
1. Bacoor	49,666	9,713	59,379	84.8	15.2	42,110	7,556	9,713	17,269	29.1
2. Cavite City	23,500	9,649	33,148	0.0	100.0	0	23,500	9,649	33,148	100.0
3. Imus	18,277	11,351	29,628	0.0	100.0	0	18,277	11,351	29,628	100.0
4. Kawit	15,328	1,855	17,183	30.0	70.0	4,598	10,730	1,855	12,585	73.2
5. Noveleta	4,558	1,702	6,260	0.0	100.0	0	4,558	1,702	6,260	100.0
6. Rosario	6,238	14,763	21,001	0.0	100.0	0	6,238	14,763	21,001	100.0
III. RIZAL	148,897	178,262	327,159	42.2	57.8	62,799	86,098	178,262	264,360	80.8
1. Angono	7,907	2,419	10,326	100.0	0.0	7,907	0	2,419	2,419	23.4
2. Antipolo	30,215	45,283	75,498	6.1	93.9	1,834	28,381	45,283	73,664	97.6
3. Baras	291	658	949	0.0	100.0	0	291	658	949	100.0
4. Binangonan	16,775	5,620	22,395	0.0	100.0	0	16,775	5,620	22,395	100.0
5. Cainta	36,463	67,162	103,625	84.1	15.9	30,677	5,786	67,162	72,948	70.4
6. Cardona	971	1,164	2,135	0.0	100.0	0	971	1,164	2,135	100.0
7. Jala-Jala	414	610	1,024	0.0	100.0	0	414	610	1,024	100.0
8. Montalban	8,189	8,566	16,755	18.4	81.6	1,505	6,684	8,566	15,250	91.0
9. Morong	1,928	1,216	3,144	0.0	100.0	0	1,928	1,216	3,144	100.0
10. Pililla	1,786	1,302	3,088	0.0	100.0	0	1,786	1,302	3,088	100.0
11. San Mateo	10,354	7,844	18,198	21.5	78.5	2,224	8,130	7,844	15,974	87.8
12. Tanay	6,039	2,559	8,598	0.0	100.0	0	6,039	2,559	8,598	100.0
13. Taytay	26,346	33,120	59,466	70.8	29.2	18,651	7,695	33,120	40,815	68.6
14. Teresa	1,219	739	1,958	0.0	100.0	0	1,219	739	1,958	100.0
TOTAL	3,305,908	919,517	4,225,424	93.9	6.1	3,104,053	201,854	919,517	1,121,371	26.5

TABLE 6.2.21 DISTRIBUTION OF WATER DEMAND IN 2005, BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	3,311,729	711,915	4,023,644	98.6	1.4	3,266,831	44,898	711,915	756,813	18.8
1. Manila	738,301	27,472	765,773	100.0	0.0	738,301	0	27,472	27,472	3.6
2. Pasay City	136,214	16,708	152,922	96.3	3.7	131,132	5,082	16,708	21,790	14.2
3. Quezon City	760,536	81,874	842,410	97.6	2.4	742,210	18,326	81,874	100,200	11.9
4. Caloocan City	235,267	33,970	269,237	100.0	0.0	235,267	0	33,970	33,970	12.6
5. Las Pinas	140,422	59,684	200,105	98.8	1.2	138,688	1,734	59,684	61,418	30.7
6. Makati	272,451	20,920	293,371	97.3	2.7	265,091	7,360	20,920	28,280	9.6
7. Malabon	98,128	25,351	123,479	98.7	1.3	96,884	1,244	25,351	26,595	21.5
8. Mandaluyong	110,518	10,394	120,911	100.0	0.0	110,518	0	10,394	10,394	8.6
9. Marikina	105,535	18,090	123,625	100.0	0.0	105,535	0	18,090	18,090	14.6
10. Muntinlupa	89,985	83,225	173,211	92.2	7.8	82,966	7,019	83,225	90,244	52.1
11. Navotas	55,863	4,737	60,600	99.4	0.6	55,550	313	4,737	5,050	8.3
12. Paranaque	158,744	56,320	215,064	98.9	1.1	156,976	1,768	56,320	58,088	27.0
13. Pasig	161,455	115,717	277,172	99.8	0.2	161,199	256	115,717	115,973	41.8
14. Pateros	13,229	5,346	18,575	100.0	0.0	13,229	0	5,346	5,346	28.8
15. San Juan	64,133	1,888	66,020	100.0	0.0	64,133	0	1,888	1,888	2.9
16. Taguig	69,925	86,909	156,834	98.8	1.2	69,078	847	86,909	87,756	56.0
17. Valenzuela	101,024	63,311	164,335	99.1	0.9	100,075	949	63,311	64,260	39.1
II. CAVITE	144,680	44,868	189,548	41.3	58.7	59,719	84,961	44,868	129,829	68.5
1. Bacoor	59,874	9,140	69,014	87.4	12.6	52,318	7,556	9,140	16,696	24.2
2. Cavite City	28,461	7,781	36,242	0.0	100.0	0	28,461	7,781	36,242	100.0
3. Imus	23,527	10,346	33,873	0.0	100.0	0	23,527	10,346	33,873	100.0
4. Kawit	18,502	603	19,105	40.0	60.0	7,401	11,101	603	11,704	61.3
5. Noveleta	5,742	1,284	7,027	0.0	100.0	0	5,742	1,284	7,027	100.0
6. Rosario	8,573	15,715	24,288	0.0	100.0	0	8,573	15,715	24,288	100.0
III. RIZAL	204,739	193,711	398,449	48.7	51.3	99,731	105,008	193,711	298,718	75.0
1. Angono	12,701	2,592	15,293	100.0	0.0	12,701	0	2,592	2,592	16.9
2. Antipolo	39,332	51,175	90,506	21.8	78.2	8,572	30,760	51,175	81,934	90.5
3. Baras	642	708	1,350	0.0	100.0	0	642	708	1,350	100.0
4. Binangonan	25,501	5,671	31,172	0.0	100.0	0	25,501	5,671	31,172	100.0
5. Cainta	48,686	73,627	122,313	88.1	11.9	42,900	5,786	73,627	79,413	64.9
6. Cardona	1,347	1,188	2,535	0.0	100.0	0	1,347	1,188	2,535	100.0
7. Jala-Jala	911	638	1,549	0.0	100.0	0	911	638	1,549	100.0
8. Montalban	10,188	8,936	19,124	34.4	65.6	3,504	6,684	8,936	15,620	81.7
9. Morong	2,833	1,290	4,123	0.0	100.0	0	2,833	1,290	4,123	100.0
10. Pililla	3,462	1,356	4,818	0.0	100.0	0	3,462	1,356	4,818	100.0
11. San Mateo	14,124	7,833	21,958	42.4	57.6	5,994	8,130	7,833	15,963	72.7
12. Tanay	9,425	2,662	12,087	0.0	100.0	0	9,425	2,662	12,087	100.0
13. Taytay	33,754	35,304	69,058	77.2	22.8	26,059	7,695	35,304	42,999	82.3
14. Teresa	1,832	730	2,562	0.0	100.0	0	1,832	730	2,562	100.0
TOTAL	3,661,148	950,493	4,611,641	93.6	6.4	3,426,281	234,867	950,493	1,185,360	25.7

TABLE 6.2.22 DISTRIBUTION OF WATER DEMAND IN 2010, BY SOURCE

CITY/ MUNICIPALITY	WATER DEMAND (M3/D)			MWSS BREAKDOWN (%)		MWSS BREAKDOWN (M3/D)		PRIVATE GROUND-WATER	GROUND-WATER TOTAL	G.W. SHARE (%)
	MWSS	PRIVATE	TOTAL	SURFACE WATER	GROUND-WATER	SURFACE WATER	GROUND-WATER			
I. NCR	3,740,899	753,685	4,494,583	98.8	1.2	3,696,001	44,898	753,685	798,583	17.8
1. Manila	804,366	27,359	831,725	100.0	0.0	804,366	0	27,359	27,359	3.3
2. Pasay City	153,165	16,736	169,901	96.7	3.3	148,083	5,082	16,736	21,818	12.8
3. Quezon City	852,444	82,662	935,106	97.9	2.1	834,118	18,326	82,662	100,988	10.8
4. Caloocan City	277,565	27,960	305,524	100.0	0.0	277,565	0	27,960	27,960	9.2
5. Las Pinas	179,932	69,889	249,821	99.0	1.0	178,198	1,734	69,889	71,623	28.7
6. Makati	302,437	21,036	323,473	97.6	2.4	295,077	7,360	21,036	28,396	8.8
7. Malabon	114,113	22,979	137,092	98.9	1.1	112,869	1,244	22,979	24,223	17.7
8. Mandaluyong	122,989	10,456	133,445	100.0	0.0	122,989	0	10,456	10,456	7.8
9. Marikina	117,556	20,112	137,668	100.0	0.0	117,556	0	20,112	20,112	14.6
10. Muntinlupa	106,746	94,265	201,011	93.4	6.6	99,727	7,019	94,265	101,284	50.4
11. Navotas	61,692	4,787	66,479	99.5	0.5	61,379	313	4,787	5,100	7.7
12. Paranaque	166,529	61,722	228,251	98.9	1.1	164,761	1,768	61,722	63,490	27.8
13. Pasig	181,869	129,726	311,595	99.9	0.1	181,613	256	129,726	129,982	41.7
14. Pateros	16,376	4,600	20,975	100.0	0.0	16,376	0	4,600	4,600	21.9
15. San Juan	67,826	1,880	69,706	100.0	0.0	67,826	0	1,880	1,880	2.7
16. Taguig	88,247	90,416	178,664	99.0	1.0	87,400	847	90,416	91,263	51.1
17. Valenzuela	127,045	67,101	194,147	99.3	0.7	126,096	949	67,101	68,050	35.1
II. CAVITE	178,439	41,718	220,157	41.8	58.2	74,549	103,890	41,718	145,608	66.1
1. Bacoor	71,216	10,799	82,015	89.4	10.6	63,660	7,556	10,799	18,355	22.4
2. Cavite City	32,500	7,310	39,810	0.0	100.0	0	32,500	7,310	39,810	100.0
3. Imus	33,381	6,818	40,199	0.0	100.0	0	33,381	6,818	40,199	100.0
4. Kawit	21,778	0	21,778	50.0	50.0	10,889	10,889	0	10,889	50.0
5. Noveleta	7,289	816	8,105	0.0	100.0	0	7,289	816	8,105	100.0
6. Rosario	12,275	15,975	28,250	0.0	100.0	0	12,275	15,975	28,250	100.0
III. RIZAL	283,791	202,608	486,399	53.7	46.3	152,420	131,371	202,608	333,979	68.7
1. Angono	19,296	2,516	21,812	100.0	0.0	19,296	0	2,516	2,516	11.5
2. Antipolo	53,929	55,380	109,309	33.7	66.3	18,149	35,780	55,380	91,160	83.4
3. Baras	1,165	731	1,896	0.0	100.0	0	1,165	731	1,896	100.0
4. Binangonan	36,874	5,250	42,124	0.0	100.0	0	36,874	5,250	42,124	100.0
5. Cainta	66,270	78,127	144,397	91.3	8.7	60,484	5,786	78,127	83,913	58.1
6. Cardona	1,825	1,178	3,003	0.0	100.0	0	1,825	1,178	3,003	100.0
7. Jala-Jala	1,646	632	2,278	0.0	100.0	0	1,646	632	2,278	100.0
8. Montalban	12,542	9,318	21,860	46.7	53.3	5,858	6,684	9,318	16,002	73.2
9. Morong	4,076	1,318	5,394	0.0	100.0	0	4,076	1,318	5,394	100.0
10. Pililla	5,108	1,324	6,432	0.0	100.0	0	5,108	1,324	6,432	100.0
11. San Mateo	19,954	7,193	27,147	59.3	40.7	11,824	8,130	7,193	15,323	56.4
12. Tanay	13,968	2,574	16,542	0.0	100.0	0	13,968	2,574	16,542	100.0
13. Taytay	44,504	36,380	80,884	82.7	17.3	36,809	7,695	36,380	44,075	54.5
14. Teresa	2,634	686	3,320	0.0	100.0	0	2,634	686	3,320	100.0
TOTAL	4,203,129	998,010	5,201,139	93.3	6.7	3,922,970	280,159	998,010	1,278,170	24.6

