(k) A list of additional containment features for production facilities in drainages with direct access to waterways or urban areas as determined necessary by the Supervisor.

(l) A list of corrosion prevention or corrosion monitoring techniques utilized.

(m) A description of all installed sensor and alarm systems. The sensor and alarm systems to be described include, but are not limited to:

(1) Tank overfill.

(2) High and low pressure for pipelines and pressure vessels.

(3) Fire sensors.

(4) H2S detectors.

(5) Gas detectors.

(n) A description of the training provided to implement the plan.

Authority: Section 3013, Public Resources Code. Reference: Sections 3106 and 3270.1, Public Resources Code.

§ 1723. Plugging and Abandonment-General Requirements.

(a) Cement Plugs. In general, cement plugs will be placed across specified intervals to protect oil and gas zones, to prevent degradation of usable waters, to protect surface conditions, and for public health and safety purposes. Cement may be mixed with or replaced by other substances with adequate physical properties, which substances shall be approved by the Supervisor. The application of these mixed materials and other substances to particular wells shall be at the discretion of the district deputy.

(b) Hole Fluid. Mud fluid having the proper weight and consistency to prevent movement of other fluids into the well bore shall be placed across all intervals not plugged with cement, and shall be surface poured into all open annuli.

(c) Plugging by Bailer. Placing of a cement plug by bailer shall not be permitted at a depth greater than 3,000 feet. Water is the only permissible hole fluid in which a cement plug shall be placed by bailer.

(d) Surface Pours. A surface cement-pour shall be permitted in an empty hole with a diameter of not less than 5 inches. Depth limitations shall be determined on an individual well basis by the district deputy.

(e) Blowout Prevention Equipment. Blowout prevention equipment may be required during plugging and abandonment operations. Any blowout prevention equipment and inspection requirements determined necessary by the district deputy shall appear on the approval to plug and abandon issued by the Division.

(f) Junk in Hole. Diligent effort shall be made to recover junk when such junk may prevent proper plugging and abandonment either in open hole or inside casing. In the event that junk cannot be removed from the hole and fresh-saltwater contacts or oil or gas zones penetrated below cannot therefore be properly abandoned, cement shall be downsqueezed through or past the junk and a 100-foot cement plug shall be placed on top of the junk. If it is not possible to downsqueeze through the junk, a 100-foot cement plug shall be placed on top of the junk.

(g) Lost Radioactive Tool. In the event that a source containing radioactive material cannot be retrieved from the hole, a 100-foot standard color dyed (red iron oxide or equivalent red

cement dye) cement plug shall be placed on top of the radioactive tool, and a whipstock or other approved deflection device shall be placed on top of the cement plug to prevent accidental or intentional mechanical disintegration of the radioactive source. In addition, the operator shall comply with the California Department of Health Services regulations in Section 30346 of Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 7, of the California Code of Regulations.
Authority: Sections 3013 and 3106, Public Resources Code. Reference: Sections 3219 and 3228, Public Resources Code.

§ 1723.1. Plugging of Oil or Gas Zones.

(a) Plugging in an Open Hole. A cement plug shall be placed to extend from the total depth of the well or from at least 100 feet below the bottom of each oil or gas zone, to at least 100 feet above the top of each oil or gas zone.

(b) Plugging in a Cased Hole. All perforations shall be plugged with cement, and the plug shall extend at least 100 feet above the top of a landed liner, the uppermost perforations, the casing cementing point, the water shut-off holes, or the oil or gas zone, whichever is highest.

(c) Special Requirements. Special requirements may be made for particular types of hydrocarbon zones, such as:

(1) Fractured shale or schist;

(2) Massive sand intervals, particularly those with good vertical permeability;

(3) Any depleted productive interval more than 100 feet thick; or

(4) Multiple zones completed in a well.

As a minimum for an open-hole plugging and abandonment, the special requirement shall include a cement plug extending from at least 100 feet below the top of the oil or gas zone to at least 100 feet above the top of the zone.

