SECTION 7

SERVICE CRITERIA

7-1 General

Performance criteria is established to evaluate the adequacy of various water system components through a systematic analysis. Necessary improvements are identified and recommended for inclusion in a Capital Improvement Program (CIP). Some criteria are based upon experience and their application is at the discretion of the water purveyor. This includes service pressures, storage capacity, and sources of supply. Other criteria, such as water quality and fire protection, are based on federal, state and local jurisdictional requirements.

This section details the criteria which will serve as a benchmark for evaluating the City's water system. A summary of the service criteria is listed in Table 7-1.

7-2 Source of Supply

Any water system should be capable of meeting all demands imposed upon the system. This can be achieved through multiple supply sources, storage, or a combination of both. Generally, the determination is based upon water availability, existing storage capacity and economics. It is prudent to secure water supplies from multiple sources so that demands can be met at reasonable levels when one or more water sources are not available.

The criterion for source of supply (total production and purchase) adopted by most water agencies is to maintain one maximum day demand. Under this criterion, reservoir storage is typically needed to regulate hourly fluctuations in demand, provide for fire flow storage and for outage of a source of supply for an extended duration. However, the City has been able to meet this criterion strictly with the supply of water from MWD, which is significantly greater than the historic demand. It is anticipated that MWD will proceed with the Central Pool Augmentation Project when the demands increase sufficiently, and the City of Manhattan Beach will be able to secure the imported supplies in the future. When implemented, the West Basin Municipal Water District's Ocean Water Desalination Project will provide a redundant supply.

The City has an adjudicated right to extract up to 1,131 acre-feet (701 gpm) of groundwater from the West Coast Basin, each year. In 2009, the City entered into an agreement to lease groundwater from the City of El Segundo. In the 2008/2009 fiscal year, the City leased 460 acre-feet (285 gpm) of groundwater from El Segundo. In the future years, the City will lease 953 acre-feet annually. The groundwater may be utilized to supply the City's entire demands during outage of the imported water supply..

Table 7-1
Service Criteria

Description	Criteria	Existing Requirement
1. Source of Supply		
a. Total	Maximum Day Demand (except for closed zones which shall be Maximum Day Demand plus Fire Flow Demand or Peak Hour, whichever is greater)	5,913 gpm
b. Local Supply	Average Day Demand	3,942 gpm (5.68 mgd)
2. Reservoir Capacity		
a. Operational Storage	35% of Average Day Demand plus fire flow	2.95 MG
b. Emergency Storage	Seven (7) Average Day Demand less local groundwater well capacity	16.80 MG
c. Fire Suppression		
Single Family Residential	2,000 gpm for 2 hours	0.24 MG
Multi-Family Residential	3,000 gpm for 3 hours	0.54 MG
Schools	3,500 gpm for 4 hours	0.84 MG
Commercial / Industrial	4,000 gpm for 4 hours	0.96 MG
3. Booster Pump Stations	Booster Pump Stations must deliver Maximum Day Demand plus Fire Flow Demand or Peak Hour Demand, whichever is greater	
	Stand-by pump equal in size to the largest duty pump	
	Flow meters, suction and discharge pressure gauges, and telemetry equipment for alarm and status notification at each station	
	Provisions for emergency power at all stations	
4. Minimum Pipe Size	6-inch	
5. Maximum Velocities	5 ft/s at Average Day Demand	
	7 ft/s at Maximum Day Demand	
	10 ft/s at Fire Flow Demand	
6. Static Pressures	Minimum 50 psi	
	Desired 60-80 psi	
	Maximum 120 psi	
7. Dynamic Pressures	Minimum 40 psi during Maximum Day Demand	
8. Fire Flow Demands		
a. Single Family Residential	2,000 gpm for 2 hours with 20 psi residual pressure at fire hydrant	0.24 MG
b. Multi-Family Residential	3,000 gpm for 3 hours with 20 psi residual pressure at fire hydrant	0.54 MG
c. Schools	3,500 gpm for 4 hours with 20 psi residual pressure at fire hydrant	0.84 MG
d. Commercial / Industrial	4,000 gpm for 4 hours with 20 psi residual pressure at fire hydrant	0.96 MG

7-3 Wells

The City of Manhattan Beach should create a complete inventory of its existing wells, and compile the information in a form that can be available. This includes the drilling records, well logs, casing selection, gravel pack gradation, wellhead design, as well as continuous information on the pump. The static and pumping levels should be recorded daily, and the wells should be video inspected when maintenance is performed. Water quality information should be similarly collected and be readily available. This information is essential in planning the water supply for the City.

