RESOLUTION NO. 627

RESOLUTION OF THE BOARD OF DIRECTORS OF THE CARPINTERIA COUNTY WATER DISTRICT OF INTENTION TO DRAFT A GROUNDWATER MANAGEMENT PLAN PURSUANT TO THE GROUNDWATER MANAGEMENT ACT (WATER CODE, SS 10750 ET SEQ.)

WHEREAS, the Legislature of the State of California has found and declared that groundwater is a valuable natural resource in California, and should be managed to ensure both its safe production and its quality ; and

WHEREAS, it is the expressed intent of the State Legislature to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions; and

WHEREAS, the Groundwater Management Act (Water Code, SS 10750 et seq.) authorizes a local agency whose service area includes a groundwater basin which is not subject to groundwater management pursuant to other provisions of law or a court order, to adopt and implement a groundwater management plan; and

WHEREAS, it is the intent of the Carpinteria County Water District to include a coordinated program with Montecito Water District and the Casitas Municipal Water District by entering into a joint powers agreement or a memorandum of understanding, in coordination with C.C.W.D., acting as the authority (Authority) having management control of the coordinated groundwater management plan developed, adopted, implemented and enforced pursuant to the provisions of the agreement or MOU; and

WHEREAS, the District, acting as the Authority, is a local agency authorized to adopt a groundwater management plan pursuant to the provisions of the Groundwater Management Act; and

WHEREAS, Water Code section 10753.2 requires that, before preparing a groundwater management plan, a local agency must first hold a public hearing to consider whether to adopt a Resolution of Intention to Draft a Groundwater Management Plan; and

WHEREAS, following the publication of notice required by law, the District, acting as the Authority, held a public hearing on September 14, 1994 to receive public comment on whether or not it should adopt a Resolution of Intention to Draft a Groundwater Management Plan; and

WHEREAS, after considering the public comment and other information presented at the hearing, the Board of Directors of the District, acting as the Authority, determines that it is in the best interest of the Authority, in coordination with M.W.D. and C.M.W.D., to draft a groundwater management plan.

NOW THEREFORE, BE IT RESOLVED AS FOLLOWS:

1. The Board of Directors of the District, acting as the Authority, deems it advisable, in the best interests of the Authority and the electors that the District, acting as the Authority, draft a groundwater management plan for Carpinteria Groundwater Basin.

2. The District, acting as the Authority, hereby declares its intention to draft a groundwater management plan pursuant to Water Code section 10750 et seq.

3. The General Manager/Secretary is directed to take any action necessary and appropriate to implement this Resolution.

4. This Resolution shall take effect immediately.

PASSED AND ADOPTED by the Governing Board of the Carpinteria County Water District on the 14th day of September, 1994, by the following vote:

AYES: HICKEY,LEMERE,GILMOUR,BRADLEY

NOES: NONE

ABSENT: FOX

APPROVED:

Wilson Bradley, Jr. ,President

ATTEST:

Robert R. Lieberknecht

Robert R. Lieberknecht, Secretary

RESOLUTION NUMBER 670

RESOLUTION OF THE BOARD OF DIRECTORS
OF THE CARPINTERIA VALLEY WATER DISTRICT
ADOPTING A GROUNDWATER MANAGEMENT PLAN

WHEREAS, The Board of Directors held a Public Hearing and adopted a Resolution of Intention to Draft a Groundwater Management Plan Pursuant to the Groundwater Management Act (Water Code, SS 10750 et seq.) on September 14, 1994; and

WHEREAS, The Board of Directors held a workshop on March 9, 1996 to encourage public participation in the process of drafting a Groundwater Management Plan; and

WHEREAS, The Board of Directors encouraged volunteers to serve on the Board Groundwater Committee along with the Manager to prepare a draft Plan; and

WHEREAS, The Board of Directors held a second Public Hearing regarding whether or not to adopt a Groundwater Management Plan on July 17, 1996 and no protests were filed, and the Board determined that no majority protest existed;

NOW, THEREFORE, BE IT RESOLVED:

That the Board of Directors hereby adopts the Groundwater Management Plan dated July 10, 1996.

Vote on the Resolution by roll call resulted as follows:

AYES:	Lemere, Lieberknecht, Roberts, Van Antwerp
NAYES:	None
ABSENT:	Hickey

Resolution Number 670 was declared approved and adopted.

Dated: August 14, 1996

APPROVED:

Fred Lemere, President

ATTEST:

Charles B. Hamilton, Secretary

Groundwater Management Plan

Carpinteria Valley water District

August 14,1996

Adopted and approved by the Board of Directors of the Carpinteria Valley Water District at a regular Board meeting held on August 14, 1996, by resolution No 670

Charles B. Hamilton, Secretary

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Introduction

Assembly Bill 3030 (AB3030), passed by the California Legislature in 1992, provides for management of the groundwater basin in order to protect water quality, maximize water supply, and to eliminate protracted legal battles over groundwater. The bill encourages local agencies to create and adopt groundwater management plans for their groundwater basins.

Based on the current information about the volume and quality of groundwater available in the Carpinteria Valley Basin, there appears to be no compelling reason for an aggressive approach to groundwater management by the Carpinteria Valley Water District (CVWD). There is, however, a clear need for systematic monitoring and analysis of groundwater levels and water quality in the Carpinteria Valley Basin. There is a ***growing use*** of the basin by private land owners, through private wells, as a source of irrigation water and the ***continuing need*** to maintain the groundwater basin as a sustainable drinking water resource for all. Systematic monitoring, analysis and reporting will provide an early warning/detection system, should the growing use of the basin begin to adversely affect the basin. As a management tool, the use of such a system allows for an informed decision-making process relative to possible groundwater management actions relative to other possible elements of a groundwater management plan identified in the legislation.

Responding to the AB3030 initiative, and the desire to accept the groundwater management challenge, Carpinteria Valley Water District's Board of Directors adopted a resolution of intention to draft a Groundwater Management Plan September 14, 1994.

Description of the Groundwater Basin

The Carpinteria Groundwater Basin extends from a small area located in Ventura County, east of the Santa Barbara County Line, across the Carpinteria Valley, to and including the small Toro canyon area on the west. The areal extent of the basin is about 12 square miles. See attached Figure 1 for map of the groundwater basin.

Estimated Basin Storage Capacity

Geotechnical Consultants, Inc (GCI) estimated in 1986 that the total basin storage, 700,000 acre feet, about 27% or 170,000 acre feet is located in Storage Unit 1in four major aquifers within the confined the area of confined groundwater. Safe yield of the basin is estimated to be about 5,000 acre feet (GCI, 1986).

Historical Monitoring and Reports

Collection of data and evaluation of the groundwater resources in the Carpinteria Valley area have historically been performed by the United States Geologic Survey (USGS) in conjunction with the Santa Barbara County Water Agency and the Carpinteria Valley Water District (District). Data collection was begun by the USGS in 1941. In 1972 the USGS monitored 19 wells. Data from the monitoring wells were supplemented with a survey conducted in 1973 in conjunction with a test hole drilling program conducted by the District and Geotechnical Consultants, Inc in 1972, 1976, and 1986. A detailed description of the basin with an emphasis on the aquifer characteristics and well yields was also prepared by Richard Slade in 1975. Limited water quality data was available for about 25% of the wells in the basin in 1976, as is the case in 1996.

Rain gauges within Carpinteria Valley have been maintained since 1941 at the Middle School and at the Carpinteria Reservoir since 1957. The USGS has collected data on stream flow measurements on Carpinteria Creek since 1941.

Since 1976 the District and the USGS have had a cooperative agreement providing groundwater level measurements and other water quality data from 41 wells in the

Valley. The agreement also provides for continued operation and maintenance of the stream gauging station on Carpinteria Creek.

Historical Variations in Groundwater Levels

At the time of the District's formation in 1941, groundwater levels were declining. Hydrographs for the basin indicate that from 1941 to 1951, prior to the importation of surface water from Lake Cachuma, groundwater levels fell below sea level. Hydrographs since 1951 show rising water levels leading up to artesian conditions in 1979. Since the 1986-1991 drought, when levels declined as well production increased, water levels have nearly returned to the historic high levels partly brought about by a very wet winter in 1983.

Historical Variations in Groundwater Pumpage

Groundwater pumpage has varied greatly over the last 60 years depending upon the availability of surface water, precipitation and land use. Both irrigation acreage and total pumpage doubled after World War II. Following the introduction of the Cachuma Project water in the early 1950s pumpage declined. Toward the end of the most recent 1987-91 drought, as many as 60 additional private wells were drilled, bringing the total number of active private wells to about 100. Estimated private pumpage that once averaged about 1600 acre feet/year, reached a new high in 1994 of 2,780 acre feet/year. District Pumpage historically averaged about 2,200 acre feet/year, but in 1,994 totaled 1,305 acre feet. Total 1994 pumpage (District and private) was 4,085 acre feet, or about 82% of the conservatively estimated 5,000 acre feet safe yield of the basin.

Water Quality

There are no known contamination problems in the Carpinteria Valley groundwater basin. Chloride, a common sea water constituent, is generally low in samples taken from the basin. Total Dissolved Solids (TDS) concentrations range from a low 450 to moderate 980 ppm. It is believed that the Rincon Fault acts as a barrier to seawater intrusion.

Action Elements

1. Inventory of Wells

   The profile of each well drilled in the basin shall include the following:

   a. Location
   b. Size of well casing (diameter)
   c. Pump size (horsepower)
   d. Depth (bottom and screened sections)
   e. Sanitary seals (yes/no depth)
   f. Meter (yes/no)
   g. Active/ inactive/ abandoned/ destroyed
   h. Secured yes/no
   i. Other data if available: drillers log, electric log, chemical analysis, etc.

   Note: This information will be treated as confidential information in the same way that customer account information is treated and released only with written permission of the well owners.

2. Monitoring of Groundwater Levels and Quality

Groundwater levels shall be measured every 2 months and aquifer characteristics and health determined annually by the District. The scope of this effort will be expanded as needed.

Annually, 30 wells shall be sampled for nitrate, chloride, TDS, and boron, a second sample of 30 wells shall be tested for general mineral and inorganic characteristics. A third sample of (number to be determined) wells shall be tested on as needed basis for trace contaminants such as VOCs (volatile organic chemicals). Frequency of sampling for water quality may increase if a problem is identified.

It is anticipated that water quality information produced by the private pumpers will also be shared with the District.

Note: Participation in this effort by well owners, whether solely by providing the District with well information (element 1), or by allowing sampling and water level measurements (element 2), or both, is entirely voluntary. Results of District water quality testing and water level measurements will be shared with well owners. Water quality testing by the District may result in benefit to all well owners through pooled purchasing power, and this opportunity will be explored.

3. Creation of a Database and Reporting System

All water level and water quality data obtained shall be organized and correlated by the District. The District will prepare an annual summary report of the data and findings, entitled "Carpinteria Valley Groundwater Basin Report".

4. Identification and Monitoring of Recharge Areas

In monitoring recharge areas, the Manager will include in the Annual Basin Report, a status report on recharge areas in the watershed. The status report will identify the major recharge areas of the watershed and identify significant potential and/or actual threats caused by pollution or reduction of recharge area.

5. Implementation of Sanitary Seal Retrofit Program

Wells identified as being contaminated or polluted, or subject to a material or substantial contamination or pollution risk (in accordance with the definitions of contamination or pollution provided in State Water Code Section 13050, attached as Exhibit A) and identified as not having a sanitary seal , shall be fitted with a sanitary seals or remedied by other actions as determined by the District, at the owners expense, in accordance with State and County standards, incorporated in this Plan as Exhibit B, County Ordinance Number 3458, Exhibit C, Water Well Standards: State

of California- Bulletin 74-81, and Exhibit D, California Well Standards- Bulletin 74-90

Examples of a "material or substantial risk" would include but be limited to the following:

1) A septic tank in close proximity to a well
2) Storage of hazardous material in close proximity to a well
3) A well located within a drainage channel or floodplain
4) A leach field in close proximity to a well
5) A horse or other livestock corral in close proximity to a well.

6. Implementation of a Well Abandoned Program

All abandoned and/or improperly secured wells shall be identified and at the owner's expense, abandoned and secured in accordance with current State and County requirements attached as Exhibits B, C, and D.

All wells that need to be destroyed shall be identified at the owner's expense, and destroyed in accordance with current State and County requirements attached as Exhibits B, C, and D.

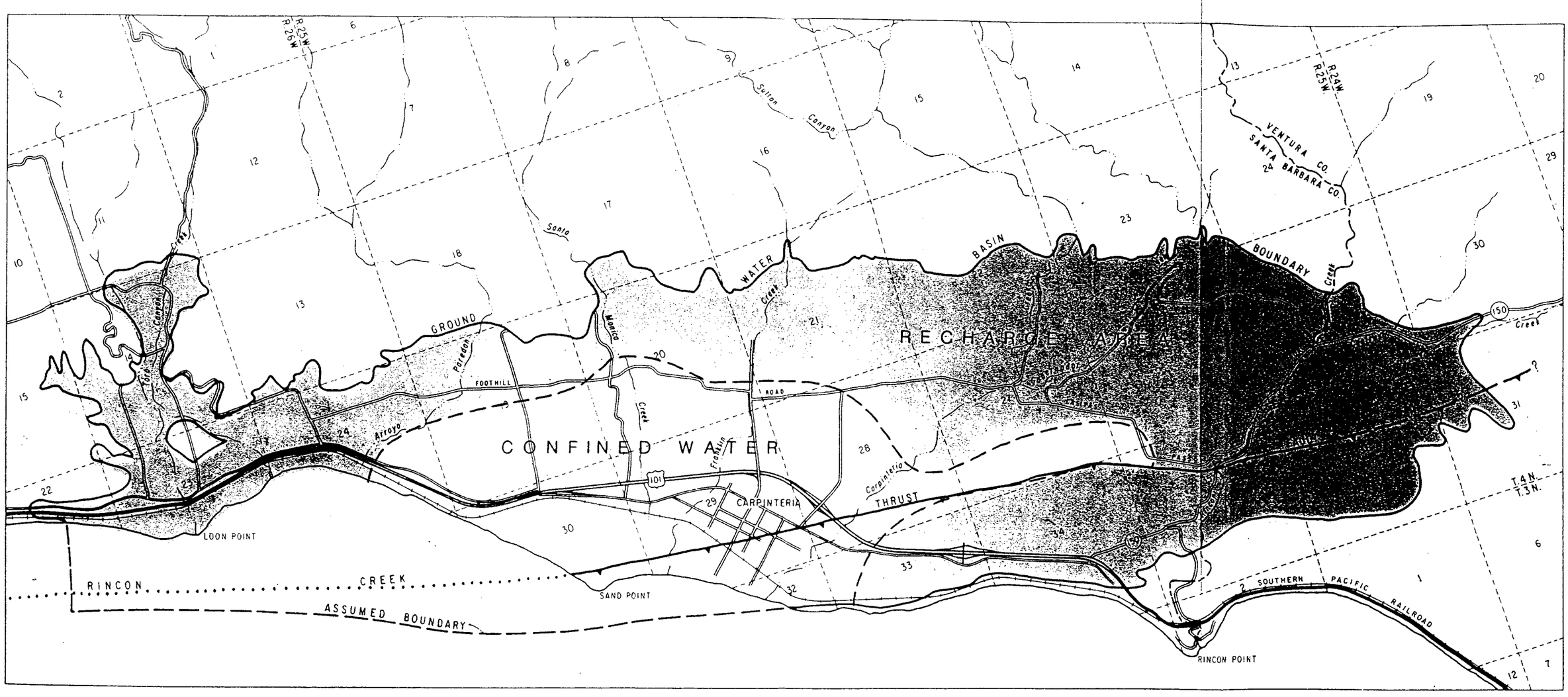
7. Dissemination of Public Information Relative to the Plan

The District shall prepare a well owners handbook, including information and regulations about well drilling, the dangers of open and/or improperly secured wells, and well abandonment and destruction procedures.

Procedures for Changes to this Plan

Material or substantial changes to the Board approved Plan will necessitate a complete review and public participation process as set forth in AB3030.

FIGURE 1



GEOTECH CONSULTANTS, INC.

LEGEND

CARPINTERIA
GROUND WATER BASIN BOUNDARY

BOUNDARY BETWEEN AREA OF RECHARGE
AND CONFINED GROUND WATER

4800 0 4800 9600
SCALE IN FEET

PLATE 1 AREA OF RECHARGE
V85037 JULY, 1986

EXHIBIT A

CALIFORNIA CODES
WATER CODE
SECTION **13050**-13051

13050. As used in this division:

(a) "State board" means the State Water Resources Control Board.

(b) "Regional board" means any California regional water quality control board for a region as specified in Section 13200.

(c) "Person" includes any city, county, district, the state, and the United States, to the extent authorized by federal law.

(d) "Waste" includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

(e) "Waters of the state" means any surface water or groundwater, including saline waters, within the boundaries of the state.

(f) "Beneficial uses" of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

(g) "Quality of the water" refers to chemical, physical, biological, bacteriological, radiological, and other properties and characteristics of water which affect its use.