TABLE 6.2.23 ANALYSIS ON WATER SUPPLY AND SUPPLY CAPACITY

YEAR	MWSS WATER DEMAND (M3/D)			MWSS PRODUCTION FROM SURFACE WATER (M3/D)					EXCESS IN PRODUCTION (M3/D)	REQUIRED GROUNDWATER SUPPLY (M3/D)		
	TOTAL	W/I CDS	LOSS (%)	EXISTING	ANGAT (ON-GOING)	WAWA (PLANNED)	UMIRAY (PLANNED)	TOTAL (M3/D)		MWSS	PRIVATE	TOTAL
1995	2,741,584	2,646,504	35.0	2,234,700	-	-	-	2,234,700	(411,804)	161,015	973,839	1,134,854
1996	2,854,449	2,761,986	34.0	2,234,700	1,231,200	-	-	3,465,900	703,914	169,183	962,975	1,132,157
1997	2,967,314	2,877,467	33.0	2,234,700	1,231,200	68,400	-	3,534,300	656,833	177,351	952,110	1,129,461
1998	3,080,178	2,992,949	32.0	2,234,700	1,231,200	68,400	738,700	4,273,000	1,280,051	185,518	941,246	1,126,764
1999	3,193,043	3,108,430	31.0	2,234,700	1,231,200	68,400	738,700	4,273,000	1,164,570	193,686	930,381	1,124,068
2000	3,305,908	3,223,912	30.0	2,234,700	1,231,200	68,400	738,700	4,273,000	1,049,088	201,854	919,517	1,121,371
2005	3,661,148	3,548,890	25.0	2,234,700	1,231,200	68,400	738,700	4,273,000	724,110	234,867	950,493	1,185,360
2010	4,203,129	4,050,388	25.0	2,234,700	1,231,200	68,400	738,700	4,273,000	222,612	280,159	998,010	1,278,169

WATER PRODUCTION:

1. EXISTING; actual average production in last 5 years: 2,352,364 M3/D
   actual production loss in MWSS in 1990; 1.5%
   assumed production loss in the future: 5%
   2,352,364 x 95% = 2,234,746
2. ANGAT; AWSOP 15CMS x 95% (production loss: 5%)
3. WAWA; MNEWSP 72MLD x 95% (production loss: 5%)
4. UMIRAY; UATP 9CMS x 95% (production loss: 5%)
5. Demand for MWSS in Angono and Taytay is assumed to be supplied with surface water through RPWSP.

TABLE 6.2.24 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 1)

SYSTEM	MWSS WELL					PRIVATE WELL					TOTAL				
CITY/MUNICIPALITY	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010
I. NCR	32,961	44,898	44,898	44,898	44,898	640,937	666,580	692,223	711,915	753,685	673,898	711,478	737,121	756,813	798,583
1. Manila	0	0	0	0	0	12,665	20,265	27,866	27,472	27,359	12,665	20,265	27,866	27,472	27,359
2. Pasay City	4,461	5,082	5,082	5,082	5,082	17,997	18,807	19,618	16,708	16,736	22,458	23,889	24,700	21,790	21,818
3. Quezon City	14,186	18,326	18,326	18,326	18,326	91,324	86,397	81,471	81,876	82,662	105,510	104,723	99,797	100,200	100,988
4. Caloocan City	0	0	0	0	0	27,476	32,969	38,462	33,970	27,960	27,476	32,969	38,462	33,970	27,960
5. Las Pinas	1,527	1,734	1,734	1,734	1,734	81,778	70,395	59,013	59,684	69,889	83,305	72,129	60,747	61,418	71,623
6. Makati	3,772	7,360	7,360	7,360	7,360	25,179	23,012	20,844	20,920	21,036	28,951	30,372	28,204	28,280	28,396
7. Malabon	554	1,244	1,244	1,244	1,244	18,473	22,889	27,304	25,351	22,979	19,027	24,133	28,548	26,595	24,223
8. Mandaluyong	0	0	0	0	0	8,976	9,685	10,395	10,394	10,456	8,976	9,685	10,395	10,394	10,456
9. Marikina	0	0	0	0	0	13,573	14,833	16,094	18,090	20,112	13,573	14,833	16,094	18,090	20,112
10. Muntinlupa	5,777	7,019	7,019	7,019	7,019	91,618	85,003	78,387	83,225	94,265	97,395	92,022	85,406	90,244	101,284
11. Navotas	106	313	313	313	313	4,051	4,406	4,761	4,737	4,787	4,157	4,719	5,074	5,050	5,100
12. Paranaque	1,147	1,768	1,768	1,768	1,768	70,158	63,129	56,100	56,320	61,722	71,305	64,897	57,868	58,088	63,490
13. Pasig	49	256	256	256	256	75,958	88,694	101,430	115,717	129,726	76,007	88,950	101,686	115,973	129,982
14. Pateros	0	0	0	0	0	1,756	3,785	5,813	5,346	4,600	1,756	3,785	5,813	5,346	4,600
15. San Juan	0	0	0	0	0	408	1,148	1,888	1,888	1,880	408	1,148	1,888	1,888	1,880
16. Taguig	640	847	847	847	847	66,367	73,952	81,537	86,909	90,416	67,007	74,799	82,384	87,756	91,263
17. Valenzuela	742	949	949	949	949	33,180	47,210	61,241	63,311	67,101	33,922	48,159	62,190	64,260	68,050
II. CAVITE	26,970	47,610	70,858	84,961	103,890	57,927	53,479	49,032	44,868	41,718	84,897	101,090	119,890	129,829	145,608
1. Bacoor	6,314	7,556	7,556	7,556	7,556	32,210	20,961	9,713	9,140	10,799	38,524	28,517	17,269	16,696	18,355
2. Cavite City	6,714	11,926	20,988	27,133	32,500	4,328	6,988	9,649	7,781	7,310	11,042	18,914	30,637	34,914	39,810
3. Imus	1,654	9,965	18,277	23,527	33,381	4,443	7,897	11,351	10,346	6,818	6,097	17,862	29,628	33,873	40,199
4. Kawit	4,329	7,529	10,730	11,101	10,889	2,830	2,342	1,855	603	0	7,159	9,872	12,585	11,704	10,889
5. Noveleta	7,070	7,070	7,070	7,070	7,269	5,659	3,680	1,702	1,284	816	12,729	10,750	8,772	8,354	8,105
6. Rosario	889	3,563	6,238	8,573	12,275	8,457	11,610	14,763	15,715	15,975	9,346	15,173	21,001	24,288	28,250
III. RIZAL	29,808	58,898	86,098	105,008	131,371	141,838	160,050	178,262	193,711	202,608	171,646	218,948	264,360	298,718	333,979
1. Angono	-	0	0	0	0	-	1,210	2,419	2,592	2,516	-	1,210	2,419	2,592	2,516
2. Antipolo	11,621	19,999	28,381	30,760	35,780	44,155	44,719	45,283	51,175	55,380	55,776	64,718	73,664	81,934	91,160
3. Baras	-	145	291	642	1,165	-	329	658	708	731	-	474	949	1,350	1,896
4. Binangonan	-	8,388	16,775	25,501	36,874	-	2,810	5,620	5,671	5,250	-	11,198	22,395	31,172	42,124
5. Cainta	3,786	4,786	5,786	5,786	5,786	48,619	57,891	67,162	73,627	78,127	52,404	62,676	72,948	79,413	83,913
6. Cardona	-	485	971	1,347	1,825	-	582	1,164	1,188	1,178	-	1,067	2,135	2,535	3,003
7. Jala-Jala	-	207	414	911	1,646	-	305	610	638	632	-	512	1,024	1,549	2,278
8. Montalban	3,243	5,680	6,684	6,684	6,684	8,030	8,298	8,566	8,936	9,318	11,273	13,978	15,250	15,620	16,002
9. Morong	-	964	1,928	2,833	4,076	-	608	1,216	1,290	1,318	-	1,572	3,144	4,123	5,394
10. Pililla	-	893	1,786	3,462	5,108	-	651	1,302	1,356	1,324	-	1,544	3,088	4,818	6,432
11. San Mateo	4,706	6,648	8,130	8,130	8,130	3,641	5,743	7,844	7,833	7,193	8,347	12,391	15,974	15,963	15,323
12. Tanay	-	3,019	6,039	9,425	13,968	-	1,280	2,559	2,662	2,574	-	4,299	8,598	12,087	16,542
13. Taytay	6,453	7,074	7,695	7,695	7,695	37,393	35,256	33,120	35,304	36,380	43,846	42,330	40,815	42,999	44,075
14. Teresa	-	609	1,219	1,832	2,634	-	370	739	730	686	-	979	1,958	2,562	3,320
TOTAL	89,739	151,406	201,855	234,866	280,159	840,702	880,109	919,517	950,493	998,010	930,441	1,031,515	1,121,372	1,155,360	1,278,170

