Figure 3.4 Drilling Area 3.

Figure 3.5 Drilling Area 4.

Figure 3.6 Drilling Area 5. This area includes the alluvial plains of the Missouri and Mississippi rivers.

Figure 3.7 Drilling Area 6.

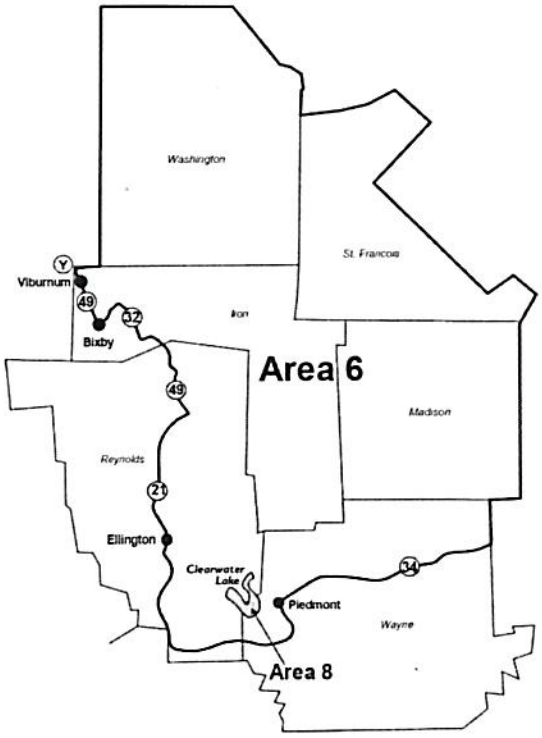


Figure 3.8 Drilling Area 10.

