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Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. T.C.A. § 4-5-205

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Revision Type (check all that apply):

___ Amendment
X New
X Repeal

Rule(s) Revised (**ALL** chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only **ONE** Rule Number/Rule Title per row)

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(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to http://state.tn.us/sos/rules/1360/1360.htm)

Repeals

Chapter 1040-01-01 through 1040-08-01
Rules of the Tennessee Oil and Gas Board

Chapters 1040-01-01 Definitions, 1040-02-01 Bond, 1040-02-02 Permits, 1040-02-03 Well Location Plats, 1040-02-04 Vertical Well Spacing, 1040-02-05 Well Identification, 1040-02-06 Drilling Wells, 1040-02-07 Casting Program, 1040-02-08 Directional Drilling, 1040-02-09 Well Plugging and Abandonment, 1040-02-10 Filing of Well Date, Reports and Maps, 1040-02-11 Exceptions and Hearings, 1040-02-12 Violations – Penalties – Notice – Hearing, 1040-03-01 Completion, Recompletion, and Related Downhole Work, 1040-03-02 Tubing and Well Equipment, 1040-03-03 Prevention of Hazards and Pollution, 1040-04-01 Pollution and Safety Controls, 1040-04-02 Procedures and Equipment for Metering, Measuring and Producing Oil Condensate and Gas, 1040-04-03 Requirements for Reporting the Volume and Disposition of Oil and Gas Produced, 1040-04-04 Ratable Take, 1040-04-05 Commingling and Automatic Custody Transfer of Hydrocarbons, 1040-04-06 Limiting Production, 1040-04-07 Regulating High Gas\Oil Ratio Wells and Preventing Waste of Gas, 1040-04-08 Subterranean Gas Storage, 1040-04-09 Pressure Maintenance Projects and Secondary Recovery, 1040-05-01 Unit Operations, 1040-06-01 Hearings and Administrative Approval, 1040-06-02 Rules of Procedure for Hearing Contested Cases, 1040-07-01 List of Forms, and 1040-08-01 Determining Under Federal Natural Gas Policy Act of 1978 are repealed.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

New Rules

Chapter 0400-51-01
Definitions

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0400-51-01-.01 Definitions of Terms

0400-51-01-.01 Definitions of Terms

For the purpose of rules contained in Divisions 0400-51 through 0400-58 the terms set out herein shall have the meaning indicated.

(1) "Abandoned well" shall mean either of the following:

(a) A well that was not adequately plugged or closed at conclusion of operations such that it constitutes or may constitute a threat to public health or the environment; or

(b) A well that has no owner, operator or other responsible person (hereinafter called "responsible party") who can be located, or such responsible party has failed or refused to undertake actions, where required by law, to abate the threat.

(2) "Access Road" shall mean any road built and used exclusively by the operator (except public roads) which provides access to and/or ends at a wellhead, tank, pit or other facility related to oil and gas exploration and/or production.

(3) "Active Work Area" as it pertains to a well site, shall mean that portion of the initially disturbed area necessary for production-related equipment, materials, and facilities, as determined by the supervisor.

(4) "Aquifer shall mean a geologic formation or portion thereof which contains and is capable of yielding a sufficient quantity of groundwater to serve as a domestic or public water supply or other use.

(5) "Automatic Custody Transfer" shall mean that the liquid hydrocarbons is automatically measured as it is transferred from the producer to the carrier.

(6) "Barrel (or, Barrel of Oil or Condensate)" shall mean the amount of 42 standard United States liquid measure gallons of 231 cubic inches per gallon, computed at a temperature of 60 degrees Fahrenheit.

(7) "Base Fluid" shall mean the continuous phase fluid type, such as water or nitrogen gas, used in a hydraulic fracturing treatment.

(8) "Blooey Line" shall mean the discharge pipe from a well drilled by air drilling. The blooey line is used to conduct the air or gas used for circulation away from the rig to reduce the fire hazard as well as to transport the cuttings a suitable distance from the well.

(9) "Blow-Out" shall mean an uncontrolled escape of oil, gas and/or water from the well.

(10) "Blow-Out Preventer" shall mean a properly selected casinghead control fitted with special gates or discs which may be closed around the drill pipe, or which completely closes the top of the casing if the pipe or tools are withdrawn.

(11) "Board" shall mean the State Board of Water Quality, Oil and Gas as authorized and created by Title 69, Chapter 3, Tennessee Code Annotated.

(12) "Bonding Agent" shall mean any entity that issues a bond for an operator to submit to the state to assure the plugging of a well or reclamation of a well site.

(13) "Bottomhole Pressure" shall mean the pressure in pounds per square inch of an oil and/or gas well determined at the face of the producing horizon by means of a pressure-recording instrument, adopted and recognized by the oil and gas industry.

(14) "Brush and Rock Plug" shall mean an obstruction, made of wood and stone, and placed in the well bore to form an effective base for plugging material.

(15) "Casing Pressure" shall mean the pressure built up between the casing and the tubing when the casing and tubing are packed off at the top of the well.

(16) "Casinghead Gas" shall mean any gas or vapor, or both, indigenous to an oil stratum and produced from such stratum with oil. It shall be treated as gas, if sold, for the purpose of paying privilege tax.

(17) "Chemical(s)" shall mean any element, chemical compound, or mixture of elements and compounds that has its own specific name or identity such as a chemical abstract service number.

(18) "Chemical Abstracts Service" shall mean the division of the American Chemical Society that is the globally recognized authority for information on chemical substances.

(19) "Chemical Abstracts Service Number or CAS Number" shall mean the unique identification number assigned to a chemical by the Chemical Abstracts Service.

(20) "Chemical Disclosure Registry" shall mean the chemical registry website known as fracfocus.org developed by the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission. If such website becomes permanently inoperable, then chemical disclosure registry shall mean another publicly accessible information website that is designated by the Supervisor.

(21) "Chemical Family" shall mean a group of chemicals that share similar chemical properties and have a common general name.

(22) "Christmas Tree" shall mean an assembly of valves and fittings at the head of the casing of a well to control the flow. Also spoken of as "wellhead connections".

(23) "Circulation" shall mean the passing of approved fluid down through the drill stem and up to the surface, in the process of rotary drilling or in setting casing.

(24) "Common Source of Supply" shall comprise and include the area, which is underlain or that, from geological or other scientific data or from drilling operations or other evidence, appears to be underlain by a common accumulation of oil or gas or both; provided, that if any such area is underlain or appears from geologic or other scientific data or from drilling operations or other evidence to be underlain by more than one common accumulation of oil or gas, or both, separated from each other by strata of earth and not connected with each other, then such area, as to each said common accumulation of oil or gas, or both, shall be deemed a separate common source of supply.

(25) "Condensate" shall mean liquid hydrocarbons that were in the gaseous phase in the reservoir at initial reservoir condition. It shall be treated as oil for the purpose of paying privilege tax.

(26) "Conductor Pipe" or "Conductor Casing" shall mean the short string of casing that is not cemented in place and serves primarily to keep the top of the well bore open in unconsolidated material.

(27) "Conservation" shall mean conserving, preserving, guarding, or protecting the oil and gas resources of the State by obtaining the maximum efficiency with minimum waste in the production, transportation, processing, refining, treating, and marketing of the un-renewable oil and gas resources of the State.

(28) "Correlative Rights" shall mean that action or regulation by the Board, which affords a reasonable opportunity to each person entitled thereto to recover or receive the oil and/or gas under his tract or tracts without being required to drill unnecessary wells or incur other unnecessary expense to recover or receive such oil or gas or its equivalent.

(29) "Cubic Foot of Gas" shall mean the volume of gas contained in one cubic foot of space at a standard pressure base of 14.73 psi and a temperature base of 60 degrees Fahrenheit.

(30) "Department" shall mean the Tennessee Department of Environment and Conservation.

(31) "Developed Area" shall mean acreage assigned by the Board to a drilling or production unit on which a well has been completed that is capable of producing oil or gas.

(32) "Directional Drilling" shall mean the drilling of a well that deviated from the vertical by more than 5 degrees.

(33) "Disposal Well" shall mean a well drilled or converted for subsurface disposal of waste products or brine, and its related surface facilities.

(34) "Drilling Mud" shall mean any approved mixture of water and clay or other material as the term is commonly used in the industry.

(35) "Dry Hole or Dry Well" shall mean a well found incapable of producing either oil or gas in sufficient quantities to justify completion or continued production.

(36) "Equitable Share of the Production" shall mean, as to each person, that part of the authorized production from the pool that is substantial in the proportion that the amount of recoverable oil and gas, or both, in the developed area of his tracts in the pool bears to the recoverable oil or gas, or both, in the total of the developed area in the pool.

(37) "Exploitation Well" shall mean a well drilled or to be drilled to one or more pools of oil and/or gas with reasonable assurance of obtaining commercial production.

(38) "Exploration Well" shall mean a well drilled in unproven or semi proven territory for the purpose of ascertaining the presence of commercial oil and/or gas accumulations.

(39) "Field" shall mean the general area which is underlain or appears to be underlain by at least one pool and including the pool or pools beneath the area.

(40) "Flow Lines" shall mean the pipes that carry the fluids or gas from a wellhead to storage or processing equipment located at or near the well site.

(41) "Forced-change of operator" shall mean any oil or gas well being taken over by a new operator without the signatures from the original permittee or previous operator of record.

(42) "Fracturing" or "to fracture" shall mean the process of pumping fluids, gas or other substances with or without a proppant down a well under pressure expressly designed to initiate and propagate fractures or fracture networks in the target producing formation to facilitate oil or gas extraction.

(43) "Gas" shall mean all natural gas and all other fluid hydrocarbons not defined as oil, including condensate because it originally was in a gaseous phase in the reservoir, but excluding helium and other rare gases.

(44) "Gas/Oil Ratio (GOR)" shall mean the portion of a well bore drilled laterally into a common source of supply for production or injection purposes.

(45) "Gathering Line" means a pipeline that transports gas or oil from a well or current production facility to a transmission line, main meter, compressor station, or tank battery.

(46) "Health Professional" shall mean a physician, physician assistant, nurse practitioner, registered nurse, or emergency medical technician licensed by the State of Tennessee.

(47) "Horizontal Drainhole" shall mean the portion of a well bore drilled laterally into a common source of supply for production or injection purposes.

(48) "Horizontal Drainhole End Point" shall mean the terminus of a horizontal drainhole.

(49) "Horizontal (Lateral) Drilling" shall mean controlled directional drilling of wells with lateral penetration through productive reservoirs.

(50) "Hydraulic Fracturing Additive" shall mean any chemical substance or combination of substances, including any chemicals and proppants, which is intentionally added to a base fluid for puposes of preparing a hydraulic fracturing fluid for treatment of a well.

(51) "Hydraulic Fracturing Fluid" shall mean the fluid, including the applicable base fluid and all hydraulic fracturing additives, used to perform a hydraulic fracturing treatment.

(52) "Illegal Gas" shall mean gas that has been produced, transported, or sold in violation of any rule, regulation, or order of the Board.

(53) "Illegal Oil" shall mean oil that has been produced, transported, or sold in violation of any rule, regulation, or order of the Board.

(54) "Illegal Product" shall mean any product derived in whole or in part from illegal oil or illegal gas.

(55) "Interested Party" shall mean any person who owns an interest within the area of, or proximate to, the tracts directly affected by the permit application.

(56) "Intermediate Casing" shall mean the string of casing set with cement after the surface casing and before the production casing that is used in the well bore to isolate, stabilize, or provide well control.

(57) "Lease Tank" shall mean the tank or other receptacle into which the oil is produced either directly from a well or from a well through gas separator, gun barrel, or similar equipment.

(58) "Market Demand" shall mean the amount of oil reasonably needed for current consumption, use, storage, or working stocks, within and without the State, or the amount of gas of any type reasonably needed for current consumption, use, or storage, within and without the State.

(59) "Mechanical Plug" shall mean a manufactured device to seal the well bore or inside diameter of casing.

(60) "Multiple Completion" shall mean the completion of any well so as to permit simultaneous production from two or more common sources of supply with such common sources of supply completely segregated.

(61) "Neet Cement" shall mean a complex, finely ground, kiln-fired calcium carbonate silicate which, when mixed with water, forms a slurry that will harden in the well bore and casing and effectively seal formations penetrated by the well bore.

(62) "Nomination" shall mean the amount of oil or gas for which a purchaser has a definite and bona fide need during a given period.

(63) "Non-producing well" shall mean any well shown on the Annual Well Report (Form CN-1272) that indicates production of 12 barrels or less of oil per year or 25 mcf or less of gas per month.

(64) "Oil" shall mean crude petroleum that was originally in an oil phase in the reservoir.

(65) "Operator" shall mean the person to whom the drilling permit has been issued, whether owner or not, supervising or responsible for drilling, operating, repairing, abandoning or plugging of wells subject to this act.

(66) "Organization Report" shall mean the form (CN-0219) required by Rule 0400-52-02-.01 to be submitted with a permit application that names the responsible parties for the well.

(67) "Owner" shall mean the person who has the right to drill into and to produce from any pool, and to appropriate the production for himself or others.

(68) "Person" shall mean any natural person, corporation, association, partnership, receiver, trustee, guardian, executor, administrator, fiduciary, or representative of any kind, and includes any government or political subdivision or any agency thereof.

(69) "Pool" shall mean an underground reservoir containing a common accumulation of crude petroleum oil or natural gas or both. Each zone of the general structure which is completely separated from any other zone in the structure is covered by the term "pool" as used therein.

(70) "Pooled Unit" shall mean two or more tracts of land, of which their ownership may be different, that are consolidated and operated as a single tract for production of oil and/or gas, either by voluntary agreement between the owners thereof, or by exercising of the authority of the Board under the statute. When such tracts are consolidated by Board authority, the size of the consolidation tract shall not exceed the size, with permitted tolerance, of a "Drilling Unit" as herein defined. In no such case is there any actual change in the title or ownership of the original tracts.

(71) "Pollution" shall mean damage or injury from the loss, escape or unapproved disposal of any substance at any well or structure installation subject to these rules.

(72) "Pollution Control Structures" shall mean structures designed to prevent pollution, including but not limited to, berms, dikes, diversion drainage ditches, hay bales, pits, or tanks.

(73) "Producer" shall mean the owner or operator of a well or wells capable of producing oil or gas, or both, in paying quantities.

(74) "Producing Formation" shall mean a formation from which oil or gas is being or has been produced. In the context of plugging operations, producing formation shall mean a formation from which oil or gas has been produced in the general vicinity of a well to be plugged.

(75) "Producing Well" shall mean any well that produces quantities greater than 12 barrels of oil per year or 25 mcf of gas per month.

(76) "Product" shall mean any commodity made from oil or gas.

(77) "Production Casing" shall mean the string of casing that is run for the purpose of confining or producing hydrocarbons and associated fluids from one or more producing formations.

(78) "Production Unit or Proration Unit" shall mean a drilling unit on which a well producing oil and/or gas has

been completed, and which is recognized as such for the purpose of production by the Board.

(79) "Property Line" as used herein shall mean the boundary dividing tracts on which mineral rights, royalty, or leases are separately owned except that where conventional units shall have been created for the drilling of the well, the boundaries of the unit shall be considered the "property line".

(80) "Proppant" shall mean sand or any natural or man-made material that is used in a fracturing treatment to prop open the artificially created or enhanced fractures.

(81) "Purchaser" shall mean any person who directly or indirectly purchases, transports, takes, or otherwise removes production to his account from a well, lease, or common source of supply.

(82) "Reclamation" shall mean the regrading of all surface disturbed areas associated with oil and gas operations except water areas, replacement of the topsoil or substitution with suitable topsoil material, application of suitable mulch and soil nutrients where necessary, and the establishment of a vegetative cover that is in accordance with acceptable standards as set forth in the rules and regulations of the Board.

(83) "Represented Party" shall mean any person who is known to the applicant, after diligent search, to own an interest within the area of, or proximate to, the tracts directly affected by the application and who is also known to have either a consultant or attorney representing him in conservation matters.

(84) "Salt Water" shall mean water, commonly referred to as oil field brine, which is produced in association with oil and/or gas and which is generally considered unsuitable for human consumption or for irrigation because of its high content of dissolved solids.

(85) "Separator" shall mean an apparatus for separating oil, gas, water, etc., with relative efficiency, as it is produced.

(86) "Shut-In Pressure" shall mean the pressure noted at the wellhead when the well is completely shut-in. Not to be confused with bottomhole pressure.

(87) "Stripper Well" shall have the ordinary meaning as that term is generally understood in the oil and gas industry (well capable of producing 10 barrels or less per day).

(88) "Substitute Unit Well" shall mean any well already drilled to, or to be drilled to, completed or recompleted in the unitized reservoir which in the interest of good conservation practices should be designed to take the place of and become the unit well as determined by special order.

(89) "Supervisor" shall mean the State Oil and Gas Supervisor as designated by the Commissioner of Environment and Conservation.

(90) "Surface Casing" shall mean the string of casing set with cement to prevent contamination of groundwater from drilling fluids and water or hydrocarbons from producing formations.

(91) "Total Water Volume" shall mean the total quantity of water from all sources used in a hydraulic fracturing treatment, including surface water, ground water, produced water or recycled water.

(92) "Trade Secret" shall have the meaning set forth in T.C.A. § 47-25-1702(4) of the Tennessee Uniform Trade Secrets Act.

(93) "Transmission Line" means a pipeline, other than a gathering line, that transports gas from a gathering line or storage facility to a gas distribution center or storage facility.

(94) "Transporter" shall mean every person engaged in the transportation of oil or gas from tanks or other receptacles located at the place of production in this State.

(95) "Tubingless Completion" shall mean the completion of any well so as to permit the passage of production from one separate underground source through one production casing set in the well.

(96) "Waste" in addition to its ordinary meaning, shall mean "physical waste" as that term is generally understood in the oil and gas industry. It shall include: (1) underground waste and inefficient, excessive, or improper use or dissipation of reservoir energy, including gas energy and water drive, of any pool; and the locating, spacing, drilling, equipping, operating, or producing of any oil well or gas well in a manner which results, or tends to result, in reducing the quantity of oil or gas ultimately recoverable from any pool; and (2) surface waste and the inefficient storing of oil and the locating, spacing, drilling, equipping, operating, or producing of oil wells or gas wells in a manner causing or tending to cause unnecessary or excessive surface loss or destruction of oil or gas.

(97) "Well Cuttings" shall mean rock samples obtained from rotary or cable tool drilling operations. The Supervisor at his discretion, may determine the required frequency for collecting well cuttings.

(98) "Well Integrity" shall mean the containment of subsurface zones or formations containing hydrocarbons produced into a well, and the containment of that production within the well all the way to the surface.

(99) "Well Site Equipment" means the equipment, including but not limited to an associated tank battery, production and hydrocarbon equipment at an oil and gas lease or location.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-01
Bond

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0400-52-01-.01 Amount of Plugging Bond

(1) A Plugging Bond is required to be in force for a well from the time a drilling or re-entry well permit is granted until the well is plugged and abandoned. The bond shall be for the sum of $2000 for wells from 0 to 2500 feet in depth; $3000 for wells that are deeper than 2500 feet, but less than or equal to 5000 feet in depth; for all wells deeper than 5000 feet the bond shall increase $3000 at the rate of $1.00 for every foot deeper than 5000 feet. The bonds shall be written in such a manner that the Principal and Bonding Agent hereto are firmly bound to the Department, jointly and severally, for the payment of the full penal sum of the bond so that the well shall be plugged and abandoned in accordance with the rules and regulations of the Board. An individual well bond shall be released upon the proper plugging of the well and the filing with the Supervisor of a Plug and Abandon Report (Form CN-0217), driller's log, downhole surveys, well cuttings and cores, and other data as required, or if the permit has been canceled because of lack of proper activity.

(2) The Bonding Agent may notify the Supervisor in writing of its desire to terminate its liability under the bond by giving written notice to the Supervisor. The Supervisor shall thereupon require the Principal in the bond to file a new bond, or to effect a change of operators on the well within 60 days. If the Principal can no longer be contacted, then any interested party may seek a change of operators on the well in accordance with subparagraph (2)(a) of Rule 0400-52-02-.02. If a new bond is filed by the Principal, or a change of operators is approved by the Supervisor, liability under the original bond shall cease and terminate as to acts and operations occurring after the effective date of the new bond or approval of the change of operators, and the original bond shall be released upon written request by the Bonding Agent. If a new bond is not filed within the 60 days, or a change of operators has not been approved, the Supervisor shall revoke the permit secured by the bond and require the Principal to plug the well in accordance with the rules and regulations of the Board. In the event of the failure of the Principal to plug

the well, the supervisor may issue a notice of non-compliance to the Principal and the Bonding Agent requiring the Bonding Agent either to cause the well to be plugged, or forfeit the amount of the bond to the Department. The Bonding Agent shall then have 60 days in which to plug the well. If the well has not been plugged within that time limit, then a notice of forfeiture shall be issued, as provided for under Rule 0400-52-01-.06. The Bonding Agent shall then have 21 days in which to petition the Board for a hearing relative to the bond forfeiture, pursuant to the Administrative Procedures Act, T.C.A. § 4-5-101 et seq. If a hearing is requested, no further action shall be taken against the bond until such hearing has taken place and a final order given by the Board. If the well is plugged in the interim, then the notice of forfeiture shall be canceled and the bond released.

0400-52-01-.02 Blanket Plugging Bond

(1) In lieu of an individual bond per well, any well operator may file with the Supervisor a blanket bond in the sum of $20,000 covering a maximum of 10 wells from 0 to 5000 feet in depth; $30,000 covering a maximum of 10 wells that are deeper than 5000 feet, but are less than or equal to 10,000 feet in depth; and no blanket bonds for wells deeper than 10,000 feet either drilled or to be drilled by the Principal in the bond at any one time. Additional wells may be covered by the bond only if wells originally covered by the bond are plugged or transferred to another operator, on a one-for-one basis with the wells to be added to the bond. Otherwise, an additional bond shall be filed for each additional group of 10 wells. The terms of such blanket bonds shall be in full compliance with the requirements for an individual well bond. A blanket bond shall be released upon the proper plugging of all wells of the operator (Principal) covered by the bond, and the filing with the Supervisor of the Plug and Abandon Reports, driller's logs, downhole surveys, well cuttings and cores, and other data as required for such wells. A blanket bond may be canceled by the Bonding Agent, notifying the Supervisor in writing, delivered personally or by registered mail, that the operator is no longer authorized by the Bonding Agent to obtain permits under said bond. If or when all wells permitted under said bond have been plugged and abandoned according to the rules and regulations of the Board, or existing permits have been canceled because of lack of proper activity, the Supervisor shall release the bond.

(2) The Bonding Agent may notify the Supervisor in writing of its desire to terminate its liability under the bond by giving written notice to the Supervisor. The Supervisor shall thereupon require the Principal in the bond to file a new bond, or to effect a change of operators on the well(s) within 60 days. If the Principal can no longer be contacted, then any interested party may seek a change of operators on the well(s) in accordance with subparagraph (2)(a) of Rule 0400-52-02-.02. If a new bond is filed by the Principal, or a change of operators is approved by the Supervisor on all wells covered by the bond, liability under the original bond shall cease and terminate as to acts and operations occurring after the effective date of the new bond, or approval of the changes of operators, and the original bond shall be released upon written request by the Bonding Agent. If a new bond is not filed within the 60 days, or a change of operators has not been approved on all wells covered by the bond, the Supervisor shall revoke the permit(s) secured by the bond and require the Principal to plug the well(s) in accordance with the rules and regulations of the Board. In the event of the failure of the Principal to plug the well(s), the Bonding Agent may either cause the well(s) to be plugged, or forfeit the amount of the bond to the Department. This action shall be initiated by the issuance of a notice of noncompliance, as provided for under Rule 0400-52-01-.07. The Bonding Agent shall then have 60 days in which to plug the well(s). If the well(s) have not been plugged within that time limit, then a notice of forfeiture shall be issued, as provided for under Rule 0400-52-01-.06. The Bonding Agent shall then have 21 days in which to petition the Board for a hearing relative to the bond forfeiture, pursuant to the Administrative Procedures Act, T.C.A. § 4-5-101 et seq. If a hearing is requested, no further action shall be taken against the bond until such hearing has taken place and a final order given by the Board. If the well(s) are plugged in the interim, then the notice of forfeiture shall be canceled and the bond released.

0400-52-01-.03 Reclamation Bond

(1) A reclamation bond is required to be filed with the Supervisor at the time an operator's permit application is submitted, and shall be effective from the time the initial surface disturbances begin until the well is plugged and the site and access roads are reclaimed. The bond shall be for the sum of $1,500 per well site. The bond shall be in favor of the Department, and shall be a performance bond, conditioned that the well site and access roads shall be reclaimed in accordance with the rules and regulations of the Board. Upon satisfactory completion of regrading and revegetation of all disturbed areas except active work areas and access roads needed for oil or gas production, the Supervisor shall release one-third of the

reclamation bond, or reduce the amount of the reclamation bond by one-third. Access roads that will continue to be used by the landowner for other legitimate purposes and maintained in usable condition, which condition reduces erosion to a practical minimum, shall not have to be revegetated by the operator. Such usage shall be established by the landowner by sworn affidavit. After plugging of the well and final reclamation of the well site, and after plantings have survived two growing seasons with an established ground cover of at least 90% herbaceous and/or woody species of which at least 80% are perennial species, the supervisor shall release the remainder of the reclamation bond.

(2) This paragraph shall be applicable only when the same Bonding Agent is responsible for both the plugging and reclamation bonds on a well. The Bonding Agent may notify the Supervisor in writing of its desire to terminate its liability under the reclamation bond by giving written notice to the Supervisor. The Supervisor shall thereupon require the Principal in the reclamation bond to file a new bond, or to effect a change of operators on the well within 60 days. If the Principal can no longer be contacted, then any interested party may seek a change of operations on the well in accordance with subparagraph (2)(a) of Rule 0400-52-02-.02. If a new reclamation bond is filed by the Principal, or a change of operators is approved by the Supervisor, liability under the original bond shall cease and terminate as to acts and operations occurring after the effective date of the new bond, or approval of the change of operators, and the original bond shall be released upon written request by the Bonding Agent. If a new reclamation bond is not filed, or a change of operators has not been approved within 60 days, the Supervisor shall revoke the permit secured by the plugging and reclamation bonds and require the Principal to plug the well and reclaim the well site and access roads in accordance with the rules and regulations of the Board. In the event of the failure of the Principal to plug the well and reclaim the well site and access roads, the Bonding Agent may either cause the well to be plugged and the well site and access roads to be reclaimed, or forfeit the amount of the bonds to the Department. This action shall be initiated by the issuance of notices on noncompliance as provided for under Rule 0400-52-01-.07. The Bonding Agent shall then have 30 days in which to plug the well and reclaim the well site and access roads. If the well has not been plugged and the well site and access roads have not been reclaimed within that time limit then notices of forfeiture shall be issued as provided for under Rule 0400-52-01-.06. The Bonding Agent shall then have 21 days in which to petition the Board for a hearing relative to the bond forfeitures, pursuant to the Administrative Procedures Act T.C.A. § 4-5-101 et seq. If a hearing is requested, no further action shall be taken against the plugging and reclamation bonds until such hearing has taken place and a final order has been given by the Board. In the event the Bonding Agent causes the well to be plugged and the well site and access roads to be reclaimed the plugging bond shall be released, and the amount of the reclamation bond shall be reduced by one-third, to $1,000, unless such reduction has previously taken place. The remainder of the reclamation bond shall be released only after plantings have survived two growing seasons with an established ground cover of at least 90% herbaceous and/or woody species provided that at least 80% are perennial species.

0400-52-01-.04 Relief of Responsibility

A permittee's bonds and other responsibilities to a well or wells shall be relieved upon approval by the Supervisor of a successor's Application to Change Operators (Form CN-0237), furnishing bonds, and the tendering of authority on Form CN-0237 by the permittee requesting the Supervisor to approve the successor's application.

0400-52-01-.05 Execution

Any of the following shall serve as bonds:

(1) A surety bond executed by the well operator as principal and by a corporate surety authorized to do business in Tennessee; or

(2) Cash; or

(3) A certified check; or

(4) A Certificate of Deposit, if it is made out exactly as follows: "Operator Name and Tennessee Department of Environment and Conservation or Tennessee Department of Environment and Conservation"; and does not contain any terms or conditions that provide that the issuing bank may charge against the deposit any debt of the depositor(s) owing to it (set-off terms); or any terms or conditions that provide that anyone whose signature appears on the signature card may withdraw funds from the account. The

operator shall be entitled to any interest earned on a certificate of deposit as the same becomes due and payable. The treasurer of the State of Tennessee shall receive and hold the originals of such certificates in the name of the State of Tennessee, in trust, for the purpose for which such deposit is made, and shall at all times be responsible for the custody and safekeeping of such deposits; provided, however, that the certificate may be returned to the issuing financial institution as may be necessary for renewal from time to time; or

(5) An irrevocable letter of credit issued by any federally insured bank or savings and loan association. The letter of credit shall comply with the format shown on Form CN-0120 (Comprehensive Bond Identification).

0400-52-01-.06 Forfeiture

(1) The Supervisor shall cause a notice of noncompliance to be served upon the operator by certified mail, addressed to the permanent address shown on the application for a permit:

(a) If the requirements with respect to proper plugging upon abandonment of a well or wells and submission of all required records and data have not been complied with within the time limits set by the Board or Department, and/or,

(b) If the requirements with respect to proper reclamation of the well site(s) and access roads have not been complied with within the time limits set by the Board or Department.

(2) The notice shall specify in what respects the operator has failed to comply with this chapter or the regulations or orders of the Board or Department.

(3) If the operator has not reached an agreement with the Supervisor, or has not complied with the requirements set forth within 30 days after mailing the notice, the plugging bond shall then be forfeited to the Department, and the money used by the Department to properly plug the well(s), and/or the reclamation bond used to reclaim the well site(s) and access roads.

(4) In the case of the plugging bonds, such bonds are penal in nature, and the full amount of the bond shall be forfeited.

(5) In the case of reclamation bonds, such bonds are considered to be performance bonds, and any portion of a reclamation bond not expended to perform the reclamation work shall be refunded to the operator or his Bonding Agent if the conditions of the bond are fully satisfied.

0400-52-01-.07 Notice of Noncompliance

At any time the Supervisor causes a notice of noncompliance to be served upon an operator (principal), copies of such notice shall be mailed to the resident agent writing such bond (where the address is known) and to the Bonding Agent at the address provided to the Tennessee Department of Commerce and Insurance for receipt of notices. The Bonding Agent shall be afforded the opportunity to act in behalf of the operator (principal) within the time set forth in regard to the proper plugging of the well or wells and submission of required well records, down hole data, and plugging reports and/or reclamation of the well site and access roads. Should the operator (principal) and Bonding Agent fail to comply within the time provided, then and only in that event, the plugging bond shall be forfeited, and/or the reclamation bond used to reclaim the well site and access roads.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-02
Permits

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0400-52-02-.01 Permit Required

(1) A permit is required from the Supervisor before any person shall conduct operations described in Chapter 0400-52-01 through Chapter 0400-52-12. Each permit, when granted, shall expire 365 days after issuance unless the applicant has commenced operations and reasonably continues said operations pursuant to the permitted objective. Any permit now in force shall expire 365 days from the date of this rule unless permittee complies with this requirement. If a permitted location is to be abandoned without the commencement of any drilling activity, then the operator shall notify the Supervisor in writing within 30 days after expiration of the permit.

(2) No work shall begin on a well pursuant to this chapter before a permit for such work on the well has been issued by the Supervisor. Furthermore, any work the operator may do, or may have done, shall be at his own risk and with the full understanding that the Supervisor may find it necessary to require changing the well location or operation plans, or otherwise deny the permit because of noncompliance with applicable rules and regulations and require that the well be plugged. No requests for exceptions shall be considered for a well that was started before a permit was issued.

(a) A legible copy of this permit shall be displayed on location upon commencement of drilling operations and remain on display at said location until completion of the well.

(3) Fifteen day progress on drilling, upon request of the Supervisor, shall be mailed to the Supervisor describing well activities for the previous week.

(4) Organization Report (Form CN-0219) shall be made to the Supervisor prior to the issuance of a permit. The applicant shall name all parties responsible for the well and give contact information for them on the Organization Report consistent with the record submitted to the Secretaries of States for any corporation or limited liability company. If such persons have previously filed an Organization Report with the Supervisor, it shall not be necessary to submit another report, unless there has been a change in the information originally submitted.

(5) The operator shall indicate on the permit application, on a space provided, if the operator has the legal right to drill and produce the well.

(6) A notice to surface owners of oil and gas estates is required as follows:

(a) No later than the filing of the application with the Department for a permit to drill and prior to initiating any site preparation, the applicant shall give notice by certified mail, return receipt requested, of his intent to drill to the property owner or owners of the surface of the land to be drilled or to be affected by the surface disturbances listed in subparagraph (c) of this paragraph.

(b) The property owners to be notified under this paragraph shall be the property owners of record in the property tax assessor's office in the county where the property is located.

(c) The notice shall include a well location plat which shows the proposed location of the oil and gas well site, the proposed location of all new ingress and egress, the location of all diversions, drilling pits, dikes, and related structures and facilities, the location of proposed storage tanks and all other surface disturbances. Said plat shall comply with Chapter 0400-52-03.

(d) The notice shall state that the property owner and applicant have 15 working days from the date of mailing to discuss the location of surface disturbances in connection with the drilling operation. It shall also state that if the property owner and applicant are unable to resolve differences regarding the location of surface disturbances, either or both may request in writing a hearing before the Supervisor or his representative. The notice shall provide the name and address of the Supervisor.

(e) The applicant shall file with the Supervisor, as a part of the application, written certification that the notice required by subparagraph (a) of this paragraph has been given, including the name

and address of each property owner given notice and the date on which each notice was mailed.

(f) The applicant and the property owners given notice under subparagraph (a) of this paragraph shall attempt to resolve any differences between them regarding surface disturbances related to the proposed drilling operation. If those differences cannot be resolved, then a hearing and order may be obtained as follows:

1. Any property owners entitled to notice (or the applicant) may request, within 15 working days of the mailing of the notice required in subparagraph (a) of this paragraph, that the Supervisor or his representative conduct a hearing. A request for hearing under this paragraph shall be in writing to the Supervisor, and shall be mailed by certified mail, return receipt requested within 15 working days of the mailing of the notice required in subparagraph (a) of this paragraph. The purpose of the hearing shall be to minimize the impact of the proposed drilling operation on the surface of the land.

2. The hearing shall be conducted as a contested case pursuant to the Administrative Procedures Act under Title 4, Chapter 5, Part 3 and shall be held before a hearing officer sitting alone. For purposes of the hearing, the Supervisor or his representative shall be the hearing officer. The hearing shall be held within 10 working days of receipt of a request for hearing by the Supervisor or his representative, and shall be held in the county of the proposed oil and gas well. Notice of the hearing shall be given to all persons entitled to notice under subparagraph (a) of this paragraph and the applicant.

3. The hearing officer shall render a decision within 10 calendar days of the hearing. The decision shall be considered a final order not subject to further agency review pursuant to T.C.A. § 4-5-315(a)(1).

4. For purposes of this subparagraph, "working day" means all calendar days excluding Saturdays, Sundays, and legal holidays as designated in T.C.A. § 15-1-101.

(g) Notwithstanding any other requirement for a permit to drill, such a permit may only be issued:

1. If the applicant submits to the Supervisor statements of no objection signed by all property owners entitled to notice under subparagraph (a) of this paragraph; or

2. If a hearing is not requested as provided in part (f)1 of this paragraph; or

3. Upon the issuing of a final order pursuant to part (f)3 of this paragraph.

(h) For purposes of satisfying the requirements of subparagraph (g) of this paragraph for issuing a permit:

1. The Supervisor may treat the persons named in the applicant's certification of property owners, under subparagraph (e) of this paragraph, as being all of the property owners entitled to notice under subparagraph (a) of this paragraph, unless the Supervisor has actual notice to the contrary.

2. If a request for hearing as provided in part (f)1 of this paragraph is not delivered to the office of the Supervisor within 15 working days plus 3 additional days after the date notice-of-intent to drill was mailed to each property owner, as stated in the applicant's certification of notice, under subparagraph (e) of this paragraph, the Supervisor may assume that no hearing was requested, unless he has actual notice to the contrary.

(7) Inspection and approval of all access roads, surface disturbances, and pollution control structures at a proposed well site by the designated gas and oil field inspector is required prior to the issuance of any permit under this chapter.

(8) Permits shall not in any way be construed as a certification by the State of Tennessee that any property interest in the premises covered by a permit is vested in the permit; they are issued solely under the regulatory powers vested in the Board and the Department under the provisions set forth in Title 60 of the

Tennessee Code and the rules and regulations promulgated by the Board pursuant to Title 60.

(9) In the event of litigation over a particular tract of land, or in the event a tract of land is contested as to the ownership of oil and gas rights, the policy of the Board shall be to issue permits in order to preserve the physical integrity of that particular tract without prejudicing any claimants to the title of that land.

(10) In the case of any well that is proposed to be fractured using a cumulative total of more than 200,000 gallons of water-based liquids:

(a) The Supervisor shall give notice to the public by e-mail, including a list of interested persons and agencies who have requested such notification, and by posting on the Department website. The Public Notice shall include the following information:

1. Name, address, and telephone number of the Division contact where further information can be obtained.

2. Name and location of the applicant.

3. The location of the well proposed to be fractured.

4. A brief description of the well plan including information regarding the sources of water to be used as base fluid, fracturing methods, whether or not an Aquatic Resource Alteration Permit for water withdrawal will be required, and estimated amounts and methods of wastewater disposal.

5. A brief description of the procedures for the Supervisor to make a final determination of whether to issue the permit.

(b) Interested persons may submit written comments for 30 days from the date of Public Notice. Any comments received shall be considered by the Supervisor, and the Supervisor shall provide written responses to those comments. Prior to Public Notice, the Supervisor may require additional information from the applicant in these cases, including but not limited to information on water sources, fracturing methodologies, and methods of wastewater disposal. The Supervisor will notify the public of permit issuance or denial through the Division's website.

(c) The applicant shall provide the Department's Public Notice of the proposed well to owners of any property within ½ mile of the proposed well head or any residence that has any drinking water wells within a ½ mile radius of the proposed wellhead within 14 days of the date of the Public Notice. In the case of a horizontal well, the ½ mile radius shall be measured from the terminus of the horizontal well bore. The determination of the presence of any such drinking water wells shall include at a minimum the information available on the Division of Water Resources Well Log Tracking System. The applicant shall collect a sample of any such well at the request of the owner and have the sample analyzed for Total Petroleum Hydrocarbons (TPH), BTEX (benzene/toluene/ethyl benzene/xylene), pH, chlorides, Total Organic Carbon (TOC) and Total Dissolved Solids, to demonstrate the condition of the water well prior to the drilling of the well to be fractured. Landowners opting for their well to be sampled by the applicant must submit a written request to the applicant within 14 days of receiving the Public Notice from the operator or the applicant is under no obligation to sample the well. Sampling results shall be provided to the Supervisor and drinking water well owner as soon as results are obtained. Sample collection protocols shall be comparable to those specified in the Department's "Quality System Standard Operating Procedure for Chemical and Bacteriological Sampling of Surface Water". Sample analyses shall be conducted by a certified laboratory utilizing standard methods and minimum detection levels consistent with Tennessee Department of Health laboratories.

0400-52-02-.02 Drilling Permit.

