COUNTY OF LOS ANGELES
Public Health

Requirements and Procedures for Private Residential and Commerical Water Wells

COUNTY OF LOS ANGELES • DEPARTMENT OF PUBLIC HEALTH • ENVIRONMENTAL HEALTH DIVISION
DRINKING WATER PROGRAM

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I. Purpose

The purpose of this handbook is to provide procedures for obtaining required approval from the Los Angeles County Department of Public Health (DPH) when constructing or re-constructing a private residential well water system, and to outline necessary construction and maintenance requirements to help ensure that your water continues to be safe to drink.

There are only two sources of water that are approved when constructing or remodeling a private residence:

1) Municipal/public water supplies or,

2) Private residential well water systems.

This handbook is about PRIVATE WATER SYSTEMS. Regulations are cited in the sidebar throughout the document. The differing regulatory authority of municipal water companies, small water systems, and private residential water wells is described in Section II, Authority.

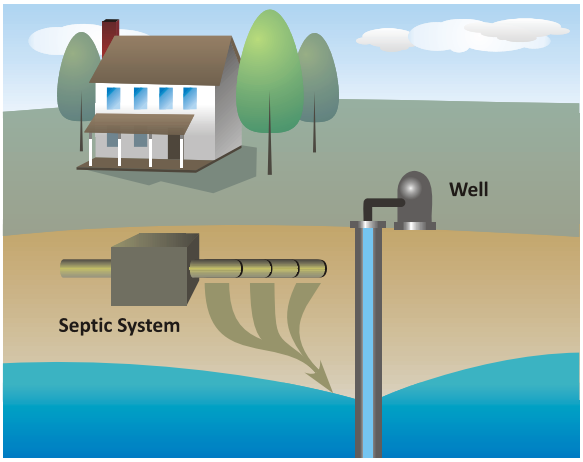
Safeguards for Private Wells

Fifteen percent of Americans rely on private residential well water systems for their drinking water supplies. Although some state and local governments set rules to protect users of these wells, most do not check the source or quality on a regular basis. Therefore, private well water system owners must take special precautions to ensure the protection and maintenance of their drinking water supplies for health and safety.

Proper well construction is key to the safety of your water supply. Water-well drillers and pump-well installers are listed in your local phone directory. Be certain that your contractor is registered, as required by the State of California and also bonded and insured.

Proper distance from possible sources of contamination will help keep your well safe. Experts suggest the following distances as a minimum for protection. The general rule is that farther is better. (See graphic below).

Contamination Source	Distance
Septic Tanks	100 feet
Livestock Yards, Silos, Septic Leach Fields	100 feet
Petroleum Tanks, Liquid-Tight Manure Storage, Fertilizer Storage and Handling	100 feet
Seepage Pits	150 feet



A full listing of setback requirements can be found in the California Well Standards, Bulletin 74-90, and accessed online at: http://www.water.ca.gov/groundwater/well_info_and_other/california_well_standards/

Protect your well area. Be careful about storage and disposal of household and yard care chemicals and wastes. Responsible farmers and gardeners minimize the use of fertilizers and pesticides. Reduce erosion and prevent surface water runoff wherever possible. Check underground storage tanks regularly that hold petroleum products.

Make sure your well water is protected. Enhance your awareness about what may pollute the drinking water source in your area. Contamination may occur naturally or as a result of human activity.

Naturally occurring pollutants can contaminate well-water supplies. These include:

Microorganisms: Bacteria, viruses, parasites, and other microorganisms are sometimes found in water. Shallow wells—those with water closest to the ground level—are at greatest risk. Runoff, or water flowing over the land surface, may pick up these pollutants from wildlife and soils. Some of these microorganisms can cause a variety of illnesses. Symptoms include nausea and diarrhea. These can occur shortly after drinking contaminated water. The effects could be short-term yet severe (similar to food poisoning), or might recur frequently or develop slowly over a long time.

Nitrates and Nitrites: Although high nitrate levels are usually due to human activities (see below), they may be found naturally in ground water. They come from the breakdown of nitrogen compounds in the soil. Flowing ground water picks them up from the soil. Drinking large amounts of nitrates and nitrites is particularly threatening to infants (for example, when mixed in formula).

Heavy Metals: Underground rocks and soils may contain arsenic, cadmium, chromium, lead, and selenium.

Fluoride: Fluoride is helpful in dental health so many water systems add small amounts to drinking water. However, the excessive presence of naturally occurring fluoride can damage bone tissue or discolor teeth.

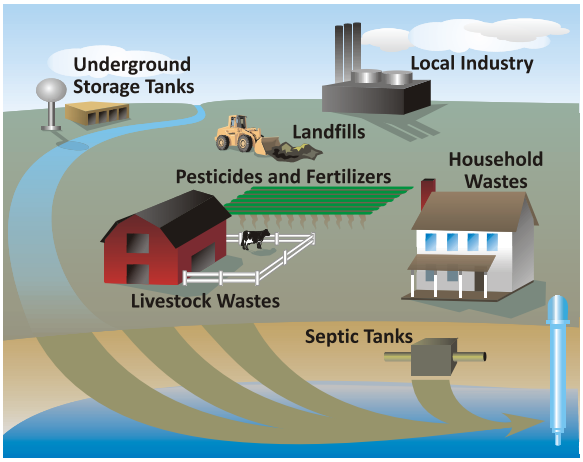
Common human activities also can pollute ground water. These pollutants can include:

Bacteria and Nitrates: Septic tanks can cause bacterial and nitrate pollution. Both septic systems and animal manures should be monitored to prevent pollution. Sanitary landfills and garbage dumps are also sources. Children, the elderly, and people whose immune systems are weak due to AIDS or cancer treatments are at extra risk when exposed to water-borne bacteria. Fertilizers can also add to nitrate problems. Nitrates cause a health threat in very young infants called “blue baby” syndrome. This condition disrupts oxygen flow in the blood.

