

V. PUBLIC WORKS AND LOCATING AND PLANNING NEW DEVELOPMENT

A. INTRODUCTION

This chapter describes the City's public works characteristics, and those services relating to locating and planning development. These two topics are discussed together because, in the case of the City of Morro Bay, they interrelate; the City's management of its domestic water facilities and wastewater treatment will determine how future growth will be accommodated in the City. The Coastal Act gives priority designations to coastal dependent industrial uses, agriculture and recreation and visitor-serving facilities for public services where existing or planned public works facilities can accommodate only a limited amount of new development.

While growth in Morro Bay has contributed to a fairly small average annual population increase over the past 20 year period, a renewed interest recently has been focused on sustaining the resources and infrastructure to support that population and the City's future potential.

In the past few years it was speculated that the City's reliance on a (presumed) limited and shallow groundwater basin had resulted in exceeding the (apparent) safe annual yield of the groundwater basins and water quality. These assumptions were later to be proven erroneous and without foundation. Studies completed by the City of Morro Bay, as part of its ongoing Water Management Plan, demonstrate through sound engineering evaluation that "overdraft" of the basins has not occurred, water resources are available to meet present and future demand, and satisfactory groundwater quality exists. Water Management Plan attention has now been turned to enhancing the City's ability to supply water and improve facility locations while maximizing their utility. Future needs of Morro Bay have also been anticipated by a planned wastewater treatment plant expansion (completion date in 1983).

As a result of previous decisions regarding water supply facilities and uninformed evaluations, Morro Bay has had to endure a history of water and building permit rationing and de facto moratoriums on new water and sewer hook-ups.

The City of Morro Bay has recognized the attraction that coastal areas have for increased development and understands the dynamics between growth and the public services and facilities needed to support growth or used to induce it. In order to assure a proper level of urban services and growth consistent with the Coastal Act's emphasis on the protection, enhancement and restoration of coastal resources, Morro Bay's Local Coastal Plan Work Program has taken the initiative to:

- (1) Discuss and analyze Coastal Act Policies regarding public works facilities and new development in the Coastal Zone;
- (2) Inventory and describe existing and proposed water and sewage facilities, including importation and reclamation proposals;

- (3) Determine current allocation of existing water and sewage services and project allocation of future water and sewage capacities among various types of uses in the Coastal Zone;
- (4) Propose policies to ensure orderly growth of the community in keeping with available public services and works.

Given the City's normal urban service demands, the special attention Morro Bay has been given by the State Coastal Commission through its precedental "Filer" decision (creating a de facto building moratorium in Morro Bay), the Public Works Chapter may be the most important part of Morro Bay's Local Coastal Program.

B. COASTAL ACCESS POLICIES

Recognizing the demands on the coastal area for public works-related developments, the Coastal Act contains numerous general and specific policies regarding public works. Although the Coastal Act emphasizes the protection, enhancement, and restoration of coastal resources, it also recognizes that public works development is necessary for the social and economic well-being of the state. Public Works facilities are defined in the Coastal Act as follows:

Sec. 30114. (a) "All production, storage, transmission, and recovery facilities for water, sewage, telephone, and other similar utilities owned or operated by any public agency or by any utility subject to the jurisdiction of the Public Utilities Commission, except for energy facilities."

The primary policy of the Coastal Act that guides public works development in the Coastal Zone is Section 30254 which appears below. The other sections of the Act relate to public works and environmental protection, preservation of agricultural land and location of new development.

Sec. 30240. (a) "Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas. (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.

Sec. 30241. "The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the areas' agricultural economy, and conflicts shall be minimized between agricultural and urban land uses through all of the following:

- (a) By establishing stable boundaries separating urban and rural areas, including, where necessary, clearly defined buffer areas to minimize conflicts between agricultural and urban land uses.

- (b) By limiting conversions of agricultural lands around the periphery of urban areas to the lands where the viability of existing agricultural use is already severely limited by conflicts with urban uses and where the conversion of the lands would complete a logical and viable neighborhood and contribute to the establishment of a stable limit to urban development.
- (c) By permitting the conversion of agricultural land surrounded by urban uses where the conversion of the land would be consistent with Section 30250.
- (d) By developing available lands not suited for agriculture prior to the conversion of agricultural lands.
- (e) By assuring that public service and facility expansions and nonagricultural development do not impair agricultural viability, either through increased assessment costs or degraded air and water quality.
- (f) By assuring that all divisions of prime agricultural lands, except those conversions approved pursuant to subdivision (b), and all development adjacent to prime agricultural lands shall not diminish the productivity of prime agricultural lands.

Sec. 30254. "New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division; provided, however, that it is the intent of the legislature that State Highway Route One in rural areas of the coastal zone remain a scenic two-lane road. Special districts shall not be formed or expanded except where assessment for, and provision of, the service would not induce new development inconsistent with this division. Where existing or planned public works facilities can accommodate only a limited amount of new development, services to coastal-dependent use, essential public services and basic industries vital to the economic health of the region, state or nation, public recreation, commercial recreation, and visitor-serving land uses shall not be precluded by other development.

Sec. 30231. "The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained, and where feasible, restored through, among other means, minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of groundwater supplies and substantial interference with surface water flow, encouraging wastewater reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams."

Sec. 30236. "Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

- (a) By establishing stable boundaries separating urban and rural areas, including, where necessary, clearly defined buffer areas to minimize conflicts between agricultural and urban land uses.

(b) By limiting conversion of agricultural lands around the periphery of urban areas to the lands where the viability of existing agricultural use is already severely limited by conflicts with urban uses and where the conversion of the lands would complete a logical and viable neighborhood and contribute to the establishment of a stable limit to urban development.

(c) By developing available lands not suited for agriculture prior to the conversion of agricultural lands.

(d) By assuring that public service and facility expansion and nonagricultural development do not impair agricultural viability, either through increased assessment costs or degraded air and water quality.

(e) By assuring that all division of prime agricultural lands, except those conversions approved pursuant to subdivision (b) of this section, and all development adjacent to prime agricultural lands shall not diminish the productivity of such prime agricultural lands."

Sec. 30240. (b) "Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas."

Sec. 30250. "New residential, commercial, or industrial development except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources. In addition, land division, other than leases for agriculture uses, outside existing developed areas shall be permitted only where 50 percent of the usable parcels in the area have been developed and the created parcels would be no smaller than the average size of surrounding parcels.

(a) Where feasible, new hazardous industrial development shall be located away from existing developed areas.

(b) Visitor-serving facilities that cannot feasibly be located in existing developed areas shall be located in existing isolated developments or at selected points of attraction for visitors. (Amended by Cal. Stats. 1979, Ch. 1090)."

Sec. 30252. "The location and amount of new development should maintain and enhance public access to the coast by (1) facilitating the provision or extension of transit service, (2) providing commercial facilities within or adjoining residential development or in other areas that will minimize the use of coastal access roads, (3) providing non-automobile circulation within the development, (4) providing adequate parking facilities or providing substitute means of serving the development with public transportation, (5) assuring the potential for public transit for high intensity uses such as high-rise office buildings, and by (6) assuring that the recreational needs of new residents will not overload nearby coastal recreation areas by correlating the amount of development with local park acquisition and development plans with the provision of onsite recreational facilities to serve the new development."

RESOURCE INVENTORY AND CONSTRAINTS

An important factor in determining the type, location and intensity of land uses within the community is the capability of the City's water and sewage systems to accommodate new growth. The Coastal Act requires that new development be closely correlated with services capacity. Therefore, to implement the Coastal Act, this section will inventory existing service capacity as well as identify the opportunities and constraints to expand and enhance these services.

1. Water Resources

a. Water Supply

Like many coastal communities, the City of Morro Bay is dependent upon groundwater for its primary water supply. This water is extracted from the adjacent Chorro and Morro Creek Basins (see Figure 20). The safe yield for these two basins was estimated in 1969 by the Department of Water Resources to be 1,700 acre-feet per year each. However, based upon recent engineering studies these figures proved to be too low.

The City also has an arrangement for water from Whale Rock Reservoir. This specific water is for emergency use, noting that the agreement with Whale Rock Commission must be renewed each year. This water source has only been used once by the City during the 1972 statewide drought and is not considered to be significant in the long term water management forecast.

Currently, the City has eight (8) wells in the Chorro Basin and another eight (8) in the Morro Basin. Due to high salt content, however, two of the Morro Basin wells are for emergency use only.

With the exception of total dissolved solids and one March 1981 well number 11A iron concentration, the groundwater from the two basins meets all acceptable water quality standards. The only treatment the water receives is chlorination. The City's water distribution system generally needs an accelerated maintenance schedule to maintain its condition and correct any leaks and/or low pressure situations.

b. Water Demand

In response to droughts, water production in the two basins has fluctuated over the last ten years. Current groundwater production by the City totals 1,611 acre-feet per year. To accurately project future water demand, it is necessary to evaluate past and present water use. This is done by developing a water use factor from total water production and population. This factor, expressed in gallons per capita per day (*gpcd), incorporates all water uses within the community into one comprehensive number.