(h) "Water quality objectives" means the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

(i) "Water quality control" means the regulation of any activity or factor which may affect the quality of the waters of the state and includes the prevention and correction of water pollution and nuisance.

(j) "Water quality control plan" consists of a designation or establishment for the waters within a specified area of all of the following:

(1) Beneficial uses to be protected.

(2) Water quality objectives.

(3) A program of implementation needed for achieving water quality objectives.

(k) "Contamination" means an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

(l) (1) "Pollution" means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following:

(A) The waters for beneficial uses.

(B) Facilities which serve these beneficial uses.

(2) "Pollution" may include "contamination."

(m) "Nuisance" means anything which meets all of the following requirements:

EXHIBIT A

(1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.

(2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

(3) Occurs during, or as a result of, the treatment or disposal of wastes.

(n) "Recycled water" means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefor considered a valuable resource.

(o) "Citizen or domiciliary" of the state includes a foreign corporation having substantial business contacts in the state or which is subject to service of process in this state.

(p) (1) "Hazardous substance" means either of the following:

(A) For discharge to surface waters, any substance determined to be a hazardous substance pursuant to Section 311(b)(2) of the Federal Water Pollution Control Act (33 U.S.C. Sec. 1251 et seq.).

(B) For discharge to groundwater, any substance listed as a hazardous waste or hazardous material pursuant to Section 25140 of the Health and Safety Code, without regard to whether the substance is intended to be used, reused, or discarded, except that "hazardous substance" does not include any substance excluded from Section 311 (b)(2) of the Federal Water Pollution Control Act because it is within the scope of Section 311(a)(1) of that act.

(2) "Hazardous substance" does not include any of the following:

(A) Nontoxic, nonflammable, and non-corrosive stormwater runoff drained from underground vaults, chambers, or manholes into gutters or storm sewers.

(B) Any pesticide which is applied for agricultural purposes or is applied in accordance with a cooperative agreement authorized by Section 116180 of the Health and Safety Code, and is not discharged accidentally or for purposes of disposal, the application of which is in compliance with all applicable state and federal laws and regulations.

(C) Any discharge to surface water of a quantity less than a reportable quantity as determined by regulations issued pursuant to Section 311(b)(4) of the Federal Water Pollution Control Act.

(D) Any discharge to land which results, or probably will result, in a discharge to groundwater if the amount of the discharge to land is less than a reportable quantity, as determined by regulations adopted pursuant to Section 13271, for substances listed as hazardous pursuant to Section 25140 of the Health and Safety Code. No discharge shall be deemed a discharge of a reportable quantity until regulations set a reportable quantity for the substance discharged.

(q) (1) "Mining waste" means all solid, semisolid, and liquid waste materials from the extraction, beneficiation, and processing of ores and minerals. Mining waste includes, but is not limited to, soil, waste rock, and overburden, as defined in Section 2732 of the Public Resources Code, and tailings, slag, and other processed waste materials, including cementitious materials that are managed at the cement manufacturing facility where the materials were generated.

(2) For the purposes of this subdivision, "cementitious material" means cement, cement kiln dust, clinker, and clinker dust.

(r) "Master recycling permit" means a permit issued to a supplier or a distributor, or both, of recycled water, that includes waste discharge requirements prescribed pursuant to Section 13263 and water recycling requirements prescribed pursuant to Section 13523.1.

13051. As used in this division, "injection well" means any bored, drilled, or driven shaft, dug pit, or hole in the ground into which waste or fluid is discharged, and any associated subsurface appurtenances, and the depth of which is greater than the circumference of the shaft, pit, or hole.

EXHIBIT B

ORDINANCE NO. 3458

26 1996

AN ORDINANCE REGULATING THE CONSTRUCTION, MODIFICATION OR REPAIR, DESTRUCTION AND INACTIVATION OF WELLS WITHIN THE UNINCORPORATED AREA OF THE COUNTY OF SANTA BARBARA BY MODIFYING CERTAIN PROVISIONS OF CHAPTER 34A OF THE COUNTY CODE AND ADOPTING BY REFERENCE THE STANDARDS CONTAINED IN BULLETIN 74-81 WATER WELL STANDARDS: STATE OF CALIFORNIA OF THE CALIFORNIA DEPARTMENT OF WATER RESOURCES.

The Board of Supervisors of the County of Santa Barbara do ordain as follows:

SECTION 1

Chapter 34A of the Santa Barbara County Code is hereby repealed and a new Chapter 34A is hereby added as follows:

SEC. 34A-1. PURPOSE

It is the purpose of this ordinance to regulate the (1) construction, (2) modification or repair, (3) destruction, (4) inactivation of wells in such a manner that the groundwater of the County will not be contaminated or polluted, and that water obtained from wells will be suitable for beneficial use and will not jeopardize the health, safety or welfare of the people of this County.

SEC. 34A-2. ACTS PROHIBITED, PERMIT REQUIRED

(a) It shall be unlawful for any person to construct, modify or repair, destroy or inactivate any well unless such person has (1) obtained a permit issued from the County for the specific work to be performed, or (2) in the case of an emergency, fully complied with the provisions of this ordinance relating to emergencies.

(b) It shall be unlawful for any person to construct, modify or repair, destroy or inactivate any well unless such construction modification or repair, destruction or inactivation is in accordance with the standards set forth in this ordinance.

SEC. 34A-3. DEFINITIONS

(a) Applicant. Applicant shall mean (1) the legal owner(s) of the property on which the well is to be constructed, modified or repaired or destroyed, or (2) that owner's agent authorized in writing to make this application, or (3) a licensed well drilling contractor who shall perform the work on the well.

(b) Contamination and Pollution. Contamination and pollution shall have the meanings ascribed to them by California Water Code, Section 13050.

(c) County. County shall mean the County of Santa Barbara, acting through its Board of Supervisors or the Santa Barbara County Health Officer, as the duly authorized representative of the Board of Supervisors.

(d) Destruction. Destruction of wells shall consist of the complete filling of the well in accordance with the procedures outlined in Bulletin 74-81, "Water Well Standards: State of California: of the California Department of Water Resources.

(e) Emergency. Emergency shall mean a circumstance which is either (1) and imminent threat of or is actually contaminating or polluting the groundwater of this County, or (2) jeopardizes the health or safety of the people of the County, or (3) will cause a substantial or immediate loss of property, crops, or livestock.

(f) Inactivate Well of Inactivation. An inactive well is one not routinely operating but capable of being made operable with a minimum of effort. It shall be considered abandoned and proper destruction required when it has not been used for a period of one year, unless the owner demonstrates his intention to use the well again. Inactivation of a well shall be accomplished by filing a permit stating the intention to reuse the well and properly maintain the well as inactive per the requirements of Bulletin 74-81.

(g) Modification or Repair. Modification or repair shall only mean the deepening of a well, reperforation, sealing or replacement of a well casing.

(h) Nuisance. Nuisance shall mean a well which threatens to or which contaminates or pollutes the groundwater of this County in such a way that it jeopardizes the health and safety of the public. A nuisance also means anything which creates and unsanitary or unsafe condition resulting from water well drilling activity.

(i) Person. Person shall mean any individual, firm, partnership, general corporation, association or governmental entity. Governmental entity, as used herein, shall not include any local agency exempt form the application of this ordinance pursuant to State Law.

(j) Well or Water Well. The term "well" or "water well" means any artificial excavation constructed by any method for the purpose of extracting water from, or injecting water into the ground. It shall also include "cathodic protection wells", as defined in California Water Code, Section 13711. This definition shall not include:

(1) Oil and gas wells, or geothermal wells constructed under the jurisdiction of the California State Department of Conservation, except those wells converted to use as water wells: or

(2) Wells used for the purpose of:

a) Dewatering excavation during construction, or

b) Stabilizing hillsides or earth embankments.

(k) Words not otherwise defined in this ordinance shall have the meaning ascribed to them in Chapter II of the California Department of Water Resources Bulletin No. 74-81 (Water Well Standards) and Chapter II of 74-1 (Cathodic Protection Well Standards), as each may be amended.

SEC. 34-A. PERMITS

Application for the permit required by this ordinance shall be (1) made in writing to the County on such forms as may be prescribed by the County, (2) signed by the applicant, and, (3) accompanied by a fee established by this Ordinance (no part of said fee shall be refundable) and, (4) shall include but no be limited to the following:

(a) Applicant's name and address; a statement that the person drilling the well is licensed under the provisions of Chapter 9 of Division 3 of the Business and Professions Code as a well drilling contractor and such license is in full force and effect; the number of such license; or, in lieu of the two latter enumerated matters, a statement that the applicant is exempt from the provisions of Chapter 9 of Division 3 of the Business and Professions Code and the basis for the alleged exemption.

(b) Estimated or proposed depth of the well, casing material, sealing material, sealing method, use of the well, and drilling method to be used.

(c) Location of the property and well site including street address and/or Assessor's Parcel Number; and the legal owner of the property.

(d) A plot plan indicating the location of the well with respect to the following items:

(1) Property lines.

(2) Sewage disposal systems or works carrying or containing sewage or industrial wastes within a 200-foot radius of the proposed well.

(3) All perennial, seasonal, natural, or artificial water bodies or watercourses, including location of 100-year floodplain, if applicable.

(4) Drainage pattern of the property.

(5) Existing wells within a 100 ft. radius of the proposed well.

(6) Access roads and easements (water, sewer, utility, roadway).

(7) Existing and/or proposed structures.

(8) Animal or fowl enclosures, pens, paddocks, stockyards within a 100 foot radius of proposed well site.

(e) Permits shall be issued subject to the terms, conditions and standards of this ordinance and may be denied only if the specific work to be performed of construction, modification or repair, destruction or inactivation as proposed would violate the terms, conditions or standards of this Ordinance.

(f) The issuance of a permit hereunder shall be deemed to be an administrative ministerial, non-discretionary act, and if an applicant complies with the terms, conditions, and standards of this Ordinance, said permit shall be issued within five (5) working days.

(g) A permit issued for construction of a well covers the construction of one (1) completed well. I the well driller proposes to change the site of the well from that shown on the site plan of a permit, the change in site must be approved by the County prior to drilling. The County shall give approval or disapproval of the change in site within 24 hours of notification by the well driller.

(h) Every permit issued pursuant to this ordinance shall expire upon completion of the task authorized thereby; however, in any even such permit shall expire one (1) year from date of issuance.

(i) Guarantee of Performance. Prior to the issuance of a permit, the person drilling the well shall post with the County a cash deposit or bond to guarantee compliance with the terms of this Ordinance and the applicable permit. such cash or bond to be in any amount deemed necessary by the Health Officer to include but not be limited to the remedy of improper work, but not in excess of the total estimated cost of such work. Licensed Well Drilling contractors shall not be required to post a bond or deposit guaranteeing performance. 85 percent of the deposit or bond shall be returned to the permittee when the work has been completed to the satisfaction of the Health Officer; the remaining 15 percent of the bond shall be returned after one (1) year of satisfactory well operation as determined by the Health Officer. These percentages may vary to cover special conditions and circumstances in order to guarantee performance and compliance with the Ordinance.

SEC. 34A-5. STANDARDS

Standards for construction, repair or modification, destruction or inactivation are set forth in Chapter II of the California Department of Water Resources Bulletin No. 74-81, Water Well Standards, and Bulletin 74-1, Cathodic Protection Well Standards, and are hereby adopted as a part of this Ordinance, with the following additional clarification and requirements for well construction.

(a) Annular Space. Gravity installation of the sealant in an annular space of a well is acceptable if the interval to be sealed is dry and the interval depth is 50 feet or less. Sealant shall be pumped into the space using a tremie or grout pipe when there is water in the annulus, or the annulus exceeds 50 feet.

(b) Disinfection Tube. Every well shall be equipped with an adequately sized opening by which disinfecting agents may be conveniently introducted directly into the well casing. This opening shall be protected against entrance of contaminants by installation of a watertight cap or plug.

(c) Drilling Waste. Drilling waste must be controlled and may not be discharged so as to create conditions which violate Water Quality Control Board Regulations, other State Laws, Federal Regulations or Local Ordinances.

(d) Mud Pits. Mud pits created to confine drilling mud shall be maintained during the well drilling operation so as not to be a safety hazard. It shall be the well driller's responsibility to properly earth fill the mud pit(s) upon completion of the job.

(e) Set-up Time. The minimum time that must be allowed for annular seals containing Type II and III (6-sack) cement to se shall be 16 hours before construction operations on the well may be resumed. When additives to shorten setting time are used with the cement, this set-up time may be reduced to a minimum of 12 hours before air jetting, bailing, swabbing, test pumping or further construction on the well may be resumed.

(f) Log of Well. Any person who has drilled, dug, excavated or bored a well subject to this Ordinance, shall within thirty (30) days after completing of the work, furnish the County with a copy of the State driller's report. The well driller shall notify the County if submission of the log is to be delayed.

(g) Horizontal Wells. The location and design of horizontal or lateral wells shall be approved by the County on a case-by-case basis prior to approval to construct or reconstruct such wells.

(h) Administrative Variance. The Health Officer may grant an administrative variance to the provisions of this Ordinance where written evidence is submitted that a modification of the standards will not endanger the health or safety of the public and strict compliance would be unreasonable in view of all the circumstances.

SEC. 34A-7. EMERGENCY

In the event of an emergency, a person may construct, modify or repair, destroy or inactivate a well without the permit required by this Ordinance providing that (1) such work is performed in conformance with the standards set forth herein, (2) the County is notified of such emergency work by the following County working day, and (3) an application for the required permit is made within three (3) County working days after initiation of such emergency work.

SEC. 34A-7. ENFORCEMENT

(a) The County may suspend or revoke a well permit issued under the Ordinance whenever the County determines that a condition resulting from any work performed under such a permit constitutes a nuisance as defined herein, or when the applicant, his agents, employees or the licensed well drilling contractor performing the work (1) violates any provision of this ordinance or any terms and conditions of the permit or (2) misrepresents any material facts in the application for a permit.

(b) Except in emergency situations, before the County suspends or revokes a well permit, the County shall make reasonable effort to notify the applicant and the licensed well driller performing work under the permit if he is not the applicant and to provide an opportunity for each to show cause why the permit should not be suspended or revoked.

(c) Upon notification by the County that the permit is suspended or revoked, or finding that no valid permit has been issued, no further work shall be performed until such violation has been abated.

(d) Rules and Regulations. The Health Officer may adopt rules and regulations to implement and administer this Ordinance.

SEC. 34A-8. NUISANCE

Upon finding by the County that well or well drilling activity constitutes a nuisance, as defined herein, the County may take the necessary action to abate such nuisance. The property owner where the well is located and/or the person causing the nuisance thereof shall be jointly liable for the reasonable costs incurred by or at the request of the County for abatement of the nuisance.

SEC. 34A-9. APPEAL

Any person whose application for a permit has been suspended, revoked or denied or whose request for an administrative variance has been denied may appeal to the Board of Supervisors of the County of Santa Barbara in writing within ten (10) days after the notice of such suspension, revocation or denial. Said appeal shall specify the reasons therefore and shall be accompanied by a filing fee, if any, as established by the Board of Supervisors of the County of Santa Barbara. The Clerk of the Board of Supervisors shall set the appeal for the hearing and shall give notice to the appellent and the appropriate County personnel of the time and place of the hearing.

SEC. 34A-10. INSPECTION

The County shall be notified at least twenty-four (24) hours in advance to make an inspection of, 1) the sealing of the annular space on a well, 2) the destruction of wells, and 3) any other operation which may be stipulated on the permit by the County to cope with special or unusual conditions. The County shall have the right to enter upon any property at any reasonable time to make inspections and examinations for the purpose of enforcement of this Ordinance, subject to the provisions of Code of Civil Procedure Section 1822.50 et seq.

SEC. 34A-11. APPLICATION FEES

(a) Each application for a well construction or modification permit shall be accompanied by a permit fee of $155.00.

(b) Each application for a well destruction or inactivation permit shall be accompanied by a permit fee of $95.00.

(c) An additional fee of $30 per hour shall be charged to the permittee for any inspection service by the Health Officer which exceeds five (5) hours on-site for witnessing annular seals, and the abatement of nuisances or hazards resulting from the well drilling operation. These application fees may be modified by Resolution of the Board of Supervisors.

SEC. 34A-12. PENALTIES

Any person who violates any provision of this Article is guilty of a misdemeanor. Each offense shall be punishable by a fine of not less than twenty-five dollars ($25.00) or more than one thousand dollars ($1,000.00) or by imprisonment in the County jail for a term not exceeding six months, or by both such fine and imprisonment. Each day such offense continues shall constitute a separate offense.

SECTION 2

This Ordinance shall take effect and be in force at the expiration of thirty days from the date of it passage; and before the expiration of fifteen days after its passage it, or a summary of it, shall be published once, with the names and the members of the Board of Supervisors voting for and against in the Santa Barbara News Press, a newspaper of general circulation published in the County of Santa Barbara, State of California.