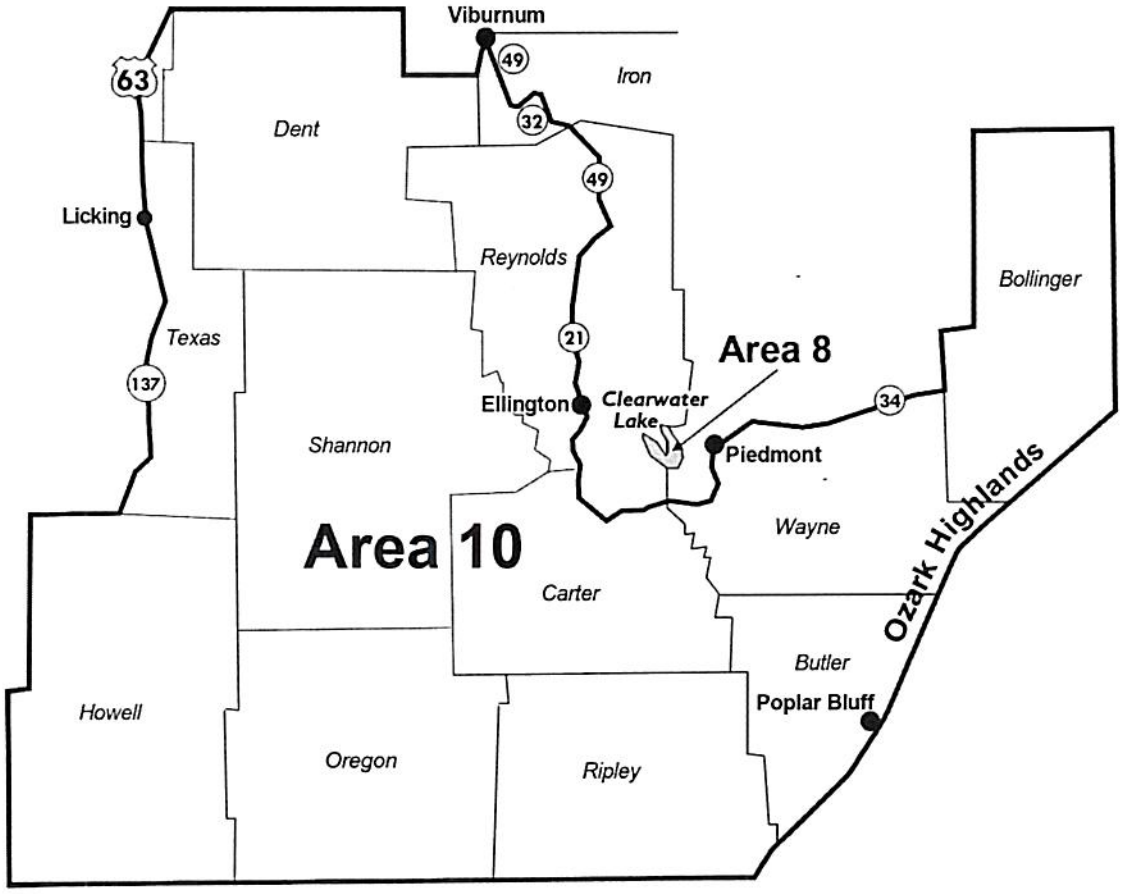


Figure 3.9 Drilling Area 12.