TABLE 6.2.25 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 2)

SYSTEM	MWSS WELL					PRIVATE WELL					TOTAL				
CITY/MUNICIPALITY	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010
I. NCR	32,961	44,898	44,898	44,898	44,898	640,937	666,580	692,223	660,888	652,943	673,898	711,478	737,121	705,786	697,841
1. Manila	0	0	0	0	0	12,665	20,285	27,866	27,472	27,359	12,665	20,285	27,866	27,472	27,359
2. Pasay City	4,461	5,082	5,082	5,082	5,082	17,997	18,807	19,618	16,708	16,736	22,458	23,889	24,700	21,790	21,818
3. Quezon City	14,186	18,326	18,326	18,326	18,326	91,324	86,397	81,471	81,874	82,662	105,510	104,723	99,797	100,200	100,988
4. Caloocan City	0	0	0	0	0	27,476	32,969	38,462	33,970	27,960	27,476	32,969	38,462	33,970	27,960
5. Las Pinas	1,527	1,734	1,734	1,734	1,734	81,778	70,395	59,013	54,444	59,540	83,305	72,129	60,747	56,178	61,274
6. Makati	3,772	7,360	7,360	7,360	7,360	25,179	23,012	20,844	20,920	21,036	28,951	30,372	28,204	28,280	28,396
7. Malabon	554	1,244	1,244	1,244	1,244	18,473	22,889	27,304	25,351	22,979	19,027	24,133	28,548	26,595	24,223
8. Mandaluyong	0	0	0	0	0	8,978	9,685	10,395	10,394	10,456	8,978	9,685	10,395	10,394	10,456
9. Marikina	0	0	0	0	0	13,573	14,833	16,094	16,326	16,626	13,573	14,833	16,094	16,326	16,626
10. Muntinlupa	5,777	7,019	7,019	7,019	7,019	91,618	85,003	78,387	74,043	76,108	97,395	92,022	85,406	81,062	83,127
11. Navotas	108	313	313	313	313	4,051	4,406	4,761	4,737	4,787	4,157	4,719	5,074	5,050	5,100
12. Paranaque	1,147	1,768	1,768	1,768	1,768	70,158	63,129	56,100	51,397	51,981	71,305	64,897	57,868	53,165	53,749
13. Pasig	49	256	256	256	256	75,958	88,694	101,430	101,771	102,216	76,007	88,950	101,686	102,027	102,472
14. Pateros	0	0	0	0	0	1,756	3,785	5,813	4,992	3,904	1,756	3,785	5,813	4,992	3,904
15. San Juan	0	0	0	0	0	408	1,148	1,888	1,888	1,880	408	1,148	1,888	1,888	1,880
16. Taguig	640	847	847	847	847	66,367	73,952	81,537	77,597	72,057	67,007	74,799	82,384	78,444	72,904
17. Valenzuela	742	949	949	949	949	33,180	47,210	61,241	57,005	54,657	33,922	48,159	62,190	57,954	55,606
II. CAVITE	26,970	47,610	70,858	70,859	70,859	57,927	53,479	49,032	42,252	36,511	84,897	101,090	119,890	113,111	107,370
1. Bacoor	6,314	7,556	7,556	7,556	7,556	32,210	20,961	9,713	8,945	10,409	38,524	28,517	17,269	16,501	17,965
2. Cavite City	6,714	11,926	20,988	20,988	20,988	4,328	6,988	9,649	6,819	5,379	11,042	18,914	30,637	27,807	26,367
3. Imus	1,656	9,965	18,277	18,277	18,277	4,443	7,897	11,351	10,061	6,250	6,097	17,862	29,628	28,338	24,527
4. Kawit	4,329	7,529	10,730	10,730	10,730	2,830	2,342	1,855	603	0	7,159	9,872	12,585	11,333	10,730
5. Noveleta	7,070	7,070	7,070	7,070	7,070	5,659	3,680	1,702	1,284	816	12,729	10,750	8,772	8,354	7,886
6. Rosario	889	3,563	6,238	6,238	6,238	8,457	11,610	14,763	14,539	13,657	9,346	15,173	21,001	20,777	19,895
III. RIZAL	29,808	58,898	86,098	105,008	151,371	141,838	160,050	178,262	193,711	202,808	171,646	218,948	264,360	298,718	333,979
1. Angono	-	0	0	0	0	-	1,210	2,419	2,582	2,516	-	1,210	2,419	2,582	2,516
2. Antipolo	11,621	19,989	28,381	30,760	35,780	44,155	44,719	45,283	51,175	55,380	55,776	64,718	73,864	81,934	91,160
3. Baras	-	145	291	642	1,165	-	329	658	708	731	-	474	949	1,350	1,896
4. Binangonan	-	8,388	16,775	25,501	36,874	-	2,810	5,620	5,671	5,250	-	11,198	22,395	31,172	42,124
5. Cainta	3,785	4,786	5,786	5,786	5,786	48,619	57,891	67,162	73,627	78,127	52,404	62,676	72,948	79,413	83,913
6. Cardona	-	485	971	1,347	1,825	-	582	1,164	1,188	1,178	-	1,067	2,135	2,535	3,003
7. Jala-Jala	-	207	414	811	1,648	-	305	610	638	632	-	512	1,024	1,549	2,278
8. Montalban	3,243	5,680	6,684	6,684	6,684	8,030	8,298	8,566	8,936	9,318	11,273	13,978	15,250	15,620	16,002
9. Morong	-	964	1,928	2,833	4,076	-	608	1,216	1,290	1,318	-	1,572	3,144	4,123	5,394
10. Pililla	-	893	1,786	3,462	5,108	-	651	1,302	1,356	1,324	-	1,544	3,088	4,818	6,432
11. San Mateo	4,706	6,648	8,130	8,130	8,130	3,641	5,743	7,844	7,833	7,193	8,347	12,391	15,974	15,963	15,323
12. Tanay	-	3,019	6,039	9,425	13,968	-	1,280	2,559	2,662	2,574	-	4,299	8,598	12,087	16,542
13. Taytay	6,453	7,074	7,695	7,695	7,695	37,393	35,256	33,120	35,304	36,380	43,846	42,330	40,815	42,999	44,075
14. Teresa	-	609	1,219	1,832	2,634	-	370	739	730	686	-	979	1,958	2,562	3,320
TOTAL	89,739	151,406	201,855	220,765	247,128	840,702	880,109	919,517	896,850	892,062	930,441	1,031,515	1,121,372	1,117,615	1,139,190

TABLE 6.2.26 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 3)