EXHIBIT C

Water Well Standards

CHAPTER II. STANDARDS

Part I. General

Section 1. Definitions.[Note 5]

A. *Well or Water Wells*. As defined in Section 13710 of the Water Code, well or water well:

"…means any artificial excavation constructed by any method for the purpose of extracting water from, or injecting water into, the underground. This definition shall not include: (a) oil and gas wells, or geothermal wells constructed under the jurisdiction of the Department on Conservation, except those wells converted to use as water wells; or (b) wells used for the purpose of (1) dewatering excavations during construction, or (2) stabilizing hillsides or earth embankments."

B. *Community Water Supply Well*. A water well used to supply water for domestic purposes in systems subject to Chapter 7, Part 1, Division 5 of the California Health and Safety Code. Included are wells supplying public water systems classified by the Department of Health Services as "Noncommunity water systems" and "State small water systems" (California Waterworks Standards, Title 22, California Administrative Code). Such wells are variously referred to as "Municipal Wells", "City Wells", or "Public Water Supply Wells".

C. *Individual Domestic Well*. A water well used to supply water for the domestic needs of an individual residence or systems of four or less service connections (or "hook-ups" as they are often called).

D. *Industrial Wells*. Water wells used to supply industry on an individual basis (in contrast to supplies provided through community systems).

E. *Agricultural Wells*. Water wells used to supply water only for irrigation or other agricultural purposes, including so-called "stock wells".

F. *Recharge or Injection Wells*. Wells constructed to introduce water into the ground as a means of replenishing groundwater basins, repelling the intrusion of seawater or disposing of waste water.[Note 6]

G. *Air-conditioning Wells*. Wells constructed to return to the groundwater which has been used as a coolant in air conditioning processes. Because the water introduced into these wells is degraded (from the standpoint of temperature), such wells have

been construed as waste discharges and are, therefore, subject to the water quality control laws (Division 7 of the Water Code and Division 5 of the Health and Safety Code).

H. *Horizontal Wells*. Water wells drilled horizontally or at an angle with the horizon (as contrasted with the common vertical well). This definition does not apply to horizontal drains or "wells" constructed to remove subsurface water from hillsides, cuts, or fills (such installations are used to prevent or correct conditions that produce landslides).

I. *Exploration Hole (or Boring)*. An uncased, temporary excavation whose purpose is the determination of hydrologic conditions at a site.

J. *Test Wells*. Wells constructed to obtain information needed for design of other wells. Test wells should not be confused with "exploration holes", which are temporary. Test wells are cased and can be converted to other uses such as groundwater monitoring and, under certain circumstances, to production wells.

K. *Inactive or Standby Well*. A well not routinely operating, but capable of being made operable with a minimum effort.

L. *Enforcing Agency*. An agency designated by duly authorized local, regional, or State government to administer and enforce laws or ordinances pertaining to the construction, alteration, maintenance, and destruction of water wells. The California State Department of Health Services or the local health agency is the enforcing agency for community water supply wells.

Section 2. Application to Type of Well.

Except as prescribed in Sections 3 and 4 (following) these standards shall apply to all types of wells described in Section 1. Before a change of use is made of a well, compliance shall be made with the requirements for the new use as specified herein.[Note 7]

Section 3. Exemption Due to Unusual Conditions.

If the enforcing agency finds that compliance with any of the requirements prescribed herein is impractical for a particular location because of unusual conditions or if compliance would result in construction of an unsatisfactory well, the enforcing agency may waive compliance and prescribe alternative requirements which are "equal to" these standards in terms of protection obtained.

Section 4. Exclusions.

The standards prescribed in Part II, "Construction", do not apply to exploration and test holes. However, the provisions of Section 7 "Reports" (following) and Part III, "Well Destruction", do apply to these holes.

Springs are excluded from these standards.[Note 8]

Section 5. Special Standards.

A. In locations where existing geologic or groundwater conditions require standards more restrictive than those described herein, such special additional standards may be prescribed by the enforcing agency.

B. Special standards are necessary for the construction of recharge or injection wells,[Note 9] horizontal wells and other unusual types of wells. Design of these wells is subject to the approval of the enforcing agency.

Section 6. Well Drillers.

The construction, alteration, or destruction of wells shall be performed by contractors licensed in accordance with the provisions of the Contractors License Law (Chapter 9, Division 3, of the Business and Professions Code) unless exempted by that act.

Section 7. Reports.

Reports concerning the construction, alteration, or destruction of water wells shall be filed with the California Department of Water Resources in accordance with the provisions of Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code.[Note 10]

Section 8. Well Location With Respect to Pollutants and Contaminants, and Structures.

A. *Separation.* All water wells shall be located an adequate horizontal distance from known or potential sources of pollution and contamination. Such sources include, but are not limited to:

- sanitary, industrial, and storm sewers;
- septic tanks and leachfields;
- sewage and industrial waste ponds;
- barnyard and stable areas;
- feedlots;
- solid waste disposal sites;
- above and below ground tanks and pipelines for storage and conveyance of petroleum products or other chemicals; and,

- storage and preparation areas for pesticides, fertilizers, and other chemicals.

Consideration should also be given to adequate separation from sites or areas with known or suspected soil or water pollution or contamination.

The following horizontal separation distances are generally considered adequate where a significant layer of unsaturated, unconsolidated sediment less permeable than sand is encountered between ground surface and groundwater. These distances are based on present knowledge and past experience. Local conditions may require greater separation distances to ensure groundwater quality protection.

Potential Pollution or Contamination Source	**Minimum Horizontal Separation Distance Between Well and Known or Potential Source**
Any sewer (sanitary, industrial, or storm; main or lateral)	50 feet
Watertight septic tank or subsurface sewage leaching field	100 feet
Cesspool or seepage pit	150 feet
Animal or fowl enclosure	100 feet

If the well is a radial collector well, minimum separation distances shall apply to the furthest extended point of the well.

Many variables are involved in determining the "safe" separation distance between a well and a potential source of pollution or contamination. No set separation distance is adequate and reasonable for all conditions. Determination of the safe separation distance for individual wells requires detailed evaluation of existing and future site conditions.

Where, in the opinion of the enforcing agency adverse conditions exist, the above separation distances shall be increased, or special means of protection, particularly in the construction of the well, shall be provided, such as increasing the length of the annular seal.

Lesser distances than those listed above may be acceptable where physical conditions preclude compliance with the specified minimum separation distances and where special means of protection are provided. Lesser separation distances must be approved by the enforcing agency on a case-by-case basis.

B. *Gradients.* Where possible a well shall be located up the groundwater gradient from potential sources of pollution or contamination. Locating wells up gradient from pollutant and contaminant sources can provide an extra measure of protection for a well. However, consideration should be given that the gradient near a well can be reversed by pumping, as shown in Figure 3, or by other influences.

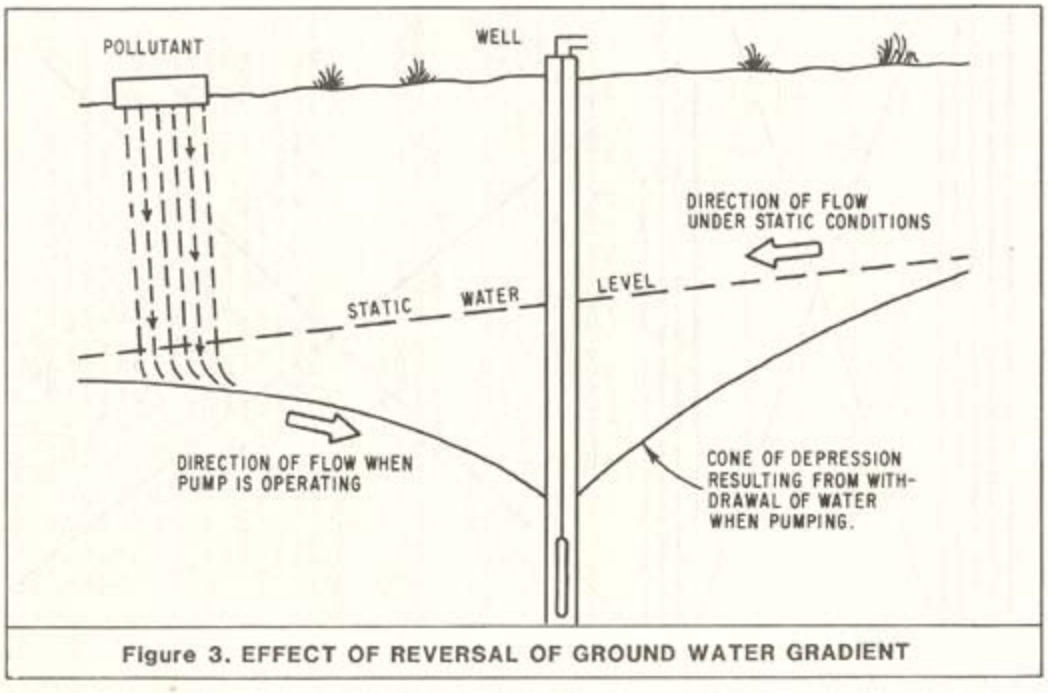


Figure 3. EFFECT OF REVERSAL OF GROUND WATER GRADIENT

C. *Flooding and Drainage.* If possible, a well should be located outside areas of flooding. The top of the well casing shall terminate above grade and above known levels of flooding caused by drainage or runoff from surrounding land. For community water supply wells, this level is defined as the:

"...floodplain of a 100 year flood..." or above "...any recorded high tide...", (Section 64417, Sitting Requirements, Title 22 of the California Code of Regulations.)

If compliance with the casing height requirement for community water supply wells and other water wells is not practical, the enforcing agency shall require alternate means of protection.

Surface drainage from areas near the well shall be directed away from the well. If necessary, the area around the well shall be built up so that drainage moves away from the well.

D. *Accessibility.* All wells shall be located an adequate distance from buildings and other structures to allow access for well modification, maintenance, repair, and destruction, unless otherwise approved by the enforcing agency.

Section 9. Sealing the Upper Annular Space.

The space between the well casing and the wall of the drilled hole, often referred to as the annular space, shall be effectively sealed to prevent it from being a preferential pathway for movement of poor-quality water, pollutants, or contaminants. In some cases, secondary purposes of an annular seal are to protect casing against corrosion or degradation, ensure the structural integrity of the casing, and stabilize the borehole wall.

A. Minimum Depth of Annular Surface Seal. The annular surface seal for various types of water wells shall extend from ground surface to the following minimum depths:

Well Type	Minimum Depth Seal Must Extend Below Ground Surface
Community Water Supply	50 feet
Industrial	50 feet
Individual Domestic	20 feet
Agricultural	20 feet
Air-Conditioning	20 feet
All Other types	20 feet

B.

1. Shallow groundwater. Exceptions to minimum seal depths can be made for shallow wells at the approval of the enforcing agency, where the water to be produced is at a depth less than 20 feet. In no case shall an annular seal extend to a total depth less than 10 feet below land surface. The annular seal shall be no less than 10 feet in length.

Caution shall be given to locating a well with a 'reduced' annular seal with respect to sources of pollution or contamination. Such precautions include horizontal separation distances greater than those listed in Section 8, above.

2. Encroachment on known or potential sources of pollution or contamination. When, at the approval of the enforcing agency, a water well is to be located closer to a source of pollution or contamination than allowed by Section 8, above, the annular space shall be sealed from

ground surface to the first impervious stratum, if possible. The annular seal for all such wells shall extend to a minimum depth of 50 feet.

3. Areas of freezing. The top of an annular surface seal may be below ground surface in areas where freezing is likely, but in no case more than 4 feet below ground surface. 'Freezing' areas are those where the mean length of the freeze-free period described by the National Weather Service is less than 100 days. In other word, 'freezing' areas are where temperatures at or below 32 degrees Fahrenheit are likely to occur on any day during a period of 265 or more days each year. In general, these areas include:

    - portions of Modoc, Lassen, and Siskiyou Counties;
    - portions of the North Lahontan area including the eastern slope of the Sierra Nevada and related valleys north of Mount Whitney and Mono Lake; and,
    - the area of Lake Arrowhead in the San Bernardino Mountains;

4. Vaults. At the approval of the enforcing agency, the top of an annular surface seal and well casing can be below ground surface where traffic or other conditions require, if the seal and casing extend to a watertight and structurally sound subsurface vault, or equivalent feature. In no case shall the top of the annular surface seal be more than 4 feet below ground surface. The vault shall extend from the top of the annular seal to at least ground surface.

The use of subsurface vaults to house the top of water wells below ground surface is rare and is discouraged due to susceptibility to the entrance of surface water, pollutants, and contaminants. Where appropriate, pitless adapters should be used in place of vaults.

C. Sealing Conditions. The following requirements are to be observed for sealing the annular space:

1. Wells drilled in unconsolidated, caving material. An 'oversized' hole, at least 4 inches greater in diameter than the outside diameter of the well casing, shall be drilled and a conductor casing temporarily installed to at least the minimum depth of annular seal specified in Subsection A, above. Permanent conductor casing may be used if it is installed in accordance with Item 3 and Item 5, below and if it extends at least to the depth specified in Subsection A, above. One purpose of conductor casing is to

hold the annular space open during well drilling and during the placement of the well casing and annular seal.

Temporary conductor casing shall be withdrawn as sealing material is placed between the well casing and borehole wall, as shown in Figure 4A (Bulletin 74-81). Sealing material shall be placed at least within the interval specified in Subsection A, above. The sealing material shall be kept at a sufficient height above the bottom of the temporary conductor casing as it is withdrawn to prevent caving of the borehole wall. Temporary conductor casing may be left in place in the borehole after the placement of the annular seal only if it is impossible to remove because of unforeseen conditions and not because of inadequate drilling equipment, or if its removal will seriously jeopardize the integrity of the well and the integrity of subsurface barriers to pollutant or contaminant movement. Temporary conductor casing may be left in place only at the approval of the enforcing agency on a case-by-case basis.

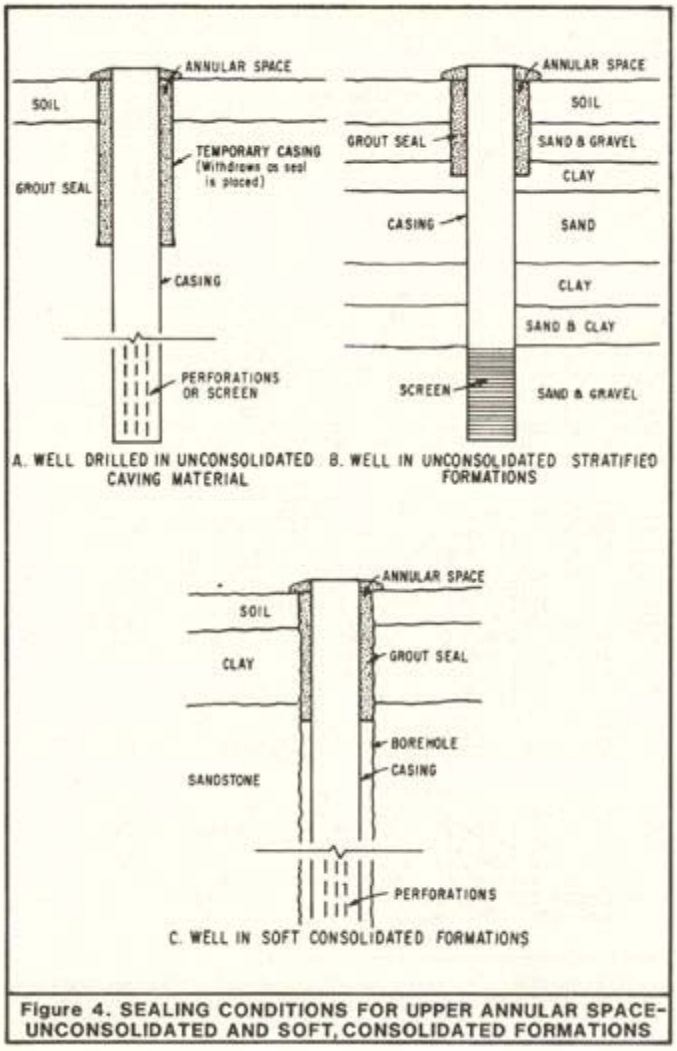


Figure 4. SEALING CONDITIONS FOR UPPER ANNULAR SPACE-UNCONSOLIDATED AND SOFT, CONSOLIDATED FORMATIONS

Every effort shall be made to place sealing material between the outside of temporary conductor casing that cannot be removed and the borehole wall to fill any possible gaps or voids between the conductor casing and the borehole wall. At least two inches of sealing material shall be maintained between the conductor casing and well casing. At a minimum, sealing material shall extend through intervals specified in Subsection A, above.

Sealing material can often be placed between temporary conductor casing that cannot be removed and the borehole wall by means of pressure grouting techniques, as described below and in Appendix B (Bulletin 74-81). Other means of placing sealing material between the conductor casing and the borehole wall can be used, at the approval of the enforcing agency.