As a minimum for a cased-hole plugging and abandonment, the special requirement shall include a cement plug extending from at least 25 feet below the top of the uppermost perforated interval to at least 100 feet above the top of the perforations, the top of the landed liner, the casing cementing point, the water shutoff holes, or the zone, whichever is highest.

(d) Bridge Plug. In a multiple zone completion, a single bridge plug above the lowermost zone may be allowed in lieu of cement through that zone if the zone is isolated from the upper zones by cement behind the casing. Subsequent bridge plugs are not allowed unless separated by cement plugs meeting the requirements of Section 1723.1(b). Temporary bridge plugs must be removed and replaced with cement plugs prior to shallower zone completions or well abandonment.
Authority: Sections 3013 and 3106, Public Resources Code. Reference: Section 3228, Public Resources Code.

§ 1723.2. Plugging for Freshwater Protection.

(a) Plugging in Open Hole.

(1) A minimum 200-foot cement plug shall be placed across all fresh-saltwater interfaces.

(2) An interface plug may be placed wholly within a thick shale if such shale separates the freshwater sands from the brackish or saltwater sands.

(b) Plugging in a Cased Hole.

(1) If there is cement behind the casing across the fresh-saltwater interface, a 100-foot cement plug shall be placed inside the casing across the interface.

(2) If the top of the cement behind the casing is below the top of the highest saltwater sands, squeeze-cementing shall be required through perforations to protect the freshwater deposits. In addition, a 100-foot cement plug shall be placed inside the casing across the fresh-saltwater interface.

(3) Notwithstanding other provisions of this section, the district deputy may require or allow a cavity shot immediately below the base of the freshwater sands. In such cases, the hole shall be cleaned out to the estimated bottom of the cavity and a 100-foot cement plug shall be placed in the casing from the cleanout point.

(c) Special Plugging Requirements. Where geologic or groundwater conditions dictate, special plugging procedures may be specified to prevent contamination of usable waters by downward percolation of poor quality surface waters, separate water zones of varying quality, and isolate dry sands that are in hydraulic continuity with groundwater aquifers.

Authority: Section 3013, Public Resources Code. Reference: Sections 3106 and 3228, Public Resources Code.

§ 1723.3. Plugging at a Casing Shoe.

If the hole is open below a shoe, a cement plug shall extend from at least 50 feet below to at least 50 feet above the shoe. If the hole cannot be cleaned out to 50 feet below the shoe, a 100-foot cement plug shall be placed as deep as possible.

Authority: Sections 3013 and 3106, Public Resources Code. Reference: Sections 3106 and 3228, Public Resources Code.

§ 1723.5. Surface Plugging.

The hole and all annuli shall be plugged at the surface with at least a 25-foot cement plug. The district deputy may require that inner strings of uncemented casing be removed to at least the base of the surface plug prior to placement of the plug.

All well casing shall be cut off at least 5 feet but no more than 10 feet below the surface of the ground. The district deputy may approve a different cut-off depth, as conditions warrant, including but not limited to excavation or grading operations for construction purposes. As defined in Section 1760(j), a steel plate at least as thick as the outer well casing shall be welded around the circumference of the casing at the top of the casing, after Division approval of the surface plug. The steel plate shall show the well's identification, indicated by the last five digits of the API well number.

Authority: Sections 3013 and 3106, Public Resources Code. Reference: Section 3106, Public Resources Code.

§ 1723.6. Recovery of Casing.

(a) Approval to recover all casing possible will be given in the plugging and abandonment of wells where subsurface plugging can be done to the satisfaction of the district deputy.

(b) The hole shall be full of fluid prior to the detonation of any explosives in the hole. Such explosives shall be utilized only by a licensed handler with the required permits.

Authority: Sections 3013 and 3106, Public Resources Code. Reference: Sections 3106 and 3228, Public Resources Code.

