

MARK-UP

RULE B-17: WELL DRILLING PITS AND COMPLETION PITS REQUIREMENTS

a) Applicability

This rule applies to all pits constructed during the drilling, completion and testing of a brine, oil, gas, or oil and gas production well, brine injection or disposal well, Class II Disposal Well, and Class II Commercial Disposal Well. Pits as used in context of this rule refer to the type pits as defined in subparagraph c) below.

b) Joint Enforcement

After the effective date of this rule, any Operator who constructs or operates a pit covered by this Rule, shall be subject to the specific enforcement provisions under the respective authorities of the Arkansas Oil and Gas Commission (AOGC) or the Arkansas Department of Environmental Quality (ADEQ). The regulation of the activities covered under this rule by AOGC and ADEQ shall be in accordance with a Memorandum of Agreement (MOA) between AOGC and ADEQ.

c) Definitions:

- 1) AOGC: Arkansas Oil and Gas Commission.
- 2) ADEQ: Arkansas Department of Environmental Quality.
- 3) APC&EC: Arkansas Pollution Control and Ecology Commission.
- 4) Closed Loop System: A system that uses a combination of solids control equipment incorporated in a series of steel tanks that eliminates the use of a Pit.
- 5) Completion Flow-Back Fluid: Any of a number of liquid and gaseous fluids or mixtures of fluids, chemicals and or solids that flow from a well and consisting of Drilling Fluid, silt, debris, water, brine, oil scum, paraffin, or other materials which have been removed from the well bore during the initial completion of a well, but does not include Frac Flow-Back Fluid.
- 6) Cuttings: Fragments of rock which are a result of the cutting action of the drill bit on rock formations encountered in the well, which are transported to the surface by the Drilling Fluid.
- 7) Discharge: The release, overflow, leakage or seepage of any fluids covered by this Rule.
- 8) Drilling Fluid: Any of a number of liquid and gaseous fluids and mixtures of fluids and solids (as solid suspensions, mixtures and emulsions of liquids, gases, Cuttings and other solids) utilized during brine, oil, or gas drilling operations. Drilling Fluid is generally synonymous with drilling mud, which typically contains bentonitic clays, chemical additives, foaming agents, lubricants,

emulsifiers and weighting materials, and which encompasses most muds used in drilling operations, especially muds that contain significant amounts of suspended solids, emulsified water or oil. Mud includes all types of Water-Based, Oil-Based and synthetic-based Drilling Fluids.

- 9) Director of the ADEQ: The Director of the Arkansas Department of Environmental Quality or his or her designated representative.
- 10) Director of AOGC: The Director of the Arkansas Oil and Gas Commission or his or her designated representative.
- 11) Ecologically Sensitive Waterbody (ESW): Waters that have been given the designated use of Ecologically Sensitive Waterbody by the Arkansas Pollution Control and Ecology Commission. This beneficial use identifies segments known to provide habitat within the existing range of threatened, endangered or endemic species of aquatic or semi-aquatic life forms.
- 12) Encountered Water: Water encountered during brine, oil, or gas drilling operations, which is of sufficient quantity to require disposal, and which is not Produced Water.
- 13) Exploration and Production Waste (E&P Waste): Wastes associated with the exploration, development and production of brine, oil, or gas and which are not regulated by the provisions of, and, therefore, exempt from the Federal Resource Conservation and Recovery Act, and may include, but are not limited to the following: salt water (produced brine or produced water); Oil-Based Drilling Fluids; Water-Based Drilling Fluids, Completion Flow-Back Fluid, Frac Flow-Back Fluid, Workover Flow-Back Fluid, Produced Water; rainwater from firewalls and Pits at drilling and production facilities; and other wastes not described above.
- 14) Extraordinary Resource Waters (ERW): Waters that have been given the designated use of Extraordinary Resource Waterbody by the Arkansas Pollution Control and Ecology Commission. This beneficial use is a combination of the chemical, physical and biological characteristics of a water body and its watershed which is characterized by scenic beauty, aesthetics, scientific values, broad scope recreation potential and intangible social values.
- 15) Frac Flow-Back Fluid: Fluids that consist of fresh water and solids such as sand or other proppant (resin or ceramic grains) or other additives that flow from a well following hydraulic fracturing of a well, until such time as the volume of fluid utilized for the hydraulic fracturing process in the well has been recovered.
- 16) Natural and Scenic Waterways (NSW): Waters that have been given the designated use of Natural and Scenic Waterways by the Arkansas Pollution Control and Ecology Commission. This beneficial use identifies segments which have been legislatively adopted into a state or federal system.
- 17) Nonhazardous Oilfield Wastes (NOW): Fluids to be used or reused in connection with activities associated with the exploration, development, and production of brine, oil, or gas and includes, but is not limited to, Drilling Fluids,