(1) Applications for a permit to drill a well for oil and gas shall be made on Application for Permit to Drill (Form CN-0211) and submitted to the Supervisor's office for approval. The application shall be accompanied by a copy of a location plat, bond, Organization Report (Form CN-0219) and a fee of five hundred dollars ($500). The application shall give the name and address of the drilling contractor, if known; otherwise

notification shall be made by letter to the Supervisor as soon as determined. Information submitted with the application shall include the intent to fracture the well, as well as an estimate of the volume of fluids to be used to fracture. The application shall also include a plan for erosion control, prevention of pollution of surface waters, and reclamation of all areas disturbed by the operations, including access roads. The plan shall conform to the requirements of Rule 0400-52-09-.05. The plan shall be sufficiently detailed to allow a gas and oil field inspector to locate the site of the facilities to be constructed and estimate the expected environmental impact, but does not have to include detailed engineering design drawings. The plan shall also include identification of all drinking water wells within a ¼ mile radius of the proposed wellhead, except where a ½ mile radius is required, as specified in paragraph (10) of Rule 0400-52-02-.01. The Supervisor may require modifications in the operator's plan if such modifications are necessary to prevent pollution or to promote reclamation. Upon approval, the operator's plan shall be a condition of the permit. Failure to comply with the plan shall be grounds for revocation of the permit and forfeiture of the bond.

(2) A drilling permit shall be amended by filing an Application to Amend Well Permit (Form CN-0228) with the Supervisor and paying a fee of $100 if the well name, number, elevation, location, or proposed total depth is changed. If the well location is changed, 1 copy of a revised survey plat shall be filed with the application. The amended permit is subject to the same terms and conditions as a well permit, including erosion control requirements. A person who is granted a drilling permit can only transfer the permit and attendant rights to another person after submitting an Application to Change Operators (Form CN-237) and receiving approval of the application from the Supervisor. The person to whom the permit is being transferred shall file an Organization Report (Form CN-0219), post a well plugging bond and a reclamation bond, if needed, and pay a fee of $100. The transfer of a permit from the original permittee to another operator, with or without the approval of the Supervisor, does not relieve the original permittee of obligations occurring before the transfer, and the bond shall not be released until all material at the time of transfer has been submitted. Unless change of operator forms have been processed or approved by the office of the Supervisor, any operation conducted on the well in question is the responsibility of the original permittee, and his bond shall not be released until all State requirements have been met.

(a) If an Application to Change Operators (Form CN-0237) is to be submitted without the signature of the current permittee, it shall be considered a forced change of operator, then the following items shall also be submitted:

1. Copy of the lease and assignments, if any, under which the permit was originally issued, or subsequently transferred, if those documents are available, or an affidavit from the landowner that no prior oil and gas leases are still active. An affidavit from the original landowner that there are no other unexpired oil and gas leases, if the title to the land has changed hands since the Department issued the permit on the land in question, or, if the original landowner cannot be located, an affidavit by the new operator or his agent that he has checked the grantor index in the register's office and found no unexplained conveyance of the oil and gas rights by the original landowner.

2. Copy of the lease and assignments, if any, under which the permit shall be transferred to the new operator.

3. Copy of a certified letter to the current permittee requesting that an Application to Change Operators (Form CN-0237) be signed, and also stating that if the application is not signed, and no written objection to a change of operator without that signature is submitted to the Department in writing within 10 working days of receipt of said letter, the new operator shall seek approval from the Department of that Approval to Change Operators without said signature. In addition, the applicant shall send the certified mail notice to the current address that is registered with the Board or the Department as shown on the Organization Report (Form CN-0219).

4. A copy of a Court Order relative to the inactive or expired status of any prior oil and gas leases may be submitted in lieu of the items mentioned in parts 2 and 3 of this subparagraph.

5. If a written objection to approving the Application to Change Operators (Form CN-0237) is properly submitted to the Department, the staff shall administratively deny the

application. If the applicant seeks to have the application considered further, he may then apply for a hearing before the Board. The Board shall then consider approval of the application only when there is no doubt as to the ownership of the oil and gas rights of the applicant. If a cloud or a question as to the title is determined to exist by the Board, then the Board shall deny the application, and refer the applicant to the court for a ruling on the question of ownership.

(b) If a well or wells revert back to a landowner, whether by court action, or by lease expiration or other provisions, and the well shall remain in operation, then the landowner shall submit an Application to Change Operators (Form CN-0237), file an Organization Report (Form CN-0219), post a well plugging bond, post a reclamation bond if required, pay a fee of $100, and otherwise comply with well spacing regulations. If the well will be used for domestic gas only, then a plugging bond in the amount of $500 shall be required.

(c) Before a well can be turned over to a landowner for use as a fresh water well, the operator shall set a 100 foot plug within 300 feet of the surface, or a cement plug at 50 feet above the casing shoe, whichever is the deeper, and the well shall be completed as a water well, and approved by the Department's Division of Water Resources. No Organization Report (Form CN-0219) is required, and in lieu of a plugging bond the landowner shall submit a notarized letter agreeing to assume liability for any subsequent plugging which might be required.

(3) If drilling operations cease for a period of 30 days, the operator shall notify the Supervisor in writing of the reason for the shutdown and the date on which operations shall be resumed.

(4) All wells shall be either properly plugged or completed within a period of 6 months following cessation of drilling. Upon written request to the Supervisor by the operator, showing valid cause for requiring additional time, a reasonable extension of as much as 90 days additional may be granted.

(5) An applicant who requests a permit to drill on site which is closer than normal statewide spacing to the boundary of an offsetting oil and gas lease, or mineral or surface property, or on a tract of land which is contested as to the ownership of oil and gas rights, shall comply with the following procedures:

(a) Notify by certified mail all affected offset and/or separate owners of oil and gas leases and mineral and surface property, as can reasonably be determined, that he is applying for a permit to drill a well; and submit a copy of the drill-site location plat with the notice.

(b) Publish the operator's name, lease name, well number and description of the drill-site location in a newspaper of general circulation in the county where the well is to be drilled, with a statement that if any interested owner objects to the drilling of said well, they should make their objections known to the Supervisor.

(c) If, within 10 days after the notice, there are no objections to issuing the permit, then the Supervisor shall issue the permit, provided all other requirements have been complied with.

(d) If there is an objection or objections to issuing the permit, the objector or objectors shall furnish the applicant and the Supervisor the basis of the objection and support his contentions with documents, etc., within 10 days after the date of the notice.

(e) If the applicant, after receiving an objection, still wants the permit he shall then apply for a hearing before the Board. The Board shall then decide whether or not to issue the permit or refer the applicant to the court for relief.

(6) If more than one applicant applies for a permit to drill the same or a conflicting location on a tract of land at a permissible distance from an offset or offsetting well, the first application received in the Supervisor's office shall be issued the permit, provided the applicant complies with all other rules and regulations governing permits to drill a well. If the first applicant fails to exercise his permit privilege, then the next applicant of record, based on time submittal, shall receive the permit, provided he complies with all other requirements.

(7) If the ownership of the drill site tract of land is contested, all claimants shall be identified by an

accompanying letter.

(8) Requests for permits for a voluntary pooled drilling unit, or for two or more leases or tracts that have been pooled for exploration or development shall be accompanied by a notarized affidavit signed by the operator that has the right to pool these leases to form a drilling unit.

(9) The Supervisor has the right to withhold the issuance of a permit to any operator in violation of any rule or regulation of this order until such violation has been removed.

0400-52-02-.03 Reserved

0400-52-02-.04 Notification To Plug and Abandon.

Prior to plugging, notice shall be given the Supervisor in order that the Supervisor or his representative may witness the work. Work performed shall be reported to the Supervisor on the Plug and Abandon Report (Form CN-0217) within 30 days after completing the work. Form CN-0217 shall be accompanied by a copy of the drilling contractor's or the service company's ticket for work done unless the work was observed by the Supervisor or his representative.

0400-52-02-.05 Reserved.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-03
Well Location Plats

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0040-52-03-.01 Preparing Plats

0400-52-03-.01 Preparing Plats

(1) Well location plats shall be constructed and certified as accurate by a surveyor registered by the State of Tennessee. The following procedures and instructions shall be strictly complied with in preparing plats:

(a) Two legible copies of a well location plat shall be submitted for each proposed well and drawn on a sheet 8½" x 14" or larger, using bond paper.

(b) The plat shall be prepared to a scale of one inch equals one hundred, two hundred, three hundred, four hundred, five hundred or six hundred feet (1" = 100, 200, 300, 400, 500 or 600'). The scale set forth on the plat should be of a graphic type rather than so many inches equaling so many feet.

(c) The top or upper edge of the plat shall be oriented to the north, and a vector depicting magnetic north shall be placed on the edge or margin of the plat.

(d) The surface elevation of the proposed drill site, referenced to mean sea level, shall be determined and a reference benchmark established within 200 feet of each location and its elevation and description noted on the plat. If the surface elevation or drill site location is altered during location preparation, it shall be re-determined by the operator, and this information submitted to the Supervisor within 10 days.

(e) A description or diagram of the proposed drill site location shall be made with reference to a specific 7½-minute topographic quadrangle map (1 inch equals 2,000 feet) by the use of the Carter Coordinate System, and Latitude and Longitude and by bearing and distance in feet to two permanent landmarks or monuments that are readily identifiable on a 7½-minute topographic map.

(f) The location plat, in addition to other requirements, shall identify surface ownership on the tract of land where the permitted well is to be located and surface ownership on offsetting tracts of land, if within 3,000 feet.

(g) The plat shall show the amount of acreage in the drill site tract.

(h) The distance in feet between the proposed drill site and the two nearest property and lease lines, and the nearest dry, abandoned, drilling or producing well, if such exists within 3,000 feet, shall be shown on the plat.

(i) In cases where the tract to be drilled is composed of separately owned interests which have been pooled or unitized the property lines and the amount of acreage in each separately owned interest shall be shown. In addition, the unit lines and the distance to the two nearest unit lines shall also be shown.

(j) The plat shall also show the location of all existing or proposed access roads, the location of all dwellings, diversions, drilling pits, dikes, tanks, and all other surface disturbances, and the location of all streams, lakes, or other bodies of water within 200 feet of the well site and visible from the access roads, or apparent on a USGS topographic map. This information may be shown on more than one sheet if necessary, provided that on each sheet the name of the operator, well name and number, scale (of graphic type), a vector depicting magnetic north, and the location of the proposed drill site are shown along with the surveyor's certification and seal, and date on which the well location plat was constructed.

(k) All plats shall be submitted with a latitude and longitude for each well site location.

(l) Any well site submitted for a horizontal well shall show the locations for the well collar; entry point of the horizontal leg and the termination point. Each of these locations shall be shown on the plat with latitude, longitude and Carter Coordinate System.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-04
Vertical Well Spacing

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0400-52-04-.01 Vertical Well Spacing

0400-52-04-.01 Vertical Well Spacing

(1) No permits shall be issued for the drilling of wells in search of oil and gas and no well shall be drilled in search of oil or gas nor shall a well be abandoned in one pool and recompleted in another pool in which no spacing rules are prescribed by special fieldwide orders, unless the location of such well shall comply with the following requirements:

(a) Wells drilled in search of oil or gas to a depth of less than 1,000 feet shall be drilled on 10-acre spacing, and shall not be located closer than 660 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 330 feet from any property or unit line.

(b) Wells drilled in search of oil or gas to a depth of 1,000 to 2,000 feet or to the base of the Chattanooga Shale, whichever is deeper, shall be drilled on 20-acre spacing, and shall not be located closer than 660 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 330 feet from any property or unit line.

(c) Wells drilled in search of oil to a depth of more than 2,000 feet shall be drilled on 40-acre spacing,

and shall not be located closer than 660 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 330 feet from any property or unit line.

(d) Wells drilled in search of gas from a depth of 2,000 feet to 5,000 feet or to the top of the Conasauga Formation shall be drilled on 40-acre spacing, and shall not be located closer than 660 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 330 feet from any property or unit line.

(e) Wells drilled in search of gas to a depth of more than 5,000 feet or below the top of the Conasauga Formation shall be drilled on 160-acre spacing, and shall not be located closer than 1,320 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 660 feet from any property or unit line.

(f) Any existing well may be deepened and produced for oil or gas from whatever zone(s) production may be obtained on the presently permitted unit size, provided, however, that any exceptions to offsetting property lines or wells under current spacing rules shall comply with the provision of subparagraph (1)(k) of Rule 0400-52-04-.01.

(g) Where a permit is requested for a wildcat well to be drilled in an area in which the surface or mineral ownership is so divided that the well cannot be located in compliance with the requirement of a distance from property lines and well spacing and a drilling unit cannot be formed in advance of drilling because it is not known whether the well shall be completed as an oil well or a gas well, a permit may nevertheless be granted for the drilling of the well when the applicant presents evidence satisfactory to the Supervisor that the applicant has available for assignment to said well leases or acreage of area and size to constitute, in the judgment of the Supervisor, a reasonable producing unit for such well and such applicant agrees to create or to apply to the Board for creation of a reasonable producing unit within 45 days after completion of the well.

(h) Upon the completion of a confirmation well to a discovery well, the operator of the discovery well shall apply for a public hearing before the Board for the purpose of establishing temporary drilling and production units. When a pool has had 5 wells drilled to and completed therein or after 1 year has elapsed from the completion of the confirmation well in the field, whichever occurs first, the operator or operators of well in the field shall petition the Board for a public hearing for the purposes of establishing field rules and regulations and the creation of drilling and production units for the pools in the field. The right is reserved, however, to any interested party to apply for a public hearing at an earlier date and if the Board finds from an examination of the information furnished that temporary or permanent drilling and production units should be formed, it shall be so ordered.

(i) Where prior to the issuance of this order, a pool has already been partially developed with a greater density of wells than that prescribed herein, the Supervisor may, without additional public hearing, exempt such pools from the provisions of this order. The exemptions for these pools shall be granted only after application has been made to the Supervisor in writing accompanied by a map delineating the locations of all existing wells completed and producing from the pool for which exception is being asked.

(j) A poolwide unit is exempt, within its internal boundary, from well spacing rules as to the particular unitized pool, but all wells shall be located interior of the unit outline in compliance with the rules for distance from property lines.

(k) The Supervisor may grant administrative approval of exceptions to this chapter, or any order of the Supervisor establishing well spacing for a pool upon submission of an application showing all pertinent information and data and after due notice is given to all operators of interest.

1. The application shall be made to the Supervisor with a copy to each known offset operator of interest and such application shall include:

(i) Statement of reason and justification for requested relief.

(ii) Map or plat as described in Chapter 0400-52-03, which additionally shows:

(I) The location at which an oil or gas well could be drilled in compliance with this chapter, or applicable order;

(II) The location at which the applicant requests permission to drill;

(III) The outline of the drilling unit to be assigned to the proposed well site with a notation as to the amount of acreage contained therein;

(IV) The outline of all other drilling or production units currently assigned to the tract or lease upon which the proposed drilling unit is located, with a notation of the amount of acreage assigned to each unit.

(iii) Sufficient geological evidence that the proposed drilling unit shall be reasonably productive of oil and/or gas.

(iv) List of names and addresses of all interested persons notified of the application.

2. Each drilling unit should comply with the well density as described in this chapter, or the applicable order.

3. The acreage assigned to the proposed drilling unit should be reasonably expected to be productive of oil and/or gas from the common source of supply.

4. If the application meets with the approval of the Supervisor and no written protest is received by the Supervisor within 10 days following prescribed notice of application, the Board may grant the requested relief without the necessity of a public hearing.

5. If the application is accompanied by a written waiver from all known offset lease owners, the 10 day delay shall be unnecessary.

6. If the Supervisor does not elect to approve the application administratively, or if written protest is received within the 10 day period, the application may be set for public hearing.

(l) Any drilling being conducted in Overton, Clay, Pickett or Fentress Counties (this is portions of Fentress County that are west of Hwy 127 and North and West of State Hwy 154) is based on 400 feet to another well and 200 feet to the unit or property line down to a depth of 2500 feet. This is an exception to the current state wide drilling requirements.

(m) Exception not to exceed 10% in spacing distances on locations interior to property boundaries shall be allowed administratively by the Supervisor. Any exception adjacent to offset operators shall comply with subparagraph (k) of this paragraph.

(2) If it is necessary to drill a well below the depth bracket for the anticipated productive zone for stratigraphic information only, the Application for Permit to Drill (Form CN-0211), shall indicate the proposed total depth and anticipated depth bracket for productive zone and unit. Following drilling, logging and testing, the well shall be plugged back, or casing set to the legal total depth appropriate for the anticipated productive zone. The plug back depth shall be indicated on the Plug and Abandon Report (Form CN-0217), which shall be accompanied by a work ticket which indicates in detail how the work was done. If production is established below the depth bracket for the anticipated productive zone, appropriate spacing shall be established by the Supervisor or Board.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-05
Well Identification

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0400-52-05-.01 Posting a Sign

0400-52-05-.01 Posting a Sign.

No well shall be placed in production, shut-in, or left unplugged until a sign has been posted on the well location. All wells shall display a sign showing the operator name and telephone number, well name and number, and permit number. The mailing address and telephone number of the Department shall also appear on the sign. The sign shall be at a minimum 8½ inches in height by 11 inches in width, made of durable material and be legible. If the tank battery serving a particular well is not within sight of that particular well, then a sign shall also be posted at a good conspicuous location at the tank battery for each well for which production is gauged individually. Where a number of wells on the same lease produce into a common tank battery, only one sign is required, and should show the name of the lease and well numbers, rather than individual permit numbers. The obligation to maintain legible signs remains until the well is plugged and abandoned.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-06
Drilling Wells

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0400-52-06-.01 Drilling Equipment
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0400-52-06-.01 Drilling Equipment

All drilling equipment shall be designed, constructed, and operated in such a manner so as to prevent accidents and insure safe operating practices. It is recommended that each operator require the drilling contractor to comply with the general rules and safety procedures of the industry.

0400-52-06-.02 Blowout Prevention

(1) The operator shall equip and operate all wells in such a manner as to prevent the uncontrolled emission of oil, gas, and water from the well.

(2) The operator shall equip all wells, other than those specified in paragraph (3) of this rule, with a minimum of the equipment specified in this paragraph:

(a) The operator shall install a blowout prevention system with 2 separate units capable of closing with the drill pipe in the hole or other equivalent control system as approved by the Supervisor or his representative. A minimum of 1500 psi working pressure or 110% of maximum surface pressure that would be reasonably expected based on the depth and location of the well is required, whichever is greater. In unknown or expected higher pressures a minimum of 5000 psi working pressure shall be required.

1. The blowout preventers shall be installed above ground level if possible but if a cellar is dug, the equipment shall be accessible during drilling operations. The entire control equipment shall be in good working condition at all times. All outlets, fittings, and connections on the casing, blowout preventers, choke manifold, and auxiliary wellhead equipment that may be subjected to wellhead pressure shall be of a material and construction that shall withstand the anticipated pressure and shall be resistant to fire. The lines from outlets on or below the blowout preventers shall be securely installed, anchored, and protected from damage.

2. Blowout preventers, accumulators, and pumps shall be used in accordance with the product manufacturer's rating and operational specifications. The operator is responsible for seeing that the blowout prevention equipment is in proper working order. This includes the proper operation of the closing unit valving, proper operation of the pressure gauges, and the presence of the manufacturer's recommended accumulator fluids. A combination of any 2 of the following secondary closing systems is acceptable:

   (i) Intrinsically safe electric-operated pump;

   (ii) Air-operated pump;

   (iii) Hand-operated pump; and

   (iv) Nitrogen-operated pump.

   Blowout preventer rams shall be of a proper size for the drill pipe being used or production casing being run in the well or shall be variable-type rams that are of the proper size range. Blowout prevention shall be installed before passing through any known production or high pressure zone in the well boring path.

3. Blowout prevention equipment and intermediate casing shall be tested to a pressure of 1,500 psi at surface for not less than 30 minutes. This shall be done prior to drilling the plug on the intermediate casing or at other intervals as approved or requested by the Supervisor. If, at the end of 30 minutes, the pressure shows a drop of 10% or more from the original test pressure, the casing shall be condemned until the leak is corrected. A pressure test demonstrating less than a 10% pressure drop after 30 minutes is proof that the condition has been corrected. A record of each test, including test pressures, times, failures, and each mechanical test of the casings, blowout preventers, surface connections, surface fittings, and auxiliary wellhead equipment shall be entered in the logbook, signed by the driller, and kept available for inspection by the Supervisor or his representative.

4. With the understanding that all permitting procedures have been followed, a well may be deepened to 200' below the bottom of the Chattanooga Shale without initiating other than the usual well control procedures. The casing shall withstand at least 1,500 psi with no more than 10% loss of pressure in 30 minutes.

(b) Accessible controls located both in the rig and at a safe remote location of at least 50 feet from wellhead.

(c) An annular choke valve.

(d) A drill pipe or power head valve capable of pump truck connection.

(e) A flow line or blooey line of the proper size and working pressure shall be installed in the most direct route practicable to pit and shall be anchored securely. The use of closed loop systems or mud tanks is acceptable.

(3) For non-Cumberland Plateau wells in areas of known lower pressures, the operator shall equip all wells with a minimum of the following equipment:

(a) An annular-type blowout preventer or other equivalent control system as approved by the Supervisor or his representative;

(b) Accessible controls located both on the rig floor and at a safe remote location at least 50 feet from wellhead;

(c) An Annular choke valve;

(d) A drill pipe or power head valve capable of pump truck connection;

(e) A flow line of the proper size and working pressure; and

(f) Blowout prevention equipment that has a rated minimum working pressure of 1500 psi.

1. The blowout preventers shall be installed above ground level if possible but if a cellar is dug, the equipment shall be accessible during drilling operations. The entire control equipment shall be in good working condition at all times. All outlets, fittings, and connections on the casing, blowout preventers, choke manifold, and auxiliary wellhead equipment that may be subjected to wellhead pressure shall be of a material and construction that shall withstand the anticipated pressure and shall be resistant to fire. The lines from outlets on or below the blowout preventers shall be securely installed, anchored, and protected from damage.

2. Blowout preventers, accumulators, and pumps shall be used in accordance with the product manufacturer's rating and operational specifications. The operator is responsible for seeing that the blowout prevention equipment is in proper working order. This includes the proper operation of the closing unit valving, proper operation of the pressure gauges, and the presence of the manufacturer's recommended accumulator fluids. Any of the following closing systems is acceptable:

   (i) Intrinsically safe electric-operated pump;

   (ii) Air-operated pump;

   (iii) Hand-operated pump; and

   (iv) Nitrogen-operated pump.

   Blowout preventers shall be of a proper size for the drill pipe being used or production casing being run.

3. Blowout prevention equipment and surface casing shall be tested to a pressure of 400 psi at surface for not less than 30 minutes before drilling the plug on the surface casing and at other intervals as approved or requested by the Supervisor. If at the end of 30 minutes the pressure shows a drop of 10% or more from the original test pressure, the casing shall be condemned until the leak is corrected. A pressure test demonstrating less than a 10% pressure drop after 30 minutes is proof that the condition has been corrected. A record of each test, including test pressures, times, failures, and each mechanical test of the casings, blowout preventers, surface connections, surface fittings, and auxiliary wellhead equipment shall be entered in the logbook, signed by the driller, and kept available for inspection by the Supervisor or his representative. If the casing is to be tested at the time of surface casing, cementing 150 psi for a period of ten minutes may be used. The annulus shall be filled with fluid and the plug shall have been landed prior to the test beginning. If a drop of over 10% or more from the original test pressure is found the casing shall be condemned until the leak is corrected. The previous criteria concerning recording of the test shall be followed.

4. The casing shall withstand at least 400 psi with no more than 10% loss of pressure in 30 minutes.

0400-52-06-.03 Casingheads.

All wells shall be equipped with casingheads with a test pressure in conformance with conditions to be anticipated in wells in which they are used. Casinghead bodies shall be equipped with proper connections and valves accessible to the surface as soon as installed. Reconditioning shall be required on any well leaking gas or oil.

0400-52-06-.04 Environmental Protection.

(1) Oil and gas wells shall be drilled and operated in a manner that protects aquifers and surface waters. Wells shall be designed to ensure the environmentally sound, safe production of hydrocarbons by containing them inside the well, isolating the productive formations from fresh water formations, and properly executing fracturing and other stimulation operations. Well design and construction must ensure that no leaks occur through or between casing strings. The fluids produced from the well (oil, water, gas) must travel directly from the producing zone to the surface inside the well conduit.

(2) All oil and gas operations shall be conducted in a manner that shall prevent or mitigate adverse environmental impacts such as soil erosion and water pollution. All areas disturbed by the operations, including access roads, shall be reclaimed as prescribed in Rule 0400-52-09-.05. Access roads shall be constructed in such a manner as to reduce erosion to a practical minimum. Sediment ponds, berms, diversion ditches, hay bales, and other measures designed to prevent erosion and discharge from well sites shall be taken to prevent or minimize soil erosion and pollution of surface waters. Erosion prevention and sediment controls at all oil and gas operations shall meet or exceed the following:

(a) The erosion prevention controls shall be designed and implemented to minimize the dislodging and suspension of soil in water. Sediment controls shall be designed and implemented to retain mobilized sediment on site.

(b) All control measures shall be properly selected, installed, and maintained in accordance with the manufacturer's specifications (where applicable) and standard engineering practices. All control measures selected shall be able to slow runoff so that rill and gully formation is prevented. When steep slopes and/or fine particle soils are present at the site, additional physical or chemical treatment of storm water runoff may be required. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the operator shall replace or modify the control for relevant site situations.

(c) If sediment escapes the drilling, production, and/or roadway areas, off-site accumulations of sediment that have not reached a stream shall be removed at a frequency sufficient to minimize offsite impacts. Fugitive sediment that has escaped the drill area and has collected in a drainage ditches or roadways shall be removed so that it is not subsequently washed into culverts and streams by the next rain and/or so that it does not pose a safety hazard. Permittees shall not initiate remediation/restoration of a stream without consulting the Department first.

(d) Sediment shall be removed from sediment traps, silt fences, sedimentation ponds, and other sediment controls as necessary.

(e) Upon attainment of stability, materials used for erosion prevention and sediment control should be removed or otherwise prevented from becoming a pollutant source for storm water discharges.

(f) Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than 30 days prior to grading or earth moving unless the area is seeded and/or mulched or other temporary cover is installed.

(g) Clearing and grubbing shall be held to the minimum necessary for drilling and/or production activities.

(h) Construction shall be sequenced to minimize the exposure time of graded or denuded areas.

(i) Erosion prevention and sediment control measures shall be in place and functional before drilling activities begin, and shall be properly maintained throughout the drilling and production phase.

(j) Permanent stabilization with perennial vegetation (using native herbaceous and woody plants where practicable) or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable.

(3) The operator shall notify the oil and gas inspector at least 24 hours prior to beginning fracturing or acid treatment activities. The operator shall maintain personnel on-site during fracturing activities, and during the initial flow back period, until such time as the well pressure returns to near pre-fracturing reservoir pressure. Unmanned flowback operations shall be checked routinely.

(4) For fracturing treatments using more than 200,000 gallons of water-based liquids, the operator shall conduct pressure monitoring during the fracturing treatment to monitor for a successful treatment and for protection of the groundwater. Annulus pressure shall be continuously monitored and recorded for all such fracturing treatments. If intermediate casing has been set, the pressure in the annulus between the intermediate casing and the production casing shall also be monitored and recorded. Records of pressure monitoring shall be included as part of the well history reporting requirements.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-07
Casing Program

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0400-52-07-.01 Casing Requirements

(1) Surface Casing

(a) The operator shall set surface casing at 100 feet below the lowest known fresh water aquifer. The Supervisor shall have the authority to require distances of less than 100 feet upon specific request from the operator if adequate technical justification can be made. The operator shall use casing that has an external collapse pressure rating great enough to handle the hydrostatic pressure of a class A cement from the casing shoe to surface and internal pressure rating to handle any anticipated down hole pressures. The operator shall use cement with a minimum 500 psi compressive strength and will allow a minimum of 8 hour wait, or until the cement has adequately set, prior to drilling the shoe out. Surface casing shall be used to protect fresh water aquifers. No casing shoe shall be drilled until a cement seal has been brought back to the surface and secured between the surface casing and the well bore, preventing any ground water contamination.

(b) In non-Cumberland Plateau wells in areas of known lower pressures, the operator shall set all surface casing 100 feet below the fresh water. The Supervisor shall have the authority to require distances less than 100 feet upon specific request from the operator if adequate technical justification can be made. The operator shall use casing with an external collapse pressure rating great enough to handle the hydrostatic pressure of a class A cement from the casing shoe to surface. A Float shoe or Baffle or Guide shoe with Wiper Plug along with annular cement volume plus 35% excess shall be required on all surface casing cement jobs. Cement shall have a minimum 500 psi compressive strength and have a minimum 8 hour wait, or longer if needed to ensure that cement has adequately set, prior to drilling the shoe out. No casing shoe shall be drilled until a cement seal has been brought back to the surface and secured between the surface casing and the well bore, preventing any ground water contamination. The operator shall present all cement and casing designs on a specifications sheet with permit application for approval.

(2) If intermediate casing is used, the operator shall set an intermediate string of casing prior to drilling into any known oil and gas producing zone. Casing shall have a minimum internal pressure rating of 110% of maximum formation pressure reasonably expected based on the depth and location of the well. The operator shall cement the intermediate casing at a minimum of 100 feet into the surface casing. Casing string shall be deep enough to prevent underground blowout from anticipated bottomhole pressures. Casing shall have an external collapse pressure rating to handle cement design from casing shoe to

surface. The operator shall use cement with 500 psi compressive strength and have a minimum 8 hour wait, or until cement has adequately set, prior to drilling the shoe out.

(3) The operator shall present all cement and casing designs on a specifications sheet with permit application for approval. A copy of cement tickets shall be kept on location to be viewed by the inspector until the drill rig is removed. In unknown or over pressured conditions a 5000 psi rating on casing shall apply. The operator shall attach a copy of all cement tickets to the well history tickets and shall include all volumes and pressures of job from start to finish. To ensure adequate annular space for cementing, the annular space outside the casing shall be at least as large as follows for the applicable casing size:

Up to 7" Outside Diameter (O.D.) Casing O.D. + 1 1/2"

More than 7" and less than 10 3/4" O.D. Casing O.D. + 2"

More than 10 3/4 "O.D. Casing O.D + 3"

(4) Any wells on the Cumberland Plateau drilled to depths above the Chattanooga Shale may be eligible for variances on the casing requirements in this rule by making a specific request to the Supervisor.

0400-52-07-.02 Conductor Pipe

Conductor pipe or conductor casing shall be used for the purpose of supporting unconsolidated surface deposits. The use and removal of less than 40 feet of conductor pipe during the drilling of any oil or gas well shall be at the option of the operator. If such conductor pipe is to be pulled it shall be pulled prior to the cementing of the surface casing. All conductor casing shall have a cement seal at the surface preventing the possibility of any groundwater contamination and shall remain in the well if not pulled prior to the surface casing cement job. If more than 40 feet of conductor pipe was installed, the conductor pipe may not be pulled.

0400-52-07-.03 Surface Casing.

(1) The operator shall submit a proposed casing program for approval by the Supervisor, on Application for Permit to Drill (Form CN-0211). If the Supervisor deems the casing program inadequate to protect fresh water zones and potential minable coal and other minerals, etc., he shall prescribe the casing program with which the operator shall comply. Unless an exception is granted by the Supervisor, suitable and sufficient surface casing shall be run and cemented to a depth not less than 100 feet below all fresh water strata encountered in the well and in a manner that shall protect such fresh water from contamination resulting from drilling operations. The Supervisor shall have the authority to require distances of less than 100 feet upon specific request from the operator if adequate technical justification can be made. The cement shall fill the annular space behind the surface casing from the base thereof to the surface of the ground. If cement returns are not received to the surface, then the annulus shall be cemented from the top.

(2) The Supervisor or his representative shall be given notice of cementing of surface casing at least 12 hours prior to conducting such operation. The Supervisor or his representative may witness the cementing operation. Form CN-0221 shall be accompanied by a copy of the drilling contractor's or service company's ticket for the work performed.

(3) The operator shall run a cement basket on the surface casing one joint below the conductor pipe, or between the first and second joints if no conductor pipe is utilized, or as directed by the Supervisor. The operator shall utilize a centralizer in order to center the casing in the well bore and ensure it will be completely surrounded or encased by cement and achieve the required isolation.

0400-52-07-.04 Production Casing.

The production, oil, or flow string, is that casing used for the purpose of segregating the zone from which production is obtained and affording a means of communication between such zone and the surface. If production casing is used in a vertical well, the operator shall cement the production casing at a minimum of 100 feet into the intermediate casing and extend the cementing across the producing formation, unless the casing is set on a packer or set and cemented above the production zone. Alternative casing and cementing designs may

be approved by the Supervisor upon request if adequate technical justification can be made. Casing shall have an external collapse pressure rating to handle cement design from total depth to surface. The operator shall use cement with 500 psi compressive strength and have a minimum 8 hour wait, or until cement has adequately set. The operator shall present all cement and casing designs on a specifications sheet with Permit Application for approval. A copy of cement tickets shall be kept on location to be viewed by the inspector until the drill rig is removed. In unknown or over pressured conditions a 5000 psi rating on casing shall apply. The operator shall attach a copy of all cement tickets to the well history tickets and shall include all volumes and pressures of job from start to finish. A description of the work done under this rule shall be reported to the Supervisor on Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221) within 60 days after completion.

0400-52-07-.05 Isolation of Oil, Gas and Fresh-Water-Bearing Strata, and Potential Minable Coal and Other Mineral Deposits.

Notwithstanding compliance with the foregoing requirements, all potential minable coal and other minerals shall be isolated from any possible communication through the annulus with oil-, gas- or water-bearing strata or deposits of other potential minable coal or other minable minerals. Pressure testing of casing as specified in Rule 0400-52-06-.02 and documentation of cementing as required in Rule 0400-52-07-.01 shall constitute the minimum requirements for maintaining isolation through well integrity. In order to ascertain whether cementing has been effectively performed, the operator may elect to either run a cement bond log, or block squeeze each stratum or zone which is required to be isolated. If the cement bond log indicates a minimum of 25 feet of cement bond above the top and 25 feet of bond below the base of each stratum or zone to be isolated, then the provision of this rule shall have been complied with. If such bonding is not shown by the bond log, the Supervisor may require the operator to perform the necessary work to assure the isolation of such above described strata zones.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-08
Directional Drilling

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0400-52-08-.01 Lateral Deviation

(1) No operator shall drill a well in which the well bore deviates laterally a resultant distance greater than that determined by a 5 degree angle from a vertical line passing through the center of the surface location of the well bore, without running a directional survey. If the operator desires to directionally control and thereby intentionally deflect a hole from the vertical (whether more or less than 5 degrees and unless done to straighten the hole or to side-track junk in the hole or because of other mechanical difficulties) a letter of approval shall be first obtained from the Supervisor. Nothing herein shall be construed to permit the drilling of any well in such a manner that it crosses property lines.

(2) Whenever a well is deviated from vertical, the point at which the well bore intersects the producing formation (pool) shall be protected to the surface and become the location of the well in determining if it complied with the spacing rules.

0400-52-08-.02 Inclination Surveys.

An inclination survey shall be made at the discretion of the Supervisor on all wells drilled with the first shot-point at a depth not greater than that of the surface casing seat and succeeding shot-points not more than 1,000 feet apart. Inclination surveys conforming to the requirements may be made either during the normal course of drilling or after the well has reached total depth. Such survey data shall be certified by the operator's representative and/or drilling contractor and shall indicate the resultant lateral deviation as the sum of the calculated lateral

displacement determined between each inclination survey point, assuming that all such displacement occurs in the direction of the nearest property line. If a directional survey determining the bottom of the hole is filed with the Supervisor upon completion of the well, it shall not be necessary to furnish the inclination survey date. Except as otherwise specified herein, all inclination and/or directional survey data shall be filed along with Well History (Form CN-0221).

0400-52-08-.03 Directional Survey

(1) A directional survey shall be run by a qualified contractor approved by the Supervisor and 2 certified copies thereof filed with the Supervisor on any well, if:

(a) The well is directionally controlled and is thereby intentionally deflected from the vertical; or

(b) The resultant level deviation as calculated from inclination survey data is a distance greater than the distance from the center of the surface location of the well bore to the nearest property or unit line and might violate the distance from property lines rule; or

(c) The well bore deviates a resultant distance greater than that determined by a 5 degree angle from a vertical line passing through the center of the surface location of the well bore.

(2) The Supervisor, on his own initiative or at the request of an offset operator, shall have the right to require the operator to run a directional survey on any well if there is reasonable cause therefore. Whenever a survey is so required, and the operator of the well and the offset operator are unable to agree as to the terms and conditions for running such survey, the Supervisor, upon request of either, shall determine such terms and conditions, after notice to all interested parties and a public hearing.

(3) Unless required by the Supervisor, a directional survey shall not be required for any well which is not directionally controlled and thereby intentionally deflected from the vertical and which has a surface location, maximum angle of deviation and total depth, in compliance with the provisions of Chapters 0400-52-01 through 0400-52-12.

(4) The provisions hereof shall not alter or affect the minimum spacing provisions of Chapters 0400-52-01 through 0400-52-12.

0400-52-08-.04 Horizontal Drilling.

(1) Wells drilled by horizontal methods shall comply with the following spacing requirements:

(a) For all oil wells, and for gas wells drilled to the top of the Conasauga Group, the surface trace of that portion of the well bore or any portion of the horizontal drainhole that penetrates the producing formation, including the horizontal drainhole end point, shall not be located closer than 330 feet from any property or unit line.

(b) For gas wells drilled below the top of the Conasauga Group, the surface trace of that portion of the well bore or any portion of the horizontal drainhole that penetrates the producing formation, including the horizontal drainhole end point, shall not be located closer than 660 feet from any property or unit line.

(c) Any number of producing formations may be penetrated by lateral drainholes from a single vertical well bore.

(d) All of the producing portion of the well shall be in compliance with the spacing requirements of this paragraph. The horizontal portion of the well is the formation of record for production.

(2) For all horizontal wells, the operator shall at a minimum cement the production casing from the first packer up to 100 feet inside the intermediate casing. Alternatively, the operator may utilize an appropriate packer at the bottom of the intermediate casing instead of cement. Casing shall have an external collapse pressure rating to handle cement design from termination point to surface. If cement is used, the operator shall use cement with 500 psi compressive strength and have a minimum 8 hour wait, or until cement has adequately set. The operator shall present all cement and casing designs on a specifications sheet with

Permit Application for approval. A copy of cement tickets shall be kept on location to be viewed by the inspector until the drill rig is removed. When unknown or over pressured conditions are encountered a 5000 psi rating on casing shall apply. The operator shall attach a copy of all cement tickets to the well history tickets and shall include all volumes and pressures of job from start to finish.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-09
Well Plugging and Abandonment

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0400-52-09-.01 Plugging Wells

(1) All wells which are to be plugged and abandoned may be filled with a mud fluid of sufficient weight to offset the hydrostatic pressure of any formation penetrated. Sufficient cement plugs shall be efficiently placed in number and properly located as to prevent the commingling of oil, gas, salt water, and fresh water from one zone to another, and to isolate potentially minable coal beds and seams and other potentially extractable minerals. All downhole plugs may be "felt for" to insure that they have been properly placed.

(2) The specific method and procedure for plugging a well shall be as follows:

(a) A mechanical plug, or a brush-and-stone plug, and a neet cement plug of not less than 25 feet in length shall be placed between each geologic group or formation.

(b) A mechanical plug, or a brush-and-stone plug, and a neet cement plug of not less than 50 feet in length shall be placed below the base of the surface casing. The plug shall be placed so that at least 25 feet of cement is below the base of the surface casing and extends up into the casing 25 feet.