§ 1723.7. Inspection of Plugging and Abandonment Operations.

Plugging and abandonment operations that require witnessing by the Division shall be witnessed and approved by a Division employee. When discretion is indicated by these regulations, the district deputy shall determine which operations are to be witnessed.

(a) Blowout prevention equipment -may inspect and witness testing of equipment and installation.

(b) Oil and gas zone plug -may witness placing and shall witness location and hardness.

(c) Mudding of hole -may witness mudding operations and determine that specified physical characteristics of mud fluid are met.

(d) Freshwater protection:

(1) Plug in open hole -may witness placing and shall witness location and hardness. Plug in cased hole -shall witness placing or location and hardness.

(2) Cementing through perforations -may witness perforating and shall witness cementing operation.

(3) Cavity shot -may witness shooting and shall witness placing or location and hardness of required plug.

(e) Casing shoe plug -shall witness placing or location and hardness.

(f) Casing stub plug -may witness placing or location and hardness.

(g) Surface plug -may witness emplacement and shall witness or verify location.

(h) Environmental inspection (after completion of plugging operations) -shall determine that Division environmental regulations (California Code of Regulations, Title 14, Subchapter 2) have been adhered to.

Authority: Sections 3013 and 3106, Public Resources Code. Reference: Section 3228, Public Resources Code.

§ 1723.8. Special Requirements.

The Supervisor, in special cases, may set forth other plugging and abandonment requirements or may establish field rules for the plugging and abandonment of wells. Such cases include, but are not limited to:

(a) The plugging of a high-pressure saltwater zone.

(b) Perforating and squeeze-cementing previously uncemented casing within and above a hydrocarbon zone.

(c) The plugging of particular zones or specifying cleanout intervals within a wellbore.

Authority: Sections 3013 and 3106, Public Resources Code. Reference: Section 3106, Public Resources Code.

§ 1723.9. Testing of Idle Wells.

Operators shall comply with all of the requirements in Section 1772.1 for the testing of idle wells.

Note: Authority cited: Section 3013, Public Resources Code. Reference: Sections 3106 and 3206.1, Public Resources Code.

§ 1724. Required Well Records

The operator of any well drilled, redrilled, deepened, or reworked shall keep, or cause to be kept, an accurate record of each operation on each well including, but not limited to, the following, when applicable:

(a) Log and history showing chronologically the following data:

(1) Character and depth of all formations, water-bearing strata, oil- and gas-bearing zones, lost circulation zones, and abnormal pressure zones encountered.

(2) Casing size, weight, grade, type, condition (new or used), top, bottom, and perforations; and any equipment attached to the casing.

(3) Tubing size and depth, type and location of packers, safety devices, and other tubing equipment.

(4) Casing pressure tests and pressure tests of the casing-tubing annulus, including date, duration, pressure, and percent bleed-off.

(5) Hole sizes.

(6) Cementing and plugging operations, including date, depth, slurry volume and composition, fluid displacement, pressures, calculated or actual fill, and downhole equipment.

(7) Drill-stem, leak-off, or other formation tests, including date, duration, depth, pressures, and recovery (volume and description).

(8) BOPE installation, inspections, and pressure tests.

(9) Water shutoff and lap tests of casing, including date, duration, depth, and results.

(10) Sidetracked casing, tools or other material, collapsed or bad casing, holes in casing, and stuck drill pipe, tubing, or other junk in casing or open hole.

(11) Depth and type of all electrical, physical, or chemical logs, tests, or surveys made.

(12) Production or injection method and equipment.

(b) Core record showing the depth, character, and fluid content, so far as determined, of all cores, including sidewall samples.

(c) Such other information as the Supervisor may require for the performance of his or her statutory duties.

Authority: Sections 3013 and 3107, Public Resources Code. Reference: Sections 3106, 3107, 3203, 3210 and 3214, Public Resources Code.