completion fluids, surfactants, and chemicals used to detoxify brine, oil, or gas wastes.

- 18) Oil-Based Drilling Fluid: Drilling Fluid containing diesel or crude oil rather than fresh water as the main liquid phase of the drilling mud.
- 19) Operator: Any person who has the primary management and ultimate decision-making responsibility over the operation of a facility or activity. The Operator is responsible for ensuring compliance with all applicable regulations and conditions.
- 20) Person: Natural person, corporation, organization, municipality, government or governmental subdivision or agency, public or private corporation, business trust, estate, trust, individual, partnership, association, or any other legal entity.
- 21) Pit: shall include:
 - A) Circulation Pit: A pit used during drilling where Drilling Fluids are circulated during drilling operations. The Circulation Pit may be part of the Mud Pit. Circulation Pits may also refer to a series of open, above-ground tanks, usually made of steel.
 - B) Completion Pit: A pit used for storage of Completion Flow-Back Fluid and Drilling Fluids or other materials which have been cleaned out of the well bore during the initial completion of a well. Circulation or Mud Pits may be used as a Completion Pits when drilling operations conclude.
 - C) Emergency Pit: A pit used for containing fluids at an operating well during an actual emergency and for a temporary period of time. Use of the Emergency Pit is necessitated due to unplanned operational issues, which may include but is not limited to, a temporary shutdown of a disposal well or fluid injection well or associated equipment, temporary overflow of saltwater storage tanks on a producing lease, gas flaring, cement circulation, or a producing well loading up with formation fluids.
 - D) Mud Pit: A pit or series of pits used during drilling where fluids are mixed and circulated during drilling operations. Mud Pits may also refer to a series of open, above-ground tanks, usually made of steel.
 - E) Reserve Pit: A pit not part of the active circulation system, used to store Drilling Fluids or to contain fluids generated during drilling operations. Such fluids would include, but not be limited to, Cuttings, Drilling Fluids, and Encountered Water.
 - F) Test Pit: A pit constructed for use during a well test.
 - G) Workover Pit: A pit used for storage of Completion Flow-Back Fluid, Workover Flow-Back Fluid and other materials which have been cleaned out of the well bore during any subsequent completion or re-completion.

- 22) **Pollution:** Such contamination or other alteration of the physical, chemical, or biological properties of any waters of the state, or such discharge of any liquid, gaseous, or solid substance in any waters of the state as will, or is likely to, render the waters harmful, detrimental, or injurious to public health, safety, or welfare; to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or to livestock, wild animals, birds, fish, or other aquatic life.
- 23) **Produced Water:** Water produced from any productive or potentially productive brine, oil, or gas producing interval in the well, which is not Completion Flow-Back Fluid, Frac Flow-Back Fluid, Workover Flow-Back Fluid, or Encountered Water.
- 24) **Stormwater:** Rainwater runoff, snow melt runoff, and surface runoff and drainage.
- 25) **Water-Based Drilling Fluid:** Drilling Fluid containing fresh waters rather than diesel or crude oil as the liquid component of the drilling mud.
- 26) **Waters of the State:** All streams, lakes, marshes, ponds, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon this state or any portion of the state.
- 27) **Water Table:** The surface between the zone of saturation and the zone of aeration and the surface of a body of unconfined ground water at which the pressure is equal to that of the atmosphere.
- 28) **Workover Flow-Back Fluid:** Any of a number of liquid and gaseous fluids and mixtures of fluids, chemicals and or solids consisting of Drilling Fluid, silt, debris, water, brine, oil scum, paraffin, or other materials which are removed from the well bore during the subsequent or recompletion of a well.