(c) A mechanical plug, or a brush-and-stone plug, and a neet cement plug of not less than 25 feet shall be placed at the surface of the well. The surface casing shall be cut off below plow depth at the request of the landowner or when determined appropriate by the Supervisor or his representative.

(d) In a well with casing that does not seal off the ground water, a mechanical plug, or a brush-and-stone plug, and a neet cement plug shall be set 100 feet below the deepest known ground water strata. The cement plug shall be adequate in length to reach at least 10 feet into the casing.

(e) In an uncased well, a mechanical plug, or a brush-and-stone plug, and a neet cement plug shall be set at least 50 feet below the deepest ground water strata and extend up to the surface or just below plow depth if appropriate.

(f) The mechanical plug or the brush-and-stone plug method may be replaced by filling the well from total depth to the surface with cement, provided, however, that such method shall be either prescribed or approved by the Supervisor.

(g) If there is fluid in the well, a dump bailer or tubing may be used to place the cement in the well.

(h) If drill water or mud is present it may be used as filler between the plugs.

(i) If any casing has been installed in the well and has not been cemented to the surface the casing shall be pulled prior to the plugging of the well. If the casing cannot be readily removed the casing shall be shot and then pulled.

(3) Any other methods not defined above, but approved by the Supervisor, may be used.

0400-52-09-.02 Inspection.

The Supervisor or his representative shall be given notice of intent to plug a well at least 12 hours prior to conducting such operation. The Supervisor or his representative may inspect the work of plugging and abandonment as it progresses, check the location and quality of plugs, check the amount of casing pulled, and check the demonstration of movement, if any, of oil, gas, or water. The operator shall submit a Plug and Abandon Report (Form CN-0217) covering the work performed to the Supervisor within 30 days after plugging and abandoning the well. This work may be observed by the Supervisor or his representative and that observance verified by his signature on the Plug and Abandon Report (Form CN-0217).

0400-52-09-.03 Deliverability Test.

Before any well shall be classified as a shut-in gas well, the operator shall furnish the results of a deliverability test. Such deliverability test shall be performed after the well has achieved a stabilized flow rate. If stabilization cannot be achieved, the maximum test period required is 24 hours. The results of the deliverability test shall be submitted on Gas Well Deliverability Tests (Form R-DT-1), and in the initial Production section of the Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221), and shall be complete as to stabilized flow rate, hours tested, choke size, and pressure in order to demonstrate that a stabilized flow rate was achieved. A copy of the chart on which the deliverability is based shall also be submitted. All deliverability tests shall be conducted once every 3 years. The well shall remain shut-in in accordance with the requirements of Rule 0400-52-09-.06. In addition, a gas well may be considered shut-in if the well has been cemented with 4½ inch casing and submitted with a report signed by a petroleum engineer or geologist.

0400-52-09-.04 Time Limit For Plugging Wells.

Except as provided in Rule 0400-52-09-.06, all wells drilled for oil and gas and found to be dry holes shall be plugged within 1 year from cessation of drilling. All wells that are non-producing or abandoned shall be plugged within 1 year from the date they cease producing 12 barrels of oil per year or 25 mcf of gas per month or are abandoned. Upon written request to the Supervisor showing good cause, an extension of up to 90 days additional may be granted. No operator or owner shall permit any well drilled for oil, gas, salt water disposal or any other purpose in connection with the production of oil and gas, to remain unplugged after such well is no longer used for the purpose for which it was drilled or converted. Nothing herein shall prevent utilizing a well for the purpose of introducing air, gas, fresh water or other liquid pressure into or upon the producing strata for the purpose of recovering oil and gas. All wells which are neither producing nor plugged shall comply with shut-in standards of oil and gas wells and shall be cased and capped in such a manner so as to protect all potential oil and/or gas zones, and fresh water in accordance with the requirements of Rule 0400-52-09-.06.

0400-52-09-.05 Surface Reclamation.

(1) Reclamation of well sites, oil or gas pipeline right-of-way, storage facility sites, and access roads.

(a) Except for active work areas, the operator shall drain and fill all surface pits that are not needed for production purposes, and shall grade and stabilize the well location and location road within 30 days of the initial disturbance, in order to minimize surface run-off and prevent excessive erosion and sedimentation. All drilling supplies and equipment, synthetic liners, trash, discarded materials and other refuse not contained and covered in the reclaimed pits shall be removed from the site. Temporary vegetative cover shall then be established on all graded areas.

(b) Within 90 days of the plugging and abandonment of any well, the operator shall remove all production and storage structure, supplies and equipment, any oil, salt water and debris, fill any remaining excavations, and grade any remaining disturbed areas, including access roads. Permanent vegetative cover shall then be established on all disturbed areas, excluding approved permanent, non-erosive facilities, and access roads which are to be turned over to the landowner.

Any access roads necessary for the operator to gain access to the well site in order to determine the adequacy of the vegetative cover or to perform additional re-vegetation may continue to be used by the operator until all of the Board's reclamation requirements have been met.

(c) Upon written request to the Supervisor showing good cause, an extension of up to 90 days additional may be granted to an operator to complete grading and/or vegetation of a well site or access roads.

(2) Re-vegetation - General Requirements.

(a) The operator shall establish, in accordance with paragraph (1) of this rule, on all surface disturbed areas except water areas and surface areas of access roads approved by the Supervisor as permanent roads, a vegetative cover that is in accordance with the approved permit and reclamation plan and that is as follows:

1. Diverse, effective, and permanent;

2. Comprised of species approved by the Supervisor that shall not impede natural vegetative cover; and

3. Capable of long term stabilization of the soil surface from erosion.

(b) The reclamation plant species shall have the following:

1. The same seasonal characteristics of growth as the original vegetation;

2. Be capable of self-regeneration;

3. Be compatible with existing plant and animal species existing in the areas; and

4. Meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws and/or regulations.

(c) Establishment of permanent vegetative cover shall conform with the standards set forth in the most recent version of the Tennessee Erosion and Sediment Control Handbook.

(d) The Supervisor may grant exceptions to the requirements of parts (b)1 and 2 of this paragraph when the species are necessary to establish a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved reclamation plan.

(3) Re-vegetation - Topsoiling, Mulching and Soil Amendments.

(a) Prior to the establishment of a permanent vegetative cover on disturbed areas where excavation activities have occurred, the operator shall replace the excavated topsoil or provide an approved topsoil substitute material suitable for supporting the long range re-vegetation goals.

(b) Suitable mulch and/or other soil stabilizing practice shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes unless the Supervisor waives this requirement based on a determination that seasonal, soil, or slope factors result in a condition whereby mulch or other stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetation cover.

(c) Nutrients and soil amendments shall be applied to the redistributed growth medium prior to re-vegetation when necessary to establish and maintain the vegetative cover.

(4) Diverse Vegetation Cover - Standards for Success.

(a) All previously disturbed and reclaimed areas shall be inspected by the Supervisor or his representative prior to final reclamation bond release in order to determine the level of success of permanent re-vegetation.

(b) Re-vegetation success shall not be determined until after at least two successfully completed spring or summer growing seasons have occurred.

(c) Standards for success shall be based on a ground cover of at least 90% consisting of herbaceous and/or woody species with a minimum of 80% being of perennial varieties.

0400-52-09-.06 Temporary Abandonment.

(1) An operator has the opportunity to place any non-producing well into Temporary Abandonment for 5 years if all of the following requirements are fulfilled:

(a) The operator shall submit a Temporary Well Abandonment Information form (CN-1368) for each well to be placed in Temporary Abandonment. This form can be obtained from Water Resources/Oil and Gas Program.

(b) The operator shall submit a $100 fee for each well per year to be placed in Temporary Abandonment.

(c) Each well shall be capped in such a manner as to have no open casing exposed to the environment (i.e., swedge with locked ball-valve or any other viable protection). The operator shall conduct a well integrity test prior to placing a well into Temporary Abandonment, if no such test has been conducted within the prior 15 years and there has been no oil or gas production from the well in that same time period. Integrity testing shall at a minimum consist of either a Mechanical Integrity Test (MIT) on the casing, or a pressure test on the casing using tubing and and a packer to a minimum of 500 psi. Alternative well integrity confirmation methods, including annual pressure monitoring at the well head, may be accepted at the discretion of the Supervisor.

(d) Any well shown on the Annual Well Report (Form CN-1272) that indicates no production shall be placed in Temporary Abandonment status or plugged.

(e) All fees received for Temporary Abandonment shall be placed in an account that shall be set aside to be used only for funding the plugging of abandoned oil and gas wells.

(2) At the end of the five year Temporary Abandonment period, each well submitted by the operator shall be reviewed by the Department. A determination shall be made on the validity of keeping the well(s) open. This determination for validity shall be based on whether the operator has a deliverability test for each gas well or if the well is producing oil. If the staff finds there is no valid reason to keep the wells open, the operator shall then have two years to plug the non-producing well(s).

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-10
Filing of Well Data, Reports and Maps

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0400-52-10-.01 Information Due Date

The required well data and reports shall be tendered to the Supervisor within 60 days from the date of drilling to total depth of the well. This date is defined as the termination of continuous drilling operations. The due date for

information submitted may not be postponed by the expressed intent to resume operations at some future date.

0400-52-10-.02 Information Required.

The following information is required within 60 days after drilling to total depth:

(1) Two final and unmarked prints of all electrical logs and other downhole surveys, if any. If no logs are run, then "NONE" should be entered in the "TYPE(S) OF GEOPHYSICAL LOGS RUN" section of the Well History Form (Form CN-0221).

(2) Driller's log - a driller's log shall be submitted in one of the following forms:

(a) On reverse side of Well History Form (CN-0221); or

(b) On a separate typed sheet (one copy).

(3) Drilling-time log - One copy for all wells drilled with rotary tools.

(4) Drill-stem test - One final copy of any.

(5) Core analysis - One copy if available.

(6) Completion Report - one copy of Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221) shall be completed, notarized and submitted for each well. All shows of oil and/or gas, water zones, and coal seams penetrated shall be reported on the reverse side of this form. If all the required information is not available at the end of the 60 day period the additional information shall be filed on a supplemental Form CN-0221 within 10 days after completion of the well.

(7) Samples and Cores-well cuttings are required at 10 foot intervals from the top of bedrock to total depth of each well, and shall be submitted to the Tennessee Office of Geology in Nashville according to the following guidelines if requested by the Supervisor:

(a) Well cuttings should arrive in sturdy containers, such as heavy cardboard boxes with sturdy bottoms. Burlap bags are acceptable, but plastic garbage bags are not.

(b) Well cuttings shall be completely dry when received.

(c) Each set of cuttings shall be in its own container. No two seats should be in the same box or burlap bag. If more than 1 container is required for a particular set of cuttings, this should be noted on all containers.

(d) Individual bags should be clearly marked and identified as to operator name, well name and number, permit number and interval. Each container shall be clearly marked with operator name, well name and number, permit number, and county.

(e) Bags should be marked with waterproof ink.

(f) Sets of well cuttings not meeting the requirements of subparagraphs (a) through (e) of this paragraph shall not be accepted by the Tennessee Office of Geology until those requirements are met. Cores which may be required by the Supervisor shall be submitted in adequate boxes clearly marked as to the name of the well and depth intervals.

0400-52-10-.03 Reserved

0400-52-10-.04 Field Map.

Persons or companies operating in a producing area shall furnish the Supervisor with a field map showing lease lines and well locations on request.

0400-52-10-.05 Information Confidential.

Upon request by the permittee to the Supervisor, the aforementioned well information shall be kept CONFIDENTIAL by the Supervisor for a period not to exceed 6 months from the date of drilling to total depth of the well, as defined in Rule 0400-52-10-.01.

0400-52-10-.06 Annual Well Report.

Operators shall file an annual report on each bonded well(s). The report shall include the well(s) name and number, permit number, location, current status of the well(s), any production for the past year, and future plans for the well(s). The annual report shall be due on the 15th of April each year. If the report is not received before May 1st, the well(s) shall be determined abandoned.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-11
Exceptions and Hearings

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0400-52-11-.01 Prevention of Waste

0400-52-11-.01 Prevention of Waste

If any operator can show to the Supervisor that the work procedures herein prescribed result in waste, or such operations are unreasonable, the Supervisor may enter such an order, as a special exception to the aforesaid rules and regulations, as shall prevent such waste or eliminate such unreasonable restraint as may result from the application of the aforesaid rules and regulations to the well or wells of such operators; provided, however, that before any operator shall be allowed the benefit of any order granting an exception as authorized by this chapter, such operator shall establish that such exception, if granted, shall not result in waste in the field as a whole or give him an inequitable and unfair advantage over another operator or operators in the field. No special exception shall be granted except upon written application, fully stating the alleged facts, which shall be acted upon within 20 days after filing the application. At least 10 days prior to acting upon such application, the Supervisor shall give e-mail notice to all operators in the Field. In addition to said notice by e-mail, the applicant shall give adjacent operators, where appropriate, at least 10 days notice by personal service or by Certified Mail. If the Supervisor denies such a request, the operator may appeal to the Board and a contested case hearing shall be scheduled as soon as possible. The Supervisor shall send e-mail notice of such hearing to all operators in the Field at least 10 days prior to the hearing.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-12
Violations, Penalties, Notice, Hearing

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0400-52-12-.01 Violations, Penalties, Notice, Hearing
0400-52-12-.02 Red Tagging of Wells

0400-52-12-.01 Violations, Penalties, Notice, Hearing

(1) The Supervisor shall have the authority to assess monetary penalties as provided in paragraphs (3), (4), and (5) of this rule for any violation of this chapter, rules and regulations, or any order adopted by the Board. In making such assessment, the Supervisor shall give due consideration to the appropriateness of the penalty with respect to the size of the business of the operator charged, the gravity of the violation, the good faith of the operator, and the operator's history of previous violations.

(2) If, upon an inspection or investigation, the Supervisor or his representative shall determine that any operator is not in compliance with any standard or regulation or rule of the Board promulgated by the Board pursuant to this chapter, he shall with reasonable promptness and in no event later than 6 months following the inspection, issue to the operator by certified mail a written citation that states the nature and, if appropriate, the location of the violation, including a reference to the provision of the chapter and the regulation alleged to have been violated. In addition, the citation shall fix a reasonable time for abatement of the violation. If the issuing Supervisor has reason to believe that such violation, or the failure to abate such violation, should result in the assessment of a penalty under paragraphs (3), (4), and (5) of this rule the citation may so state.

(3) Any operator who has received a citation of this chapter, rules and regulations or order of the Board, promulgated pursuant to this chapter, and has failed to correct such violation within the period of correction of this citation, shall be assessed a penalty of up to $1,000 for each day the violation exists. The period of correction may be suspended or lengthened by the assessing party upon a showing by the operator of a good faith effort to comply with the correction requirements, and that failure to comply with the correction requirements is due to factors beyond his reasonable control.

(4) Any operator who has received a citation for a violation of this chapter, or rules and regulations, or order of the Board and such violation is specifically determined not to be of a serious nature, may be assessed a penalty of up to $1,000 for each such violation.

(5) Any operator who willfully or repeatedly violates the requirements of this chapter, or rules and regulations, or order of the Board promulgated pursuant to this chapter may be assessed a penalty of up to $10,000 for each violation.

(6) Penalties provided for by paragraphs (3), (4), and (5) of this rule shall be imposed in the manner hereinafter provided. Whenever the Board, through the Supervisor, has determined that such a penalty should be assessed against an operator, a written notice and assessment of a penalty shall be issued to the operator by certified mail, return receipt requested, stating the amount of the penalty to be assessed and the reason therefore (which may be done by reference to citations issued prior to or simultaneously with such notification).

(7) Any citation or notice and assessment of a penalty issued pursuant to this rule shall inform the operator of his rights to appeal such citation or assessment of a penalty to the Board. Any such citation or notice shall become final 20 days after the receipt of such citation or notice and assessment of penalty by the operator unless the operator, within the period of 20 days, shall file a written notice of appeal with the Supervisor.

(8) If the operator files an appeal of such citation or assessment of a penalty as provided by paragraph (7) of this rule, the proceedings on such appeal shall be conducted in accordance with the provisions of the Uniform Administrative Procedures Act, as amended, compiled in Title 4, Chapter 5, and the rules of procedure of the Oil and Gas Board governing the conduct of contested cases. The Board shall afford the operator an opportunity for a hearing, after reasonable notice, The Board shall thereafter render a final order, in accordance with the provisions of § 4-5-314, affirming, modifying or vacating the Supervisor's citation or assessment of a penalty. A final order rendered pursuant to this rule shall be effective upon its entry unless a later effective date shall be stated therein. A petition to stay the effective date of a final order may be filed under the provisions of § 4-5-316. A petition for reconsideration of a final order may be filed under the provision *of* § 4-5-317. Judicial review of a final order may be sought by filing a petition for review under the provisions of § 4-5-322.

0400-52-12-.02 Red Tagging of Wells.

If, upon an inspection or investigation, the Supervisor or any of his authorized personnel shall determine that a well or tank battery is not in compliance with any standard or regulation or rule or order of the Board promulgated by the Board pursuant to this chapter, he shall with reasonable promptness and in no event later than 5 working days following the inspection, place a "red tag" (NOTICE THIS WELL CLOSED - Form CN-0110) on the well or tank battery, which notice shall state that drilling or plugging of the well or any further production of oil and gas from the well or tank battery is hereby ordered to be terminated until approval to proceed has been granted by the Supervisor. The notice shall further indicate the nature of the violation or threatened violation, including a reference to the provision of the chapter and the regulation which has been violated.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-53-01
Completion, Recompletion, and Related Downhole Work

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0400-53-01-.01 Time Limit for Well Completion

All wells drilled in connection with the production of oil and gas, unless plugged in accordance with well abandonment procedures as stated in Chapter 0400-52-09, shall be completed within 1 year from cessation of drilling unless the operator is following the procedures outlined in Rule 0400-52-09-.06 Temporary Abandonment.

0400-53-01-.02 Notification for Re-entry.

Notification to the supervisor is required prior to conducting work for the purpose of deepening a well pursuant to producing oil and/or gas.

The operator shall notify the Supervisor 24 hours in advance of conducting this proposed operation.

This rule shall not deter an operator from taking immediate action in an emergency to prevent damage when a service company, other than the drilling contractor, performs any work germane to this rule. The service company shall furnish the operator, and the operator upon request shall furnish the Supervisor with legible and exact copies of reports furnished the owner or operator of the well.

0400-53-01-.03 Report Filing.

The operator shall file a Well History, Work Summary and Completion or Recompletion Report (Form CN-0221) with the Supervisor within 60 days after completing, recompleting or working over a well pursuant to producing oil and/or gas. Wells shall be considered completed when they are capable of being turned into the tanks and/or gas transmission or gathering lines. Well history information shall include the actual materials and volumes used to fracture, the amounts and concentrations of any additives used, the amount of wastewater generated, and the method of disposal of wastewater, for the purpose of making this information easily available to the public.

1) Required disclosures. In the case of any well fractured using a cumulative total of greater than 200,000 gallons of water-based liquids, the following shall apply:

(a) Vendor and service provider disclosures. Service providers who perform any part of a hydraulic fracture using greater than 200,000 gallons of water based liquids and vendors who provide hydraulic fracturing additives directly to the operator for such a hydraulic fracture shall, with the exception of information claimed to be a trade secret, furnish the operator with the information required by subparagraph (b) of this paragraph., as applicable. Such vendors and service providers shall provide this information as soon as possible within 30 days following the conclusion of the fracturing activity and in no case later than 90 days after the commencement of the fracturing activity.

(b) Operator disclosures. Within 60 days following the conclusion of a hydraulic fracture using greater

than 200,000 gallons of water-based liquids, and in no case later than 120 days after the commencement of such hydraulic fracturing activity, the operator of the well shall complete the chemical disclosure registry form and post the form on the chemical disclosure registry, including:

1. the operator name;

2. the date of the hydraulic fracture;

3. the county in which the well is located;

4. the API number for the well;

5. the well name and number;

6. the longitude and latitude of the wellhead;

7. the true vertical depth of the well;

8. the total volume of water used in the hydraulic fracturing of the well or the type and total volume of the base fluid used in the fracturing, if something other than water;

9. each hydraulic fracturing additive used in the hydraulic fracturing fluid and the trade name, vendor, and a brief descriptor of the intended use of function of each hydraulic fracturing additive in the hydraulic fracturing fluid;

10. each chemical intentionally added to the base fluid;

11. the maximum concentration, in percent by mass, of each chemical intentionally added to the base fluid; and

12. the chemical abstract service number for each chemical intentionally added to the base fluid, if applicable.

(c) If the vendor, service provider, or operator claim that the specific identity of a chemical, the concentration of a chemical, or both the specific identity and concentration of a chemical is/are claimed to be a trade secret, the operator of the well shall so indicate on the chemical disclosure registry form and, as applicable, the vendor, service provider, or operator shall submit to the Supervisor a Claim of Entitlement Form notifying the Supervisor that the specific identity of a chemical, the concentration of a chemical, or both is being withheld as a trade secret. The operator shall nonetheless disclose all information required under subparagraph (b) of this rule that is not claimed to be a trade secret. If a chemical is claimed to be a trade secret, the operator shall also include in the chemical registry form the chemical family or other similar descriptor associated with such chemical.

(d) Unless the information is entitled to protection as a trade secret, information submitted to the Supervisor or posted to the chemical disclosure registry is public information.

(e) Inaccuracies in information. A vendor is not responsible for any inaccuracy in information that is provided to the vendor by a third party manufacturer of the hydraulic fracturing additives. A service provider is not responsible for any inaccuracy in information that is provided to the service provider by the vendor. An operator is not responsible for any inaccuracy in information provided to the operator by the vendor or service provider.

(f) Disclosure to health professionals. Vendors, service companies, and operators shall identify the specific identity and amount of any chemicals claimed to be a trade secret to any health professional who requests such information in writing if the health professional provides a written statement of need for the information and executes a confidentiality agreement. The written statement of need shall be a statement that the health professional has a reasonable basis to believe that (1) the information is needed for purposes of diagnosis or treatment of an individual, (2) the individual being diagnosed or treated may have been exposed to the chemical concerned,

and (3) knowledge of the information will assist in such diagnosis or treatment. The confidentiality agreement shall state that the health professional shall not use the information for purposes other than the health needs asserted in the statement of need, and that the health professional shall otherwise maintain the information as confidential. Where a health professional determines that a medical emergency exists and the specific identity and amount of any chemicals claimed to be a trade secret are necessary for emergency treatment, the vendor, service provider, or operator, as applicable, shall immediately disclose the information to that health professional upon a verbal acknowledgment by the health professional that such information shall not be used for purposes other than the health needs asserted and that that health professional shall otherwise maintain the information as confidential. The vendor, service provider, or operator, as applicable may request a written statement of need, and a confidentiality agreement from all health professionals to whom information regarding the specific identity and amount of any chemicals claimed to be a trade secret was disclosed, as soon as circumstances permit. Information so disclosed to a health professional shall in no way be construed as publicly available.

(2) Disclosures not required. A vendor, service provider, or operator is not required to:

(a) disclose chemicals that are not disclosed to it by the manufacturer, vendor, or service provider;

(b) disclose chemicals that were not intentionally added to the hydraulic fracturing fluid; or

(c) disclose chemicals that occur incidentally or are otherwise unintentionally present in the trace amounts, may be the incidental result of a chemical reaction or chemical process, or may be constituents of naturally occurring materials that become part of a hydraulic fracturing fluid.

(3) Trade secret protection. Vendors, service companies, and operators are not required to disclose trade secrets to the chemical disclosure registry or in the Well History Report. If the specific identity of a chemical, the concentration of a chemical, or both the specific identity and concentration of a chemical are claimed to be entitled to protection as a trade secret, the vendor, service provider or operator may withhold the specific identity, the concentration, or both the specific identity and concentration of the chemical, as the case may be, from the information provided to the chemical disclosure registry or in the Well History Report, in the manner provided by paragraph (1) of this rule.

(a) The vendors, service providers, or operators, as applicable, shall provide the specific identity of a chemical, the concentration of a chemical, or both of a chemical claimed to be a trade secret to the Board upon request from the Supervisor stating that such information is necessary to respond to a spill or release or a complaint from a person who may have been directly and adversely affected or aggrieved by such spill or release. Upon receipt of a written statement of necessity, such information shall be disclosed by the vendor, service provider, or operator, as applicable, directly to the Supervisor or his representative and shall in no way be construed as publicly available.

(b) The Supervisor or his representative may disclose information regarding the specific identity of a chemical, the concentration of a chemical, or both the specific identity and concentration of a chemical claimed to be a trade secret to additional Department staff members to the extent that such disclosure is necessary to allow the Department staff member receiving the information to assist in responding to the spill, release, or complaint, provided that such individuals shall not disseminate the information further. In addition, the Supervisor may disclose such information to any Board Member, the relevant county public health director or emergency manager, or to the Tennessee Department of Public Health or the Tennessee Department of Environment and Conservation Directors upon request by that individual. Any information so disclosed to the Supervisor, a Department staff member, a Board Member, a county public health director or emergency manager, or to the Tennessee Department of Public Health or the Tennessee Department of Environment and Conservation Directors shall at all times be considered confidential and shall not be construed as publicly available. The Tennessee Department of Public Health and the Tennessee Department of Environment and Conservation Directors, or his or her designee, may disclose such information to their respective staff members under the same terms and conditions as apply to the Supervisor.

(4) Any party who is adversely affected by a claim of trade secret that the party believes to be improper may file an action for damages pursuant to T.C.A. § 60-1-403 or for injunctive relief pursuant to T.C.A. § 47-25-1703(c).

0400-53-01-.04 Gas/Oil Ratio Tests.

(1) All oil wells drilled shall be equipped so that gas/oil ratios can be taken at any time. Production and gas/oil ratio tests shall be made when requested by the Supervisor, and shall be witnessed by the Supervisor or his representative.

(a) Gas production potential tests shall be made on the Gas Well Deliverability Tests (Form R-DT-1) and submitted as prescribed above to the Supervisor, and conducted every three years until the well is plugged and abandoned when requested by the Supervisor.

(b) Gas wells shall not be tested by the "open-flow" method. The back-pressure method of determining the open-flow, as outlined by the Bureau of Mines in their Monograph 1, "Back-Pressure Data on Natural Gas Wells", shall be used. When for any reasons, the completed back-pressure method is not feasible, an acceptable method, not entailing excessive physical waste of gas may be used upon recommendation of the Department.

(c) Gas/Oil (c: Gas/Condensate) ratios shall be reported on Form CN-0221.

(d) In the event any operator considers that, for the purpose of determining field allowable, his well has not had a fair determination of its gas/oil ratio, or that its gas/oil ratio has changed because of natural causes or corrective work on his well, he may make application in writing to the Supervisor for a re-test or a special test of the gas/oil ratio of his well, and for an adjustment of his well if applicable. If, upon re-testing a well, the Supervisor finds that the new gas/oil ratio justifies a change in the allowable, he is authorized to make such change.

0400-53-01-.05 Reserved

0400-53-01-.06 Gas Composition Analysis.

Gas Composition Analysis shall be completed and submitted to the Supervisor within 60 days after the Supervisor requests such data.

0400-53-01-.07 Bottomhole Pressure Tests.

Bottomhole Pressure Tests shall be conducted and submitted to the Supervisor within 60 days after the Supervisor requests such data.

0400-53-01-.08 Reserved.

0400-53-01-.09 Reserved.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-53-02
Tubing and Well Equipment

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0400-53-02-.01 Reserved.

0400-53-02-.02 Connections.

(1) When requested by the Supervisor or his representative, wellhead connections shall be tested prior to installation at a pressure indicated by the Supervisor in conformance with conditions existing in areas in which they are used.

(2) Whenever such tests are made in the field, they shall be witnessed by the Supervisor.

(3) Tubing and tubingheads shall be free from obstructions in wells used for bottomhole pressure test purposes.

0400-53-02-.03 Separators.

All flowing and gas-lift oil wells are to be produced through efficient operating separators, except in the case of low-pressure headings or gas-lift wells with low-gas output (less than 100 lbs. surface pressure).

0400-53-02-.04 Safety Valves.

(1) A safety valve is required on all flowing wells, with a surface pressure in excess of 1,000 pounds in the following categories.

(a) Any location inaccessible during period of storm or floods.

(b) Location within any wildlife refuges, parks or game preserves, or bodies of water used for recreation or navigation.

(c) Location within 600 feet of public roads or waterways, railroads, inhabited dwellings, or closer than 1,000 feet to any school or church.

(2) Where the use of safety valves would unduly interfere with normal operations of a well, the Supervisor may, upon submission of pertinent data in writing, waive the requirements of this rule.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-53-03
Prevention of Hazards and Pollution

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0400-53-03-.01 Safety

(1) Each operator shall so conduct his operations and maintain his equipment as to reduce to a minimum the danger of explosion, fire, or waste.

(2) All tests for production should be started and completed during daylight hours unless approval is obtained by the Supervisor.

(3) No boiler, open fire, or electric generator shall be operated within 100 feet of any producing oil or gas well or oil tank.

(4) Any rubbish, debris, or vegetation that might constitute a fire hazard shall be removed to a distance of at least 100 feet from the vicinity of wells to be tested.

(5) All waste shall be disposed of in such a manner as to avoid creating a fire hazard or polluting streams

and fresh water strata.

(6) No test oil, condensate, salt water, or any other fluid substance shall be discharged to or disposed of in any way into any stream, lake, or other body of water, or into any ditch or surface drainage depression leading to any stream, lake, or other body of water, except in compliance with the Water Quality Control Act T.C.A. §§ 69-3-101 et seq. and the regulations of the Board of Water Quality, Oil and Gas, Chapter 1200-04-03.

(7) All wells shall have the equipment and containers or lined pits necessary to prevent the spillage of oil, condensate, water, or any other fluids or substances produced or used during any production test. The equipment shall be in place prior to the start of the production test, and shall be large enough to contain any plausible spill.

(8) All wells shall be cleaned into a pit or tank, located at a distance of at least 100 feet from any fire hazard or dwellings. If it seems likely that a pit will overflow, additional pits shall be constructed, or else tanks shall be brought in to contain the surplus fluids.

(9) No oil or gas well shall be drilled closer than 200 feet from a dwelling or closer than 100 feet from a state highway or county road.

(a) That portion of this regulation concerning distance from a dwelling may be waived by the Supervisor upon submission of a notarized statement by the dwelling owner agreeing to the well location.

(10) No oil or gas well shall be drilled within 200 feet of any water well that is in active use. This requirement may be waived by the Supervisor upon submission of a notarized statement from the well owner agreeing to the location of the oil or gas well and a plan identifying the additional measures to be taken to prevent pollution of the water well.

(11) No oil or gas well shall be drilled within 100 feet of any stream, lake, or other body of water, so that an undisturbed riparian zone can be maintained, except that this requirement may be waived upon submission of a plan identifying additional measures acceptable to the Supervisor to be taken to prevent pollution of the waters of the State. No oil or gas well shall be drilled within 330 feet of any water body designated as an Outstanding National Resource Water (ONRW).

(12) The siting of wells, pits, or storage facilities in wetlands or in flood-prone areas (as indicated by the observed high water mark) of a stream is prohibited.

0400-53-03-.02 Environment

(1) All personnel, including operators and service personnel shall be trained in the prevention of spills and made aware of the consequences of spillage. There shall be a Site Coordinator designated for each well site who shall be the principle contact for all activities on the location and the responsible party for submitting an action and safety plan for each well site. The action plan shall include contingency measures to mitigate and minimize the risk of failure, spills, or releases due to unplanned events. Site Coordinators shall be certified by completing the Tennessee Site Coordinator Training Course. Equivalent training credentials may be temporarily accepted at the Supervisor's discretion until such time as the course certification can be obtained.

(2) Operators shall implement necessary procedures and safeguards during drilling and completion operations to prevent the uncontrolled flow of oil from wells, including, but not limited to:

(a) Follow reasonable procedures such as cleaning and lubricating pipe threads so that pipe can be made up to proper tightness.

(b) Lay flow and test lines on ground or install adequate supports for crossing streams and drainways with the lines.

(c) At truck loading terminals, provide containers to catch unrecoverable oil at the hose connections, and provide proper maintenance of valves and other equipment. Train personnel to take

necessary procedures to prevent spillage.

(d) During completion operations, produce and clean wells into tanks instead of pits if at all possible.

(e) At the same time that any pits or other diversion, transport, or storage facilities are constructed at ground level, dikes, diversion ditches, or other structures shall also be constructed to prevent any surface water from entering the pits or other facilities.

(f) Remove oil, salt water, or other fluids from pits as soon as practical after it has accumulated in them, and dispose of it in such a way that none can enter surface water or ground water, or otherwise adversely affect the environment or threaten public health and safety. Uncontaminated fresh water (free of salt, hydrocarbons or other potential pollutants) produced during drilling operations may be land applied on site.

(g) All pits or other diversion, transport, or storage facilities shall be constructed so that waste fluids do not discharge from them. There shall be no discharge pipe, overflow weir, trickle tube, or any other device allowing any discharge. The operator is responsible for maintaining adequate storage capacity at all times. No pit shall be located so that any part of it, including a dike or diversion structure, is within a horizontal distance of 100 feet of the normal high-water line of any stream or lake. All pits shall be lined using a synthetic liner of at least 10 mil thickness. If a rocky or uneven surface is encountered in pit construction, sand or sandy material shall be placed below the liner sufficient to protect the liner from damage. The synthetic liner shall be protected from deterioration, punctures, or other activity that may damage the integrity of the liner. As an alternative, compacted clay liners or other equivalent measures may be used at the discretion of the Supervisor. In areas where groundwater is close enough to the surface that it will be encountered in construction of a pit, pits shall be constructed above ground, or the operator shall use a closed-loop system.

(h) Containment at tanks shall equal at a minimum the storage capacity of 1½ times the capacity of the largest tank in the tank battery.

(i) All tanks shall be maintained to prevent corrosion which can lead to both fluid loss from the vessel and accelerated reduction in its useful life span.

(j) To prevent fire hazard, all tank batteries and tanks shall be kept free of brush or overgrowth within the berm surrounding the tank or tanks.

(k) Dikes and ditches designated in subparagraphs (e) and (g) of this paragraph should be constructed in a manner to accommodate permanent facilities such as pumping units and flow lines.

(l) Provide dikes and/or containment pits at storage tanks upon initial installation where such tanks are so located as to be deemed hazardous. If containment pits are to be used, they should be constructed according to the guidelines set forth in Rule 0400-54-01-.05.

(3) The following additional requirements shall apply to mud and reserve pits.

(a) The operator shall indicate in the drilling application that mud and/or reserve pits are to be constructed. The application shall include at a minimum the size and configuration of the pits, the liner to be used, the type of fluid system and drilling fluids to be used, and the method of disposal of all drilling fluids used at the site.

(b) Mud circulation and reserve pits shall be constructed with a synthetic liner of at least 20 mil thickness, with a 4 inch welded seam overlap, completely covering the pit bottom and inside walls. Other materials and methods used for liner construction must be approved by the Supervisor prior to use.

(c) Mud circulation and reserve pits shall be constructed and operated with a minimum of 2 feet of freeboard, and shall be designed so that only runoff from the immediate work area may enter the pit. Pits constructed above ground with bermed side walls shall be constructed with a minimum

of 2:1 side slopes on both interior and exterior walls. The top of the bermed walls must be a minimum of 2 feet wide.

(d) Closed loop systems may be used for mud and circulation, and must be maintained in a leak-free condition.

(4) Operators shall implement prudent production operations to prevent potential oil spills, including, but not limited to:

(a) Connect fill lines to storage tanks so that oil and gas shall not spray into the atmosphere.

(b) Install "equalizer" lines between adjacent tanks as a safeguard against overflow.

(c) Install oil and gas separators where gas is produced in sufficient quantities to be hazardous.

(d) Pump contaminated unsalable residual oil from storage tanks into an accumulator tank instead of open pits.

(e) Place locks, remove handles, or otherwise secure all valves, so vandals cannot open them to cause spills.

(5) The Supervisor should notify all oil industry related companies, including operators, service companies, drilling contractors, and crude oil gatherers and purchasers of their responsibility and liability in regard to oil spills. In the case of a spill of oil, saltwater, or other drilling or production associated materials, the operator shall contact the Supervisor or his representative within 12 hours upon knowledge of the spill.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-01
Pollution and Safety Controls

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0400-54-01-.01 Operator's Responsibility

Each operator shall so conduct his operations and maintain his equipment as to reduce to a minimum the danger of explosion, fire, or waste.

0400-54-01-.02 Proper Handling of Drilling Foam.

When it becomes necessary to use detergents during air-rotary drilling operations, the foam generated by such activity shall be directed into a containment pit and retained there until it has been degraded to a harmless form.

0400-54-01-.03 Proper Disposal of Waste.

No waste oil, oil field waste, or any other fluid substance shall be discharged to or disposed of in any way into any stream, lake, or other body of water, or into any ditch or surface drainage depression leading to any stream, lake,

or other body of water, except in accordance with a discharge permit obtained from the Department. No solid waste, including but not limited to contaminated soils at a well site, shall be disposed of except as allowed by the Solid Waste Disposal Control Act T.C.A. §§ 68-211-101 et seq.

Any Naturally Occurring Radioactive Material (NORM) or Technically Enhanced Naturally Occurring Radioactive Material (TENORM) produced at a well site shall be disposed of in accordance with the Tennessee State Regulations for Protection Against Radiation, Chapter 0400-20-05.

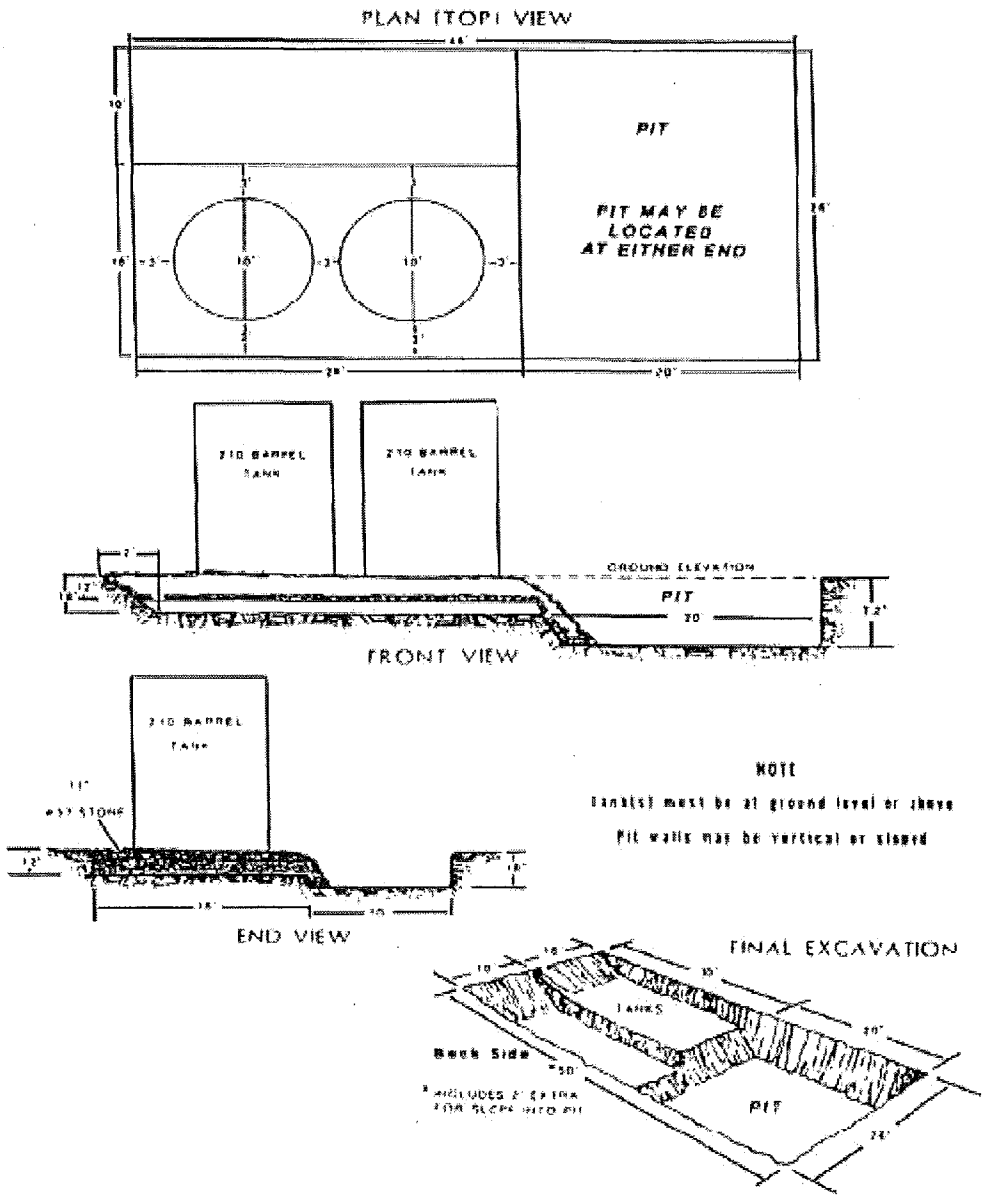
0400-54-01-.04 Removal of Debris.