The wells should be designed in accordance with the Water Well Standards: State of California Bulletin 74-81, the AWWA standards, California Department of Public Health requirements, and sound engineering judgment. The pumps should be placed low enough so that subsequent lowering should not be necessary. If at all possible, well screens should be below the pump suction to preclude cascading of water into the well casings. (The casings should be large enough to maintain a velocity of less than 0.1 foot per second at the maximum anticipated flow.) Additionally, the casings diameters should be selected to allow lining the wells in the future without loosing capacity. The use of higher grade materials, such as stainless steel (most recently used at Well 11A) should be considered to increase the useful life of all future wells.

The well design should include a 4-inch diameter camera tube extending to below the pump suction elevation, and a sounding tube. A separate air line with a depth gauge and an air connection or depth to water transducer should be provided at every well. Flow meters, pressure gauges, transducers, and telemetry equipment should be included to continuously monitor the wells. Either permanent emergency generators with automatic transfer switches; or portable generator connections with manual transfer switches should be provided at each future well site. Sufficient capacity should be provided to pump the average day demand to either Block 35 Ground Level Reservoir or Peck Reservoir.

7-4 Storage

For a water system such as the City's, three categories of storage are of importance: operational, emergency, and fire suppression.

Operational Storage

Operational storage serves to equalize variations in sources of supply and demand over short periods of time (daily or weekly) and to fight fires. Utilizing the daily demand hydrograph, the component of operational storage needs to account for the difference in supply and demand, which can be determined with an extended period simulation of the system over a day, or week, etc. This component is approximately 35 percent of the average day demand.

Fire flow requirements for various land uses are shown in Table 7-1. Fire flow storage volumes required are 0.24 MG for single family residential, 0.54 MG for multiple family residential, 0.84 MG for schools, and 0.96 MG for commercial/industrial uses.

The operational storage might typically be based on one maximum day demand if groundwater storage is not available. For the City of Manhattan Beach's system, operational storage criteria is based on 35 percent of the average day demand plus fire flow.

Emergency Storage

Emergency storage is used in the event of an interruption in the primary water supply source. MWD estimates that most outages in its service can be mitigated within 7 days. Accordingly, many agencies that depend solely on imported MWD water utilized 7 average days of storage as their emergency storage criterion. For the City of Manhattan Beach, this is approximately 39.7 MG, provided that no other sources are available during the interruption of the imported water supply.

It is reasonable to expect that groundwater sources will be available during an outage of the imported water supplies. Therefore, the required emergency storage volumes may typically be reduced by an agency's groundwater supply capacity. The City of Manhattan Beach's emergency storage volumes can be reduced by the actual production capacity of its wells. Currently, Well 11A produces about 2,275 gpm. The existing requirement for emergency storage would therefore be 16.8 MG. With the future recommended well supply capacity of about 4,300 gpm, the entire average day demand can be supplied through groundwater sources. However, manganese has to be mitigated when groundwater is the only source of supply.

Fire Suppression Storage

Fire suppression storage is the volume required to supply the service area with the required fire flows, which range from 2,000 to 4,000 gpm for a duration of two (2) to four (4) hours. To deliver the maximum fire flow of 4,000 gpm for 4 hours, a storage volume of 0.96 million gallons is required.

7-5 Booster Pump Stations

Booster pump stations are typically sized to deliver the maximum day demands of the service areas. In a closed zone such as the Hill Area Pressure Zone, the pump stations must be able to deliver the maximum day demand plus the fire flow or the peak hour flow, whichever is greater..

All booster pump stations must incorporate a standby pump of the same size as the largest duty pump. The pump stations should be equipped with modern pump controllers, flow meters, suction and discharge pressure gauges, proper isolation valves, and telemetry equipment. Flow meters and pressure gauges are essential tools for monitoring pump performance and demand conditions in the service area. Telemetry equipment is used to remotely monitor the status of the facility, and notify personnel in the event of a failure.

Pump stations should be constructed of fireproof materials and provided with peripheral sprinkler systems to prevent fire damage. Furthermore, power to the pump stations should be provided through underground service to minimize possibility of damage during fires. Pump stations with electric motors should be equipped with standby generators and automatic transfer switches to operate them during commercial power outages.