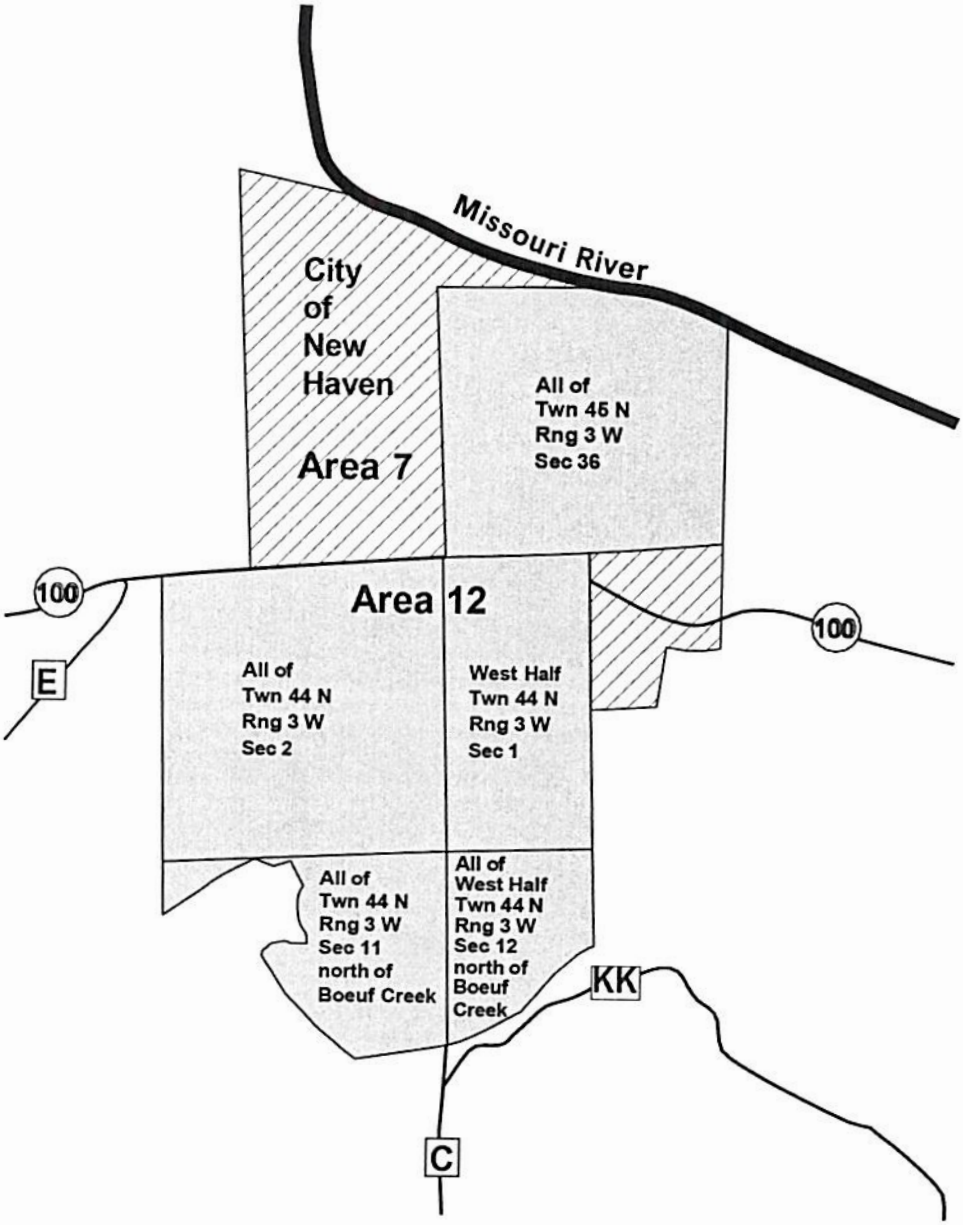
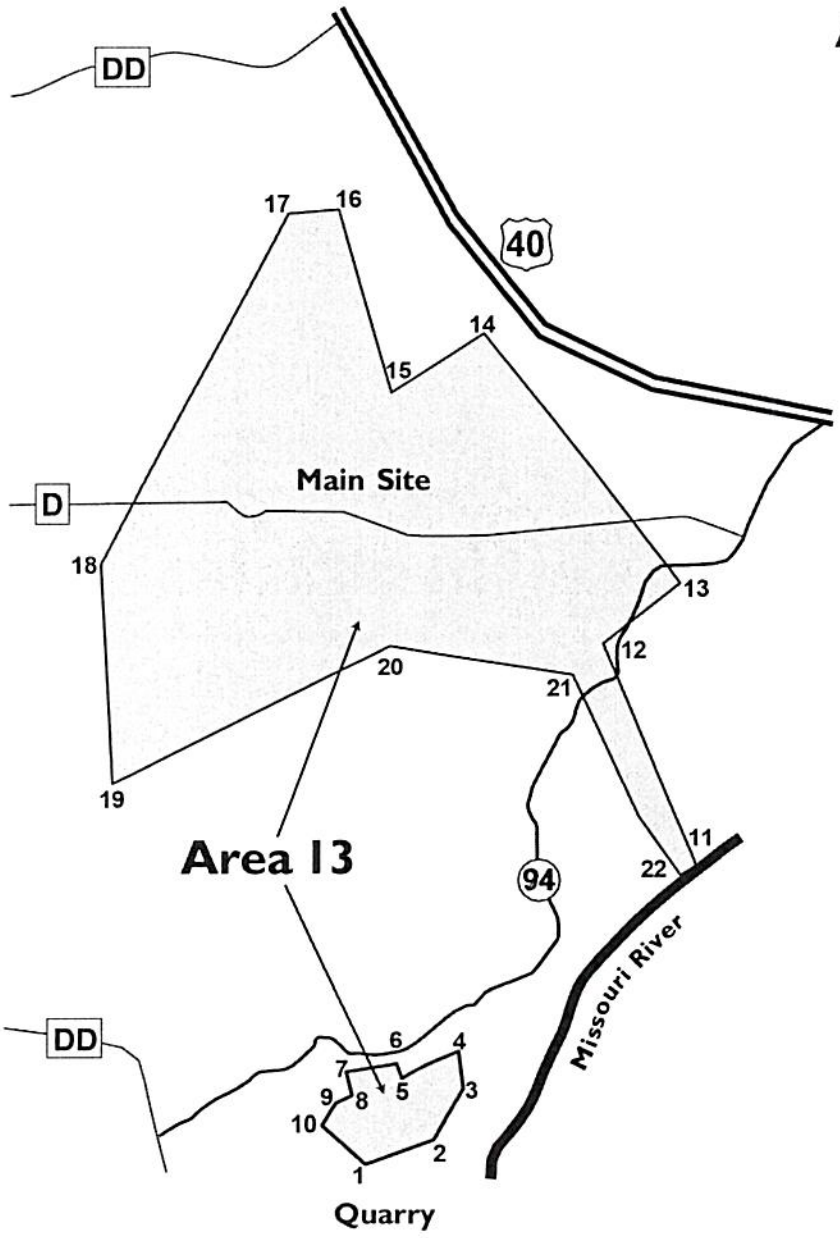


Figure 3.10 Drilling Area 13.