SYSTEM	MWSS WELL					PRIVATE WELL					TOTAL				
CITY/MUNICIPALITY	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010
I. NCR	32,961	44,898	44,898	44,898	44,898	640,937	666,580	692,223	606,845	598,900	673,898	711,478	737,121	651,743	643,798
1. Manila	0	0	0	0	0	12,665	20,265	27,866	27,472	27,359	12,665	20,265	27,866	27,472	27,359
2. Pasay City	4,461	5,082	5,082	5,082	5,082	17,997	18,807	19,618	16,708	16,736	22,458	23,889	24,700	21,790	21,818
3. Quezon City	14,186	18,326	18,326	18,326	18,326	91,324	86,397	81,471	81,874	82,662	105,510	104,723	99,797	100,200	100,988
4. Caloocan City	0	0	0	0	0	27,476	32,969	38,462	33,970	27,960	27,476	32,969	38,462	33,970	27,960
5. Las Pinas	1,527	1,734	1,734	1,734	1,734	81,778	70,395	59,013	48,901	53,996	83,305	72,129	60,747	50,635	55,730
6. Makati	3,772	7,360	7,360	7,360	7,360	25,179	23,012	20,844	20,920	21,036	28,951	30,372	28,204	28,280	28,396
7. Malabon	554	1,244	1,244	1,244	1,244	18,473	22,885	27,304	25,351	22,979	19,027	24,133	28,548	26,595	24,223
8. Mandaluyong	0	0	0	0	0	8,976	9,685	10,395	10,394	10,456	8,976	9,685	10,395	10,394	10,456
9. Marikina	0	0	0	0	0	13,573	14,833	16,094	14,463	14,763	13,573	14,833	16,094	14,463	14,763
10. Muntinlupa	5,777	7,019	7,019	7,019	7,019	91,618	85,003	78,387	64,358	66,423	97,395	92,022	85,406	71,377	73,442
11. Navotas	106	313	313	313	313	4,051	4,406	4,761	4,737	4,787	4,157	4,719	5,074	5,050	5,100
12. Paranaque	1,147	1,768	1,768	1,768	1,768	70,158	63,129	56,100	46,212	46,797	71,305	64,897	57,868	47,980	48,565
13. Pasig	49	256	256	256	256	75,958	88,694	101,430	86,967	87,412	76,007	88,950	101,686	87,223	87,668
14. Pateros	0	0	0	0	0	1,756	3,785	5,813	4,613	3,525	1,756	3,785	5,813	4,613	3,525
15. San Juan	0	0	0	0	0	408	1,148	1,888	1,888	1,880	408	1,148	1,888	1,888	1,880
16. Taguig	840	847	847	847	847	66,367	73,952	81,537	67,700	62,160	67,007	74,799	82,384	68,547	63,007
17. Valenzuela	742	949	949	949	949	33,180	47,210	61,241	50,318	47,970	33,922	48,159	62,190	51,267	48,919
II. CAVITE	26,970	52,468	52,468	52,468	52,468	57,927	53,479	49,032	39,537	33,796	84,897	105,948	101,500	92,005	86,264
1. Bacoor	6,314	7,556	7,556	7,556	7,556	32,210	20,961	9,713	8,749	10,212	38,524	28,517	17,269	16,305	17,768
2. Cavite City	6,714	11,926	11,926	11,926	11,926	4,328	6,988	9,649	5,847	4,406	11,042	18,914	21,575	17,773	16,332
3. Imus	1,654	11,245	11,245	11,245	11,245	4,443	7,897	11,351	9,787	5,956	6,097	19,142	22,596	21,012	17,201
4. Kawit	4,329	10,929	10,929	10,929	10,929	2,830	2,342	1,855	603	0	7,159	13,272	12,784	11,532	10,930
5. Noveleta	7,070	7,070	7,070	7,070	7,070	5,659	3,680	1,702	1,284	816	12,729	10,750	8,772	8,354	7,886
6. Rosario	889	3,742	3,742	3,742	3,742	8,457	11,610	14,763	13,287	12,406	9,346	15,352	18,505	17,029	16,147
III. RIZAL	29,808	63,649	86,098	105,008	131,371	141,838	160,050	178,262	193,711	202,608	171,646	223,699	264,360	298,718	333,979
1. Angono	-	0	0	0	0	-	1,210	2,419	2,592	2,516	-	1,210	2,419	2,592	2,516
2. Antipolo	11,621	19,999	28,381	30,760	35,780	44,155	44,719	45,283	51,175	55,380	55,776	64,718	73,664	81,934	91,160
3. Baras	-	188	291	642	1,165	-	329	658	708	731	-	517	949	1,350	1,896
4. Binangonan	-	10,414	16,775	25,501	36,874	-	2,810	5,620	5,671	5,250	-	13,224	22,395	31,172	42,124
5. Cainta	3,785	5,786	5,786	5,786	5,786	48,619	57,891	67,162	73,627	78,127	52,404	63,677	72,948	79,413	83,913
6. Cardona	-	728	971	1,347	1,825	-	582	1,164	1,188	1,178	-	1,310	2,135	2,535	3,003
7. Jala-Jala	-	109	414	911	1,646	-	305	610	638	632	-	414	1,024	1,549	2,278
8. Montalban	3,243	5,680	6,684	6,684	6,684	8,030	8,298	8,566	8,936	9,318	11,273	13,978	15,250	15,620	16,002
9. Morong	-	1,419	1,928	2,833	4,076	-	608	1,216	1,290	1,318	-	2,027	3,144	4,123	5,394
10. Pililla	-	1,045	1,786	3,462	5,108	-	651	1,302	1,356	1,324	-	1,696	3,088	4,818	6,432
11. San Mateo	4,706	6,648	8,130	8,130	8,130	3,641	5,743	7,844	7,833	7,193	8,347	12,390	15,974	15,963	15,323
12. Tanay	-	3,225	6,039	9,425	13,968	-	1,280	2,559	2,662	2,574	-	4,504	8,598	12,087	16,542
13. Taytay	6,453	7,695	7,695	7,695	7,695	37,393	35,256	33,120	35,304	36,380	43,846	42,951	40,815	42,999	44,075
14. Teresa	-	713	1,219	1,832	2,634	-	370	739	730	686	-	1,082	1,958	2,562	3,320
TOTAL	89,739	161,015	183,465	202,374	228,738	840,702	880,109	919,517	840,092	835,304	930,441	1,041,124	1,102,982	1,042,466	1,064,041

TABLE 6.2.27 SUMMARY OF GROUNDWATER DISCHARGE (SCENARIO 4)

SYSTEM	MWSS WELL					PRIVATE WELL					TOTAL				
CITY/MUNICIPALITY	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010	1990	1995	2000	2005	2010
I. NCR	32,961	44,898	44,898	44,898	44,898	640,937	696,079	751,221	737,240	767,418	673,898	740,977	796,119	782,138	812,316
1. Manila	0	0	0	0	0	12,665	20,491	28,317	27,926	27,812	12,665	20,491	28,317	27,926	27,812
2. Pasay City	4,461	5,082	5,082	5,082	5,082	17,997	19,481	20,965	18,172	16,996	22,458	24,563	26,047	23,254	22,078
3. Quezon City	14,186	18,326	18,326	18,326	18,326	91,324	86,756	82,189	82,643	83,471	105,510	105,082	100,515	100,969	101,797
4. Caloocan City	0	0	0	0	0	27,476	35,836	44,197	37,493	31,884	27,476	35,836	44,197	37,493	31,884
5. Las Pinas	1,527	1,734	1,734	1,734	1,734	81,778	75,853	69,927	64,628	70,083	83,305	77,587	71,661	66,362	71,817
6. Makati	3,772	7,360	7,360	7,360	7,360	25,179	24,031	22,883	21,041	21,160	28,951	31,391	30,243	28,401	28,520
7. Malabon	554	1,244	1,244	1,244	1,244	18,473	23,926	29,380	26,545	24,258	19,027	25,170	30,624	27,789	25,502
8. Mandaluyong	0	0	0	0	0	8,976	9,737	10,497	10,500	10,586	8,976	9,737	10,497	10,500	10,586
9. Marikina	0	0	0	0	0	13,573	14,899	16,224	18,233	20,266	13,573	14,899	16,224	18,233	20,266
10. Muntinlupa	5,777	7,019	7,019	7,019	7,019	91,618	89,454	87,289	86,448	94,464	97,395	96,473	94,308	93,467	101,483
11. Navotas	106	313	313	313	313	4,051	4,763	5,475	4,865	4,911	4,157	5,076	5,788	5,168	5,224
12. Paranaque	1,147	1,768	1,768	1,768	1,768	70,158	67,727	65,295	58,812	61,791	71,305	69,495	67,063	60,580	63,559
13. Pasig	49	256	256	256	256	75,958	89,596	103,233	115,924	129,951	76,007	89,852	103,489	116,180	130,207
14. Pateros	0	0	0	0	0	1,756	4,325	6,895	5,841	5,145	1,756	4,325	6,895	5,841	5,145
15. San Juan	0	0	0	0	0	408	1,157	1,906	1,906	1,898	408	1,157	1,906	1,906	1,898
16. Taguig	640	847	847	847	847	66,367	79,444	92,521	89,534	93,367	67,007	80,291	93,368	90,381	94,214
17. Valenzuela	742	949	949	949	949	33,180	48,604	64,028	66,738	69,394	33,922	49,553	64,977	67,687	70,343
II. CAVITE	26,970	45,921	64,875	80,324	98,894	57,927	58,667	59,408	49,635	45,623	84,897	104,588	124,283	129,958	144,517
1. Bacoor	6,314	7,556	7,556	7,556	7,556	32,210	23,951	15,693	10,190	10,806	38,524	31,507	23,249	17,746	18,362
2. Cavite City	6,714	11,869	18,270	25,006	31,521	4,328	7,553	10,778	9,081	7,983	11,042	19,422	29,048	34,087	39,504
3. Imus	1,654	9,014	16,374	22,182	30,733	4,443	8,563	12,683	11,355	8,804	6,097	17,577	29,057	33,537	39,537
4. Kawit	4,329	7,183	10,037	10,625	10,688	2,830	2,689	2,548	1,199	301	7,159	9,872	12,585	11,823	10,989
5. Noveleta	7,070	7,070	7,070	7,070	7,070	5,659	4,067	2,475	1,579	1,042	12,729	11,137	9,545	8,649	8,112
6. Rosario	889	3,229	5,569	7,885	11,326	8,457	11,844	15,231	16,231	16,687	9,346	15,073	20,800	24,116	28,012
III. RIZAL	29,808	54,199	84,734	103,549	128,964	141,838	165,915	189,991	199,009	209,323	171,646	220,113	274,725	302,558	338,286
1. Angono	-	0	0	0	0	-	1,210	2,419	2,592	2,516	-	1,210	2,419	2,592	2,516
2. Antipolo	11,621	16,767	26,858	29,142	33,213	44,155	45,264	46,373	52,402	57,386	55,776	62,031	73,230	81,545	90,599
3. Baras	-	145	291	642	1,165	-	329	658	708	731	-	474	949	1,350	1,896
4. Binangonan	-	8,388	16,775	25,501	36,874	-	2,810	5,620	5,671	5,250	-	11,198	22,395	31,172	42,124
5. Cainta	3,785	4,786	5,786	5,786	5,786	48,619	61,036	73,454	75,421	80,308	52,404	65,822	79,240	81,207	86,094
6. Cardona	-	485	971	1,347	1,825	-	582	1,164	1,168	1,178	-	1,067	2,135	2,535	3,003
7. Jala-Jala	-	207	414	911	1,646	-	305	610	638	632	-	512	1,024	1,549	2,278
8. Montalban	3,243	4,499	6,585	6,585	6,585	8,030	8,437	8,845	9,323	9,620	11,273	12,936	15,430	15,908	16,205
9. Morong	-	964	1,928	2,933	4,078	-	608	1,216	1,290	1,318	-	1,572	3,144	4,123	5,396
10. Pililla	-	893	1,786	3,462	5,108	-	651	1,302	1,356	1,324	-	1,544	3,088	4,818	6,432
11. San Mateo	4,706	8,362	8,388	8,388	8,388	3,641	6,020	8,399	8,488	7,966	8,347	12,382	16,787	16,876	16,354
12. Tanay	-	3,019	6,039	8,425	13,968	-	1,280	2,559	2,662	2,574	-	4,299	8,598	12,087	16,542
13. Taytay	6,453	7,074	7,695	7,695	7,695	37,393	37,014	36,634	36,538	37,834	43,846	44,088	44,329	44,234	45,529
14. Teresa	-	609	1,219	1,832	2,634	-	370	739	730	686	-	979	1,958	2,562	3,320
TOTAL	89,739	145,017	194,508	228,771	272,756	840,702	920,661	1,000,620	985,883	1,022,363	930,441	1,065,678	1,195,128	1,214,654	1,295,119

TABLE 6.2.28 NUMBER OF CONNECTIONS AND WATER CONSUMPTION IN THE ANTIPOLO BASIN

AREA	NO. OF CONNECTIONS					WATER CONSUMPTION (M^3/D)				
	DOM.	P.F.	COM.	IND.	TOTAL	DOM.	P.F.	COM.	IND.	TOTAL
ANTIPOLO MUNICIPALITY	4445	1	223	44	4713	3606	4	533	1565	5707
ANTIPOLO BASIN	3535	3	172	28	3738	2962	10	270	46	3288
SHARE (%)	79.5	300	77.1	63.6	79.3	82.1	250	50.7	2.9	57.6

Note: Data on P.F. may be processed improperly. But its influence is negligible.