Heavy Metals: Activities such as mining and construction can release large amounts of heavy metals into nearby ground water sources. Some older fruit orchards may contain high levels of arsenic, once used as a pesticide.

Fertilizers and Pesticides: Farmers use fertilizers and pesticides to promote growth and reduce insect damage. These products are also used on golf courses and suburban lawns and gardens. The chemicals in these products may end up in ground water. Many fertilizers contain forms of nitrogen that can break down into harmful nitrates. This could add to other sources of nitrates

mentioned above. This polluted water can pose problems to ground water and local streams and rivers. The types of soil and the amount of water moving through the soil also play a role.



Leaking Underground Tanks and Piping: Petroleum products, chemicals, and wastes stored in underground storage tanks and pipes may end up in ground water. Tanks and piping leak if they are constructed or installed improperly. Steel tanks and piping corrode with age. Tanks are often found on farms. The possibility of leaking tanks is great on old, abandoned farm sites.

Household Wastes: Improper disposal of many common products can pollute ground water. These include cleaning solvents, used motor oil, paints, and paint thinners. Even soaps and detergents can harm drinking water. These are often a problem from faulty septic tanks and septic leaching fields.

Lead & Copper: Household plumbing materials are the most common source of lead and copper in home drinking water. Lead can cause serious damage to the brain, kidneys, nervous system, and red blood cells. The age of plumbing materials—in particular, copper pipes soldered with lead—is also important. Even in relatively low amounts of these metals can be harmful.

Water Treatment Chemicals: Improper handling or storage of water-well treatment chemicals (disinfectants, corrosion inhibitors, etc.) close to your well can cause problems.

Ongoing Maintenance is an important part of well safety. Many homeowners procrastinate on maintenance until problems arise, which can be costly. It's better to maintain your well, identify problems early, and correct them quickly to protect your well's performance.

Consult with your well contractor on proper maintenance of your water well system. Keep records of well installation and repairs plus pumping and water tests in a safe place. These records can help identify changes and potential problems with your well water system and are a valuable resource for professionals to trouble-shoot your system, should problems arise. In addition, keep these records readily available as they may greatly expedite the rebuilding process following an emergency or natural disaster.

II. Authority

It is the responsibility of Los Angeles County Department of Public Health (the Department) to protect health, prevent disease, and promote the health and well being for all persons in the County. Within the Department, the Environmental Health Division strives to promote health and quality of life by identifying, preventing, and controlling harmful environmental factors in Los Angeles County. Within the Environmental Health Division, the Drinking Water Program (the Program) is responsible for reviewing the plans and approving private residential water wells within designated cities and unincorporated areas of the County, as well as regulating small water systems.

Since drinking water safety is a critical component to ensure the health and well being of residents, property owners and developers who use or intend to use private wells must demonstrate that water on their property complies with the regulatory standards for drinking water quality.

Municipal Water Companies: California Department of Public Health (CDPH) regulates the municipal water companies (those who service greater than 200 connections) under the provisions of the Safe Drinking Water Act (SDWA).

Small Water Systems: CDPH, under the provisions of Section 116330 of the California Health and Safety Code, has delegated primacy to 35 local primacy agencies (LPAs) for the regulation of public water systems that serve fewer than 200 service connections. Los Angeles County has been designated as one of these LPAs.

Private Water Wells: The Los Angeles County Department of Public Health regulates the use of domestic water wells under its sanitation and well permitting requirements as set forth in the Los Angeles County Code.

Los Angeles County Code, Title 28, Plumbing, Chapter 6, Section 601.1.

Except where not deemed necessary for safety or sanitation by the Authority Having Jurisdiction, each plumbing fixture shall be provided with an adequate supply of potable running water piped thereto in an approved manner, so arranged as to flush and keep it in a clean and sanitary condition without danger of backflow or cross-connection.

Los Angeles County Code, Title 11, Health and Safety, Section 11.38.165.

When the well yield test has been completed to the satisfaction of the Director and documentation of laboratory analysis showing that the water quality meets the primary bacteriological and chemical requirements of the Safe Drinking Water Standards, is provided to the department, a water availability approval shall be issued by the Director for the purpose of obtaining a building permit.

California Well Water Standards - Bulletin 74-90/74-80 states:

Any person who wishes to drill or bore a well for the purpose of domestic use and/or drinking water purposes must meet the California Well Water Standards.

III. Definitions

The following terms are found throughout this handbook:

Annular Seal *is the material between the natural borehole wall and the casing, usually placed near the land surface, and is designed to keep surface water and other potential contamination out of a well.*

Bond Density Test *also known as the Cement Bond Log is an acoustic signal test to assess the depth and integrity of the annular seal. The test measures time and attenuation of sound energy sent and received by a transmitter and receiver within a borehole, and measured at various depths. The converted and measured amplitude of the charted signal at various depths will exhibit the presence of casing, or lack of, by viewing the log chart. Because the compressive strength of cement affects the magnitude of the signal, lower amplitude signal magnitude will indicate a high degree of cement bonding and conversely, a high amplitude signal magnitude may otherwise indicate a low-to-absent cement bond.*

Contaminant *means any health-related physical, chemical, biological, or radiological substance or matter in water that may cause harm to human health.*

CUP (Conditional Use Permit) *is required for certain land uses which may need special consideration relative to placement and design to ensure compatibility with surrounding land uses. A CUP does not re-zone the land. In Los Angeles County, CUPs generally require a public hearing; however, minor CUPs are approved by the Director of Planning without a public hearing.*

Department *means the Los Angeles County Department of Public Health.*

Director *means the director of the Los Angeles County Department of Public Health (also referred to as the Health Officer) or his/her duly authorized designee.*