7-6 Pressure Regulating Stations

The City's system currently does not have pressure regulating stations. However, should they be incorporated into the system in the future, they should be constructed with sufficient valving to deliver the entire range of demands and the fire flows within their proper operating range. Wherever possible, a minimum of two pressure regulating stations should serve these zones. Pressure regulating stations should be constructed with a pressure relief valve at the downstream end to preclude excessive pressures in the service area in case of malfunctioning of the pressure reducing valves. Each pressure regulating station should be equipped with flow meters and telemetry equipment so that their operation can be remotely controlled through the SCADA system.

7-7 System Pressures

Most water utilities set 50 pounds per square inch (psi) as the minimum static pressure throughout the system. The water system should also be capable of maintaining a minimum residual pressure of 40 psi during peak hour demand period.

A residual pressure of 20 psi must be maintained at the hydrant outlets in developed areas during fire flow. The hydraulic model does not include laterals from the mainline to the hydrants. It is estimated that there can be a loss of up to 10 psi through a lateral and hydrant at 1,000 gpm. The system evaluation is therefore based on providing 30 psi at the nearest mainline junction in the model.

Static pressures should not exceed 120 psi, except were system operating conditions and geographical conditions warrant a higher maximum pressure. In areas where pressures exceed 80 psi, the Uniform Plumbing Code requires customers to install “an approved type pressure regulator preceded by an adequate strainer” on their service connections to protect domestic plumbing and water heaters. This is the case in the City’s “beach areas”, due to the lower ground elevations.

7-8 Transmission and Distribution Pipelines

The distribution system should be sized and designed to provide redundant service at adequate pressures for normal use as well as at fire flow conditions. In most cases, this can be accomplished by looping the system. Looping through easements or other areas which are not easily accessible should be avoided. Provisions should be made for supplying each service zone from at least two sources where practical.

In order to maintain adequate system pressures and prolong the life of the pipe, flow velocities should be limited. The system should operate at velocities of 1 to 3 feet per second (fps) normally, with a maximum velocity of 5 fps at Average Day Demand flows. The pipe velocity at Maximum Day Demand flows should not exceed 7 fps.

The pressure in the system at any given point for a particular flow is dependent on a number of variables including pipe size, roughness and length. These components all contribute to the magnitude of pressure losses in the system. The system should be also designed and operated to maintain system losses less than 3 feet for each 1000 feet of pipe length for transmission pipelines; and 10 feet for each 1000 feet of pipe length for distribution pipelines under Maximum Day Demand conditions.

All pipes should be sized to provide adequate fire flows. To achieve this, when a single, unlooped pipe provides fire service to an area, a minimum diameter of 6-inch should be maintained to the last hydrant. All mains should be constructed with a minimum diameter of 6-inch. These pipe size recommendations should be adhered to for all new design and construction projects, as well as any waterline replacement/upgrade projects.

7-9 Service Life of Facilities

All facilities have useful lives for which relatively trouble-free service can be expected. Once exceeded, these facilities become less reliable, expensive to maintain and are subject to failure. Therefore, facility age is considered in the assessment of all water systems and in formulating future replacement projects.

The determination of the useful life is dependent upon multiple considerations. Table 7-2 details the planning criteria that is generally in accordance with the State Controller's Office criteria for useful life. These criteria should be one of the considerations in determining the phasing of facility replacement.

Table 7-2
Planning Criteria for Facility Useful Life

Facility	Useful Life (Years)
Steel Reservoirs	60-100
Steel Reservoir Coating and Lining	20
Concrete Reservoirs	60-100
Lined & Coated Ductile Iron/Steel Pipe	60-75
PVC Pipe	40
AC Pipe	75
CI and Steel Pipe (Lining or coating of non-current practice)	40
Pump Stations/Wells/Treatment Facilities	
Structure	40-60
▪ Piping	40
▪ Valves	20-40
▪ Mechanical	20-25
▪ Electrical	15-20
▪ Mild Steel Well Casing	30-50

7-10 Fire Suppression

The required fire flows are based upon the California Fire Code. Table 7-3 is reproduction of Table B105.1 of the California Fire Code. Since there are a number of land use classifications, as well as special conditions affecting the flow required, typical flows for modeling were selected for each land use. These selections are shown in Table 7-4.

The single family residential flow was set at 2,000 gpm for 2 hours. Multiple family residential fire flow was set at 3,000 gpm for 3 hours. Fire flow for schools was established at 3,500 gpm for 3 hours. Fire flow for commercial and industrial uses was established at 4,000 gpm for 4 hours.

