

CHAPTER TWELVE
POTABLE WATER SYSTEMS

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CHAPTER TWELVE: POTABLE WATER SYSTEMS

12.1 INTRODUCTION

This chapter describes the potable water supply for the Mountain House community.

12.2 ASSUMPTIONS

The potable water supply will be utilized for human consumption, irrigation and other uses within the residential, commercial, school, public and open space areas of the Mountain House community. The criteria used to plan and design the water supply facilities meet or exceed established San Joaquin County (County) and State of California (State) guidelines and standards. A brief summary of the criteria used for each element of the potable water supply system is provided below.

Design Component Design Criteria Utilized

Water Demand	Water demand is calculated based on the boundaries and land use plan detailed in this Master Plan. Quantification is based on actual demands within a similar community accounting for land use type and implementation of water conservation measures. The estimated amount of water required for the entire Community at buildout with conservation measures is 9,856 ac. ft/year. This includes existing homes within the community that are currently serviced by private well.
Water Storage	Design based on typical engineering design standards which exceed County standards.
Water Treatment	Design based on criteria established by the State.
Water Distribution	Design based on County standards as stated in the County Department of Public Works Design Standards manual.

12.3 POTABLE WATER SUPPLY AND DISTRIBUTION

12.3.1 Water Supply

The water supply for the Mountain House community will be provided by the Byron Bethany Irrigation District (BBID) via their pre-1914 appropriative water right to divert water from the Sacramento-San Joaquin Delta and to a small degree by riparian water currently drawn from Old River. BBID water may be used for municipal, industrial and/or agricultural uses at any location within their district. Historical BBID diversions for agricultural customers within the Mountain House project area have generally occurred from April through October each year and have averaged about 9,413 ac. ft/year for the period from 1976 to 1991. The 9,413 ac. ft/year is the amount of water that BBID has agreed to wholesale to Mountain House.

The water service agreement between the MHCS D and BBID that has been approved and signed by BBID and will become effective upon its signing by the MHCS D after its formation (Appendix 12-A: Water Services Agreement Between BBID and Mountain House MHCS D). Any agreement between Mountain House and BBID regarding drainage will be approved by the San Joaquin County Department of Public Works.

Under a water exchange agreement between BBID and the State Department of Water Resources, surplus summer water (water not needed at Mountain House in the summer months) would not be diverted by BBID and would be allowed to flow down to the State's San Luis Reservoir for storage. In the winter months, in-lieu water would be diverted by BBID for use at Mountain House.

The exchange agreement with the State for winter water has been approved and signed by all parties and is now effective.

Figure 12.1: Riparian Water Rights Areas and Figure 12.2: Riparian Water Rights Areas/NW Area Enlargement illustrate riparian water rights areas in the Master Plan area.

Assumptions:

- a) The project requires 9,856 ac. ft/year with conservation measures, resulting in an additional need of 443 ac. ft/year over the amount to be supplied by BBID. This additional need can be supplied by riparian rights or by expanded water supply contracts with BBID. The amount of riparian water available to lands with existing riparian rights is limited to that which can be used on those same lands. Since the riparian land within the boundaries of the community equals 1,262 acres and the estimated use of urban water on the 1,262 acres is 2.05 ac. ft/year, then 2,600 acre feet of riparian water is available. Therefore, the combined water available from BBID and riparian rights is 12,013 ac. ft/year (2,600 + 9,413).
- b) If the 433 ac. ft. of required riparian or other water is used, it shall be delivered to the treatment plant through the raw water conveyance pipeline used to convey BBID raw water. The water agreement between BBID and Mountain House includes provisions for the pumping of such waters.
- c) Lands within Mountain House that are not currently within the BBID service area must be annexed to BBID prior to service, if BBID water is to be used on these lands.

Objective: To provide the Mountain House community with an adequate year-round water supply.

Policies:

- a) Water supply and usage in Mountain House shall comply with the County Water Policy.

- b) A water service agreement specifying the quantity, cost and conditions of water service to the Mountain House community shall be maintained between the Mountain House Community Services District (MHCS D) and BBID.
- c) An exchange agreement shall be maintained between the State and BBID to provide a winter (November through March) water supply to the Mountain House community.
- d) The portions of the Mountain House project area which do not currently lie within the BBID service area shall be annexed to BBID (see Figure 1.6), unless riparian water sources are used for these properties.
- e) The portions of the Mountain House area currently within the Westside Irrigation District and the Plain View Water District shall be de-annexed from their respective districts and annexed to BBID.
- f) Riparian water rights associated with land between Byron Road and Old River shall be reserved for project use. Until the parcels with riparian water rights are developed, the water diverted under riparian rights must be reserved for agricultural irrigation.
- g) Obsolete agricultural irrigation and drainage facilities shall be removed or properly abandoned upon development of an area.

Implementation:

- a) Consistency with County's Water Policy. Specific Plan II and each subsequent Specific Plan shall reevaluate the adequacy of the confirmed water supply for the Specific Plan Area in light of any potential or adopted restrictions on water diversion by BBID or DWR. The Specific Plans shall not be approved unless it can be demonstrated that the confirmed water supply is sufficient to serve the Specific Plan Area through buildout.
- b) Annexation to BBID. Annexation to BBID shall be required prior to the recordation of the Final Map for any area outside the boundaries of the BBID, that will require delivery of BBID water for urban use as a specific condition of commencement of construction.
- c) Riparian Water Use. For a specific land area of a Tentative Map that contemplates the use of riparian or other water sources, an executed agreement between BBID and the MHCS D shall be provided prior to the recordation of a Final Map. This agreement shall indicate that the parties have agreed to the terms under which BBID will wheel riparian water through their pumping and conveyance facilities to the Mountain House community as provided for in the BBID Water Services Agreement.

Annexation into BBID shall be required prior to any annexation to the MHCS D for those lands contemplating using BBID owned water. A landowner may annex into BBID without immediate plans to annex into

the MHCSD, but with the understanding that the MHCSD cannot supply treated water until MHCSD annexation is complete. All lands requiring urban BBID water must be annexed to the MHCSD before any BBID water can be delivered.

- d) While there is presently a sufficient water supply for the development of the community, if in the future, because of actions or conditions beyond the control of the County or the community and there is insufficient water for buildout of the community, then measures shall be undertaken to obtain an additional supply of water, to implement more extensive conservation measures, or to revise the Master Plan.

12.3.2 Water Demand

It is estimated that the water demand at buildout within the Mountain House community will be approximately 11,457 AF/YR if conservation measures are not implemented. When the conservation measures discussed in Table 12.1: Potable Water Demand are implemented, the water demand at buildout will be approximately 9,856 AF/YR.

Objective: To provide a safe, reliable and sufficient water supply to meet demands at buildout of the Mountain House community.

Policies:

- a) Development within Mountain House shall consume less water than in similar communities, and less than that assumed in current County standards.
- b) Sufficient safe and reliable water shall be provided.

Implementation:

- a) Water Demand. Water demand shall adhere to the water conservation requirements specified in Section 12.3.3: Water Conservation.
- b) Water Usage. Specific Plans subsequent to Specific Plan I shall include a comparison of actual water demand for the community with the projected water demand used in the Master Plan. If water use specified in the Master Plan is exceeded for a previous Specific Plan, subsequent Specific Plans shall specify additional actions that would be implemented to achieve adequate availability of water, with continued or additional water conservation measures. In addition, the Master Plan will be revised, if necessary, prior to approval of a Specific Plan to reflect new projected water demand and revised infrastructure facilities to permit increased water usage. Further, Specific Plans shall identify measures to be incorporated into the project to ensure that the demand would not exceed the confirmed supply.