Any rubbish or debris that might constitute a fire hazard shall be removed to a distance of at least 100 feet from the vicinity of wells, tanks and pump stations.

0400-54-01-.05 Containment Pit at Tank Batteries.

A containment pit is required at each permanent oil tank or battery of tanks, and such pits shall be surrounded by a retaining wall or suitably ditched to a collecting sump, each of sufficient capacity and construction to contain potential spillage. Tank batteries shall not be located closer than 100 feet from any state highway or county road.

CONSTRUCTION DETAILS FOR TANK PAD AND PIT



0400-54-01-.06 Vents Required.

All storage facilities shall be vented.

0400-54-01-.07 Improper Loading.

Oil transporters and producers shall not load oil from oil storage facilities into vehicles parked on public roads.

0400-54-01-.08 Gathering Lines.

All gathering lines shall be buried beneath the surface wherever no blasting is required, and shall be steel or weather resistant black plastic wherever outcropping, resistant rock makes it necessary to lay the pipe on top of the ground. Lines crossing streams, rivers, intermittent streams or other drainways shall be constructed in such a fashion as to bridge the drainage features and protect the gathering lines from damage due to lack of adequate support. Failure of support may result in rupture of or discharge from the line. If the line is to be installed below the stream bed or below ground level and shall cross state waters an Aquatic Resources Alteration Permit shall

be obtained prior to the activity occurring. Burial is not required, however, in those instances where this would conflict with the Natural Gas Pipeline Safety Act and rules at 40 CFR Part 192.

0400-54-01-.09 Improper Casing.

All producing wells that are not properly cased and/or cemented shall cease production. The operator is required to perform corrective work before production can be resumed.

0400-54-01-.10 Disposal of Salt Water.

(1) Underground injection is the preferred form of disposal of salt water, provided, however, that such injection is permitted by appropriate State and Federal agencies.

(2) Produced salt water may either be injected into a subsurface formation(s) productive of hydrocarbons, if part of an approved secondary recovery project, into a subsurface formation(s) not productive of hydrocarbons, if through an approved salt water disposal well, or else may be transported off-lease to an authorized salt water disposal facility if prior approval has been granted by the Department.

(3) Produced salt water shall not be put in any unlined pit, pond, lake or depression, or in any other place in a manner that shall constitute a pollution hazard to the waters of the State including ground water.

(4) No salt water or fracturing liquids shall be discharged to or disposed of at the land surface where they can enter surface water or ground water, unless such discharge is permitted by appropriate State and Federal agencies. Salt water or fracturing liquids discharged to and temporarily stored in lined pits shall be removed before they can leak into underground water.

(5) All pits or ditches used for temporary storage or transport of salt water shall be lined with an impermeable man-made liner in accordance with the liner requirements specified in subparagraph (2)(g) of Rule 0400-53-03-.02.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-02
Procedures and Equipment for Metering, Measuring and Producing Oil Condensate and Gas

Table of Contents

0400-54-02-.01 Gas/Oil Ratios Equipment
0400-54-02-.02 Gauging
0400-54-02-.03 Testing
0400-54-02-.04 Improper Transfer
0400-54-02-.05 Lease Tank Outlets
0400-54-02-.06 Bleed-off Lines
0400-54-02-.07 Commingling Prohibited
0400-54-02-.08 Required Test Lines
0400-54-02-.09 Reserved
0400-54-02-.10 Reserved
0400-54-02-.11 Reserved
0400-54-02-.12 Reserved
0400-54-02-.13 Basic Orifice Coefficients
0400-54-02-.14 Pilot Tubes
0400-54-02-.15 Gas Measurements

0400-54-02-.01 Gas/Oil Ratios Equipment

All leases are to be so equipped as to permit the determination of gas/oil ratios on individual flowing and gas-lift wells. Gas/oil ratio data on all wells shall be available to the Supervisor at all times.

0400-54-02-.02 Gauging.

Each lease shall be provided with sufficient tankage and/or meters to permit proper gauging of the oil/condensate and gas produced. The tanks or meters shall be identified by a sign showing the ownership of the tanks or meters and the name of the lease from which the oil/condensate or gas is being produced. In no case shall meters be the sole means of measuring oil runs from any field. There shall be used at least one gauge tank to check the readings of oil and condensate meters.

0400-54-02-.03 Testing.

All oil tendered to any transportation system shall be gauged and tested for Basic Sediment and Water and temperature. For each and every transfer of oil from the lease tanks the number of the "on-seal" observed temperature and the percent of Basic Sediment and Water shall be recorded on each and every run ticket, and the producer and purchaser of any transfer of oil from lease tanks shall receive a copy of the run or delivery ticket or tickets.

0400-54-02-.04 Improper Transfer.

There shall not be any simultaneous movement of oil into and out of any tank that is being used for delivering oil to a gatherer or transporter. Transfer of oil or gas from the possession of one lease to the possession of another lease, except when properly accounted for, is hereby prohibited. The possession of improper mechanical means for transferring oil from one lease tank or well to the lease tank or well of another lease is hereby prohibited.

0400-54-02-.05 Lease Tank Outlets.

All pipeline outlets from lease tanks shall be kept sealed at all times except when a pipeline is being made from the tank, and the number of the "on-seal" and "off-seal" shall be recorded on each and every run ticket. Additionally, all pipeline outlets from lease tanks shall be made secure to prevent the unauthorized discharge or transfer of oil.

0400-54-02-.06 Bleed-Off Lines.

Basic Sediment and Water bleed-off lines of lease tanks shall be sealed or locked at the time any pipeline run is being made.

0400-54-02-.07 Commingling Prohibited.

Oil produced from separately owned leases, not pooled, unitized, or consolidated shall not be commingled in lease tanks except as hereinafter provided for in this order.

0400-54-02-.08 Required Test Lines.

Reserved.

0400-54-02-.09 Reserved

0400-54-02-.10 Reserved.

0400-54-02-.11 Reserved.

0400-54-02-.12 Reserved.

0400-54-02-.13 Basic Orifice Coefficients.

Basic orifice coefficients used in the calculation of gas flow shall be those contained in the American Gas Association's Gas Measurement Committee Report No. 3 or some other basic orifice coefficients generally accepted in the industry and approved by the Supervisor, such as those published by the Foxboro Company, American Meter Company, and Pittsburg Equitable Meter Company. Corrections for base pressure and base temperature shall be made. Corrections for supercompressibility are recommended when available. Corrections

for Reynolds number and expansion factor are recommended only in cases where their combined correction is equal to or exceeds 1%.

0400-54-02-.14 Pilot Tubes.

Gas measurements with Pilot Tubes shall be based on Reid's formula and shall follow recommendations similar to those set forth in Appendix 4 of the Bureau of Mines Monograph 7. Corrections for base pressure and base temperature shall be made as in orifice measurements.

0400-54-02-.15 Gas Measurements.

Gas measurements with orifice well tests shall follow recommendations similar to those set forth in Bulletin No. E-7 of the American Meter Company. Corrections for base pressure and base temperature and gravity shall be made as in orifice measurements.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-03
Requirements for Reporting the Volume and Disposition of Oil and Gas Produced

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0400-54-03-.01 Time Reports
0400-54-03-.02 Month Defined
0400-54-03-.03 Reserved
0400-54-03-.04 Reserved
0400-54-03-.05 Reporting-Producers
0400-54-03-.06 Monthly Reporting-Transporters
0400-54-03-.07 Reserved
0400-54-03-.08 Report Filing
0400-54-03-.09 Computing Method
0400-54-03-.10 Report Verification
0400-54-03-.11 Monthly Report-Gas
0400-54-03-.12 Monthly Report-Plant
0400-54-03-.13 Report-Gas Gatherers

0400-54-03-.01 Time Reports

The length of time reports and other pertinent data, covered by this chapter, shall be kept on file by the operators and available for inspection by the Supervisor or members of his staff, for not less than a period of 3 years.

0400-54-03-.02 Month Defined.

A "month" and "calendar month" shall mean the interval of time from 7:00 a.m. on the first day of any month of the calendar to 7:00 a.m. of the first day of the next succeeding month of the calendar.

0400-54-03-.03 Reserved.

0400-54-03-.04 Reserved.

0400-54-03-.05 Reporting-Producers.

Each producer of oil and such producer of condensate from a gas well, where produced in liquid form at the wellhead by ordinary production methods or as Calculated Theoretical Condensate, defined as the amount of condensate (allocated back to lease) that normally would be separated by conventional methods from natural gas well volumes flowing full stream directly to a plant without any condensate separation having been made at lease or a plant, shall furnish for each year an Annual Well Report (Form CN-1272) pursuant to Rule 0400-52-10-.06

setting forth complete information and data indicated by such reports respecting oil produced from every lease operated by said producer and respecting condensate produced from gas wells at the wellhead in liquid form by ordinary production methods from each lease operated by said producer.

0400-54-03-.06 Monthly Reporting-Transporters.

Each transporter of oil and condensate shall furnish for such calendar month a Transporter's and Storer's Monthly Report for Crude Oil and/or Condensate (Form CN-0229) containing complete information and data indicated by such form including the quantity of oil removed from each lease and permit numbers of producing wells on each lease.

0400-54-03-.07 Reserved.

0400-54-03-.08 Report Filing.

The transporter's and storer's reports for each month shall be prepared and filed according to instructions on the form, on or before the 25th day of the next succeeding month.

0400-54-03-.09 Computing Method.

All quantities included in the reports provided for in this chapter shall be reported in barrels computed from 100% tank tables and based upon actual physical gauges.

0400-54-03-.10 Report Verification.

All reports provided for in this chapter shall be verified by affidavit in the form or forms indicated; any reports not so verified shall not be taken as filed in compliance with this chapter.

0400-54-03-.11 Monthly Report-Gas.

All gas produced within the State of Tennessee, excepting gas vented from stripper wells, shall be reported on the Annual Well Report (Form CN-1272) and Monthly Gatherer's and/or Transporters Natural Gas Report (CN-0244). Every producer shall complete the Annual Well Report (Form CN-1272) pursuant to Rule 0400-52-10-.06. Every transporter shall complete Form CN-0244. The transporter thus required to report, shall execute under oath and file in the manner hereafter directed on or before the last day of each month, Form CN-0244, setting forth fully the data and information indicated by such form, which shall be completed as to data covering the calendar month next preceding the date of filing.

0400-54-03-.12 Monthly Report-Plant.

Each operator of a gasoline plant, cycling plant, or any other plant at which gasoline, butane, propane, condensate, kerosene, oil or other liquid products are extracted from natural gas, shall be furnished for each calendar month. Such report for each month shall be prepared and filed before the last day of each month.

0400-54-03-.13 Report-Gas Gatherers.

Gas gatherers shall report the amounts of gas handled and disposed of on Monthly Producers Natural Gas Report (Form CN-0239). The gas which he has produced in the field shall be reported on Form CN-0239, under the section of the report entitled "Production." The gas gathered in the same field along with gas which he has gathered in nearby fields and transported to that field shall be reported on the same form, under the section entitled "Acquisitions." He shall indicate in this section the company from whom the gas was received, the field from which this gas was produced, and the amount of gas received. In the event the gatherer has produced no gas in the field from which he is gathering, then he shall indicate in the Production Section of Form CN-0239 that he has no gas production. His acquisition in that field shall be listed in the Acquisitions section.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-04
Ratable Take

Table of Contents

0400-54-04-.01 Taking Oil and Gas Ratably

0400-54-04-.01 Taking Oil and Gas Ratably

(1) It is required that oil and gas be taken ratably from wells producing from a common pool. The application of vacuum at the wellhead of a well, or upon any gas or oil-bearing reservoir is prohibited, except on application, notice and hearing. A copy of the application and notice of hearing shall be mailed by certified mail to each offset operator within 5 days after the application is filed. Wherever authority is granted to impose a vacuum, a continuous record thereof shall be kept by the operator as required by the order authorizing same. The record shall be made available to the Board on request. Should any operator, or a person with financial interest feel that oil and gas is not being taken ratably from well or wells in which he participates, then he may make that fact known through application for a public hearing and present and exhibit appropriate technical data to demonstrate such positions to the Board. A decision shall be made by the Board provided the applicant complies with the rule governing said hearings.

(2) At a minimum, consideration of approval for use of a vacuum pump shall include the following:

(a) A comprehensive presentation of the information pertinent to the request;

(b) Well histories of the well in question and surrounding wells;

(c) Electronic logs, if available, for each well;

(d) 7½ minute topographic quadrangle maps indicating the location of each well within one mile of the well site;

(e) A property map of the same area showing the surface owners, and mineral lease holders on surrounding properties; and

(f) A copy of a signed document, from each interested party, i.e., surrounding landowners and lease holders, stating that they have no objection to the well in question being pulled on a vacuum.

(3) Subparagraph (2)(f) of this rule may be waived if the gas that is pulled from the well is re-injected back into the same reservoir(s) as it is pulled from as a secondary recovery operation.

(4) All requests made to the Board shall include the requirements of paragraph (2) of this rule.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-05
Commingling and Automatic Custody Transfer of Hydrocarbons

Table of Contents

0400-54-05-.01 Permission to Commingle
0400-54-05-.02 Notice Publication
0400-54-05-.03 Granting Permission
0400-54-05-.04 Meter Calibrations
0400-54-05-.05 Operational Limitations
0400-54-05-.06 By-Pass Lines
0400-54-05-.07 Reserved
0400-54-05-.08 Retention of Reports

0400-54-05-.01 Permission to Commingle.

Permission to commingle gas and/or liquid hydrocarbons and to measure and transfer custody of liquid hydrocarbons by use of methods other than customary gauge tanks may be obtained without the necessity of a public hearing, in the absence of protest, as hereinafter provided, and upon strict compliance with the procedure set forth herein.

(1) Detailed schematic diagram of the mechanical installation to be used with adequate explanation of the flow of gas and/or liquid hydrocarbons and indicating locations of locking devices and seals to provide assurance against, or evidence of, tampering.

(2) Statement by the producer that in his opinion the use of the proposed method shall provide reasonably accurate measurement and shall not create inequities.

(3) A list of all known interested parties, including operators and royalty owners, affected by the application.

0400-54-05-.02 Notice Publication.

Notice of the filing of an application for projects applicable to this chapter shall be published in a newspaper of general circulation in the county wherein the field is located.

0400-54-05-.03 Granting Permission.

Upon the basis of application as herein provided, no permission for projects applicable to this chapter shall be granted if, in the judgment of the Supervisor, the data and information submitted does not warrant the approval of the application or if any party protests the application by filing written protest with the Supervisor within 15 days following the first publications of the notice of the application; however, in either of the foregoing events, the application may be set for public hearing at the election of the applicant or the Supervisor.

0400-54-05-.04 Meter Calibrations.

The applicant shall provide a suitable means of calibrating each meter used for measurement of hydrocarbons in order that its accuracy in operation can be proven, such calibration to be done before or at the time the meter is initially installed and at such intervals or other times as the Supervisor or his representative shall, after consideration of the inherent characteristics of the particular equipment, deem proper. The results of all meter calibrations required by this order shall be certified as being true and correct by the party performing the calibration. These results shall be available upon request to the Supervisor or his representative.

0400-54-05-.05 Operational Limitations.

The approved custody transfer or commingling installation shall be permitted to operate so as to transfer or commingle, as produced, the hydrocarbons produced from the well or wells served by such installation. The limitations on the operation of such installation are as follows:

(1) The daily production rate from any well or wells shall not cause waste.

(2) Unless otherwise permitted, no production from a well in a prorated pool in excess of the total monthly allowable may be transferred during a calendar month.

(3) The production from any given well in any one day shall not be increased more than 25% of the legally permissible hydrocarbon production from such well or wells.

0400-54-05-.06 By-Pass Lines.

Permission, in writing, from the Supervisor shall be obtained for all by-pass lines or other lines that shall permit flow around the regular meter, and each such line shall have a meter that shall permit individual well measurement.

0400-54-05-.07 Reserved

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

0400-54-05-.08 Retention of Reports.

Should approval be given, the applicant shall indicate in the "Remarks" column on the current CN-0239 form that appropriate well tests have been conducted. The applicant shall retain the actual reports of such tests and such reports shall be kept on file, and available for inspection by the Supervisor or any party at interest for a period of not less than 3 years.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-06
Limiting Production

Table of Contents

0400-54-06-.01 Prorating a Pool

0400-54-06-.01 Prorating a Pool

The Board, after public hearing, may prorate a pool for the purpose of protecting correlative rights and to minimize the waste of oil and/or gas. Prior to prorating a pool, its wells may be shut-in until subparagraph (1)(h) of Rule 0400-52-04-.01 is complied with, or in lieu thereof, a poolwide unit is established.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-07
Regulating High Gas/Oil Ratio Wells and Preventing Waste of Gas

Table of Contents

0400-54-07-.01 Classification
0400-54-07-.02 Escaping Gas
0400-54-07-.03 Unitization
0400-54-07-.04 Wells Regulated
0400-54-07-.05 Gas-Lifted Wells
0400-54-07-.06 Application of Rules

0400-54-07-.01 Classification.

An oil well with a gas/oil ratio in excess of 2,000 cubic feet of gas per barrel of oil (2,000:1) shall be considered a high gas/oil ratio well and may be limited by the Supervisor in the amount of gas permissible to produce.

0400-54-07-.02 Escaping Gas.

No gas shall be flared or permitted to escape into the atmosphere, but shall not be utilized without waste, except upon approval of the Supervisor or where special orders are operative. If necessary to prevent undue waste of gas or dissipation of reservoir energy, the Board may limit venting of gas.

0400-54-07-.03 Unitization.

An attempt shall be made to unitize all pools, or reservoir, with high gas/oil ratios.

0400-54-07-.04 Wells Regulated.

Production from wells in pools or reservoirs that have both oil and gas production shall be regulated by the rules

of this chapter.

0400-54-07-.05 Gas-Lifted Wells.

Wells that are gas-lifted with gas from gas wells shall be prorated in the same manner as are high-ratio naturally flowing oil wells after subtracting the input gas from the output gas. The uneconomical or unreasonable use of gas for gas-lifting shall not be permitted.

0400-54-07-.06 Application of Rules.

If gas is produced from an oil reservoir or common source of supply and is returned to the same source, only gas not returned or utilized for lease or unit operations shall be considered in applying the rules of this chapter.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-08
Subterranean Gas Storage

Table of Contents

0400-54-08-.01 Conditioned Usage

0400-54-08-.01 Conditioned Usage.

Application for usage of subterranean reservoirs for gas storage shall be submitted to the Board. The Board may, after public hearing, grant the applicant's request conditioned as follows:

(1) That the underground reservoir sought to be used for the injection, storage and withdrawal of natural gas is suitable and feasible for such use, provided no reservoir, any part of which is producing or is capable of producing oil and gas in paying quantities, shall be subject to such use, unless all owners in such underground reservoir shall have agreed thereto in writing; or

(2) Unless such reservoir has a greater value or utility as an underground reservoir for gas storage than for the production of the remaining volumes of original reservoir natural gas and condensate, and all owners, in interest shall have consented to such use in writing; and

(3) That the use of the underground reservoir for the storage of natural gas shall not contaminate other formations containing fresh water, oil, gas, or other commercial mineral deposits; and

(4) That the proposed storage shall not endanger lives or property; and

(5) That the storage reservoir may be drilled through, in a prudent manner, for the purpose of exploration for, or producing, underlying oil and/or gas pools.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-09
Pressure Maintenance Projects and Secondary Recovery

Table of Contents

0400-54-09-.01 Application
0400-54-09-.02 Administrative Approval
0400-54-09-.03 Approval by Special Order
0400-54-09-.04 Poolwide Unit-Formation
0400-54-09-.05 Casing and Sealing Wells

0400-54-09-.06 Input Well Procedure
0400-54-09-.07 Pro-rata Payment
0400-54-09-.08 Application for Hearing

0400-54-09-.01 Application.

Any person desiring to institute secondary recovery or pressure maintenance projects shall apply to the Supervisor by letter setting forth the request, and submit a Pressure Maintenance and Secondary Recovery Questionnaire (Form CN-0141).

0400-54-09-.02 Administrative Approval.

If the common source of supply, for which such operations are to be instituted, lies within a single lease, or all interested parties voluntarily agree, the project may administratively be approved by the Supervisor.

0400-54-09-.03 Approval by Special Order.

All other categories of secondary recovery and pressure maintenance projects shall be approved by special order, after a public hearing and by determination of the Board that waste shall be prevented and the unit operation shall increase ultimate recovery; that the unit operation is feasible; that each owner shall receive his just and equitable share; and that 50% or more of the owners have approved the unit operation.

0400-54-09-.04 Poolwide Unit-Formation.

When the common source of supply is not restricted to a single lease, a poolwide unit shall be formed prior to the Oil and Gas Board granting approval for secondary recovery and pressure maintenance projects.

0400-54-09-.05 Casing and Sealing Wells.

Wells drilled or reworked for use in the injection of fluids or gases shall be adequately cased and sealed to prevent injection or migration of injected substances into any strata or stratum other than the objective.

0400-54-09-.06 Input Well Procedure.

The drilling and plugging of any input well shall follow the same procedure that is employed in drilling or plugging oil and gas wells.

0400-54-09-.07 Pro-rata Payment.

The owners of working interest in secondary recovery and pressure projects are required to pay their pro-rata share of the cost of equipping and operating said project. If any working interest owner fails to tender this just and reasonable share of costs, the Board may provide that the operator shall withhold all proceeds and be reimbursed for the non-participating owner's share of the proceeds to the extent of 150% to 200% of the amount advanced.

0400-54-09-.08 Application for Hearing.

Any owner may apply for a hearing before the Board to obtain relief from unjust and unreasonable costs assessed by the project operation, provided he shows that he has either conferred or attempted to confer with the operator for the purpose of settling the dispute prior to making application to the Board.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-55-01
Unit Operations

Table of Contents

0400-55-01-.01 Unit Operation
0400-55-01-.02 Drilling and Production Units
0400-55-01-.03 Poolwide Units

0400-55-01-.01 Unit Operation.

(1) Unit operations shall be ordered by the Board only after notice and hearing and shall be based on findings that:

(a) The order is reasonably necessary to conserve the natural resources of the State; shall prevent waste of oil and gas, and the drilling of an unnecessary well or wells; shall appreciably increase the ultimate recovery of oil and gas from the affected pool; is economically feasible; and shall protect correlative rights of both landowners and owners of mineral rights.

(b) The order shall provide for the allocation to each separate tract within the unit a proportionate share of the unit production, thereby ensuring the recovery by the owners of that tract their just and equitable share of recoverable oil or gas in the unit.

(c) The order shall provide the designation of a unit operator, but only with the consent of the designated person, and approve the terms and plans of the unit operating agreement in the absence of a voluntary agreement among the owners.

(d) The order shall make provision for the proportionate allocation of cost to the producers, which allocation shall be in the same proportion that the separately owned tracts share in unit production. The cost of capital investment in wells and physical equipment and intangible drilling cost shall be shared in like proportion, provided that no such producer or owner who has not consented to the unitization shall be required to contribute to the cost or expenses of the unit operation, or to the cost of capital investment in wells and physical equipment and intangible drilling cost, except out of proceeds of production accruing to the interest of such owners out of production from such unit operation. However, no well costs credit allowable shall be adjusted on the basis of less than the average well costs within the unitized area. If any producer or owner fails to tender his just and reasonable share of cost, the Board may provide that the operator shall withhold and be reimbursed for the non-participant's share of cost of the proceeds to the extent of 350% of the amount advanced.

(e) It is provided, however, that the order requiring unit operation shall not vary nor alter any of the terms of the required written contract or contracts evidencing approval nor impose any terms or operations upon the nonsigners of said contract or contracts more onerous than the terms and operations set out in said contract or contracts.

(f) The order shall provide for the forced integration of separately owned tracts and other property ownership into drilling, production, or pool units. Continuous operations incident to the drilling of a well upon any portion of a unit shall be deemed, for all purposes, the conduct of such operations upon each separately owned tract in the unit. That portion of the production allocated to each separately owned tract included in a unit shall, when produced, be deemed for all purposes to have been actually produced from such tract by a well drilled thereon.

0400-55-01-.02 Drilling and Production Units.

(1) Any owner with interest in a tract of land offsetting production and who cannot comply with the spacing rules for drilling a well on said tract may make application for a hearing before the Board for the purpose of having the tract, or a portion thereof, included in a production unit.

(2) Drilling and production unit wells shall comply with the rules on spacing between wells and distance from property lines as prescribed in Chapters 0400-52-01 through 0400-52-12.

(3) The shape and pattern of production and drilling units should be designed to permit the attendant unit well to economically, efficiently and equitably drain the unit's pro-rata share of the pool's oil and/or gas, and shall be based on available geologic and engineering parameters. Length of any drilling unit shall not exceed twice its width.

0400-55-01-.03 Poolwide Units

(1) Poolwide units may be formed on a volumetric or surface area basis provided that sufficient data are available to determine the geometry and to define the physical characteristics of the reservoir.

(2) Drilling, production, or poolwide units can only be revised by the Board if new pertinent geological or engineering evidence becomes available which was not in existence at the time a unit was formed.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-56-01
Hearings and Administrative Approval

Table of Contents

0400-56-01-.01 Hearings
0400-56-01-.02 Administrative Approval

0400-56-01-.01 Hearings.

(1) Public hearings, after legal notice, shall be held by the Board as needed by the Board to implement its responsibility and upon applications made for such hearings. A notice of public hearing as provided by T.C.A. § 60-1-204 shall be given by publishing 1 notice of the time and place thereof in at least 3 newspapers of general circulation in at least 3 major cities in Tennessee, and such notice shall be published at least 10 days prior to the date of such hearing. Applicant shall pay the cost incurred in publishing legal notices. The time and place for each public hearing shall be fixed by the Board as soon as reasonably possible and each public hearing shall be conducted by the Board. If more than one hearing is to be held on a particular date, the Board conducting the hearings shall determine the order in which they shall be held.

(2) The applicant shall open the hearing and present the testimony and exhibits offered in support of the application. The applicant's witnesses shall then be subject to cross-examination by the Board and by any person with an interest in the subject matter of the application. The Board shall determine the order of appearance of the other participants in the hearing.

(3) Each person having an interest in the subject matter of the application and who has complied with the rules and procedures may present testimony and exhibits in support of or in opposition to the applicant. All witnesses shall be subject to cross-examination as set forth in paragraph (2) of this rule.

(4) The applicant may offer rebuttal testimony and exhibits, but the witness shall again be subject to cross--examination. Surrebuttal testimony and exhibits and subsequent testimony and exhibits may be permitted at the discretion of the person conducting the hearing.

(5) All witnesses shall testify under oath.

(6) Closing statements and statements of position may be made by the participants and all other interested parties before the hearing is closed or at such time as designated by the Board.

(7) The Supervisor shall record each hearing showing appearances, testimony and exhibits, statements, and all other records submitted at the hearing.

0400-56-01-.02 Administrative Approval.

(1) Administrative approval of certain matters of a routine nature may be granted by the Supervisor upon submission of an application showing all pertinent information and data and after due notice is given to all operators of interest.

(a) The application shall be made to the Supervisor with a copy to each known offset lease owner and such application shall include:

1. statement of reason and justification for requested relief,

2. map or sketch illustrating the information pertinent to the request relief,

3. list of names and addresses of all interested persons notified of the application.

(b) If the application meets with the approval of the Supervisor and no written protest is received by the Supervisor within 15 days following prescribed notice of the application, the Supervisor may grant the requested relief without the necessity of a public hearing.

(c) If the application is accompanied by a written waiver from all known offset lease owners, the 15 day delay shall be unnecessary.

(d) If the Supervisor does not elect to approve the application administratively or if written protest is received within the 15 day period, the application may be set for public hearing.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-56-02
Rules of Procedure for Hearing Contested Cases

For Rules of Procedure for Hearing Contested Cases see Rules of the Secretary of State, Chapter 1360-04-01.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-57-01
List of Forms

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0400-57-01-.01 Report and Permit Forms

0400-57-01-.01 Report and Permit Forms.

(1) The report and permit forms designated below may be obtained from the Board, 401 Church St., Nashville, TN 37243-1534, and are hereby adopted and made a part of the rules set out in Chapters 0400-51-01 through 0400-57-01:

(a) Application to Amend Well Permit (Form CN-0228)

(b) Application to Change Operators (Form CN-0237)

(c) Application for Permit to Drill (Form CN-0211)

(d) Gas Well Deliverability Tests (Form R-DT-1)

(e) Monthly Gatherer's and/or Transporter's Natural Gas Report (Form CN-0244)

(f) Organization Report (Form CN-0219)

(g) Plug and Abandon Report (Form CN-0217)

(h) Pooling Affidavit (Form CN-0690)

(i) Pressure Maintenance and Secondary Recovery Questionnaire (Form CN-0141)

(j) Statement of No Objection to Proposed Surface Disturbance (Form CN-0691)

(k) Surface Owners Notification Certification (Form CN-0694)

(l) Transporter's and Storer's Monthly Report for Crude Oil and/or Condensate (Form CN-0229)

(m) Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221)

(n) Comprehensive Bond Identification (Form CN-0120)

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-58-01
Determinations Under Federal Natural Gas Policy Act of 1978

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0400-58-01-.01 Definitions.

(1) "F.E.R.C." means the Federal Energy Regulatory Commission.

(2) "F.E.R.C. Rules" means rules or regulations adopted by F.E.R.C. implementing the NGPA.

(3) "NGPA" means the Natural Gas Policy Act of 1978 enacted by the United States Congress on November 9, 1978, and as that Act may subsequently be amended, supplemented, or superseded by subsequent legislation by Congress.

(4) "Application" shall mean a written request for status determination in accordance with Rule 0400-58-01-.03 herein and shall also mean "petition" within the meaning of other rules, regulations, and orders by the Board, when applied to NGPA status determination proceedings by the Board.

(5) "Sections 102, 103, 107, and 108" or reference to any one or more of those sections shall mean and be in reference to those sections of the NGPA.

0400-58-01-.02 Applicability of Other Rules.

Except where the same conflict with these rules pertaining to NGPA Determinations, F.E.R.C. rules, or the NGPA, all other rules, regulations, and orders of the Board are applicable thereto.

0400-58-01-.03 Application and Filing Procedure.

Any interested person requesting the classification of a gas well under Sections 102, 103, 107 or 108 by the Board pursuant to the authority granted to the Board by Section 503 of the NGPA, in order to determine the applicable status for such wells, shall initiate such determination by:

(1) Filing with the Board NGPA Form No 121.

(2) Filing with the Board Forms TGP 102, TGP 103, TGP 107 or TGP 108, whichever is appropriate.

(3) Filing with the Board all forms, information, plats, exhibits, affidavits, documents, and evidence required by Part 274 of the F.E.R.C. rules, and other applicable F.E.R.C. rules, and required by these rules herein, and by Board Forms TGP 102, 103, 107 and 108.

(4) Attesting to the application in the manner required by Section 274 and other applicable rules of the F.E.R.C. rules for such filings.

(5) Paying a fee of twenty-five dollars ($25) to the State of Tennessee through the Supervisor for each application filed. Checks should be made payable to the State of Tennessee.

0400-58-01-.04 Evidence by Affidavit.

Applications may be considered and determined by the Board on the basis of information contained in the application provided such application complies with all other rules herein. If there are no objections to the applications by any interested parties, the Board may consider and act on sworn affidavits, as well as exhibits, forms and other matters filed with the Board and constituting a part of the record of the hearing of the application. If confidentiality applies (Rule 0400-52-10-.05) to any items submitted as evidence, a separate letter identifying the items and giving the period of confidentiality should be included with the application.

0400-58-01-.05 Intervention.

Any person may intervene in an application and become a proponent or opponent of any application.

0400-58-01-.06 Attesting to Written Orders.

Written orders of the Board concerning applications may be signed by the Chairman of the Board and such orders certified by the Chairman as an order duly promulgated by the Board shall have full force and effect as orders signed by the Board members.

0400-58-01-.07 List of Participants.

A list of participants in the proceedings, as well as any persons who submitted or sought an opportunity to submit written comment (whether or nor such persons participated in the proceedings) shall be made for each hearing.

0400-58-01-.08 Forms.

(1) Applications shall be made upon Forms TGP 102 (Application for New Natural Gas Determination), TGP 103 (Application for New Production Well Determination), TGP 107 (Application for High Cost Natural Gas Determination), and/or TGP 108 {Application for Stripper Well Natural Gas Determination), and any form required by F.E.R.C. The original and two copies of such application shall be filed with the Board, along with a self-addressed stamped envelope for return of one of the copies after the filing date and docket number have been noted by the Board. The F.E.R.C. 121 Form and Form TGP 102, 103, 107 and 108 may be submitted in lieu of the second complete copy of the application. All applications shall be fully completed as appropriate in conformance with Board rules as well as with F.E.R.C. rules, and the well for which a determination is being sought shall have been classified by the Tennessee Office of Geology before such applications may be heard by the Board. Upon receipt of an application, the Board shall notify the applicant of the receipt of such application and, should the application be incomplete in any respect, indicate the nature of the incompleteness. Upon the receipt of application, such application shall be considered filed with the Board, assigned a docket number, and notice duly published, provided all other rules referred to herein have been complied with.

(2) The date the application is received by the Board shall be considered the filing date or record, unless after a determination has become final it is determined that the application did not, in fact, qualify for the request status in the first place, in which case the Board shall consider the filing date of record of a new application to be the date the disqualified application for a price determination for a particular reservoir

was received by the Board. This exception shall be allowed between categories as well as within a particular category, but shall only apply to those wells for which commercial sale of natural gas has occurred after the original determination was filed. Written notice shall be given to the F.E.R.C. and to the applicant for any determination for which this exception shall apply.

0400-58-01-.09 Notice or Determination.

After making a determination that an application does or does not qualify for the requested status under the NGPA, the Board shall give written notice of such determination to F.E.R.C. in accordance with F.E.R.C. rules.

0400-58-01-.10 Method of Determinations.

(1) The Board hereby certifies that it shall take such steps as are reasonably necessary or appropriate to perform its function in accordance with Part 214 of the implementing rules of F.E.R.C.

(2) The method by which the Board shall make determination is as follows:

(a) Applicants for determination shall file on forms required by the F.E.R.C. and by the Board in order to receive a hearing. Forms required by the Board are:

1. Form CN-0211 (Application for Permit to Drill)

2. Form CN-0228 (Application to Amend Well Permit)

3. Form CN-0237 (Application to Change Operators) if applicable

4. Form CN-0219 (Organization Report)

5. Form CN-0221 (Well History, Work Summary, and Completion or Recompletion Report)

6. Form R-DT-1 (Gas Well Deliverability Tests)

7. Form CN-0244 (Monthly Gatherer's and/or Transporter's Natural Gas Report)

8. Form No. TGP 102 (Application for New Natural Gas Determination), TGP 103 (Application for New Production Well Determination), TGP 107 (Application for High Cost Natural Gas Determination), or TGP 108 (Application for Stripper Well Natural Gas Determination), whichever is appropriate.

(b) Notice of filing by applicants is required by the rules of the Board to be given by applicants to identified purchases, as required by Section 274.201(e) of the said Regulations of F.E.R.C. (paragraph (3) of Rule 0400-58-01-.03).

(c) Public notice of the filing, pending hearing, and pending determination of applications for determinations shall be given by the Board at least ten (10) days prior to such hearing, giving the date, time, and place of such hearing. Such public notice shall be given by publication at least once in a newspaper of general circulation published in Nashville, Knoxville, and Chattanooga.

(d) All such rules and regulations and orders of the Board are required to be in writing, T.C.A. § 60-1-204(d). Petitions shall be filed at least fifteen days prior to the hearing thereon. When a proceeding is instituted, the Board assigns a docket number to the application and records the fact and the dates of the filing of the application in a docket book provided for such purpose (subparagraph (g) of this paragraph). Testimony is recorded, transcribed, and preserved as a part of the permanent record of the hearing. Any person testifying is required to do so under oath; however, relevant unsworn statements, comments, and observations by any interested person may be heard and considered by the Board and included in the record. In matters where there are no objections of record, sworn affidavits of witnesses may be received in evidence (Rule 0400-58-01-.04). The relevancy of any testimony or other evidence is subject to challenge by any party to the hearing or any member of the Board. When so interposed, such objections are acted upon by the Chairman, his ruling being subject to challenge and overturning by a majority vote of

the Board.

(e) Full opportunity is afforded all interested parties at a hearing to present evidence and to cross-examine witness.

(f) The Board maintains data files which contain the records on each individual well in the State. Such well records consist of the following:

1. Application to Amend Well Permit (Form CN-0228).

2. Application to Change Operators (Form CN-0237).

3. Application for Permit to Drill (Form CN-0211).

4. Gas Well Deliverability Tests (Form R-DT-1).

5. Monthly Gatherer's and/or Transporter's Natural Gas Report (Form CN-0244).

6. Organization Report (Form CN-0219).

7. Plug and Abandon Report (Form CN-0217).

8. Pressure Maintenance and Secondary Recovery Questionnaire (Form CN-0141).

9. Transporter's and Storer's Monthly Report for Crude Oil and/or Condensate (Form CN-0229).

10. Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221).

11. Application for New Natural Gas Determination (Form TGP-102).

12. Application for New Production Well Determination (Form TGP-103)

13. Application for High Cost Natural Gas Well Determination (Form TGP-107).

14. Application for Stripper Well Natural Gas Determination (Form TGP-108).

Further, the Board maintains a library of drill cuttings, cores and logs from wells in the state. Records of the Board include extensive geologic and engineering data, such as geologic structure, isopach, and cross-section maps, production data, well potential test results, bottom hole pressure surveys, fluid analyses, gas analyses, and other similar data.

The Board maintains field or reservoir base maps and all wells completed in or penetrating a reservoir are identified.

A monthly activity report is published by the Board for all wells being drilled or completed in the State and a monthly production report is available giving monthly production from all producing wells in the State.