Source: Computer Service Center, MWSS

TABLE 6.2.29 GROUNDWATER DISCHARGE IN THE ANTIPOLO BASIN (1990)

(UNIT: MCM)

OWNER	NO. OF WELLS	DISCHARGE	USE		
			DOM.	COM.	IND.
MWSS	10	3.5803	1.1884	0.1119	0.0190
PRIVATE	26	3.5210	2.2591	0.2209	1.0410
TOTAL	36	7.1013	3.4475	0.3328	1.0600
DAILY (M^3/D)		19,456	9,445	912	2,904
MWSS %	27.7	50.4	34.5	33.6	1.8

Source: Study Team

TABLE 6.2.30 PROJECTED MWSS SERVED POPULATION

(POBLACION SYSTEM)

BARANGAY/ MUNICIPALITY	POPULATION WITHIN STUDY AREA					SERVICE RATIO (%)				POPULATION WITHIN SERVICE AREA			
	1990	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
1. Bagong Nayon	14,402	18,115	22,117	26,202	30,110	0	0	0	0	0	0	0	0
2. Santa Cruz	9,338	11,763	14,377	17,044	19,597	0	30	50	70	0	4,313	8,522	13,718
3. De La Paz	21,033	26,441	32,269	38,215	43,906	70	80	85	90	18,509	25,815	32,483	39,515
4. Beverly Hills	1,034	1,385	1,767	2,161	2,532	90	90	95	100	1,247	1,590	2,053	2,532
5. San Roque	17,227	21,673	26,465	31,355	36,034	60	80	90	95	13,004	21,172	28,220	34,232
6. Dalig	14,241	17,896	21,843	25,869	29,723	70	80	90	95	12,527	17,474	23,282	28,237
7. San Jose	13,061	16,408	20,014	23,693	27,214	70	90	90	95	11,485	18,013	21,323	25,853
8. San Isidro	19,260	24,220	29,566	35,020	40,240	40	60	70	80	9,688	17,740	24,514	32,192
9. San Luis	3,121	3,955	4,856	5,777	6,656	0	70	90	95	0	3,399	5,198	6,323
SUB-TOTAL	112,717	141,856	173,274	205,335	236,012	47	63	71	77	66,460	109,516	145,596	182,603
10. Taytay	7,970	9,181	10,517	12,268	13,978	50	50	50	50	4,591	5,259	6,134	6,989
11. Angono	1,750	2,225	2,705	3,470	4,189	0	40	50	100	0	1,082	1,735	4,189
12. Binangonan	700	833	958	1,155	1,334	0	0	0	100	0	0	0	1,334
13. Teresa	210	234	256	289	318	0	0	0	100	0	0	0	318
SUB-TOTAL	10,630	12,473	14,436	17,182	19,819	37	44	46	65	4,591	6,341	7,869	12,830
TOTAL	123,347	154,329	187,710	222,517	255,831	46	62	69	76	71,050	115,857	153,465	195,433

TABLE 6.2.31 DOMESTIC DEMAND PROJECTION IN THE ANTIPOLO BASIN

(POBLACION SYSTEM)

BARANGAY/ MUNICIPALITY	POPULATION WITHIN THE BASIN				MWSS SERVED POPULATION				P.C.W.D (LPCD)				MWSS DOMESTIC WATER DEMAND (M3/D)				OTHER DOM. DEMAND IN BASIN				TOTAL DOM. DEMAND IN BASIN (M3/D)			
	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010	1995	2000	2005	2010
1. Bagong Nayon	0	0	0	0	0	0	0	0	138	149	155	162	0	0	0	0	0	0	0	0	0	0	0	0
2. Santa Cruz	5,041	5,161	7,305	8,399	0	4,313	8,522	13,718	138	149	155	162	0	643	1,321	2,222	696	275	0	0	696	918	1,321	2,222
3. De La Paz	21,153	25,815	30,572	35,125	18,509	25,815	32,483	39,515	138	149	155	162	2,554	3,846	5,035	6,401	365	0	0	0	2,919	3,846	5,035	6,401
4. Beverly Hills	0	0	0	0	1,247	1,590	2,053	2,532	138	149	155	162	172	237	318	410	0	0	0	0	172	237	318	410
5. San Roque	19,505	23,819	28,220	32,431	13,004	21,172	28,220	34,232	138	149	155	162	1,795	3,155	4,374	5,546	897	394	0	0	2,692	3,549	4,374	5,546
6. Dalig	17,896	21,843	25,869	29,723	12,527	17,474	23,282	28,237	138	149	155	162	1,729	2,604	3,609	4,574	741	651	401	241	2,470	3,255	4,010	4,815
7. San Jose	16,408	20,014	23,693	27,214	11,485	18,013	21,323	25,853	138	149	155	162	1,585	2,684	3,305	4,188	679	298	367	220	2,264	2,982	3,672	4,409
8. San Isidro	19,376	23,653	28,016	32,192	3,682	17,740	24,514	32,192	138	149	155	162	1,337	2,643	3,800	5,215	1,337	881	543	0	2,674	3,524	4,342	5,215
9. San Luis	3,955	4,856	5,777	6,656	0	3,399	5,199	6,323	138	149	155	162	0	506	806	1,024	546	217	90	54	546	724	895	1,078
SUB-TOTAL	103,335	126,161	149,451	171,740	66,460	109,516	145,596	182,603	138	149	155	162	9,171	16,318	22,567	29,582	5,261	2,717	1,401	515	14,432	19,035	23,968	30,097
10. Taytay	0	0	0	0	4,591	5,259	6,134	6,989	180	187	193	200	826	983	1,184	1,398	0	0	0	0	826	983	1,184	1,398
11. Angono	2,225	2,705	3,470	4,189	0	1,082	1,735	4,189	141	160	181	205	0	173	314	859	314	260	314	0	314	433	628	859
12. Binangonan	833	958	1,155	1,334	0	0	0	1,334	141	160	181	205	0	0	0	273	117	153	209	0	117	153	209	273
13. Teresa	234	256	289	318	0	0	0	318	141	160	181	205	0	0	0	65	33	41	52	0	33	41	52	65
SUB-TOTAL	3,292	3,919	4,914	5,841	4,591	6,341	7,869	12,830	180	182	190	202	826	1,156	1,498	2,595	464	454	575	0	1,290	1,610	2,073	2,595
TOTAL	106,627	130,080	154,365	177,581	71,050	115,857	153,465	195,433	141	151	157	165	9,998	17,474	24,065	32,177	5,725	3,171	1,976	515	15,723	20,645	26,041	32,692

NOTE: Served population includes served population by the system outside of the basin.

TABLE 6.2.32 WATER DEMAND PROJECTION IN THE ANTIPOLO BASIN

BARANGAY/ MUNICIPALITY	1995					2000					2005					2010				
	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL
1. Bagong Nayon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Santa Cruz	696	0	0	0	696	918	18	3	284	1,222	1,321	31	5	452	1,809	2,222	45	7	758	3,032
3. De La Paz	2,919	100	19	1,145	4,183	3,846	105	17	1,475	5,443	5,035	117	18	1,321	6,491	6,401	129	19	1,780	8,330
4. Beverly Hills	172	7	1	77	257	237	6	1	105	349	318	7	1	109	436	410	8	1	140	560
5. San Roque	2,692	221	13	101	3,027	3,549	237	14	691	4,491	4,374	253	16	1,001	5,644	5,546	283	17	1,344	7,189
6. Dalig	2,470	67	13	500	3,050	3,255	71	11	220	3,557	4,010	84	13	511	4,618	4,815	92	14	836	5,756
7. San Jose	2,264	62	2,818	711	5,855	2,982	73	2,818	1,187	7,060	3,672	77	2,819	1,131	7,699	4,409	84	2,819	1,428	8,741
8. San Isidro	2,674	506	10	599	3,789	3,524	526	11	1,169	5,230	4,342	543	14	1,301	6,199	5,215	559	16	1,779	7,568
9. San Luis	546	0	0	0	546	724	14	2	224	963	895	19	3	276	1,193	1,078	21	3	349	1,451
SUB-TOTAL	14,432	963	2,873	3,134	21,402	19,035	1,050	2,878	5,354	28,316	23,968	1,132	2,888	6,101	34,089	30,097	1,200	2,896	8,414	42,507
10. Taytay	826	32	6	371	1,235	983	27	4	435	1,449	1,184	23	4	405	1,621	1,398	23	4	477	1,907
11. Angono	314	0	45	0	359	433	5	46	77	560	628	7	46	97	779	859	17	48	101	1,024
12. Binangonan	117	0	0	0	117	153	0	0	0	153	209	0	0	0	209	273	6	1	93	373
13. Teresa	33	0	0	0	33	41	0	0	0	41	52	0	0	0	52	65	1	0	22	89
SUB-TOTAL	1,290	32	51	371	1,744	1,610	32	50	511	2,203	2,073	35	51	502	2,661	2,595	52	53	693	3,393
TOTAL	15,723	995	2,925	3,505	23,147	20,645	1,081	2,928	5,865	30,520	26,041	1,167	2,939	6,603	36,749	32,692	1,252	2,949	9,107	46,000

NOTE: Served population includes served population by the system outside of the basin.