d) **Commencement of Construction Operations**

The Operator shall notify the appropriate AOGC Regional Office, via mail, e-mail or fax, at least forty-eight (48) hours prior to the commencement of Pit construction operations. The Notice of Commencement (NOC) shall be on a form agreed upon by AOGC and ADEQ and shall include at a minimum (i) the Operator information (name, address, and emergency contact phone number), (ii) the location of the drill pad site (latitude and longitude in degrees, minutes, seconds, and County, Section, Range, and Township, including the 1/4 of the 1/4 position within the Section), (iii) the approximate size of the drill pad, (iv) the approximate distance to the nearest Waters of the State, (v) the type of fluid system and type of Drilling Fluids to be used, (vi) well name, (vii) nearest city/town, and (viii) the approximate date Pit construction operations shall commence. Upon receiving the Notice of Commencement, AOGC shall forward a copy to ADEQ, Arkansas Department of Health, and the County Judge of the county in which the pit is located. AOGC and ADEQ staff may conduct site inspections as deemed necessary.

e) **Discharges Prohibited**

The Discharge from a Pit or any activity associated with the drilling or completion of a well to any surface or ground waters or in a location where it is likely to cause pollution to any surface or groundwaters is prohibited. Such discharge may subject the Operator to ADEQ enforcement actions under the provisions of the Water and Air Pollution Control Act (Act 472 of 1949, as amended, A. C. A. § 8-4-101, et seq.) and enforcement actions of AOGC under Act 105 of 1939, as amended. Any Discharge must be reported within twenty-four (24) hours to the AOGC and ADEQ. Leakage from any Pit is considered an unauthorized Discharge.

f) Mud, Circulation and Reserve Pit Construction Requirements:

1) General Requirements:

- A) Mud, Circulation and Reserve Pits constructed within the 100 year flood plain must be in accordance with any county or other local ordinance or requirement pertaining to the 100 year flood plain.
- B) The location of all Mud, Circulation or Reserve Pits shall be chosen with reasonable consideration to maximizing the distance from surface waters. Mud, Circulation or Reserve Pit construction in streams, creeks, lakes, or any other water bodies is strictly prohibited.
- C) Any Mud, Circulation or Reserve Pit construction in wetlands must receive appropriate prior authorization from the U.S. Army Corps of Engineers.
- D) In areas other than jurisdictional wetlands referenced in subparagraph f) 1) C) above, where the water table is ten (10) feet or less below the ground surface, all Mud, Circulation or Reserve Pits shall be constructed above ground, or the Operator shall use a closed loop system.

2) Reserve Pit Requirements:

- A) All Reserve Pits shall be constructed with a minimum of two (2) feet of freeboard, and shall be maintained to handle a storm event up to a 10-year, 24-hour storm event during the operation of the Reserve Pit. Reserve Pits constructed above ground utilizing bermed side walls, shall be constructed with a minimum of 2:1 (two feet horizontal to one foot vertical) side slope on both the interior and exterior walls. The top of the bermed pit walls must be a minimum of 2 feet wide.
- B) All Reserve Pits shall be constructed with a liner using one of the following methods:
 - i) A synthetic liner of at least twenty (20) mils thickness, with a four (4) inch welded seam overlap, completely covering the Reserve Pit bottom and inside walls. Sand or sandy material must be placed below the liner if a rocky or uneven surface is encountered. The synthetic liner must be protected from

deterioration, punctures and/or any activity which may damage the integrity of the synthetic liner.

- ii) A compacted clay liner may be applied to the bottom and sides of the Reserve Pit to create an impervious/impermeable barrier. Construction of the Reserve Pit and compacted clay liner shall be in accordance with sound construction and engineering principles designed and constructed to prevent any leakage or seepage to Waters of the State, with due consideration given to the topography, Pit material composition, and availability of liner material(s). The clay used to construct the liner may be in situ or mixed with additional off-site materials, if the on-site clay is inadequate.
- iii) Other materials or methods used for liner construction must be approved by both the Director of the ADEQ and the Director of the AOGC prior to use.