Table 7-3
Minimum Required Fire Flow and Flow Duration for Buildings

Fire Flow Calculation Area (sq. ft.)					Fire Flow (gpm)[c]	Flow Duration (hrs)
Type IA and IB[b]	Type IIA and IIIA[b]	Type IV and V-A[b]	Type IIB and IIIB[b]	Type V-B[b]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
-	-	115,801-,125,500	83,701-90,600	51,501-55,700	6,250	
-	-	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
-	-	135,501-145,800	97,901-16,800	60,201-64,800	6,750	
-	-	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
-	-	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
-	-	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
-	-	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
-	-	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. The minimum required fire flow shall be allowed to be reduced by 25 percent for Group R

b. Types of construction are based on the *California Building Code*

c. Measured at 20 psi at hydrant outlet

Generally, fire hydrants must be spaced at an average of 450 feet in single family residential areas, 400 feet in multi-family areas, and 350 feet in all other areas.

Table 7-4
Fire Flow and Fire Hydrant Location Criteria

Land Use	Flow (gpm)	Duration (hrs)	Residual Pressure at Hydrant Outlet (psi)	Average Spacing between Hydrants (ft)	Max Distance from Hydrant to any Point on Lot Frontage (ft)
Residential Single Family	2,000	2	20	450	225
Residential Multi-Family	3,000	3	20	400	225
Schools	3,500	4	20	350	210
Commercial / Industrial	4,000	4	20	350	210

7-11 Operational Flexibility

Operational Flexibility is achieved by providing multiple sources of supply, back-up or stand-by facilities, and looped distribution system piping. Criteria to be applied include:

- Provide multiple sources of supply
- Provide looped system whenever possible
- Provide emergency interconnections with neighboring agencies.
- Provide standby generators at wells and pump stations

7-12 Distribution System Maintenance Program

Regular maintenance of a distribution system is an essential part of a properly operated water distribution system. Maintenance should include periodic cleaning and flushing of the system, servicing of valves and hydrants, conducting leak surveys, replacement and repairs, and disinfection of repaired sections. Each maintenance and repair activity should be documented.

<u>Flushing</u>

Flushing is performed to remove any accumulated sediments or other impurities which have been deposited in the system pipes. It will also help to restore system capacity. Flushing is performed by causing a large volume of water to pass through a pipe section that has been isolated. Flushing valves or fire hydrants are opened to allow flow into the isolated pipeline and settled sediments are suspended. It is important that system flushing be performed systematically to remove the debris. The system computer model developed as part of this master plan study should be used to establish a phased flushing protocol for the entire system.

<u>Servicing of Valves and Hydrants</u>

Valves are often found inaccessible, inoperable, or closed and should therefore be tested and exercised regularly. In the event of a line break, it is important that valves operate properly so that the break can be isolated for repair. Records of repair should require a notation of the time at which valves are closed and reopened so that valves do not remain closed inadvertently.

Hydrants should be periodically inspected for leaks at the hose outlets. Leaking hydrants should be removed and/or reconditioned and then replaced.

Leak Surveys

Comparison of pumping and purchase records, and customer meter readings and other uses such as system flushing can indicate if excessive leakage is occurring in the system. Leak surveys should be conducted when excessive leakage is suspected.

Water Main Replacement and Repair

Water mains are repaired and/or replaced when pipes are found to be broken, corroded, or leaking. Pipes are either replaced or repaired with a sleeve and clamp around the outside of the damaged section. The method of repair should consider if the line is scheduled for replacement, its location in the system, and the conditions which led to the failure. Following the repair or replacement of any pipe, the line should be flushed and disinfected in accordance with the applicable requirements.

7-13 Storage Tank and Reservoir Maintenance

The storage tanks should be inspected periodically by a qualified diver. The reports from diving inspections should be utilized in scheduling the subsequent inspection program, as well as the maintenance/repair projects.

7-14 Water Quality

The quality of water served by the City of Manhattan Beach has to be in accordance with the Federal standards as well as the State of California Department of Public Health (CDPH) standards as set forth in Title 22 of the California Code of Regulations.

The basic water quality standards are established by the Safe Drinking Water Act (SDWA), which was passed by the Congress in 1974. Amendments to the SDWA were enacted in 1986 and 1996. The SDWA mandated the U.S. Environmental Protection Agency (EPA) to develop primary drinking water standards or maximum contaminant levels (MCL'S) in public water supplies.