Pressure grouting shall be accomplished by perforating temporary conductor casing that cannot be removed, in place. The perforations are to provide passages for sealing material to pass through the conductor casing to fill any spaces and voids between the casing and

borehole wall. Casing perforations shall be a suitable size and density to allow the passage of sealing materials through the casing and the proper distribution of sealing material in spaces between the casing and borehole wall. At a minimum, the perforations shall extend through the intervals specified in Subsection A, above, unless otherwise approved by the enforcing agency.
Temporary conductor casing that must be left in place shall be perforated immediately before sealing operations begin to prevent drilling or well construction operations from clogging casing perforations. Once the casing has been adequately perforated, sealing material shall be placed inside the conductor casing and subjected to sufficient pressure to cause the sealing material to pass through the conductor casing perforations and completely fill any spaces or voids between the casing and borehole wall, at least within the intervals specified in Subsection A, above. Sealing material shall consist of neat cement, or bentonite prepared from powdered bentonite and water, unless otherwise approved by the enforcing agency.
Sealing material must also fill the annular space between the conductor casing and the well casing within required sealing intervals.

2. Wells drilled in unconsolidated material with significant clay layers. An 'oversized' hole, at least 4 inches greater in diameter than the outside diameter of the well casing, shall be drilled to at least the depth specified in Subsection A, above, and the annular space between the borehole wall and the well casing filled with sealing material in accordance with Subsection A, above (see Figure 4B, above). If a significant layer of clay or clay-rich deposits of low permeability is encountered within 5 feet of the minimum seal depth prescribed in Subsection A, above, the annular seal shall be extended at least 5 feet into the clay layer. Thus, the depth of seal could be required to be extended as much a another 10 feet. If the clay layer is less than 5 feet in total thickness, the seal shall extend through its entire thickness.

If caving material is present within the interval specified in Subsection A, a temporary conductor casing shall be installed to hold the borehole open during well drilling and placement of the casing and annular seal, in accordance with the requirements of Item 1, above. Permanent conductor casing may be used if it is installed in accordance with Item 3 and Item 5, below, and it extends to at least the depth specified in Subsection A, above.

3. Wells drilled in soft consolidated formations (extensive clays, sandstones, etc.). An 'oversized' hole, at least 4 inches greater than the outside diameter of the well casing, shall be drilled to at least the depth specified in Subsection A, above. The space between the well casing and the borehole shall be filled with sealing material to at least the depth specified in Subsection A, above, as shown by Figure 4C, above.

If a permanent conductor casing is to be installed to facilitate the construction of the well, an oversized hole, at least 4 inches greater in diameter than the outside surface of the permanent conductor casing, shall be drilled to the bottom of the conductor casing or to at

least the depth specified in Subsection A, above, and the annular space between the conductor casing and the borehole wall filled with sealing material. In some cases, such as in cable tool drilling, it may be necessary to extend permanent conductor casing beyond the depth of the required depth of the annular surface seal in order to maintain the borehole. Sealing material is not required between conductor casing and the borehole wall other than the depths specified in Subsection A, above, and Section 13, below.

4. Wells situated in "hard" consolidated formations (crystalline or metamorphic rock). An oversized hole shall be drilled to the depth specified in Subsection A, above and the annular space filled with sealing material. If there is significant overburden, a conductor casing may be installed to retain it. If the material is heavily fractured, the seal should extend into a solid material. If the well is to be open-bottomed (lower section uncased), the casing shall be seated in the sealing material (see Figure 5A).

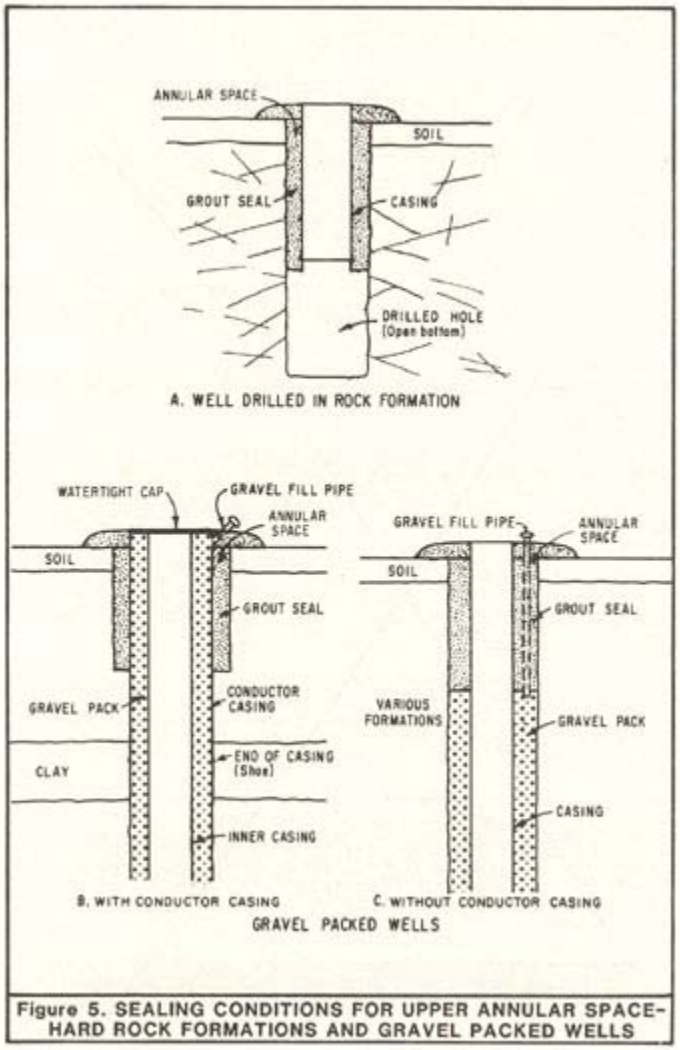


Figure 5. SEALING CONDITIONS FOR UPPER ANNULAR SPACE-HARD ROCK FORMATIONS AND GRAVEL PACKED WELLS

5. Gravel packed wells.

    a. With conductor casing. An oversized hole, at least 4 inches greater than the diameter of the conductor casing, shall be drilled to the depth specified in Subsection A, above and the annular space between the conductor casing and drilled hole filled with sealing

material. (In this case the gravel pack may extend to the top of the well but to prevent contamination by surface drainage, a welded cover shall be installed over the top in the space between the conductor casing and the production casing, see Figure 5B).

b. Without conductor casing. An oversized hole at least 4 inches greater in diameter than the production casing, shall be drilled to the depth specified in Subsection A, above and the annular space between the casing and drilled hole filled with sealing material. If gravel fill pipes are installed through the seal, the annular seal shall be of sufficient thickness to assure that there is a minimum of 2 inches between the gravel fill pipe and the wall of the drilled hole. The gravel pack shall terminate at the base of the seal (see Figure 5C). If a temporary conductor casing is used, it shall be removed as the sealing material is placed.

6. For wells situated in circumstances differing from those described above, the sealing conditions shall be as prescribed by the enforcing agency.

7. Converted wells. Wells converted from one use to another, particularly those constructed in prior years without annular seals, shall have annular seals installed to the depth required in Subsection A, above and at the thickness described in Subsection E. Where it is anticipated that a well will be converted to another use, the enforcing agency may require the installation of a seal to the depth specified for community water supply wells.Note 11

8. Wells that penetrate zones containing poor-quality water, pollutants, or contaminants. If geologic units or fill known or suspected to contain poor-quality water, pollutants, or contaminants are penetrated during drilling, and, the possibility exists that poor-quality water, pollutants, or contaminants could move through the borehole during drilling and well construction operations and significantly degrade groundwater quality in other units before sealing material can be installed, then precautions shall be taken to seal off or 'isolate' zones containing poor-quality water, pollutants, and contaminants during drilling and well construction operations. Special precautions could include the use of temporary or

permanent conductor casing, borehole liners, and specialized drilling equipment. The use of conductor casing is described in Item 1, above.

D. Conductor Casing. For community water supply wells, the minimum thickness of steel conductor casing shall be 1/4 inch for single casing or a minimum of No. 10 U. S. Standard Gage for double casing. Steel used for steel casing shall conform to the specifications for steel casing described in Section 12.

E. Sealing Material. Sealing material shall consist of neat cement, sand cement, concrete, or bentonite. Cuttings from drilling, or drilling mud, shall not be used for any part of the sealing material.

1. Water. Water used to prepare sealing mixtures should generally be of drinking water quality, shall be compatible with the type of sealing material used, be free of petroleum and petroleum products, and be free of suspended matter. In some cases water considered nonpotable, with a maximum of 2,000 milligrams per liter chloride and 1,500 mg/l sulfate, can be used for cement-based sealing mixtures. The quality of water to be used for sealing mixtures shall be determined where unknown.

2. Cement. Cement used in sealing mixtures shall meet the requirements of American Society for Testing and Materials C150, Standard Specification for Portland Cement, including the latest revisions thereof.

Types of Portland cement available under ASTM C150 for general construction are:
Type I - General purpose. Similar to American Petroleum Institute Class A.
Type II - Moderate resistance to sulfate. Lower heat of hydration than Type I. Similar to API Class B.
Type III - High early strength. Reduced curing time but higher heat of hydration than Type I. Similar to API Class C.
Type IV - Extended setting time. Lower heat of hydration than Types I and III.
Type V - High sulfate resistance.
Special cement setting accelerators and retardants and other additives may be used in some cases. Special field additives for Portland cement mixtures shall meet the requirements of ASTM C494, Standard Specification for Chemical Admixtures for Concrete, and latest revision thereof.
Hydrated lime may be added up to 10 percent of the volume of cement used to make the seal mix more fluid. Bentonite may be added to cement-based mixes, up to 6 percent by

weight of cement used, to improve fluid characteristics of the sealing mix and reduce the rate of heat generation during setting.
Dry additives should be mixed with dry cement before adding water to the mixture to ensure proper mixing, uniformity of hydration, and an effective and homogeneous seal. The water demand of additives shall be taken into account when water is added to the mix.
Minimum times required for sealing materials containing Portland cement to set and begin curing before construction operations on a well can be resumed are:

- Types I and II cement – 24 hours
- Type III cement – 12 hours
- Type V cement – 6 hours

Type IV cement is seldom used for annular seals because of its extended setting time. Allowable setting times may be reduced or lengthened by use of accelerators or retardants specifically designed to modify setting time, at the approval of the enforcing agency.
More time shall be required for cement-based seals to cure to allow greater strength when construction or development operations following the placement of the seal may subject casing and sealing materials to significant stress. Subjecting a well to significant stress before a cement-based sealing material has adequately cured can damage the seal and prevent proper bonding of cement-based sealants to casing(s).
If plastic well casing is used, care shall be exercised to control the heat of hydration generated during the setting and curing of cement in an annular seal. Heat can cause plastic casing to weaken and collapse. Heat generation is a special concern if thin-wall plastic well casing is used, if the well casing will be subject to significant net external pressure before the setting of the seal, and/or if the radial thickness of the annular seal is large. Additives that accelerate cement setting also tend to increase the rate of heat generation during setting and, thus, should be used with caution where plastic casing is employed.
The temperature of a setting cement seal can be lowered by circulating water inside the well casing and/or by adding bentonite to the cement mixture, up to 6 percent by weight of cement used.
Cement-based sealing material shall be constituted as follows:

c. Neat Cement. For Types I or II Portland cement, neat cement shall be mixed at a ratio of one 94-pound sack of Portland cement 5 to 6 gallons of 'clean' water. Additional water may be required where special additives, such as bentonite, or 'accelerators' or 'retardants' are used.

d. Sand Cement. Sand-cement shall be mixed at a ratio of not more than 188 pounds of sand to one 94-pound sack of Portland cement (2 parts sand to 1 part cement, by weight) and about 7 gallons of

clean water, where Type I or Type II Portland cement is used. This is equivalent to a '10.3 sack mix.' Less water shall be used if less sand than 2 parts sand per one part cement by weight is used. Additional water may be required when special additives, such as bentonite, or 'accelerators' or 'retardants' are used.

e. Concrete. Concrete is often useful for large volume annular seals, such as in large-diameter wells. The proper use of aggregate can decrease the permeability of the annular seal, reduce shrinkage, and reduce the heat of hydration generated by the seal.

   Concrete shall consist of Portland cement and aggregate mixed at a ratio of at least six-94 pound sacks of Portland cement per cubic yard of aggregate. A popular concrete mix consists of eight-94 pound sacks of Type I or Type II Portland cement per cubic yard of uniform 3/8-inch aggregate.

   In no case shall the size of the aggregate be more than 1/5 the radial thickness of the annular seal. Water shall be added to concrete mixes to attain proper consistency for placement, setting, and curing.

f. Mixing. Cement-based sealing materials shall be mixed thoroughly to provide uniformity and ensure that no 'lumps' exist.

   Ratios of the components of cement-based sealing materials can be varied depending on the type of cement and additives used. Variations must be approved by the enforcing agency.

3. Bentonite. Bentonite clay in 'gel' form has some of the advantages of cement-based sealing material. A disadvantage is that the clay can sometimes separate from the clay-water mixture.

Although many types of clay mixtures are available, none has sealing properties comparable to bentonite clay. Bentonite expands significantly in volumes when hydrated. Only bentonite clay is an acceptable clay for annular seals.
Unamended bentonite clay seals should not be used where structural strength of the seal is required, or where it will dry. Bentonite seals may have a tendency to dry, shrink and crack in arid and semi-arid areas of California where subsurface moisture levels can be

low. Bentonite clay seals can be adversely affected by subsurface chemical conditions, as can cement-based materials.
Bentonite clay shall not be used as a sealing material if roots from trees and other deep rooted plants might invade and disrupt the seal, and/or damage the well casing. Roots may grow in an interval containing a bentonite seal depending on surrounding soil conditions and vegetation.
Bentonite-based sealing material shall not be used for sealing intervals of fractured rock or sealing intervals of highly unstable, unconsolidated material that could collapse and displace the sealing material, unless otherwise approved by the enforcing agency.
Bentonite clay shall not be used as a sealing material where flowing water might erode it.
Bentonite clay products used for sealing material must be specifically prepared for such use. Used drilling mud and/or cuttings from drilling shall not be used in sealing material.
Bentonite used for annular seals shall be commercially prepared, powdered, granulated, pelletized, or chipped/crushed sodium montmorillonite clay. The largest dimension of pellets or chips shall be less than 1/5 the radial thickness of the annular space into which they are placed.
Bentonite clay mixtures shall be thoroughly mixed with clean water prior to placement. A sufficient amount of water shall be added to bentonite to allow proper hydration. Depending on the bentonite sealing mixture used, 1 gallon of water should be added to about every 2 pounds of bentonite. Water added to bentonite for hydration shall be of suitable quality and free of pollutants and contaminants.
Bentonite preparations normally require ½ to 1 hour to adequately hydrate. Actual hydration time is a function of site conditions and the form of bentonite used. Finely divided forms of bentonite generally require less time for hydration, if properly mixed.
Dry bentonite pellets or chips may be placed directly into the annular space below water, where a short section of annular space, up to 10 feet in length, is to be sealed. Care shall be taken to prevent bridging during the placement of bentonite seal material.

F. Radial Thickness of Seal. A minimum of two inches of sealing material shall be maintained between all casings and the borehole wall, within the interval to be sealed, except where temporary conductor casing cannot be removed, as noted in Subsection B, above. A minimum of two inches of sealing material shall also be maintained between each casing, such as permanent conductor casing, well casing, gravel fill pipes, etc., in a borehole within the interval to be sealed, unless otherwise approved by the enforcing agency. Additional space shall be provided, where needed, for casings to be properly centralized and spaced and allow the use of a tremie pipe during well construction (if required), especially for deeper wells.

G. Placement of Seal.

    1. Obstructions. All loose cuttings, or other obstructions to sealing shall be removed from the annular space before placement of the annular seal.

2. Centralizers. Well casing shall be equipped with centering guides or 'centralizers' to ensure the 2-inch minimum radial thickness of the annular seal is at least mantained. Centralizers need not be used in cases where the well casing is centered in the borehole during well construction by use of removable tools, such as hollow-stem augers.

The spacing of centralizers is normally dictated by the casing materials used, the orientation and straightness of the borehole, and the method used to install the casing. Centralizers shall be metal, plastic, or other non-degradable material. Wood shall not be used as a centralizer material. Centralizers must be positioned to allow the proper placement of sealing material around casing within the interval to be sealed.
Any metallic component of a centralizer used with metallic casing shall consist of the same material as the casing. Metallic centralizer components shall meet the same metallurgical specifications and standards as the metallic casing to reduce the potential for galvanic corrosion of the casing.

3. Foundation and Transition Seals. A packer or similar retaining device, or a small quantity of sealant that is allowed to set, can be placed at the bottom of the interval to be sealed before final sealing operations begin to form a foundation for the seal.