3) Mud and Circulation Pits:

- A) Closed Loop Systems may be used for Mud and Circulation Pits, and must be maintained in a leak-free condition.
- B) Earthen Mud and Circulation Pits shall be constructed with a minimum of two (2) feet of freeboard, and shall be maintained to handle a storm event up to a 10-year, 24-hour storm event during the operation of the Mud or Circulation Pit.
- C) Earthen Mud and Circulation Pit liners shall be constructed using one of the following methods:
 - i) A synthetic liner of at least twenty (20) mils thickness, with a four (4) inch welded seam overlap, completely covering the Reserve Pit bottom and inside walls. Sand or sandy material must be placed below the liner if a rocky or uneven surface is encountered. The synthetic liner must be protected from deterioration, punctures and/or any activity which may damage the integrity of the synthetic liner.
 - ii) Bentonite drilling mud from fresh Water-Based Drilling Fluids may be used on the bottom and sides of the earthen Mud or Circulation Pit to create an impervious/impermeable barrier. Application of the Mud or Circulation Pit bentonite drilling mud liner shall be in accordance with sound construction and standard industry practices designed and constructed to prevent any Discharge.
 - iii) A concrete liner may be applied to the bottom and sides of the earthen Mud or Circulation Pit to create an impervious/impermeable barrier. Construction of the Mud or Circulation Pit concrete liner shall be in accordance with sound

construction and standard industry practices designed and constructed to prevent any Discharge.

- D) Oil-Based Drilling Fluids shall not be placed in an earthen Mud or Circulation Pit unless the Pit is lined with a synthetic or concrete liner as prescribed in subparagraph f) 3) C) i) or iii) above.
- E) If Oil-Based Drilling Fluids are to be used, and the location of the Mud or Circulation Pit is within 100 feet of a pond, lake, stream, ERW, ESW or NSW, the Operator is required to use a Closed Loop System.

g) Operating Requirements For Mud, Circulation or Reserve Pits:

- 1) No waste oil, hydraulic fluids, transmission fluids, trash or any other miscellaneous rig waste may be placed, stored or disposed into a Mud, Circulation, or Reserve Pit.
- 2) ~~Post-drilling~~ Produced Water, and Frac Flow-Back Fluid may not be placed, stored or disposed in a Mud, Circulation, or Reserve Pit, except that as part of a Frac Flow-Back Fluid recycling program, Frac Flow-Back Fluids, and upon approval of both AOGC and ADEQ Directors, Produced Water, may be temporarily placed or stored in a Reserve Pit, for a period not to exceed ninety (90) days per pit use for this purpose if:
 - A) The Reserve Pit is constructed with a clay liner as specified in subparagraph f) 2) B) ii) above and a synthetic liner of at least forty (40) mils thickness, or two (2) twenty (20) mils thickness synthetic liners, in addition to all other applicable Reserve Pit construction requirements as specified in subparagraph f) 2) above, and have a means to monitor between the synthetic liners (if two liners are utilized) and below the bottom of the lower most synthetic liner; and
 - B) The Operator requests approval from ADEQ in writing prior to the placement or storage of the Frac Flow-Back Fluid or approved Produced Water, in a Reserve Pit. Such request shall include the AOGC Well Permit Number, well names(s), description of the water to be stored, anticipated dates of use, volume of water to be stored or placed, detailed information on any proposed pipelines for the transfer Frac Flow-Back Fluids including a map showing proposed pipeline location for; and
 - C) No Frac Flow-Back Fluids or other fluids mixed with Frac Flow-Back Fluids temporally stored or placed in a Reserve Pit may be sent to any commercial land applications disposal facility or land applied onsite.
- 3) Water-Based Drilling Fluid, Stormwater, water from Waters of the State, or Encountered Water may be placed or stored in an earthen Mud, Circulation or Reserve Pit.
- 4) Mud, Circulation and Reserve Pits must be maintained in such a manner as to prohibit any Discharges. The Operator is required to maintain adequate storage capacity at all times.