Health Officer *means the director of the Los Angeles County Department of Public Health or his/her duly authorized designee.*

Maximum Contaminant Level (MCL) *is the legal threshold limit for drinking water contaminants as established by the United States Environmental Protection Agency (US EPA). MCLs are enforceable standards.*

Point of Entry (POE) *refers to water treatment devices utilizing treatment technologies installed at the point of entry, before it enters the dwelling, to achieve compliance with current drinking water standards. POE devices are identified as the preferred alternative for achieving compliance with State and Federal drinking water standards necessary for obtaining water availability approval from the Department.*

Point of Use (POU) *refers to treatment devices utilizing treatment technologies installed at all fixtures within the dwelling that are used for drinking water purposes.*

Potable Water Availability *refers to the presence of water which is satisfactory for drinking, culinary, and domestic purposes according to Los Angeles County Code Title 28, Section 218.0, at the site where the existing or proposed residential dwelling is located.*

Private Residential and Commercial Water Well *refers to a groundwater source to be utilized only for domestic/potable purposes with fewer than five connections.*

Safe Drinking Water Act (SDWA) *was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. This is the main federal law that ensures the quality of drinking water in the United States. The SDWA authorizes the US Environmental Protection Agency (EPA) to set national health-based standards for drinking water to protect against both naturally-occurring and man-made contaminants that may be found in drinking water. The US EPA, the individual states, and the water systems then work together to make sure that these standards are met.*

Service Connections *refers to the point of connection between the customer's piping or constructed conveyance, and the water system's meter, service pipe, or constructed conveyance.*

Shared Well *refers to an individual private water well to be shared by two, three, or four residential units. The well typically exists on one lot or parcel, cannot cross more than one property line, and access to the well is reserved for all users through legal instruments including easements and a covenant and agreement.*

Sustainable Water *refers to the continuous supply of water from a private well or public municipal water system.*

Water Availability Approval *is the letter that is issued to a property owner to be presented to the Building and Safety Department indicating that all water well requirements have been satisfied, thereby allowing issuance of the Building Permit.*

Will-Serve Letter *is a letter to confirm that a public utility can and will furnish the water services to a specific customer.*

Well - New Construction *refers to a well that is being drilled for the first time at a specified location.*

Well - Reconstruction / Renovation *refers to a pre-existing well that requires repair or overhaul in order to operate effectively and/or efficiently, as well as to comply with regulatory standards.*

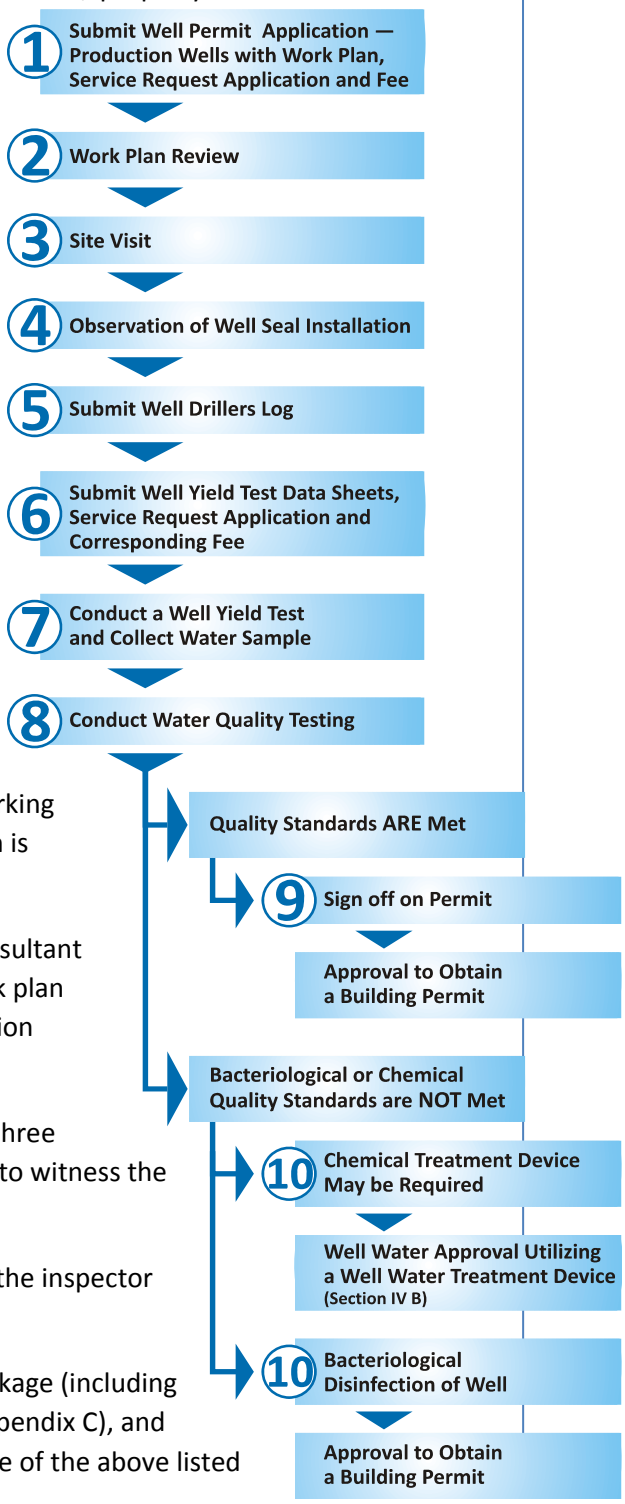
Well Water Treatment Device Approval *means an approval that is issued to a homeowner for a well water treatment device that has been verified to work properly to reduce primary inorganic chemicals in the drinking water. This approval must be obtained prior to the issuance of a Water Availability Approval letter.*

Well yield test *refers to the established protocol approved by the Director/Health Officer by which a qualified person investigates the sustainability of a water source through pumping and recovery measurements. A qualified person is defined as a person who holds a current, valid Class A General Engineering Contractor C-57 or C-61 (D-21) license, or a California Registered Geologist.*

IV. Pathway to Water Availability Approval

A. Well Water Availability Approval for New Construction

The following flowchart outlines the specific steps for homeowners / property owners to follow when seeking well water availability approval to obtain a building permit for new construction. These steps are further explained immediately following the flowchart.