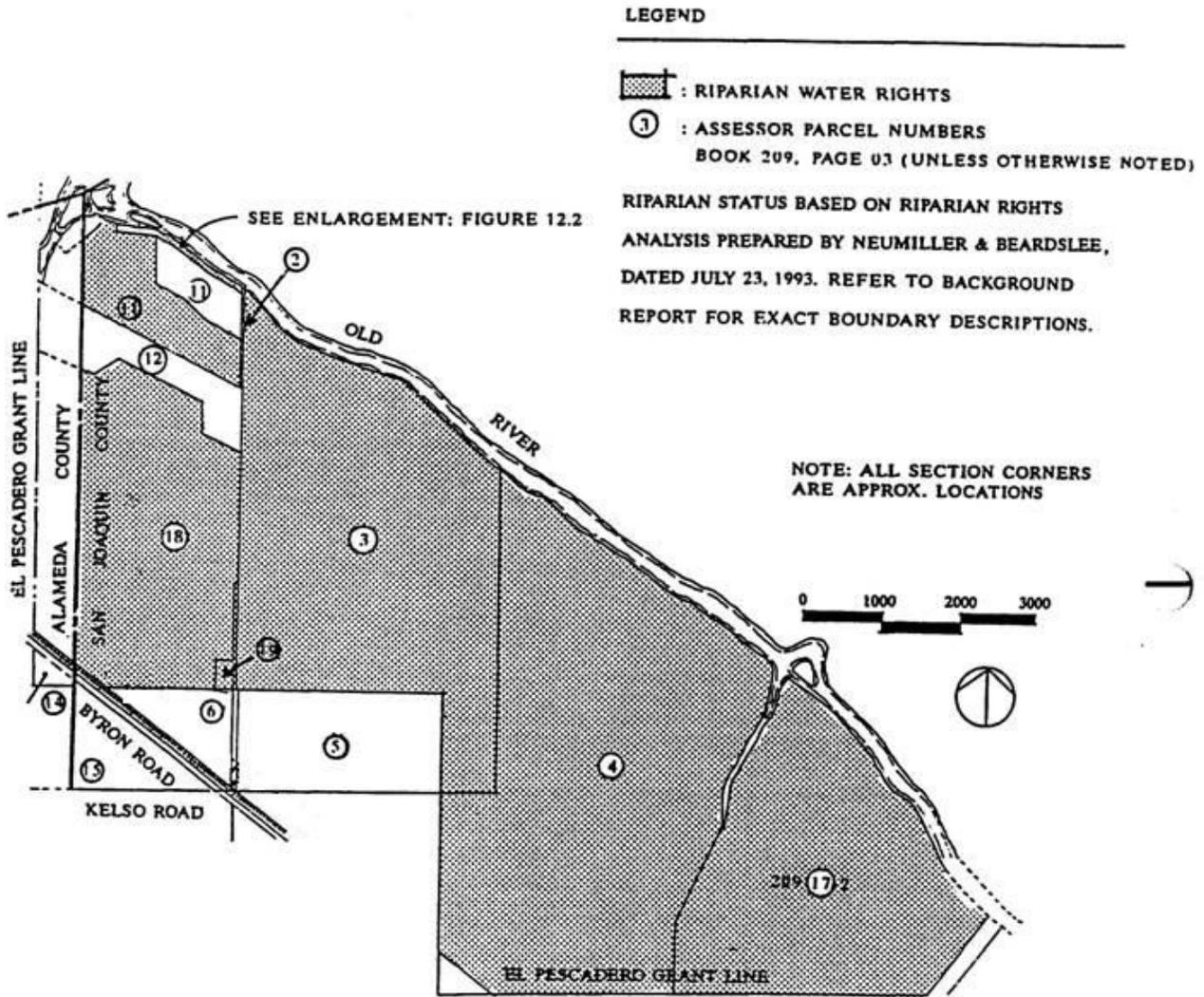


FIGURE 12.1 - RIPARIAN WATER RIGHTS AREAS

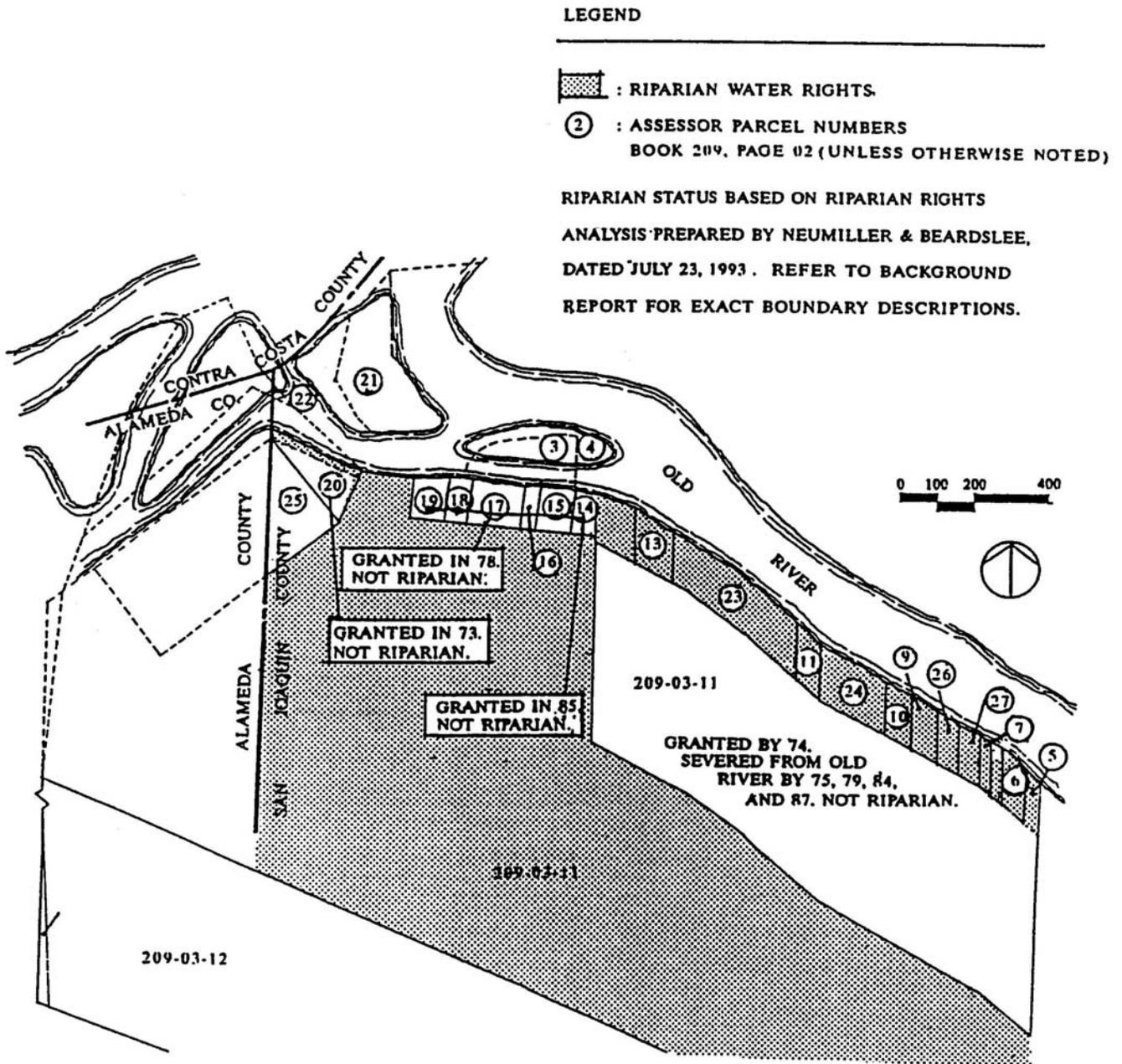


FIGURE 12.2 - RIPARIAN WATER RIGHTS AREAS/NW AREA ENLARGEMENT

MOUNTAIN HOUSE MASTER PLAN

**Table 12.1:
Potable Water Demand**

LAND USE	Gross Area in Acres	Expected Units (DU)	Comments	Base Demand Level Using County Standards		Base Demand Level Without Conservation Without Reclamation		Base Demand Level With Conservation Without Reclamation	
				Average Annual Water Use (gpd)	Total Annual Water Use (AF/YR)	Average Annual Water Use (AF/YRAC)	Total Annual Water Use (AF/YR)	Average Annual Water Use (AF/YRAC)	Total Annual Water Use (AF/YR)
RESIDENTIAL (du/ac)									
R/VL Residential/Very Low	57.8	121	2,3	450	61	1.50	87	1.30	75
R/L Residential/Low	1073.1	4,829	2,3	450	2,434	2.50	2,683	2.00	2146
R/L Residential/Low--Active Adult	131.8	593	2,3	450	299	2.50	330	2.00	264
R/M Residential/Medium	969.2	5,898	2,3	450	2,973	3.00	2,908	2.50	2423
R/M Residential/Medium--Active Adult	13.5	81	2,3	450	41	3.00	41	2.50	34
R/MH Residential/Medium High	186.8	2,615	2,3	450	1,318	3.50	654	3.00	560
R/MH Residential/Medium High--Active Adult	14.0	196	2,3	450	99	3.50	49	3.00	42
R/MH Residential/Medium High--Senior Housing	0.0	-	2,3	450	-	3.50	-	3.00	0
R/H Residential/High	62.1	1,242	2,3	450	626	4.00	248	3.50	217
R/H Residential/High--Senior Housing	0.0	-	2,3	450	-	4.00	-	3.50	0
R/H Residential/High (I-205)	-	-	-	-	-	-	-	-	-
MX Mixed Use (Town Center)	0.0	200	2,3	450	101	4.00	100	3.50	100
SUBTOTAL	2,508.3	15,775			7,952		7,098		5,861
ADDITIONAL & BONUS UNITS									
Additional Units (Town Center)		240	2,3	450	121	4.00	121	3.50	121
Bonus Units (For R/H Housing)		90	2,3	450	45	4.00	45	3.50	45
SUBTOTAL		330			166		166		166
COMMERCIAL									
C/N Neighborhood	12.8		2,4	2,000	29	1.50	19	1.30	17
C/C Community	97.4		2,4	2,000	218	1.50	146	1.30	127
C/G General	41.8		2,4	2,000	94	1.50	63	1.30	54
C/FS Freeway Service	24.8		2,4	2,000	56	1.50	37	1.30	32
C/O Office	50.8		2,4	2,000	114	1.50	76	1.30	66
C/R Recreation (Golf Club, Rec Ctr)	179.4		2,4	2,000	402	1.50	269	1.30	233
MX Mixed Use (I-205)	16.0		2,4	2,000	36	1.50	24	1.30	21
MX Mixed Use (Town Center and Old River)	54.1		2,4	2,000	121	2.50	135	2.00	108
SUBTOTAL	477.1				1069		770		658
INDUSTRIAL									
I/L Limited Industrial (N. of Byron)	57.0		2,4	1,800	115	1.50	86	1.30	74
I/L Limited Industrial (N. of Byron--Expansion)	37.7		2,4	1,800	76	1.50	57	1.30	49
I/L Limited Industrial (S. of Byron)	185.9		2,4	1,800	375	1.50	279	1.30	242
I/G General Industrial	56.1		2,4	1,800	113	1.50	84	1.30	73
I/G General Industrial--Expansion Area	55.8		2,4	1,800	113	1.50	84	1.30	73
SUBTOTAL	392.5				791		589		510
OPEN SPACE									
NP Neighborhood Park	61.3		2	4.50	276	4.50	276	4.00	245
CP Community Park	97.6			4.50	439	4.50	439	4.00	390
CP MH Creek Community Park	95.0			4.50	428	4.50	428	4.00	380
RP Regional Park	82.0			0.50	41	0.50	41	0.50	41