TABLE 6.2.33 WATER DEMAND PROJECTION IN THE MWSS SERVICE AREA

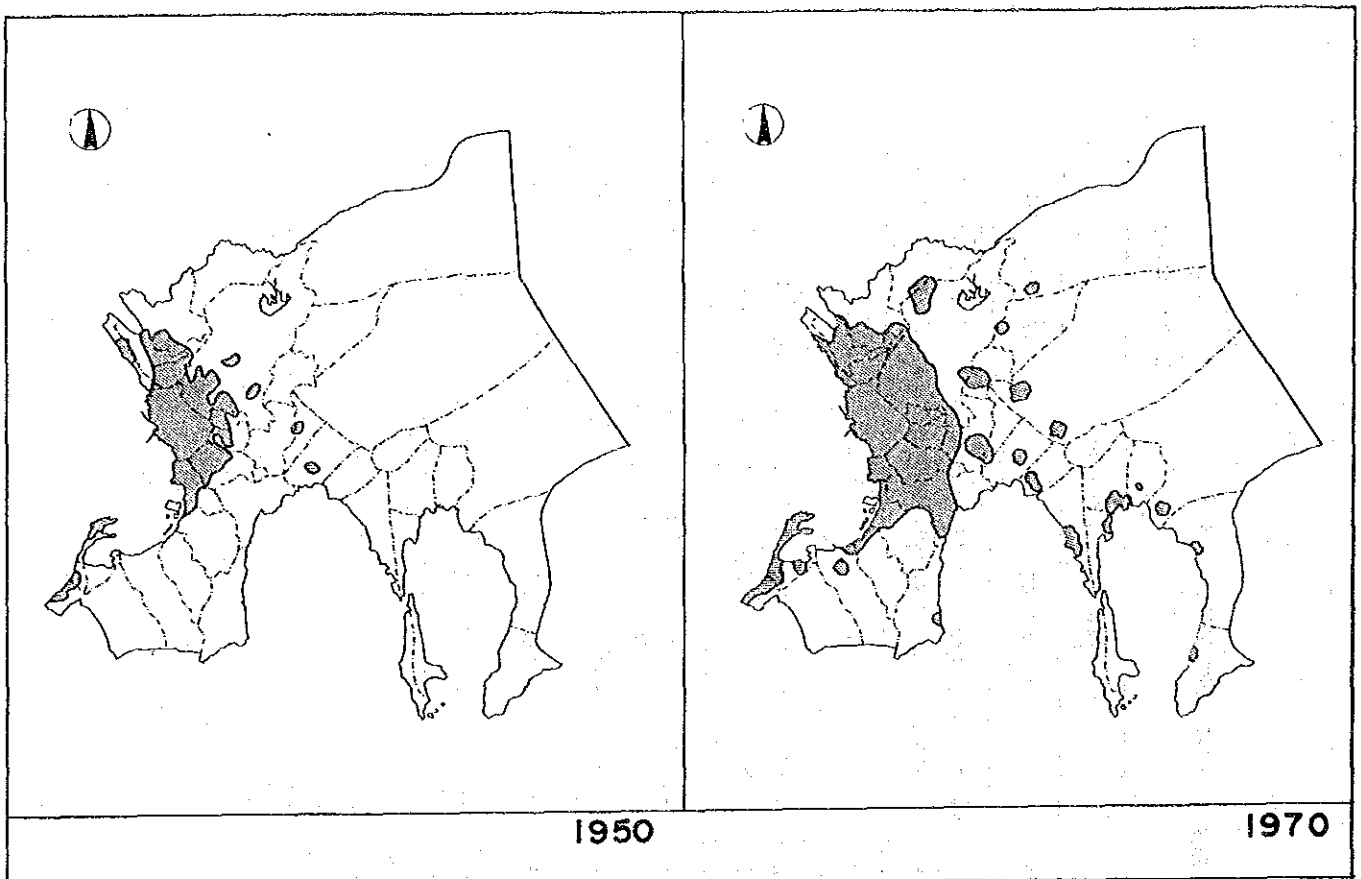
BARANGAY/ MUNICIPALITY	1995					2000					2005					2010				
	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL	DOM.	COM.	IND.	LOSS.	TOTAL
1. Bagong Nayon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Santa Cruz	0	0	0	0	0	843	18	3	284	947	1,321	31	5	452	1,809	2,222	45	7	758	3,032
3. De La Paz	2,554	100	19	1,145	3,818	3,846	105	17	1,475	5,443	5,035	117	18	1,321	6,491	6,401	129	19	1,780	8,330
4. Beverly Hills	172	7	1	77	257	237	6	1	105	349	318	7	1	109	436	410	8	1	140	560
5. San Roque	1,795	221	13	101	2,130	3,155	237	14	691	4,097	4,374	253	16	1,001	5,644	5,546	263	17	1,344	7,169
6. Dalig	1,729	67	13	500	2,309	2,604	71	11	220	2,906	3,609	84	13	511	4,217	4,574	92	14	836	5,516
7. San Jose	1,585	62	11	711	2,369	2,684	73	2,818	1,187	6,762	3,305	77	2,819	1,131	7,332	4,188	84	2,819	1,428	8,520
8. San Isidro	1,337	52	10	599	1,998	2,643	526	11	1,169	4,349	3,800	543	14	1,301	5,657	5,215	559	16	1,779	7,568
9. San Luis	0	0	0	0	0	506	14	2	224	746	806	19	3	276	1,103	1,024	21	3	349	1,397
SUB-TOTAL	9,171	509	66	3,134	12,881	16,318	1,050	2,878	5,354	25,599	22,567	1,132	2,888	6,101	32,688	29,582	1,200	2,896	8,414	42,092
10. Taytay	826	32	6	371	1,235	983	27	4	435	1,449	1,184	28	4	405	1,621	1,398	28	4	477	1,907
11. Angono	0	0	0	0	0	173	5	46	77	300	314	7	46	97	464	859	17	48	101	1,024
12. Binangonan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	273	6	1	93	373
13. Teresa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	1	0	22	89
SUB-TOTAL	826	32	6	371	1,235	1,156	32	50	511	1,750	1,498	35	51	502	2,085	2,595	52	53	693	3,393
TOTAL	9,998	541	72	3,505	14,116	17,474	1,081	2,928	5,865	27,349	24,065	1,167	2,939	6,603	34,773	32,177	1,252	2,949	9,107	45,485
SERVICE RATIO (%)	64	39	2	100	61	85	100	100	100	90	92	100	100	100	95	98	100	100	100	99

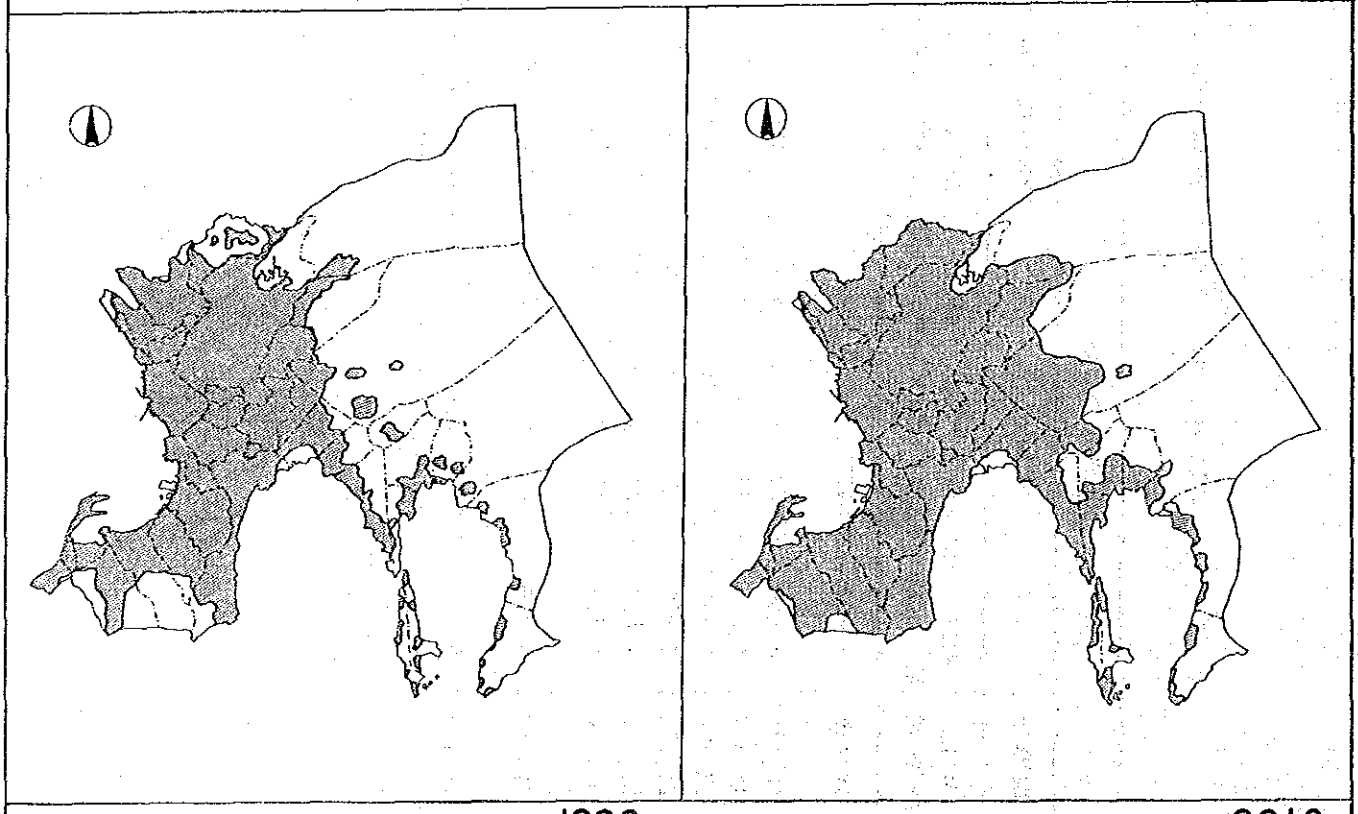
NOTE: Served population includes served population by the system outside of the basin.