(g) Applications for determinations shall be filed and assigned a docket number upon receipt. The professional staff of the Board shall then study the application and data submitted in conjunction with records of the Board as identified in subparagraph (f) of this paragraph. Information contained in the application shall be verified to the extent possible with information on file with the Board. The staff of the Board includes professional engineers, geologists, and attorneys, as well as other support staff. The application and relevant data shall be considered and discussed in a joint meeting of the professional staff, prior to the public hearing of the application before the Board. Requests for clarification of data or for additional data may be made, where deemed necessary by the staff. Unresolved questions may be asked of the applicant at the hearing.

(h) The initial authority of the Board for making determination in accordance with the NGPA was

established by an emergency order of the Board, which was made at a scheduled hearing under the Uniform Administrative Procedures Act. This action was properly advertised in accordance with the state law and Board rules.

After studying the application, all data submitted by the applicant, all data available in the files of the Board, and hearing any additional evidence submitted at the hearing, the staff of the Board shall make a recommendation to the Board. Where there is no objection, evidence may be submitted by affidavit without oral testimony. Regarding uncontested applications, the Board shall hear them en masse and, where appropriate, grant the same by one order. A list of applications recommended for approval shall be made available prior to the hearing so that comments or objections may be expressed when the applications are considered by the Board.

(i) The Board shall give written notice to the F.E.R.C. of any change in the procedures described in these rules.

Authority: T.C.A §§60-1-105, 60-1-201 et seq., and 4-5-201 et seq.; Natural Gas Policy Act of 1978, Public Law No. 95-621, 92 Stat. 3350 (November 9, 1978).

* If a roll-call vote was necessary, the vote by the Agency on these rulemaking hearing rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)
Pete Claussen				✓	
Derek Gernt	✓				
Ken Haislip	✓				
Chuck Head	✓				
Brian Hensley	✓				
Jim Washburn	✓				

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Oil & Gas Board on 09/28/2012, and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 05/03/12

Rulemaking Hearing(s) Conducted on: (add more dates). 07/10/12

Date: September 28, 2012

Signature: Chuck Head

Name of Officer: Chuck Head

Title of Officer: Chairman

Subscribed and sworn to before me on: September 28, 2012

Notary Public Signature: Marcus D. Williams

My commission expires on: 08·11·2013

MARCUS D. WILLIAMS STATE OF TENNESSEE NOTARY PUBLIC WILLIAMSON COUNTY

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

R E Cooper Jr

Robert E. Cooper, Jr.
Attorney General and Reporter

3-19-13
Date

Department of State Use Only

Filed with the Department of State on: 3/20/13

Effective on: 6/18/13

Tre Hargett

Tre Hargett
Secretary of State

RECEIVED 2013 MAR 20 PM 1:56 DEPARTMENT OF STATE

Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. § 4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

A public hearing was held on July 10, 2012 at the Knoxville Environmental Field Office, 3711 Middlebrook Pike Knoxville, Tennessee. Approximately 35 people attended this public hearing. Sixteen (16) people offered oral comments during the hearing. The initial public comment period ended at 4:30 p.m. on July 20, 2012.

The public comment process for the draft rules was extended until 5:30 p.m. August 3, 2012. The extension was granted as a result of overwhelming public participation. The hearings were attended by interested citizens, government agencies, local media, and representatives of numerous groups, institutions, and public and private organizations. The list of attendees represented the following organizations:

American Petroleum Institute (API)
America's Natural Gas Alliance (ANGA)
Atlas Energy LP
CONSOL Energy Inc. (CNX)
Environmental Standards
Knoxville Activist Collective
League of Women Voters of Tennessee (LWV)
Sierra Club
Statewide Organizing for Community eMpowerment (SOCM)
SOCM E3 Committee (Energy, Ecology, and Environmental Justice)
Southern Environmental Law Center
Spectra Energy
Tennessee Citizens for Wilderness Planning (TCWP)
Tennessee Clean Water Network (TCWN)
United Mountain Defense (UMD)

One hundred and eleven (111) private citizens responded with written comments. The following organizations also responded with written comments regarding the proposed rule changes:

American Petroleum Institute (API)
Atlas Energy, LP
Beverage & Diamond for Halliburton Energy Services, Inc.
CONSOL Energy Inc. (CNX)
Harpeth River Watershed Association
Historic Rugby
League of Women Voters of Tennessee (LWV)
LightWave Solar
Natural Resource Services
Perkins & Trotter, PLLC
Plugmill Systems, Inc.
Saint Joseph Petroleum, LLC
Sierra Club
Southern Environmental Law Center
SOCM E3 Committee (Energy, Ecology, and Environmental Justice)
Swan Conservation Trust
Tennessee Citizens for Wilderness Planning (TCWP)
Tennessee Clean Water Network (TCWN)
Tennessee Oil and Gas Association (TOGA)
TMD Energy
Walden Resources, LLC

A number of comments (both written and oral) are not included in this document because: 1) they were not directly related to the proposed rules, 2) stated a belief, opinion or request that did not specifically ask for a response, 3) required a response that would be speculative or unrelated to the rules or 4) requested information or involved matters subject to control or regulation by other government agencies.

Comments and Responses

Subjects included in the comments or questions follow: (Several of the public comments that represent similar concerns and issues are grouped together under specific categories).

A. General Issues about Fracturing (Fracking)

Comment: **A-1) The most common comments received in this process were many variations of the following:**

Why does Tennessee need to allow fracking at this time?

Please do not allow fracking to come to our beautiful state.

The environmental risks of fracking are well known, therefore fracking should be banned.

A moratorium should be placed on all fracking until the effects can be further studied.

Response: Fracturing involves using high pressure to create fissures or fractures in a rock formation to allow oil or gas to flow more easily up a well. It has been practiced in many forms since the 1940s. Currently, in Tennessee the methods used for well fracturing are one of the following: CO_2, N_2, mixed with sand and some water as a surfactant, or HCL. These recorded methods for fracturing have been in place and used extensively since 1969 so fracturing is not a new process in Tennessee. All oil and gas wells are fractured one way or another, and have been for decades. In Tennessee we have no record of any groundwater contamination or safety issues associated with the fracturing process. To ban all fracturing would be not only unwarranted, but would be in effect the same as making oil and gas production illegal in our state without any evidence of harm caused.

TDEC recognizes that the current public concerns over fracturing began with the advent of large-scale hydraulic fracturing in the Marcellus Shale in Pennsylvania and Ohio in the last decade, as well as in other deep shale formations in other parts of the country. The advent of horizontal drilling techniques combined with new methods of hydraulic fracturing made these deep shales viable sources of natural gas. These fracturing methods use large amounts of liquids (as much as 1 to 5 million gallons per well) to fracture, along with some chemical additives, and create issues with chemical handling, wastewater disposal, and water withdrawals from streams.

No hydraulic fracturing of this type and volume has yet occurred in Tennessee; these methods are counter-productive in the Chattanooga Shale. However, we share the commenters' concerns that a more robust regulatory structure may be desirable in the event that hydraulic fracturing methods like those practiced in the Marcellus Shale were to ever be attempted in Tennessee. Our intent with this rulemaking is to provide a regulatory framework for future fracturing using large amounts of water without introducing unnecessary regulatory burdens on those operators using current methods that have not been proven harmful.

Comment: **A-2) Several commenters asked for the 200,000 gallon number to be removed from Rule 0400-52-02-.01(10) and fracking regulations to cover all amounts of fluid.**

Response: As stated above, the intent of this rulemaking is to be able to adequately regulate large volume hydraulic fracturing should it ever be attempted here without affecting current methods of fracturing using nitrogen gas or small water volumes. The amount of 200,000

gallons was initially proposed by environmental groups as part of a 2011 legislative initiative. Here it is used as a trigger for applying new requirements for such fracturing, such as public notice.

TDEC well history information indicated that two wells in the state have been fractured with large volumes of a water-based treatment. One well was treated with 145,000 gallons of water and another well was treated with 175,000 gallons of water. Accordingly, TDEC agreed that the 200,000 gallon threshold, while not a technically derived number, was a logical and reasonable boundary for distinguishing between the acceptable existing practices and large hydraulic fractures that represent a change in methods that the public should be made aware of.

B. Board Makeup

Comment: **How many people who represent the general public service are on the regulatory board and how many people are actually on it?**

Response: The make-up of the Oil and Gas Board is set by legislative statute, and TDEC cannot alter this by the process of rulemaking.

The current Oil and Gas Board is made of six members. Three members are Ex Officio that represent environment, conservation and economic and community development; one member represents the oil and gas industry; one member represents mineral test hole industry; and one member represents landowners with oil and gas wells located on their property. All members are appointed by the Governor's office and are given four year terms.

Effective October 1, 2012 2012 Public Chapter 986 of 2012 merged the Tennessee Oil and Gas Board into the Water Quality Control Board to form the Board of Water Quality Oil and Gas. This will add an Oil and Gas industry representative and a landowner representative to create a twelve member board.

C. American Petroleum Institute (API) standards

Comment: **Many commenters want to know why the proposed regulations do not adopt the standards of the American Petroleum Institute:**

The use of these industry accepted standards is the minimum needed and a foundation from which to create more specific rules.

From what I understand, the proposed regulations fall short of reaching the standards of the American Petroleum Institute. Why would you discuss fewer regulations for this practice which is just now beginning to be studied?

Why in the world would we want to adopt something that is even below these standards [API]?

Response: The American Petroleum Institute (API) publishes guidance on all aspects of oil and gas drilling activities, and TDEC recognizes and depends on their excellent standards and recommendations. Our regulations are indeed consistent with API guidance. API in their comments state that "Tennessee itself already references API standards 26 times in their state regulations..."

However, no states have adopted API standards universally into their rules, nor does API itself recommend that states do so. Their standards are broadly based to cover all kinds of drilling in a variety of geologies, depths, and pressures. To adopt all API guidance would be to impose significant costs on the industry with little additional environmental protection. For example, this might require an operator to spend 5 times as much for a certain grade of steel casing pipe, when a much cheaper pipe would be more than adequately protective for a shallow, low pressure well.

Accordingly, TDEC has chosen to adopt API **performance-based best practices** as a solid foundation for Tennessee field operations. These performance-based practices allow the flexibility to implement the appropriately protective methods and materials based upon the real depths and pressures that will be encountered at a well site. For example, rather than specify a strength of casing pipe that must always be used in every situation, we have adopted performance based-language: "The casing shall have a minimum internal pressure rating of 110% of the maximum formation pressure reasonably expected based upon the depth and location of the well."

D. Definitions

Comment: **D-1) Several suggestions were submitted for revision of definitions.**

Response: We agree with many of the comments made regarding definitions by American Petroleum Institute (API), America's Natural Gas Alliance (ANGA), Consol Energy, TMD Energy, Tennessee Clean Water Network (TCWN) and the Tennessee Oil and Gas Association (TOGA). Accordingly, we have added definitions for or revised our definitions for:

Aquifer
Base Fluid
Blooey Line
Chemical Abstract Service
Chemical Abstract Service Number
Chemicals
Chemical Disclosure Registry
Chemical Family
Conductor Pipe
Flow Lines
Fracturing
Health Professional
Hydraulic Fracturing Additive
Hydraulic Fracturing Fluid
Intermediate Casing
Production Casing
Proppant
Surface Casing
Total Volume Storage
Trade Secret
Well Integrity

Comment: **D-2) In your document when you refer to fracturing, are you including vertical wells treated by fluid volumes less than 200,000 gallons per treatment?**

Response: The definition of fracturing refers to any kind of fracturing methodology, liquid or gas, of any volume. Under the proposed rules, wells to be fractured using greater than 200,000 gallons of water-based liquids will require public notice and other new requirements, and this will include both vertical and horizontal wells.

E. Public Disclosure

Comment: **E-1) A commenter expressed a specific concern that citizens, especially those living near oil and gas operations, have access to timely information about these activities, such as pre-drilling water quality data, geologic infrastructure, the timing and nature of any chemicals that will be pumped into the ground or disposed of in their communities and the procedure and results for ongoing monitoring of surface and groundwater. This presumes that such data is being collected in the first place?**

Response: We concur with the commenter that our draft language concerning disclosure was non-specific. Commenters from both industry and environmental groups referenced the State of Colorado's regulations for fracturing chemical disclosure. Accordingly we have incorporated language adapted from the State of Colorado's regulations on disclosure for water volumes and chemical additives for hydraulic fracturing of any well to use greater than 200,000 gallons of liquid. The rules will specify the use of the website *FracFocus* as the chemical disclosure registry site, which is accessible free on the internet. See subparagraphs (1)(b), (1)(c), (1)(d) and paragraph (3) of Rule 0400-53-01-.03.

Comment: **E-2) Notify the land owner of the well location property, surrounding land owners, TDEC and local news media when the fracking operation is complete. This must be done within 30 days of the completion.**

Response: While there have been occasions when environmental or safety issues have occurred at oil or gas well sites in Tennessee (fires, significant oil spills), no impacts have been documented from the fracturing activities themselves. Fracturing of oil and gas wells in the State of Tennessee has been a common practice with no reported contamination or unsafe event since permitting began in 1969. Accordingly TDEC believes this level of notification for fracturing activities requested by the commenter to be unwarranted.

Currently all operators are required to submit a Well History to report the condition of the well and what type of fracturing treatment has taken place at the permitted well site. The information from a fracture can be obtained from the files of the oil and gas program in approximately 60 to 90 days after the fracturing event.

In addition, the new rules specify that any fracture using greater than 200,000 gallons of water-based liquids must be advertised in a 30-day public notice period prior to drilling and fracturing.

Comment: **E-3) Prescribe a time limit to have the post drilling information entered into the public website by the operator.**

Response: We concur with the commenter that a time limit is needed. These revised regulations will require an operator to enter information onto a national chemical disclosure registry if the operator performs a hydraulic water based fracture using greater than 200,000 gallons of liquid within 60 days of the conclusion of fracturing activity. For all other fracturing activities, existing rules require the operator to submit to the Tennessee Oil and Gas Program a Well History demonstrating what kind of treatment, if any, was conducted on a well within 60 days.

F. Geology

Comment: **F-1) Several commenters asked about the safety of drilling through karst geology as it relates to changing groundwater flows and contaminate transport.**

Drilling karst, whether it is in close proximity to a surface water body or not, should not be permitted. An arbitrary distance from a surface water area will not necessarily be a protective measure in karst environments.

Response: The karst features known as sinkholes, caves, swallets, and collapse features generally occur within the first two hundred feet of the surface. There are some recorded instances where some cave systems extend to as deep as six hundred feet beneath the surface, but not in areas where our oil and gas drilling occurs. In areas where oil and gas deposits and extensive karst features overlap such as Overton, Pickett, Clay and Western Fentress Counties, these karst features occur within the first two hundred feet of the surface.

We believe that the rules we are proposing will continue to be effective in protecting the groundwater in karst areas from contamination. The rules require all oil and gas operators to have a casing program that includes steel pipe to be placed in the boring and cement placed from the bottom of the casing to the surface of the ground. The cement must come back to the surface to ensure that groundwater is protected. In all cases 7 inch steel casing is placed in the boring down to the Chattanooga Shale to insure that all shallow aquifers are isolated.

There are some instances where the operator may drill through a void. In these cases, the operator must cement up to the void with excess cement and then place cement down between the steel casing and the boring and place cement from the cement basket to the surface, thus sealing off both holes bored into the void. All operators are required

to have a cement basket and centralizers on their 7 inch casing to ensure proper placement of the casing and cement. This process has and does protect the ground water that occurs within the karst area.

Comment: **F2) A commenter asked about the relationship between fracturing and earthquake activity.**

Response: Drilling in karst is not related to any earthquake activity in Tennessee. While some earthquakes in other parts of the country have been tentatively linked to the long-term use of underground injection wells for waste disposal along fault zones, extraction of oil and gas deposits is unrelated to earthquake activity.

Comment: **F-3) Several comments were submitted about why TDEC will allow fracturing west of the plateau if there are no viable gas deposits in the shallow Chattanooga shale.**

The proposed rules need to include a prohibition on any drilling in the Chattanooga Shale west of the Cumberland Plateau because according to TDEC's information, the formation does not and will not contain gas because a confining layer does not exist.

Response: In general, the Chattanooga Shale in Middle Tennessee is not worthwhile for oil or gas extraction - there are only limited areas east of Nashville that have any productive potential in the Chattanooga Shale Formation. For most of the state, a geologic structure known as the Nashville Dome uplifted these older rocks so that the Chattanooga Shale was completely eroded away in the area from Monteagle, Tennessee to the southeast of Nashville to Celina, Tennessee (northeast of Nashville) in a band over 60 miles across. The Chattanooga Shale either outcrops or is too shallow to contain producible quantities of natural gas in a wide swath beyond the edges of the Dome.

West of Nashville, natural gas from the Chattanooga Shale has no real commercial potential, as demonstrated by the small number of wells drilled between Nashville and Memphis since permitting began in 1969. The Chattanooga Shale and younger formations west of Nashville are too shallow to be sustainably productive. Without an impermeable rock layer above to seal in the volatile hydrocarbons under pressure, there cannot be any viable hydrocarbons trapped in the shale to recover.

However, there could be small localized areas that contain oil deposits that could conceivably be produced. Because of that remote possibility, TDEC will not impose a ban that would take away a landowner's right to develop their mineral rights. It is also possible that mineral right owners in the future may attempt drilling down to much deeper shale layers than the Chattanooga Shale.

TDEC does not intend to ban all such future exploration with no environmental or safety basis to do so.

Comment: **F-4) A specific, major question for us is whether or not the rock layers above and below the shale gas formations can contain the methane and any unrecovered fracturing fluids to the shale.**

Response: The presence of producible hydrocarbons in a shale layer demonstrates that the surrounding rock layers are sufficient to prevent the hydrocarbons and any other potential pollutants (naturally occurring brine, fracturing fluids) from migrating upward thousands of feet to drinking water aquifer formations. Otherwise the volatile hydrocarbons would have escaped eons ago. Our regulations are designed specifically to prevent migration or leakage of hydrocarbons, brine or other pollutants to other formations via the well bore itself.

Comment: **F-5) A commenter asked about requiring pre-drilling geologic surveys.**

Response: The term "geologic survey" is broad and we are not clear about the intent of the commenter in this context. Certainly the geologic characteristics from the surface to the Chattanooga Shale are well understood in Tennessee. If the commenter is referring to a survey for caves, voids, the exact location of fractures that will be encountered, etc., then there is no way to survey for these features other than to drill an exploratory test hole. This is sometimes done, and this activity is permitted by TDEC under Mineral Test Hole permits (T.C.A. § 60-1-501 et seq.). Therefore we do not see a need for this requirement.

G. Permitting, Penalties

Comment: **G-1) Several comments were submitted asking why there is not a 30 day notice on permits much like other Water Pollution Control permits.**

The 30 day public notice for a fracking permit should be required with no exceptions. Permitting the fracking process should have no less a public process than what is established for an individual ARAP.

I do think the comment period must be more than 15 days..... while there may be other ways for people to follow this complex issue, I think many do still depend on traditional media and we often need more time to consider issues.

Response: TDEC utilizes different lengths of public notice and comment period for different kinds of permits, and the sole intent of this particular public notice is to insure that no fractures of greater than 200,000 gallons of liquid can occur in Tennessee without the public being made aware. However, in the interests of consistency with the most common notices utilized by the Division (NPDES and ARAP), we agree to change the notice period to 30 days. See subparagraph (10)(b) of Rule 0400-52-02-.01.

Comment: **G-2) The term fluid should be changed to liquid to avoid gas (also referred to as fluid in physics).**

Response: We concur with changing the term 'fluid' to 'liquid' to avoid regulatory ambiguity. Our original intent was to apply the new public notice and disclosure rules only to water-based liquid fracturing using greater than 200,000 gallons. Accordingly, the wording has been changed to 'water-based liquids'.

Comment: **G-3) Several commenters stated: There should be very substantial fines/penalties above the current ones applicable that MUST be paid for each offense. These fines/penalties must be paid immediately upon finding of guilt of the infraction.**

Response: The assessment of civil penalties is a discretionary function of the Department. Because of the broad range of scenarios and variables that can occur relating to a violation, penalties are assessed on a case-by-case basis. This policy is consistent with all the other regulatory programs in TDEC.

Comment: **G-4) Several commenters asked about storm water plans:**

Approved storm water and wastewater plans are to be submitted, available to the public, reviewed and adopted by TDEC prior to any site preparation or hydrofracking activity is initiated.

Establish comprehensive construction storm water runoff permit requirements to protect surface water runoff during well construction.

Response: The Federal Government exempted the oil and gas industry from the requirement to apply for coverage under NPDES Construction Storm water permits, and Tennessee has followed the federal lead in not requiring such permit coverage or storm water pollution prevention plans (SWPPPs) associated with those permits. However, the Tennessee Oil and Gas Rules require erosion controls and best management practices to control storm

water runoff from well sites. In addition, discharges of sediment from a well site are regulated under the Tennessee Water Quality Control Act.

Comment: **G-5) The amendment as written below, designated in red, in paragraph (1) of Rule 0400-52-02-.02 are not clear that they are intended for fracturing volumes greater than 200,000 gallons of water based liquids as listed in Rule 0400-52-02-.01(10). They would not be practical and would be a burden to normal operations in Tennessee for volumes equal to or smaller than 200,000 gallons.**

(1)..... Information submitted with the application shall include the intent to fracture the well, if known, as well as an estimate of the volume of fluids to be used in the fracture..... The plan shall also include identification of all drinking wells within ½ mile radius of the proposed wellhead.....

Response: We concur with the commenter that the draft wording was not completely clear. It was our original intention to limit the new rules concerning public notice, disclosure, water well sampling, etc. to apply only to wells to be fractured using greater than 200,000 gallons of water-based liquids. The rule language has been changed to eliminate the ambiguity.

H. Blowout Prevention (BOP)

Comment: **H-1) The addition of a 3000 psi working pressure is well above levels adequate for many shallow O&G and CBM wells and may create an undue hardship. Recommend minimum of 1500 psi or 110% of maximum anticipated surface pressure.**

Response: We concur with the commenter. The rule language has been changed to "a minimum of 110% of the maximum surface pressure that would be reasonably expected based on the depth and location of the well" instead of the 3000 psi working pressure requirement, as per the recommendation of API.

Comment: **H-2) The casing policy requiring only one BOP, should be expanded to include wells on the parts of the plateau known to have low pressure formations.**

Response: We agree with the commenter that the draft rule language differentiates wells requiring a single BOP from those requiring redundant BOP on the basis of geographical descriptions written in legislation rather than by actual pressures that would be encountered. Accordingly, we have changed the rule language to read "For non-Cumberland Plateau wells in areas of known lower pressures" instead of referencing by county.

In addition, the rules provide operators the option to apply for a variance to the blowout prevention on the plateau area if warranted, provided there is an established pressure associated to the depth to be drilled. For wells drilled in areas of unknown pressures and below the Chattanooga Shale, variances for blowout prevention will not be granted.

Comment: **H-3) The addition of paragraph (2) of Rule 0400-52-06-.02 requiring secondary closing systems do not address intrinsically safe electrical pumps that should be required for gas drilling.**

Response: We concur with the commenter. Rule language has been changed accordingly, inserting the words "intrinsically safe" before all references to electric pumps.

I. Environmental Protection, Safety

Comment: **I-1) Flow-back after shale gas well fractures may be several days to several weeks in duration. Suggest change to the operator shall maintain personnel on-site during fracturing activity and beginning of flow back activity.**

Response: We concur with the commenters. The rule language has been changed to read "The operator shall maintain personnel on-site during the fracturing or other treatment activity, and during the initial flow back period, until such time as the well pressure returns to near pre-fracturing reservoir pressure. Unmanned flow back operations shall be checked routinely."

Comment: **I-2) There needs to be a definite plan for closure of the well when gas extraction is complete.**

Response: The closure for any oil and gas well is addressed under the rules, depending on the condition and intended use of that well. For example, the operator may desire to leave the well open for a period of time and has the option to place the well on temporary abandonment. If an operator plans to close the site, closure is addressed under plugging requirements and environmental protection.

Comment: **I-3) The used waste water from the fracking process must be contained such that it cannot run off into adjacent water sources or seep into underground water tables. If the used waste water does run off into surface or underground water sources then TDEC, surrounding land owners and the local news media must be notified within 24 hours.**

Response: Currently all operators are required to obtain the proper permits prior to releasing any liquids that may have any elevated contaminates. All fluids are required to be contained and then placed in an underground injection well or other disposal arranged. These activities must be reported as part of well history reporting requirement, and in the case of fractures using greater than 200,000 gallons of water-based liquids, the disposal plans for wastewater must be submitted as part of the application and included on the public notice. We have also added a requirement under "Environment" that the Supervisor must be notified within 12 hours of knowledge of any spill. TDEC would then notify the media and surrounding landowners if warranted.

Comment: **I-4) A commenter suggested the addition of: Rule 0400-53-03-.02(5)..... If spills of oil, saltwater or chemicals occur the operator shall contact a representative of the Oil and Gas Board. In addition, if a spill of oil and/or chemicals occurs, the National Response Center at 1-800-424-8802 must be contacted. This notification must be in the form of a phone call, e-mail and/or fax and must occur within 12 hours upon knowledge of the spill.**

Response: We concur with the commenter. Language will be placed into the regulations to address the reporting of spills to TDEC, see item I-3 above. Notification to the National Response Center is a federal requirement not administered by the state.

Comment: **I-5) Several commenters expressed concern about wastewater and if it can be land applied.**

Response: Drilling water produced during the drilling activities associated with a permitted well can be land applied if the fluids do not contain excessive brine or salt water. Any wastewater produced at a site that cannot be land applied must be disposed of by underground injection, meeting all applicable requirements, or other regulated methods.

J. Casing Requirement

Comment: **J-1) We received various comments about casing depths:**

Setting surface casing more than 50 feet below fresh water can create a control problem in air drilled wells. Recommend the following: Surface casing shall be set a minimum of 50 feet below the lowest known fresh water aquifer.

In some cases oil or gas zones occur less than 100' below fresh water zones. I would recommend that the wording (unless production zones occur less than 100' from freshwater zones.

Response: We concur with the commenters that when air-drilling in some Tennessee formations, the aquifer water encountered is often difficult to control in order to set casing at 50 feet below the water level, and that attempting to set it at 100 feet below could prove to be impractical given the volumes and pressures of water to handle. It was also pointed out that in some locations west of the Plateau, there can be less than 100 feet depth between the aquifer water and the producing formation. We agree that provisions must be made to deal with these situations.

Accordingly, rule language under Casing Requirements has been changed to read as follows: "The operator shall set surface casing at 100 feet below the lowest known fresh water aquifer with class A cement only. The Supervisor shall have the authority to require distances of less than 100 feet upon specific request of the operator if adequate technical justification can be made." This request can be made directly to the Supervisor in the application; no appeal or presentation to the board will be required.

We also restructured the provisions on casing requirements that apply on and off the Plateau to make them clearer.

Comment: **J-2) We propose a change in surface casing with a change in pressure rating to cover shallow depths associated with many wells in Tennessee (110% of maximum anticipated formation pressure).**

Response: We concur with the commenter. Rule language has been altered to read "Casing shall have a minimum internal pressure rating of 110% of maximum formation pressure reasonably expected based on the depth and location of the well", as per API recommendations.

Comment: **J-3) Production casing: This proposed rule is unclear as to whether it includes casing on packers and/or tubing production strings.**

Response: We concur with the commenter that this issue is unclear in the rule. Accordingly we have added language stating that where production casing is used, all production casing for vertical wells shall be cemented in place and through the zone being produced. A well with tubing or production casing on a packer will be considered an open-hole completion and not a completely cased boring. In these cases a variance must be applied for and received prior to conducting such activity.

Comment: **J-4) Production casing is defined as casing set through the producing formation. In some cases production casing is set and cemented in place above the producing formation.**

Response: While the definition of production casing does not include mention of cementing, the commenter is correct that in horizontal drilling the cement is set at a point above where the bore turns horizontally into the producing formation. The rule language under Production Casing has been changed to address cementing into the production formation for vertical wells. Language has also been added under the section on Horizontal Drilling that addresses cementing in horizontal wells.

K. Cement Bond Logs (CBL)

Comment: **K-1) We propose this be restricted to wells fractured with greater than 200,000 gallons of water based liquids or wells being temporary abandoned where Mechanical Integrity Tests cannot be performed to establish isolation.**

Response: We have reconsidered the use of cement bond logs as a well integrity standard. See response under K-2 below.

Comment: **K-2) The state received several comments not in favor of making cement bond logs a requirement:**

Cement bond logs are subject to interpretation and the state should not be in a position of analyzing them. What constitutes a good bond; 90% bond over 10' or 80% bond over 20' etc.?

Bond logging results can vary based on actual well conditions and in most circumstances a mechanical integrity test would yield a higher degree of integrity and be the preferred method.

The cost of running a CBL outweighs the cost of plugging a well.

Response: We concur with the commenters that a CBL is not the best choice for a well integrity standard. API guidance 10TRI section 5.5 is very specific: "This practice (CBL) is not recommended as a best practice for cement evaluation". Accordingly we have elected to use the pressure testing of casing proposed under "Blowout Prevention" and the documentation of the cement job required under "Casing Requirements" as the minimum standard for well integrity testing.

After consideration of comments and consulting with API guidance, we have decided to use the following language for our minimum well integrity standard, under the section on Isolation of Oil, Gas, and Fresh-Water-Bearing Strata: "Pressure testing of casing as specified in Rule 0400-52-06-.02, and documentation of cementing as required in Rule 0400-52-07-.01 shall constitute the minimum requirements for maintaining isolation through well integrity."

In addition, we have added a section under Temporary Abandonment that will require operators to conduct a Mechanical Integrity Test or other pressure testing on any well proposed to be placed into Temporary Abandonment, if that well has not been tested or produced within the last 15 years.

L. Pit and Tank Batteries

Comment: **L-1) A commenter needs clarification on the definition of a "public road" or a reduction in the spacing of 100 feet.**

Response: TDEC concurs that clarification is needed. Rule language has been changed from 'public road' to 'any state highway or county road'.

Comment: **L-2) A commenter stated that the addition subparagraph (2)(e) of Rule 0400-52-06-.02 requiring flowlines to be constructed in a straight line to a pit would circumvent the use of a closed loop system or use of mud tank.**

Response: TDEC concurs that the use of closed systems and mud tanks are acceptable. Rule language has been changed accordingly to state this. In addition, subparagraph (2)(e) of Rule 0400-52-06-.02 has been changed to read 'flow lines or blooey lines' to be more accurate and definitions for these terms have been added.

Comment: **L-3) Several commenters expressed concern that lining tank battery pits is not realistic due to animal destruction and environmental degradation and asked for no liner to be required.**

Response: While TDEC acknowledges the difficulties of maintaining synthetic liners in some situations, all tank battery pits should be lined with a synthetic liner. The need for containing drips and spills in the pits and preventing soil and groundwater contamination applies everywhere.

M. Water Wells, Lakes, Streams, Floodplains

Comment: **M-1) There is no time limit specified for the water well owner to comply with the request for a sample analysis and there is no requirement that any notification be in writing leaving no documented history for the process.**

Response: TDEC concurs with the commenter. Accordingly a time deadline of "within 14 days of the date of the Public Notice" has been added to the rule language and a requirement that the water well owner/landowner must submit a written request to the applicant for the water well to be tested.

Comment: **M-2) The industry should only have to identify wells in the public record within the proposed ½ mile radius of a proposed well. This is all the EPA requires for injection wells.**

Response: The ½ mile radius in the draft rule language applies only to hydraulic fractures using greater than 200,000 gallons of water-based liquids. The operator's responsibility to identify those wells is limited to those wells available in TDEC records. However, if an unrecorded water well owner comes forward, that individual may request his or her well to be tested.

Comment: **M-3) Prohibiting all drilling locations in flood plains is too broad. I suggest the well site and tank batteries be sited above the 50 year floodplain.**

Response: No regulations have been written to specifically address flood plains. The revised regulations state that no oil or gas wells or associated equipment shall be located in a flood prone area. This language, although not as specific as "flood plain", was necessary due to the fact that floodplains are not often calculated or designated in the areas where most drilling occurs.

Comment: **M-4) The terms wetlands and floodplains can be ambiguous and lead to conflict. A better wording could be: Wells shall be drilled only on sites approved by oil and gas inspectors and any that are subject to dispute may be brought before the proposed committee of geoscientists/engineers assigned to arbitrate such things.**

Response: The term wetland is not an ambiguous term; it is well-defined in both federal and state regulation. The term 'flood plain' has not been used in the current revised regulations. Only flood prone areas are mentioned to address the areas that are very susceptible to flooding and should be evaluated by operators and our inspectors on a case by case basis prior to receiving a permit to drill. The intent of this clause is simply to avoid placing wells, pits, storage, etc. in an area where it could be damaged in a flash flood and cause spill. We consider the creation of a professional committee to be unnecessary at this time, but an operator always has the option to appeal a disputed call to the Board. We do not anticipate this being a significant issue; we believe operators and inspectors have been working together effectively to avoid wetlands and flood prone areas.

Comment: **M-5) Identification of water wells should be limited to those within 1500' and only for wells that are to be fractured with more than 200,000 gallons of fluid. Testing of water wells should be left up to the well operator. Multiple commenters have suggested varying distances.**

Response: This half mile radius will apply only to wells proposed to be fractured using greater than 200,000 gallons of liquid. A search of the data base within a half mile of the well head of the hydraulic fracture is consistent with other states implementing these types of regulations such as Pennsylvania, New York, Texas, Arkansas, Colorado, etc. For all other wells a ¼ mile radius will be used.

Comment: **M-6) Several commenters suggested a greater spacing from streams and other water bodies to match the greater distances other states use.**

Response: There is a high density of numerous small intermittent streams on the Cumberland Plateau, Ridge and Valley, and Highland Rim areas in Tennessee. To compare states with differences in rainfall, topography, and Eco region characteristics is therefore inappropriate. To require a greater set back than 100 feet would unnecessarily limit the number of drilling locations in the most active areas of drilling in the state, and may eliminate the ability for some land owners to develop their mineral rights.

However, we have added rule language that increases the setback distance from Outstanding National Resource Waters from 100 feet to 330 feet.

Comment: **M-7) Several commenters asked about procedures and results for ongoing monitoring of surface and groundwater:**

Baseline monitoring of wells, surface waters and groundwater must be a preliminary safeguard established in the permitting process and performed before issuance of a fracking permit. This is a good and necessary scientific process which will establish some track record for the fracking method process and could be an assurance established for those proposing to use the fracking process as a safe method.

I think it is very important to establish a baseline so that the chemical composition of soil and water in the area can be tested and compared.

Test the water quality of all water sources adjacent to and on the property where the Fracking operation is to be performed. This would include creeks, streams, rivers, lakes, underground aquifers, ponds and wells. The test results must be provided to the owners of the well location property, surrounding land owners, TDEC and the local newspapers.

Comment: We agree that a baseline sample of an adjacent landowner's drinking water well is appropriate, and we have provided for this in Rule 0400-52-02-.01 Permit Required. This language will require an applicant to collect and analyze a sample from any drinking wells within a ½ mile radius of any well proposed to be fractured using greater than 200,000 gallons of liquids, if the landowner so requests.

We can find no examples of any states that require pre-, during- and post-drilling monitoring of groundwater and surface waters around all wells. States monitor surface water quality via non-oil and gas related programs. Tennessee's surface water monitoring programs have not shown water bodies to be impaired by hydrocarbons or fracturing chemicals from oil and gas drilling. The state of Texas, for example, has groundwater aquifer monitoring programs, but they are designed to monitor the aquifers as a whole resource, and not targeted at detecting potential contaminants from individual wells.

The concentrations of chemical additives used in large-volume hydraulic fracturing in other parts of the country are low enough that detection of such additives in surface water or groundwater would be unlikely even if a subsurface leak were to occur. In addition, the potential sources to surface and groundwater of petroleum and other chemicals are ubiquitous in a watershed such that tying any 'hit' back to a given well would be problematic. Given the difficulty of achieving any meaningful results from such monitoring, TDEC cannot justify the cost imposed by such requirements.

N. Spacing, Forced Pooling

Comment: **N-1) We received numerous comments to repeal the forced pooling option.**

Response: It was clear that many commenters believed that the force pooling rules are a way for an operator to 'steal' a portion of their mineral rights, or force them to sign an agreement against their will. In reality the force pooling requirement is intended as a protection for the minerals owner when the surrounding mineral owners have leased their property for

development for extraction of oil and gas. If drilling occurs adjacent to your property, this rule prevents them from extracting the resource that you share without paying you for your share.

If a minerals owner desires to lease and permit their minerals and the adjacent minerals owner declines to enter into an agreement, the force pooling option provides an avenue for development. This prevents an adjoining mineral rights owner from "blocking" your ability to drill on your land. To develop a field for oil and gas production the operator (leasor) has to have greater than 50% of the leases to receive a permit to drill; has to go before the oil and gas board to receive approval and meet certain requirements for notification to all affected adjacent mineral owners. The mineral owner who chooses not to sign a lease does not have to, but may be force pooled with their minerals. However, the minerals owner who chooses not to sign can receive more for his produced oil and gas minerals based on current law.

All decisions are based on current spacing requirements for oil and gas wells permitted in the state. Because force pooling requirements are mandated by a statute, any change to this would have to be made by the General Assembly.

Comment: **N-2) I suggest this addition; Special spacing of 5 acres and wells drilled not closer than 466 ft. can be permitted if approved by regulatory authorities.**

Response: This is a former spacing requirement that is no longer considered due to the current geologic information available. However, different spacing requirements can be considered by the board and staff if compelling scientific information is presented for review.

O. Chemical Additives, Waste Water

Comment: **O-1) Where is the list of approved chemical additives that may be used in fracking?**

Response: At this point we have chosen not to promulgate such a list. The EPA is currently studying the issue and is expected to pass down minimum rules for fracturing to the states in the near future. We have elected to wait to see what the EPA does on this issue before we put a list into the rules.

However, the Supervisor does have the authority to consider the chemical additives proposed in a fracturing treatment and request modifications if warranted before issuing a permit.

Comment: **O-2) A commenter wants clarification of dealing with wastewater, there needs to be wording separating water produced during drilling operations that is uncontaminated freshwater and water produced from well treatments or production operations.**

Response: We concur with the commenter and clarification has been added to the regulations to distinguish uncontaminated freshwater and water produced from well treatments or production operations, under subparagraph (2)(f) of Rule 0400-53-03-.02 Environment.

Comment: **O-3) Several commenters wanted clarification of the phrase the actual materials and volumes used to fracture, [and] the amounts and concentrations of any additive used" that is reported on the Well History, example: should it be hand written, Chemical Abstract Number, MSDS, etc.**

Response: We concur with the commenters that the draft rule language was not specific enough. Rule language has been added to address specifically what should be reported on the Well History and on an internet disclosure registry.

Comment: **O-4) Several commenters want protection of trade secrets in respect to additives used in the fracking process.**

Response: Clarification on trade secret protection has been added using wording adapted from the Colorado Oil and Gas regulations for disclosure of chemical additives for a hydraulic fracture.

Comment: **O-5) Several commenters want disclosure of the timing and nature of any chemicals that will be pumped into the ground or disposed of in their communities.**

Response: The rule language specifies that the operator must include as part of their application their plan for disposal of wastewater if they propose to fracture using greater than 200,000 gallons of water-based liquids. This information will also be made part of the public notice for such a fracturing activity. The timing of such disposal is not addressed since the date of disposal will not be known at the time of application and public notice. However, if wastewater were to be disposed of via underground injection well, this activity would be permitted by the Division of Water Resources under UIC regulations, and this information would be available in that permitting process.