C/R Golf Course	0.0			4.00	0	4.00	0	4.00	-
OS/O Lakes	95.6			0.0	0	0.0	0	0.00	0
OS/RC Dry Creek	13.0			0.0	0	0.0	0	0.00	0
OS/O Water Quality/Detention Basin	21.0			0.0	0	0.0	0	0.00	0
OS/RC Wetland / Resource Conservation	17.2		1	0.0	0	0.0	0	0.00	0
OS/O Trails, Transmission Line/Gas Corridors	30.4			4.50	137	4.50	137	4.00	122
OS/O Buffer Areas	8.3			1.00	8	1.00	8	0.50	4
SUBTOTAL	521.4				1,329		1,329		1,182
SCHOOLS									
P K-8	176.0		2	2.00	352	2.00	352	1.80	317
P High School	46.5		2	2.00	93	2.00	93	1.80	84
P Community College	107.9		2	2.00	216	2.00	216	1.80	194
SUBTOTAL	330.4				661		661		595
PUBLIC									
P Wastewater Treatment Plant	22.0			0.50	11	0.50	11	0.50	11
P Utility Area	26.2			0.50	13	0.50	13	0.50	13
P Water Treatment Plant	16.9			0.50	8	0.50	8	0.50	8
P Water Tank/Booster Station	2.7			0.50	1	0.50	1	0.50	1
P Transit	10.9		2	0.50	5	0.50	5	0.50	5
P Public Facilities, Other (public)	13.1			0.50	7	0.50	7	0.50	7
P Public Facilities, Other (private)	18.9			0.50	9	0.50	9	0.50	9
p Major Arterial Street Right-of-Way	114.9			1.00	115	1.00	115	1.00	115
p Minor Arterial Street Right-of-Way	250.8			0.50	125	0.50	125	0.50	125
P Railroad Right-of-Way	33.2								
SUBTOTAL	509.6				296		296		296
TOTALS	4,739.3	16,105			12,263		10,908		9,269

Comments:
 1) Assumed to be non-irrigated acreage.
 2) Assumed to have only a demand for potable water.
 3) County demands expressed in gallons per day per dwelling unit.
 4) County demands expressed in gallons per day per acre.
 5) Dwelling units are Expected Units, within the permitted density ranges, between minimum and maximum densities.

12.3.3 Water Conservation

Because water is such a valuable commodity, it must be used wisely and efficiently. The State has directed existing communities to initiate water conservation to the maximum feasible level on a permanent basis. Currently, implementation is called for through the adoption of Best Management Practices (BMPs) for water conservation. The State has established a list of 16 BMPs which communities should consider in their conservation programs. It has been assumed that, at a minimum, the Mountain House community will incorporate low-flow plumbing fixtures, water-conserving appliances and low-water using landscaping into its community standards. It is estimated that the implementation of these measures will reduce overall water demands by approximately 14%.

Should the 14% conservation amount be realized, the community at buildout would generate a surplus of 2,158 ac. ft/year. If no conservation practices were realized, the total available water of 12,014 acre feet per year would still be sufficient for the total community demand of 11,457 acre feet per year.

It should be noted that reclaimed water will not be utilized within the project area for urban irrigation or industrial uses and thus will not be used to reduce potable water demands. Treated wastewater will be utilized off-site for agricultural irrigation.