1. Submit Well Permit Application – Production Wells with the work plan, Service Request Application and corresponding fee to the Los Angeles Department of Public Health, Environmental Health Division, Drinking Water program (see Appendix A and B). Applications can be mailed or hand-carried to the following locations:

Environmental Health Headquarters **5050 Commerce Drive** **Baldwin Park, CA 91706**	**Calabasas District Office** **26600 Agoura Road, #110** **Calabasas, CA 91302**
LA County Building and Safety – Santa Clarita **26415 Carl Boyer Dr.** **Santa Clarita, CA 91350**	**Antelope Valley One Stop** **335-A East Avenue K-6** **Lancaster, CA 93536**

2. The work plan is reviewed by the inspector within 10 working days of date received to ensure all necessary information is included and avoid delays in the review process.

3. The inspector schedules a site visit with the driller or consultant to evaluate the location. Following the site visit, the work plan and application will be reviewed. An Approval or Correction Sheet shall be issued within 20 working days.

4. The driller or consultant contacts the inspector (at least three business days in advance) to schedule an inspection and to witness the installation of the well seal.

5. The driller or consultant submits the Well Drillers Log to the inspector for sign off.

6. The applicant submits the Well Yield Test Data Sheet Package (including Test Information and Pumping Test Data Sheets) (see Appendix C), and Service Request Application and corresponding fee to one of the above listed

locations. The inspector will schedule the Well Yield Test within 10 business days following application approval.

7. A Well Yield Test is conducted. A well water sample is collected for water quality testing.

8. The applicant must have the water tested by an approved laboratory to verify that the water meets State water quality standards for bacteriological and primary inorganic chemicals.

9. When the water standards are met, the inspector signs off on the Well Permit Application – Production Wells form, and the Water Availability Approval letter is issued.

10. If the water does not meet the bacteriological standards, disinfection may be required. If the primary inorganic chemical standards are not met, a well water treatment device may be required (see following flow chart regarding Well Water Availability Approval Utilizing a Well Water Treatment Device, further described in Section VIII [Water Quality Part B—Use of Treatment Devices to meet Water Quality Regulations] that begins on Page 19 of this document).

B. Well Water Availability Approval Utilizing a Well Water Treatment Device

When laboratory testing of the well water has revealed that one or more primary inorganic chemicals have exceeded maximum contaminant levels, an application packet to add a treatment device is mailed to the property owner from the County Department of Public Health.

The following flowchart outlines the specific steps for homeowners / property owners to follow for well water availability approval utilizing a well water treatment device. Each step is further explained immediately following the flowchart.

1. The property owner must first submit to the Department a Notification of Intent to add a treatment device, indicating willingness to add the device (See Appendix D).

2. The Application to Install a Well Water Treatment Device, Service Request Application (see Appendix A), a work plan, and payment of the fee must be submitted to the Department.

3. The work plan is reviewed by the inspector within 10 working days of receipt.

4. The work plan is either approved or returned for correction to the property owner within 20 working days.

5. Upon work plan approval, the treatment device may be installed.* (During residential construction, frequently the water treatment device is removed to avoid damage, theft, etc. If the device has been removed, prior to issuance of the Certificate of Occupancy, one additional laboratory sample must be submitted to verify continued water standard compliance.)

6. Water samples must be obtained. Laboratory testing is conducted to verify that State standards can now be met.

7. A covenant is recorded indicating that a water treatment device has been installed to ensure compliance with State water quality standards.

8. Upon meeting water quality standards, a Water Availability Approval is issued allowing the property owner to obtain a building permit.

Further information can be found in Section VIII Water Quality Part B, Use of Treatment Devices to Meet Water Quality Requirements, that begins on Page 19 of this document.

V. Water Availability Requirements

In order to obtain a building permit, a property owner must comply with the requirements for potable water availability approval. The following sections outline the necessary methods and requirements to obtain this approval, as set forth in the Los Angeles County Codes – Title 11, Health and Safety, Title 28, Plumbing and the California Code of Regulations – Title 22.

The current well yield requirement is based on California Code of Regulations, Title 22, Section 64215.

Los Angeles County Code – Title 28, Plumbing, Chapter 2, Section 218.0.

Potable Water means water which is satisfactory for drinking, culinary, and domestic purposes and meets the requirements of the health authority having jurisdiction.

A. Water Availability Requirements for New Residential and Commercial Construction

Required proof of water supply availability will vary according to the intended source of water.

The approved sources of water when constructing or remodeling a private residence are:

1. Public/municipal water supply
2. Private water wells
3. Shared wells

California Code of Regulations, Title 22, Section 64215.

Prior to receiving permit approval, a state small water system which was not in existence on November 12, 1991 shall demonstrate to the local health officer that sufficient water is available from the water system's sources and distribution storage facilities to supply a minimum of three gallons per minute for at least 24 hours for each service connection served by the system.

1. When proposing to utilize a PUBLIC/MUNICIPAL WATER SUPPLY:

Documentation must be provided establishing that the project is within the service area of the local public water supply system and piped-in water is available. The property owner must obtain a will-serve letter indicating that water service will be provided from a permitted public water system. The will-serve letter is valid for a period of **one year** from the date issued.