P. Tennessee Clean Water Network (TCWN) proposed regulatory language

The Tennessee Clean Water Network submitted suggested regulatory language that will be responded to within the context of the proposed language. The TCWN suggestions are designated by "{ }" at the beginning and end of the proposed language and will underlined if it is to be added and struck through if proposed to be deleted. The Department's response will be designated by "[ ]" at the beginning and end of the response and in bold.

To 0400-51-01-.01:

{( ) "API" shall mean the American Petroleum Institute.}

[This definition will not be needed because the term API will not be utilized in the rule language.]

{( ) "Aquifer" shall mean a geologic formation, portion thereof, or group of formations (including overlying unconsolidated material) which contains and is capable of yielding a sufficient quantity of ground water to serve as a domestic or public water supply or other use.}

[TDEC concurs that a definition is needed. A definition very similar to this one has been added as suggested.]

{( ) "Well Integrity" means the containment of subsurface zone(s) or formation(s) containing hydrocarbons produced into a well, and the containment of that production within the well all the way to the surface for the life of that well.}

[We concur with the need for this definition, and have incorporated it into the rules as requested.]

To 0400-52-02-.01:

{~~1040-02-02-.01~~ 0400-52-02-.01 Permit Required} **[We appreciate the identification of this typo, and have made the correction as suggested.]**

To 0400-52-02-.01(10):

(10) In the case of any well that is proposed to be fractured {~~using a cumulative total of >200,000 gallons of liquids:~~} **[We propose to keep the 200,000 gallon threshold. See TDEC response under Comment A-2) of the Response to Comments document.]**

{(a)} The Supervisor shall give notice to the public by e-mail {to a list of interested persons who have requested TDEC notify them of Oil and Gas permit applications} **[We concur and have added this clause as requested]** and posting on the department web site, and the public shall be allowed to submit comments for {~~15~~ 30} **[We concur. See TDEC response to comment G-1 in the Response to Comments document]** days from the date of notification. Any comments

received shall be considered by the Supervisor, and the Supervisor shall provide written responses to those comments. {~~Prior to Public Notice, the Supervisor may require additional information from the applicant in these cases, including but not limited to information on water sources, fracturing methodologies, and methods of wastewater disposal~~}. **[We believe this clause has definite regulatory value, allowing the Supervisor to take additional review time as needed for fracturing proposals that are new to TN, and using that time to steer the applicant towards safer methods.]**

{(b)} The public notice shall contain the following information:

a. Name, address, and telephone number of the applicant;
b. Name, address, email, and telephone number of TDEC contact person;
c. A brief description of the proposed activity;
d. The purpose of the proposed activity;
e. The location of the well proposed to be fractured;
f. A map of the proposed location including in which watershed the activity would take place and all state waters within a 1 mile radius of the well;
g. Information regarding the sources of water, fracturing methods to be used, and amounts and methods of wastewater disposal
h. The procedure to submit comments on the proposed activity;
i. The procedure for requesting a public hearing; and
j. A brief description of the procedure for the Supervisor to make a final determination of whether to issue the permit.}

[We concur that our draft language was not specific concerning the content of the public notice. Accordingly, we have inserted language under subparagraph (a) of this paragraph that is consistent with TDEC Public Notice rules for NPDES Permits, and very similar to your suggested language above.]

{(c)} The applicant shall provide the Department's public notice of the proposed well to the owners of any residence that have any {~~active domestic~~} **[We concur that our term was awkward, and have adjusted the language to read "drinking water wells'.]** water well{~~s~~} within a ½ mile radius of the proposed wellhead at least 60 days {~~2 weeks~~} **[The commenter provides no justification for such an expanded notification period. We have changed the wording to '14 days', which is consistent with other oil and gas landowner notifications, which have worked well to date.]** prior to the beginning of drilling operations. In the case of a horizontal well, the ½ mile radius shall be measured from the terminus of the horizontal well bore. The determination of the presence of any such domestic wells shall include at a minimum the information available on the Division of Water Supply's Water Log Tracking System {and door-to-door surveys where owner or occupants are contacted in person}. **[The Department has no program currently that requires door-to-door surveys, and we see no no need to implement one in this case.]** The applicant shall collect a sample of any such well at the request of the owner in accordance with the requirements in Rule 0400-52- -.05 Baseline Assessment.} ~~and have the sample analyzed for Total Petroleum Hydrocarbons (TPH), BTEX (benzene/toluene/xylene) and Total Dissolved Solids, to demonstrate the condition of the water well prior to the drilling of the well to be fractured.~~ **[See TDEC response under Baseline Assessment. The intent of the baseline well monitoring was to collect enough water quality indicator information to allow for detection of any significant changes to well quality that could be associated with drilling. If an indicator parameter suggests possible contamination, then the well owner can collect more detailed information as needed. We have, however, added pH, TOC, and chlorides to this list of parameters.]** Sampling results shall be provided to the Supervisor and domestic well owner as soon as results are obtained. Sample analyses shall be conducted by a certified laboratory utilizing standard methods and minimum detection levels consistent with Tennessee Department of Health laboratories.

{(d)} The applicant shall publish a copy of the Department's Public Notice required by subsection (b) above in a newspaper of general circulation local to the proposed well site. The text of the Notice shall be in at least 12 point type. **[We find this proposed requirement to be impractical and of dubious value – many areas where drilling occurs have no local distribution newspaper nearby, and others only publish at infrequent intervals. We believe that the digital public**

notice and notification to adjacent landowners will be adequate.]

{(e)} Permit applicants shall notify the public of the application by posting a sign containing the information in the Public Notice required by subsection (b) above near the point of entrance to the proposed well site and within view (or adjacent to the right shoulder) of a public road. Where possible, the sign must be located so that a vehicle may safely stop to allow the sign to be read and to record information. In any case, the sign must be within ten (10) feet of the nearest edge of the public right of way. The sign must be perpendicular to the road and be readable from either direction. The letter size of the first line, "PUBLIC NOTICE" shall be at least 7 inches high. The remainder of the lettering shall be at least 3" high. Letter width should be at least one-fifth the height of the letter. The typeface shall be sans serif (block type) and one of the following color combinations: black type on yellow background, black on white, yellow on black, or white on blue. The minimum sign size shall be sufficient to allow all required information to be presented in the minimum allowable type size with a boarder of not less than 3 inches around the lettered portion of the sign. The sign shall be maintained for at least thirty (30) days following distribution of the approved Public Notice. The applicant shall provide certification to the Supervisor of compliance with this requirement. **[We believe that a sign posting at the proposed well location is unlikely to be seen by many in the remote areas where most drilling is done. In some cases the point of entrance from the nearest public road will be so far from the actual well site that it may create a false impression about the location. The well location will be indicated in the public notice.]**

{(f)} A copy of the Public Notice shall be sent to any person who specifically requests one. **[The Public Notice is part of the public record. TDEC will of course provide a copy of the public notice to any who request it, but there is no need to state it in rule language.]**

{(g)} By the time of Public Notice issuance the Department will have posted the permit application and draft permit in the Division's existing online permit database. **[Such a requirement would be more appropriate in a TDEC internal procedural document.]**

{(h)} The Supervisor will notify the public of permit issuance or denial through the Division's website and e-mail. All interested parties will be notified directly. Interested parties include anyone who provided written comments during the public comment period or as testimony during a public hearing, water well owners within a ½ mile radius of the wellhead to be fractured, and any other person known by the Division to be directly affected by the permit. **[We concur with the first statement that the Supervisor will notify the public of our decision via the website and e-mail, and have added this clause to subparagraph (b) of this paragraph.]**

To 0400-52-02-.02(5):

(c) If, within ~~ten ({10}~~{60}~~)~~ days after the notice, there are no objections to issuing the permit, then the Supervisor shall issue the permit, provided all other requirements have been complied with. **[The commenter provides no justification for such an extension of the notification. The current 10 day period has functioned without complaint or incident to date.]**

(d) If there is an objection or objections to issuing the permit, the objector or objectors ~~must~~ shall furnish the applicant and the Supervisor the basis of the objection and support his contentions with documents, etc., within ~~ten ({10}~~{60}~~)~~ days after the date of the notice. **[The commenter provides no justification for such an extension of the notification. The current 10 day period has functioned without complaint or incident to date.]**

To 0400-52-04-.01(1):

(a) Wells drilled in search of oil or gas to a depth of less than ~~one thousand (~~1,000~~)~~ feet shall be drilled on {~~10~~} {40} -acre spacing, and shall not be located closer than ~~six hundred sixty (~~660~~)~~ feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than ~~three hundred thirty (~~330~~)~~ feet from any property or unit line. **[The commenter provides no justification for increasing the spacing requirement from 10 acres to 40 acres. The current spacing requirement has worked well to date without incident or complaint. A forty acre spacing could limit the ability of some**

landowners to develop their mineral rights.]

{~~(l) Any drilling being conducted in Overton, Clay, Pickett or Fentress Counties (this is portions of Fentress County that are west of Hwy 127 and North and West of State Hwy 154) is based on 400 feet to another well and 200 feet to the unit or property line down to a depth of 2500 feet. This is an exception to the current state wide drilling requirements.~~} **[We disagree that we have the authority to delete the statutory spacing requirements.]**

To Chapter 0400-52-04:

{NOTE: Specific authority to regulate well spacing is at T.C.A. § 60-1-202(a)(4)(L). Specific authority to delete (1)(l) is at T.C.A. § 60-1-106 and 2010 census data for Overton (22,083), Clay (7,861), Pickett (5,077), and Fentress (17,959) Counties.} **[We disagree that we have the authority to delete the statutory spacing requirements.]**

To Chapter 0400-52-06:

{0400-52-06-.01 General Requirements}
{0400-52-06-.02} Drilling Equipment
{0400-52-06-.03 Well Logging}
{0400-52-06-.04 Cased Hole Logging}
{0400-52-06-.05} Blowout Prevention
{0400-52-06-.06} Casingheads
{0400-52-06-.07} Environmental Protection

{0400-52-06-.01 - General Requirements

Oil and gas wells shall be drilled and completed in a manner that protects the geologic formations and aquifers from material inside the well bore during subsequent drilling operations and, in combination with other steel casing and cement sheaths that are subsequently installed:

1. protects the groundwater with multiple layers of protection for the life of the well;

2. maintains well integrity for the life of a well;

3. ensures that operations proceed within established parameters and in accordance with the well design, well plan, and permit requirements; and

4. includes testing prior to well construction, during well construction, and over the life of a well to ensure its integrity is maintained.}

[This language consists of general statements of intent, but provides no specific regulatory value. However, we have added similar general language under Rule 0400-52-06-.04, as a lead-in to the section on 'Environmental Protection'.]

0400-52-06-.0{2} Drilling Equipment

All drilling equipment shall be designed, constructed, and operated in such a manner so as to prevent accidents and insure safe operating practices. It is recommended that each operator require the drilling contractor to comply with the general rules and safety procedures of the industry.

{0400-52-06-.03 Well Logging

(a) General

Well logs shall be completed to log subsurface conditions noted during drilling and mechanical integrity tests and hydraulic pressure tests shall be used to assess well integrity during the construction of the well.

(b) Open-hole Well Logging

After drilling of the hole is completed, and before casing is installed and cementing operations begin, open hole well logging shall be completed prior to setting casings to: locate and evaluate the hydrocarbon producing formations; achieve the well design objectives; and properly achieve the isolation benefits of the casing and cement. Logging tools shall include one or more of the following log types: Gamma Ray; Resistivity; Density; and/or Caliper.}

[We do not see any value in testing the borehole prior to setting casing and cement.]

{1040-02-06-.04 Cased Hole Logging

After cementing the casing, "cased-hole" logs shall be run inside the casing to know the exact location of the casing, casing collars, and quality of the cement job relative to each other and relative to the subsurface formation locations. These logs shall include the gamma ray, a collar locator, and a cement bond log that measures the presence of cement and the quality of the cement bond or seal between the casing and the formation.}

[We believe that the casing integrity testing and cement documentation that we have proposed under Rule 0400-52-06-.02 Blowout Prevention and Chapter 0400-52-07 Casing Program are adequate to assure isolation of strata. See TDEC response in the Response to Comments document to comment K-2) concerning the use of cement bond logs and well integrity testing.]

0400-52-06-.~~02~~{.05} Blowout Prevention

{(1)} All wells shall be equipped and operated in such a manner as to prevent the uncontrolled emission of oil, gas, and water from the well.

{(2) Any applicant for a permit for a gas well proposed for drilling less than 1,000 feet deep that is proposed within two (2) miles of an outcrop of a gas formation shall survey the outcrop prior to drilling to determine whether there are gas seeps and springs or water seeps that discharge from the gas formation in the area. The potential for a blowout of fracturing fluids and gases shall be addressed in the Drilling Plan submitted during the permit application.}

[This Colorado requirement is intended to prevent fracturing that occurs near the edge of an escarpment from 'blowing out' the side of the hill or mountain in places where the producing formation is elevated enough to be exposed on a hill or mountainside. This language is unnecessary in Tennessee. The elevations and topography of our state are such that none of the formations that would be fractured or otherwise pressurized from the surface are exposed on the side of a mountain or escarpment where a 'blow out' could occur.]

{~~(2)~~(3)} Blowout prevention for regular state spacing requirements for all wells shall be equipped with a minimum of the following equipment:

(a) A blowout prevention system with 2 separate units capable of closing with the drill pipe in the hole or other equivalent control system as approved by the supervisor or authorized representative of the supervisor. A minimum of 3000 psi working pressure is required;

(b) Accessible controls both in the rig and at a safe remote location of at least 50 feet from wellhead;

(c) An annular choke valve;

(d) A drill pipe or power head valve capable of pump truck connection;

(e) A flow line of the proper size and working pressure shall be installed in a straight line to pit and shall be anchored securely; and

(f) Blowout prevention equipment that has a rated minimum working pressure of 3000 psi. In unknown or expected higher pressures a 5000 psi working pressure shall be required.

1. The blowout preventers shall be installed above ground level if possible but if a cellar is dug, the equipment shall be accessible during drilling operations. The entire control

equipment shall be in good working condition at all times. All outlets, fittings, and connections on the casing, blowout preventers, choke manifold, and auxiliary wellhead equipment that may be subjected to wellhead pressure shall be of a material and construction that shall withstand the anticipated pressure and shall be resistant to fire. The lines from outlets on or below the blowout preventers shall be securely installed, anchored, and protected from damage.

2. Blowout preventers, accumulators, and pumps shall be used in accordance with the product manufacturer's rating and minimum operational specifications. The permittee is responsible for seeing that the blowout prevention equipment is in proper working order. This includes the proper operation of the closing unit valving, proper operation of the pressure gauges, and the presence of the manufacturer's recommended accumulator fluids. A combination of any 2 of the following secondary closing systems is acceptable:

   (i) Electric-operated pump.

   (ii) Air-operated pump.

   (iii) Hand-operated pump.

   (iv) Nitrogen-operated pump.

   Blowout preventer rams shall be of a proper size for the drill pipe being used or production casing being run in the well or shall be variable-type rams that are of the proper size range. Blowout Prevention shall be installed before passing through any known production or high pressure zone in the well boring path.

3. Blowout prevention equipment and intermediate casing shall be tested to a pressure of 1,500 psi at surface for not less than 30 minutes. This shall be done prior to drilling the plug on the intermediate casing or at other intervals as approved or requested by the supervisor. If, at the end of 30 minutes, the pressure shows a drop of 10% or more from the original test pressure, the casing shall be condemned until the leak is corrected. A pressure test demonstrating less than a 10% pressure drop after 30 minutes is proof that the condition has been corrected. A record of each test, including test pressures, times, failures, and each mechanical test of the casings, blowout preventers, surface connections, surface fittings, and auxiliary wellhead equipment shall be entered in the logbook, signed by the driller, and kept available for inspection by the supervisor or authorized representative of the supervisor.

4. With the understanding that all permitting procedures have been followed, a well may be deepened to 200' below the bottom of the Chattanooga Shale without initiating other than the usual well control procedures. The casing shall withstand at least 1,500 psi with no more than 10% loss of pressure in 30 minutes.

{(~~3~~)}{(4)} Blowout prevention for wells in accordance with special well spacing requirements as per subparagraph (1)(l) of Rule 0400-52-04-.01. All wells shall be equipped with a minimum of the following equipment:

(a) An annular-type blowout preventer or other equivalent control system as approved by the supervisor or authorized representative of the supervisor;

(b) Accessible controls both on the rig floor and at a safe remote location at least 50 feet from wellhead;

(c) An Annular choke valve;

(d) A drill pipe or power head valve capable of pump truck connection;

(e) A flow line of the proper size and working pressure; and

(f) Blowout prevention equipment that has a rated minimum working pressure of 1500 psi.

1. The Blowout preventers shall be installed above ground level if possible but if a cellar is dug, the equipment shall be accessible during drilling operations. The entire control equipment shall be in good working condition at all times. All outlets, fittings, and connections on the casing, blowout preventers, choke manifold, and auxiliary wellhead equipment that may be subjected to wellhead pressure shall be of a material and construction that shall withstand the anticipated pressure and shall be resistant to fire. The lines from outlets on or below the blowout preventers shall be securely installed, anchored, and protected from damage.

2. Blowout preventers, accumulators, and pumps shall be used in accordance with the product manufacturer's rating and minimum operational specifications. The permittee is responsible for seeing that the blowout prevention equipment is in proper working order. This includes the proper operation of the closing unit valving, proper operation of the pressure gauges, and the presence of the manufacturer's recommended accumulator fluids. Any of the following closing systems is acceptable:

   (i) Electric-operated pump.

   (ii) Air-operated pump.

   (iii) Hand-operated pump.

   (iv) Nitrogen-operated pump.

   Blowout preventer shall be of a proper size for the drill pipe being used or production casing being run.

3. Blowout prevention equipment and Surface casing shall be tested to a pressure of 400 psi at surface for not less than 30 minutes before drilling the plug on the surface casing and at other intervals as approved or requested by the supervisor. If at the end of 30 minutes the pressure shows a drop of 10% or more from the original test pressure, the casing shall be condemned until the leak is corrected. A pressure test demonstrating less than a 10% pressure drop after 30 minutes is proof that the condition has been corrected. A record of each test, including test pressures, times, failures, and each mechanical test of the casings, blowout preventers, surface connections, surface fittings, and auxiliary wellhead equipment shall be entered in the logbook, signed by the driller, and kept available for inspection by the supervisor or authorized representative of the supervisor. If the casing is to be tested at the time of surface casing, cementing 150 psi for a period of ten minutes may be used. The annulus shall be filled with fluid and the plug shall have been landed prior to the test beginning. If a drop of over 10% or more from the original test pressure is found the casing shall be condemned until the leak is corrected. The previous criteria concerning recording of the test shall be followed.

4. The casing shall withstand at least 400 psi with no more than 10% loss of pressure in 30 minutes.

All wells shall be equipped and operated in such a manner as to prevent the uncontrolled emission of oil, gas, and water from the well.

~~1040-02-06-.03~~ 0400-52-06-.03 Casingheads.

All wells shall be equipped with casingheads with a test pressure in conformance with conditions to be anticipated in wells in which they are used. Casinghead body shall be equipped with proper connections and valves accessible to the surface as soon as installed. Reconditioning shall be required on any well leaking gas or oil.

~~1040-02-06-.04~~ 0400-52-06-.04 Environmental Protection.

(1) All oil and gas operations shall be conducted in a manner that ~~will~~ shall prevent or mitigate adverse environmental impacts such as soil erosion and water pollution. All areas disturbed by the operations,

including access roads, shall be reclaimed as prescribed in ~~rule 1040-02-09-.05~~ Rule 0400-52-09-.05. Access roads shall be constructed in such a manner as to reduce erosion to a practical minimum. Sediment ponds, berms, diversion ditches, hay bales, and other measures designed to prevent erosion and discharge from well sites shall be taken to prevent or minimize soil erosion and pollution of surface waters.

{(2) Oil and gas wells shall be drilled and operated in a manner that protects aquifers and surface waters.

(3) Wells shall be designed to ensure the environmentally sound, safe production of hydrocarbons by containing them inside the well, protecting groundwater resources, isolating the productive formations from other formations, and properly executing hydraulic fractures and other stimulation operations. The well design and construction must ensure no leaks occur through or between any casing strings. The fluids produced from the well (oil, water, and gas) must travel directly from the producing zone to the surface inside the well conduit.}

[We concur with this language as a general lead-in to Environmental Protection. Accordingly we have inserted this language as the new paragraph (1) of this rule, and moved the old paragraph (1) to paragraph (2) of this rule.]

{(4) All well designs and well plans shall include contingency plans to mitigate and eliminate the risk of failure due to unplanned events to ensure the protection of people and the environment.}

[We concur with this addition, and have incorporated this language into paragraph (1) of Rule 0400-53-03-.02 Environment.]

{(5) Erosion prevention and sediment controls at all oil and gas operations shall meet or exceed the following requirements:} **[We agree that this is a wording improvement and have made this change as suggested, under paragraph (2) of this rule.]**

(a) The erosion prevention controls shall be designed {and implemented} to minimize the dislodging and suspension of soil in water. Sediment controls shall be designed {and implemented} **[We agree that this is a wording improvement, and have made this change as suggested.]** to retain mobilized sediment on site. {These erosion prevention and sediment controls shall be developed and submitted to the Supervisor in a site-specific Stormwater Prevention and Sediment Control Plan ("SWPPP"), which shall be prepared in accordance with good engineering practices and the latest edition of the Tennessee Erosion and Sediment Control Handbook.} **[We do not intend to require SWPPPs for oil and gas facilities at this time. See TDEC response in the Response to Comments document to comment G-4).]**

(b) All control measures ~~must~~ shall be properly selected, installed, and maintained in accordance with the manufacturer's specifications (where applicable) and standard engineering practices. All control measures selected ~~must~~ shall be able to slow runoff so that rill and gully formation is prevented. When steep slopes and/or fine particle soils are present at the site, additional physical or chemical treatment of storm water runoff may be required. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the operator ~~must~~ shall replace or modify the control for relevant site situations.

(b) If sediment escapes the drilling, production, and or roadway areas, off-site accumulations of sediment that have not reached a stream ~~must~~ shall be removed at a frequency sufficient to minimize offsite impacts. Fugitive sediment that has escaped the drill area and has collected in a drainage ditches or roadways ~~must~~ shall be removed so that it is not subsequently washed into culverts and streams by the next rain and/or so that it does not pose a safety hazard. Permittees shall not initiate remediation/restoration of a stream without consulting the Department first. {Discharged water must not cause an objectionable color contrast with the receiving stream. The storm water discharge must result in no materials in concentrations sufficient to be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.} **[This language is already part of TDEC rules, as part of narrative water quality standards. Any such discharge would be regulated under the TN Water Quality Control Act, and repeating this language in the oil and gas rules is redundant.]**

(d) Sediment shall be removed from sediment traps, silt fences, sedimentation ponds, and other sediment controls as necessary.

(e) Upon attainment of stability, materials used for erosion prevention and sediment control should be removed or otherwise prevented from becoming a pollutant source for storm water discharges.

(f) Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than ~~thirty (30)~~ days prior to grading or earth moving unless the area is seeded and/or mulched or other temporary cover is installed.

(g) Clearing and grubbing ~~must~~ shall be held to the minimum necessary for drilling and or production activities.

(h) Construction ~~must~~ shall be sequenced to minimize the exposure time of graded or denuded areas.

(i) Erosion prevention and sediment control measures ~~must~~ shall be in place and functional before drilling activities begin, and ~~must~~ shall be properly maintained throughout the drilling and production phase.

(j) Permanent stabilization with perennial vegetation (using native herbaceous and woody plants where practicable) or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable.

{~~(3)~~(5)} The operator shall notify the oil and gas inspector at least {14 days ~~24 hours~~} prior to beginning fracturing activities. The operator shall maintain personnel on-site during the fracturing activity and during the back flow period. **[Oil and gas site notifications to the inspectors are consistently either 12 hours or 24 hours, and are intended solely to allow the inspector to be on-site if they choose. This time frame has worked well in the past. Furthermore, the operator will not usually know 14 days in advance the exact day that the fracturing activity will begin.]**

To Chapter 0400-52-07:

{0400-52-07-.01 Casing Program, General Requirements}
{0400-52-07-.02 Casing Program, Prior Approval Required}
{0400-52-07-.03 Cement Selection}
(0400-52-07-.04 Casing Centralizers}
{0400-52-07-.05} Casing Requirements
{0400-52-07-.06} Conductor Pipe
{0400-52-07-.07 Surface Casing Construction}
{0400-52-07-.08 Intermediate Casing Construction}
{0400-52-07-.09} Production Casing
{0400-52-07-.10 Completion Reports}
{0400-52-07-.11} Isolation of Oil, Gas and Fresh-Water bearing Strata, and Potential Minable Coal and Other Mineral Deposits

{0400-52-07-.01 Casing Program, General Requirements

(1) Well Design.

Each well design and construction shall address each casing string used, including conductor, surface, intermediate, and production. Groundwater protection through zone isolation shall be maintained. All casing setting depths shall be determined in advance as part of the Drilling Plan to assure isolation, meet regulatory requirements, achieve a well system with integrity to support the rest of the drilling operation, and contain any pressures that might occur inside the well. The actual length of the casing strings should adjusted as the well is drilled based on measurements and data from the drilling process, including the results of logs, drill cuttings analysis, and analysis of pressures and drilling loads while drilling.

(2) Casing used in oil and gas wells that will be hydraulically fractured shall meet API standards, including

API Spec 5CT - including requirements for compression, tension, collapse, and burst resistance, quality, and consistency. The casing used in a well should be designed to withstand the anticipated hydraulic fracturing pressure, production pressures, corrosive conditions, and other applicable factors. If used or reconditioned casing is installed in a well that will be hydraulically fractured, it should be tested to ensure it meets API performance requirements for new built casing. Casing and coupling threads should meet API standards and specifications to ensure performance, quality, and consistency, including API Spec 5B. If proprietary casing and coupling threads from a specialized supplier are used, these threads must also pass rigorous testing done by the supplier and should adhere to applicable subsets of the API qualification tests.

(3) After the casing has been run into the drilled hole, it shall be cemented in place to provide zonal isolation between different formations (including full isolation of the groundwater) and to provide structural support of the well. Top and bottom rubber wiper plugs shall be used to minimize mixing of cement with drilling fluid while it is being pumped.}

[Much of this language is redundant to that already found in our Casing Program requirements. Paragraphs (1) and (3) of this rule are general statements rather than specific technical requirements, and thus add no regulatory value. Under paragraph (2) of this rule, TDEC would not directly reference API Specs in a rule, since those specs may be revised periodically. For TDEC's response to the universal application of API standards in the rules, see comment C-1) of the Response to Comments document.]

{0400-52-07-.02 Casing Program, Prior Approval Required}

(1) The operator's proposed casing program must be submitted for approval by the Supervisor, on Application for Permit to Drill (Form P-AD-1). If the Supervisor deems the casing program inadequate to protect fresh water zones and potential minable coal and other minerals, etc., he shall prescribe the casing program with which the operator will comply. {~~Unless an exception is granted by the Supervisor,~~} **[We prefer to keep this clause to provide the flexibility to address site-specific circumstances if needed. The commenter will note that there is nothing in this wording that requires the Supervisor to grant an exception.]** Suitable and sufficient surface casing shall be run and cemented to a depth not less than one hundred (100) feet below all fresh water strata encountered in the well and in a manner that will protect such fresh water from contamination resulting from drilling operations. The cement must fill the annular space behind the surface casing from the base thereof to the surface of the ground. If cement returns are not received to the surface, then the annulus must be cemented from the top.

{(2) The Application for Permit to Drill shall include a Drilling Plan for approval by the Supervisor that shall: identify all plugged and abandoned wells within 1,000 feet of any vertical well or 1,000 feet from any horizontal well component; identify all private and public water drinking water aquifer and surface water sources within 2,000 feet of any vertical or horizontal well component; and describe the proposed method for fracturing.} [We believe that these issues are adequately addressed under Rule 0400-52-07-.03 Surface Casing, Rule 0400-52-03-.01 Preparing Plats, and Rule 0400-52-02-.02 Drilling Permit. Plugged and abandoned wells are identified by the Supervisor from our records as part of our review. The commenter provides no justification for increasing the radius for identifying surface water from the current distance of 200 feet to 2000 feet.]

{(3) The Application for Permit to Drill shall include a Waste Control and Disposal Plan that includes a chemical inventory of expected additives and fuels to be used; describes methods and procedures that will be used to control spillage; and describes methods and procedures planned for waste treatment of disposal, including at a minimum drill cuttings and muds, drilling fluids, fracturing fluids, flowback liquids, and downhole equipment contaminated with Technically-Enhanced Naturally-Occurring Radioactive Materials (TENORMs).} **[Most of these items will be required to be part of the Public Notice for any fracture >200,000 gallons of water-based liquids. The requirement for applications to include an action plan containing contingency measures for spills or other releases has been added under 0400-53-03-.02 Environment as per your comment under item (4) under Environmental Protection. The handling of TENORMS has been addressed under 0400-54-01-.03 Proper Disposal of Waste.]**

{(4) The Application for Permit to Drill shall include a Casing and Cementing Plan that discusses the expected casing depths; expected or possible geologic hazards such as caves, faults, and mines; the formations that will be encountered by depth; formations expected to be confining layers of fracturing fluids;

proposed types of cements and additives and their expected amounts; borehole conditioning procedures; locations of centralizers; types of casings; methods for determining depths to aquifers and methods planned for protection; and fracture model height and length geometry.} **[We believe that casing plans are adequately addressed under Rule 0400-52-07-.03 Surface Casing.]**

{(5) The Application for Permit to Drill shall include a Water Use and Supply Plan that discusses where source water will be obtained, the local and regional effects of that withdrawal, and the permitting activities associated with such withdrawal.} **[Source water information and any permitting activities associated with water withdrawals would be required as part of the application and Public Notice for any fractures using >200,000 gallons of water-based liquids. The potential impacts of such a withdrawal would be a necessary part of TDEC's review of an ARAP permit for water withdrawal.]**

{(6) The Supervisor or his representative shall be given notice of cementing of surface casing at least {14 days ~~12 hours~~} prior to conducting such operation. The Supervisor or his representative may witness the cementing operation. Form R-WH1 must be accompanied by a copy of the drilling contractor's or service company's ticket for the work performed. **[The commenter offers no justification for increasing the notification time to the inspector.]**

{0400-52-07-.03 Cement Selection

(1) API Spec 10A and API RP 10B-2 shall be consulted in the selection and use of cementing products. Selected cements, additives, and mixing fluid shall be laboratory tested in advance to ensure they meet the requirements of the well design.

(2) Cement shall be placed completely around the casing and at the proper height above the bottom of the drilled hole (cement top) to achieve successful zone isolation and well integrity.

(3) Cement practices shall be completed to ensure that isolation is achieved. These practices should include, at a minimum:
- (a) Prior to drilling, operators should investigate and review the history of nearby wells for cementing problems encountered, e.g. lost returns, irregular hole erosion, poor hole cleaning, poor cement displacement, etc.
- (b) Computer simulation and other planning should be carried out in order to optimize cement placement procedures.
- (c) Operators should use established, effective drilling practices to achieve a uniform, stable well bore with desired hole geometry.
- (d) Operators should ensure that the drilling fluid selection is appropriate for the designed well and the geologic conditions likely to be encountered.
- (e) Casing hardware, including float equipment, centralizers, cement baskets, wiper plugs (top and bottom), and stage tools should be selected as necessary as part of the well design that will meet the cement design objective and challenges and ensure isolation.
- (f) Casing centralizers should be selected to help center the casing in the hole and provide for good mud removal and cement placement, especially in critical areas, such as casing shoes, production zones, and groundwater aquifers.
- (g) Appropriate cement testing procedures should be properly carried out by the service company personnel.
- (h) Cement slurry design shall include testing to measure the following parameters depending on site-specific geologic conditions:
  - (i) Critical parameters shall include: slurry density, thickening time, fluid loss control, free fluid, compressive strength development, fluid compatibility (cement, mix fluid, mud, spacer).
  - (ii) Secondary Parameters recommended for use as appropriate to address specific well conditions include: sedimentation control, expansion or shrinkage of set cement, static gel strength development, mechanical properties (Young's Modulus, Poisson's Ratio, etc.).
- (i) Cement job design shall include proper cement spacer design and volume.
- (j) The operator shall ensure proper well bore preparation, hole cleaning, and conditioning with wiper trips prior to the cement job.
- (k) Rotation and reciprocation of casing should be considered where appropriate to improve mud removal and cement placement.

(l) Service providers shall ensure proper mixing, blending, and pumping of the cement in the field.

(4) After the cement is set and prior to commencing further drilling or completion operations, the cement surrounding the casing shoe shall have a compressive strength of at least 500 psi and should achieve 1200 psi in 48 hours at bottomhole conditions. Production casing cement shall be tested to ensure it is adequate to withstand the anticipated hydraulic fracturing pressure. In addition, each casing string, except the conductor casing, shall be pressure tested prior to "drill out."}

[Cement requirements are covered under Rule 0400-52-07-.01 Casing Program, and are similar to the language proposed by the commenter.]

{0400-52-07-.04Casing Centralizers

Casing centralizers shall be used in all wells. The casing shall be centralized in the hole in order to ensure it will be completely surrounded or encased by cement during cementing operations and achieve the required isolation. API RP 10D-2 and API TR 10TR4 shall be used to determine the number and placement of centralizers in vertical and deviated well bores and centralizer selection guidelines, respectively.}

[We agree, and have added a version of the above language under item (3) of 0400-52-07-.03 Surface Casing. As previously stated, TDEC will not directly reference an API standard or Spec in the rules, since the API standards will be occasionally revised.]

0400-52-07-{~~.01~~}{.05} Casing Requirements

{(1) Conductor Casing – conductor casing shall be used for the purpose of supporting unconsolidated surface deposits. A conductor casing shall be installed when groundwater is present in unconsolidated sediments overlying the most shallow bedrock formation and shall extend at least 10 feet into competent bedrock. The conductor casing shall be designed and installed to: hold back the unconsolidated surface sediments as the drilling operations proceed; isolate shallow groundwater within unconsolidated sediments; prevent surface water runoff from entering the subsurface boring; prevent shallow groundwater from migrating down the continued borehole once the conductor pipe is set; and protect the subsequent casing strings from corrosion and to structurally support some of the wellhead load.

NOTE: API and preexisting rule moved from proposed 0400-52-07-.02}

[We have added the first sentence in your paragraph (1) above to the beginning of Rule 0400-52-07-.02 Conductor Pipe as suggested. Most of the remaining language consists of defining the purpose of conductor pipe rather than stating regulatory requirements. Conductor casing must be installed whether shallow groundwater is present or not, if needed to keep unconsolidated sediments out of the well bore, but we believe a requirement to extend the conductor casing 10 feet into bedrock in all cases is excessive – the intent is to extend the conductor casing into stable consolidated material.]

(2) Surface Casing - surface casing shall be set at 100 feet below the lowest known fresh water aquifer with class A cement only. The casing used shall have an external collapse pressure rating great enough to handle the hydrostatic pressure of a class A cement from the casing shoe to surface and Internal pressure rating to handle any anticipated down hole pressures. Cement shall have a minimum 500 psi compressive strength and have a minimum 8 hour wait prior to drilling the shoe out. A blowout preventer shall be installed at all times for emergencies, but casing shall not be used as pressure control. Surface casing shall be used to protect fresh water aquifers. No casing shoe shall be drilled until a cement seal has been brought back to the surface and secured between the surface casing and the well bore, preventing any ground water contamination. {The Supervisor or Supervisor's representative shall be given notice of cementing of surface casing at least 14 days prior to conducting such operation.}

[The commenter offers no justification for extending the notification period to the inspector. The current 12 hour notification to the inspector has worked without incident or complaint to date.]

{(3)} Intermediate Casing - an intermediate string of casing shall be set prior to the drilling into any known oil and gas producing zone. Casing shall have a minimum internal pressure rating of 3000 psi. Casing shall be cemented at a minimum of 100 feet into the surface casing. {The Supervisor or Supervisor's representative shall be given notice of cementing of surface casing at least 14 days prior to conducting

such operation.} **[The commenter offers no justification for extending the notification period to the inspector. The current 12 hour notification to the inspector has worked without incident or complaint to date.]** Casing string shall be deep enough to prevent underground blowout from anticipated bottomhole pressures. Casing shall have an external collapse pressure rating to handle cement design from casing shoe to surface. Cement shall have 500 psi compressive strength and have a minimum 12 hour wait prior to drilling the shoe out. All cement and casing designs shall be presented on a specifications sheet with Permit Application for approval. A copy of Cement Tickets shall be kept on location to be viewed by inspector until drill rig is removed. In unknown or over pressured conditions a 5000 psi rating on casing shall apply. A copy of all Cement Tickets shall be attached to the well history tickets and shall include all volumes and pressures of job from start to finish. To insure adequate annular space for cementing, the annular space outside the casing shall be at least as large as follows for the applicable casing size:

Up to 7" Outside Diameter (O.D.) Casing O.D. + 1 1/2"

More than 7" and less than 10 3/4" O.D. Casing O.D. + 2"

More than 10 3/4 "O.D. Casing O.D + 3"

{(4)} In wells with special well spacing requirements (off-Plateau) as per subparagraph (1)(I) of Rule 0400-52-04-.01, all surface casing shall be set 100 feet below the fresh water and use class A cement only. {The Supervisor or the Supervisor's representative shall be given notice of cementing of surface casing at least 14 days prior to conducting such operation.} **[The commenter offers no justification for extending the notification period to the inspector. The current 12 hour notification to the inspector has worked without incident or complaint to date.]** Casing shall have an external collapse pressure rating great enough to handle the hydrostatic pressure of a class A cement from the casing shoe to surface. A Float shoe or Baffle or Guide shoe with Wiper Plug along with annular cement volume plus 35% excess shall be required on all surface casing cement jobs. Cement shall have a minimum 500 psi compressive strength and have a minimum 8 hour wait prior to drilling the shoe out. No casing shoe shall be drilled until a cement seal has been brought back to the surface and secured between the surface casing and the well bore, preventing any ground water contamination. All cement and casing designs shall be presented on a specifications sheet with Permit Application for approval.

~~{(4) Any wells on the Cumberland Plateau drilled to depths above the Chattanooga Shale may be eligible for variances on the previous casing requirements by making a specific request to the Supervisor.}~~

[We prefer to keep this clause in order to provide some flexibility for shallower, lower pressure wells if warranted. The commenter will note that the Supervisor is under no obligation to grant any such variance.]