As given in Table 4 (and shown in Figure 10), individual water use in the City has declined markedly over the last decade, also in response to drought, water conservation and rationing measures. Based on these trends, the City's consulting engineers have assumed a 166 *gpcd figure (0.19 af/yr./person x 12,195 people; Brown and Caldwell, 1981).

FIGURE 20
 MORRO, CHORRO AND LOS OSOS
 HYDROLOGIC SUBAREAS

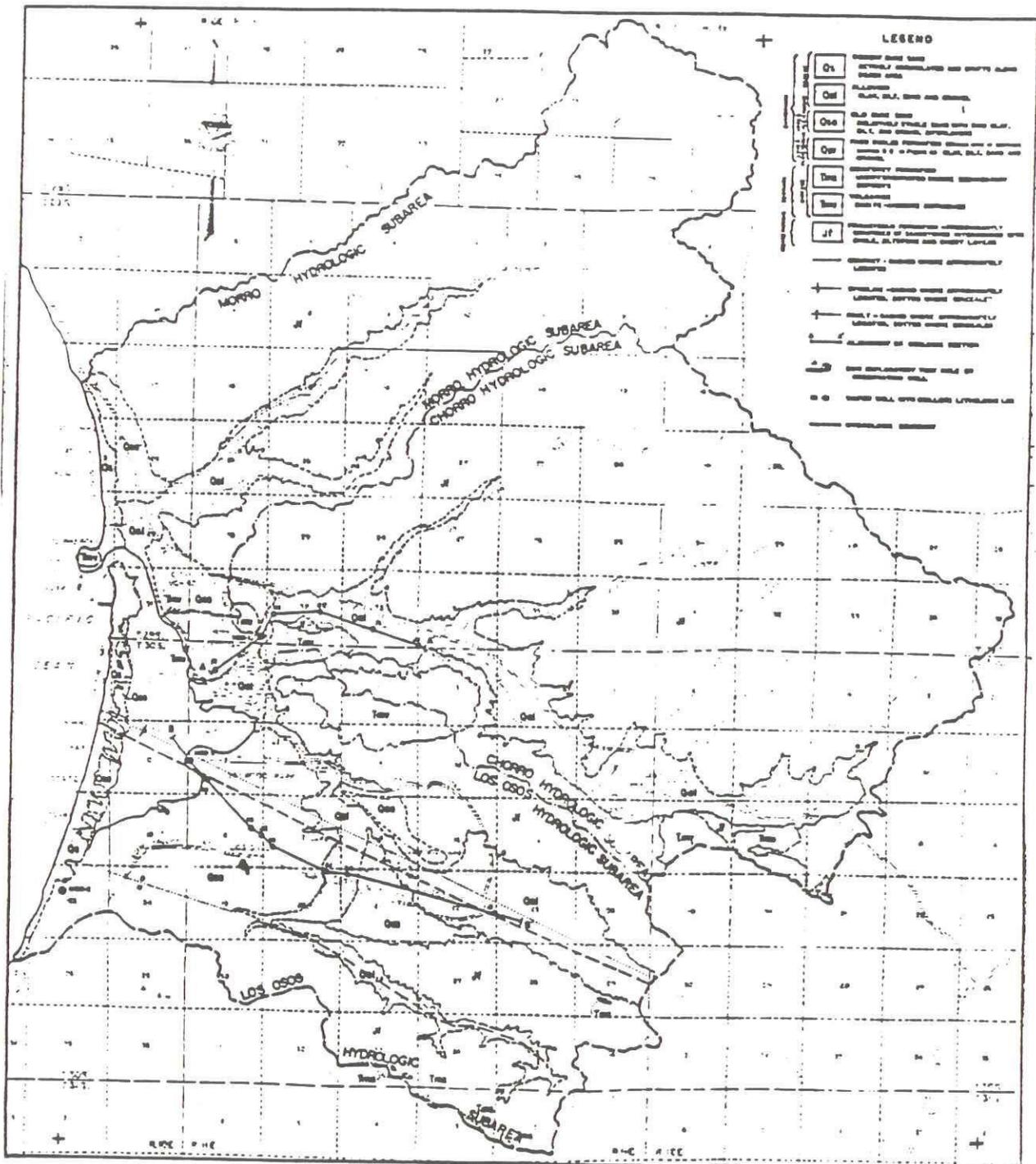


TABLE 4*
 HISTORICAL URBAN WATER DEMAND

Year	Urban Population	Total Water Production million gallons ^a	Water use Factor gcd ^b
1970	7,109	500.01	193
1971	7,450	499.55	184
1972	7,514	503.62	184
1973	7,725	464.21	165
1974	7,942	483.01	167
1975	8,165	491.50	165
1976	8,394	513.07	167
1977	8,561	406.78	130
1978	8,729	465.92	146
1979	8,896	525.94	162
1980	9,064	524.90	159

^a From City of Morro Bay, groundwater production records

^b From total production, divided by urban population

*Revised from Brown and Caldwell, 1981 to reflect recent population information

The City's build-out population is estimated to be 13,500 people. Build-out water demand is therefore, estimated to be 2,565 acre-feet a year (0.19 af/yr./person x 13,500 people).

Anticipating that the "safe yield" of the two groundwater basins would be exceeded, the City adopted a program in 1977 of controlling new growth through issuing a fixed number of water equivalencies necessary for the historic annual development rate. The equivalencies were established by multiplying the number of building permits issued for each specific land use by its average water consumption and then equated to residential units. 161 water equivalencies were set to allow an annual growth rate of three percent, a rate which would not exceed the safe yield of the two basins until 1982. At this time, the city expects that Whale Rock Reservoir would be available to augment the water supply.

The water equivalency program is dependent on the ability of the groundwater basins to produce 1,7000 acre-feet per year. City water production records show however, that his level of production is not always achieved during drought condition due to mismanaged water

facilities. Additionally, the program needed adjustment to meet the requirements of the Coastal Act in the protection of priority land uses.

The Coastal Act requires that when existing or planned public works facilities can accommodate only a limited amount of new development, certain land uses shall receive priority. These land uses are in order of priority:

- (1) Commercial fishing/agriculture
- (2) Coastal-dependent industries
- (3) Recreation/Visitor-serving uses
- (4) Commercial
- (5) Industrial
- (6) Residential development

City records show no water supplied to agricultural land uses within City limits. The limited agricultural production is provided water from wells outside City limits. Past City records indicate that on the average coastal-dependent (commercial fishing and recreational boating) uses account for approximately two percent of the total annual City water consumption while visitor serving uses account for another 20 percent.

The Chorro and Morro Basins also support notable agricultural operation outside the city limits. While the major activity is grazing on some adjacent hillsides, crop production is found in the bottom lands of the two creeks. Here, irrigated crops are a major consumer of groundwater resources (see the Agricultural Component for a more detailed discussion). Additional rural land uses also rely on the two groundwater basins for water.

Since there has been no monitoring of rural or agricultural water use, until recently, estimating their past and present water demand is difficult. Using land use acreages, Brown and Caldwell (1981) estimates current agricultural extraction of groundwater from the two basins equals 1,7568 acre-feet per year with other rural land uses utilizing an additional 86 acre-feet. Table 5 gives the current groundwater production for the two basins for all land uses and the estimated year 2000 extractions. Figure 11 graphically shows the projected water demand.

TABLE 5
 TOTAL PROJECTED WATER DEMAND
 MORRO AND CHORRO BASINS

USES	DEMAND IN ACRE FEET PER YEAR		
	1979	1990	2000
City of Morro Bay	1,614	2,053	2,268
Rural Areas	86	107	118
Miscellaneous	486	486	486
Agriculture (outside city limits)	1,758	1,865	2,155
TOTAL	3,944	4,511	5,027

Source: Brown and Caldwell, 1981.

c. Existing Water Problems

During non-drought years the City has no water problems that merit discussion other than repair and maintenance of the water distribution system. Absent implementation of a water management plan, the City's existing water production system will not be sufficient to serve existing customers. Recent droughts of the past decade have, however, displayed where improvements to the City's groundwater extraction system are needed. Deficiencies exist predominantly as a result of well location. Well placement in close proximity to the seawater/groundwater interface and placement of wells too close to one another are the primary causes of problems during non-drought years. Many of the Morro Basin wells pump groundwater in close proximity to the seawater/groundwater interface. During drought periods, lowering of the water table forces these wells to draw water from the seawater/groundwater interface. This situation is not indicative of seawater intrusion since the seawater/groundwater boundary has not moved inland but is rather a phenomenon known as seawater upconing. In addition, many of the City's wells are located too close to one another. Not only does this placement result in an added expense in terms of pumping costs, it creates a problem during drought years due to mutual interference of wells. Wells too close to one another accents the decrease of pumping level and during drought years when water tables lower, a further decrease in well pumping rates from those of non-drought periods occurs.