The State of California Department of Health Services has the responsibility for the State's drinking water program. It is accountable to the EPA for enforcement of the SDWA and for adoption of standards that are at least as stringent as that of the EPA. Since California conducts independent risk assessments, some of its standards are more stringent than the standards of the Federal Government.

The maximum contaminant levels are the maximum permissible levels of contaminants in water, which enter the distribution system of a public water system. MCL'S for bacteriological quality and trihalomethanes are measured within the distribution system. The Federal and State MCL'S are enforceable and must be met by appropriate public drinking water systems.

The Federal maximum contaminant level goals (MCLG's) establish the maximum level of contaminant with an adequate margin of safety that would cause no known or anticipated adverse effect on the health of consumers. MCLG's are non-enforceable health goals based on health considerations only.

The secondary MCL's are established to protect public welfare and to provide pure, wholesome and potable water. They are measured at the point of delivery to the consumer. They involve protection of the taste, odor and appearance of the water. Federal secondary MCL's are not enforceable. The State secondary MCL's are enforceable for all new systems and new sources developed by existing systems.

Action levels (AL's) are health based limits that take into account analytical detection levels. These are interim guidance levels, which may trigger mitigation action by the water utility. Public notification is not required but may be recommended by the Department of Health Services.

Since the 1986 Amendments, several rules have been promulgated by the EPA. These include:

- Lead and Copper Rule - (June 7, 1991) requires treatment techniques consisting of optimal corrosion control treatment, source water treatment, public education and lead service line replacement.
- Consumer Confidence Report Rule - (August 19, 1998) requires community water systems to prepare and provide to their customers annual consumer confidence reports on the quality of the water delivered by the systems. This rule allows customers to make health-based decisions regarding their drinking water consumption.
- Radionuclides - (December 7, 2000) This rule finalized the MCLG's, MCL's, and monitoring, reporting and public notification requirements for uranium, combined radium-226 and radium-228, gross alpha particle radioactivity, and beta particle and photon radioactivity.
- Public Notification Rule - (June 5, 2000) requires owners and operators of public water systems to notify customers when they fail to comply with the requirements of the National Primary Drinking Water Regulations; have a variance or exemption from the drinking water regulations; or are facing other situations posing a risk to public health. The rule sets the requirements that the public water systems must follow regarding the form, manner, frequency, and content of a public notice.
- Unregulated Contaminant Monitoring Rule - (January 11, 2001) requires EPA to establish criteria for a program to monitor unregulated contaminants, and to publish a list of contaminants to be monitored.
- Surface Water Treatment Rule - (June 29, 1989) requires all public water systems using surface water supplies and groundwater under the influence of surface water to filter and disinfect for protection against Giardia lamblia, Legionella, enteric viruses and heterotrophic bacteria.

  The State surface water treatment regulations resulted from a series of amendments to the National Primary Drinking Water Regulations. The State regulations became effective on June 5, 1991. In California, all public water systems must filter all their surface water and part of their groundwater under the influence of surface water.

- Interim Enhanced Surface Water Treatment Rule - (February 16, 1999) The purposes of this rule are to improve control of microbial pathogens including specifically the protozoan Cryptosporidium in drinking water; and address risk tradeoffs with disinfection by-products. The rule establishes a MCLG of zero for Cryptosporidium; 2-log Cryptosporidium removal requirements for systems that filter; strengthened combined filter effluent turbidity performance standards and individual filter turbidity provisions; disinfection benchmark provisions to assure continued levels of microbial protection while facilities take the necessary steps to comply with the new disinfection byproduct standards; inclusion of Cryptosporidium in the definition of groundwater under the direct influence of surface water and in the watershed control requirements for unfiltered public water systems; requirements for covers on new finished water reservoirs; and sanitary surveys for all surface water systems regardless of size. This rule builds upon the treatment technique requirements of the Surface Water Treatment Rule.

- Total Coliform Rule - (June 29, 1990) Establishes microbiological standards and monitoring requirements for all public water systems. Compliance is based upon the presence or absence of total coliforms in a sample rather than on an estimate of coliform density. The State regulations are identical to the Federal regulations.

- Arsenic Rule - (January 2001) This rule established a MCL of 0.01 mg/L for arsenic. The compliance date is January 23, 2006

- Filter Backwash Rule – This rule applies to conventional or direct filtration treatment systems and recycle spent filter backwash water for protection from Cryptosporidium. It requires that all recycle flows be conveyed to the head of the treatment system for complete treatment. All required improvements must be completed by June 8, 2006.