2. When proposing to utilize a PRIVATE RESIDENTIAL WATER WELL:

The Department requires that all new residential or commercial developments be provided with an adequate and sustainable supply of water from either a public water system or from an on-site well. The Department has determined that a well will be considered an adequate source of sustainable water if it demonstrates that the well can supply a minimum of three gallons of water per minute for at least 24 hours. However, a well yield certified at two gallons per minute may be accepted, provided that a minimum of 1,500 gallons of storage capacity is added to the closed well water distribution system. This storage requirement is *in addition to* Fire Department requirements for stored water.

3. When proposing to utilize a SHARED WELL:

A shared water well is an individual private water well to be shared by two, three, or four residential units. The well typically exists on one lot or parcel, cannot cross more than one

property line, and access to the well is reserved for all users through legal instruments including easements and a covenant and agreement. When associated with a subdivision, the application is required to be filed with the subdivision and reviewed by the Departments of Public Works, Fire, Public Health, and Planning prior to final map recordation. For additional information, please contact your local or regional planning office.

All shared water wells require Director's Review by the Department of Regional Planning, pursuant to Section 22.24.090 and 22.56.1764 of the Los Angeles County Code.

Shared wells must meet the same yield and water quality requirements prescribed for single-family homes. In addition to these requirements, the well must demonstrate a 50 percent safety factor in well capacity. For example, a well intended to be shared between two dwellings would need a well capacity of 9 gallons per minute (3 gallons per minute [gpm] for each dwelling plus the 50 percent safety factor) or 6 gpm if each house had a minimum 1500 gallon storage capacity over and above Fire Department requirements (2 gpm per dwelling plus the 50 safety factor).

Any well that is shared among five to fourteen dwellings constitutes a State Small Water System. Those systems are regulated under the provisions of the California Code of Regulations, Title 22, and Article 3.

An Important Note Regarding Hauled Water:

Hauled water does not fulfill the water availability requirements for new development. The Department, acting as the health authority, has developed the requirements for potable water based on guidance from the State Department of Public Health. The Department does not recognize hauled water as a reliable source of water that is appropriate for drinking, culinary, or domestic purposes. Hauled water does not provide the equivalent level of protection for public health or the consistent level of reliability as that permitted by a public water system or an approved on-site water source. Therefore, hauled water does not satisfy the requirements for potable water for new residential or commercial construction. For new residential and commercial construction, only public water systems or approved private water wells satisfy the requirements for potable water.

Several factors were considered in the determination that hauled water does not satisfy the requirements for potable water, including the fact that the transient nature of the source makes it difficult to adequately regulate. Regulation and enforcement of water haulers are conducted by the State. Furthermore, there is an increased risk of contamination of the water during the transfer of the water from the tanker trucks to the onsite storage facilities. Moreover, storage tank systems exposed to routine opening by manual filling, as with hauled water, have been demonstrated to be the source of microbiological contamination. Additionally, the trucks used to haul potable water may be used to haul other materials as well, thereby increasing the risk of contamination.

In the event that an onsite well serving an existing residence goes seasonally or permanently dry, the Department may permit hauled water as the source of potable water in order to provide a minimum level of water service. In this case, if the search for additional water by deepening the existing well or drilling a new well is unsuccessful, the Department policy may permit the homeowner to have water hauled from an outside source when delivered to an approved onsite storage tank.

The prohibition of hauled water as the source of potable water does NOT apply to existing property owners currently utilizing hauled water; existing property owners where the water well has gone dry or seasonally dry; or where plans were reviewed and approved for the use of hauled water prior to January 1, 2003.

B. Rebuilding Following a Fire or other Natural Disaster

To assist homeowners with timely disaster recovery while ensuring protection of public health, special criteria have been established for the review and approval of plans for the re-construction of homes following fire or other natural disasters. This process includes review and approval of construction plans for rebuilding by the Drinking Water Program. These requirements outlined below apply only to potable water approval. For locations with On-site Wastewater Treatment Systems, additional documentation and requirements apply. Complete procedures entitled "Requirements and Procedures for Obtaining Approval of an Onsite Wastewater Treatment System (OWTS)" are available online at: www.lapublichealth.org/eh (see Land Use Program, Onsite Wastewater Treatment Systems).

Following a fire or natural disaster, the property owner will be required to provide evidence that their existing well is undamaged and was previously permitted. When this evidence is available, no well yield testing will be required. However, the homeowner will be required to submit bacteriological water quality testing results in all cases.

When the property owner is NOT able to provide proof of previous water supply approval, the following will be required: 1) a bond density test; 2) a well yield test; and 3) water quality testing. The water quality testing must indicate compliance with bacteriological and inorganic chemical standards prescribed by California Code of Regulations, Title 22.

VI. Well Construction

Any person who wishes to secure a production water well permit must first submit an application to the Department. A well can only be drilled by a California contractor who holds a C-57 license.

The well shall have a durable watertight casing and shall extend to a depth that would exclude contamination or pollution by surface drainage and undesirable groundwater. The space between the outer casing and the drilled hole (annular seal) shall be sealed with concrete or other impervious material to protect against surface or subsurface contamination or pollution. The annular seal shall extend a minimum of 50 feet below ground surface. After the annular seal has been installed, a watertight enforced-concrete slab shall extend horizontally from the well casing in all directions. A pump above the well casing or submersible shall be installed.

California Well Water Standards – Bulletin 74-90/74-80 states:

Any person who wishes to drill or bore a well for the purpose of domestic use and/or drinking water purposes must meet the California Well Water Standards.

Los Angeles County Code Title 11, Health and Safety,
Section 11.38.230.