Due to a temporary decline in water levels during the recent 1976-77 drought and the belief that the published value of safe yield at that time was being exceeded, the California Coastal Commission felt the Chorro and Morro Groundwater Basins were in a state of overdraft. In addition, increases in chloride concentrations led the California Coastal Commission to believe that seawater intrusion may be occurring. As a result the California Coastal Commission on December 14, 1977 imposed a de facto building moratorium on the City. Unfortunately, this action was found by engineering studies to be premature and unsupported by the ultimate data conclusions.

d. Water Management Plan

The City's ongoing water management activities involve annual infrastructure improvements (i.e., water line, well pump and storage tank replacement). Indeed, Morro Bay has always had a "Water Management Plan", but in more recent times it has renewed efforts to better manage the resources available. This is illustrated by the February, 1981, study which addresses the steps to be taken to meet the City's water demand through the year 2000 (City Consultant Engineers: Brown and Caldwell; incorporated herein by reference). As a companion and further refinement of the 1981 study, a California Department of Water Resources report was commissioned for completion in 1982. As can be noted, the subject of water management is a dynamic process and information is constantly being collected to adjust future planned program activities. It is the commitment of Morro Bay to continue to monitor all data which will lead to Water Management Plan Refinements.

A summary of Brown and Caldwell's Preliminary Water Management Plan major conclusions are provided in the listing which follows:

1. Groundwater currently leaving the Chorro Creek Basin as subsurface outflow amounts to 2,090 acre-feet per year and groundwater currently leaving the Morro Creek Basin as subsurface outflow amounts to 3,400 acre-feet per year. With quantities of subsurface outflow as great as those shown for both basins, it is not possible for seawater intrusion to be occurring in either Chorro Creek or Morro Creek.

FIGURE 10*
 URBAN UNIT WATER USE FACTOR

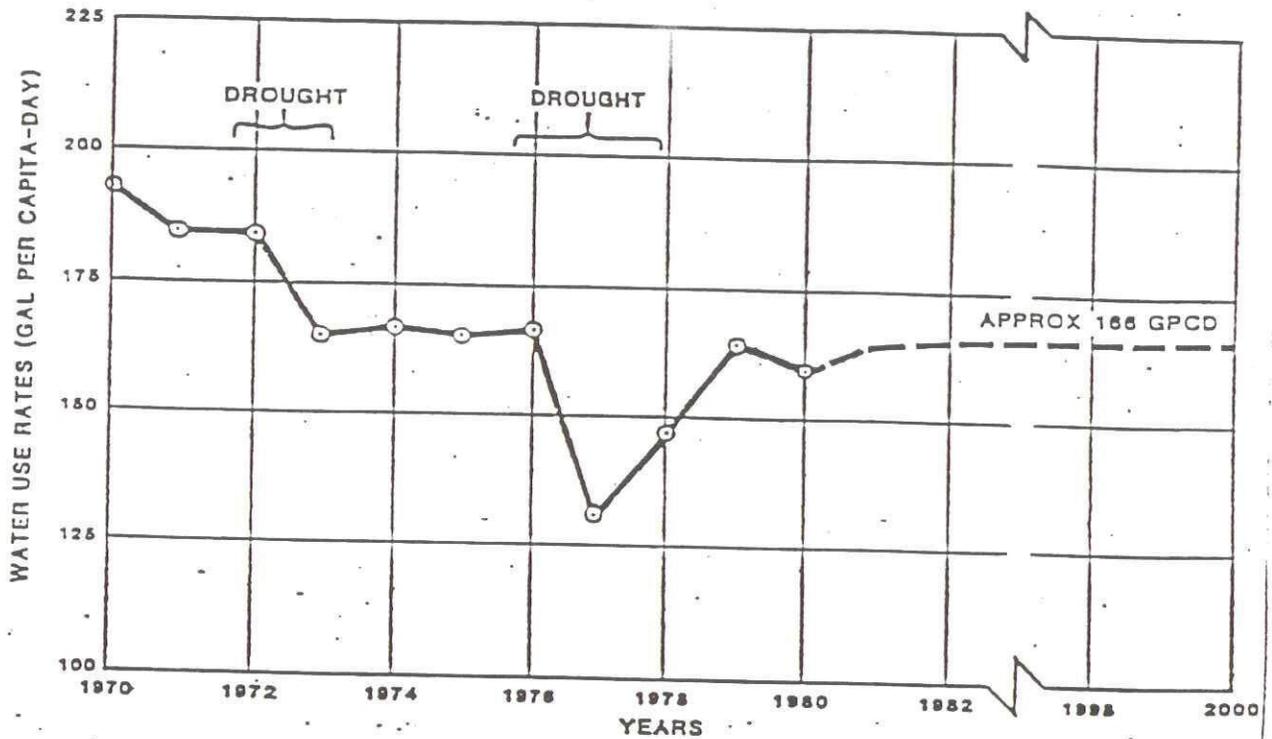
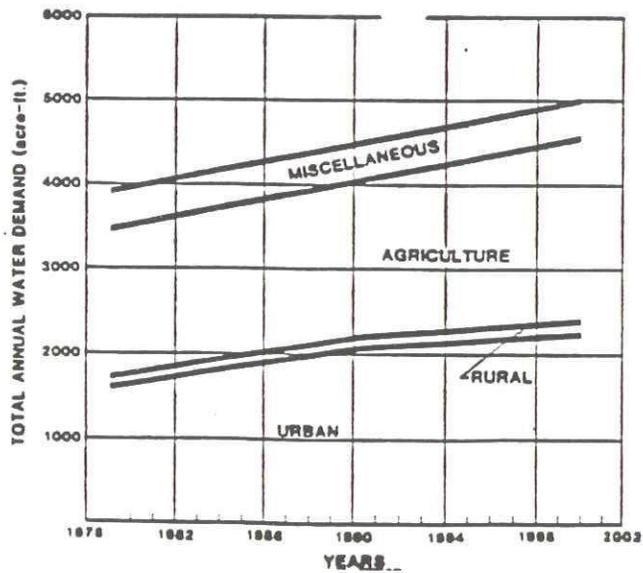


Fig. 4-2. Urban Unit Water Use Factor.

*Revised from Brown and Caldwell, 1981 to reflect recent population information.

FIGURE 11
 PROJECTED WATER DEMAND



2. Past estimates of safe yield for the study area were conservatively low.
3. Due to limited available data, a determination of safe yield for the basins is not presently possible.
4. The long-term yield of the two groundwater basins under a normal year is at least 3,944 acre-feet per year. The total current subsurface outflow of groundwater from both basins is approximately 5,500 acre-feet per year. Therefore it is believed that the long-term yield is much greater than the 3,944 acre -feet per year now being produced. However, all that can be stated with certainty, at present, is that the current long-term yield under normal year conditions is 3,944 acre-feet per year or greater.
5. In the past, the City of Morro Bay has experienced a deficiency in its ability to supply and distribute water, although water resources available have always been adequate.
6. Although incorrect, previous conclusions that Chorro Creek and Morro Creek Basins were in a state of overdraft may have been reasonable in light of conservatively low published estimates of safe yields.
7. The two groundwater basins within the study area are not now, and have not been, in a state of overdraft.
8. With proper management of available water resources, the long-term yield of the study area is adequate to meet the total water demand anticipated in the year 2000 under conditions of "normal year", "normal drought" and "extreme drought".
9. Groundwater quality is satisfactory for all current purposes in the basins.
10. Occurrence of high chloride water in wells located near the coast have coincided with heavy pumping in those wells and are the result of upconing of saline water from below the well mixing with fresh water in the vicinity of the well screen. This situation is not indicative of seawater intrusion into the groundwater basins, but is only a local condition reflective of well location and pumping patterns.
11. Higher than normal levels of chloride have been found in Chorro Creek Basin in City Well No. 12 located more than one mile inland from the coast, while wells between No. 12 and the coast did not show increases in chloride. Chloride levels alone, therefore, do not reliably indicate either seawater intrusion or upconing of saline water.
12. The proposed wastewater reclamation scheme would make up to 770 acre-feet of groundwater available for municipal use each year.
13. Recharge basins used to percolate storm water and other excess surface water would increase the long-term yield of the groundwater basins.
14. The City of Morro Bay has little or no control over basin discharges, irrigation practices, and crop selection within the study area.

15. Existing, unused wells may allow movement of poor quality water into fresh groundwater aquifers.
16. Water quantity and water quality can be enhanced by following a planned operational scheme in pumping the city wells.
17. City Well Nos. 1 and 2 are located too near the coast, resulting in operational and water quality problems.
18. The Preliminary Water Management Plan must include wastewater reclamation, recharge of storm water and excess surface water, a planned operational scheme for pumping existing wells, abandonment of Well Nos. 1 and 2, location of additional wells inland and continued study and data collection.

Seawater Intrusion: In February 1972, the California Department of Water Resources (DWR) published Bulletin 63-6: Sea-water Intrusion: Morro Bay Area San Luis Obispo County. The abstract to this document reads as follows:

ABSTRACT

Because the quality of groundwater has been degraded by the intrusion of seawater, several wells have been abandoned along the coastal margin of Morro, Chorro, and Los Osos Ground Water Basins in the Morro Bay area of San Luis Obispo County. Increases in chloride-ion content in groundwater have occurred primarily in response to the lowering of water levels to below sea level during periods of intensive pumpage. In localized areas, other probable sources of degradation are the natural intrusion resulting from a decline in recharge at dry periods, downward percolation of ocean water in tidal areas, and the dissolution of evaporites by downward percolating waters.