- 5) Mud, Circulation and Reserve Pit levees or walls shall be protected and maintained at all times to prevent deterioration or discharge. In addition, Pit liners shall also be maintained and protected from deterioration or puncture causing discharge of fluids until such time that the Pit is emptied and closed.
 - 6) Mud, Circulation and Reserve Pits shall contain only Drilling Fluids generated during the drilling of the well or wells at the drilling pad where the Pit is constructed, except that as part of a Frac Flow-Back Fluid recycling program a Reserve Pit, permitted in accordance with subparagraph g) 2) above, may temporarily contain Frac Flow-Back Fluids and upon approval by both AOGC and ADEQ Directors, Produced Water, which may be ~~except that transfer of Frac Flow-Back Fluids~~ to another drill pad Reserve Pit is permitted in accordance with subparagraph g) 2) above. The transfer of Frac Flow-Back Fluids and approved Produced Water, via tank truck, shall be in accordance with General Rule E-3. If the transfer of Frac Flow-Back Fluids and approved Produced Water, is via pipeline, such pipeline shall be constructed and maintained in a leak-free condition and protected from deterioration, punctures and/or any activity which may damage the integrity of the pipeline. If the proposed pipeline will result in a stream crossing, a short term activity authorization shall be received from the ADEQ prior to construction. Any discharge from the pipeline shall be reported immediately to ADEQ.
 - 7) In the event of an emergency and with prior approval from either the Director of ADEQ or the AOGC, the Reserve Pit may be used for temporary additional storage of Water-Based Drilling Fluids from another drilling pad location. In the event of an emergency, any request for approval must be submitted to both ADEQ and AOGC for review. ADEQ or AOGC will provide notice to each other at the time of the approval of any request made pursuant to this paragraph.
 - 8) Except as specified in subparagraph i) 1), or in an emergency and with prior approval from the Director of the ADEQ hauling or transporting Drilling Fluids from a Pit to an off-site location, not located on a drilling pad, for additional storage is prohibited.
 - 9) Oil-Based Drilling Fluids shall be segregated from Water-Based Drilling Fluids and other Drilling Fluids.
- h) Fluid Disposal and Earthen Pit Closure Requirements for Water-Based Drilling Fluid and Encountered Water.
- 1) Water-Based Drilling Fluid, Stormwater, water from Waters of the State, or Encountered Water stored in the Pits shall be removed to the maximum extent practical using pumps or similar equipment at the time of Pit closure, and shall be disposed of in one of the following manners:
 - A) Land applied in accordance with an active ADEQ land application permit.
 - B) Disposed of fluid into approved NPDES or state permitted facility.

- C) Injected via Class II wells permitted by AOGC.
- D) Pumping the Water-Based Drilling Fluids back down the well bore of the well in accordance with AOGC requirements.
- E) Water-Based Drilling Fluids exhibiting high viscosity to high solids concentration may be solidified or stabilized by combining with available native soils and buried in situ. The Operator is responsible for ensuring the native soils are properly mixed to prevent any discharge.

F) Transported by truck or by pipeline to a Reserve Pit, which is part of an approved Frac Flow-back Fluid recycle program.

~~F)G)~~ By any other method as approved by ADEQ and AOGC.

- 2) The Operator shall take all reasonable measures to ensure that Drilling Fluid and Encountered Water that is removed from the well-site, are properly transported to and disposed of or recycled or reclaimed at an AOGC or ADEQ permitted site or facility, or a permitted site or facility outside of Arkansas.
 - 3) Any synthetic liner used shall be removed to the fullest extent practicable and properly disposed or recycled.
 - 4) The closed Pit shall be filled with native materials and covered with topsoil at depths consistent with adjoining onsite areas, with the contour mounded or sloped to discourage erosion and restored as close to the original contours as is practicable. Topsoil and native materials removed during Pit construction may be preserved and used during closure.
 - 5) The oil & grease content of the material to be buried in situ shall be less than 3% by dry weight.
 - 6) The pit and applicable portion of the drill pad not utilized for production purposes, shall be returned to grade, reclaimed and seeded within a reasonable amount of time not to exceed one hundred eighty days (180) days after the drilling or workover rig is removed from the site, or in the case of a multiple well drill pad, within 180 days after the drilling or workover rig utilized for the last well to be drilled from the drill pad is removed, during which period the reserve pit shall be maintained in accordance with the provisions of this rule. An extension of the time to close the pit may be granted upon approval of both AOGC and ADEQ. Vegetative coverage of 75%, or equivalent to the surrounding landscape, whichever is less, shall be obtained within six (6) months of Pit closure. Until vegetation is established, the Operator is responsible for maintaining a stormwater erosion and sediment control plan.
 - 7) The Operator shall submit the Notice of Pit closure to AOGC signed by the Operator within 30 days after Pit closure has been completed. AOGC shall forward a copy to ADEQ.
- i) Fluid Disposal and Earthen Pit Closure Requirements for Oil-Based Drilling Fluids.