A. *All water wells drilled, dug, or bored after August 11, 1967, shall have a durable, watertight casing, which shall extend to a depth that will exclude contamination or pollution by surface drainage and undesirable groundwater, and extend at least 18 inches above the surrounding natural ground level at the well site after drilling and until the pump is permanently mounted.*
B. *All gravel-packed wells shall have an outside, watertight casing meeting the requirements of subsection A of this section. The top of the space between the outer and inner casings shall be closed or sealed to exclude surface drainage. The space between the outer easing and the drill hole shall be sealed as required by Section 11.38.280 of this chapter. When an additional pipe is provided for a "gravel chute," the top thereof shall extend above the floor or ground level, and be fitted with a tight cap or lid, unless in a locked room or an enclosure which is locked, bolted or screwed on tightly.*

Los Angele County Code Title 11, Health and Safety,
Section 11.38.250.

All water wells drilled, dug, excavated, or bored after August 11, 1967, shall be provided with:
A. *A watertight, reinforced-concrete slab of a minimum thickness of six inches shall extend horizontally at least three feet from the well casing in all directions.*

Los Angeles County Code – Title 11, Health and Safety, Section 11.38.280.

All domestic water wells and springs shall be sealed with concrete or other impervious material so as to protect against surface or subsurface contamination or pollution. The concrete slab shall adequately slope so as to drain water away from the well casing. The top surface of the slab at its outer edge shall be at least four inches above the surrounding ground level. This slab need not be provided, or the size and method of construction thereof may be modified, when the protection intended by this requirement or the exception of subsection D of this section is provided by an alternate method approved by the director.
B*. For pumps or pump motors installed above the well casing, the pump or motor shall be mounted on a concrete pedestal constructed around the well casing and sealed thereto, the top of which is at least eight inches above the finished grade at the well site and at least four inches above the slab surrounding such well.*
C. *The pedestal and slab (and curtain wall, if required to protect an existing well) shall be poured monolithically, or otherwise constructed as approved by the director, to effectively prevent leakage between the pedestal and the slab.*
D*. Exemptions. Means or methods other than those specified in subsections B or C of this section may be used to provide the required protection when the director determines such alternates are necessary and that they provide equivalent protection. A submersible-type pump may be installed with subsurface discharge and access when all subsurface entrances to the well or casing, other than into the aquifer, are effectively sealed, the enclosure is designed and constructed to exclude surface water or drainage, the area around the casing is provided with effective drainage, and other protective features are provided which the director determines will effectively prevent contamination or pollution from entering the well or the aquifer.*

VII. Well Yield Testing

Every person performing a well yield test, for the purpose of establishing water availability for residential and commercial development, shall first make an application and secure a well yield test permit. A well yield test can only be performed by a person holding a current valid Class A General Engineering Contractor's license, C-57 or C-61 (D-21); a California Registered Civil Engineer; a Registered Environmental Health Specialist; or a Registered Geologist.

A fee will be charged by the Department for processing each well yield test. If a second yield test is required for a well, an additional fee will be assessed.

The well yield test performed as part of the permit process is valid for three years from the date of conclusion of the well yield test. **If the building permit is not obtained within this three-year timeframe, a new well yield test will be required.**

Prior to conducting the test, the property owner or the owner's representative shall:

- Complete the well yield test information sheet, including: well owner information, water well data information, driller information and pump data information. Detailed information on the well construction and the existing pump (if any) in the well to be tested must be provided, as indicated on the application form. All necessary forms can be found in the Appendices of this handbook or may be downloaded from the Website: www.lapublichealth.org/eh (see Environmental Protection Bureau, Drinking Water Program).
- Make certain that the well to be tested is fully developed prior to conducting the test in order to eliminate the presence of a false static water level that may exist immediately after a well is constructed.
- Determine and use the appropriate pump size to accomplish the goal specified in the pumping rate section.
- Contact the Department at least 48 hours (two business days) in advance to schedule an appointment with your inspector to monitor the pumping and recovery phase of the well yield test. If the pumping and recovery portion of the test is NOT monitored, it shall be deemed invalid and will require additional testing.

Time of Test

The aquifer test may be conducted whenever water from precipitation is not flowing over the ground surface. A three week delay in well yield testing will be in effect whenever two inches of rain has been recorded within a ten day period in the location of the well to be tested. Production from the well is not permitted for 24 hours prior to the beginning of pumping for the test.

Discharging Pumped Water

The water pumped from the well during the test shall be discharged at an adequate distance from the well (minimum of 50 feet) so it does not infiltrate into the ground and influence the results of

the test. If this cannot be safely accomplished or if the water is flowing offsite onto someone else's property, a temporary water storage tank may be necessary to capture the pumped water.

Well Yield Test Procedures

The well yield test procedures may vary, as they are dependent upon the specific site's geological conditions. The requirements are specified, as follows, for rock formations and alluvial sediment:

Rock Formations

Pumping Duration:

The test shall be at least 24 hours in duration.

Pumping Rate:

The pumping rate during the test shall be controlled to maintain a constant discharge rate and allow pumping water levels to stabilize at some point in the test (i.e. not rising or falling).

Pumpage Measurements:

Use of a Flow Meter

A totalizing flow meter shall be installed in the discharge line along with a control valve. The instantaneous dial shall read and record only in units of gallons per minute (gpm). The totalizer (odometer type) dial shall read only in gallons. At the start of the test, the time of day, the static water level, and the totalizer dial reading shall be recorded. The total pumpage, the pumping rate in gpm, and the exact time of the meter measurement shall be recorded every half hour for the first four hours of pumping, and hourly thereafter for the next six hours. The total gallons pumped (as determined by the totalizer dial) and the instantaneous pumping rate (timed one minute interval) shall be recorded after each measurement.

The flow meter shall be calibrated at the beginning of the pumping period, after five hours of pumping, after ten hours of pumping, and then immediately before the conclusion of the 24-hour pumping period by timing the filling of a container of known volume (e.g. a five-gallon bucket). The flow meter shall be within ± 10 percent of the calibration measurement. All calibration measurements shall be recorded.

As soon as the pump is turned off at the end of the pumping portion of the test, the final totalizer dial reading shall be recorded, along with the exact time of day that the pumping was terminated.

