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ENVIRONMENTAL HEALTH
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Requirements for Well Construction / Decommissioning

This Department has been meeting with representatives of the well drilling industry, local water master, the State Department of Water Resources, and the State Department of Toxic Substances Control to reach agreement on the acceptable methods for constructing and decommissioning wells. The following requirements have come out of these meetings. At the appropriate time subsequent agreements will be published.

Requirements:

1. The annular seal for all wells shall extend at least 50 feet below ground surface. Site specific conditions may require a deeper seal.
   Reference: ANSI/AWWA A100-97, 4.7.8.2.

2. Well casing shall be equipped with centralizers to ensure that the 2'' minimum radial thickness of the annular seal is maintained for the sanitary seal. Centralizers shall be placed at intervals no greater than 45 feet. This would allow for a centralizer to be placed at 6 feet below grade and another at 51 feet, just below the bottom of the annular seal so as to not interfere with the placement of the tremie tube.
   Reference: California Well Standards, 74-90.

3. The concrete slab or base at ground surface around the casing shall adequately slope so as to drain water away from the well casing. The minimum slope shall be ¼'' per foot. The slope may be in all directions away from the casing or in one direction but must extend from the casing to the edge of the slab.
   Reference: California Well Standards, 74-90, Los Angeles County Code, Title 11.

4. The reinforcing mesh or rebar shall be elevated off the ground when the slab is poured.

5. When the motor is mounted on the pedestal, the center of the pedestal shall be level to allow proper alignment of the motor. The joint between the discharge head and the pedestal shall be sealed. The portion of the slab not covered by the discharge head shall be sloped ¼'' per foot out to the edge.

6. PVC casing that extends above the slab shall be protected against UV damage by painting or providing a metal collar.

7. The water-cement ratio by weight for sealing material shall be 0.50.
   Reference: Portland Cement Association Engineering Bulletin, Design and Controls of Concrete Mixtures, Thirteenth Edition.

8. The best method for either constructing or decommissioning a well is dependent upon site specific conditions. Therefore, the work plan to accomplish either of these tasks should identify the existing site specific conditions and then develop a procedure to successfully deal with the identified conditions.

9. The placement of all material into a borebhole or annular space shall be from the bottom up and throught a tremie pipe that prevents freefall, bridging, dilution, or separation of the sand or aggregate from the sealing material

10. The minimum procedure for decommissioning a well in an area with a single aquifer is:
    a. A video-log of the well is required when:
        i. The construction details are unknown
        ii. The sounding data does not match the well log
        iii. The well is unused or inoperative
        iv. The well has been modified
        v. The well is non-residential
        vi. If other details show that more information is needed to design a decommissioning protocol.
    b. Assemble all known information about the well.
    c. Using the known data, develop a work plan to restore, as far as feasible, the controlling geological conditions that existed before the well was constructed. Work plans shall consist of: well log, video log, lithology, water level, vulnerability to contamination, details or original construction, specifications of materials to be used, cement formulations, placement of material, perforator and pressure sealing method, calculations as to volume of grout required to seal the casing and voids.
    d. Complete the well permit application form. File a service request and pay the required fee.
    e. Review the work plan with the local Environmental Health inspector and reach an agreement as to the scope of the work.
    f. Remove obstructions and contaminants.
    g. Fill the casing up to 150 feet below grade with at least a six-sack fine sand mix. Used drilling mud or drill cuttings are not acceptable. Perforate the casing from 150 feet up to the bottom of the annular seal, if any. Pressure grout (20-40 psi) with neat cement from 150 feet up 4 feet below grade. Pressure shall be maintained for a length of time sufficient for the cementing mixture to set. Cut the casing at 5 ft. and mushroom a cap over the casing. Cover with fill material up to grade. If the developer needs to cut the casing deeper than 4 feet, OSHA requirements shall be considered.
    h. The placement of all materials shall prevent free fall, dilution, and/or separation of aggregates from cementing materials by pumping through a tremie tube.
    i. As a rule of thumb, divide the diameter of the casing by 2 to get the minimum number of perforations required per round per foot.
    j. Verify that the volume of material placed in the well at least equals the volume of the hole.
    k. Arrange for an appointment with the local environmental health inspector to witness the placement of the annular seal
    l. Submit a copy of the well completion report to this office.

11. Where there is multiple water bearing zones, the casing is to be perforated only within the areas of the aquitards and pressure grouted using packers. The casing perforations to seal the aquitard shall not extend into the aquifer. If the zone to be sealed is greater than 200 feet, the placement of sealing material shall be accomplished in lifts no greater than 200 feet.

12. When wells having a PVC casing are to be decommissioned, the casing is to be drilled out 150 feet below grade and filled with approved sealing materials pumped through a tremie tube.

13. Dry holes or exploratory borings are to be destroyed by the placement of approved fill up to a maximum of 50 feet below ground surface. The upper 50 feet is to be sealed using neat cement pumped from the bottom up through a tremie tube. Approved fill material is defined as any inert material equal or finer than native material such as cement, sand-cement grout, concrete, clay, silt or sand. Used drilling mud and drill cuttings are not acceptable.