The onshore areal extent of sea water intrusion has been controlled by seaward underflow during periods of low pumpage. An undetermined amount of freshwater underflow is lost to the sea from the nondegraded aquifer systems underlying the Baywood Park-Los Osos community. further investigation is necessary to evaluate the freshwater potential in that vicinity and in the offshore extensions of those aquifers.

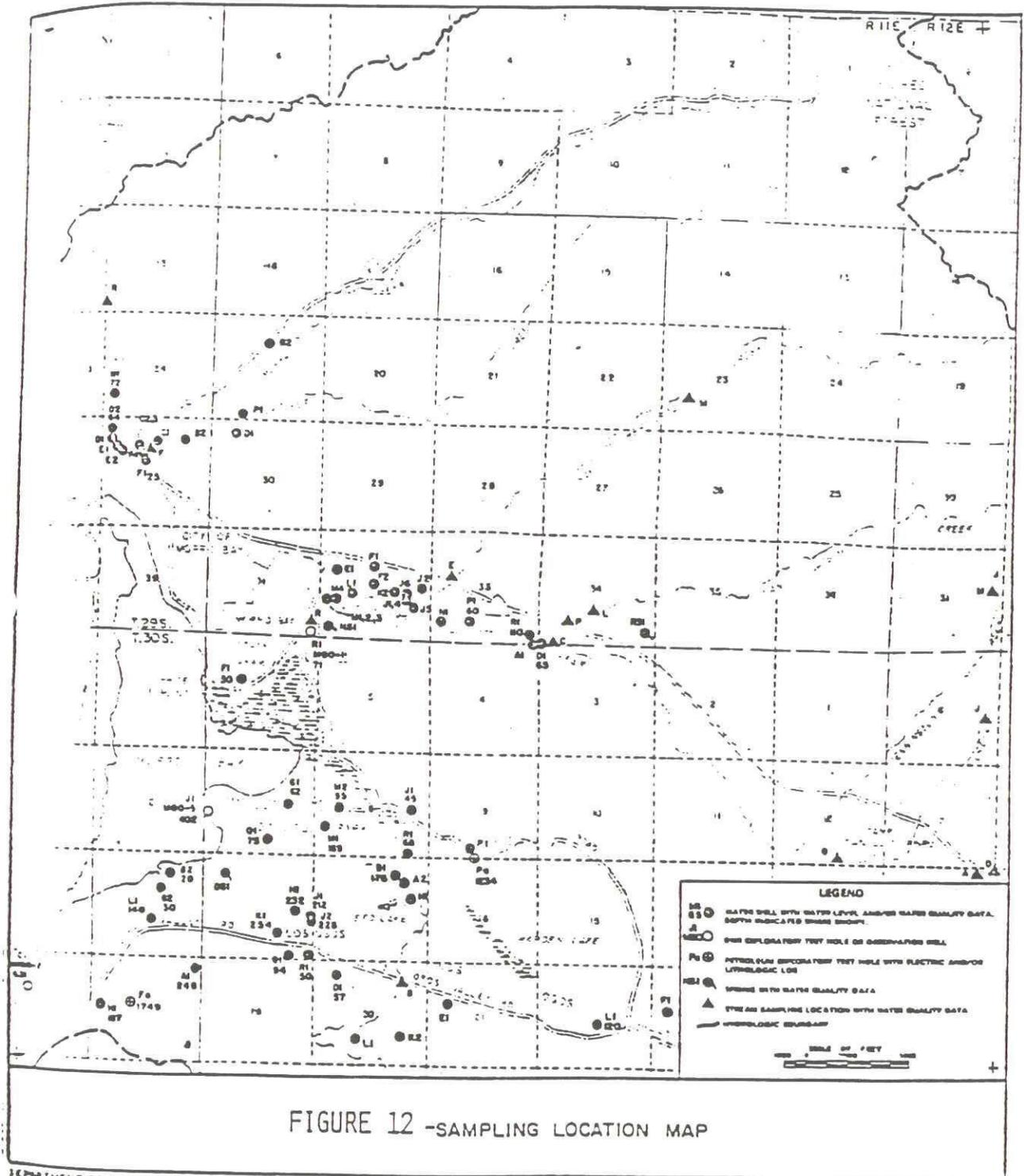
DWR bases evidence of seawater intrusion on high chloride-ion and total dissolved solids (TDS) concentrations. Concentrations of these constituents for various Chorro Basin wells is shown in Table 6. Well locations are displayed in Figure 12. For comparison purposes, DWR states that in nondegraded portions of the aquifer system, TDS content is as high as 800 mg/1 and chloride-ion concentrations as high as 120 mg/1. These increases are most likely attributed to irrigation return waters that have percolated to the groundwater. Increases above natural background levels are attributed to fluctuations in rainfall and increased drawdown during periods of lesser freshwater outflow.

TABLE 6

AVERAGE TDS AND CHLORIDE-ION CONCENTRATIONS
 IN GROUND WATER FROM ALLUVIUM,
 SEAWARD CHORRO GROUND WATER BASIN, 1951-70
 In milligrams per liter

Well	Date or year of sampling	Number of samples	TDS	Chloride ion
29S/11E-31D1	3-25-64	1	706	165
29S/11E-31R1	11-19-70	1	2,226	1,008
29S/11E-32F1	10-30-62	1	960	248
29S/11E-32M1	6-16-55	1	927	170
	9-30-58	1	1,108	157
	1959	3	993	127
	1960	4	319	—
	10-30-61	1	5,257	2,404
	10-23-62	1	1,328	350
	1963	2	1,125	262
	1964	2	1,438	405
	1965	2	1,017	244
	9-27-65	1	1,110	273
	1967	2	1,010	235
	11-19-68	1	835	—
	3-20-70	1	920	185
29S/11E-32M2	1-4-60	1	791	126
	3-7-63	1	840	135
29S/11E-32M3	1951	2	415	—
	1952	5	770	—
	1953	2	424	—
	6-11-54	1	1,410	372
	1959	3	4,854	2,220
	1960	6	2,304	—
29S/11E-32M4	1960	4	221	—
	3-7-63	1	990	134

FIGURE 12



Concentrations of chloride-ion for various Morro Basin wells is shown in Figure 13. Background concentration for chloride is not discussed but can be assumed to be comparable to Chorro Basin (120 mg/l). Increases in chloride-ion above background concentrations are attributed generally to drawdown elevations below sea-level.

An important item is not discussed in this report and needs to be discussed in order to put statements of seawater intrusion into perspective. First, it is a fact that along coastal areas, groundwater is underlain by seawater. It is understandable that these wells do display high chloride-ion and TDS concentrations. This is merely a result of being in close proximity to an area where freshwater naturally overlies seawater. Chloride-ion and TDS concentrations will increase due to insufficient rainfall. Because of a lowered water table, there is not as much fresh water to draw from. Merely by pumping action, the well is forced to draw from saline water underlying freshwater. This situation is not indicative to seawater intrusion into the groundwater basins, but is only a condition reflective of well location and pumping.

Table 6 does not convincingly portray a picture of a seawater intrusion situation. The drinking water standard for TDS is 500 mg/l. Natural background concentration for TDS is 800 mg/l. Even a natural water state of TDS exceeds the standard because Morro and Chorro Basin water is very hard. Substantial increases in TDS occur mostly during periods of less rainfall. The drinking water standard for chloride-ion is 250 mg/l. Most chloride-ion concentrations are within the realm of this standard. Well 29S/11E-31R1 displays the result of the only high chloride sample during a normal rainfall year with a chloride concentration of 1,008 mg/l. The result of only one well cannot be construed to imply seawater intrusion. Two samples from two different wells show chloride-ion in the 2,000-ths. Note these two samples were taken during a period of extremely low rainfall.

Only chloride-ion concentrations are used to substantiate seawater intrusion in the Morro Basin. Only one well (29S/10EE-25D2) displays dramatic increases in chlorides. This well is located extremely close to the ocean and is most likely drawing from seawater naturally underlying freshwater.

As a result of the recent Brown and Caldwell study, seawater intrusion was further investigated. As a part of the preliminary water management investigation, the extent of seawater intrusion was studied in order to assess necessary mitigation measures. A summary of Brown and Caldwell findings is discussed.

The understanding of seawater intrusion is an important part of water management. One of the methods used in the February, 1981, study to evaluate seawater intrusion is a hydrologic budget. A hydrologic budget is an assessment of the inflow and outflow of water to a basin and like any budget is a step toward managing a resource. There have been some reports which suggested that Chorro Creek and MORro Creek Groundwater Basins have been intruded by seawater. If this were true, the hydrologic budgets for both basins would show a value at zero for subsurface outflow, and would require a positive amount to be added for seawater intrusion inflow to allow a balance between inflow and outflow. The Preliminary Water Management Plan, however, shows values for subsurface outflow of 2,090 acre-feet per year for Chorro Creek Basin and 3,400 acre-feet per year for Morro Creek Basin. Therefore, it must be concluded that seawater intrusion is not occurring nor has it occurred in the past. An additional withdrawal of about 5,500 acre-feet per year would be required before seawater intrusion would be a factor in the combined hydrologic budgets.