A transition seal, up to 5 feet in length, consisting of bentonite, is sometimes placed in the annular space to separate filter pack and cement-based sealing materials. The transition seal can prevent cement-based sealing materials from infiltrating the filter pack. A short interval of fine-grained sand, usually less than 2 feet in length, is sometimes placed between the filter pack and the bentonite transition seal to prevent bentonite from entering the filter pack. Also, fine sand is sometimes used in place of bentonite as the transition seal material.
Fine-sized forms of bentonite, such as granules and powder, are usually employed for transition seals if a transition seal is to be placed above the water level in a well boring. Coarse forms of bentonite, such as pellets and chips, are often used where a bentonite transition seal is to be placed below the water level.
Transition seals should be installed by use of a tremie pipe, or equivalent. However, some forms of bentonite may tend to bridge or clog in a tremie pipe.
Bentonite can be placed in dry form or as slurry for use in transition seals. Water should be added to the bentonite transition seal prior to the placement of cement-based sealing materials where bentonite is dry in the borehole. Care should be exercised during the addition of water to the borehole to prevent displacing the bentonite.
Water should be added to bentonite at a ratio of about 1 gallon for every 2 pounds of bentonite to allow for proper hydration. Water added to bentonite for hydration shall be of suitable quality and free of pollutants and contaminants.
Sufficient time should be allowed for bentonite transition seals to properly hydrate before cement-based sealing materials are placed. Normally, ½ to 1 hour is required for proper hydration to occur. Actual time of hydration is a function of site conditions.
The top of the transition seal shall be sounded to ensure that no bridging has occurred during placement.

4. Timing and Method of Placement. The annular space shall be sealed as soon as practical after completion of drilling or a stage of drilling. In no case shall the annular space be left unsealed longer than 14 days following the installation of casing.

Sealing material shall be placed in one continuous operation from the bottom of the interval to be sealed, to the top of the interval. Where the seal is more than 100 feet in length, the deepest portion of the seal may be installed first and allowed to set or partially set. The deep initial seal shall be no longer than 10 feet in length. The remainder of the seal shall be placed above the initial segment in one continuous operation.
Sealing material shall be placed by methods (such as the use of a tremie pipe or equivalent) that prevent freefall, bridging, or dilution of the sealing material, or separation of sand or aggregate from the sealing material. Annular sealing materials shall not be installed by freefall unless the interval to be sealed is dry and no deeper than 30 feet below ground surface.

5. Groundwater Flow. Special care shall be used to restrict the flow of groundwater into a well boring while placing material, where subsurface pressure causing the flow of water is significant.

6. Verification. It shall be verified that the volume of sealing material placed at least equals or exceeds the volume to be sealed.

Pressure. Pressure required for placement of sealing materials shall be maintained long enough for cement-based sealing materials to properly set.

Section 10. Surface Construction Features.

A. Openings. Openings into the top of the well which are designed to provide access to the well, i.e., for measuring, chlorinating, adding gravel, etc., shall be protected against entrance of surface waters or foreign matter by installation of

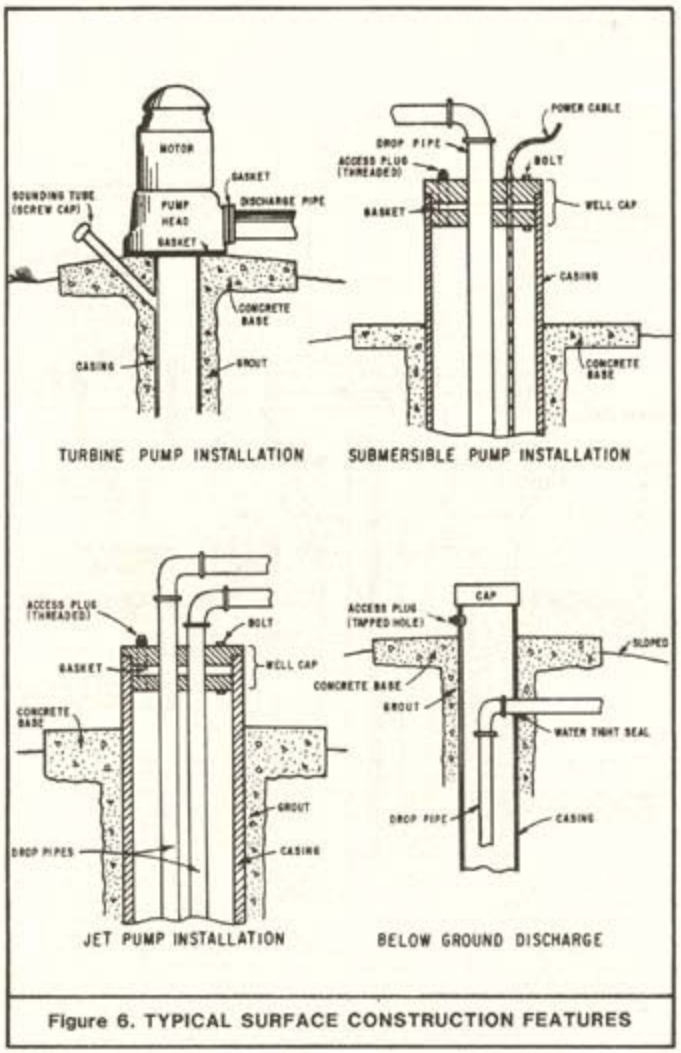


Figure 6. TYPICAL SURFACE CONSTRUCTION FEATURES

watertight caps or plugs. Access openings designed to permit the entrance or egress of air or gas (air or casing vents) shall terminate above the ground and above known flood levels and shall be protected against the entrance of foreign material by installation of down-turned and screened "U" bends (see Figures 6 and 7).

All other openings (holes, crevices, cracks, etc.) shall be sealed.
A "sounding tube",Note 12 taphole with plug, or similar access (see Figure 6) for the introduction of water level measuring devices shall be affixed to the casing of all wells. For wells fitted with a "well cap" the cap shall have a removable plug for this purpose.

1. Where the pump is installed directly over the casing, a watertight seal (gasket) shall be placed between the pump head and the pump base (slab), or a water-tight seal (gasket) shall be placed between the pump base and the rim of the casing, or a "well cap" shall be installed to close the annular opening between the casing and the pump column pipe (see Figure 6 and 7).

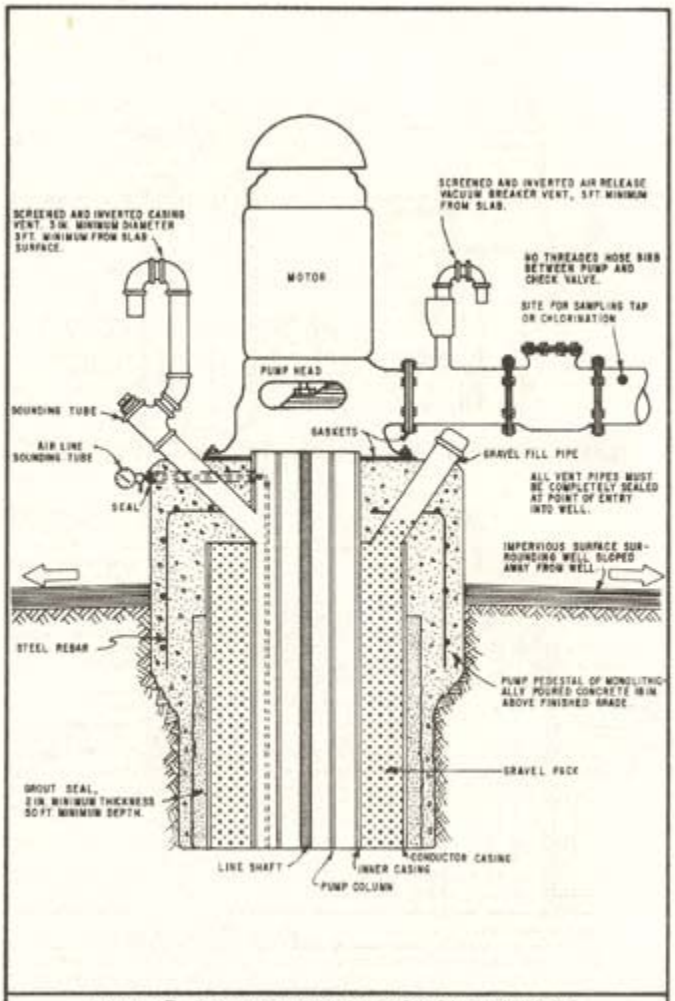


Figure 7. SURFACE CONSTRUCTION FEATURES COMMUNITY WATER SUPPLY WELL

2. Where the pump is offset from the well or where a submersible pump is used, the opening between the well casing and any pipes or cables which enter the well shall be closed by a watertight seal or "well cap".

3. If the pump is not installed immediately or if there is a prolonged interruption in construction of the well, a watertight cover shall be installed at the top of the casing.

4. A watertight seal or gasket shall be placed between the pump discharge head and the discharge line; or, in the event of a below-ground discharge, between the discharge pipe and discharge line (see Figures 6 and 7).

5. Bases. A concrete base or pad, sometimes called a pump block or pump pedestal, shall be constructed at ground surface around the top of the well casing and contact the annular seal, unless the top of the casing is below ground surface, as provided by Subsection B, below.

The base shall be free of cracks, voids, or other significant defects likely to prevent water tightness. Contacts between the base and the annular seal, and the base and the well casing, must be water tight and must not cause the failure of the annular seal or well casing. Where cement-based annular sealing material is used, the concrete base shall be poured before the annular seal has set, unless otherwise approved by the enforcing agency.

The upper surface of the base shall slope away from the well casing. The base shall extend at least two feet laterally in all directions from the outside of the well boring, unless otherwise approved by the enforcing agency. The base shall be a minimum of 4 inches thick.

A minimum base thickness of 4 inches is normally acceptable for small diameter, single-user domestic wells. The base thickness should be increased for larger wells. Shape and design requirements for well pump bases vary with the size, weight, and type of pumping equipment to be installed, engineering properties of the soil on which the base is to be placed, and local environmental conditions. A large variety of base designs have been used. The Vertical Turbine Pump Association has developed a standard base design for large lineshaft turbine pumps. This design consists of a square, concrete pump base whose design is dependent on bearing weight and site soil characteristics.

Where freezing conditions require the use of a pitless adapter, and the well casing and annular seal do not extend above ground surface or into a pit or vault, a concrete base or pad shall be constructed as a permanent location monument for the covered well. The base shall be 3 feet in length on each side and 4 inches in thickness, unless otherwise approved by the enforcing agency. The base shall have a lift-out section, or equivalent, to allow access to the well. The lift-out shall facilitate inspection and repair of the well.

6. Where the well is to be gravel packed and the pack extends to the surface, a watertight cover shall be installed between the conductor casing and the inner casing (see also Section 9, Subsection B, Item 5 and Figure 5).

B. Well Pits or Vaults. The use of well pits, vaults, or equivalent features to house the top of a well casing below ground surface shall be avoided, if possible, because of their susceptibility to the entrance of poor-quality water, contaminants and pollutants. Well pits or vaults can only be used if approval is obtained from the enforcing agency. A substitute device, such as a pitless adapter or pitless adapter unit (a variation), should almost always be used in place of a vault or pit.

Pitless adapters and units were developed for use in areas where prolonged freezing occurs, and below ground (frost line) discharges are common. Both the National Sanitation Foundation and Water Systems Council have developed standards for the manufacture and installation of pitless adapters and units. (See Appendix E, Bibliography, Bulletin 74-81.)

If a pit or vault is used it shall be watertight and structurally sound. The vault shall extend from the top of the annular seal to at least ground surface.

The vault shall contact the annular seal in a manner to form a watertight and structurally sound connection. Contacts between the vault and the annular seal, and the vault and the well casing, if any, shall not fail or cause the failure of the well casing or annular seal. Where cement-based annular seal materials are used, the vault shall be set into or contact the annular seal material before it sets, unless otherwise approved by the enforcing agency. If bentonite-based sealing material is used for the annular seal, the vault should be set into the bentonite before it is fully hydrated.

Cement-based sealing material shall be placed between the outer walls of the vault and the excavation into which it is placed to form a proper, structurally sound foundation for the vault, and to seal the space between the vault and excavation.

The sealing material surrounding a vault shall extend from the top of the annular seal to ground surface unless precluded in areas of freezing. If cement-based sealing material is used for both the annular seal and the space between the excavation and vault, the sealing material shall be emplaced in a 'continuous pour'. In other words, cement-based sealing material shall be placed between the vault and excavation and contact the cement-based annular seal before the annular seal has set.

The vault cover or lid shall be watertight but shall allow the venting of gases. The lid shall be fitted with a security device to prevent unauthorized access. The outside of the lid shall be clearly and permanently labeled 'WATER WELL'. The vault and its lid shall be strong enough to support vehicular traffic where such traffic might occur.

The top of the vault shall be set at, or above, grade so that drainage is away from the vault. The top of the well casing contained within the vault shall be covered in accordance with requirements under Subsection A, above, so that water, contaminants, and pollutants that may enter the vault will not enter the well casing. The cover shall be provided with a pressure relief or venting device for gases.

C. Enclosure of Well and Appurtenances. In community water supply wells, the well and pump shall be located in a locked enclosure to exclude access by unauthorized persons.

D. Pump Blowoff. When there is a blowoff or drain line from the pump discharge, it shall be located above any known flood levels and protected against the possibility of backsiphonage or backpressure. The blowoff or drain line shall not be connected to any sewer or storm drain except when connected through an air gap.

E. Air Vents. In community water supply wells to minimize the possibility of contamination caused by the creation of a partial vacuum during pumping, a casing vent shall be installed (Figure 7). In addition, to release air trapped in the pump column when the pump is not running, air release vents shall be installed (Figure 7). Air vents are also recommended for other types of wells except those having jet pump installations requiring positive pressure (which cannot have a vent).

F. Backflow Prevention. All pump discharge pipes not discharging or open to the atmosphere shall be equipped with an automatic device to prevent backflow and/or back siphonage into a well. Specific backflow prevention measures are required for drinking water supply wells as prescribed in Title 17, Public Health, California Code of Regulations (Sections 7583-7585 and 7601-7605, effective June 25, 1987).

Irrigation well systems, including those used for landscape irrigation, and other well systems that employ, or which have been modified to employ, chemical feeders or injectors shall be equipped with a backflow prevention device(s) approved by the enforcing agency.

Part III. Destruction of Wells

Section 20. Purpose of Destruction.

A well that is no longer usefulNote 21 (including exploration and test holes) must be destroyed in order to: 1. Assure that the groundwater supply is protected and preserved for further use. 2. Eliminate the potential physical hazard.

Section 21. Definition of "Abandoned" Well.

A well is considered 'abandoned' or permanently inactive if it has not been used for one year, unless the owner demonstrates intention to use the well again. In accordance with Section 115700 of the California Health and safety Code, the well owner shall properly maintain an inactive well as evidence of intention for future use in such a way that the following requirements are met:

(1) The well shall not allow impairment of the quality of water within the well and groundwater encountered by the well.

(2) The top of the well or well casing shall be provided with a cover, that is secured by a lock or by other means to prevent its removal without the use of equipment or tools, to prevent unauthorized access, to prevent a safety hazard to humans and animals, and to

prevent illegal disposal of wastes in the well. The cover shall be watertight where the top of the well casing or other surface openings to the well are below ground level, such as in a vault or below known levels of flooding. The cover shall be watertight if the well is inactive for more than five consecutive years. A pump or motor, angle drive, or other surface feature of a well, when in compliance with the above provisions, shall suffice as a cover.
(3) The well shall be marked so as to be easily visible and located, and labeled so as to be easily identified as a well.
(4) The area surrounding the well shall be kept clear of brush, debris, and waste materials.
If a pump has been temporarily removed for repair or replacement, the well shall not be considered 'abandoned' if the above conditions are met. The well shall be adequately covered to prevent injury to people and animals and to prevent the entrance of foreign material, surface water, pollutants, or contaminants into the well during the pump repair period.
Section 22. General Requirement.
All "abandoned" wells and exploration or test holes shall be destroyed. The objective of destruction is to restore as nearly as possible those subsurface conditions which existed before the well was constructed taking into account also changes, if any, which have occurred since the time of construction. (For example, an aquifer which may have produced good quality water at one time but which now produces water of inferior quality, such as a coastal aquifer that has been invaded by seawater.)

Destruction of a well shall consist of the complete filling of the well in accordance with the procedures described in Section 23 (following).

Section 23. Requirements for Destroying Wells.

A. Preliminary Work. Before the well is destroyed, it shall be investigated to determine its condition, details of construction, and whether there are obstructions that will interfere with the process of filling and sealing. This may include the use of downhole television and photography for visual inspection of the well.

1. Obstructions. The well shall be cleaned, as needed, so that all undesirable materials, including obstructions to filling and sealing, debris, oil from oil-lubricated pumps, or pollutants and contaminants that could interfere with well destruction are removed for disposal.

The enforcing agency shall be notified as soon as possible if pollutants and contaminants are known or suspected to be in a well to be destroyed. Well destruction operations may then proceed only at the approval of the enforcing agency.
The enforcing agency should be contacted to determine requirements for proper disposal of materials removed from a well to be destroyed.

2. Where necessary, to ensure that sealing material fills not only the well casing but also any annular space or nearby voids within the zone(s) to be sealed, the casing should be perforated or otherwise punctured.

3. In some wells, it may be necessary or desirable to remove a part of the casing. However, in many instances this can be done only as the well is filled. For dug wells, as much of the lining as possible (or safe) should be removed prior to filling.