Objective: To utilize the Mountain House water supply efficiently.

Policies:

- a) On-going water conservation shall be encouraged within the Mountain House community by the Mountain House MHCSD through the use of public information and education programs.
- b) Certain on-going water conservation measures shall be required by the Mountain House MHCSD.
- c) Best beneficial use of reclaimed water shall be practiced.

Implementation:

- a) Water Conservation and Monitoring Program. The Mountain House MHCSD shall provide for a water conservation action plan that includes the requirement for water conserving appliances, landscaping, and other conserving devices.
- b) Public Information. The residents and patrons of the Mountain House community shall be informed about the importance of water conservation and ways which water use can be reduced through the establishment of programs promoting the benefits of such water conservation.

- c) Conservation Measures. The following conservation measures shall be required:
- Landscaping. Low-water-using landscaping (e.g. xeriscape) shall be incorporated into residential, school, commercial, industrial and other public areas within Mountain House.
 - Wastewater Reuse. Effective wastewater reuse will be developed to the extent economically feasible in the design and operation plan for the wastewater treatment plant.
 - Pressure Regulation. The Mountain House MHCS D may require that residential structures be fitted with a maximum pressure regulating device.
 - Water Conserving Appliances. In addition to low flush toilets and shower heads as required by Title 24 of the California Code, the installation of water conserving appliances shall be encouraged by the MHCS D. The MHCS D will educate the citizens on available water conserving appliances such as dish and clothes washers, and shall encourage or shall provide incentives for the installation of these appliances.
- d) Water Rate. A water rate structure shall be developed which will encourage water conservation.

12.3.4 BBID Service to Interim Agricultural Operations

Due to the long buildout expected for the community, agricultural operations will continue to be active in some areas as development occurs in others. Provision of irrigation water is critical to ensuring the continuing viability of interim agricultural operations. Other land use considerations regarding interim agricultural operations are discussed in Section 3.2.4: Pre-Existing Land Uses Within Mountain House.

The portion of the Master Plan area south of Byron Road is within the service area of Byron Bethany Irrigation District (BBID). BBID provides irrigation water through three irrigation canals, each of which is an unlined ditch and with piping only at crossings of roadways and drainage ways. The irrigation water applied to the farmland tends to raise the groundwater level. To keep the groundwater low and not adversely affect farming operations, BBID owns and maintains groundwater drain pipes along Mountain House Parkway and Byron Roads that carries away groundwater. The drain water is discharged to the Delta-Mendota Intake Canal northwest of the Master Plan area in Contra Costa County.

A small portion of BBID's San Joaquin County service area is located outside of the Mountain House project area, adjacent to the southeast corner of the project area boundary. This area of land is currently provided with irrigation water via BBID's 155-foot-elevation canal. This portion of land will not be part of Mountain House, but continued irrigation water service will need to be provided.

Objective: To maintain water service to lands outside of the Mountain House project area which are within the BBID service area.

Objective: To maintain a supply of irrigation water to lands under agricultural use.

Policies:

- a) Continued irrigation water and drainage service shall be provided to the land within the BBID service area located east of the project site and Mountain House Parkway throughout project buildout.
- b) Irrigation water service and drainage shall be maintained so long as required by farming practices. In order to assure continued service to remaining customers, BBID's ability to provide service shall not be impaired.
- c) The project shall provide permanent or interim facilities as needed, as each phase develops, that will assure continued service to BBID customers.

Implementation:

- a) Continuation of Agricultural Water Service. The appropriate Specific Plans shall identify how water and drainage services to the land east of the project and Mountain House Parkway within the BBID service area would be affected. They shall identify the infrastructure needed to maintain these services and when construction of these facilities would need to be completed (schedule may be expressed in terms of when certain parcels are developed).
- b) Requirements for Agricultural Irrigation. To ensure an uninterrupted source of irrigation water to undeveloped land, Development Permits, as applicable, shall include a detailed assessment of how irrigation water and drainage services to land within the project site that has not been or is not immediately planned for development would be affected. The assessment shall include consideration of interruption of irrigation patterns, temporary interruptions in service due to installation of underground utilities, and access to farm fields by workers, equipment and trucks. A plan for constructing/modifying facilities to maintain irrigation water and drainage services and a schedule for constructing these facilities shall be included.
- c) Farm Drainage Requirements. As part of the environmental assessment, development permits, as applicable, shall include a report on the existing impacted farm irrigation drainage. Such plans shall include a map of existing farm drains that flow through or drain the Specific Plan area. Any such drains are to be identified on the maps as to type, location and function. The report will include an analysis of the impacts on the drainage system and a determination of the planned dispossession of the

system. If any portion of the system is to be abandoned, the pipes and drains shall be removed unless reusable. If the drainage system is usable for the control of the water table and/or storm runoff, it may be integrated into the storm system and be subject to the same conditions required for storm runoff.

- d) Costs. Any costs associated with reconstruction or rerouting of irrigation waters caused by development shall be paid for by the individual development causing the reconstruction or rerouting subject to reimbursement if the first builder has to front larger area rerouting.

12.3.5 Raw Water Conveyance

New facilities are required to convey untreated (raw) water from the intake channel on the California Aqueduct to the Mountain House water treatment plant. These new facilities will include a new raw water pump station and new raw water transmission pipeline(s) from the raw water pump station to the water treatment plant.

The raw water pump station will be located along the eastern side of the Intake Channel to the California Aqueduct adjacent to BBID's existing Pump Station 1 South.

The raw water transmission pipelines will be located on the west side of Bruns Road, then cross Byron Road and run parallel to Byron Road within the adjacent U.P.R.R. easement.

Figure 12.3: Location of Raw Water Pipeline and Pump Station indicates the location for the raw water pump station and the alignment for the raw water transmission pipeline(s).

Objective: To provide adequate conveyance facilities to supply the community with raw water.

Policy:

- a) Conveyance facilities shall be provided with appropriate backup equipment and power.

Implementation:

- a) Pump Station and Pipeline. The Use Permit for the initial phase of the water treatment plant shall include provisions for a new or expanded pump station and conveyance pipeline(s) from the water source to the treatment plant. The size, number, and location of the pipeline(s) shall be finalized prior to the County's approval of the use permit.
- b) Capacities. Both the new pump station (or additional pumps) and the pipeline(s) shall be designed to convey the flow required to serve maximum day demands at Mountain House during the various phases of development. Ultimately, the capacity of the pump station and

conveyance system will need to be approximately 20 mgd (31 cfs or 13,900 gpm).

- c) Pump Station Requirements. The new pump station shall provide backup diesel power as necessary to insure reliability. The entire pump station building and the pumps needed to serve the initial phases of development shall be constructed initially. Additional pumps shall be added to the pump station as development occurs and the demand for water increases. One standby pump shall be provided at all phases of the pump station phasing.
- d) Impact on Habitat. Construction of the BBID raw water conveyance pipelines from the intake off-site to the on-site water treatment plant shall not impact any special-status animal or plant species.

12.3.6 Water Treatment Plant

Mountain House is being planned during a time when major regulatory revisions for water quality are in progress. Both Federal and State agencies have made changes to drinking water standards and are proposing further changes, which will have significant implications for Mountain House in terms of required treatment processes, monitoring requirements and construction and operation and maintenance costs. Thus, the proposed process and facilities are subject to change during subsequent design.

Most of the treatment facilities will be located inside a large industrial type building rather than as separate utility structures. Locating the facilities in the building more closely conforms to the siting criteria discussed in Section 12.3.10.

The attached Site Plan for the ultimate treatment system is shown in Figure 12.4.