FIGURE 13

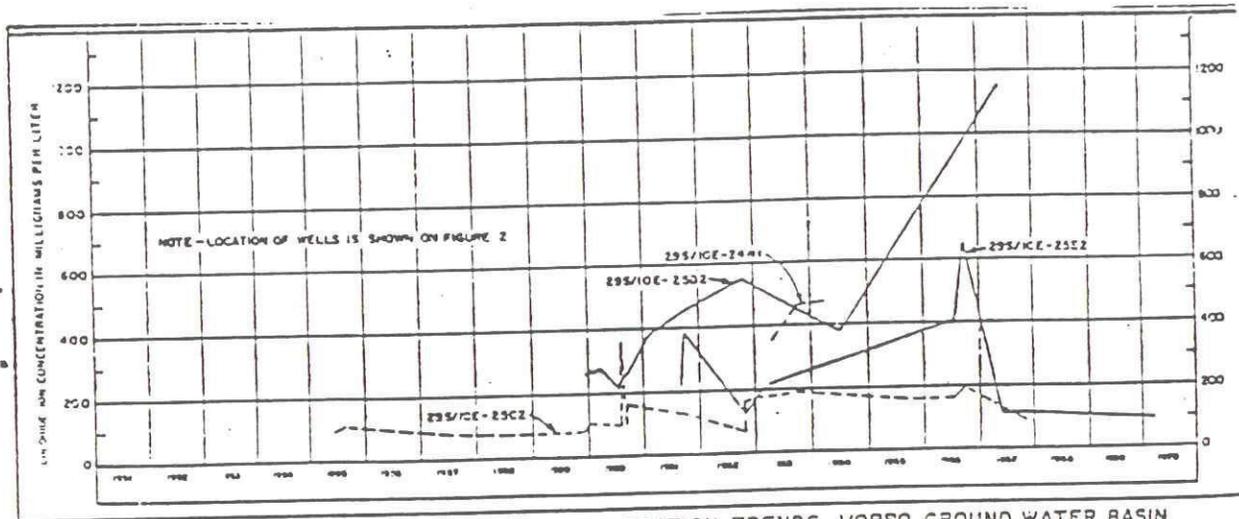


FIGURE 13- WATER LEVEL AND CHLORIDE ION CONCENTRATION TRENDS-MORRO GROUND WATER BASIN

DEPARTMENT OF WATER RESOURCES, SOUTHERN DISTRICT, 1971

Another tool used to evaluate the possibility of seawater intrusion is water quality investigations. Based on water quality analysis, it appears that groundwater quality is good. Except for the total dissolved solids (TDS) the mineral constituent concentrations all fall within the acceptable range of criteria for drinking water.

Most of the TDS values in the Chorro Creek Basin and Morro Creek Basin are attributable to the total hardness of the water and all the wells show concentrations which categorize the groundwater as very hard. The hardness of the groundwater is attributed to natural geologic conditions within the basin and there is little that can be done to lessen these values except for importation of water that is not so hard, blending with imported water or dilution with storm waters by artificial recharge. During the past drought period, increases in chlorides occurred in the Chorro Basin. With the exception of one well on one date, ground water quality has always met standards set for chlorides. Increases in chloride concentrations that occurred during drought periods may be due to wastewater discharges in the eastern portion of the Chorro Basin and/or from highly mineralized surface waters of San Bernardo Creek infiltrating into the groundwater. In addition, increases beyond standards set for chlorides occurred on numerous occasions in the Morro Creek Basin during the past drought. These increases occurred in wells located near the coast during heavy pumping. These increases appear to be due to the upconing of saline water, not seawater intrusion. Upconing of seawater occurs as a result of seawater, naturally underlying a groundwater basin, being drawn up by a heavily pumped well in a groundwater basin where water levels have dropped. In an upconing situation, seawater does not move inland to occupy an area once occupied by fresh groundwater as occurs in a seawater intrusion situation.

Regardless of the degree of concentration of the mineral constituents in seawater, the ratios of certain minerals remain nearly the same. This is true regardless of whether the sample was taken in the open ocean, or in some landlocked embayment where the seawater composition may be altered by inflows from the land, affected by products of decomposition or evaporated to some extent. Thus, when wells are intruded by seawater even though the concentrations of mineral constituents are lower than those found in seawater the ratios should remain the same.

Several methods have been used in the 1981 study to compare the composition of the groundwater produced in Chorro and Morro Basins with that of seawater. Table 7 shows the ratio of selected mineral constituents in groundwater in Chorro Creek Basin Wells and the ratio for seawater. The comparison indicates the relationship between the groundwater produced by the City's wells and seawater. Table 8 shows a similar relationship for the Morro Creek Basin wells. Also shown are the ratios for groundwater produced by wells in the Chorro Narrows. On only four dates have the ratios been higher than normal. Even though the TDS for wells in the Chorro Narrows consistently show high TDS values the ratio as shown does not clearly show a seawater-type composition.

There is a thick clay layer existing near the ground surface in the wide alluvial area just upstream of, and within, the Chorro Narrows. Mineral salts appear to have leached from the soil, or from surface water, and collected just above this fine-grained zone, moved downgradient to the well area and found entrance into the well through the gravel packs around the casings. Also, when water levels are drawn down following heavy pumping, poor quality water from fractures in the bedrock may be pulled into the well.

The available data shows that during the two normal droughts which occurred within the past ten years water levels were generally lower at the end of the fourth period. Normal precipitation and recharge to the groundwater basins in the years following the normal

droughts is more than adequate to replenish the lost storage and to allow the groundwater basins to regain their potential. Generally, this rejuvenation of the groundwater basins occurs within one year following such normal droughts.

Long-Term Yield: The capacity of the groundwater basins to supply water to meet anticipated demands must be established prior to consideration of management alternatives. Normally, the long-term yield of a groundwater basin is stated as its "safe yield" which can be defined as the amount of water which can be withdrawn from a groundwater basin, annually, without producing an undesired result. The key to establishing a value for safe yield is to acquire adequate data. In the case of the Chorro Creek and Morro Creek Basins, such data are not available. Therefore it is not possible to define the safe yield of either groundwater basin. However, based on available data, it is possible to estimate the yield that can be obtained from the aquifers in these groundwater basins under certain conditions. To avoid confusion, this estimate is described as "long-term yield," as opposed to safe yield. The long-term yield of both groundwater basins was estimated for certain specific conditions: (1) the "normal year" (2) the "normal drought"; and (3) the "extreme drought." These terms are further defined in the following discussion.

Climatic Conditions for Estimating Long-Term Yield: In order to establish a basis for evaluating long-term yield over a normal climatic period, the "normal year" is defined, herein, as any year in which the precipitation equals or exceeds the 50-year mean, or any year followed by a year in which the precipitation either equals or exceeds the 50-year mean precipitation. This is due to the fact that the groundwater basins have demonstrated a rapid response to precipitations, in that water levels quickly rise back to their normal levels following one season of normal precipitation. Therefore, any seasonal depletion of storage during normal years would be replaced by infiltration of precipitation during the subsequent wet season.

For the purpose of this discussion, a "normal drought" is a frequently occurring period of years during which precipitation is below the 50-year mean. A review of the 110-year record of precipitation at San Luis Obispo indicates that a two-year drought period is such a frequent occurrence. During the last ten years two-year drought periods have occurred twice. The lowest annual rainfall on record is approximately seven inches. Occurrence of rainfall at this low level for two consecutive years has not occurred over the 110 year record. However, to be conservative, it is assumed that the normal drought consists of a two-year period with rainfall of seven inches per year.

Evaluation of the precipitation records at the City of San Luis Obispo indicates that the longest continuous period of annual precipitation below the 50-year mean is seven years. A seven-year period occurred between 1893 and 1900, and a similar seven-year period occurred between 1944 and 1951. The lowest average annual precipitation during any year of the most recent seven-year period was about 31 inches. Therefore, the extreme drought is herein defined as a seven-year period during which the average annual precipitation is 13 inches per year.