B. Filling and Sealing Conditions. Following are requirements to be observed when certain conditions are encountered:

1. Wells situated in unconsolidated material in an unconfined groundwater zone. In all cases the upper 20 feet of the well shall be sealed with suitable sealing material and the remainder of the well shall be filled with suitable fill, or sealing material. (See Figure 9A, of Bulletin 74- 81.)

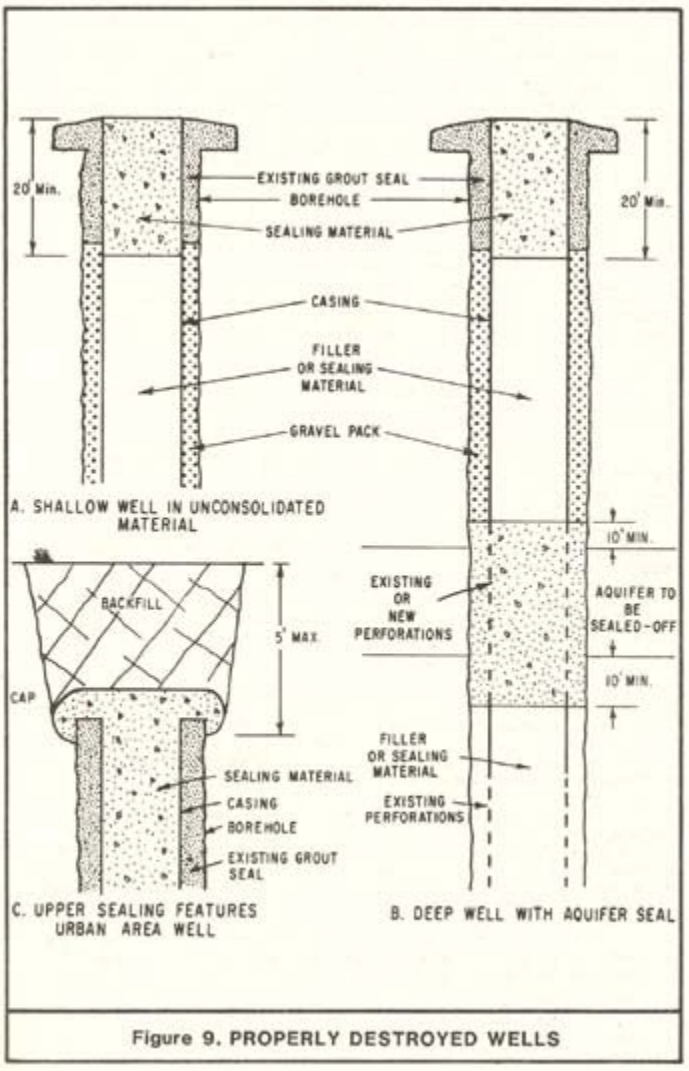


Figure 9. PROPERLY DESTROYED WELLS

2. Well penetrating several aquifers or formations. In all cases the upper 20 feet of the well shall be sealed with impervious material.

In areas where the interchange of water between aquifers will result in a significantNote 22 deterioration of the quality of water in one or more aquifers, or will result in a loss of artesian pressure, the well shall be filled and sealed so as to prevent such interchange. Sand or other suitable inorganic material may be placed opposite the producing aquifers and other formations where impervious sealing material is not required. To prevent the vertical movement of water from the producing formation, impervious material must be placed opposite confining formations above and below the producing formations for a distance of 10 feet or more. The formation producing the deleterious water shall be sealed by placing impervious material opposite the formation, and opposite the confining

formations for a sufficient vertical distance (but no less than 10 feet) in both directions, or in the case of "bottom" waters, in the upward direction. (See Figure 9B.)
In locations where interchange is in no way detrimental, suitable inorganic material may be placed opposite the formations penetrated. When the boundaries of the various formations are unknown, alternate layers of impervious and pervious material shall be placed in the well.

3. Well penetrating creviced or fractured rock. If creviced or fractured rock formations are encountered just below the surface, the portions of the well opposite this formation shall be sealed with neat cement, sand-cement grout, or concrete. If these formations extend to considerable depth, alternate layers of coarse stoneNote 23 and cement grout or concrete may be used to fill the well. Fine grained material shall not be used as fill material for creviced or fractured rock formations.

4. Well in noncreviced, consolidated formation. The upper 20 feet of a well in a noncreviced, consolidated formation shall be filled with impervious material. The remainder of the well may be filled with clay or other suitable inorganic material.

5. Well penetrating specific aquifers, local conditions. Under certain local conditions, the enforcing agency may require that specific aquifers or formations be sealed off during destruction of the well.

C. Placement of Material. The following requirements shall be observed in placing fill or sealing material in wells to be destroyed:

1. The well shall be filled with the appropriate material (as described in Subsection D of this section) from the bottom of the well up.

2. Where neat cement grout, sand-cement grout, or concrete is used, it shall be poured in one continuous operation.

3. Sealing material shall be placed in the interval or intervals to be sealed by methods that prevent free fall, dilution, and/or separation of aggregate from cementing materials.

4. Where the head (pressure) producing flow is great, special care and methods must be used to restrict the flow while placing the sealing material. In such cases, the casing must be perforated opposite the area to be sealed and the sealing material forced out under pressure into the surrounding formation.

5. In destroying gravel-packed wells, the casing shall be perforated or otherwise punctured opposite the area to be sealed. The sealing material shall then be placed within the casing, completely filling the portion adjacent to the area to be sealed and then forced out under pressure into the gravel envelope.

6. When pressure is applied to force sealing material into the annular space, the pressure shall be maintained for a length of time sufficient for the cementing mixture to set.

7. To assure that the well is filled and there has been no jamming or "bridging" of the material, verification shall be made that the volume of material placed in the well installation at least equals the volume of the empty hole.

D. Materials. Requirements for sealing and fill materials are as follows:

8. Impervious Sealing Materials. No material is completely impervious. However, sealing materials shall have such low permeability that the volume of water passing through them is of small consequence.

Suitable impervious materials include neat cement, sand-cement grout, concrete, and bentonite clay, all of which are described in Section 9, Subsection D, "Sealing Material" of these standards; and well-proportioned mixes of silts, sands, and clays (or cement), and native soils that have a coefficient of permeability of less than 10 feet per year.Note 24 Used drilling muds are not acceptable.

9. Filler Material. Many materials are suitable for use as filler in destroying wells. These include clay, silt, sand, gravel, crushed stone, native soils, mixtures of the aforementioned types, and those described in the preceding paragraph. Material containing organic matter shall not be used.

D. Additional Requirements for Wells in Urban Areas.

In incorporated areas or unincorporated areas developed for multiple habitation, to make further use of the well site, the following additional requirements must be met (see Figure 9C):

1. A hole shall be excavated around the well casing to a depth of 5 feet below the ground surface and the well casing removed to the bottom of the excavation.

2. The sealing material used for the upper portion of the well shall be allowed to spill over into the excavation to form a cap.

3. After the well has been properly filled, including sufficient time for sealing material in the excavation to set, the excavation shall be filled with native soil.

Temporary Cover. During periods when no work is being done on the well, such as overnight or while waiting for sealing material to set, the well and surrounding excavation, if any, shall be covered. The cover shall be sufficiently strong and well enough anchored to prevent the introduction of foreign material into the well and to protect the public from a potentially hazardous situation.

EXHIBIT C

EXHIBIT D

Part II. Monitoring Well Construction

Section 8. Well Location With Respect to Pollutants and Contaminants, and Structures.

Monitoring wells are usually constructed to observe conditions at defined or required locations. Monitoring well locations are usually selected on the basis of known or expected hydrologic, geologic, and water quality conditions and the location of pollutant or contaminant sources. Monitoring wells frequently need to be located close to or within areas of pollution or contamination.

A. *Separation.* Monitoring wells shall be located an adequate distance from known or potential sources of pollution and contamination, including those listed in Section 8 of the Water Well Standards, unless regulatory or legitimate data requirements necessitate they be located closer.

B. *Flooding and Drainage.* Monitoring wells should be located in areas protected from flooding, if possible. Provisions for locating monitoring wells in areas of flooding and drainage are contained in Section 8 of the Water Well Standards.

C. *Accessibility.* All monitoring wells shall be located an adequate distance from buildings and other structures to allow access for well maintenance, modification, repair, and destruction, unless otherwise approved by the enforcing agency.

Disposal of Wastes When Drilling in Contaminated or Polluted Areas. Drill cuttings and wastewater from monitoring wells or exploration holes in areas of known or suspected contamination or pollution shall be disposed of in accordance with all applicable federal, State, and local requirements. The enforcing agency should be contacted to determine requirements for the proper disposal of cuttings and wastewater.

Section 9. Sealing the Upper Annular Space.

The space between the monitoring well casing and the wall of the well boring, usually referred to as the "annular space," shall be effectively sealed to prevent it from being a preferential pathway for the movement of poor quality water, pollutants, and contaminants. Since monitoring wells are often constructed to obtain water from discrete intervals, a secondary purpose of the annular seal can be to isolate the well intake section or screen to

one water-bearing unit. The annular seal can also serve to protect the structural integrity of the well casing and to protect the casing from chemical attack and corrosion. Because monitoring wells are often located close to, or within areas affected by pollutants and contaminants, an effective annular seal is often critical for the protection of groundwater quality.

General discussion of sealing methods and requirements for monitoring wells is contained in Section 9, Section 13, and Appendix B, of the Water Well Standards. Special requirements for monitoring wells include the following:

A. *Minimum Depth of Annular Seal.*

1. *Water quality monitoring wells and monitoring wells constructed in areas of known or suspected pollution or contamination.* The annular space shall be sealed from the top of the filter pack or monitoring zone to ground surface, unless otherwise approved by the enforcing agency. The top of the filter pack or monitoring zone shall not extend into another water-bearing unit above the single water-bearing unit being monitored unless otherwise approved by the enforcing agency. The filter pack or monitoring zone shall not extend into any confining layers that overlie or underlie the unit to be monitored, unless otherwise approved by the enforcing agency. The annular surface seal shall be no less than 20 feet in length.

   Seal lengths less than 20 feet are permissible only if shallow zones will be monitored and approval has been obtained from the enforcing agency. If possible, special protection shall be provided where a reduced-length seal is used, as described in Section 8 of the Water Well Standards.

2. *Other Monitoring Wells.* The upper annular seal shall extend from ground surface to a minimum depth of 20 feet. An annular seal less than 20 feet in length is permissible if provisions in Item 1, above, are followed.

3. *Sealing Off Strata.* Additional annular sealing material shall be placed below the minimum depth of the upper annular seal, as is needed, to prevent the movement of poor-quality water, pollutants, and contaminants through the well to zones of good-quality water. Requirements for sealing off zones are in Section 13 of the Water Well Standards.

4. *Shallow Water Level Observation Wells.* Water level observation wells less than 15 feet in total depth that are used to assess root zone drainage in agricultural areas are exempt from an annular surface seal requirement, unless otherwise required by the enforcing agency.

5. *Areas of Freezing.* The top of the annular seal may be below ground surface in areas where freezing is likely. Such areas include those listed in Section 9 of the Water Well Standards. The top of the annular seal shall not be more than 4 feet below ground surface. The remainder of the space above the seal may be made an integral part of a vault, in accordance with Section 10, Subsection E, below.

6. *Vaults.* At the approval of the enforcing agency, the top of the annular seal and well casing can be below ground surface where traffic or other conditions require. In no case shall the top of the annular seal be more than 4 feet below ground surface.

   The top of the annular seal shall contact a suitable, watertight, structurally-sound subsurface vault, or equivalent feature, that encloses the top of the well casing in accordance with Section 10, Subsection E below. The vault shall extend from the top of the annular seal to at least ground surface.

B. *Sealing Conditions.*

1. Temporary Conductor Casing. If "temporary" conductor casing is used during drilling, it shall be removed during the placement of the casing and annular seal materials, as described in Section 9 of the Water Wells Standards. If the temporary conductor casing "cannot" be removed, as defined in Section 9 of the Water Well Standards, sealing material shall be placed between the conductor casing and borehole wall, and between the well casing and conductor casing, in accordance with methods described in Section 9 of the Water Well Standards. Sealing material shall extend to at least the depths specified in Subsection A of this section.

2. Permanent Conductor Casing. If a permanent conductor casing is to be installed, the monitoring well borehole diameter shall be at least 4 inches greater than the outside diameter of the conductor casing. The inner diameter of the permanent conductor casing shall in turn be at least 4 inches greater than the outside diameter of the well casing.

   Sealing material shall be placed between the permanent conductor casing and the borehole

wall, and the conductor casing and the well casing. The sealing material shall extend to at least the depths specified in Subsection A of this section.

C. *Radial Thickness of Seal.* A minimum of two inches of sealing material shall be maintained between all casings and the borehole wall, within the interval to be sealed, except as noted in Section 9 of the Water Well Standards. At least two inches of the sealing material shall also be maintained between all "casings" in a borehole, within the interval to be sealed unless otherwise approved by the enforcing agency. Additional space shall be provided, where needed, to allow casings to be properly centralized and spaced and allow the use of a tremie pipe during well construction (if required), especially for deeper wells.

D. *Sealing Material.* Sealing material shall consist of neat cement, sand- cement, or bentonite clay. Cement-based sealing material shall be used opposite fractured rock, unless otherwise approved by the enforcing agency. Concrete shall be used only with the approval of the enforcing agency.

Sealing material shall be selected based on required structural, handling, and sealing properties, and the chemical environment into which it is placed. Used drilling mud or cuttings from drilling shall not be used for any part of sealing material.

1. *Water.* Water used for sealing mixtures should generally be of drinking water quality, shall be compatible with the type of sealing material used, shall be free of petroleum and petroleum products, and shall be free of suspended matter. Good-quality water is necessary to ensure that sealing materials achieve proper consistency for placement and achieve adequate structural and sealing properties.

Nonpotable water can sometimes be used for preparing cement-based sealing materials. In no case shall the concentration of chloride in water used in cement-based sealing material exceed 2,000 milligrams per liter. Sulfate shall not exceed 1,500 mg/l.

Water used for sealing material shall be chemically analyzed if unknown. Only drinking-quality water of known composition should be used for preparing sealing mixtures for monitoring wells to be used for sensitive water-quality determinations.

2. *Cement-Based Sealing Materials.* Discussion and standards for cement- based sealing materials are contained in Section 9 of the Water Well Standards. Special considerations that apply to monitoring wells are:

a. *Additives.* Care should be exercised in the use of special additives for cement-based sealing materials, such as those used for modifying cement setting times. Some additives could interfere with sensitive water quality determinations.

b. *Cooling Water.* In the case of water quality monitoring wells, care should be exercised in the use of circulating cooling water to protect plastic casing from heat build-up during setting of cement-based sealing materials. Water introduced and/or circulated in a well for cooling could interfere with water quality determinations.

3. *Bentonite-Based Sealing Materials.* Discussion and standards for bentonite-based sealing materials are contained in Section 9 of the Water Well Standards.

E. *Transition Seal.* A bentonite-based transition seal, up to 5 feet in length, is often placed in the annular space to separate filter pack and cement-based sealing materials. The transition seal can prevent cement-based sealing materials from infiltrating the filter pack. A short interval of fine-grain sand, usually less than 2 feet in length, is often placed between the filter pack and the bentonite transition seal to prevent bentonite from entering the filter pack. Also, fine sand is sometimes used in place of bentonite as the transition seal material.

Fine grain forms of bentonite, such as granules and powder, are usually employed for a transition seal if a transition seal is to be placed above the water level in a well boring. Coarse forms of bentonite, such as pellets and chips, are often used where a bentonite transition seal is to be placed below the water level.

Transition seals should be installed by using a tremie pipe or equivalent. However, some forms of bentonite may tend to bridge or clog in a tremie pipe.

Bentonite can be replaced in the well annulus in dry form or as slurry for transition seals. Water should be added to the bentonite transition seal prior to the placement of cement-based sealing materials where the bentonite is dry in the borehole. Care should be exercised during the addition of water to the borehole to prevent displacing the bentonite.

Water should be added to bentonite at a ratio of about 1 gallon for every 2 pounds of bentonite to allow for proper hydration. Water added to bentonite for hydration or to make a slurry shall be of suitable quality and free of pollutants and contaminants.

Sufficient time should be allowed for bentonite transition seals to properly hydrate before cement-based sealing materials are placed. Normally, ½ to 1 hour is required for hydration to occur. Actual time of hydration is a function of site conditions.

The top of the transition seal shall be sounded to ensure that no bridging occurred during placement.

F. *Placement of Annular Seal Material.* All loose cuttings and other obstructions shall be removed from the annular space before sealing materials are placed. Sealing may be accomplished by using pressure grouting techniques, a tremie pipe, or equivalent. Sealing materials shall be installed as soon as possible during well construction operations. Sealing materials shall not be installed by "free-fall" from the surface unless the interval to be sealed is dry and less than 30 feet deep.

Casing spacers shall be used within the interval(s) to be sealed to separate individual well casing strings from one another in a borehole of a nested monitoring well. The spacers shall be placed at intervals along the casing to ensure a minimum separation of 2 inches between individual casing strings. Spacers shall be constructed of corrosion-resistant metal, plastic, or other non-degradable material. Wood shall not be used as spacer material.