~~1040-02-07-.01~~ 0400-52-07-.{06} Conductor Pipe

{The surface hole shall be drilled using air, freshwater, or freshwater-based drilling fluid. Oil-based drilling fluids are prohibited. The conductor pipe shall be a steel casing inserted into the hole and cemented in place using proper cementing practices and in accordance with the well design. ~~That pipe ordinarily used for the purpose of supporting unconsolidated surface deposits, is termed conductor pipe. The use and removal of conductor pipe during the drilling of any oil or gas well shall be at the option of the operator. If the conductor pipe is to be pulled it must shall be pulled prior to the cementing of the surface casing.~~} All conductor casing shall have a cement seal at the surface preventing the possibility of any groundwater contamination and shall remain in the well. {~~if not pulled prior to the surface casing cement job. If more than 40 feet of conductor pipe was installed, the conductor pipe may not be pulled.~~} **[Much of this language is redundant to that already found in our Casing Program requirements. In reference to prohibiting oil-based drilling fluids, see our response to comment O-1) in the Response to Comments document.]**

~~1040-02-07-.02~~ 0400-52-07-.{07} Surface Casing {Construction}

(1) ~~{The operator's proposed casing program must shall be submitted, for approval by the Supervisor, on Application for Permit to Drill (Form P-AD-1). If the Supervisor deems the casing program inadequate to protect fresh water zones and potential minable coal and other minerals, etc., he shall prescribe the casing program with which the operator will shall comply. Unless an exception is granted by the~~

~~Supervisor, suitable and sufficient surface casing shall be run and cemented to a depth not less than fifty (50) 100 feet below all fresh water strata encountered in the well and in a manner that will shall protect such fresh water from contamination resulting from drilling operations. The cement must shall fill the annular space behind the surface casing from the base thereof to the surface of the ground. If cement returns are not received to the surface, then the annulus must be cemented from the top.~~ The surface casing shall be designed and installed to isolate groundwater and to contain pressures that might occur in the subsequent drilling process.}

(2) ~~The Supervisor or his representative shall be given notice of cementing of surface casing at least 12 hours prior to conducting such operation. The Supervisor or his representative may witness the cementing operation. Form R-WH1 must shall be accompanied by a copy of the drilling contractor's or service company's ticket for the work performed.~~ The surface casing shall be drilled to a depth based on the deepest groundwater resources depths identified during development of the Drilling Plan and based upon observed depths of groundwater while drilling and reported aquifer elevations of nearby wells. The surface hole shall be drilled using air, freshwater, or freshwater-based drilling fluid. Oil-based drilling fluids are prohibited. Drilling shall move slowly and pause periodically to allow time for groundwater to infiltrate into the borehole to ensure recognition of each groundwater-bearing zone. At a minimum, the surface casing shall be set at least 100 feet below the deepest aquifer encountered while drilling the well.}

(3) ~~A cement basket and centralizer are to be run on the surface casing between the first and second joints of surface casing or as directed by the supervisor.~~ The surface casing shall be cemented from the bottom to the top, completely isolating groundwater aquifers. After the surface casing cement has achieved the appropriate compressive strength and prior to drilling out, the surface casing shall be pressure tested using a casing pressure test. This test shall be conducted at a pressure that will determine if the casing integrity is adequate to meet the well design and construction objectives. In addition, immediately after drilling out of the surface casing plus a short interval of new formation below the surface casing shoe, a formation pressure integrity test (also known as a "shoe test" or "leak-off test") shall be performed. If the test results of the formation pressure integrity test are inadequate, remedial measures shall be undertaken as appropriate.}

{(4) A Cement Bond Log and/or other diagnostic tool(s) shall be completed prior to continuing the boring to determine that cement integrity is adequate to meet the well design and construction objectives.}

{(5) A cement basket shall be run on the surface casing between the first and second joints of surface casing or as directed by the supervisor. Centralizers are required for the entire depth of the surface casing in accordance with the spacing requirements established by the API.}

{0400-52-07-.08 Intermediate Casing Construction}

{Intermediate casing shall be designed and installed to isolate subsurface formations that may cause borehole instability and provide protection from abnormally pressured subsurface formations. The intermediate casing shall be cemented to the surface, and a CBL and/or other diagnostic tool(s) shall be run for the entire length of the casing to determine that the cement integrity is adequate to meet the well design and construction objectives. After the intermediate casing cement has achieved the appropriate compressive strength and prior to drilling out, the intermediate casing shall be pressure tested. This test shall be conducted at a pressure that will determine if the casing integrity is adequate to meet the well design and construction objectives. In addition, immediately after drilling out of the intermediate casing plus a short interval of new formation below the intermediate casing shoe, a formation pressure integrity test (also known as a "shoe test" or "leak-off test") should be performed. If the test results of the formation pressure integrity test are inadequate or indicate a failure, remedial measures shall be undertaken as appropriate. In the case of a failure, remedial cementing operations shall be undertaken as appropriate.}

~~1040-02-07-.03~~ 0400-52-07-.{09} Production Casing, {Vertical Component}

The production, oil, or flow string, is that casing used for the purpose of segregating the zone from which production is obtained and affording a means of communication between such zone and the surface. ~~A description of the work done under this section must rule shall be reported to the Supervisor on Well History, Work Summary, and Completion or Recompletion Report (Form R-WH-I) within sixty (60) days after completion.~~ {After the production hole is drilled and logged, production casing shall be run to the total vertical depth of the well and cemented in place using proper cementing practices to provide zonal isolation between the producing zone

and all other subsurface formations and for pumping the hydraulic fracturing fluids and other stimulation techniques from the surface into the producing formation without affecting any other geologic horizon in the well.}

{At a minimum, tail cement shall be brought at least 500 ft above the highest formation where hydraulic fracturing will be performed. In all cases, the casing shall be cemented to achieve the required subsurface isolation between zones. Prior to perforating and hydraulic fracturing operations, the production casing shall be pressure tested at a pressure that will determine whether casing integrity is adequate to meet the well design and construction objectives. A Cement Bond Log and/or other diagnostic tool(s) shall also be run to determine that the cement integrity is adequate to meet the well design and construction objectives. Remedial cementing operations shall be considered if there is evidence of inadequate cement integrity.}

[We have revised our Casing Program language under 0400-52-07. We believe it is superior in terms of specificity and enforceability to address casing and cementing quality, and operators have used it for a number of years without issues. In reference to prohibiting the use of oil-based drilling fluids, see our response to comment O-1 of the Response to Comments document. In reference to the use of CBLs and other integrity tests, see our response to comment K-2).]

{0400-52-07-.10 Completion Reports}

A description of the work done under this ~~section~~ Chapter shall be reported to the Supervisor on Well History, Work Summary, and Completion or Recompletion Report (Form R-WH-I) within sixty (60) days after completion.

~~1040-02-07-.04~~ 0400-52-07-{.11} Isolation of Oil, Gas and Fresh-Water-Bearing Strata, and Potential Minable Coal and Other Mineral Deposits.

Notwithstanding compliance with the foregoing requirements, all potential minable coal and other minerals ~~must~~ shall be isolated from any possible communication through the annulus with oil-, gas- or water-bearing strata or deposits of other potential minable coal or other minable minerals. Cement bond logs or other integrity tests shall be required on all wells proposed to be fractured and on any wells to be placed into Temporary Abandonment as per Rule 0400-52-09-.06 In order to ascertain whether or not such work has been reasonably performed, the operator may elect to either run a cement bond log, or block squeeze each stratum or zone which is required to be isolated. ~~{If the cement bond log indicates a minimum of twenty-five (25) feet of cement bond above the top and twenty-five (25) feet of bond below the base of each stratum or zone to be isolated, then the provision of this rule shall have been complied with.}~~ **[We believe this minimum standard has utility in making regulatory decisions.]** If such bonding is not shown by the bond log, the Supervisor may require the operator to perform the necessary work to assure the isolation of such above described strata zones.

To 0400-52-08-.04:

~~1040-02-08-.04~~ 0400-52-08-.04 Horizontal Drilling.

{(1) Operators shall minimize the number of vertical wells and pads in favor of centralizing wells on a single pad with multiple horizontal wells from a single surface location, where feasible, to reduce the cumulative surface impact of the development operation. The considerations for setting conductor, surface, intermediate, and production casing strings are the same as those for vertical wells.}

[While this statement explains one of the main advantages to be gained from horizontal vs. vertical wells, TDEC cannot require an operator to drill a horizontal well instead of a vertical one, making this language unenforceable.]

{(2)} Wells drilled by horizontal methods shall comply with the following spacing requirements:

(a) For all oil wells, and for gas wells drilled to the top of the Conasauga Group, the surface trace of that portion of the well bore or any portion of the horizontal drainhole that penetrates the producing formation, including the horizontal drainhole end point, shall not be located closer than ~~three hundred thirty (~~330~~)~~ feet from any property or unit line.

(b) For gas wells drilled below the top of the Conasauga Group, the surface trace of that portion of the well bore or any portion of the horizontal drainhole that penetrates the producing formation, including the horizontal drainhole end point, shall not be located closer than ~~six hundred sixty~~

~~(660)~~ feet from any property or unit line.

(c) Any number of producing formations may be penetrated by lateral drainholes from a single vertical well bore.

(d) All of the producing portion of the well ~~must~~ shall be in compliance with the spacing requirements of this paragraph. The horizontal portion of the well is the formation of record for production.

Proposed new Chapter 0400-52-__:

{Chapter 0400-52-_____
Fracturing

0400-52-_-.01 General
0400-52-_-.02 Water Use and Supply Plan
0400-52-_-.03 Waste Control and Disposal Plan
0400-52-_-.04 Use of Additives
0400-52-_-.05 Baseline Assessment
0400-52-_-.06 "Mini frac" Treatment and Analysis
0400-52-_-.07 Treatment Parameter Monitoring
0400-52-_-.08 Pressure Monitoring
0400-52-_-.09 Tiltmeter and Microseismic Monitoring
0400-52-_-.10 Post-Fracturing Monitoring
0400-52-_-.11 Post-Completion Monitoring

0400-52-_____-.01 General

The well operator or the operator's designated representative shall be on site throughout the hydraulic fracturing process. Prior to beginning the hydraulic fracture treatment, all equipment shall be tested to make sure it is in good operating condition. All high-pressure lines leading from the pump trucks to the wellhead shall be pressure tested to the maximum treating pressure. Any leaks must be eliminated prior to initiation of the hydraulic fracture treatment. Fracturing with oil-based additives of any type is prohibited.

0400-52-_____-.02 Water Use and Supply Plan

Operators of wells that will be fractured shall submit a Water Use and Supply Plan upon submittal of the well Permit Application. The Plan shall address how the operator plans to proactively communicate with local water planning agencies to ensure oil and gas operations do not constrain the resource requirements of local communities and to ensure compliance with all regulatory requirements. The planning effort shall include a review of potential water resources and wastewater management options that could be used to support hydraulic fracturing operations. This review shall address: anticipated volumes of water required for basin-wide fracturing; competing water requirements and constraints such as the location and timing of water withdrawal; water source; water transport; fluid handling and storage requirements; flow back water treatment/disposal options; permitting requirements (including, if applicable, the requirement to obtain an Aquatic Resource Alteration Permit from the Division of Water Pollution Control for withdrawals from surface waters); and potential for water recycling.
If water supplies are to be obtained from surface water sources, operators shall address potential issues associated with the timing and location of withdrawals, including, but not limited to: sensitive watersheds; historical droughts; low flow periods during the year; periods of the year when activities such as irrigation and other community and industrial needs place additional demands on local water availability; potential to maintain a stream's designated uses; potential impacts to downstream wetlands and end-users; potential impacts to fish and wildlife; potential aquifer depletion; and any mitigation measures necessary to prevent transfer of invasive species from one surface water body to another.

If water supplies are to be obtained from groundwater sources, operators shall consider the use of non-potable water where feasible and possible.}

[Source water information and any permitting activities associated with water withdrawals would be required as part of the application and Public Notice for any fractures using >200,000 gallons of water-based liquids. The potential impacts of such a withdrawal would be a necessary part of TDEC's review of an ARAP permit for water withdrawal.]

{0400-52-____-.03 Waste Control and Disposal Plan

The waste management plan to be submitted by the operator shall address management of solid waste and disposal practices for fluids within the hydraulic fracturing program, including planned flowback water characterization and disposition and description of the preferred transport method from the well pad (*i.e.*, truck or piping). Operators shall review and evaluate practices regarding waste management and disposal from the process of hydraulic fracturing, including: the preferred disposition of waste/wastewater (*e.g.*, treatment facility, disposal well, potential reuse, centralized surface impoundment or centralized tank facility); permit requirements; and the location, construction, and operation of proposed centralized flow back impoundments. The waste management plan shall also include the following information: design and capacity of storage impoundments and/or tanks; liners of any impoundment or secondary containment and why the proposed liner is sufficiently capable of containing a release; depths to the uppermost groundwater beneath the site; the number and individual and total capacity of receiving tanks on the well pad for flow back water; planned public access restrictions, including physical barriers and distance to edge of well pad; and placement of liners to prevent possible leakage from such impoundments.

The waste management plan completed by the operators should also include a transportation plan within their hydraulic fracturing program. The transportation component of that plan shall discuss the estimated truck volumes within a basin, designation of appropriate off road parking/staging areas, and approved transportation routes. Measures to reduce or mitigate the impacts of transporting large volumes of fracture fluids should be considered.

Liquid waste disposal shall follow a detailed chain-of-custody from origination to final disposal. Operators should consider options for the recycling of fracture treatment flow back fluid for use in future fracturing operations.

If the operator plans to dispose of any wastewater from the fracturing operations, including flowback, by indirect discharge to an existing wastewater treatment plant, the operator shall ensure that the treatment plant can effectively treat the waste without upsetting their system or causing a problem in the receiving water and comply with all requirements of T.C.A. Title 69 Chapter 3 and TDEC Rules Chapter 1200-4-14 Pretreatment Requirements. Pre-approval by the Division of Water Pollution Control is required prior to discharge of wastewater from fracturing to an existing wastewater treatment plant and the treatment plant sampling requirements modifications to the POTW's permits to ensure water quality standards in receiving waters are maintained at all times.}

[Information on waste disposal will be required and included as part of Public Notice for fractures using >200,000 gallons of water-based liquids, as specified in Rule 0400-52-02-.01(10)(a) Permit Required. Wastewater disposal at NPDES-permitted wastewater treatment plants or underground injection facilities is already regulated under existing rules, as the commenter has indicated.]

{0400-52-__-.04 Use of Additives

Operators shall strive to minimize the use of additives and should assess the feasibility of using more environmentally benign additives. Operators should evaluate potential opportunities for beneficial reuse of flowback and produced fluids from hydraulic fracturing in preference over surface discharge or reinjection.}

[This language states general goals to strive for rather than specific, enforceable requirements, and therefore we see no value as rule language.]

{0400-52-____.05 Baseline Assessment

A well operator who wishes to preserve its defense that the pollution of a private or public water supply existed prior to the drilling or alteration of the well shall conduct baseline monitoring prior to drilling and land alteration at a proposed well site. An operator electing to preserve its defenses that well operations did not contaminate a water supply shall complete baseline monitoring of any water supply within a one-half mile radius of the vertical well and horizontal well component. A copy of the results of the baseline assessment shall be provided to the Supervisor and the landowner or water well owner or operator within 10 business days of receipt of the results. Any test results not received by the Supervisor within 10 business days may not be used to preserve an operator's presumption of innocence should a contamination claim be made after drilling and fracturing operations are completed. Operators of wells that will be fractured should review the available information describing water

quality characteristics (surface and groundwater) in the area and, if necessary, proactively work with state and local regulators to assess the baseline characteristics of local groundwater and surface water bodies.

Once the location for a well has been selected and before it is drilled, water samples from any source of water located within a 1/2-mile radius shall be obtained and tested. Sources of water to be tested include rivers, creeks, lakes, ponds, and water wells. The area of sampling should be based on the anticipated fracture length plus a safety factor.

Operators shall analyze baseline water samples for parameters that are typical in hydraulic fracturing and its additives, which shall include, but not be limited to:

Total Dissolved Solids (TDS)	Total Suspended Solids (TSS)	Chlorides
Carbonates	Bicarbonates	Sulfate
Surfactants	Thermogenic Methane (dissolved)	Biogenic Methane (dissolved)
Barium	Strontium	Arsenic
NORMs	Total Petroleum Hydrocarbons (TPH), Diesel and Gasoline Range Organics	Flow rate (cubic feet per second)
pH (field)	Methane (as a gas)	Iron
Color, Odor, Sediment, and Bubbles Observations	Nitrates and Nitrites	PAHs (polynuclear aromatic hydrocarbons)

Operators should also analyze baseline water for additional parameters depending on site-specific geology and hydrology.}

[While the new rules will offer nearby water well owners the opportunity to have the operator provide a baseline water quality analysis of their well prior to drilling, we do not intend to require extensive groundwater and surface water monitoring around every oil and gas well. See TDEC response to comment M-7.]

{0400-52-_ -.06 "Mini frac" Treatment and Analysis

Prior to beginning a fracturing job, the owner or operator shall complete a diagnostic study, called a mini frac analysis, to determine any needed adjustments to the planned job are made and the results are used to refine computer models.}

[API defines this type of treatment and analysis in their Guidance Document HF1, and states only that sometimes this process is conducted to collect data to refine computer models and gain additional information on conditions that might bear on the fracturing treatment. API does not recommend this practice be done, nor suggest that it be a requirement for all wells. Operators are welcome to avail themselves of these surveys, but we have no justification for requiring them under rule.]

{0400-52-__.07 Treatment Parameter Monitoring

Process monitoring and quality control during the hydraulic fracture treatment is required to monitor for a successful treatment and for protection of the groundwater. Certain parameters shall be continuously monitored. These include surface injection pressure (psi), slurry rate (bpm), proppant concentration (ppa), fluid rate (bpm), and sand or proppant rate (lb/min). The data collected should be used to refine computer models used to plan future hydraulic fracture treatments.}

[During fracturing treatments most operators monitor these parameters, but it is not TDEC's intent to require operators to collect data to "refine computer models used to plan future hydraulic fracture treatments". We would consider that level of information to be better left to industry innovation and on-site best professional judgement, not as regulatory requirements.]

{0400-52-__.08 Pressure Monitoring

Pressure shall be measured at the pump and in the pipe that connects the pump to the wellhead. If the annulus

between the production casing and the intermediate casing has not been cemented to the surface, the pressure in the annular space shall be monitored and controlled. Pressure behavior throughout the hydraulic fracture treatment shall be monitored so that any unexplained deviation from the pretreatment design can be immediately detected and analyzed before operations continue. Pressure exerted on equipment shall not exceed the working pressure rating of the weakest component. The intermediate casing annulus shall be equipped with an appropriately sized and tested relief valve. The relief valve shall be set so that the pressure exerted on the casing does not exceed the working pressure rating of the casing. The flow line from the relief valve shall be secured and diverted to a lined pit or tank.}

[Pressure monitoring of this type is typically conducted during fracturing operations. We concur that this language is appropriate for inclusion for fractures using >200,000 gallons of liquids, and have added this section as suggested under 0400-52-6-.04(4) Environmental Protection.]

{0400-52-_-.09 Tiltmeter and Microseismic Monitoring

Fracture monitoring using microseismic and tiltmeter surveys shall be used on every well to evaluate new techniques, refine the effectiveness of fracturing techniques in new areas, and calibrating hydraulic fracturing computer models. A tiltmeter or a micoseismic mapping shall be used to achieve real time mapping of a hydraulic fracture treatment in progress.}

[The suggested language above is paraphrased from API's guidance on Hydraulic Well Fracturing section 10.4.3, which states that microseismic monitoring and tiltmeter surveys are NOT (emphasis added) used on every well, but are commonly used to evaluate new techniques or the effectiveness of a technique in a new area. While an operator may choose to conduct such surveys when attempting a hydraulic fracture in an area for the first time to assess and modify a fracture method, TDEC will not require such surveys to be conducted on every well, as per API's guidance.]

{0400-52-__-.10 Post-Fracturing Monitoring

Monitoring shall be conducted to determine which perforations accepted proppant and to determine the fracture growth beyond the perforation. Either a tracer test or a temperature log shall be run. Prior to a hydraulic fracturing treatment, the proppant shall be "tagged" with a tracer. After the proppant has been pumped into the formation, a cased-hole log, capable of detecting the tracer, shall be run to further confirm that placement of the proppant was as intended. A temperature log shall be run if a tracer test is not performed.}

[These tests are designed for operators to evaluate the success of their fracturing treatment at each perforation. These tests do not evaluate the areal extent of a given fracture or whether or not the fracture has created a pathway for fracture fluids to migrate to fresh water aquifers. Therefore, such testing does not provide additional environmental protection.]

{0400-52-__.11 Post-Completion Monitoring

Throughout the life of a producing well, conditions shall be monitored on an annual basis to ensure integrity of the well and well equipment. Mechanical integrity pressure monitoring shall be used to determine the mechanical integrity of tubulars and other well equipment when the well is producing and during fracturing operations.

During well fracturing, casing integrity shall be inferred by showing there is no leakage into the "A" annulus (if a frac string is used), or between the "A" annulus and "B" annulus by monitoring these pressures. After fracturing and upon final completion, the tubing/packer integrity shall be demonstrated by showing there is no leakage of injected fluids through the tubing or packer into the "A" annulus causing pressure buildup. Monitoring of these annular pressures is required during production to determine whether there are leaks. Maximum and minimum allowable annular surface pressures should be assigned to all annuli based on the gradient of the fluid in each. These upper and lower limits establish the safe working range of pressures for normal operation in the well's current service and shall constitute "do not exceed" limits.

Wellhead seal tests shall be conducted to test the mechanical integrity of the sealing elements (including valve gates and seats) and determine if they are capable of sealing against well pressure. If non-normal pressures are noted in an annulus, a re-pressure test of the wellhead seal system shall be conducted to determine if the source of communication is in the surface in the wellhead system.

When equipment is removed from a well or depressurized for maintenance, a breakdown or visual inspection shall be conducted to document the condition of the equipment after being in service.}

[We have no basis for requiring annual well integrity testing. The question of whether periodic well integrity testing is appropriate or at what intervals can be addressed in a future rule-making. However, we have added a requirement under Rule 0400-52-09-.06 for well integrity tests to be conducted on wells that have not been tested or produced in the last 15 years if they are proposed to be placed in Temporary Abandonment.]

To 0400-52-09-.05:

~~1040-02-09-.04~~ 0400-52-09-.04 Time Limit For Plugging Wells.

Except as provided in Rule ~~1040-02-09-.06~~ 0400-52-09-.06, all wells drilled for oil and gas and found to be dry holes shall be plugged within {~~one (1) year~~ 6 months} from cessation of drilling. All wells that are non-producing or abandoned shall be plugged within {~~one (1) year~~ 6 months} **[The one year time limit is consistent with other states and with the STRONGER review. The commenter provides no justification for reducing this time limit by half.]** from the date they cease producing ~~twelve (~~12~~)~~ barrels of oil per year or ~~twenty five (~~25~~)~~ mcf of gas per month or are abandoned. Upon written request to the Supervisor showing good cause, an extension of up to ~~ninety (~~90~~)~~ days additional may be granted. No operator or owner shall permit any well drilled for oil, gas, salt water disposal or any other purpose in connection with the production of oil and gas, to remain unplugged after such well is no longer used for the purpose for which it was drilled or converted. Nothing herein shall prevent utilizing a well for the purpose of introducing air, gas, fresh water or other liquid pressure into or upon the producing strata for the purpose of recovering oil and gas. All wells which are neither producing nor plugged ~~must~~ shall comply with shut-in standards of oil and gas wells and shall be cased and capped in such a manner so as to protect all potential oil and/or gas zones, and fresh water in accordance with the requirements of Rule ~~1040-02-09-.06~~ 0400-52-09-.06.

To 0400-52-09-.05(1)(a):

(a) Except for active work areas, the operator shall drain{, remove liners,} **[We concur that synthetic liners should be included in reclamation language. Accordingly we have added the words 'synthetic liners' in this subparagraph in the second sentence of this paragraph, after 'All drilling supplies and equipment.]** sentence and fill all surface pits that are not needed for production purposes, and shall grade and stabilize the well location and location road within ~~thirty (~~30~~)~~ days of the initial disturbance, in order to minimize surface run-off and prevent excessive erosion and sedimentation. All drilling supplies and equipment, **[synthetic liners,]** trash, discarded materials and other refuse not contained and covered in the reclaimed pits shall be removed from the site. Temporary vegetative cover shall then be established on all graded areas.

To 0400-52-09-.05(2)(c):

(c) Establishment of permanent vegetative cover shall conform with the standards set forth in the most recent version of the Tennessee Erosion and Sediment Control Handbook. ~~Suggested seeding mixtures, rates, and dates are shown in the following table:~~

~~Seeding Group~~	~~Rate-Pounds Per Acre~~	~~Rate-Pounds Per 1,000 Square Feet~~	~~Seeding Dates~~
~~For Temporary Cover:~~			
~~cereal wheat or rye (100%)~~	~~20-25~~	~~0.5-0.6~~	~~10/15-11/30~~
~~sudan grass hybrid (100%)~~	~~20~~	~~0.5~~	~~04/15-08/15~~

~~Seeding Group~~	~~Rate-Pounds Per Acre~~	~~Rate-Pounds Per 1,000 Square Feet~~	~~Seeding Dates~~
~~For Permanent Cover:~~			
~~tall fescue (100%)~~	~~30~~	~~0.7~~	~~02/15-04/15~~ ~~08/15-10/15~~

~~tall fescue (90%)~~	~~30~~	~~0.7~~	~~02/15-04/15~~
~~white (ladino) clover (10%)~~	~~3~~	~~0.1~~	~~08/15-10/15~~
~~tall fescue (86%)~~	~~30~~	~~0.7~~	~~02/15-04/15~~
~~crownvetch (14%)~~	~~5~~	~~0.1~~	~~08/15-10/15~~
~~sericea lespedeza (scarified) (60%)~~	~~30~~	~~0.7~~	~~03/01-04/15~~
~~tall fescue (30%)~~	~~15~~	~~0.3~~	~~03/01-04/15~~
~~annual lespedeza (10%)~~	~~5~~	~~0.1~~	~~03/01-04/15~~
~~sericea lespedeza (79%)~~	~~30~~	~~0.7~~	~~03/01-04/15~~
~~weeping lovegrass (8%)~~	~~3~~	~~0.1~~	~~03/01-04/15~~
~~annual lespedeza (13%)~~	~~5~~	~~0.1~~	~~03/01-04/15~~

~~1. Seeding rate should be increased by 20 percent on sites where a seedbed cannot be prepared.~~

~~2. Temporary cover should be disked or mowed before permanent vegetation is established.~~

~~3. Where more than 90 percent of a mixture is composed of tall fescue, annual fertilizing should be done to maintain an adequate cover.~~

~~4. Crown vetch may be used in Middle and East Tennessee and the northern half of West Tennessee, but should not be used on areas that will receive heavy traffic.~~

~~5. Sericea lespedeza and weeping lovegrass are both suitable for sites that are subject to drought.~~

~~6. Disturbed areas on which temporary cover must be established between December 1 and February 15 should be mulched, and then seeded with permanent vegetation as soon as possible.~~

~~(c)~~ The Supervisor may grant exceptions to the requirements of parts (b)1 and 2 of this paragraph when the species are necessary to establish a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved reclamation plan. {~~All items under subparagraph (c)~~ <u>of this paragraph</u> ~~are suggested guideline measures~~.}

[We concur that this sentence is no longer applicable now that subparagraph (c) has been revised. Sentence will be deleted as suggested.]

To 0400-52-09-.06:

~~1040-02-09-.06~~ <u>0400-52-09-.06</u> Temporary Abandonment.

(1) An operator has the opportunity to place any non-producing well into Temporary Abandonment for {~~five (5)~~ <u>2</u>} years if all of the following requirements are fulfilled: **[The 5 year requirement for Temporary Abandonment was passed into rule in late 2011, and is just now being implemented under Notices of Non-Compliance and Orders. TDEC has no justification for reducing the time span at this time, and we would prefer to wait some time to gauge the effectiveness of these new rules before making further changes.]**

(a) The operator shall submit a Temporary Abandonment form for each well to be placed in temporary abandonment. This form can be obtained from Water Pollution Control/Oil and Gas Program.

(b) The operator shall submit a ~~one hundred dollar ($100)~~ fee for each well per year to be placed in temporary abandonment.

(c) Each well shall be capped in such a manner as to have no open casing exposed to the environment (i.e., swedge with locked ball-valve or any other viable protection).

(d) Any well shown on the Annual Well Report that indicates no production ~~must~~ shall be placed in temporary abandonment status or plugged.

(e) All fees received for temporary abandonment ~~will~~ shall be placed in an account that ~~will~~ shall be set aside to be used only for funding the plugging of abandoned oil and gas wells.

{(f) Site stabilization activities are completed within 30 days of cessation of drilling to prevent erosion and protect surface water. Those activities must meet or exceed the minimum standards established in the Tennessee Erosion & and Sediment Control Handbook and those standards established in TDEC Rule 0400-52-09-.05.

(2) The operator shall drain all surface pits, remove liners, and shall grade and stabilize the well location and location road within thirty (30) days of beginning temporary abandonment to minimize surface run-off and prevent excessive erosion and sedimentation. All drilling supplies and equipment, trash, discarded materials and other refuse shall be removed from the site. Temporary vegetative cover shall then be established on all graded areas.

(3) Within ninety (90) days of beginning temporary abandonment, the operator shall remove all production and storage structure, supplies and equipment, any oil, and salt water and debris and shall grade any remaining disturbed areas, including access roads. Permanent vegetative cover shall then be established on all disturbed areas, excluding approved permanent, non-erosive facilities, and access roads. Any access roads necessary for the operator to gain access to the well site to determine the adequacy of the vegetative cover or to perform additional re-vegetation may continue to be used by the operator until all reclamation requirements have been met.}

[Site reclamation requirements under Rule 0400-52-09-.05 Surface Reclamation will apply to Temporary Abandonment well sites also. There is no need to restate the requirements here.]

(4) At the end of the {2 ~~five~~} **[The 5 year requirement for Temporary Abandonment was passed into rule in late 2011, and is just now being implemented under NONCs and Orders. TDEC has no justification for reducing the time span at this time, and we would prefer to wait some time to gage the effectiveness of these new rules before making further changes.]** year Temporary Abandonment period, each well submitted by the operator shall be reviewed by the Department. A determination ~~will~~ shall be made on the validity of keeping the well(s) open. This determination for validity ~~will~~ shall be based on whether the operator has a deliverability test for each gas well or if the well is producing oil. If the staff finds there is no valid reason to keep the wells open, the operator ~~will~~ shall then have {six (6) months ~~two years~~} **[Some operators have a large number of wells that will be affected by the rules on plugging and abandonment just passed in late 2011. To plug all of these wells in 6 months is not possible. We prefer to wait some time to gage the effectiveness of these recent rule changes before making further changes.]** to plug the non-producing well(s).

To Chapter 0400-52-11-.01:

0400-52-11-.01 Prevention of Waste – {Repealed}

~~{1040-02-11-.01 0400-52-11-.01 Prevention of Waste~~

~~If any operator can show to the Supervisor or Oil and Gas Board that the work procedures herein prescribed result in waste, or such operations are unreasonable, the Supervisor may enter such an order, as a special exception to the aforesaid rules and regulations, as will shall prevent such waste or eliminate such unreasonable restraint as may result from the application of the aforesaid rules and regulations to the well or wells of such operators; provided, however, that before any operator shall be allowed the benefit of any order granting an exception as authorized by this chapter, such operator must shall establish that such exception, if granted, will shall not result in waste in the field as a whole or give him an inequitable and unfair advantage over another operator or operators in the field. No special exception will shall be granted except upon written application, fully stating the alleged facts, which shall be the subject of a hearing to be held no earlier than ten (10) days after filing the application. Prior to the hearing upon such application, at least ten (10) days notice thereof shall be given by publication to all operators in the Field. In addition to said notice by publication, the applicant must shall give adjacent operators, where appropriate, at least ten (10) days notice of said hearing by personal service or by~~

~~Registered Mail.~~}

[Although we cannot agree with deletion, we do agree that changes are needed to clarify the procedures to be followed, and have done so. Although it has never been utilized, TDEC recognizes that new technologies can be attempted, and a wide variety of scenarios can be encountered by operators. The Supervisor should retain the discretion to consider unusual circumstances or new, potentially beneficial methods that may not fit cleanly under the current wording of the rules.]

To 0400-53-01-.03:

~~1040-03-01-.03~~ 0400-53-01-.03 {Completion and Disclosure} Report Filing.

The operator shall file a Well History, Work Summary and Completion or Recompletion Report (Form R-WH-1) with the Supervisor {and post the form on the chemical disclosure registry (www.FracFocus.org)} within ~~sixty (60)~~ days after completing, recompleting or working over a well pursuant to producing oil and/or gas. Wells shall be considered completed when they are capable of being turned into the tanks and/or gas transmission or gathering lines. {~~Well History information shall include the actual materials and volumes used to fracture, the amounts and concentrations of any additives used, the amount of wastewater generated, and the method of disposal of wastewater, for the purpose of making this information easily available to the public.~~ The} Well History, Work Summary and Completion or Recompletion Report {shall include:

(i) the operator name;
(ii) the date of the hydraulic fracturing treatment;
(iii) the county in which the well is located;
(iv) the API number for the well;
(v) the well name and number;
(vi) the longitude and latitude of the wellhead;
(vii) the true vertical depth of the well;
(viii) the total volume of water used in the hydraulic fracturing treatment of the well or the type and total volume of the base fluid used in the hydraulic fracturing treatment, if something other than water;
(ix) each hydraulic fracturing additive used in the hydraulic fracturing fluid and the trade name, vendor, and a brief descriptor of the intended use or function of each hydraulic fracturing additive in the hydraulic fracturing fluid;
(x) each chemical intentionally added to the base fluid;
(xi) the maximum concentration, in percent by mass, of each chemical intentionally added to the base fluid; and
(xii) the chemical abstract service number for each chemical intentionally added to the base fluid, if applicable.

A vendor, service provider, or operator is not required to:

(1) disclose chemicals that are not disclosed to it by the manufacturer, vendor, or service provider;
(2) disclose chemicals that were not intentionally added to the hydraulic fracturing fluid; or
(3) disclose chemicals that occur incidentally or are otherwise unintentionally present in trace amounts, may be the incidental result of a chemical reaction or chemical process, or may be constituents of naturally occurring materials that become part of a hydraulic fracturing fluid.}

[We concur in part with the commenter. Both industry and environmental interests expressed a desire for a chemical disclosure registry on a public website such as Fracfocus, and both cited Colorado's regulations as a preferred example. Accordingly we have adapted the Colorado rules to our formatting and imported them into this section as suggested. We are aware that the Colorado rules were the subject of thorough negotiations, and the final product included a process for protecting trade secrets while disclosing the family name of some chemicals. We have also included a version of that provision of the Colorado rules as well. However, as per our original intent, this language will apply only to fractures using >200,000 gallons of water-based liquids.]

To 0400-53-03-.01:

~~1040-03-03-.01~~ 0400-53-03-.01 Safety

(1) Each operator shall so conduct his operations and maintain his equipment as to reduce to a minimum the

danger of explosion, fire, or waste.

(2) All tests for production should be started and completed during daylight hours unless approval is obtained by the Supervisor.

(3) No boiler, open fire, or electric generator shall be operated within ~~one hundred (~~100~~)~~ feet of any producing oil or gas well or oil tank.

(4) Any rubbish, debris, or vegetation that might constitute a fire hazard shall be removed to a distance of at least ~~one hundred (~~100~~)~~ feet from the vicinity of wells to be tested.

(5) All waste shall be disposed of in such a manner as to avoid creating a fire hazard or polluting streams and {~~fresh water strata~~ groundwater}. **[We prefer to keep the existing language to clearly distinguish drinking water quality aquifers from deeper non-potable sources.]**

(6) No test oil, condensate, salt water, or any other fluid substance shall be discharged to or disposed of in any way into any stream, lake, or other body of water, or into any ditch or surface drainage depression leading to any stream, lake, or other body of water, except in compliance with the Water Quality Control Act T.C.A. § 69-3-101 and the regulations of the Water Quality Control Board 1200-04-03.

{(7) No well that will be hydraulically fractured may be drilled within 1,000 feet of any previously abandoned or orphaned well that was not constructed consistent with these rules and not properly abandoned to prevent the upward migration of oil, gas, or fracturing additives through either the inside of the casing or the area outside of the casing to adjoining the geologic formations.} **[The commenter provides no justification for requiring a 1000 foot setback. Under the existing rules in Rule 0400-52-04-.01 Vertical well Spacing, an operator cannot drill closer than 660 feet from an existing oil or gas well.]**

{(8) No well may be drilled within 1,000 feet of any sinkhole in any area designated as "karst" or an "area of high density of karst features" as illustrated on the Geologic Hazards Map of Tennessee, 1977, Environmental Geology Series No. 5, by Robert Miller.} **[See response to Comment F-1.]**

{(9)} All wells shall have the equipment and containers or lined pits necessary to prevent the spillage of oil, condensate, water, or any other fluids or substances produced or used during any production test. The equipment shall be in place prior to the start of the production test, and shall be large enough to contain any plausible spill.

{(10)} All wells shall be cleaned into a pit or tank, located at a distance of at least {~~one hundred (100)~~ 500} feet from any fire hazard or dwellings. **[Commenter provides no rationale for increasing the setback distance by 400 feet. We are aware of no problems with the current setback.]**

(a) If pits are to be used, the sides and bottoms of the pits ~~must~~ shall be lined with {a composite liner system that meets or exceeds the standards given in 0400-53-03-.02 Environment, 2.(h) ~~with heavy gauge seamless plastic sheets~~,} or other artificial liner approved by the Supervisor. **[The language in subparagraph (2)(g) under Environment requires a synthetic liner of at least 10 ml, or a compacted clay liner upon approval by the Supervisor.]**

(b) If it seems likely that a pit will overflow, additional pits must be constructed, or else tanks must be brought in to contain the surplus fluids.

{(11)} No oil or gas well shall be drilled closer than {~~two hundred (200)~~ one thousand (1,000)} feet from a dwelling or closer than ~~one hundred (~~100~~)~~ feet from a public road. **[The commenter offers no justification for such a large increase in the setback distance. To apply such a setback would result in many landowners being unable to develop their mineral rights.]**

(a) That portion of this regulation concerning distance from a dwelling may be waived by the supervisor upon submission of a notarized statement by the dwelling owner agreeing to the well location.

{(12)} No oil or gas well shall be drilled within {~~two hundred (200)~~ one thousand (1,000)} feet of any water well

or surface water body that is used for drinking, {commercial,} irrigation, or livestock {~~that is in active use. This requirement may be waived by the Supervisor upon submission of a notarized statement from the well owner agreeing to the location of the oil or gas well and a plan identifying the additional measures to be taken to prevent pollution of the water well.~~} [The commenter offers no justification for such an increase in the setback distance. Again, this would seriously limit the ability of many landowners to develop their mineral rights. We do not intend to take away landowners rights to allow drilling closer than 200 feet to their own well if they so choose.]

{~~(13)~~} No oil or gas well shall be drilled {within a flood plain or ~~one hundred (100) feet~~ one thousand (1,000) feet} of any stream, lake, or other body of water, so that an undisturbed riparian zone can be maintained, {~~except that this requirement may be waived upon submission of a plan identifying additional measures acceptable to the Supervisor to be taken to prevent pollution of the waters of the State.~~} **[The commenter offers no justification for such an increase in the setback distance. Given the density of jurisdictional streams in east TN geology/topography, this would limit the ability of many landowners to develop the mineral rights on their own property.]**

{~~(14)~~} No oil or gas well shall be drilled within {2,000 ~~330~~} feet of any water body designated {as a State Scenic River, Exceptional Tennessee Water or} an Outstanding National Resource Water (ONRW). **[The commenter provides no justification for such an increase in the setback distance.]**

{~~(15) The siting of wells, pits, or storage facilities in wetlands or in flood-prone areas (as indicated by the observed high water mark) of a stream is prohibited.~~} **[We prefer to keep this clause as proposed. While the siting of wells, etc in wetlands and flood prone areas has not been a problem in TN to date, it allows the Supervisor more latitude to make changes to a site plan to avoid such features if needed.]**

To 0400-53-03-.02(2):

(2) Implement necessary procedures and safeguards during drilling and completion operations to prevent the uncontrolled flow of oil from wells, including, but not limited to:

(a) Follow reasonable procedures such as cleaning and lubricating pipe threads so that pipe can be made up to proper tightness.

(b) Lay flow and test lines on ground or install adequate supports for crossing streams and drainways with the lines.