Assumptions:

Processes will be designed to meet the following minimum standards. Changes in regulatory requirements will be automatically incorporated.

- a) A total of 99.9 percent reduction of Giardia cysts through filtration and disinfection; and
- b) A total of 99.99 percent reduction of viruses through filtration and disinfection.
- c) Limits on contamination by certain substances that are included on the U.S. Environmental Protection Agency's list drinking water contaminants.
- d) Compliance with the Surface Water treatment rule which requires disinfection of surface water supplies.
- e) Other regulations regarding disinfectants and disinfection by-products.

- f) Compliance with California’s Title 22 regulation as administered by the California Department of Health.

Objective: To provide adequate and safe potable water to the community.

Policy:

- a) The treatment process shall be designed to meet the safety standards and regulations of all overseeing agencies. The treatment plant shall be constructed to minimize impacts on adjoining land uses in particular the adjacent wetlands. The treatment process shall be designed to provide the required capacity at each stage of its construction. Changes in regulatory requirements affecting treatment processes will override the provisions of this Master Plan.

Implementation:

- a) Review Process. A Use Permit shall be required for the water treatment plant and shall be approved prior to the approval of the First Development Permit. The Use Permit application shall provide a schedule for ensuring that the water treatment plant is fully operational prior to the issuance of a permit for construction of any building.
- b) Water Treatment Process. The treatment process and any future expansions shall comply with all present and future applicable agency regulations but at a minimum shall include the following:

Raw Water Reservoir	The treatment process shall include a raw water storage system designed and built in a manner so as to assure one day of stored raw water supply equivalent to the water treatment plant’s daily capacity. The raw water reservoir’s primary function is to serve as a presedimentation basin. This preliminary sedimentation reduces silt and settleable organic matter prior to chemical treatment. The secondary function of the raw water reservoir is to serve as emergency storage in case of temporary shutdowns of the raw water pump station due to maintenance or repairs. Additionally, the benefits of the raw water storage include the ability to provide adequate treatment using contact clarification in lieu of a conventional treatment plant and to minimize the possibility of an interruption in service.
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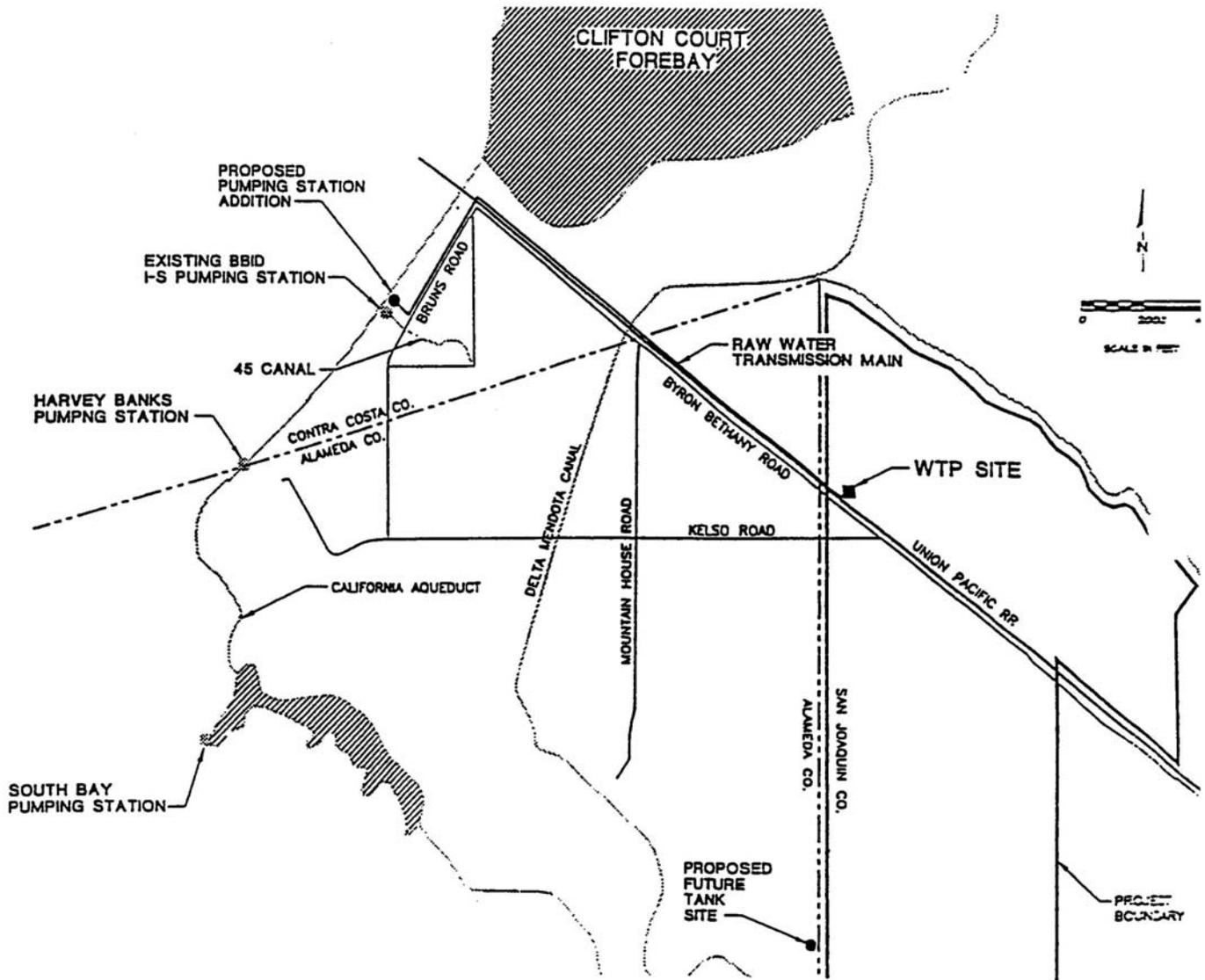


