

How to Conduct Radionuclide Testing for Well Completion Interim Approval

Prepared by Water Supply Division

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TCEQ Plans Review Well Completion Checklist

In order for you to receive interim approval, you must complete the Plans Review Well Completion Checklist items including specified chemical testing. For certain counties, you must conduct radionuclide testing. The checklist may be found at the website:

<http://www.tnrcc.state.tx.us/permitting/waterperm/ud/wcomplete.pdf>

Counties for which Radionuclide Testing is Required for Well Completion

Several areas of Texas have elevated radionuclide levels. If you are drilling a well in one of the counties listed in Table 1, you must conduct radionuclide testing for interim approval. This list was prepared from compliance data for existing water systems. Counties listed here have had samples exceeding the maximum contaminant levels for gross alpha and/or combined radium 266 and radium 228.

Table 1: List of Counties where Radionuclide Testing is Required

COUNTY	STATE CODE #
Atascosa	007
Bexar	015
Bosque	018
Brazoria	020
Brewster	022
Burnet	027
Concho	048
Dallam	056
Erath	072
Fort Bend	079
Frio	082
Gillespie	086
Gray	090
Grayson	091
Harris	101
Irion	118

COUNTY	STATE CODE #
Kendall	130
Kerr	133
Liberty	146
Llano	150
Lubbock	152
McCulloch	154
Mason	160
Matagorda	161
Medina	163
Montgomery	170
Moore	171
Parker	184
Pecos	186
Polk	187
Refugio	196
San Jacinto	204

COUNTY	STATE CODE #
San Saba	206
Tarrant	220
Tyler	229
Upton	231
Val Verde	233
Victoria	235
Walker	236
Washington	239
Williamson	246
Zavala	254

Compliance Related Information to Consider

Before you consider methods and laboratories you must take into consideration the information listed in Table 2. The laboratory you use must be able to conduct analyses for gross alpha, gross beta and radium-228. For gross alpha and radium-228, if the levels of these contaminants exceed the “trigger” conditions below, the laboratory must be able to perform the additional testing listed for radium-226, combined uranium and the uranium isotopes 234, 235, 238. For gross beta, if the levels exceed the “trigger” conditions below (not common), the laboratory must perform Tritium, Radioactive Strontium and Gamma Emitters. In other words, when you review your radiological data and the report has gross alpha over 15 pCi/L and uraniums are not reported, you will have to resample or reanalyze and resubmit complete results. If you see gross alpha plus radium-228 over 5 pCi/L, and don't have radium-226, you will have to resample or reanalyze and resubmit complete results.

Table 2: Compliance Related Information

Contaminant (pCi/Liter except *)	Trigger
Gross Alpha	Performed on all samples
Gross Beta	Performed on all samples
Radium-228	Performed on all samples
Radium-226	If gross alpha + Ra-228 >5.0 pCi/Liter
Combined Uranium*	If gross alpha >15 pCi/Liter; reported in (F g/Liter)
Uranium-234	If gross alpha >15 pCi/Liter
Uranium-235	If gross alpha >15 pCi/Liter
Uranium-238	If gross alpha >15 pCi/Liter
Tritium	If gross beta >50 and the system is designated by TCEQ as vulnerable.
Radioactive Strontium	If gross beta >50 and the system is designated by TCEQ as vulnerable.
Gamma Emitting Radionuclides	If gross beta >50 and the system is designated by TCEQ as vulnerable.

You must calculate radionuclide compliance for gross alpha and Combined radium-226 and radium-228 from analytical results if the laboratory does not. Non-detections are calculated as a zero (“<” sign in front of a result or error margin). See Figure 1 below.

Figure 1: Compliance Calculations from Radionuclide Analytical Results

- Gross alpha (pCi/L): gross alpha result - uranium-234 result - uranium-238 result - uranium-235 result - gross alpha error margin - uranium -234 error margin - uranium-238 error margin - uranium-235 error margin = compliance level (Maximum Contaminant Level is 15 pCi/L)
- Combined radium (pCi/L): radium-226 result + radium-228 result - radium-226 error margin - radium-228 error margin = compliance level (MCL is 5 pCi/L)
- Combined Uranium (MCL is 30 µg/L): no calculation

Acceptable Methods for Radionuclide Testing

The link below lists the methods acceptable for analyzing radionuclides for public drinking water. Also be aware that radionuclides take longer to analyze, so plan ahead.

<http://www.tnrcc.state.tx.us/enforcement/csd/qa/FieldsJanuary04.pdf>

Laboratory Information for Radionuclides Only

At this time, public water systems are **not** required to use a laboratory certified by TCEQ for public drinking water for the well completion interim approval. This is subject to change. Any of the following laboratories may be solicited to perform public drinking water analyses for you. You must verify that the laboratory can conduct the analyses as required above. The lists only concern certification of radionuclide methods by TCEQ.

Laboratories certified by TCEQ:

Texas Department of Health
Bureau of Laboratories
1100 West 49th Street
Austin, TX 78756-3199
Phone: 512-458-7587
Certified for gross alpha, gross beta, radium-226, radium-228, uranium, radioactive strontium-89, radioactive strontium-90, tritium, and gamma emitters.

Environmental Health Laboratories
Client Services
110 S. Hill St.
South Bend, IN 46617
(574) 233-4777
(800) 332-4345
Certified for gross alpha, gross beta, radium 226, radium 228, uranium.

GEL Laboratories of Ohio, LLC
6954 Cornell Road, Suite 300
Cincinnati, OH 45242
(513) 489-2001
Certified for gross alpha, gross beta, radium-226, and radium-228.

General Engineering Laboratories, Inc.
P.O. Box 30712
Charleston, SC 29417
Mr. James M. Stelling
(843) 566-8171
Certified for gross alpha, gross beta, radium-226, radium-228, uranium, radioactive iodine, radioactive strontium-889, radioactive strontium-90, tritium, gamma emitters, and radioactive cesium.

Pace Analytical Services, Inc.

PO Box 148

Madison, PA 15663

(724) 722-5214

Certified for gross alpha, gross beta, radium-226, radium-228, uranium, radioactive strontium-89, and radioactive strontium 90.

Severn Trent Laboratories

<http://www.stl-inc.com/index.htm>

STL St. Louis

13715 Rider Trail North

Earth City, MO 63045

Phone: 314-298-8566 or 800-333-3305

Fax: 314-298-8757

Certified for gross alpha, gross beta, radium-226, radium-228, uranium, radioactive strontium-89, radioactive strontium-90, tritium, and gamma emitters.

Laboratories not certified by TCEQ:

Jordan Labs

Carl Crownover, P.E. or Terry Moore

842 Cantwell Dr.

Corpus Christi, TX 78408

(361)-884-0371

Gross alpha, gross beta, radium 226, and radium 228.

MWH Laboratories (Monrovia, CA)

750 Royal Oaks Drive #100

Monrovia, CA 91016

Phone: (626) 386-1100, (800) 566-LABS

Fax: (626) 386-1101

California's Department of Health Services certifies MWH Labs for determination of gross alpha, gross beta, radium 226, radium 228, uranium.

Additional laboratories not certified by TCEQ:

<http://www.bechteljacobs.com/icpt/analabs.html>