Any metallic component of a spacer used with metallic casing shall consist of the same material as the casing. Metallic spacer components shall meet the same metallurgical specifications and standards as the casing to reduce the potential for galvanic corrosion of the casing.

The spacing of casing spacers is normally dictated by casing materials used, the orientation and straightness of the borehole, and the method used to install the casing. Spacers shall not be more than 12 inches in length and shall not be placed closer than 10 feet apart along a casing string within the interval to be sealed, unless otherwise approved by the enforcing agency.

Casing spacers shall be designed to allow the proper passage and distribution of sealing material around casing(s) within the interval(s) to be sealed.

Additional discussion and standards for placement of the annular seal are contained in Section 9, Section 13, and Appendix B of the Water Well Standards.

Section 10. Surface Construction Features.

Surface construction features of a monitoring well shall serve to prevent physical damage to the well; prevent entrance of surface water, pollutants, and contaminants; and prevent unauthorized access.

A. *Locking Cover.* The top of a monitoring well shall be protected by a locking cover or equivalent level of protection to prevent unauthorized access.

B. *Casing Cap.* The top of a monitoring well casing shall be fitted with a cap or "sanitary seal" to prevent surface water, pollutants, or contaminants from entering the well bore. Openings

or passages for water level measurement, venting, pump power cables, discharge tubing, and other access shall be protected against entry of surface water, pollutants, and contaminants.

C. *Flooding.* The top of the well casing shall terminate above ground surface and known levels of flooding, except where site conditions, such as vehicular traffic, will not allow.

D. *Bases.* Unless otherwise approved by the enforcing agency, a concrete base or pad shall be constructed around the top of a monitoring well casing at ground surface and contact the annular seal, unless the top of the casing is below ground surface as provided by Subsection E, below. The base shall be at least 4 inches thick and shall slope to drain away from the well casing. The base shall extend at least two feet laterally in all directions from the outside of the well boring, unless otherwise approved by the enforcing agency.

The base shall be free of cracks, voids, and other significant defects likely to prevent water tightness. Contacts between the base and the annular seal, and the base and the well casing must be water tight and must not cause the failure of the well casing or annular seal.

Where cement-based annular sealing material is used, the concrete base shall be poured before the annular seal has set, unless otherwise approved by the enforcing agency.

E. *Vaults.* At the approval of the enforcing agency, the top of the well casing may be below ground surface because of traffic or other critical considerations. A structurally-sound watertight vault, or equivalent feature, shall be installed to house the top of a monitoring well that is below ground surface. The vault shall extend from the top of the annular seal to at least ground surface. In no case shall the top of the annular seal be more than 4 feet below ground surface.

The vault shall contact the annular seal in a manner to form a watertight and structurally sound connection. Contacts between the vault and the annular seal, and the vault and the well casing, if any, shall not fail or cause the failure of the well casing or annular seal.

Where cement-based annular seal materials are used, the vault shall be set into or contact the annular seal material before it sets, unless otherwise approved by the enforcing agency. If bentonite-based sealing material is used for the annular seal, the vault should be set into the bentonite before it is fully hydrated.

Cement-based sealing material shall be placed between the outer walls of the vault and the excavation into which it is placed to form a proper, structurally sound foundation for the

vault, and to seal the space between the vault and excavation. Bentonite-based sealing material may be used between the vault and excavation at the approval of the enforcing agency.

Sealing material surrounding a vault shall extend from the top of the annular seal to ground surface, unless precluded in areas of freezing. If cement-based sealing material is used for both the annular seal and the space between the excavation and vault, the sealing material shall be placed in a "continuous pour." In other words, cement-based sealing material shall be placed between the vault and excavation and contact the cement-based annular seal before the annular seal has set.

The vault cover or lid shall be watertight but shall allow the venting of gases, unless otherwise approved by the enforcing agency. The lid shall be fitted with a security device to prevent unauthorized access. The lid shall be strong enough to support vehicular traffic where such traffic might occur.

The top of the vault shall be set at or above grade so drainage is away from the vault. The top of the well casing contained within the vault shall be covered in accordance with requirements under Subsections A and B, above, so that water, contaminants, or pollutants that may enter the vault will not enter the well casing.

F. *Protection From Vehicles.* Protective steel posts, or the equivalent, shall be installed around a monitoring well casing where it is terminated above ground surface in areas of vehicular traffic. The posts shall be easily seen and shall protect the well from vehicular impact.

Additional requirements for surface construction features are in Section 10 of the Water Well Standards.

Part III. Destruction of Wells

Section 20. Purpose of Destruction.

A well that is no longer useful[Note 21] (including exploration and test holes) must be destroyed in order to: 1. Assure that the groundwater supply is protected and preserved for further use. 2. Eliminate the potential physical hazard.

Section 21. Definition of "Abandoned" Well.

A well is considered 'abandoned' or permanently inactive if it has not been used for one year, unless the owner demonstrates intention to use the well again. In accordance with Section 115700 of the California Health and safety Code, the well owner shall properly maintain an

inactive well as evidence of intention for future use in such a way that the following requirements are met:

(1) The well shall not allow impairment of the quality of water within the well and groundwater encountered by the well.

(2) The top of the well or well casing shall be provided with a cover, that is secured by a lock or by other means to prevent its removal without the use of equipment or tools, to prevent unauthorized access, to prevent a safety hazard to humans and animals, and to prevent illegal disposal of wastes in the well. The cover shall be watertight where the top of the well casing or other surface openings to the well are below ground level, such as in a vault or below known levels of flooding. The cover shall be watertight if the well is inactive for more than five consecutive years. A pump or motor, angle drive, or other surface feature of a well, when in compliance with the above provisions, shall suffice as a cover.

(3) The well shall be marked so as to be easily visible and located, and labeled so as to be easily identified as a well.

(4) The area surrounding the well shall be kept clear of brush, debris, and waste materials.

If a pump has been temporarily removed for repair or replacement, the well shall not be considered 'abandoned' if the above conditions are met. The well shall be adequately covered to prevent injury to people and animals and to prevent the entrance of foreign material, surface water, pollutants, or contaminants into the well during the pump repair period.

Section 22. General Requirement.

All "abandoned" wells and exploration or test holes shall be destroyed. The objective of destruction is to restore as nearly as possible those subsurface conditions which existed before the well was constructed taking into account also changes, if any, which have occurred since the time of construction. (For example, an aquifer which may have produced good quality water at one time but which now produces water of inferior quality, such as a coastal aquifer that has been invaded by seawater.)

Destruction of a well shall consist of the complete filling of the well in accordance with the procedures described in Section 23 (following).

AB 3030 GROUNDWATER MANAGEMENT WORKSHOP OF
THE BOARD OF DIRECTORS OF
CARPINTERIA COUNTY WATER DISTRICT
CARPINTERIA CITY COUNCIL CHAMBER
SATURDAY, MARCH 9, 1996 AT 9:00 A.M.

AGENDA

1. CALL TO ORDER, PRESIDENT LEMERE

2. WELCOMING REMARKS AND INTRODUCTIONS, PRESIDENT LEMERE

   a. Introductions of Directors and Staff

   b. Public (self) Introductions

   c. Why we are here - Statement of Purpose of Workshop

   d. Desired Outcome of Workshop

   e. Schedule of Workshop

9:15 - 10:00	Review of Plan by Manager
10:00 - 10:15	Break
10:15 - 11:00	Questions and Answers
11:00	Directors comments and closing remarks by President

3. REVIEW OF DRAFT PLAN, MANAGER

4. QUESTIONS AND ANSWERS, PRESIDENT

5. DIRECTORS COMMENTS

6. COMMITTEE FORMATION / TIMETABLE

7. CLOSING REMARKS, PRESIDENT LEMERE

   Thank you to City for use of Council Chamber; thank you to all for participation, etc. ag3996

GROUNDWATER MANAGEMENT WORKSHOP
AT CARPINTERIA CITY HALL
MARCH 9, 1996

1. Question from unidentified citizen: What does County of Santa Barbara have to do with this? Will they or can they have any jurisdiction? Chip Wullbrandt answered that County of Santa Barbara will have jurisdiction if a plan is not adopted by the Water District.

2. Dennis Kuttler wanted to know if an environmental impact report was required. Chip Wullbrandt, in a very lengthy answer said no.

   Charles Hamilton also said that the County of Santa Barbara is involved in process for well permits, abandonment of wells and in public health and safety.

3. George Bliss requested that those who ask questions to identify themselves.

4. Scott Van Der Kar had some comments about the cost of Cachuma Water versus the cost of the District pumping the wells.

5. John Murphy wanted to know if this was just another way for the District to generate revenue.

6. Someone asked how the Basin was defined and if it was fully known.

7. Dennis Kuttler wanted a better understanding of "safe yield" of the Basin.

8. Someone asked where the water was if there is 170,000 acre feet in the Basin and we are only using 5,000 acre feet as a safe yield. I think at this point Harold Sullwold said he didn't know where or was sure of where those numbers came from.

9. Fred Lemere asked how much the Basin could be overdrafted to cause saltwater intrusion. Harold Sullwold said he didn't know.

10. Bob Lieberknecht said USGS used a safe yield of 1,700 acre feet in the 1940's, 3,400 acre feet in the 1960's and the Geo-Tech study used 5,000 acre feet as the safe yield.

11. Scott Van Der Kar wanted to know if there was any data to indicate if the "recharge" was different in each of the four aquifers. Answer was no data.

12. Chip Wullbrandt discussed co-ordinating data with the County of Santa Barbara as they use 5,000 acre feet as the safe yield of the Basin.

13. Peter Lapidus - exchange

14. Scott Van Der Kar uses more water from his well to water the trees than he used CCWD water through the meter. CCWD water costs too much. He only used enough CCWD water to keep trees alive.

15. Dave Leland - Are we trying to create another agency?
    Charles Hamilton - No.

16. Scott Van Der Kar - Can outsiders take our water?
    Charles Hamilton - Not likely.
    Chip Wullbrandt said that drilling and exporting water eleswhere not excluded.

17. Water Quality - Chip Wullbrandt said that water with a TDS of 1000 ppm or higher has to be treated. We need to help ourselves.

18. Scott Van Der Kar - Would rather CCWD had data than County of Santa Barbara. That data be kept confidential.

19. Peter Lapidus thinks our data not very good. His well not plotted on map correctly. We don't have any "concrete" data. Chip said that we need your help in getting data.

20. Marvin Sheaffer - Will County of Santa Barbara work with us?

21. Case Van Wingerden - Is recharge a part of program? High costs of District water caused well drilling and use of wells. They're not using District water. Drought allocation not helpful to anybody. Should be working to recharge the Basin.

22. Dave Leland working with Camrosa on AB3030.

23. Ange Granaroli - This is just another foot in the door to tell them what to do.

24. John Murphy - Is this just a revenue generator?

25. Chuck Evans - Orange County allows anybody to have a well.

26. Scott Van Der Kar has a meter on his well as a condition of his permit. No one from the County of Santa Barbara has looked at it. He fears control by County of Santa Barbara

and the imposition of additional fees.

27. George Bliss - Abandonment of wells. Still using his old well. Scott Van Der Kar said that having an abandoned well was an asset toward getting a permit to drill a well. Not likely to abandon his wells.

28. Mr. Berberet said that some lab results not reliable. He took three samples of same water to same lab. Different results reported for the same water.

Volunteers for Committee;

Ange Granaroli
Carl Stucky
Tony Brown
Gary Kavistad

Charles Hamilton looking for 90 day time table for committee recommendations.

AC/rg

WELL LIST

Abbott, Duncan	P.O. Box 1322	Carpinteria, CA	93014-1322
Acos, James/Patricia Hopkins	396 Toro Cyn Rd	Carpinteria, CA	93013
Alonzo, Ronald/Wanda	3146 Via Real	Carpinteria, CA	93013
Aluminum Filter Co	PO Box 456	Carpinteria, CA	93013
Armendariz, Joe	PO Box 1049	Carpinteria, CA	93014
Arnesen, James	P.O. Box 1143	Carpinteria, CA	93014-1143
Arnesen, Omar M.	1969 Lillingston Cyn	Carpinteria, CA	93013
B & H Flowers	P.O. Box 250	Carpinteria, CA	93014-0250
Baba T & Co.	3889 Foothill Road	Carpinteria, CA	93013
Bailard, Andrew	13692 Ellmar Circle	Santa Ana, CA	92705
Bailard, Jim	1150 Bailard Avenue	Carpinteria, CA	93013
Bailard, L N JR	P.O. Box 928	Carpinteria, CA	93014-0928
Bailard, Thomas	127 Selby Lane	Atherton, CA	94027
Baker, Robert A	P.O. BOx 456	Carpinteria, CA	93014-0456
Barba, Francisco	4837 Seventh St	Carpinteria, CA	93013
Barnard, Charles M	6650 Casitas Pass Rd	Carpinteria, CA	93013
yes JACK Berberet/Beckstead	477 Concha Loma Dr	Carpinteria, CA	93013
yes Bliss Lands Inc.	P.O. Box 5001	Carpinteria, CA	93014-5001
Bonebakker, Erno	PO Box 88	Carpinteria, CA	93014
Bradley, Wilson JR	PO Box 480	Carpinteria, CA	93014
Brand, Barry	1650 Cravens Ln	Carpinteria, CA	93013
Brand Flowers	1628 Cravens Ln	Carpinteria, CA	93013
Broad, Jeffrey/Eli	3177 Padaro Ln	Carpinteria, CA	93013
Brown, Anthony	1565 Seacoast Way	Carpinteria, CA	93013
Brown Investments, Inc	P.O. Box 98	Carpinteria, CA	93014
Brown Ranch Co	PO Box 98	Carpinteria, CA	93014
Burns, Eugene	1121 Lagoon View Ct	Cardiff, CA	92007
California Tropics	6950 Casitas Pass Rd	Carpinteria, CA	93013

Cameron, Arthur	PO Box 653	Summerland, CA 93067	
Carpinteria Cemetery	1501 Cravens Ln	Carpinteria, CA 93013	
Casitas Gardens	PO Box 1025	Carpinteria, CA 93014-1025	
Castile, Richard S	PO Box 7000-603	Redondo Beach, CA 90277	
Cate School	1960 Cate Mesa Rd	Carpinteria, CA 93013	
Catlin, William & Carol	5809 Casitas Pass Rd	Carpinteria, CA 93013	
Chang, Mary/Candy, Jim	1269 Casitas Pass Rd	Carpinteria, CA 93013	
Clark, Lydia B	3136 Serena Ave	Carpinteria, CA 93013	
Clark Ranch	1101 Eugenia Pl #D	Carpinteria, CA 93013	
Crouse, Donald/Bonnie	176 Toro Cyn Rd	Carpinteria, CA 93013	
Dal Posso, Charles	1392 Casitas Pass Rd	Carpinteria, CA 93013	
Dautch, Robert	7117 Gobernador Cyn Rd	Carpinteria, CA 93013	
Drown, Daniel/Karen	PO Box 632	Summerland, CA 93067	
Duca, Maurice J	3003 Padaro Ln	Carpinteria, CA 93013	
Dunn, David J	4660 La Jolla Village D	San Diego, CA 92122	
Endow, Tom	1530 Santa Monica Rd	Carpinteria, CA 93013	
Ever-Bloom Inc	4701 Foothill Rd	Carpinteria, CA 93013	
Fanucchi, Rosemarie C.V.	4856 Carpinteria Ave	Carp, CA 93013	
Firestone, Brooks	PO Box 2698	Santa Barbara, CA 93120	
Fourticq, Michael/Janet	161 N Hudson	Los Angeles, CA 90004	
G & N Floral Co Inc	PO Box 131	Carpinteria, CA 93014	
Gallup - Carpinteria	3895 Via Real	Carpinteria, CA 93013	
yes √Granaroli, Angelo P	1390 Casitas Pass Rd	Carpinteria, CA 93013	
Grant, Campbell	1880 Cravens Ln	Carpinteria, CA 93013	
Hall Ranch	13692 Ellmar	Santa Ana, CA 92705	
Hall Re Corp Inc	PO Box 2450	Newport Beach, CA 92658	
Hickey, Glen	3354 Foothill Rd	Carpinteria, CA 93013	
Hickey Bros Land Co	PO Box 147	Carpinteria, CA 93014	
Hoffman, Hattie	1392 Casitas Pass Rd	Carpinteria, CA 93013	
Holden, Glen	2121 Ave Of The Stars 34Th FL	Los Angeles, CA 90067	
Hollandia Flowers	PO Box 1327	Carpinteria, CA 93014-1327	
Hopkins, Maxine	5432 Carpinteria Ave #C	Carpinteria, CA 93013	

yes ✓Horton, W F C/O Stucky PO Box 1096 Carpinteria, CA 93014
Hubbard's Bluff 6910 Casitas Pass Rd Carpinteria, CA 93013
Huff, Robert PO Box 997 Menlo Park CA 94025
Inta, Edith SBNP PO Drawer N N Santa Barbara, CA 93102
Ishibashi, Kay PO Box 679 Carpinteria, CA 93014
Jones, Robert PO Box 99Santa Barbara, CA 93102
KBDR Properties 6235 Santa Monica Blvd Hollywood, CA 90038
Kono & Sons 5888 Via Real Carpinteria, CA 93013
Kuttler, Dennis 10 S California St Ventura, CA 93001
Kuwabara/Tamura 445 S Figueroa St #2700 Los Angeles, CA 90071
Lemere, Fred 5032 Carpinteria Ave Carpinteria, CA 93013
Levin, Neal 9595 Wilshire Blvd #505 Beverly Hills, CA 90212
yes Levin, Pam Robert/ 800 Rincon Hill Rd Carpinteria, CA 93013
Lieberknecht, Robert 1545 Lisa St Carpinteria, CA 93013
Lindros, Carl E 200 E Carrillo St #302 Santa Barbara, CA 93101
Marsh, Richard 7010 Gobernador Cyn Rd Carpinteria, CA 93013
Masanada, Dan 255 Industrial Way Buellton, CA 93427-9565
Mattice Inc Corp 933 Castillo St Santa Barbara, CA 93101
yes ✓ Mauracher, Ali 6200 Casitas Pass Rd Carpinteria, CA 93013
yes - I think David Leland ↗ Mc Closkey Ranch Co 6345 Casitas Pass Rd Carpinteria, CA 93013
Mc Intyre, Scott 6350 Via Real Carpinteria, CA 93013
Meeker, William 368 Lambert Rd Carpinteria, CA 93013
Mesa Assoc Mutual Water Co 7110 Gobernador Cyn RdCarpinteria, CA
Miller, William W 906 Logan Ave Ventura, CA 93004
Moore Ranch 5844 Casitas Pass Rd Carpinteria, CA 93013
Morris, David PO Box 39 Carpinteria, CA 93014
Nichols, Peter 6950 Casitas Pass Rd Carpinteria, CA 93013
Nishimura Farms Inc 5885 Casitas Pass Rd Carpinteria, CA 93013
Nordstrom, John 4227 Hunts Point Rd Bellevue, WA 98004
O,Connell, Jack 228 w Carrillo Suite F S. B., Ca 93101
Ocean Breeze Nursery 3910 Via Real Carpinteria, CA 93013
Ota Bros 6792 Rincon Hill Rd Carpinteria, CA 93013