FIGURE 12.3 – LOCATION OF RAW WATER PIPELINE AND PUMP STATION

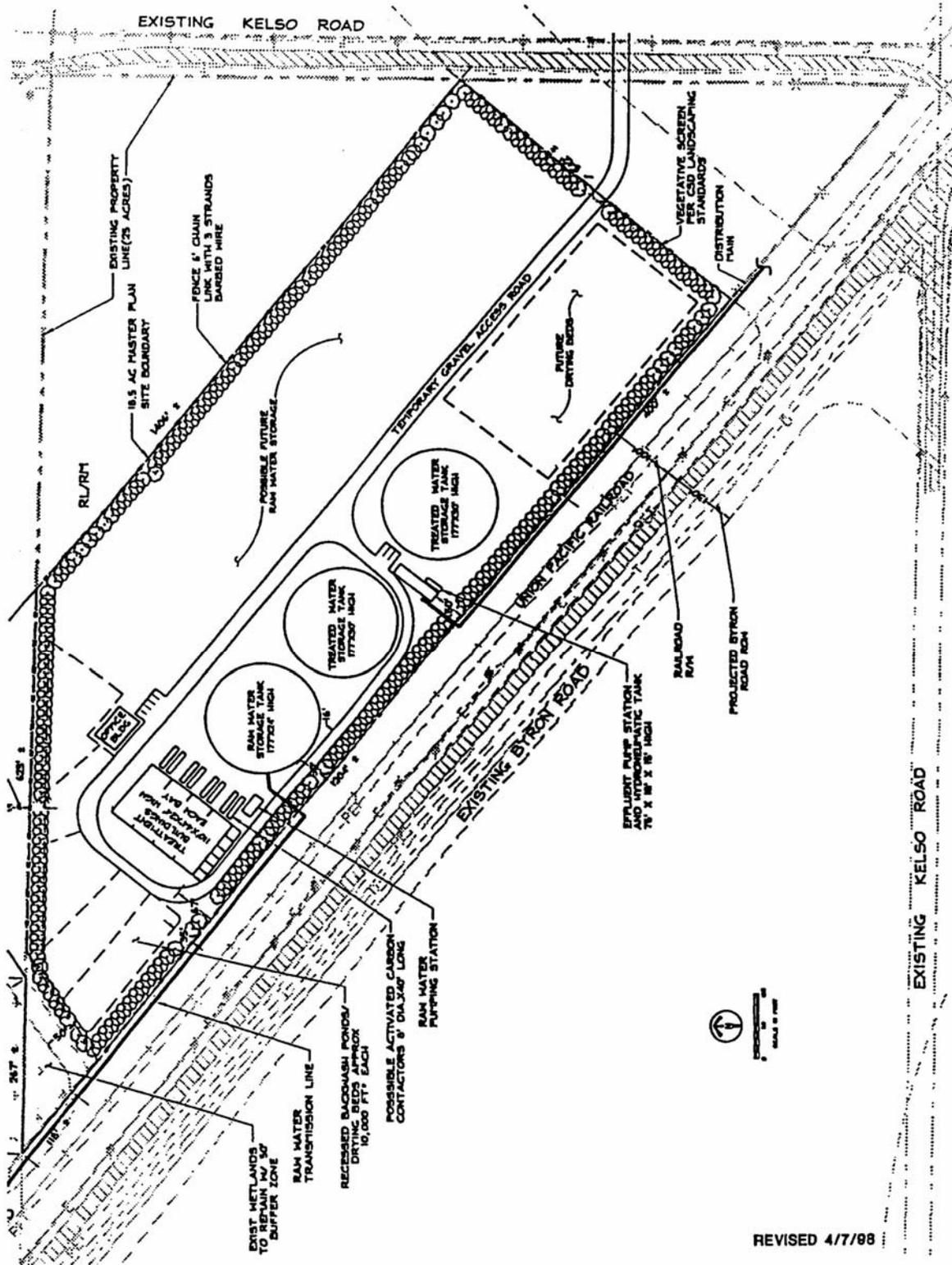


FIGURE 12.4 – WATER TREATMENT PLANT SITE LAYOUT

Disinfection (Ozone) Contractors	The disinfection (ozone) contractors serve as a pretreatment oxidation and disinfection process.
Clarifier	The clarifier provides flocculation and sedimentation. Flocculation is the mixing of the water with chemical additions to form a coagulated floc which is passed along to the next step, sedimentation. Sedimentation, or clarification is where the particulate matter, chemical floc, and precipitates from suspension are removed through gravity settling.
Filters	Filtration will be used to remove nonsettleable floc remaining after the water has left the sedimentation basins.
Washwater Recovery Basins	Filters are cleaned by backwashing (reversing the flow) upward through the bed. Sludge Drying Beds The sludge from the washwater recovery basins is then pumped to the sludge drying beds where the sludge is dried prior to disposal.
Clearwell	Clearwells are used to store the treated water. Having this storage allows the treatment plant to operate at a constant flow with no “peaks” or “valleys” and it also provides for some emergency storage in case the treatment plant is temporarily shut down for maintenance or repairs.

- c) Visual Impacts. Treatment plant layout and modular construction shall be designed to minimize the visual impacts on adjoining land uses by maintaining as low a profile as possible and utilizing screening and landscaping.

12.3.7 Water Storage

In any water supply system, there is a certain amount of water storage, usually called operational storage, which must be provided in order to allow for efficient operation of the overall system. Also, although the water supply facilities for Mountain House will be designed to provide maximum reliability and flexibility, a situation may arise which requires that portions of the water supply system be

shut down for short periods of time. During these “shut down” periods, emergency storage is required to meet the demands of the community. In the event of a fire, fire storage is also required.

If restrictions were to be placed on the water pumping rights, the community will increase its water storage capacities to handle the additional needs. Such capacity increases will not be needed until well into the community’s development because the oversizing of each phase’s storage has sufficient contingency to handle the potential pumping restrictions.

The location of water storage tanks within the community, if used, shall be dictated by the need to provide an acceptable water supply to the adjacent community. Therefore, the siting of water storage tanks and adjacent booster pumps stations are primarily controlled by the hydraulic needs of the water supply system. Such hydraulic needs allow some latitude in placing the facility within a portion of a neighborhood.

The sizing and locating of individual water storage facilities prior to a project’s design stage is difficult for long term developments such as Mountain House. It is feasible to locate all storage at the treatment plant. Another option would be to divide the storage and place smaller tanks around the community. In both cases, pipe sizing, land availability, fire needs and economics play a major part. From 60% to 100% of the community may be served from storage at the treatment site. In the event that remote sites are to be used in the future they will need to comply with the siting criteria provided in Section 12.3.10.

Assumptions:

- a) At buildout of the Mountain House community, the amounts of storage required in million gallons are as follows:

Emergency Storage	=	Two times average day demand	=	17.6
Operational Storage	=	30 % of maximum day demand	=	5.8
Fire Storage	=	8,000 gpm for 2 hours	=	1.0
Total Storage Required at Buildout			=	24.4

- b) Initially, and for most of the community’s buildout, storage will be located at the treatment plant.

Objective: To provide the Mountain House community with adequate water storage facilities to ensure efficient system operation and “back up” supply in the event of an emergency or required system shutdown.

Policy:

- a) Treated water storage facilities shall be provided to hold the required amount of operational, emergency and fire storage for the community at the various stages of development and at buildout of the community.

Implementation:

- a) Development Permits. Development permits shall be required for water storage facilities located off of the water treatment plant site. The Development Permit for the initial phase of the water treatment facility shall include water storage facilities.
- b) Facilities Design. Where feasible, storage facilities shall be designed in a manner that allows for phased construction.
- c) Water Storage Permit. Prior to the submittal of any Tentative Map for development for any area over two miles from the water treatment plant, a Development Permit shall be required for water storage facilities. The permit application shall include an engineering study addressing the feasibility of constructing remote storage tanks. This measure applies to all development subsequent to Specific Plan I.
- d) Phased Water Storage Facilities. Water storage adequate to meet the storage criteria specified in 12.3.7 shall be provided either at the treatment plant site or in various locations in the community. In any case, storage adequate to meet the requirements of development in Specific Plan I shall be located at the treatment plant.

12.3.8 Water Distribution System

Chapter 4.30: Water Distribution System Design of the Department of Public Works Improvement Standards were used as the basis for the design detail requirements of Mountain House's water distribution system.

Figure 12.5: Water Distribution and Treatment Facilities Plan shows that the area to be served by the distribution system is limited to the Mountain House community shown in the General Plan. Figure 12.5 shows the main water transmission pipelines that have been designed to provide water service to the various neighborhoods within the service area.

Distribution networks will be built in increments that correspond with each neighborhood, except that the initial Specific Plan will require additional connecting lines from the treatment plant to the first Specific Plan Area because they are not contiguous. At all stages of development, a loop water system will be maintained to ensure compliance with fire safety provisions. All line sizing will be engineered to handle through flows from successive Specific Plans in accordance with the Master Plan. A detailed cost and phasing breakdown are provided in the PFP.

Water supply facilities shall be designed in a manner that allows for phased construction and shall be constructed so that each phase provides appropriate treatment and adequate capacity to serve the amount of development anticipated at any given time. The capacity required for each facility to serve a particular phase of the development shall be defined in the Specific Plan for that phase of

development.