- 1) Oil-Based Drilling Fluids shall be removed from the Pit and hauled to a permitted Class 1 (as defined by APC&EC Regulation No. 22) landfill for disposal or be transferred to above ground tanks for re-use at another well location, or other disposal methods or uses of Oil-Based Drilling Fluids as approved by the ADEQ. The Operator shall inform the AOGC of the location of the disposal or transfer of the Oil-Based Drilling Fluid. AOGC shall forward a copy to ADEQ.
 - 2) If an Oil-Based Drilling Fluid other than diesel is used as the base, additional analytical or disposal requirements may be required, which shall require prior notification and approval by ADEQ.
 - 3) Any synthetic liner used shall be removed to the fullest extent practicable and properly disposed or recycled.
 - 4) The closed Pit shall be filled with native materials and covered with topsoil at depths consistent with adjoining onsite areas, with the contour mounded or sloped to discourage erosion and restored as close to the original contours as is practicable. Topsoil and native materials removed during Pit construction may be preserved and used during closure.
 - 5) The area shall be returned to grade, reclaimed and seeded within a reasonable amount of time not to exceed one hundred eighty days (180) days after the drilling rig is removed from the site. Vegetative coverage of 75%, or equivalent to the surrounding landscape, whichever is less, shall be obtained within six (6) months of closure. Until vegetation is established, the Operator is responsible for maintaining a stormwater erosion and sediment control plan.
 - 6) The Operator shall submit the Notice of Pit closure to AOGC signed by the Operator within 30 days after Pit closure has been completed. AOGC shall forward a copy to ADEQ.
- j) Requirements for Workover Pits, Emergency Pits and Test Pits
- 1) No Produced Water, Workover Flow-Back Water, waste oil, or any other Nonhazardous Oilfield Wastes (NOW) shall be placed in a Workover, Emergency, or Test Pit, unless the Pit is lined in accordance with subparagraph f) 2) B) above.
 - 2) All Workover, Emergency, or Test Pits shall be closed within thirty (30) days after the associated workover, emergency, or test ceases. Any Workover, Emergency, or Test Pit shall be closed in accordance with the requirements of subparagraph h) above.
- k) Other drilling mud systems not specifically authorized by this Rule shall require prior notification and approval by the Director of the AOGC and the Director of ADEQ.
- l) Stormwater Erosion and Sediment Controls
- 1) The Operator shall prepare a stormwater erosion and sediment control plan for the well site covered by this rule. The plan shall be prepared in accordance with

proven and accepted engineering practices. The plan shall describe and ensure the implementation of both erosion and sediment control practices which are to be used to reduce pollutants in stormwater discharges associated with the well pad and access roads to minimize erosion and reduce the sediments which may enter waters of the state and assure compliance with any applicable Water Quality Standards (WQS). Facilities shall implement the provisions of the plan required under this rule. The Operator shall provide upon request by the ADEQ or AOGC a copy of the stormwater erosion and sediment control plan.

- 2) In lieu of a stormwater erosion and sediment control plan as required above, the Operator may use a guidance document that provides Operators the appropriate erosion and sediment controls based upon geographic region, terrain, and distance to adjacent water bodies previously submitted and approved by ADEQ.
- 3) Any facility that potentially discharges stormwater runoff to a water body listed for siltation pursuant to Section 303(d) of the Clean Water Act, or an ERW, ESW or a NSW shall have a site specific stormwater erosion and sediment control plan prepared and certified by a registered professional engineer, and such plan shall incorporate best management practices to provide reductions of the listed pollutants to the extent reasonably feasible. The 303(d) list, and the location of ERW, ESW, and NSW waters are available from ADEQ's website at the following address: <http://www.adeq.state.ar.us/water/>.