

**19.15.16.9 SEALING OFF STRATA:**

**A.** During the drilling of an oil well, injection well or other service well, the operator shall seal and separate the oil, gas and water strata above the producing or injection horizon to prevent their contents from passing into other strata.

**B.** The operator shall ensure that fresh waters and waters of present or probable value for domestic, commercial or stock purposes are confined to their respective strata and are adequately protected by division-approved methods. The operator shall take special precautions by methods satisfactory to the division in drilling and abandoning wells to guard against loss of artesian water from the strata in which it occurs, and the contamination of artesian water by objectionable water, oil or gas.

**C.** The operator shall ensure that water is shut off and excluded from the various oil- and gas-bearing strata that are penetrated. The operator shall ordinarily make water shut-offs by cementing casing.

[19.15.16.9 NMAC - Rp, 19.15.3.106 NMAC, 12/1/08]

**19.15.16.10 CASING AND TUBING REQUIREMENTS:**

**A.** The operator shall equip a well drilled for oil or gas with surface and intermediate casing strings and cement as may be necessary to effectively seal off and isolate all water-, oil- and gas-bearing strata and other strata encountered in the well down to the casing point. In addition, the operator shall equip a well completed for oil or gas production with a string of properly cemented production casing at sufficient depth to ensure protection of oil- and gas-bearing strata encountered in the well, including the strata to be produced.

**B.** The operator shall use sufficient cement on surface casing to fill the annular space behind the casing to the top of the hole, provided that authorized division field personnel may allow exceptions to this requirement when known conditions in a given area render compliance impracticable.

**C.** Cementing shall be by pump and plug method unless the division expressly authorizes some other method.

**D.** Cementing shall be with conventional-type hard-setting cements to which the operator has added additives (lighteners, densifiers, extenders, accelerators, retarders, etc.) to suit conditions in the well.

**E.** Authorized division field personnel may, when conditions warrant, allow exceptions to Subsection D of 19.15.16.10 NMAC and permit the operator to use oil-base casing packing material in lieu of hard-setting cements on intermediate and production casing strings; provided that when the operator uses such materials on the intermediate casing string, the operator places conventional-type hard-setting cements throughout all oil- and gas-bearing zones and throughout at least the lowermost 300 feet of the intermediate casing string. When the operator uses such materials on the production casing string, the operator shall place conventional-type hard-setting cements throughout all oil- and gas-bearing zones that shall extend upward a minimum of 500 feet above the uppermost perforation or, in the case of an open-hole completion, 500 feet above the production casing shoe.

**F.** The operator shall test casing strings and prove satisfactory as provided in Subsection I of 19.15.16.10 NMAC.

**G.** After cementing, but before commencing tests Subsection I of 19.15.16.10 NMAC requires, all casing strings shall stand cemented in accordance with one of the options in Paragraphs (1) and (2) of Subsection G of 19.15.16.10 NMAC. Regardless of which option the operator

chooses, the casing shall remain stationary and under pressure for at least eight hours after the operator places the cement. Casing shall be under pressure if the operator uses some acceptable means of holding pressure or if the operator employs one or more float valves to hold the cement in place. The operator shall either

(1) allow casing strings to stand cemented a minimum of 18 hours prior to commencing tests; an operator using this option shall report on form C-103 the actual time the cement was in place before the operator initiated tests; or

(2) in the counties of San Juan, Rio Arriba, McKinley, Sandoval, Lea, Eddy, Chaves and Roosevelt only, allow casing strings to stand cemented until the cement reaches a compressive strength of at least 500 psi in the "zone of interest" before commencing tests; provided however, that the operator shall not commence tests until the cement is in place for at least eight hours.

(a) The "zone of interest" for surface and intermediate casing strings is the bottom 20 percent of the casing string, but is no more than 1000 feet nor less than 300 feet of the bottom-part of the casing unless the casing is set at less than 300 feet. The "zone of interest" for production casing strings includes the interval or intervals where immediate completion is contemplated.

(b) To determine that a minimum compressive strength of 500 psi has been attained, the operator shall use the typical performance data for the particular cement mix used in the well, at the minimum temperature indicated for the zone of interest by Figure 107-A, Temperature Gradient Curves. Typical performance data used shall be that data the cement manufacturer or a competent materials testing agency furnishes, as determined in accordance with the latest edition of API publication Recommended Practice for Testing Well Cements, RP 10B-2. (See Temperature Gradient - Page 17A)

**H.** An operator using the compressive strength criterion in Paragraph (2) of Subsection G of 19.15.16.10 NMAC shall report the following information on form C-103:

(1) volume of cement slurry in cubic feet and brand name of cement and additives, percent additives used and sequence of placement

if the operator uses more than one type cement slurry;

(2) approximate temperature of cement slurry when mixed;

(3) estimated minimum formation temperature in zone of interest;

(4) estimate of cement strength at time of casing test; and

(5) actual time cement in place prior to starting test.

**I.** The operator shall test casing strings except conductor pipe after cementing and before commencing other operations on the well. The operator shall file form C-103 with the division for each casing string reporting the grade and weight of pipe used. In the case of combination strings utilizing pipe of varied grades or weights, the operator shall report the footage of each grade and weight used. The operator shall also report results of the casing test, including actual pressure held on pipe and the pressure drop observed on the same form C-103.

(1) The operator shall pressure test casing strings in wells drilled with rotary tools. Minimum casing test pressure shall be approximately one-third of the manufacturer's rated internal yield pressure except that the test pressure shall not be less than 600 psi and need not be greater than 1500 psi. In cases where combination strings are involved, the above test pressure shall apply to the lowest pressure rated casing used. The operator shall apply test pressures for a period of 30 minutes. If a drop of more than 10 percent of the test pressure occurs the casing shall be considered defective and the operator shall apply corrective measures

(2) The operator may test casing strings in wells drilled with cable tools as outlined in Paragraph (1) of Subsection I of 19.15.16.10 NMAC, or by bailing the well dry in which case the hole shall remain satisfactorily dry for a period of at least one hour before the operator commences further operations on the well.

**J. Well tubing requirements.**

(1) The operator shall tube flowing oil wells equipped with casing larger in size than 2 7/8-inch OD.

(2) The operator shall tube gas wells equipped with casing larger in size than 3½-inch OD.

(3) The operator shall set tubing as near the bottom as practical and tubing perforations shall not be more than 250 feet above top of pay zone.

(4) The district supervisor of the appropriate division district office, upon application, may grant exceptions to these requirements, provided waste will not be caused.

(5) The district supervisor may request that the director review an application. The operator shall submit information and give notice as the director requests. The division may approve un-protested applications after 20 days of receipt of the application and supporting information. If a person protests the application, or the director decides, the division shall set the application for hearing.

[19.15.16.10 NMAC - Rp, 19.15.3.107 NMAC, 12/1/08]