TABLE 6.2.34 WATER DEMAND AND SUPPLY IN THE ANTIPOLO BASIN

(UNIT: CU.M/DAY)

	ANTIPOLO BASIN						MWSS SERVICE AREA					
	DEMAND	SUPPLY				SHORTAGE	DEMAND	SUPPLY				NET SHORTAGE
YEAR	DAILY AVERAGE	MWSS EX. WELL	PRIVATE WELL	MWSS REHAB.	MWSS AUGMENT.	DAILY AVERAGE	DAILY AVERAGE	MWSS EX. WELL	PRIVATE WELL	MWSS REHAB.	MWSS AUGMENT.	DAILY AVERAGE	DAILY MAXIMUM
1990	19,456	9,809	9,647	--	--	--	--	9,809	2,434	--	--	--	--
1995	23,147	9,809	9,647	2,070	5,810	(4,189)	14,116	9,809	2,434	2,070	5,810	(6,007)	1,051
1996	24,622	9,809	9,647	2,070	5,810	(2,714)	16,763	9,809	3,512	2,070	5,810	(4,439)	3,943
1997	26,096	9,809	9,647	2,070	5,810	(1,240)	19,409	9,809	4,591	2,070	5,810	(2,871)	6,834
1998	27,571	9,809	9,647	2,070	5,810	235	22,056	9,809	5,669	2,070	5,810	(1,303)	9,725
1999	29,045	9,809	9,647	2,070	5,810	1,709	24,702	9,809	6,748	2,070	5,810	265	12,617
2000	30,520	9,809	9,647	2,070	5,810	3,184	27,349	9,809	7,826	2,070	5,810	1,834	15,508
2005	36,749	9,809	9,647	2,070	5,810	9,413	34,773	9,809	8,512	2,070	5,810	8,572	25,958
2010	46,000	9,809	9,647	2,070	5,810	18,664	45,485	9,809	9,647	2,070	5,810	18,149	40,892





STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

FIGURE 6.1.1

GROWTH OF THE STUDY AREA

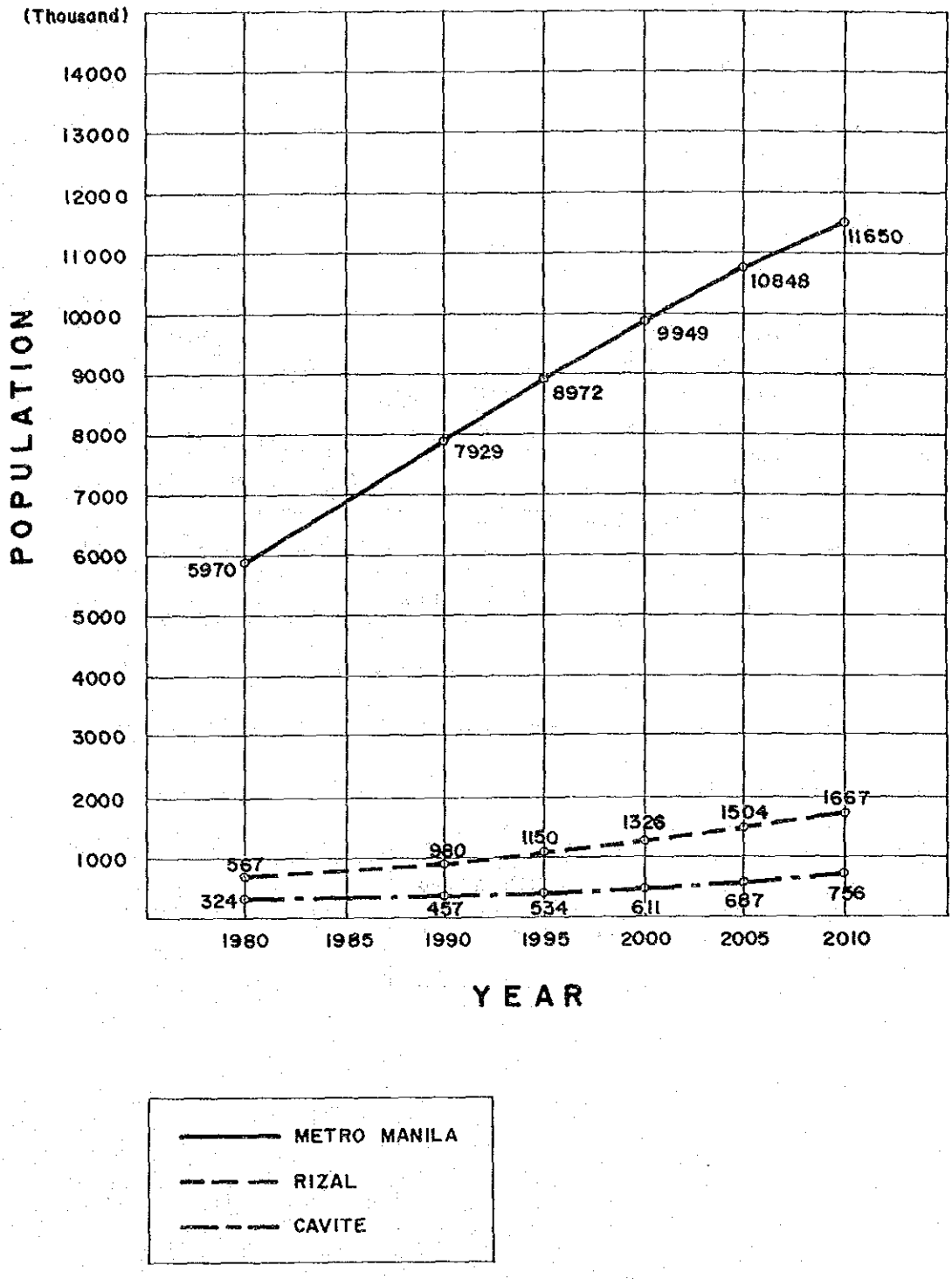


FIGURE 6.1.2

ESTIMATED POPULATION GROWTH OF THE STUDY AREA

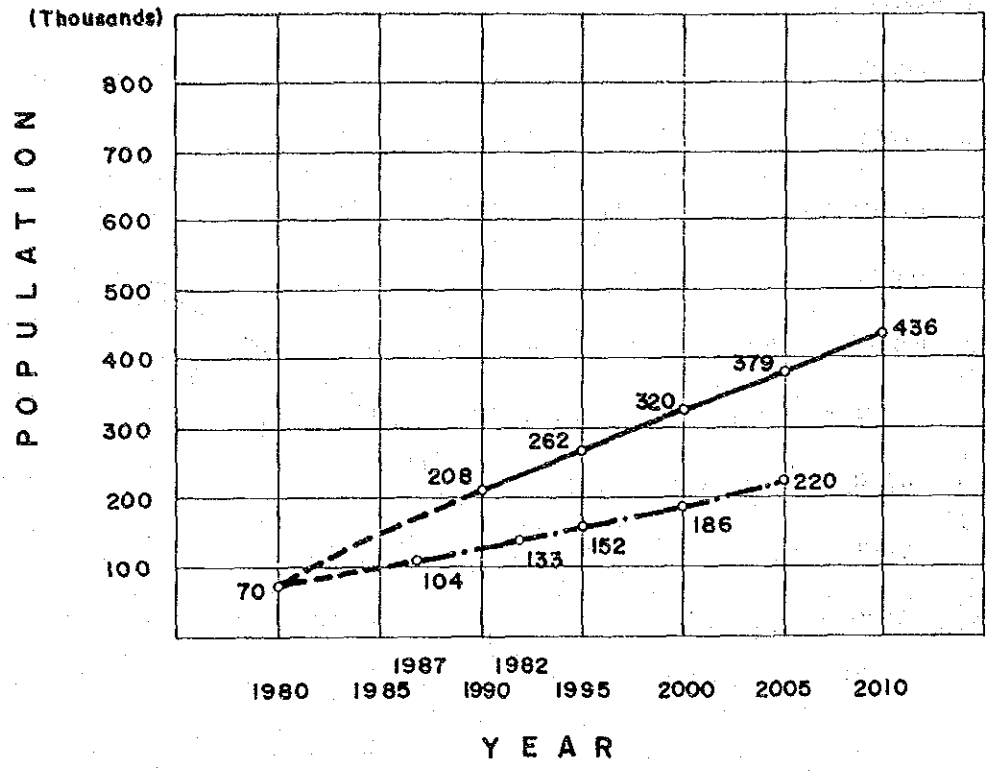
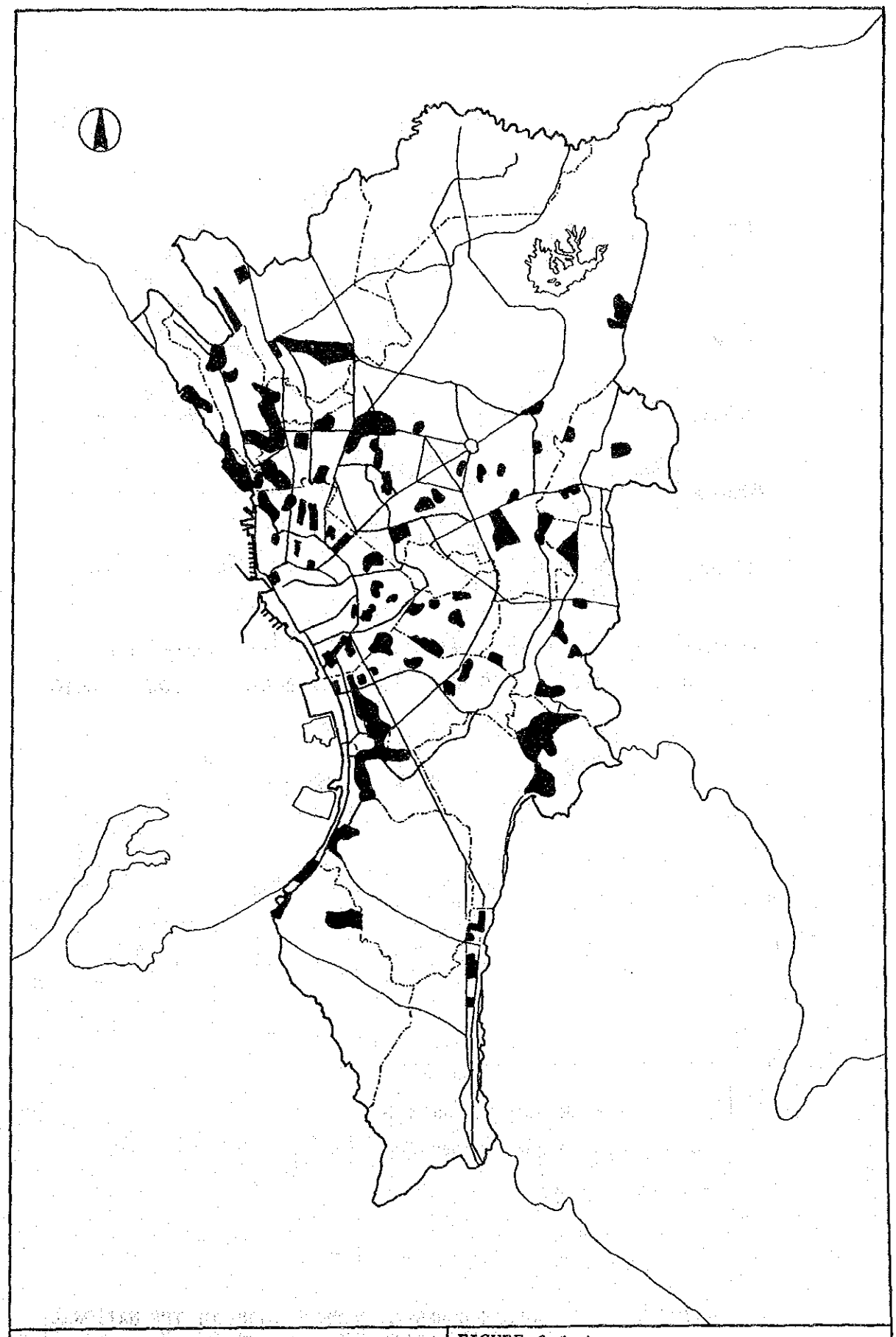