TABLE 7
Comparison of a Ratio of Selected Mineral Constituents in
Groundwater in Chorro Basin Wells to Seawater

Date	Well number	R, percent ^a	TDS, mg/l
3/14/79	Morro Bay No. 8	38	
3/14/79	Morro Bay No. 9	32	648
3/14/79	Morro Bay No. 9A	29	753
3/14/79	Morro Bay No. 10	37	753
3/14/79	Morro Bay No. 10A	31	700
			823
10/31/79	Morro Bay No. 11A	38	
3/14/79	Morro Bay No. 12	43	763
3/14/79	Morro Bay No. 16	34	980
			770
6/16/55	29S/11E-32M1	49	
12/12/56	29S/11E-32M1	41	927
11/22/57	29S/11F-32M1	84	880
9/30/58	29S/11E-32M1	50	1,717
7/28/59	29S/11E-32M1	36	1,108
9/9/59	29S/11E-32M1	33	1,035
			-
11/24/59	29S/11E-32M1	49	
12/22/59	29S/11E-32M1	35	1,075
8/2/60	20S/11E-32M1	50	868
10/30/61	29S/11E-32M1	196	1,025
10/23/62	29S/11E-32M1	94	5,257
			1,328
3/7/63	20S/11E-32M1	68	
9/23/63	29S/11E-32M1	70	1,090
7/14/64	29S/11E-32M1	76	1,160
10/7/64	29S/11E-32M1	96	1,352
8/3/65	29S/11E-32M1	62	1,523
			1,113
10/4/65	29S/11E-32M1	72	
9/25/66	29S/11E-32M1	74	920
5/25/67	29S/11E-32M1	58	1,110
11/2/67	29S/11E-32M1	71	938
11/19/68	29S/11E-32M1	126	1,082
			2,087
12/8/69	29S/11E-32M1	50	
3/20/70	29S/11E-32M1	48	956
10/22/70	29S/11E-32M1	57	920
3/7/63	29S/11E-32M2	42	1,147
8/2/60	29S/11E-32M3	180	842
			5,402
3/7/63	29S/11E-32M4	43	
3/20/70	29S/11E-32N1	243	990
			570
	Seawater	473	34,300

$$^a R \text{ percent} = \frac{(\text{mg/l SO}_4 \times 0.0208) + (\text{mg/l Cl} \times 0.0282)}{(\text{mg/l Ca} \times 0.0499) + (\text{mg/l Mg} \times 0.0822)} \times 100$$

TABLE 8
Comparison of a Ratio of Selected Mineral Constituents in Groundwater
in Morro Basin Wells to Seawater

Date	Well number	R, percent ^a	TDS, mg/l
3/14/79	Morro Bay No. 3	62	
3/14/79	Morro Bay No. 4	18	770
3/14/79	Morro Bay No. 13	47	595
3/14/79	Morro Bay No. 14	43	718
3/14/79	Morro Bay No. 15	42	630
			630
	Seawater	473	34,300

$$^a R \text{ percent} = \frac{(\text{mg/l SO}_4 \times 0.0208) + (\text{mg/l Cl} \times 0.0282)}{(\text{mg/l Ca} \times 0.0499) + (\text{mg/l Mg} \times 0.0822)} \times 100$$

Past Estimates of Safe Yield: Although the available data have been sparse, estimates of safe yield for the Morro Creek Basin and Chorro Creek Basin have been made in the past. The California Department of Water Resources (DWR), in its Bulletin May 18, 1958, estimated that the safe yield for each basin was 1,500 acre-feet per year. In a memorandum report by DWR to the Central Coastal Regional Water Quality Control Board, dated October 1969, DWR revised these estimates to 1,700 acre-feet per year for each basin. Neither of these reports gave any indication of the basis for these estimates.

Comparing the current groundwater demand of 3,944 acre-feet per year and the estimated total safe yield of these two groundwater basins of 3,400 acre-feet per year, as reported by DWR, it is understandable that the California Coastal Commission could consider the basins to be overdrawn requiring a restriction on further development in the City of Morro Bay. Supporting that decision was the assumption that seawater intrusion is a continual adverse condition affecting both the Chorro Creek and Morro Creek Basins. However, as the hydrologic budgets for both basins indicate, there is a positive subsurface outflow of freshwater from the basins amounting to 2,090 acre-feet per year for Chorro Creek Basin and 3,400 acre-feet per year for Morro Creek Basin. Therefore, it must be concluded that seawater intrusion is not occurring and has not occurred in the past.

Long-Term Yield, Normal Year: The current total water demand of 3,944 acre-feet per year is being met by the two groundwater basins from inflow sources only. This is evidenced by the fact that groundwater storage is not being depleted except on a seasonal basis. Therefore, the long-term yield under a normal year is at least 3,944 acre-feet per year. The total current subsurface outflow of groundwater from both basins amounts to approximately 5,500 acre-feet per year. Therefore, it is believed that the long-term yield is much greater than the 3,944 acre-feet per year now being produced. However, all that can be stated with certainty, at present, is that the current long-term yield under normal-year conditions is 3,944 acre-feet per year or greater.

Long-Term Yield, Normal Drought: As defined above, groundwater withdrawal during a normal year will not affect groundwater in storage, other than on a seasonal basis. Therefore, it can be assumed that at the start of any drought period the groundwater basins will be full and the groundwater in storage can be utilized during the drought to provide additional supplies. As described earlier the total quantity of recoverable groundwater from storage in Chorro Creek Basin is 7,000 acre-feet and the total quantity of recoverable groundwater from storage utilized only from the middle storage unit of Morro Basin is 3,200 acre-feet. The total available storage is 10,200 acre-feet for both basins.

Since a two-year drought period will be followed by a normal year, the groundwater basins would be fully recharged the year following the two-year drought. Therefore, during the two-year drought for recoverable groundwater in storage can be utilized for water supply purposes much the same as water that might be stored in a surface reservoir can be utilized. The total groundwater storage in both basins, of 10,200 acre-feet, utilized over a two-year period would provide 5,100 acre-feet per year of water supply for consumptive use.

In addition, there will be approximately 1,315 acre-feet per year of groundwater available from inflow sources, and consequently the total available storage would not need to be temporarily depleted. Also, other groundwater basin management elements discussed below will be implemented. These management schemes will also offset the need for temporary groundwater depletion. The year 2000 water demand is estimated to be 5,027 acre-feet per

year. During a normal drought, however, 6,415 acre-feet of water per year is available for use.

Long-Term Yield, Extreme Drought Conditions: By similar analysis to that used for the normal drought, Brown and Caldwell determined that the lowest average annual precipitation during any 7 year period at San Luis Obispo was about 13 inches. This precipitation is approximately 61 percent of the 50 year mean precipitation at that station. Therefore, it is assumed that the current quantity of groundwater being supplied from inflow sources will be reduced under extreme drought conditions to 61 percent of that value, or 2,406 acre-feet per year.

The long-term yield under extreme drought conditions that can be expected without implementing any groundwater basin management techniques is the total increment of groundwater storage, 1,456 acre-feet per year, and the annual production available from inflow sources of 2,406 acre-feet per year. This amounts to 3,863 acre-feet per year from only these sources. It is obvious that this quantity has been sufficient to meet the past demands of water users, however, by the year 2000 when the projected demand will be 5,027 acre-feet per year, there will be an apparent maximum deficiency of 1,164 acre-feet per year. It is evident, therefore, that certain groundwater basin management elements must be implemented to provide an overall water resource management plan to meet the extreme drought conditions in the year 2000.

It is the intent of the City to adopt a water management plan. It is not the intent of the City to deplete water reserves because techniques to offset deficits are known and readily implementable through future water management activities. Groundwater depletion is only a problem if the situation is ignored and not addressed by management activities.

alternate Additions of Water Source: In addition to utilization of groundwater storage during drought periods, the City of Morro Bay shall develop additional sources of water from some of these potential sources as part of a water management plan:

- (1) Implement the proposed wastewater reclamation program to provide an additional 770 acre-feet per year of water supply for agricultural and golf course purposes, thereby relieving the ground water basin of this demand. Although not presently contemplated, the reclamation program could be expanded to provide additional quantities of reclaimed wastewater.
- (2) Provide recharge facilities to collect storm water which normally flows out to sea, for recharge to groundwater basin. Such recharge programs would allow storage of additional quantities of water in the groundwater basin each year.
- (3) During normal and wet years, there is surplus water available from Whale Rock Reservoir which in many years is lost by spillage over the dam. In a normal year, any surplus water could be purchased by the City of Morro Bay and delivered directly to the City's distribution system. Alternately, the surplus water could be regularly delivered to recharge facilities for storage underground.
- (4) The City of Morro Bay reports that the estimated leakage from its distribution system is approximately 15 percent of water supplied. The projected quantity of water to be supplied for urban purposes through the distribution system during build-out is 2,565 acre-feet per year. Through the City's system repair activities, it is reasonably

expected that this loss can be reduced by two-thirds, resulting in a gain of ten percent. This would produce a gain of about 260 acre-feet of usable water.

(5) During the drought year of 1977, as a result of conservation efforts by the City of Morro Bay, the unit water use factor was reduced to 131 gallons per capita per day. If such conservation measures are reinstated and applied on a regular basis, not just during drought periods, the total urban water demand during build-out can be reduced by approximately 630 acre-feet per year. This alternative is not anticipated to be carried out on a long-term basis.

(6) Modify locations of City wells to allow additional groundwater extraction.

(7) During the next 20 years, it is conceivable that additional imported water sources may become available to the City of Morro Bay. Such projects include the Nacimiento Water Project, the State Water Project, and construction of local storage facilities. Such imported sources, when available, may also be utilized to meet any further demand which may occur beyond the year 2000.

Ability of Water Management Plan to Meet Water Demands: The 1981 study informs that it is possible to meet water demands of the year 2000, population of 12,195 person. Since water benefits derived from the various supplemental water sources is not quantified, however, it is difficult to assess the actual population beyond this figure that may be permitted. As a result of a preliminary evaluation of the various plan options, the City of Morro Bay is anticipated to be able to meet the 13,500 person build-out water demand even during extreme droughts (and even though the City is downstream of other water users.)