Art & Pete

yes ✓Overgaag, Joe PO Box 1249 Carpinteria, CA 93014

Owen, Brian/Leslie 186 Toro Cyn Rd Carpinteria, CA 93013

Paloheimo Ranch 1795 1/2 Cravens Ln Carpinteria, CA 93013

Penfield & Smith Charles Watson PO Box 98Santa Barbara, CA 93102

Persoon, John 4998 Foothill Rd Carpinteria, CA 93013

Phelps Ranch 622 Los Alamos Dr Ojai, CA 93023

Pinkham, Nelson 2065 Lillingston Cyn Carpinteria, CA 93013

QAD Inc 6450 Via Real Carpinteria, CA 93013

Raya Bros 6949 Gobernador Cyn Rd Carpinteria, CA 93013

yes Razo, Nick 955 Pear St Carpinteria, CA 93013

Ridgeland Mutual Water 709 Olive St Carpinteria, CA 93013

Roberts, Matthew 3180 Foothill Rd Carpinteria, CA 93013

Rock, John/Ruth PO Box 247 Carpinteria, CA 93014

Rodriguez, John 1310 Casitas Pass Rd Carpinteria, CA 93013

Santa Barbara Polo Club 3375 Foothill Rd Carpinteria, CA 93013

Satow Bros Inc 3646 W El Segundo Blvd Hawthorne, CA 90250

Schaff, Victor PO Box 1275 Carpinteria, CA 93014

Schettino, Sal A 7074 Casitas Pass Rd Carpinteria, CA 93013

will send Rep. → Schwartz, Naomi 105 E Anapamu Santa Barbara, CA 93101
Salud Carbajah

Selbert, James H 222 East Carrillo #310 Santa Barbara, CA 93101

Shade, Richard/Jeannette 575 Toro Cyn Rd Santa Barbara, CA 9310

Staal, Gardner & Dunne 5855 Olivas Park Dr Ventura, CA 93003

Stein, J Bradley 1315 Casitas Pass Rd Carpinteria, CA 93013

Sullwold, Harold 900 Calle De Los Amigos N-11 S.B., CA 93105

Tanabe, Richard 1335 Casitas Pass Rd Carpinteria, CA 93013

The Cambridge House 5050 7TH St Carpinteria, CA 93013

Theilmann, Theodore/Mary Anne 3198 Via Real Carpinteria, CA 93013

Thompson, Charles 7676 Stanley Park Rd Carpinteria, CA 93013

yes - 3 ✓Thor, Lester 975 Terracina Dr Santa Paula, CA 93060

Valley Flowers Inc PO Box 1279 Carpinteria, CA 93014

Van Antwerp, Richard 709 Olive Ave Carpinteria, CA 93013

Van Der Kar, F O 7075 Casitas Pass Rd Carpinteria, CA 93013

Van Der Kar, J Chris	7017 Shepard Mesa Dr	Carpinteria, CA 93013
Van Der Kar, Scott	7075 Casitas Pass Rd	Carpinteria, CA 93013
Van Wingerden, Harry	3902 Via Real	Carpinteria, CA 93013
Van Wingerden, Rene	4444 Foothill Rd	Carpinteria, CA 93013
Vedder Co, Dwight G	2020 Lillingston Cyn	Carpinteria, CA 93013
Wakefield, Ray	PO Box 95	Carpinteria, CA 93013
Ward, Maria	PO Box 241	Carpinteria, CA 93014
Watanabe, Kaz	6898 Casitas Pass Rd	Carpinteria, CA 93013
Westland/J C Farms	PO Box 1291	Carpinteria, CA 993014-1291
White Farms	3600 Foothill Rd	Carpinteria, CA 93013
Whitney Ranches, Inc	6505 Casitas Pass Rd	Carpinteria, CA 93013
Wigmore, John/Dina	870 Neptune Ave	Leucadia, CA 92024
Williams, Arthur H	466 Toro Cyn Rd	Santa Barbara, CA 93108
Williams, Helen Anne	3191 Padaro Ln	Carpinteria, CA 93013
Williams, L B	7391 Gobernador Cyn Rd	Carpinteria, CA 93013
Woronovich, Alexander/Barbara	2900 Torito Rd	Santa Barbara, CA 9310
Wrinkle, Roland	24244 Bella Court	Newhall, CA 91321
Wullbrandt, Chip	PO Box 99	Santa Barbara, CA 93102
Zangger, Carl H	3215 Foothill Rd	Carpinteria, CA 93013
Zanier, Marie	6560 Gobernador Cyn Rd	Carpinteria, CA 93013

Attendance

Carpinteria Water District
Groundwater workshop 3-9-96

	name	phone
X	Anthony Brown	684-7878
X	CAIL STUCKY	684-0700
	MARVIN & LINDA SCHAEFER	525-8236
	Lila E. Thar	525-6276
	DAVID LELANDE (McCloskey)	684-3668
	Viktor Mauracher	6840197
	Scott Van Der Kar	684-7400
	John P. Murphy	684-1998
963-7000 X	GARY M. KVISTAD	684-6121
	Nick J. RAZO	6842923
	Pete Lapidus	566-1461
	JACK BEEBER	[illegible]
	Natald Sullwold	687-8259
X	George Dillon	684-2921
	Art & Pete Overgaag	684-4146
X	DENNIS KUTTLER	684-7969
	Tom T Ota	684-2850
X	FAUSTO P GRANAROLI	684 5704
	Dick Barnett-Casitas MWD	649-2251 Ext. 118

name		phone
Ron White		684-3870
Rosann M. Stegall	Rancho Monte Alegre	684-4078
Chuck Evans	Montecito WD	969-2271
ROB GODFREY	Carp Chbr of Commerce	684-4558
X Carl Wingarden	West Karpt	684-4011
ALVIN CORSE	CCWD	684-2816
NORM COTA	CCWD	684-2816
Chip Wullbrandt	CCWD	962-0011

M E M O R A N D U M

DATE: April 1, 1996 gwc328

TO: CCWD GROUNDWATER COMMITTEE

FROM: Charles Hamilton, General Manager

RE: Meeting of March 28, 1996 - summary report

CC: Fred Lemere, CCWD Board President

The Groundwater Committee met on Thursday, March 28, 1996, at 3:00 p.m. Enclosed is a copy of the sign-in sheet.

It was agreed that the committee would meet aggressively in order to try to finish things up in a timely manner. Meetings were scheduled for the next two Thursdays, at 3:00 p.m. A fourth meeting may be necessary. It was also agreed that the Manager would prepare summary reports of the meetings to be mailed out to all committee members.

The meeting began with a discussion of the workshop and a general review of the scope and purpose of the draft Groundwater Management Plan. The draft plan contains no language relative to long-standing water rights, nor does it include any language to establish fees. It is viewed primarily as a tool to systematically collect and report on information about conditions of the basin. It was noted that nothing we did could actually prevent the State legislature from enacting legislation that forced controls on the District or the private pumpers.

Several comments were made relative to the first two proposed elements of the Plan.

It was suggested by Ted Theilmann that an inventory of all wells also include data about sanitary seals - whether the wells have one, and if so, how deep. Other well information about the wells should be collected if available, such as how deep they are. The Manager will prepare a well data page for review by the committee.

It was suggested that sanitary seals ought to be required if wells are found without them and they are going to stay in use. It was reported that the required depth for an ag well sanitary seal is 20 ft. and for a domestic well it is 50 ft. The Manager agreed to research the sanitary seal issue, including the potential cost of retrofitting.

It was also suggested that water quality tests might be structured on a tiered basis:

a. a large sample of wells annually for nitrate, chloride, total dissolved solids, and boron.

b. a smaller sample of wells to give more generic mineral and organic information.

c. a few that test for trace contaminants, possibly in the areas where there may be reason to be concerned about industrial exposure.

It was the general consensus of the committee that problems identified with a specific well ought to be remedied and paid for by the well owner, and not the District. It was also discussed that the costs of water quality testing and well level measurements would be borne by the District, and carried out by existing staff. It was mentioned that services of a consulting hydrogeologist might be necessary to review and summarize the annual report on the basin, but that the District would not be using a consultant, other than Dr. Sullwold, in the preparation of the actual Plan.

Next meeting: Thursday, April 4, 3:00 p.m. at the District.

GROUNDWATER COMMITTEE

– SIGN-IN SHEET

3/28/96

NAME	PHONE #
CHARLES HAMILTON	684-2816
TED THEILMANN	684-5215
George Tsiros	684-2921
Matt Roberts	684-5539
Rene VanW	684 1747
GARY KVISTAD	684-6121
BOB LIEBERKNECHT	684-4729
	684-2816
Anthony Brown	684-7878
Dennis Kuttler	684-2545

M E M O R A N D U M

DATE: April 9, 1996 gwc44

TO: **CCWD GROUNDWATER COMMITTEE**

FROM: Charles Hamilton, General Manager

RE: Meeting of April 4, 1996 - summary report

CC: Fred Lemere, CCWD Board President

The Groundwater Committee met on Thursday, April 4, 1996, at 3:00 p.m. Enclosed is a copy of the sign-in sheet.

The meeting began with a review of the previous meeting.

Some new questions were raised relative to the first two proposed elements of the Plan:

1) Will participation in the management plan be required or obtained on a voluntary basis? The general consensus was that it should be entirely voluntary, given the value to all, and with the expectation that enough owners will volunteer so as to eliminate any need for a mandate.

2) How would the information be treated on a given owner's well? Confidential? When would it ever be made public? How would an inquiry be treated from a prospective buyer? It was determined that legal counsel would be consulted on this matter, but that generally all information would be confidential and treated in the same way that a customer's account is now treated: confidentially. It was felt that the District would have an obligation to go public with any information about a well's water quality or level that might indicate a potential negative impact on others.

3) If the District wanted to obtain information about a well from a reluctant well owner in the instance when it might be deemed necessary for public health or safety reasons, how would the District proceed? Again, legal counsel on this matter would be obtained for discussion at the next meeting.

4) Various comments about the text of items 3 and 4 was discussed and will be incorporated into the next draft to be distributed on Thursday.

Relative to item 3 - a database and a reporting system - the Manager will prepare an outline of what the annual report is proposed to contain, and also obtain some copies of other district annual basin reports for comparison.

It was noted that there would be a public information benefit of such a plan to the well owners relative to information about sanitary seals and abandonment procedures. And it was also suggested that applicable County and State law be included as an appendix to the plan.

Next meeting: Thursday, April 11, 3:00 p.m. at the District.

AB 3030 GROUNDWATER COMMITTEE

ATTENDANCE

4/11/96

NAME

CHARLES HAMILTON

Harold Sullwold

Nona Cola

ROBERT LIEBERKNECHT

CARL STUCKY

INATI ROBERTS

Anthony Brown

Cam Winegardner

GARY KVISTAD

TED THEIGHMANN

Angelo Lanucci

M E M O R A N D U M

DATE:	April 19, 1996	GWC411
TO:	**CCWD GROUNDWATER COMMITTEE**	
FROM:	Charles Hamilton, General Manager	
RE:	Meeting of **APRIL 18, 1996 - SUMMARY REPORT**	
CC:	Fred Lemere, CCWD Board President	

The Groundwater Committee met on Thursday, April 18, 1996, at 3:00 p.m. Enclosed is a copy of the sign-in sheet.

The Manager distributed copies of the following:

1. County Ordinance No. 3458 Regulating the Construction, Modification or Repair, Destruction and Inactivation of Wells within the Unincorporated Area of the County of Santa Barbara.
2. Section 13050 of the State Water Code - Definitions
3. A revised draft of the AB3030 Plan dated April 18, 1996
4. An letter to the editor of the SLO 5 Cities Press about groundwater plans.

Discussion then proceeded with a review of text changes to the action items in the plan.

The Manager reported on his discussion with legal counsel about confidentiality. Text changes were proposed to the Note about confidentiality with the understanding that use of the Freedom of Information Act can ultimately result in all of the information being made public.

After some discussion it was determined that Policy statements to be drafted about the preservation and recharge areas would be focused on identification and monitoring of only the District's interests in these areas. The Manager agreed to have some draft policy statements prepared for distribution at the next meeting.

Considerable discussion focused on the sanitary seal Element, and it was suggested that "risk" be qualified to read "material or substantial risk." Various examples will be cited in the text to provide definition.

Gerry Winant, of the County Environmental Health Services Department noted that the County normally does not require a sanitary seal (when none exists) if a well is destroyed.

It was also proposed that a Well Owners Handbook, as part of a public information Element of the Plan be prepared and included with the Plan.

Next meeting: Thursday, April 25, 3:00 p.m. at the District.

AB3030 GROUNDWATER MANAGEMENT PLAN

4/18/96

COMMITTEE

(SIGN-IN)

NAME	
CHARLES B. HAMILTON	
ANGELO P. SPANAROLI	
Harold Sandwald	
Ted THEILMANN	
GARY KVISTAD	
CARL STUCKY	
Noem Costa	
ALVIN GORSE	
Carl Wingrave	
GERRY WINANT	Environmental Health Services 681-4434
Matt Roberts	

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M E M O R A N D U M

DATE:	May 6, 1996	GWC425
TO:	**CCWD GROUNDWATER COMMITTEE**
FROM:	Charles Hamilton, General Manager
RE:	Meeting of **APRIL 25, 1996 - SUMMARY REPORT**
CC:	Fred Lemere, CCWD Board President

The Groundwater Committee met on Thursday, April 25, 1996, at 3:00 p.m. Enclosed is a copy of the sign-in sheet.

Previous Plan text changes were reviewed and changes were made as shown in the enclosed May 1 draft. Much of the discussion focused on the proposed role of the District in monitoring and reporting on the condition of the Basin recharge area.

The revised draft now includes additional language relative to well abandonment and open and unsecured wells, and a section relative to how the Plan may be changed. The Committee requested to be included in any future efforts to amend the Plan. The Manager stated that he would re-convene the Committee to review the preliminary draft of the Carpinteria Valley Groundwater Basin Report in 1997.

The Manager was referred to Wayne Ferren of UCSB to obtain information relative to the Carpinteria Salt Marsh Reserve and groundwater quality. It was also suggested that the Manager get in touch with John Murphy of the Flower Growers Association for additional information.

The Plan draft is now in the final stages of preparation, and is tentatively scheduled for a Public Hearing on July 17, 1996. Copies of the final proposed draft Plan will be mailed to all Committee members and all other well owners prior to the Public Hearing.

There are no additional meetings anticipated for the Advisory Committee at this time. Many thanks for your time and effort in assisting me in this process! You have been very helpful.

GROUNDWATER COMMITTEE

SIGN - IN

APRIL 25, 1996

NAME

CHARLES HAMILTON
ALVIN CORSE
TED THEILMANN

GARY KVISTAD
Carl Wingarden
CARL STUCKY
ANGELO GRANAROLI