The flow meter shall be installed in the appropriate place in the horizontal discharge pipe to avoid any turbulent flow. The discharge pipe shall be properly sized in order to have full flow.

Use of Tank to Capture Flow:

In the event that an accurate flow meter cannot be used (e.g. if the output from the well is less than a few gpm), the pumper shall determine the flow rate by obtaining the time to fill a container of known volume (e.g. a five-gallon bucket). The number of seconds/minutes to fill the container and the exact time of day each such measurement is collected shall be recorded every hour.

Measuring Water Levels During Test:
(It is recommended that your inspector be contacted 48 hours in advance, to schedule an appointment to observe the installation of the airline prior to beginning the test.)

Where an airline is to be used for determining the depth to water, documentation must be provided on the length of the air line, psi readings, and conversion factor to calculate depth to water, if applicable. If airline measurements are to be used for the test, the water level measuring airline must be calibrated with an electric sounder prior to the placement of the pump. The pumping level (depth to water) shall then be measured every 15 minutes during the first hour of pumping, and hourly for the next nine hours. The pumping water level shall also then be measured after 23 hours, 23-1/2 hours, and finally after 24 hours. (All equipment used for measuring the water level of the well must be capable of accurate depth measurements.)

All measurements shall be recorded, including the exact time of day that each water level measurement has been made. If the test pump is to be pulled out, the water level measuring airline must be calibrated with an electric sounder at the conclusion of the test, whenever possible.

Measuring Recovery of Water Levels:
Water-level measurements shall be taken at 23 hours, 23 1/2 hours, and finally 24 hours after the pump has been turned off. If full recovery has still not been achieved, the same water-level measurements and frequency shall continue every 24 hours for five days or until full water level recovery occurs, whichever comes first. All measurements shall be recorded, including the exact time of day that each water level measurement has been made.

Full recovery means that the water level in the well has recovered to within 90 percent of the initial pre-test static water level.

Determining Well Yield:
The allowable yield of the well will be the total gallons pumped for 24 hours, as determined by the totalizer dial readings divided by the pumping duration of the test in minutes, provided that full recovery occurs within 24 hours. In those cases where full recovery does not occur within 24 hours, the allowable yield will be the total gallons pumped for 24 hours, as determined by the totalizer dial readings divided by the total number of minutes for full recovery. A well that has not fully recovered within five days will be considered a non-sustainable source of water.

Alluvial Sediments

The Well Yield Test for Alluvial Sediments may be used only after Environmental Health concurs that all available information accurately demonstrates that the well is entirely placed in alluvial sediments and not within rock formations. This procedure is valid after the appropriate steps have been taken to assure that the well has been properly developed. Prior to the start of the well yield test, a standing (static) water level measurement shall be taken.

The well yield test for alluvial sediments shall be conducted using one of the following methods:

Constant Yield and Drawdown Test:

The constant yield and drawdown test requires that the water in storage inside the well casing be removed and a stable pumping level established. The test starts at this point and a constant pumping level is maintained for the duration of the test period. The yield that maintains this constant pumping level at the end of the test period is considered to be the constant yield for the well. Plot the drawdown measurements against the time elapsed since the beginning of the pump test. Pump until at least four consecutive drawdown measurements—taken at least one hour apart—and the elapsed time yield a straight line on the plot of drawdown measurements.

Total Yield Test:

This test method consists of installing a flow meter on the discharge line, turning the pump on, and pumping the well until it produces a certain volume of water or else exceeds the time limit (24 hours) to achieve a certain volume of production and thus fails the test. In this test, casing storage, pumping levels, and breaking pump suction are ignored. Total yield is sometimes converted to average yield by dividing the total production by the total pumping time. Average yield is not the same as constant yield; in a given well, average yield is often higher than constant yield. This is because the computation of average yield includes the amount of water stored within the well casing as well as the amount of water it receives in recovery from an aquifer. Therefore, the results of the total yield test and the constant yield and drawdown test are not comparable.

At the conclusion of the well yield test, let the well set for 24 hours, then take the final standing-water-level measurements 30 minutes apart to determine the amount of water-level recovery. Full recovery for this test means that the water level in the well has recovered to within 90 percent of the initial static water level.

Special Consideration

If there are unique conditions that warrant special consideration or if the owner desires to use an alternative to these requirements, a California Registered Geologist may make recommendations that consider the nature of the watershed and recharge capacity.

VIII. Water Quality Requirements

Los Angeles County regulations require that water for domestic purposes from new, repaired or reconstructed wells must meet all bacteriological and chemical requirements of the State of California Drinking Water Standards (SDWS) prior to use, as described in the California Code of Regulations (CCR) Title 22. Authority for implementing this requirement is delegated to the County's Department of Health, to be administered through the department's Bureau of Environmental Protection—Drinking Water Program. (Ordinance 2005-0053, adopted by the Los Angeles County Board of Supervisors July 2005).

A. Water Quality Standards

Quality and safety of drinking water are critical to public health. The United States Environmental Protection Agency (EPA) and California Department of Public Health (CDPH) establish specific bacteriological and chemical standards that must be met if water is to be consumed by humans. These standards set specific maximum levels of potential contaminants that have an adverse effect on human health. The CDPH sets primary maximum contaminant levels (MCLs) that are health-based drinking water standards that must be met to ensure protection of public health.

Private water wells can provide safe clean sustainable water, however private well water also can be contaminated. Under Title 11 of Los Angeles County Code Section 11.38 property owners/homeowners must demonstrate through testing that the water on the property complies with current drinking water regulatory limits. No water from a new or reconstructed well shall be used for domestic purposes until the water meets the bacteriological and inorganic chemical standards, as well as inorganic sample levels below MCLs, listed by the California Code of Regulations, Title 22. If the well is vulnerable to potential sources of contamination, other chemical analyses may be required.