- Disinfectants and Disinfection by Products Rule -This rule is required by the 1986 Amendments. It must balance the need for protection from cancer causing chemicals that result from disinfection of drinking water (the by-products) with the need to eliminate the microbes through disinfection.

  The first stage of this rule was the Draft Disinfectants/Disinfection By-Products Rule (D/DBPR), proposed on July 29, 1994. The compounds affected by the first stage were as follows:

  Chlorine
  Chloramines
  Chlorine Dioxide

  Total Trihalomethanes (TTHMS)
  Total Haloacetic Acids (THAAS)
  Total Organic Carbon (TOC)
  Bromate
  Chlorite

  The Stage 1 rule proposed MCLS of 0.080 mg/l for trihalomethanes, 0.060 mg/l for total haloacetic acids, 0.010 mg for bromite, 1.0 mg/l for chlorite, determined as the annual average of quarterly measurements. The proposed maximum residual disinfection level for chlorines and chloramines was 4.0 mg/l and for chlorine dioxide was 0.08 mg/l.

  Currently, only the total trihalomethanes is regulated. The State established MCL is 0.1 mg/l. The final rule will be reviewed along with the Enhanced Surface Water Treatment Rule (ESWTR).

- Groundwater Rule - This rule, originally named the Groundwater Disinfection Rule, was first proposed in July 1992. The proposed rule, published on May 10, 2000 requires all groundwater systems to disinfect unless they meet natural disinfection requirements or qualify for a variance. This rule will need to be adopted no later than Stage 2 Disinfection By-Products Rule. The proposed rule has a risk based regulatory strategy for addressing risks through a multiple-barrier approach. It relies on five components.

1. Periodic sanitary surveys of groundwater systems
2. Hydrogeologic assessments to identify wells sensitive to fecal contamination
3. Source water monitoring for systems drawing from sensitive wells without treatment or with other indications of risk
4. Correction of significant deficiencies and fecal contamination
5. Compliance monitoring to ensure disinfection treatment is reliably operated where it is used.

Note: CDPH has determined that all groundwater wells must provide a treatment that achieves at least 99.99 percent (4-log) inactivation or removal of viruses (starting December 1, 2009).

In addition to the SDWA requirements, Assembly Bill 733 (passed in 1996), required water purveyors with 10,000 or more customers to submit an estimate of the total cost of providing fluoridation facilities at each source of supply by July 1996.

The funding for this requirement has to be provided by the State and not by the water purveyor. The Department of Health Services has a priority list of purveyors to receive funding for fluoridation based upon the lowest cost per connection.

A summary of the federal and state water quality standards are presented in Tables 7-5 and 7-6.

Table 7-5
Primary Drinking Water Standards

Contaminant	USEPA		CDHS	
	MCL (mg/l)	Date	MCL (mg/l)	Effective Date
Inorganics				
Aluminum	-	-	1	2/25/1989
Antimony	0.006	07/92	0.006	9/8/1994
Arsenic	0.01	2001	0.05	1977
Asbestos	7 MFL[a]	01/91	7 MFL[a]	9/8/1994
Barium	2	01/91	1	1977
Beryllium	0.004	07/92	0.004	9/8/1994
Cadmium	0.005	01/91	0.005	9/8/1994
Chromium	0.1	01/91	0.05	5/30/1905
Copper	1.3	06/91		
Cyanide	0.2	07/92	0.15	6/12/2003
Fluoride	4	04/86	2	04/98
Lead	0.015[b]	06/91	0.015[b]	12/11/1995
Mercury	0.002	6/24/1977	0.002	1977
Nickel	Remanded		0.1	9/8/1994
Nitrate	(as N) 10	6/24/1977	(as NO3) 45	1977
Nitrite (as N)	1	01/91	1	9/8/1994
Total Nitrate/Nitrite (as N)	10	01/91	10	9/8/1994
Perchlorate	---	---	0.006	3/9/2008
Selenium	0.05	01/91	0.05	9/8/1994
Thallium	0.002	07/92	0.002	9/8/1994