Compliance of Water Management Plan with Coastal Act: The implementation of these and other water management plan actions must be done in keeping with the provisions of the Coastal Act; specifically, consistent with those policies requiring protection of agriculture and environmentally sensitive habitat areas.

As part of the implementation process of the Final Water Management Plan, it will be necessary for the City to address environmental concerns in order to meet California Environmental Quality Act requirements. Among the items addressed will be: (1) the need for an adequate water supply for coastal-dependent activities such as recreation, commercial fishing, oyster farming and fish and shellfish processing; (2) the need of wetlands to be seasonally flushed of accumulated salts from sediments will be addressed; (3) the need for riparian habitat for an adequate groundwater supply will be addressed; (4) the dependence of an anadromous fishery on riparian vegetation for cooling and groundwater to maintain pools when surface flows cease; and (5) availability of sufficient water for agriculture.

2. Wastewater Resources

a. Wastewater Facilities

Wastewater treatment facilities are shared jointly by the unincorporated community of Cayucos and the City of Morro Bay, 40 to 60 percent, respectively. Each community operates its own individual wastewater collection system.

The Wastewater Treatment Plant provides secondary treatment to the effluent which is discharged through a 300-foot ocean outfall. The plant currently discharges an average of 1.6 million gallons per day (mgd). The City's wastewater collection system is at capacity in many portions of the community.

The total design capacity of the existing Wastewater Treatment Plant is 1.7 million gallons per day (mgd); therefore, Morro Bay's share (60 percent) is 1.02 mgd. When the treatment plant was designed in 1964, the capacity was based upon meeting the then current water quality standards. Since these standards are now much more stringent, the plant capacity was lowered in recent years to ensure adequate water quality. However, recent improvements to the plant have returned it to 1.7 mgd. Expansion of the plant to a 2.4 mgd capacity is planned for the near future. Morro Bay's share of the expanded plant (60 percent) would then be 1.44 mgd.

b. Wastewater Demand

In response to drought conditions and water conservation measures over the past decade, individual wastewater flow rates in the community have varied, as verified by the figures given in Table 9. In 1975, domestic and commercial wastewater use was an estimated 93 gallons per capita per day (*gpcd). This is projected to increase to 110 *gpcd by 1999. This table does not reflect current population projections. Table 10 gives current estimated flow rates.

As can be seen in Table 10, plant capacity will be exceeded in the year 2000 and if the plant was further expanded to 2.87 NGD as proposed, this plant expansion would not be sufficient to accommodate a build-out population.

3. Locating and Planning New Development

The Coastal Act includes policies requiring growth to occur in an orderly, well-planned fashion. Specifically, the Act states that new development shall:

- (1) be located in or near existing developed areas;
- (2) protect coastal resources; and
- (3) give priority to coastal-dependent uses

The Act also recognizes that the provision of public services is a significant factor in the location, pattern, timing and density of new development.

Future growth in Morro Bay will be determined by the ability to provide service and by what the community views as a desirable environment. Build-out of the community under the City's adopted Land Use Plan (1976) would allow a total population of over 16,000 while the current Zoning Ordinance would only provide a population of 15,400 people. These figures are higher than previous estimates because they reflect the trend in the community of a higher number of persons per household. Under the proposed LCP Land Use Plan, total build-out within the community would be approximately 13,500 people.

As discussed elsewhere in this Plan, future water facilities will be sufficient to meet future water demands. These facilities will not, however, be available until funding becomes available for construction and construction has been completed. Therefore, additional population is contingent upon provision of additional water facilities. In addition, anticipated

wastewater treatment plant expansion will be capable of supporting a smaller population than build-out would allow. Thus, recognizing that future development in the community will be limited by the availability of public services, and to be consistent with the intent of the Coastal Act, it is necessary for the City to let priorities and guidelines for future growth.

To ensure the protection of Morro Bay's economic viability, specific land uses must be given priority in the allocation of public services. The Water Equivalency Ordinance should be amended to reflect the following priorities:

- (1) Commercial fishing/agriculture
- (2) Coastal dependent industries
- (3) Recreation/visitor-serving uses
- (4) Commercial
- (5) Industrial
- (6) Residential Development
 - (a) infill areas
 - (b) Areas contiguous to existing development
 - (c) Other

These land uses will be allocated a number of equivalencies consistent to their existing levels of demand. Those equivalencies not utilized in one year will be transferred to other uses in the subsequent year.

4. Traffic

The City recognizes that the Morro Bay Boulevard, Quintana Road, State Highway One complex interchange/intersection does not operate efficiently. Caltrans has identified necessary modifications to improve safety and traffic flow. ("A Report on Traffic Engineering Services for the City of Morro Bay", April, 1978.)

D. PUBLIC WORKS AND LOCATING AND PLANNING NEW DEVELOPMENT: GENERAL POLICIES

Policy 3.01. The City of Morro Bay shall approve future growth in conjunction with water and sewage treatment availability. Development shall be approved only if the City finds that sewer and water services are available to serve the proposed use. The City shall allocate water and sewer services to development based on Coastal Development Permit No. 4-81-309, as amended and approved by the Coastal Commission. The amount of water and sewer services to be allocated to new development shall be limited to the amounts of recovered water due to the water pipe replacement program, and/or to other conservation measures (e.g., retrofit of existing facilities with water-saving fixtures) approved in Permit No. 4-81-309, as amended. If the City develops additional sources of water and/or improves its water management so that additional water is demonstrably recovered, the City may submit a revised water allocation program as a subsequent amendment for Coastal Commission review and approval. Until a water management program which provides additional water for allocation is approved and amended into the LUP, the allocation program for future developments shall be as described in the findings and exhibits adopted by the Coastal Commission for Permit 4-81-309, as amended; which specifically includes the "Water Recovery Allocation Model and Percentage Allocation System", as well as the provision for distributing water conserved through measures such as the retrofit of existing facilities with water saving fixtures.

TABLE 9

SUMMARY OF PROJECTED
 WASTEWATER FLOWS
 FOR MORRO BAY/CAYUCOS

CATEGORY	BASE UNITS			
	1975	1979	1989	1999
Gallons per capita per day	93	96	103	110
Average Day (Maximum Month) in MGD				
Domestic and Commercial	0.98	1.19	1.65	2.11
Industrial	0.02	0.02	0.03	0.03
Tourist	0.61	0.63	0.68	0.73
Total Average Day	1.61	1.84	2.36	2.87

SOURCE: John Carollo Engineers, 1978

TABLE 10

SUMMARY OF CURRENT PROJECTED WASTEWATER FLOW RATES
 MORRO BAY AND CAYUCOS

CATEGORY	BASE UNITS			
	1980	1990	2000	BUILD-OUT
Population				
Morro Bay	9,064	11,040	12,195	13,500
Cayucos	2,305	2,775	3,246	5,642
Total	11,369	13,815	15,441	19,142
Domestic and Commercial Flow (gpcd)	96	103	110	120*
Average Day Flow, MGS				
Industrial	0.02	0.03	0.03	0.03*
Tourist	0.63	0.68	0.73	0.80
TOTAL MGD	1.74	2.13	2.46	3.13

*Estimated by City of Morro Bay

SOURCE: City calculations

Methods of obtaining additional water resources shall ensure protection of the biological productivity of coastal waters. Accordingly, extractions of water from groundwater basins shall not exceed Basin Safe Yield except under a conjunctive use program. Determinations of Basin Safe Yield shall ensure that groundwater extractions, stream diversions, etc. do not exceed a magnitude when the biological productivity of coastal waters is adversely affected.

Residential priority for first three quarters shall be the following:

1. Low or moderate income housing
 - (a) multi-family
 - (b) single family
 - (c) newly subdivided multi-family
 - (d) newly subdivided single family
2. Market rate housing
 - (a) single family (owner occupied)
 - (b) single family (speculative built)
 - (c) multi-family (rental no subdivision)
 - (d) infill subdivisions

Residential priority in fourth quarter shall be the following:

1. Low or moderate income housing
 - (a) multi-family
 - (b) single family
 - (c) newly subdivided multi-family
 - (d) newly subdivided single family
2. Market rate housing
 - (a) single family (owner occupied)
 - (b) single family (speculative built)
 - (c) multi-family (rental no subdivision)
 - (d) infill subdivisions

Policy 3.02. In any system the City of Morro Bay uses for water allocation, the City shall insure the following uses receive priority for available water and wastewater treatment facilities:

Commercial Fishing / Agriculture
Coastal-Dependent Land Uses
Coastal-Related Land Uses
Essential Public Services and Basic Industries
Public Recreation
Commercial Recreation
Visitor-Serving Land Uses
Residential and other Commercial and Industrial Land Uses

Residential land uses shall be allocated water based on the following order of varying residential parcels:

- (1) presently subdivided parcels within existing developed areas;
- (2) presently subdivided parcels contiguous to developed areas or unsubdivided parcels within existing developed areas;
- (3) unsubdivided parcels contiguous to developed areas;
- (4) unsubdivided parcels isolated from either presently developed or subdivided areas.