Area Boundary Points

	LAT	LONG
1	38 39' 03"	90 45' 13"
2	38 39' 10"	90 44' 44"
3	38 39' 26"	90 44' 32"
4	38 39' 37"	90 44' 33"
5	38 39' 30"	90 44' 58"
6	38 39' 33"	90 44' 59"
7	38 39' 32"	90 45' 19"
8	38 39' 25"	90 45' 16"
9	38 39' 22"	90 45' 22"
10	38 39' 18"	90 45' 29"
11	38 40' 28"	90 42' 58"
12	38 41' 31"	90 43' 32"
13	38 41' 52"	90 43' 02"
14	38 43' 11"	90 44' 15"
15	38 42' 53"	90 44' 54"
16	38 43' 49"	90 45' 13"
17	38 43' 50"	90 45' 33"
18	38 42' 02"	90 46' 52"
19	38 40' 53"	90 46' 49"
20	38 41' 37"	90 44' 57"
21	38 41' 22"	90 43' 44"
22	38 40' 24"	90 43' 04"

AUTHORITY: sections 256.606 and 256.626, RSMo 2016. Original rule filed April 2, 1987, effective July 27, 1987. Emergency amendment filed Nov. 16, 1993, effective Dec. 11, 1993, expired April 9, 1994. Amended: Filed Aug. 17, 1993, effective March 10, 1994. Amended: Filed June 27, 2018, effective Feb. 28, 2019. Amended: Filed March 20, 2024, effective Nov. 30, 2024.*

**Original authority: 256.606, RSMo 1991, and 256.626, RSMo 1985, amended 1991.*

10 CSR 23-3.100 Sensitive Areas
(Rescinded February 28, 2019)

AUTHORITY: sections 256.606 and 256.626, RSMo 2000. Original rule filed April 2, 1987, effective July 27, 1987. Emergency amendment filed Nov. 16, 1993, effective Dec. 11, 1993, expired April 9, 1994. Amended: Filed Aug. 17, 1993, effective March 10, 1994. Amended: Filed July 13, 1994, effective Jan. 29, 1995. Amended: Filed Nov. 1, 1995, effective June 30, 1996. Amended: Filed April 23, 2001, effective Dec. 30, 2001. Emergency amendment filed March 21, 2005, effective April 1, 2005, expired Sept. 27, 2005. Amended: Filed Sept. 27, 2005, effective April 30, 2006. Amended: Filed Jan. 4, 2007, effective Aug. 30, 2007. Amended: Filed June 27, 2018, effective Feb. 28, 2019.

10 CSR 23-3.110 Plugging of Water Wells

PURPOSE: This rule establishes standards for plugging a water well.

(1) General Plugging Requirements for Water Wells.

(A) Abandoned wells shall be plugged in accordance with these rules pursuant to sections 256.603(1) and 256.615, RSMo. If a well presents a contamination threat to groundwater, the department may order that the well be plugged.

(B) A permittee shall report to the department any unplugged abandoned wells existing on property where the permittee performed work under these rules.

(C) The well owner shall be responsible for plugging abandoned wells or causing the well to be plugged, except as follows:

1. When the permittee improperly locates, constructs, or completes a well, then the permittee is responsible for plugging the well unless the department has set a timeframe for remediation of the well;

2. A dry hole shall be plugged within thirty (30) days and a plugging registration record submitted. A certification record is not required; or

3. Wells that produce saline water shall be plugged within thirty (30) days and a plugging registration record submitted. A certification record is not required.

(2) General Plugging Methods.

(A) A well that is to be plugged shall be disconnected from the water distribution system and the borehole sealed to prevent contaminants from entering an aquifer or prevent aquifer mixing.

(B) Contaminated wells shall be plugged by a permitted contractor. The department shall be consulted for plugging specifications. Groundwater sampling may be required.

(C) Wells contaminated by bacteria only may be plugged by the well owner.

(D) Wells that have an unknown casing depth shall be plugged full length with grout materials pursuant to 10 CSR 23-3.110(2)(E).

(E) Grout materials —

1. Cement slurry;
2. Bentonite;
3. Bentonite slurry; or
4. Other approved grout.

(F) Grout placement methods —

1. Tremie;
2. Reverse tremie;
3. Gravity; or
4. Pressure.

(G) The top portion of the casing shall be removed and the excavated area filled by well type pursuant to 10 CSR 23-3.110(3).