When well water laboratory tests show that the well water meets drinking water standards, the Los Angeles Department of Public Health will issue a Water Availability Approval letter to the applicant or authorized consultant.

If well water laboratory tests from the property show that the well does not meet bacteriological standards, the property owner must remediate the well and retest the well water until it meets bacteriological standards.

If well water tests from the property are found to exceed the current MCL for a primary inorganic chemical, the Department will provide Well Water Treatment Application "packet" to applicant (see Appendix D). This packet provides the necessary information and procedures related to options to bring well water supplies into compliance with drinking water standards. (See also flow chart and procedures on page 8)

Notice to Well Owners:

A property owner utilizing a private water well is responsible for making sure that the well water is safe to drink. The Department recommends that private wells be tested on a regular basis for nitrate, coliform bacteria, and primary inorganic chemicals (i.e. arsenic, lead, copper, etc.) to detect contamination problems early. Additional information may be obtained from the Department regarding well water quality in specific areas and what contaminants are found most frequently.

The well owner also is responsible for maintenance and upkeep of the well. A water well, along with its pumping system, needs to be serviced on a regular basis to maintain the entire system in an efficient operating condition.

Well rehabilitation is considered necessary on a regular basis to help mitigate problems associated with the buildup of chemical precipitates and organic growths/biofilms on the casing perforations and within the gravel pack. The buildup of these materials occurs naturally over time in water wells and the amount of water going through the well system will drop significantly if portions of the perforations are clogged.

The buildup of these precipitates and biofilms also occurs on the intake of the pump, which over time further reduces the ability of a well and pumping system to deliver groundwater to the homeowner at an acceptable, useable rate. Buildup of the precipitates and organic growths/biofilms on the perforations, gravel pack and pump intake will can cause shorter pump durations, deeper pumping levels, and higher pumping lifts, resulting in increased pumping costs.

Wells are rehabilitated by using chemicals to dissolve the encrusted materials so they can be pumped out, and cleaning the well with a brush that can be attached to a drilling rig. High pressure jetting, hydrofracturing, and well surging are also procedures for rehabilitation, where water is injected into the well at extreme pressure. Contractors will often use a combination of these methods.

More information is available on EPA's private drinking water wells website: www.epa.gov/safewater/privatewells

B. Use of Treatment Devices to Meet Water Quality Requirements

A water treatment device may be used for the treatment of well water exceeding current MCLs for any regulated primary inorganic chemical. This device may be used at the point of entry into the residence (also called the POE) in order to meet the State Drinking Water Standards necessary for obtaining water availability approval from the Department.

In March 2007 the Department developed a plan for the treatment of well water that exceeded the

MCL for any regulated primary inorganic chemical, including arsenic. An evaluation was conducted comparing point-of-entry (POE) and point-of-use (POU) devices to be utilized by the well owner for achieving compliance with drinking water standards. (POU refers to treatment devices utilizing treatment technologies installed at all fixtures within the dwelling that are used for drinking water purposes). This comparison concluded that POE devices directly address the needs of public health protection in compliance with drinking water standards. However, all devices will be evaluated on a case by case basis.

Well Water Treatment Device Approval must be obtained from the Department before issuance of a Water Availability Approval letter.

Procedures for Obtaining Approval to Use a Water Treatment Device

A water treatment device may be used for the treatment of well water which is found to exceed current MCLs for any regulated primary inorganic chemical. This device should be installed in the water line prior to entry into the house in order to achieve state drinking water standards necessary for obtaining water availability approval from the Department. A Well Water Treatment Device Approval letter shall be obtained from the Department prior to issuance of the Water Availability Approval letter. To facilitate the process of obtaining approval, the Department will provide complete well water treatment device application "packet" to the property owner/homeowner that includes:

- Application to Install a Well Water Treatment Device
- *Notification of Intent* (property owner's intent to install a water treatment device)
- A *Service Request Application*
- The *Work Plan Guidelines for Installation of a Well Water Treatment Device*

It is the homeowner/property owner's response responsibility to complete the Notification of Intent and return it to the Department indicating their willingness to provide a water treatment device for the purpose of improving the water quality of the well water. All devices submitted for approval will be considered. The Department will review the specifications regarding the ability to reduce the specified contaminant to the acceptable level as the basis of their decision to approve the device. A list of currently approved devices can be obtained by contacting the Drinking Water Program at (626) 430-5420.

The homeowner/property owner must provide the Department with a completed Application to Install a Well Water Treatment Device, a Service Request Application, a completed Work Plan and payment of the applicable fees for plan review and approval.

The Work Plan shall include:

- A plot plan:
  - Not exceeding a paper size of 11" x 17" and drawn to scale of no less than 1" = 20' for parcels of one acre or less, and 1" = 40' for parcels over one acre. The typeface and size must remain legible.
  - Clearly indicating the location of the well and POE, as well as a plumbing diagram of the well head to the dwelling, to any accessory buildings, and to all exterior hose bibs.
  - Also indicating the location of any water storage tanks and the well house.

- On a separate sheet of paper provide the water treatment device specifications including a diagram of the overall mitigation system. This sheet should also include NSF or equivalent certifications of all water grade components.
- List the types of contaminants to be removed from the water.
- Installation requirements per the manufacturer's specifications.
- Maintenance requirements specified by the manufacturer. Each individual device will have specific requirements for maintenance and operation. Some devices may require back-flushing, others may just require replacement of filter-cartridge. These requirements are specific to the device. If the device requires back-flushing, specify the amount of water to be released into the OWTS; the frequency of back-flushing; and the chemicals contained in the back-flushed water.

Please Note:

The amount of water generated by back-flushing the well water mitigation system may require an increased capacity of the Onsite Wastewater Treatment System (OWTS).