Objective: To provide a reliable water distribution system that will provide optimum quality, a reasonable pressure range during maximum water demand periods, and adequate capacity to deliver water in cases of emergencies.

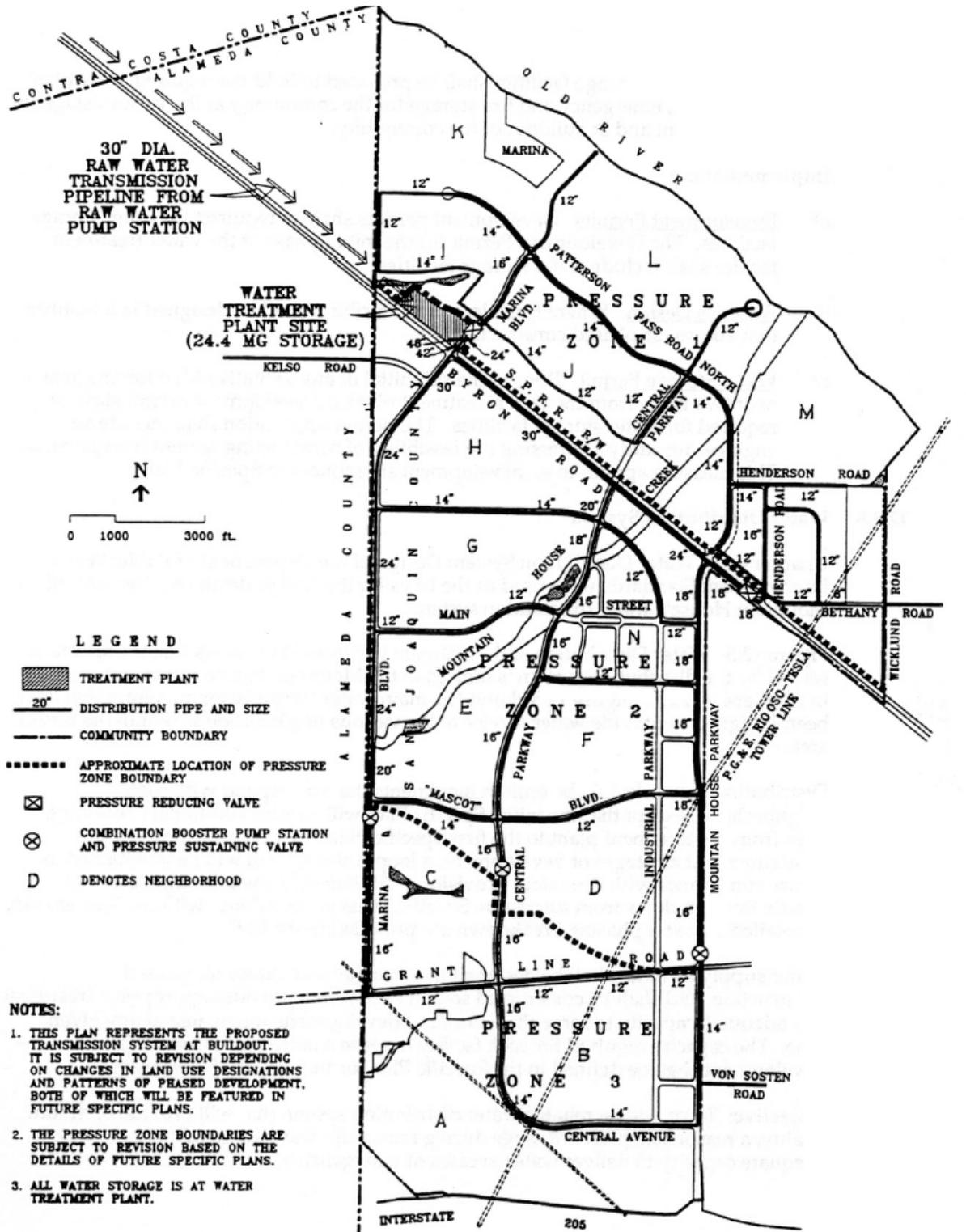
Policy:

- a) The water distribution system shall be designed and constructed to assure a reliable and cost-effective water supply to the community.

Implementation:

- a) Water System Design. The main water transmission pipelines shall be provided as indicated in Figure 12.5: Water Distribution and Treatment Facilities Plan.
- b) Supplemental Analyses. It is understood that Mountain House will develop in phases, and the order of phased development is not known at this time. Therefore, at each incremental phase a supplemental analysis shall be performed of the transmission system to determine the minimum amount of the facilities that will be needed to adequately serve the phase. All supplemental analysis shall be performed in conformance to the design criteria specified by County Standards as adopted by the MHCSO and the Master Plan. The final water supply system and fire flows must meet the approval of the County Fire Warden and other agencies specified by County standards. Improvements to the proposed treatment process shall be studied as part of more detailed subsequent design.
- c) Water Demand Review. For each Specific Plan, an analysis shall be performed of the water treatment and transmission system to reaffirm the amount of facilities that will be needed, including storage, to adequately serve that particular phase. For Specific Plan I, this analysis shall be included with the Use Permit for the treatment plant.

MOUNTAIN HOUSE MASTER PLAN



NOTE:
SEE MHCS D PLANS FOR
CURRENT FACILITIES.

FIGURE 12.5 – WATER DISTRIBUTION AND TREATMENT FACILITIES PLAN

12.3.9 Sludge Disposal

The sludge produced by the Mountain House water treatment plant will contain coagulants such as alum and polymer, which are added during the treatment process to enhance solids removal; but, it will not contain toxic heavy metals or other substances in toxic concentrations. Sludges containing only alum and polymer coagulants are not considered either toxic or a health risk and may be blended with native soils without a permit.

Objective: To ensure that the disposal of water treatment plant sludges does not adversely impact the community or the surrounding environment.

Policies:

- a) Water treatment plant sludge shall be disposed of through industrial reuse, land spreading, and/or dedicated land disposal inside and in the vicinity of the Mountain House community to the maximum extent feasible in accordance with applicable regulations. Landfill disposal of sludge would be chosen only if the sludge were to become contaminated or other alternatives were determined to be infeasible.
- b) Adequate sludge treatment and drying facilities shall be provided at the plant through project buildout.

Implementation:

- a) Sludge Disposal Program. The initial Development Permit for the water treatment plant shall specify the water treatment sludge reuse, disposal method(s) that will be used throughout the development of Specific Plan I. Approval of subsequent Specific Plans shall be contingent on the identification of means of water treatment sludge reuse/application/disposal consistent with applicable local, state, and federal policies and regulations, and which minimizes landfill disposal. If landfill disposal were proposed, an agreement or “will serve” letter with a landfill that would accept the sludge for at least the next five years shall be provided with the subsequent Specific Plan. If land spreading or dedicated land disposal were proposed, then guarantees of adequate acres for sludge disposal for at least the next five years must be provided. Provisions for sludge disposal shall be updated annually so that there are always firm provisions for disposal for at least five years into the future. Satisfaction of this sludge requirement for each development permit shall be accomplished by certification from the MHCSD.
- b) Sludge Treatment Assessment. A detailed assessment of water sludge treatment and drying needs shall be provided in the Development Permit for the water treatment plant. The assessment shall provide the supporting calculations for determining sludge production rates, estimates on percent moisture content in raw sludge and dried sludge, application rates and design parameters for sludge drying beds, projected surface

area requirements for the drying bed, and land required for sludge disposal (if appropriate).