(H) New or existing wells that have unusual conditions, which include but are not limited to contamination, a liner, a foreign object, or a pump stuck in the borehole, shall be plugged full-length by a permitted contractor using cement, emplacing the cement grout by one (1) of the following methods: tremie, tremie pressure, or reverse tremie. Alternate plugging methods may be used upon advanced written approval by the department.

(3) Domestic and Multifamily Water Well Plugging Requirements.

(A) Hand dug and augered wells less than eighty feet (<80') in depth may be plugged by the landowner or a non-permitted person.

1. Remove the pump, pipe, debris, and surface covering.

2. Remove at a minimum the top one foot (1') of well lining unless the well is located in an agricultural setting where the removal of well lining shall be three feet (3') below ground surface. Lining may be composed of rock, brick, tile, tin, or clay pipe.

3. Disinfect the well. If water is in the well, add chlorine to the water pursuant to 10 CSR 23-3.050(7). If no water is in the well, disinfect the fill material as it is placed into the well.

4. Fill the well with clean fill from total depth to one foot (1') from ground surface or if in an agricultural setting three feet (3') from ground surface.

5. Fill the remaining hole with clay or clay-rich soil. Soil should be mounded slightly to help offset settling.

(B) Unconsolidated material wells.

1. Remove the pump, pipe, and any debris from the well.

2. Remove the top two feet (2') of casing. If well is located in an agricultural setting remove the top three feet (3') of casing below ground surface. Excavate the area at least two feet (2') in diameter larger than the existing casing. If the well casing is surrounded by a concrete pad or asphalt, the casing may be cut off flush.

3. Disinfect the well. If water is in the well, add chlorine to the water pursuant to 10 CSR 23-3.050(7). If no water is in the well, disinfect the fill material as it is placed into the well.

4. Add clean fill.

A. Wells less than or equal to two hundred feet (≤ 200') total depth, add clean fill from total depth to approximately twenty feet (20') below ground surface.

B. Wells greater than two hundred feet (200') total depth, add clean fill from total depth to approximately fifty feet (50') below ground surface.

5. Add grout plug.

A. Wells less than or equal to two hundred feet (≤200') total depth, add grout from top of clean fill to one foot (1') below ground surface in yard or non-agricultural setting or three feet (3') below ground surface in an agricultural setting. Grout plug shall total twenty feet (20').

B. Wells greater than two hundred feet (>200') total depth, add grout from top of fill to one foot (1') below ground surface in yard or non-agricultural setting or three feet (3') below ground surface in agricultural setting. Grout plug shall total fifty feet (50').

6. Add soil or clean fill.

A. Completely fill the excavated area above the grout plug with soil or clean fill.

B. If the well casing is surrounded by a concrete pad or asphalt, fill the top one foot (1') of casing above the grout plug with cement grout or quick-setting concrete.

7. If the well casing and screen are removed from the well, native material is allowed to collapse into the borehole; fill any remaining borehole with grout and add a minimum one foot (1') soil cap in a yard or non-agricultural setting or a three foot (3') soil cap in an agricultural setting.

(C) Bedrock wells.

1. Remove the pump, pipe, liner, and debris from well. If any item is left in the well, see 10 CSR 23-3.110(2)(H) for plugging requirements.

2. Remove the top two feet (2') of casing. If well is located in an agricultural setting remove the top three feet (3') of casing below ground surface. Excavate the area at least two feet (2') in diameter larger than the existing casing. If the well casing is surrounded by a concrete pad or asphalt, the casing may be cut off flush. If the top two feet (2') of casing cannot be removed due to encountering bedrock or hard impervious material when digging around the casing, cut the casing flush with the top of bedrock or impervious material.

3. Disinfect the well. If water is in the well, add chlorine to the water pursuant to 10 CSR 23-3.050(7). If no water is in the well, disinfect the fill material as it is placed into the well.

4. Add clean fill. If the well is not filled full length with grout, then fill the well from total depth to fifty feet (50') below the bottom of the casing with clean fill.