Table 7-5
Primary Drinking Water Standards

Contaminant	USEPA		CDHS	
	MCL (mg/l)	Date	MCL (mg/l)	Effective Date
Radionuclides				
Uranium	30 µg/L	12/7/2000	20 pCi/L	1/1/1989
Combined readium-226 & 228	5 pCi/L	6/24/1977	5 pCi/L	1977
Cross Alpha particle activity	15 pCi/L	6/24/1977	15 pCi/L	6/24/1977
Gross Beta particle activity	dose of 4 millirem/yr	6/24/1977	50 pCi/L[c]	1977
Strontium-90	8 pCi/L	6/24/1977	8 pCi/L[c]	1977
Tritium	20,000 pCi/L	6/24/1977	20,000 Pci/L[c]	1977
Volatile Organic Chemicals (VOCS)				
Benzene	0.005	06/87	0.001	2/25/1989
Carbon Tetrachloride	0.005	06/87	0.0005	4/4/1989
1,2-Dichlorobenzene	0.6	01/91	0.6	9/8/1994
1,4-Dichlorobenzene	0.075	06/87	0.005	4/4/1989
1,1-Dichloroethane	-	-	0.005	6/24/1990
1,2-Dichloroethane	0.005	06/87	0.0005	4/4/1989
1,1-Dichloroethylene	0.007	06/87	0.006	2/25/1989
cis-1,2-Dichloroethylene	0.07	01/91	0.006	9/8/1994
trans-1,2-Dichloroethylene	0.1	01/91	0.01	9/8/1994
Dichloromethane	0.005	07/92	0.005	9/8/1994
1,3-Dichloropropene	-	-	0.0005	2/25/1989
1,2-Dichloropropane	0.005	01/91	0.005	6/24/1990
Ethylbenzene	0.7	01/91	0.3	6/12/2003
Methyl-tert-butyl ether (MTBE)	-	-	0.013	5/17/2000
Monochlorobenzene	0.1	01/91	0.07	9/8/1994
Styrene	0.1	01/91	0.1	9/8/1994
1,1,2,2-Tetrachloroethane	-	-	0.001	2/25/1989
Volatile Organic Chemicals (VOCS)				
Tetrachloroethylene	0.005	01/91	0.005	05/89
Toluene	1	01/91	0.15	9/8/1994
1,2,4 Trichorobenzene	0.07	07/92	0.005	9/8/1994
1,1,1-Trichloroethane	0.2	06/87	0.2	2/25/1989
1,1,2-Trichloroethane	0.005	07/92	0.005	9/8/1994
Trichloroethylene	0.005	06/87	0.005	2/25/1989
Trichlorofluoromethane	-	-	0.15	6/24/1990
1,1,2-Trichloro-1,2,2-Trifuoroethane	-	-	1.2	6/24/1990
Vinyl Chloride	0.002	06/87	0.0005	4/4/1989
Xylenes	10	01/91	1.75	2/25/1989
Non-Volatile Synthetic Organic Chemicals (SOCS)				
Alachlor	0.002	01/91	0.002	9/8/1994
Atrazine	0.003	01/91	0.001	6/12/2003
Bentazon	-	-	0.018	4/4/1989
Benzo(a) Pyrene	0.0002	07/92	0.0002	9/8/1994
Carbofuran	0.04	01/91	0.018	6/24/1990
Chlordane	0.002	01/91	0.0001	6/24/1990
Dalapon	0.2	07/92	0.2	9/8/1994