The above noted priority list has been employed in the water allocation regulations contained in Coastal Permit No. 4-81-309, as amended. This policy shall not be construed to preclude projects, for which water has been credited through conservation measures (such as retrofit of existing facilities with water-saving fixtures), from being approved, provided that the regulations and procedures contained in Coastal Permit No. 4-81-309, as amended, are complied with.

Policy 3.03 The City may develop a specific, comprehensive, long-range water plan which will implement water management policies that will provide water service consistent with sound resource planning. New water and sewer services to previously unsubdivided areas shall not be approved until a Water Management Plan has been developed, adopted, and submitted for Coastal Commission review and approval as a subsequent amendment to the LUP.

Policy 3.04 Chapter 3 Coastal Act Policies shall be the basis for reviewing the adequacy of any Water Management Plan. A Water Management Plan shall ensure at a minimum, the following:

1. An adequate water supply for coastal-dependent activities such as commercial fishing, oyster farming, fish and shellfish processing, recreational boating and fishing and industrial energy development.
2. Continued protection of the Morro Bay wetland areas with assurances that the wetlands shall continue to be seasonally flushed of accumulated salts from sediments.
3. An adequate ground surface water supply to protect the biological productivity of coastal waters including riparian stream corridors upon which the anadromous fishery depends for viability.
4. Sufficient water for agricultural operations in the Morro and Chorro Valleys.

Once a Water Management Plan has been incorporated into the LUP, the approved elements of the plan shall be implemented with each project approval accompanied by findings that the resources listed above have been protected consistent with Chapter 3 policies contained in the Coastal Act. Upon implementation of the Water Management Plan, new subdivision in previously undeveloped areas may be permitted.

- Policy 3.05 The City of Morro Bay shall adopt a five-year Capital Improvement Program which specifies maintenance, improvements, and extensions of water and sanitary sewer facilities, including recommendations of the Water Management Plan.
- Policy 3.06 The City will continue a program of providing wastewater treatment facilities to accommodate the build-out population of 12, 195, determined to be the build-out figure in Coastal Development Permit No. 406-01, which permitted further expansion of the wastewater treatment facilities to 2.4 mgd.
- Policy 3.07 Water-saving devices shall be required in new developments. These devices may include; but are not limited to the following:
- (1) faucets with faucet aerators to help reduce the flow of water to 2 gallons per minute, or less;
 - (2) water restrictions on shower heads to restrict water to 3 gallons per minute, or less;
 - (3) water conservation toilets to restrict each flush to 3 gallons or less.
- Efforts to conserve or reduce water consumption through the implementation of water-saving techniques shall be recognized by the City when determining priority of water use allotments.

3.08 WATER MANAGEMENT PLAN (Adopted 1995)

Determining the long term water source for the City of Morro Bay has been a topic of Debate for many years. Numerous consultant reports, project investigations and voter initiatives have not been able to forge a water policy. With the completion of the *Analysis and Recommendation for a Water Management Plan for the City of Morro Bay* as prepared by Boyle Engineering Corporation and with the passage of Measure G which mandates the use of State Water through the Coastal Aqueduct as an imported source of water, the City is now able to formulate the City's long term water management plant. The Plan is set forth below.

The City shall review the water management plan at least once every five years to ensure that water sources are adequate and to reflect any changes in climatic, hydrological, technological, or political conditions that could affect the City's long-term water supply, whether negatively or positively. As part of the five year review, the City shall prepare a report and submit a copy to the Executive Director for review. When necessary updates to the water management plan are identified through the five year review, or as necessary at the discretion of the City, the City shall update the water management plan by amending the Land Use Plan.

The following programs will be implemented and/or continued in that State Water usage has been mandated by the people:

1. The City will develop appropriate levels of water conservation needed based on water availability and quality.
2. The City should continue with voluntary water conservation unless average annual personal water use exceeds 130 gpcd, at which time an extensive consumer education program shall be implemented and if unsuccessful, more stringent measures shall be adopted.
3. The City shall continue the use of groundwater within the limits of the City's water rights and promote the continued conservation of all water use through existing programs and promote additional methods of conservation to the benefit of the consumers.
4. The City shall take all the necessary steps to obtain the City's rights to its groundwater within the Morro and Chorro Basins.
5. Even with delivery of State Water, use of reclaimed water is the City's second highest priority and remains a productive source of potential conservation for both large and small scale projects, respectively, and as a result, should be pursued when funded by a potential user. Required as part of a wastewater plant upgrade or permit condition or when it is shown as cost effective for City use. Staff is further directed to pursue small scale projects as both internal and external funding sources are made available.
6. The City shall continue its participating in the State Water Project, in particular, the Coastal Branch Aqueduct and local facilities.
7. The City shall apply for and obtain permits to allow operation of the existing desalination facilities as a source of routine replacement water. With the high energy consumption of desalination, it is expected that the facilities will be operated intermittently once State Water is available. The main purpose of the facilities will be to make up for shortfalls in State Water and/or groundwater during droughts and blending to meet the City Council's established **minimum**** water quality standards, so long as those standards are consistent with the State Department of Health Service potable drinking water standards.* The permits should allow use of the facilities at the discretion of the City, so that the City can utilize all of its water supply options without declaring a water emergency.
8. Once permits are obtained, and before State Water is available, the City should begin operation of the desalination facilities, to verify its performance and to allow groundwater basins to achieve the minimum water quality standards established by the City Council, so long as those standards are consistent with the State Department of Health Services potable drinking water standards.* Due to a settlement agreement between the City and the Cayucos Sanitary District, no discharge of brine waste from the desalination facilities into the jointly owned outfall shall occur.
9. The City shall monitor groundwater levels and quality. The desalination plant initially shall be operated as necessary to reduce groundwater pumping to ensure that

groundwater quality meets or exceeds established minimum water quality standards for a continuous period of not less than four consecutive months. Thereafter, the desalination plant shall be used as needed to ensure **the City's**** minimum water quality standards are met, as routine replacement, and to offset drought conditions.*

10. When State Water becomes available, the City shall conjunctively use State Water, groundwater, and routine replacement desalination water to meet its demands in an economical manner without causing adverse levels of sea water intrusion or exceeding minimum water quality criteria as defined by the State or a subsequent action by the City.

11. A replacement well or wells for Well No. 8 should be constructed, far enough from Chorro Creek that the pumped water will not be under the influence of surface water.

12. The City shall consider construction of a blending system to uniformly blend its water supplies within the City. Blending will greatly improve water quality, and will increase flexibility in which groundwater wells are pumped. Blending will also help the City meet stringent new water quality regulations currently being promulgated at the State and Federal levels.

13. If a permit is not received for operation of the desalination facilities as a routine replacement water source, the City should consider whether to continue to participate in Nacimiento Water Supply Project, as that project moves into the Phase 4, preliminary design and environmental review.

Should the City be relieved of its mandate to participate in State Water by a subsequent vote of the people, then the following programs would be pursued:

1. Immediate creation of a voluntary retrofit program throughout the entire City promoted and paid for the City, since Conservation is the City's number one priority.

2. The City shall continue the use of groundwater within the limits of the City's water rights and promote the continued conservation of all water use through existing programs and promote through a massive advertising campaign to encourage additional methods of conservation.

3. The City should continue with voluntary water conservation unless average annual personal water use exceeds 130 gpcd, at which time an extensive consumer education program shall be implemented and if unsuccessful, more stringent measures shall be adopted.

4. The City shall take all the necessary steps to obtain the City's rights to its groundwater within the Morro and Chorro Basins. The City's outstanding applications with the SWRCB, Division of Water Rights requested a total of 1723 AF.

5. A replacement well or wells for Well No. 8 should be constructed, far enough from Chorro Creek that the pumped water will not be under the influence of surface water.

6. The City shall consider construction of a blending system to uniformly blend its water supplies with the City. Blending will greatly improve water quality, and will increase flexibility in which groundwater wells are pumped. Blending will also help the City meet stringent new water quality regulations currently being promulgated at the State Federal levels.

7. The City shall establish incentives to increase the use of greywater for irrigation within the limits of the criteria as set forth by State Health. Should those limits make greywater use impractical within the City, staff is directed to pursue the necessary legislative option at the State level to set reasonable standards and limits on greywater use.

8. Upgrade a portion of the wastewater effluent (100-200 AF) to tertiary treatment and build pipelines to distribute to schools, parks and or farms for irrigation. All available options should be investigated as possible sources for water reclamation.

9. The City shall apply for and obtain permits to allow operation of the existing desalination facilities as a source of routine replacement water. With the high energy consumption of desalination, it is expected that the facilities will be operated intermittently. The main purpose of the facilities will be to make up for shortfalls in groundwater during droughts and blending to meet the City Councils' **minimum**** established water quality standards, so long as those standards are consistent with the State Department of Health Services potable drinking water standards.* The permits should allow use of the facilities at the discretion of the City, so that the City can utilize all of its water supply options without declaring a water emergency.

10. The City will continue to participate in Phase 4 design and environmental review of the Lake Nacimiento project. If it is determined to be cost effective, then participation through the construction phase of this project should be considered by the City.

* =language approved by Coastal Commission Staff

**=added by Coastal Commission Staff at time of approval