5. Add a grout plug. Place a grout plug on top of clean fill from a point fifty feet (50') below the bottom of the casing completely filling the casing to one foot (1') below ground surface.

6. Add soil or clean fill. Fill the excavated area above the grout plug and with soil. Clean fill may be used to fill the excavated area above the grout plug if the well site is to be paved. If the well casing is surrounded by a concrete pad or asphalt, then fill the top one foot (1') of casing with cement grout or quick-setting concrete.

7. For a well with greater than eighty feet (>80') of casing the well may be plugged as follows.

A. Add clean fill. Fill the well with clean fill from total depth to fifty feet (50') below the bottom of the casing.

B. Add a lower grout plug. The lower grout plug shall extend from fifty feet (50') below the bottom of the casing to at least thirty feet (30') into the casing.

C. Add clean fill. Clean fill may be added on top of the lower grout plug and extend to fifty feet (50') below ground surface.

D. Add an upper grout plug. The upper grout plug shall extend from the top of clean fill (fifty feet (50') below ground surface) to one foot (1') below ground surface.

E. Add soil or clean fill pursuant to 10 CSR 23-3.110(3)(C)6.

8. For a well that has greater than one hundred feet (>100') of standing water, the grout plug shall be emplaced by one (1) of the following methods: tremie, tremie pressure, reverse tremie, or gravity. If the gravity method is used only bentonite chips or pellets are allowed and shall be added slowly to avoid bridging. For reverse tremie, pour the cement slurry in one (1) continuous operation. For all methods, the tremie pipe shall be no greater than twenty feet (20') from the bottom of the well or the top of the fill material.

9. If the borehole does not have casing, the borehole may be filled with clean fill from total depth to fifty feet (50') below ground surface. From fifty feet (50') to within one foot (1') of ground surface, the borehole shall be filled with grout. Fill the top one foot (1') with soil or clean fill pursuant to 10 CSR 23-3.110(3)(C)6.

(4) High Yield Well Plugging Requirements.

(A) High yield wells must receive prior approval from the department, unless they are plugged in accordance with subsection (B) or (C) of this section.

(B) Bedrock wells.

1. Remove all materials from the well prior to plugging.

2. Cut the casing two feet (2') below ground surface or flush with bedrock if encountered. If the well is located in an agricultural setting, remove the top three feet (3') of casing below ground surface.

3. Disinfect the well. If water is in the well, add chlorine to the water pursuant to 10 CSR 23-3.050(7).

4. Fill the well full-length from total depth to the top of casing with cement slurry using one (1) of the tremie or reverse tremie methods.

5. Fill the remaining hole above the cut off casing with soil or fill material.

(C) Unconsolidated wells.

1. Wells two hundred feet or less (≤200') in total depth may be plugged as follows:

A. Remove all materials prior to plugging;

B. Cut the casing two feet (2') below ground surface. If well is located in an agricultural setting, remove the top three feet (3') of casing below ground surface;

C. Fill the well from total depth to twenty feet (20') from surface with disinfected clean fill;

D. Plug the upper twenty feet (20') with bentonite or cement grout; and

E. Fill the remaining hole above the cut off casing with soil or fill material.

2. Wells greater than two hundred feet (>200') total depth may be plugged pursuant to 10 CSR 23-3.110(3)(B).

(5) Public Water Supply Well Plugging Requirements.

(A) Public water supply wells must receive prior approval from the department, unless plugged in accordance with subsection (4)(B) of this rule.

AUTHORITY: sections 256.606, 256.614, 256.615, and 256.626, RSMo 2016. This rule was previously filed as 10 CSR 23-3.020(3)–(9). Emergency rule filed Nov. 16, 1993, effective Dec. 11, 1993, expired April 9, 1994. Original rule filed Aug. 17, 1993, effective March 10, 1994. Amended: Filed July 13, 1994, effective Jan. 29, 1995. Amended: Filed June 27, 2018, effective Feb. 28, 2019. Amended: Filed March 20, 2024, effective Nov. 30, 2024.*

**Original authority: 256.606, RSMo 1991; 256.614, RSMo 1985, amended 1991; 256.615, RSMo 1991; and 256.626, RSMo 1985, amended 1991.*