Table 7-5
Primary Drinking Water Standards

Contaminant	USEPA		CDHS	
	MCL (mg/l)	Date	MCL (mg/l)	Effective Date
Non-Volatile Synthetic Organic Chemicals (SOCS)				
Dibromochloropropane	0.0002	01/91	0.0002	5/3/1991
Di(2-ethylhexyl)adipate	0.4	07/92	0.4	9/8/1994
Di(2-ethylhexyl)phthalate	0.006	07/92	0.004	6/24/1990
2,4-D	0.07	01/91	0.07	9/8/1994
Dinoseb	0.007	07/92	0.007	9/8/1994
Diquat	0.02	07/92	0.02	9/8/1994
Endothall	0.1	07/92	0.1	9/8/1994
Endrin	0.002	07/92	0.002	9/8/1994
Ethylene Dibromide	0.00005	01/91	0.00005	9/8/1994
Glyphosate	0.7	07/92	0.7	6/24/1990
Heptachlor	0.0004	01/91	0.00001	6/24/1990
Heptachlor Epoxide	0.0002	01/91	0.00001	6/24/1990
Hexachlorobenzene	0.001	07/92	0.001	9/8/1994
Hexachlorocyclopentadiene	0.05	07/92	0.05	9/8/1994
Lindane	0.0002	01/91	0.0002	9/8/1994
Methoxychlor	0.04	01/91	0.03	6/12/2003
Molinate	-	-	0.02	4/4/1989
Oxamyl	0.2	07/92	0.05	6/12/2003
Pentachlorophenol	0.001	01/91	0.001	9/8/1994
Picloram	0.5	07/92	0.5	9/8/1994
Polychlorinated Biphenyls	0.0005	01/91	0.0005	9/8/1994
Simazine	0.004	07/92	0.004	9/8/1994
Thiobencarb	-	-	0.07	4/4/1989
Toxaphene	0.003	01/91	0.003	9/8/1994
2,3,7,8-TCDD (Dioxin)	$3x10^{-8}$	07/92	$3x10^{-8}$	9/8/1994
2,4,5-TP (Silvex)	0.05	01/91	0.05	9/8/1994
Disinfection Byproducts				
Total trihalomethanes	0.08	1/1/2002[d]	0.1	3/14/1983
Total haloacteic acids	0.06	1/1/2002[d]		
Bromate	0.01	1/1/2002[d]		
Chlorite	1	1/1/2002[d]		
Treatment Technique				
Acrylamide	TT[e]	01/91	TT[e]	9/8/1994
Epichlorahydrin	TT[e]	01/91	TT[e]	9/8/1994

a. MFL = Million fibers per liter, with fiber length > 10 microns

b. Regulatory Action Level; if system exceeds, it must take certain actions such as additional monitoring, corrosion control studies and treatment, and for lead, a public educaiton program; replaces MCL.
c. MCLs are intended to ensure that exposure above 4 millirem/yr does not occur.
d. Effective for surface water systems serving more than 10,000 people; effective for all others 1/1/04
e. TT = treatment technique, because an MCL is not feasible

Table 7-6
Secondary Drinking Water Standards

Contaminant	USEPA MCL (mg/l)	CDHS MCL (mg/l)
Aluminum	0.05 to 0.2	0.2
Chloride	250	250 (Recommended)
Color	15 color units	15
Copper	1	1
Corrosivity	non-corrosive	non-corrosive
Fluoride	2	
Foaming agents	0.5	0.5
Iron	0.3	0.3
manganese	0.05	0.05
Methyl-*tert*-butyl either (MTBE)		0.005
Odor	3 threshold odor numbers	3 threshold odor numbers
pH	6.5 - 8.5	
Silver	0.1	0.1
Sulfate	250	250 (Recommended)
Thiobencarb (Bolero)		0.001
Turbidity		5 Units
Total dissoved solids (TDS)	500	500 (Recommended)
Zinc	5	5

7-15 Future Regulations

Future regulations proposed by the USEPA and CDPH that may affect the City of Manhattan Beach's future water quality, supply, and treatment standards are presented in Table 7-7.

Table 7-7
Future Regulations Proposed by the USEPA and CDHS

Regulation	Potential Contaminants	Comments	Anticipated Review Date
Revisions to Total Coliform Rule (TCR)	Total Coliforms Fecal Cloriform / *E. coli*	The TCR, promulgated in 1989, may be revised by EPA. Revisions are anticipated to include addressing or monitoring finished water quality in the distribution system.	June 2010
Distribution System Rule	Microbiological Contaminates	Possible changes may include intrusion of facilities, pressure transient monitoring, finished water storage monitoring; and provisions for monitoring nitrification, corrosion, permeation and leaching.	Uncertain
Perchlorate	Perchlorate	A Drinking Water Equivalent Level (DWEL) of 24.5 ppb was established as part of the Integration Risk Information System (IRIS) assuming 100% exposure of drinking water. Contribution of perchlorate exposure from food is under review. Uncertain as to if EPA will regulate perchlorate in drinking water. Note: CDPH's MCL Perchlorate is 0.006 mg/l.	Uncertain
Radon Rule	Radon	At each entry point to the water system, initial monitoring of 4 consecutive quarters may be required. Final EPA rule with Alternative MCL (AMCL) limits was originally scheduled for 2009.	Uncertain

As the supplier of the imported water, Metropolitan Water District of Southern California is responsible for meeting the primary and secondary standards for imported water. The City is responsible for maintaining quality, including disinfectant residuals, in its system; and to meet the primary and secondary standards for well water.