FIGURE 6.1.3 COMPARISON BETWEEN AWSOP'S AND THE JICA TEAM'S POPULATION PROJECTION FOR THE MUNICIPALITY OF ANTIPOLO



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA JAPAN INTERNATIONAL COOPERATION AGENCY	FIGURE 6.1.4 BLIGHTED AREAS IN THE NCR

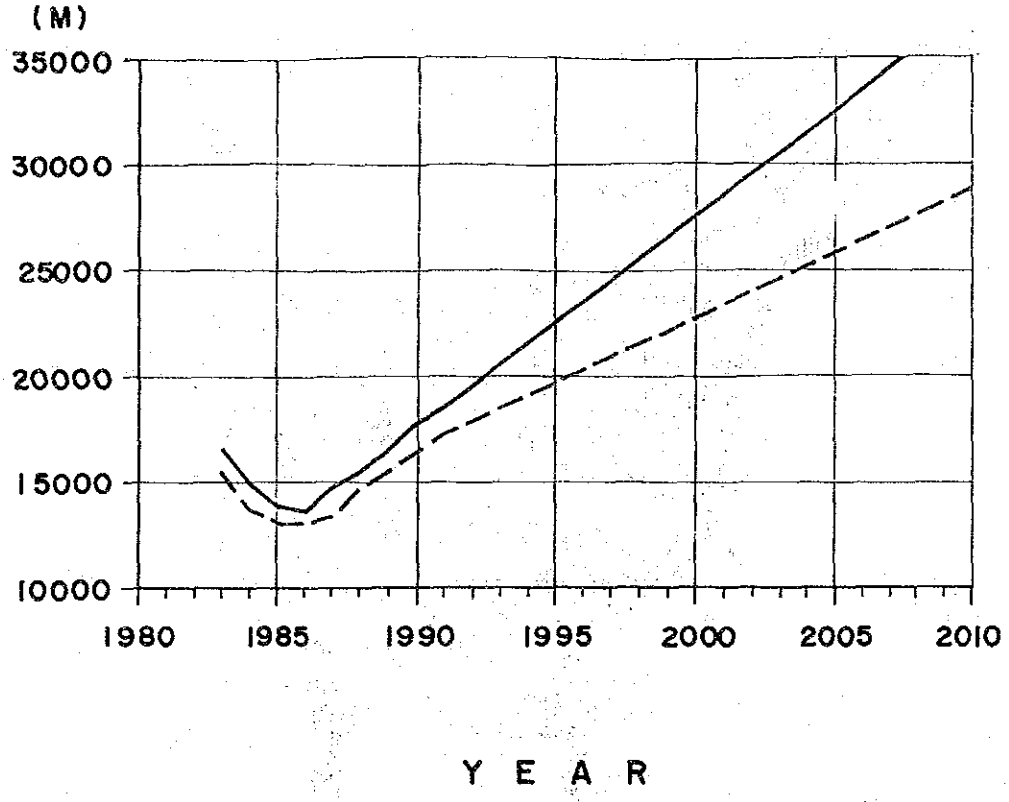
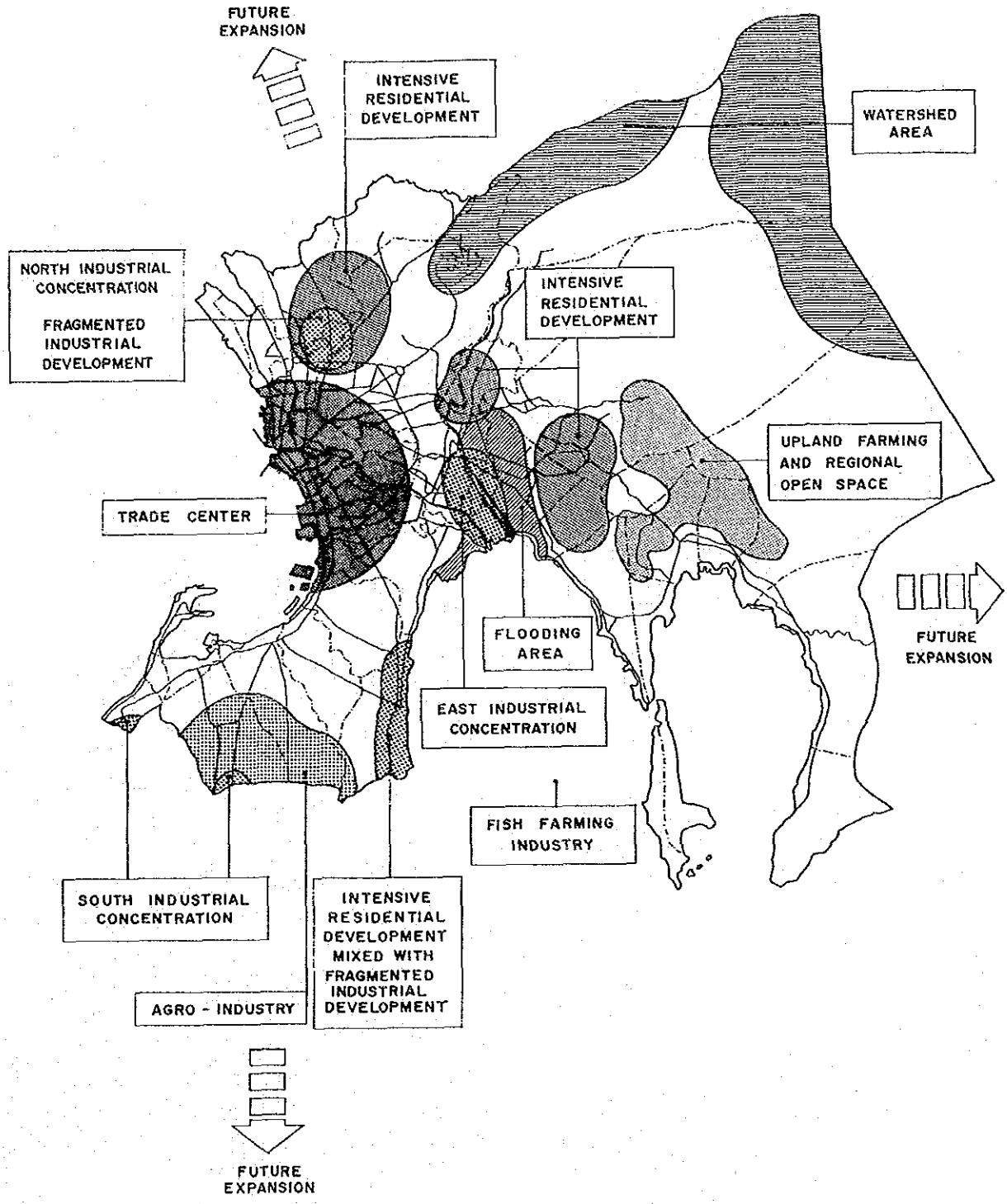


FIGURE 6.1.5 GROSS DOMESTIC PRODUCT (GDP) OF THE NATIONAL CAPITAL REGION



STUDY FOR THE GROUNDWATER DEVELOPMENT IN METRO MANILA	FIGURE 6.1.6
JAPAN INTERNATIONAL COOPERATION AGENCY	STRUCTURE PLAN