12.3.10 Siting Criteria

The site of the water treatment plant was selected for the following reasons (see Figure 12.4 for conceptual site plan):

- To efficiently tie into raw water supply lines coming down Byron Road.
- To maintain a relatively low elevation in order to avoid the need to pump raw water up to the water treatment plant.
- To locate the water treatment plant on the west side of the community in order to avoid routing raw water lines through development areas.
- To avoid higher density residential or commercial areas.

Objective: Water treatment facilities shall have minimal aesthetic or other impacts on surrounding areas.

Policies:

- a) The water treatment plant and related facilities shall be sited, designed and landscaped to avoid negative impacts on surrounding areas, especially residential neighborhoods and wetlands. All buildings and structures shall be low profile to the greatest extent practical.
- b) Treated water storage may be located in several locations within the community if found beneficial after study and approval by the County; otherwise it shall all be located at the water treatment plant.

Implementation:

- a) Siting of Treatment Plant. The water treatment plant shall be sited to minimize noise or odor nuisances that could adversely impact adjacent land uses. Landscaping, including trees, shrubs and decorative sound walls, shall be included in order to act as a buffer between plant operations and the adjacent land uses.
- b) Structures. Structures shall be designed, if possible, to appear as buildings rather than utility structures.
- c) Pump Stations. Booster pump stations shall be located to conceal these facilities from public streets. Such facilities shall be fenced or otherwise enclosed with a masonry fence or structure in order to mitigate visual and/or noise impacts. The facility shall be landscaped and maintained in such a manner that will be compatible with the adjacent land uses.
- d) Water Storage Tanks. The preferred location for water storage tanks is in non-residential areas. In such cases, the visual qualities of the facility and

site landscaping shall be compatible with that normally encountered in a non-residential atmosphere.

In the event that a water storage tank must be located within a residential area, its design shall be such as to minimize, as much as possible, the adverse visual and noise impacts on the adjacent community. The color of the storage tank shall be such as to minimize the visual impact on the adjacent land uses. Colors selected shall be generally neutral that will allow the facility to blend in with the visual character of the neighborhood. Landscaping, especially trees, shall be used to visually buffer the storage tank.

Water storage facilities shall be:

- Located at the highest available point relative to their pressure zone;
- Constructed with the lowest profile consistent with sound economical engineering practices. Tanks shall be depressed below ground level as much as possible;
- Constructed to provide for Public Safety in the event of rupture; and
- Screened from view to the greatest extent possible using a combination of grading, fencing, landscaping, walls, and tank color.

12.4 REGULATORY REQUIREMENTS AND PERMITS

The Mountain House water supply system will meet all regulatory requirements set forth in Titles 17 and 22 of the California Code of Regulations, Chapter 7 of the California Health and Safety Code entitled, "California Safe Drinking Water Act" and the applicable sections of the Uniform Fire Code. To obtain the initial operating permit an application will be prepared and submitted to DHS, and a technical report will be prepared discussing the water system which includes the following:

- Detailed plans and specifications for the proposed system;
- Water quality information; and
- Description of the proposed system.

The permit must be amended if there are any changes, modifications or additions to the water source or method of treatment.

In addition to the above, an approval by DWR may be required for the change in the diversion point of the raw water pump station as well as the granting of an easement to construct the station on State lands. Approvals will also be required from various owners of pipelines that will be crossed during construction.

See Chapter Seventeen: Implementation for a listing of permit requirements.

12.5 PHASING AND COSTS

12.5.1 Capital Facility Cost and Phasing

Almost \$51 million will be needed to construct the community's water system, including water supply, treatment, storage and distribution. Installation of the initial water system network, including the raw water pump station and pipeline, is the largest cost item prior to commencement of residential development; almost \$16 million is currently budgeted in or prior to the first year of construction. An alternative of constructing the pipeline in two phases will be studied in the pre-design stage.

The water treatment plant is assumed to be phased in components equal to 25% of the total facility, with one component in place at the start of each phase of development. Therefore, the first component is assumed to be in place prior to the start of residential construction. Storage tanks are assumed to be phased in three increments after the first Specific Plan. Storage ponds, pumps, and other items will be provided in smaller increments.

Provision of agricultural water supply as the community develops is addressed in Section 12.3.4: BBID Service to Interim Agricultural Operations.

12.5.2 Operations and Maintenance

Water system operations and facility maintenance will be the responsibility of the MHCSO. Facilities will be maintained on an ongoing basis, with maintenance activities funded from user charges on the monthly water bills paid by community residents and businesses. Maintenance personnel will be cross-trained to handle the maintenance of all water and wastewater equipment which will minimize duplication of effort and maximize cost savings. These service costs and the corresponding revenues are included in the fiscal analysis in the PFP.

12.6 SPECIFIC PLAN REQUIREMENTS

The following list is a compilation of all Specific Plan requirements contained in this chapter.

- a) Consistency with County's Water Policy. Specific Plan II and each subsequent Specific Plan shall reevaluate the adequacy of the confirmed water supply for the Specific Plan Area in light of any potential or adopted restrictions on water diversion by BBID or DWR. Specific Plans shall not be approved unless it can be demonstrated that the confirmed water supply is sufficient to serve the Specific Plan Area through buildout.
- b) Water Conservation Monitoring Program. A Water Conservation Monitoring Program shall be approved by the County prior to submittal of the first Development Permit. As part of each Specific Plan after Specific Plan I, the validity of Master Plan assumptions regarding water use shall be evaluated. If water demand exceeds that projected in the Draft Master Plan, actions shall be taken to reduce water usage. Actions could include a public information campaign, additional water conservation fixtures to be included in subsequent

development, mandatory water rationing and on-site reclamation.

- c) Continuation of Agricultural Water Service. The appropriate Specific Plans shall identify how water and drainage services to the land east of the project and Mountain House Parkway within the BBID service area would be affected. They shall identify the infrastructure needed to maintain these services and when construction of these facilities would need to be completed (schedule may be expressed in terms of when certain parcels are developed).
- d) Water Demand Review. For each Specific Plan, an analysis shall be performed of the water treatment and transmission system to reaffirm the amount of facilities that will be needed, including storage, to adequately serve that particular phase. For Specific Plan I, this analysis shall be included with the Use Permit for the treatment plant.
- e) Sludge Disposal Program. The initial Development Permit for the water treatment plant shall specify the water treatment sludge reuse, disposal method(s) that will be used throughout the development of Specific Plan I. Approval of subsequent Specific Plans shall be contingent on the identification of means of water treatment sludge reuse/application/disposal consistent with applicable local, state, and federal policies and regulations, and which minimizes landfill disposal. If landfill disposal were proposed, an agreement of “will serve” letter with a landfill that would accept the sludge for at least the next five years shall be provided with the subsequent Specific Plan.
- f) Phasing. The capacity required for each facility to serve a particular phase of the development shall be defined in the Specific Plan for that phase of development. Distribution networks shall be built in increments that correspond with each neighborhood, except that the initial Specific Plan shall require additional connecting lines from the treatment plant to the first Specific Plan Area because they are not contiguous.
- g) Water Usage. Specific Plans subsequent to Specific Plan I shall include a comparison of actual water demand for the community with the projected water demand used in the Master Plan. If water use specified in the Master Plan is exceeded for a previous Specific Plan, subsequent Specific Plans shall specify additional actions that would be implemented to achieve adequate availability of water, with continued or additional water conservation measures. In addition, the Master Plan will be revised, if necessary, prior to approval of a Specific Plan to reflect new projected water demand and revised infrastructure facilities to permit increased water usage. Further, Specific Plans shall identify measures to be incorporated into the project to ensure that the demand would not exceed the confirmed supply.