(c) At truck loading terminals, provide containers to catch unrecoverable oil at the hose connections, and provide proper maintenance of valves and other equipment. Train personnel to take necessary procedures to prevent spillage.

(d) During completion operations, produce and clean wells into tanks instead of pits if at all possible.

(e) At the same time that any pits or other diversion, transport, or storage facilities are constructed at ground level, dikes, diversion ditches, or other structures shall also be constructed to prevent any surface water from entering the pits or other facilities.

(f) Remove oil, salt water, or other fluids from pits as soon as practical after it has accumulated in them, and dispose of it in such a way that none can enter surface water or ground water, or otherwise adversely affect the environment or threaten public health and safety.

(d) All pits or other diversion, transport, or storage facilities shall be constructed so that waste fluids do not discharge from them. There shall be no discharge pipe, overflow weir, trickle tube, or any other device allowing any discharge. The operator is responsible for maintaining adequate storage capacity at all times.

(h) No pit shall be located so that any part of it, including a dike or diversion structure, is within a horizontal distance of ~~one hundred ({100)~~ 1,000} feet of the normal high-water line of any stream or lake. {All pits shall have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent

the liner's rupture or tear. The operator shall construct a temporary pit so that the slopes are no steeper than two horizontal feet to one vertical foot (2H:1V).} All pits shall {~~be lined using a synthetic liner of at least 10 ml thickness~~ have a composite liner system consisting of a welded seam geomembrane liner of at least ~~10 ml~~ 60 mil ~~pi~~ thickness High Density Polyethylene (HDPE) liner and a two (2)-foot compacted layer having a permeability no greater than $1x10^{-7}$ centimeters per second. The geomembrane liner shall be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions. The liner material shall be resistant to ultraviolet light. Liner compatibility shall comply with EPA SW-846 method 9090A.} As an alternative, compacted clay liners or other equivalent measures may be used at the discretion of the Supervisor~~.~~,{as long as the permeability requirement of the composite liner system is met or exceeded.}

{(i) The operator shall minimize liner seams and orient them up and down, not across a slope. The operator shall use factory welded seams where possible. Prior to field seaming, the operator shall overlap liners four to six inches and orient seams parallel to the line of maximum slope, *i.e.*, oriented along, not across, the slope. The operator shall minimize the number of field seams in corners and irregularly shaped areas. Qualified personnel shall perform field seaming. The operator shall weld field liner seams.

(j) The operator shall anchor the edges of all liners in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep.

(k) Pits shall be constructed such that the bottom of the liner will be no closer than ten (10) vertical feet separation between the uppermost groundwater.}

[We concur with several of the above suggestions. Accordingly we have added language to subparagraph (g) of this paragraph that specifies smoothing of the pit to prevent liner damage and a requirement to construct pits above ground if groundwater is near the surface. Liner specifications that are comparable to those used in a Class I landfill are not appropriate for a temporary pit.]

{(l)} Containment at tanks ~~must~~ shall equal at a minimum the storage capacity of ~~one and one half (1.5)~~ 1½ times the capacity of the largest tank in the tank battery.

{(m)} All tanks ~~must~~ shall be maintained to prevent corrosion which can lead to both fluid loss from the vessel and accelerated reduction in its useful life span.

{(n)} To prevent fire hazard, all tank batteries and tanks shall be kept free of brush or overgrowth within the berm surrounding the tank or tanks.

{(o)} Dikes and ditches designated in subparagraphs (e) and (g) of this paragraph should be constructed in a manner to accommodate permanent facilities such as pumping units and flow lines.

{(p)} Provide dikes and/or containment pits at storage tanks upon initial installation where such tanks are so located as to be deemed hazardous. If containment pits are to be used, they should be constructed according to the guidelines set forth in Rule ~~1040-04-01-.07~~ 0400-54-01-.07.

(3) All surface pits ~~must~~ shall be drained of water {, the liner removed,} and back filled with dirt as soon as they are no longer needed for drilling or testing. {Water must be sampled in accordance with the Waste Control and Disposal Plan for constituents of concern, results submitted to the Department for approval, and the disposal method approved by the Department prior to disposal.} **[The removal of synthetic liners has been addressed under Rule 0400-52-09-.05 Surface Reclamation, and this paragraph (3) has been moved to that rule. Disposal of wastewater is already regulated under existing water pollution rules.]**

{(4) Soil sampling must be completed upon closure of any pit or containment area to confirm that no soil contamination has occurred due to unintended leakage. The parameter list for sampling must include

constituents of concern that are representative of the fluids stored. The results of the sampling activities must be provided to the Department and approved prior to closure and stabilization of the closure containment structures.} **[We have clarified that contaminated soils at a wells site must be disposed of in accordance with Solid Waste Management rules – see Rule 0400-54-01-.03 Proper Disposal of Waste.]**

{(5)} Implement prudent production operations to prevent potential oil spills, including, but not limited to:

(a) Connect fill lines to storage tanks so that oil and gas ~~will~~ shall not spray into the atmosphere.

(b) Install "equalizer" lines between adjacent tanks as a safeguard against overflow.

(c) Install oil and gas separators where gas is produced in sufficient quantities to be hazardous.

(d) Pump contaminated unsalable residual oil from storage tanks into an accumulator tank instead of open pits.

(e) Place locks, remove handles, or otherwise secure all valves, so vandals cannot open them to cause spills.

{(6)} The Supervisor should notify all oil industry related companies, including operators, service companies, drilling contractors, and crude oil gatherers and purchasers of their responsibility and liability in regard to oil spills.

To 0400-54-01-.06:

~~1040-04-01-.07~~ 0400-54-01-.06 Containment Pit at Tank Batteries.

A containment pit is required at each permanent oil tank or battery of {tanks ~~located within corporate limits or where such tanks are less than six hundred (600) feet from any highway or inhabited dwelling, or less than one thousand (1,000) feet from any school or church or within one hundred (100) feet of a stream or where such tanks are so located as to be deemed hazardous by the Supervisor.~~} Tanks {~~not falling in the aforementioned categories~~} ~~must~~ shall be surrounded by a retaining wall or suitably ditched to a collecting sump, each of sufficient capacity and construction to contain potential spillage. Tank batteries shall not be located closer than 100 feet from any state highway or county road. **[We concur with this comment. The language above has been deleted as suggested. Containment pits should be required around all tank batteries regardless of location.]**

To 0400-54-01-.12:

~~1040-04-01-.12~~ 0400-54-01-.12 Disposal of Salt Water.

(1) Underground injection is the preferred form of disposal of salt water, provided, however, that such injection is permitted by appropriate State and Federal agencies.

(2) Produced salt water may either be injected into a subsurface formation(s) productive of hydrocarbons, if part of an approved secondary recovery project, into a subsurface formation(s) not productive of hydrocarbons, if through an approved salt water disposal well, or else may be transported off-lease to an authorized salt water disposal facility if prior approval has been granted by the Department.

(3) Produced salt water shall not be put in any unlined pit, pond, lake or depression, or in any other place in a manner that ~~will~~ shall constitute a pollution hazard to the waters of the State including ground water.

{(4) Produced water or fracturing fluids containing chlorides shall not be land applied unless the operator first determines the depth to the uppermost groundwater, the complete list of constituents in the water, and the soil type and its ability to absorb contaminants. Further, the operator shall establish a groundwater monitoring well system capable of determining if the groundwater has been contaminated by land application activities and the rate and direction of groundwater flow. The groundwater monitoring system shall depend on site-specific factors and shall include no less than three (3) groundwater monitoring wells in the uppermost groundwater-bearing zone.} **[Existing rules already prohibit the land application of**

salt water, therefore no monitoring requirement is needed. The words 'or fracturing fluids' have been added to paragraph (4) of this rule.]

{(5)} No salt water **[or fracturing fluids]** shall be discharged to or disposed of at the land surface where it can enter surface water or ground water. Salt water discharged to and temporarily stored in lined pits shall be removed before it can leak into {~~under~~}ground water. **[We prefer to leave the wording as currently written in order avoid excluding interflow water from protection.]**

{(6)} All pits or ditches used for temporary storage or transport of salt water shall be lined with an impermeable {~~man-made~~} liner {in accordance with the liner system and permeability requirements in 0400-53-03-.02 Environment, subparagraph (2)(g).} **[We concur, and will make this change.]**

Addendum to Public Hearing Comments

At the Oil and Gas Board meeting on September 28, 2012, the Board decided to hear oral comments from any members of the public present who wished to speak after the staff presentation on the rule proposal before the board began its deliberations. Twenty-six commenters addressed the Board. Any new comments made at this meeting that were not previously addressed in the Response to Comments document are addressed in this Addendum.

Comments and Responses

Comment: Many commenters asked that the Board take no action on these rule changes to give the public more time to study and comment on this. Some noted that no hearing was held in middle Tennessee.

Response: The Board considered these comments by questioning TDEC staff about the public participation process for this rule-making effort. TDEC summarized this information for the Board and explained that several stakeholders meetings with both industry and environmental groups were held over a year-long process, in addition to following the normal procedures for public notice and comment. Staff noted that the two public hearings on these rules were held in Knoxville as that is closer to the area where most oil and gas drilling is occurring. When the board began its deliberations, it considered first whether to act on the rules. The board voted unanimously to proceed to consider the rules. The board then went through the rules section by section, considering the changes that had been made in response to comments made during the comment period as well as those made at the board meeting. The board made a number of changes in response to the comments as well as a few other changes as noted below.

Comment: Commenters also asked that the Board take no action on these rule changes to let the new Board of Water Quality, Oil and Gas consider the rules.

Response: The Board recognized that the law (Public Chapter 986 of 2012) merging it into the Water Quality Control Board to create the new Board of Water Quality, Oil and Gas was going to take effect on October 1. However, the Board has been aware of the issues involved in this rulemaking for several years. Many comments were made about fracturing during a previous rulemaking by the Board in 2011 and those commenters were informed then that the subject would be addressed in a separate rulemaking. The board has been familiar with the particulars of the proposed rule since it approved starting the formal rulemaking process last spring. Because of the Board's in-depth knowledge of the issues and because there is a need to move ahead with the improvements for environmental protection provided by these rules, the Board voted to proceed.

Comment: There are certain to be spills and releases to the environment from fracturing, and the regulations are inadequate to protect the environment and public health.

Response: There are currently no surface water or groundwater impairments documented in Tennessee from fracturing activities, nor any fracturing-related health issues that we are aware of. Part of the intent of these rule changes is to strengthen the rules in order to prevent such problems from occurring in the future.
New requirements for pits, notification to the Supervisor in the case of a spill, casing, cementing, and blowout prevention requirements are all being added as part of this rulemaking to address these very issues. Although the risk of spills or other releases in any industry or transport system can never be completely eliminated, these provisions are needed and reasonable improvements in the current rules to minimize those risks.

Comment: The rule language is dense and hard for citizens to follow. Commenter doesn't like the sound of the wording "Supervisor's discretion" in the rules.

Response: We recognize that it can be very difficult for the public to read and understand rule language. Unfortunately rule language for an industry like this must often use language that is not only highly technical but also be legally enforceable and as unambiguous as possible. In an effort to make rule-making more understandable, we included an Executive Summary document that explains the nature of the changes and their intent in simpler terms.

The wording "at the Supervisor's discretion" is indeed used in the rules in several sections. Conditions of depth and pressure encountered in a given well can vary considerably, and we think it is necessary to retain some flexibility for regulators and operators to adapt to field conditions. It is not intended as a way around safe drilling practices, and the Supervisor has no obligation to agree to any alternatives methods requested by an applicant.

Comment: Commenter does not like the way the procedures for the Board meeting are organized. Commenter would prefer that TDEC present proposals to the public, while the Board listens from the gallery.

Response: It is the Board that was given the authority and responsibility to adopt rules under Tennessee Code Annotated, Title 60, Chapter 1. It is appropriate for the Board, not the public to be in charge of its meetings. It is also appropriate for the public to be able to attend the meeting. The commenter should note that there is no legal requirement for the Board to allow the public to address them, but the Board consented to hear testimony.

Comment: Commenter suggested that the later portion of a paragraph on page 36 of the rules under 'Intermediate Casing' should be moved to become a separate item (3) under that section. This would have the effect of making the requirements for cement job documentation apply to all kinds of casings, not just intermediate casing.

Response: During deliberations, the Board asked TDEC technical staff about this comment and they confirmed that the suggested change reflected the original intent of the rule. The Board made this change.

Comment: Commenter requested that a clause be added to item (4) on page 57 of the rules under 'Disposal of Salt Water' as follows:

(4) No salt water or fracturing liquids shall be discharged to or disposed of at the land surface where they can enter surface water or groundwater (insert) *unless such discharge is permitted by the appropriate State and Federal agencies.*
Response: The Board considered this comment during deliberation. TDEC technical staff had no objection to this change. This addition merely acknowledges that there are other rules and regulations both State and Federal under which a discharge might be legally permitted. The Board made this change.

Comment: Commenter expressed that a public notice period of 30 days as proposed in these rule changes was atypical, noting that no other states had any public notice or time delay in permitting a well site that was comparable to this time period.

Response: The Board debated this comment during deliberations, and asked several questions of TDEC staff related to the mechanics of the public notice period. After some debate, the Board moved to support the 30 day notice period for fractures more than 200,000 gallons of water-based liquids as proposed, and did not make this change.

Comment: Commenter stated that a consortium of environmental groups had submitted extensive comments, and that TDEC had "ignored virtually all of their comments".

Response: The staff stated in the presentation at the meeting that many of the changes made as a result of public input during the comment period were based on comments from environmental interests. The above Responses to Comments show the same thing. Several of these changes were significant, including specifications for public notice content, increasing the public notice period from 15 to 30 days, chemical disclosure on the Fracfocus website, and pressure monitoring and recording during fracturing.

Comment: Commenter stated that EPA should have a "needs assessment program" to ask why something, like fracturing, is needed at all.

Response: The Board has no authority to make requirements of EPA.

Comment: Commenter requested that the rules be amended so that Tennessee Wildlife Resources Agency (TWRA) would also receive public notice for a well permit in cases where high-quality waters, waters with noted fisheries, or waters containing threatened and endangered species were within a certain distance of the proposed well.

Response: We agree that TWRA should always be included in any public notice from TDEC, regardless of the nature or classification of the waterbodies involved. TWRA is automatically placed on all of TDEC's public notice lists of interested parties. These rules do provide that any interested agencies be given notice of the large volume fractures. Accordingly there is no need to mention TWRA specifically in the rules.

Comment: Commenter requested that adjoining land owners within a 2 mile radius should receive TDEC's public notice.

Response: The Board discussed this comment during deliberations, and moved to add language to the rule to address this comment. The sentence under 0400-52-02-.01 (10)(c)) was amended to read: "The applicant shall provide the Department's public notice of the proposed well to the owners *of any property* or any residence that has any drinking water wells within a ½ mile radius of the proposed wellhead..." Consistent with a change made earlier, in this same subsection, the board changed "domestic well" to "drinking water well."

Comment: Commenter requested that the time period for the applicant to provide the Department's public notice to a drinking water well owner within a ½ mile radius be changed from 14 days to 7 days of the date of the public notice, and that the time period for a drinking well owner to request that the applicant sample his water well be changed from 14 days to 21 days.

Response: The Board debated this comment during deliberations, and asked staff for clarification on the meaning and intent of the rule change as written. One concern was that these time frames were chosen to be sure that they can run concurrently with the 30 days public notice period and the samples be taken prior to drilling to represent a baseline condition. The commenter provided no rationale for changing the proposed time deadlines. After some discussion, the Board did not make a change in response to this comment.

Comment: Commenter expressed concern that the rule changes not be applied retroactively to previously permitting sites, and asked that language be added to the rules to state this.

Response: The Board examined this issue during deliberations. TDEC counsel stated that the general legal interpretation of any rule is that it is not retroactive unless it specifically states that it is, and that it was not TDEC's intent to make these changes retroactive or to interpret the rule changes to be so. Therefore it was not necessary to include a clause in the rules as requested.

Comment: Commenter asked if TDEC has a water well database and if so, was it available for public use on-line.

Response: TDEC staff clarified to the commenter and the Board that TDEC does indeed have a database of drinking water wells, but that this database is not yet available for use on-line. TDEC committed to making this information available on-line in the near future, and also promised to make interim arrangements to allow for identifying water wells in applications if the database has not been made available on-line when these rule changes take effect.

Comment: Commenter requested additional language under 0400-52-09-.06 that would specify some alternative methods of confirming well integrity for wells to be placed in Temporary Abandonment that have not been produced or tested in the last 15 years.

Response: The Board discussed this at some length during deliberations. After some consultation with TDEC technical staff, the Board moved to make a change in response to this comment. The language on page 41 of the rules under 0400-52-09-.06(1)(c), last sentence, was amended to read: "Alternative well integrity confirmation methods, *including annual pressure monitoring at the wellhead*, may be accepted at the discretion of the Supervisor."

Comment: Commenter pointed out that the rule language under Casing Requirements on page 34 sets forth casing and cementing requirements for intermediate casings, even though some shallow Highland Rim wells do not need or commonly utilize intermediate casings.

Response: The Board discussed this comment during deliberations, and moved to make a change in response to this request. TDEC technical staff agreed with the change. The language under 0400-52-07-,01 Casing Requirements, section (2) was amended to read: *"If intermediate casing is used,* the operator shall set an intermediate string of casing prior to the drilling..."

Comment: A board member pointed out that in some vertical wells, packers are appropriately utilized with production casing instead of cementing through the production zone. Requested that language allowing this methodology as an option be added to the rule similar to that allowed under Horizontal Wells.

Response: The Board considered this issue during deliberations TDEC staff had no objection to the change. The rule language under 0400-52-07-.04 Production Casing was amended to read: "If production casing is used in a vertical well, the operator shall cement the production casing at a minimum of 100 feet into the intermediate casing and extend the cementing across the producing formation, *unless the casing is set on a packer or set and cemented above the production zone."*

Comment: Commenter stated that applicants should be required to disclose all information on chemical additives to be used and their concentrations prior to conducting fracturing activities rather than upon well completion, and that this information should be included in the public notice.

Response: The Board debated this comment during deliberations, and asked TDEC staff for more information. Operators do not know with accuracy exactly what additives and in what volumes/concentrations they will use to fracture a given well prior to drilling, and so prior disclosure at the time of public notice could include only rough estimates that are subject to change. This raised the questions of, "If the operator makes a change in their fracturing plan that differs from what was placed on public notice, would the permit have to be re-noticed to the public? If the operator varies in any way in their fracturing process from the projected plans that were noticed, would this constitute a permit violation?" After some discussion, there was no motion made to make a change requiring prior disclosure.

Comment: Commenter expressed concerns that operators would use the trade secret protections in the rules as a way to keep the most toxic of the chemical additives they use hidden from the public.

Response: These rules do not create trade secret protections, they specify a process for how claims of trade secret protection made by an operator will be handled by TDEC in the context of fracturing chemicals. Trade secret protections are established under statutes and case law in this state. Rule 0400-53-01-.03(4) refers to existing statutory provisions allowing for a court action for an injunction or damages as the method to be followed if someone wishes to challenge a claim of trade secret as improper.

Comment: Commenter inquired about the intent of changing "will" or "must" to "shall."
Response: Counsel responded that "shall" is generally understood to mean a mandatory requirement and other terms introduce ambiguity. The Board in its deliberations noted a few places where this had not been done and made the change.

Comment: Commenters and board members noted some typographical errors and suggested some clarifications in wording.

Response: The Board made these corrections.

Comment: Commenters expressed concern about whether the rules would be adequately enforced.

Response: Enforcement is a separate matter than rulemaking and such a comment does not call for a change in the rules.

Comment: One commenter expressed appreciation that TDEC has shared its final proposal on the rules with the public when it was sent to Board members in advance of the meeting and noted that this had not been done in other states when rules on fracturing were adopted.

Response: No response necessary.

Comment: Commenters stated that the majority of comments made during the comment period were against the practice of fracturing.

Response: The Board noted that fracturing in one form or another has been occurring in Tennessee for many decades. The board is aware of the strength of feeling about these rules, but determined that the rules were appropriate to better regulate the practices currently occurring in Tennessee as well as establish requirements applicable to the large volume fracturing that is not yet occurring here.

Regulatory Flexibility Addendum

Pursuant to T.C.A. §§ 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(1) The type or types of small business and an identification and estimate of the number of small businesses subject to the proposed rule that would bear the cost of, or directly benefit from the proposed rule.

There are approximately twenty to twenty five active small businesses of this type in the oil and gas exploration and drilling sector in Tennessee that would be affected by these rule changes.

(2) The projected reporting, recordkeeping, and other administrative costs required for compliance with the proposed rule, including the type of professional skills necessary for preparation of the report or record.

The changes in reporting and record keeping requirements in these rule changes is minimal, and would affect only fracturing jobs using >200,000 gallons of liquids. So far no such fracturing jobs have occurred in the state, and none are expected in the near future.

(3) A statement of the probable effect on impacted small businesses and consumers.

There should be little additional economic costs to small businesses. Requirements for slightly thicker synthetic liners for pits and for containment pits around all tank batteries should add relatively small costs, and these costs are generally passed on to the investors rather than consumers. The new provisions that are being added to the rules for blowout prevention and casing requirements represent codification of existing policies into rule, and therefore do not represent new requirements.

(4) A description of any less burdensome, less intrusive or less costly alternative methods of achieving the purpose and objectives of the proposed rule that may exist, and to what extent the alternative means might be less burdensome to small business.

None. We have endeavored to keep rule changes applicable to current drilling and fracturing methods minimal. Most of the rule changes are targeted at potential future fracturing practices not currently in use in Tennessee.

(5) A comparison of the proposed rule with any federal or state counterparts.

The rules proposed are consistent with federal guidance to the states from Department of Energy, federal Bureau of Land Management regulations, and are adapted from State of Colorado and State of Arkansas oil and gas rules pertaining to fracturing and chemical disclosure. The rules proposed are less burdensome than state rules in OH, WV, NY, TX, OK, and PA, where large water-volume fracturing of deep strata wells is the common practice. This methodology is currently not practiced in Tennessee. The requirement for extending surface casing 100 feet below the lowest fresh water aquifer (changed from 50 feet) is consistent with most other states. In reference to synthetic liners for pits, no other states had a rule requirement for liners less than 10 ml in thickness.

(6) Analysis of the effect of the possible exemption of small businesses from all or any part of the requirements contained in the proposed rule.

Most of the proposed rule changes were targeted towards large-volume water-based fracturing methods that to date have not been practiced in Tennessee. The intent was to have little or no effect on existing businesses and current drilling and fracturing practices. While the proposed rules do not exempt a category of business, most of them apply only to certain fracturing methods not currently in use in the state.

Impact on Local Governments

Pursuant to T.C.A. §§ 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (http://state.tn.us/sos/acts/106/pub/pc1070.pdf) of the 2010 Session of the General Assembly)

The Department does not anticipate an impact on local governments from this rulemaking.

Additional Information Required by Joint Government Operations Committee

All agencies, upon filing a rule, must also submit the following pursuant to T.C.A. § 4-5-226(i)(1).

(A) A brief summary of the rule and a description of all relevant changes in previous regulations effectuated by such rule;

The primary purposes of these rule changes are to address large-volume hydraulic fracturing practices, to incorporate existing casing and blowout prevention policies into the rules, and to update some other specifications for all oil and gas wells including those for siting restrictions, pits, and tanks. The most significant provisions are as follows:

- Adding requirements for public notice and public chemical disclosure registry for water-based fractures using more than 200,000 gallons. Includes trade secret protection process for proprietary chemical information.
- Adding an option for drinking water well owners within a ½ mile radius of a proposed well to request the operator to collect and analyze a sample to establish baseline water quality of the water well prior to drilling. This would only apply if the proposed oil/gas well will be fractured using more than 200,000 gallons of water-based liquids.
- Adding a requirement to monitor well pressures during water-based fracturing treatments using more than 200,000 gallons.
- Adding requirements for operators to notify inspectors at least 24 hours prior to fracturing or other well treatment activities, and to maintain personnel on-site during those activities.
- Additional well siting restrictions, prohibiting well sites in wetlands or flood-prone areas, and increasing the setback from Outstanding National Resource Waters to 330 feet.
- Incorporation of the Division's Casing and Blowout Prevention Policies into rule language, and clarifying revisions to casing and blowout prevention language. This includes minimum standards for integrity testing and documentation of casing and cementing.
- Adding a requirement for well integrity testing for wells that are proposed to be placed into Temporary Abandonment if the well has not been produced or tested in the last 15 years.
- Increasing the standard requirement for surface casing to be extended below aquifers from 50 feet to 100 feet.
- Additional minimum specifications for pits and pit liners, including a minimum standard of 10 mil thickness for synthetic liners and a new section of requirements for pits associated with mud drilling. Includes the requirement for containment pits around all tanks, regardless of location.
- Addition of and revisions to several definitions.
- Moving the rules from Rule Divisions 1040-01 through 1040-08 to Rule Divisions 0400-51 through 0400-58.

(B) A citation to and brief description of any federal law or regulation or any state law or regulation mandating promulgation of such rule or establishing guidelines relevant thereto;

There is no federal law relevant to this program. These rules are adopted pursuant to T.C.A. § 60-1-201 et seq. The Tennessee House of Representatives adopted HR 98 regarding the process for input to the development of these rules, which the Department followed.

(C) Identification of persons, organizations, corporations or governmental entities most directly affected by this rule, and whether those persons, organizations, corporations or governmental entities urge adoption or rejection of this rule;

Oil and gas drillers and associated contractors and operators are most affected by these rule changes and they had no objection to the final version of these rules.

(D) Identification of any opinions of the attorney general and reporter or any judicial ruling that directly relates to the rule;

The Department is not aware of any such opinions or rulings.

(E) An estimate of the probable increase or decrease in state and local government revenues and expenditures, if any, resulting from the promulgation of this rule, and assumptions and reasoning upon which the estimate is based. An agency shall not state that the fiscal impact is minimal if the fiscal impact is more than two percent (2%) of the agency's annual budget or five hundred thousand dollars ($500,000), whichever is less;

These rule changes are expected to be budget-neutral.

(F) Identification of the appropriate agency representative or representatives, possessing substantial knowledge and understanding of the rule;

Michael Burton
Water Pollution Control
6th Floor Annex,
401 Church Street
Nashville, Tennessee 37243-1534
(615) 532-0166 or (615) 532-0455

(G) Identification of the appropriate agency representative or representatives who will explain the rule at a scheduled meeting of the committees;

Alan M. Leiserson
Legal Services Director
Department of Environment and Conservation

(H) Office address, telephone number, and email address of the agency representative or representatives who will explain the rule at a scheduled meeting of the committees; and

Office of General Counsel
Department of Environment and conservation
20th Floor L & C Tower
Nashville, Tennessee 37243-1548
(615) 532-0131
Alan.Leiserson@tn.gov

(I) Any additional information relevant to the rule proposed for continuation that the committee requests.

The Department is not aware of any.

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For Department of State Use Only

Sequence Number: 03-13-13
Rule ID(s): 5398-5457
File Date: 3/20/13
Effective Date: 6/18/13

Rulemaking Hearing Rule(s) Filing Form

Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing. T.C.A. § 4-5-205

Agency/Board/Commission:	Environment and Conservation
Division:	Water Resources
Contact Person:	Michael Burton
Address:	6th Floor, L & C Annex 401 Church Street Nashville, Tennessee
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Email:	Michael.K.Burton@tn.gov

Revision Type (check all that apply):

___ Amendment
X New
X Repeal

Rule(s) Revised (**ALL** chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please enter only **ONE** Rule Number/Rule Title per row)

Chapter Number	**Chapter Title**
0400-51-01	Definitions
Rule Number	**Rule Title**
0400-51-01-.01	Definitions of Terms

Chapter Number	**Chapter Title**
0400-52-01	Bond
Rule Number	**Rule Title**
0400-52-01-.01	Amount of Plugging Bond
0400-52-01-.02	Blanket Plugging Bond
0400-52-01-.03	Reclamation Bond
0400-52-01-.04	Relief of Responsibility
0400-52-01-.05	Execution
0400-52-01-.06	Forfeiture
0400-52-01-.07	Notice of Compliance

Chapter Number	**Chapter Title**
0400-52-02	Permits
Rule Number	**Rule Title**
0400-52-02-.01	Permit Required
0400-52-02-.02	Drilling Permit
0400-52-02-.03	Reserved
0400-52-02-.04	Notification to Plug and Abandon
0400-52-02-.05	Reserved

Chapter Number	Chapter Title
0400-52-03	Well Location Plats
Rule Number	**Rule Title**
0400-52-03-.01	Preparing Plats

Chapter Number	Chapter Title
0400-52-04	Vertical Well Spacing
Rule Number	**Rule Title**
0400-52-04-.01	Vertical Well Spacing

Chapter Number	Chapter Title
0400-52-05	Well Identification
Rule Number	**Rule Title**
0400-52-05-.01	Posting a Sign

Chapter Number	Chapter Title
0400-52-06	Drilling Wells
Rule Number	**Rule Title**
0400-52-06-.01	Drilling Equipment
0400-52-06-.02	Blowout Prevention
0400-52-06-.03	Casingheads
0400-52-06-.04	Environmental Protection

Chapter Number	Chapter Title
0400-52-07	Casing Program
Rule Number	**Rule Title**
0400-52-07-.01	Casing Requirements
0400-52-07-.02	Conductor Pipe
0400-52-07-.03	Surface Casing
0400-52-07-.04	Production Casing
0400-52-07-.05	Isolation of Oil, Gas and Fresh-Water-Bearing Strata, and Potential Minable Coal and Other Mineral Deposits

Chapter Number	Chapter Title
0400-52-08	Directional Drilling
Rule Number	**Rule Title**
0400-52-08-.01	Lateral Deviation
0400-52-08-.02	Inclination Surveys
1040-20-08-.03	Directional Survey
0400-52-08-.04	Horizontal Drilling

Chapter Number	Chapter Title
0400-52-09	Well Plugging and Abandonment
Rule Number	**Rule Title**
0400-52-09-.01	Plugging Wells
0400-52-09-.02	Inspection
0400-52-09-.03	Deliverability Test
0400-52-09-.04	Time Limit for Plugging Wells
0400-52-09-.05	Surface Reclamation
0400-52-09-.06	Temporary Abandonment

Chapter Number	Chapter Title
0400-52-10	Filing of Well Date, Reports and Maps
Rule Number	**Rule Title**
0400-52-10-.01	Information Due Date
0400-52-10-.02	Information Required
0400-52-10-.03	Reserved
0400-52-10-.04	Field Map

0400-52-10-.05	Information Confidential
0400-52-10-.06	Annual Well Report

Chapter Number	Chapter Title
0400-52-11	Exceptions and Hearings
Rule Number	**Rule Title**
0400-52-11-.01	Prevention of Waste

Chapter Number	Chapter Title
0400-52-12	Violations, Penalties, Notice, Hearing
Rule Number	**Rule Title**
0400-52-12-.01	Violations, Penalties, Notice, Hearing
0400-52-12-.02	Red Tagging of Wells

Chapter Number	Chapter Title
0400-53-01	Completion, Recompletion, and Related Downhole Work
Rule Number	**Rule Title**
0400-53-01-.01	Time Limit for Well Completion
0400-53-01-.02	Notification for Re-entry
0400-53-01-.03	Report Filing
0400-53-01-.04	Gas/Oil Ratio Tests
0400-53-01-.05	Reserved
0400-53-01-.06	Gas Composition Analysis for Permit Tests
0400-53-01-.07	Bottomhole Pressure Tests
0400-53-01-.08	Reserved
0400-53-01-.09	Reserved

Chapter Number	Chapter Title
0400-53-02	Tubing and Well Equipment
Rule Number	**Rule Title**
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0400-53-02-.02	Connections
0400-53-02-.03	Separators
0400-53-02-.04	Safety Valves

Chapter Number	Chapter Title
0400-53-03	Prevention of Hazards and Pollution
Rule Number	**Rule Title**
0400-53-03-.01	Safety
0400-53-03-.02	Environment

Chapter Number	Chapter Title
0400-54-01	Pollution and Safety Controls
Rule Number	**Rule Title**
0400-54-01-.01	Operator's Responsibility
0400-54-01-.02	Proper Handling of Drilling Foam
0400-54-01-.03	Proper Disposal of Waste
0400-54-01-.04	Removal of Debris
0400-54-01-.05	Containment Pit and Tank Batteries
0400-54-01-.06	Vents Required
0400-54-01-.07	Improper Loading
0400-54-01-.08	Gathering Lines
0400-54-01-.09	Improper Casing
0400-54-01-.10	Disposal of Salt Water

Chapter Number	Chapter Title
0400-54-02	Procedures and Equipment for Metering, Measuring and Producing Oil Condensate and Gas

Rule Number	Rule Title
0400-54-02-.01	Gas/Oil Ratios Equipment
0400-54-02-.02	Gauging
0400-54-02-.03	Testing
0400-54-02-.04	Improper Transfer
0400-54-02-.05	Lease Tank Outlets
0400-54-02-.06	Bleed-off Lines
0400-54-02-.07	Commingling Prohibited
0400-54-02-.08	Required Test Lines
0400-54-02-.09	Reserved
0400-54-02-.10	Reserved
0400-54-02-.11	Reserved
0400-54-02-.12	Reserved
0400-54-02-.13	Basic Orifice Coefficients
0400-54-02-.14	Pilot Tubes
0400-54-02-.15	Gas Measurements

Chapter Number	Chapter Title
0400-54-03	Requirements for Reporting the Volume and Disposition of Oil and Gas Produced
Rule Number	**Rule Title**
0400-54-03-.01	Time Reports
0400-54-03-.02	Month Defined
0400-54-03-.03	Reserved
0400-54-03-.04	Reserved
0400-54-03-.05	Reporting-Producers
0400-54-03-.06	Monthly Reporting-Transporters
0400-54-03-.07	Reserved
0400-54-03-.08	Report Filing
0400-54-03-.09	Computing Method
0400-54-03-.10	Report Verification
0400-54-03-.11	Monthly Report-Gas
0400-54-03-.12	Monthly Report-Plant
0400-54-03-.13	Report-Gas Gatherers

Chapter Number	Chapter Title
0400-54-04	Ratable Take
Rule Number	**Rule Title**
0400-54-04-.01	Taking Oil and Gas Ratably

Chapter Number	Chapter Title
0400-54-05	Commingling and Automatic Custody Transfer of Hydrocarbons
Rule Number	**Rule Title**
0400-54-05-.01	Permission to Commingle
0400-54-05-.02	Notice Publication
0400-54-05-.03	Granting Permission
0400-54-05-.04	Meter Calibrations
0400-54-05-.05	Operational Limitations
0400-54-05-.06	By-Pass Lines
0400-54-05-.07	Reserved
0400-54-05-.08	Retention of Reports

Chapter Number	Chapter Title
0400-54-06	Limiting Production
Rule Number	**Rule Title**
0400-54-06-.01	Prorating a Pool

Chapter Number	Chapter Title
0400-54-07	Regulating High Gas/Oil Ratio Wells and Preventing Waste of Gas
Rule Number	**Rule Title**
0400-54-07-.01	Classification
0400-54-07-.02	Escaping Gas
0400-54-07-.03	Unitization
0400-54-07-.04	Wells Regulated
0400-54-07-.05	Gas-Lifted Wells
0400-54-07-.06	Application of Rules

Chapter Number	Chapter Title
0400-54-08	Subterranean Gas Storage
Rule Number	**Rule Title**
0400-54-08-.01	Conditioned Usage

Chapter Number	Chapter Title
0400-54-09	Pressure Maintenance Projects and Secondary Recovery
Rule Number	**Rule Title**
0400-54-09-.01	Application
0400-54-09-.02	Administrative Approval
0400-54-09-.03	Approval by Special Order
0400-54-09-.04	Poolwide Unit-Formation
0400-54-09-.05	Casing and Sealing Wells
0400-54-09-.06	Input Well Procedure
0400-54-09-.07	Pro-rata Payment
0400-54-09-.08	Application for Hearing

Chapter Number	Chapter Title
0400-55-01	Unit Operations
Rule Number	**Rule Title**
0400-55-01-.01	Unit Operation
0400-55-01-.02	Drilling and Production Units
0400-55-01-.03	Poolwide Units

Chapter Number	Chapter Title
0400-56-01	Hearings and Administrative Approval
Rule Number	**Rule Title**
0400-56-01-.01	Hearings
0400-56-01-.02	Administrative Approval

Chapter Number	Chapter Title
0400-56-02	Rules of Procedure for Hearing Contested Cases

Chapter Number	Chapter Title
0400-57-01	List of Forms
Rule Number	**Rule Title**
0400-57-01-.01	Report and Permit Forms

Chapter Number	Chapter Title
0400-58-01	Determinations Under Federal Natural Gas Policy Act of 1978
Rule Number	**Rule Title**
0400-58-01-.01	Definitions
0400-58-01-.02	Applicability of Other Rules
0400-58-01-.03	Application and Filing Procedure
0400-58-01-.04	Evidence by Affidavit
0400-58-01-.05	Intervention
0400-58-01-.06	Attesting of Written Orders

0400-58-01-.07	List of Participants
0400-58-01-.08	Forms
0400-58-01-.09	Notice of Determination
0400-58-01-.10	Method of Determinations

Chapter Number	**Chapter Title**
1040-01-01	Definitions
Rule Number	**Rule Title**
1040-01-01-.01	Definitions of Terms

Chapter Number	**Chapter Title**
1040-02-01	Bond
Rule Number	**Rule Title**
1040-02-01-.01	Amount of Plugging Bond
1040-02-01-.02	Blanket Plugging Bond
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(Place substance of rules and other info here. Statutory authority must be given for each rule change. For information on formatting rules go to http://state.tn.us/sos/rules/1360/1360.htm)

Repeals

Chapter 1040-01-01 through 1040-08-01
Rules of the Tennessee Oil and Gas Board

Chapters 1040-01-01 Definitions, 1040-02-01 Bond, 1040-02-02 Permits, 1040-02-03 Well Location Plats, 1040-02-04 Vertical Well Spacing, 1040-02-05 Well Identification, 1040-02-06 Drilling Wells, 1040-02-07 Casting Program, 1040-02-08 Directional Drilling, 1040-02-09 Well Plugging and Abandonment, 1040-02-10 Filing of Well Date, Reports and Maps, 1040-02-11 Exceptions and Hearings, 1040-02-12 Violations – Penalties – Notice – Hearing, 1040-03-01 Completion, Recompletion, and Related Downhole Work, 1040-03-02 Tubing and Well Equipment, 1040-03-03 Prevention of Hazards and Pollution, 1040-04-01 Pollution and Safety Controls, 1040-04-02 Procedures and Equipment for Metering, Measuring and Producing Oil Condensate and Gas, 1040-04-03 Requirements for Reporting the Volume and Disposition of Oil and Gas Produced, 1040-04-04 Ratable Take, 1040-04-05 Commingling and Automatic Custody Transfer of Hydrocarbons, 1040-04-06 Limiting Production, 1040-04-07 Regulating High Gas\Oil Ratio Wells and Preventing Waste of Gas, 1040-04-08 Subterranean Gas Storage, 1040-04-09 Pressure Maintenance Projects and Secondary Recovery, 1040-05-01 Unit Operations, 1040-06-01 Hearings and Administrative Approval, 1040-06-02 Rules of Procedure for Hearing Contested Cases, 1040-07-01 List of Forms, and 1040-08-01 Determining Under Federal Natural Gas Policy Act of 1978 are repealed.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

New Rules

Chapter 0400-51-01
Definitions

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0400-51-01-.01 Definitions of Terms

0400-51-01-.01 Definitions of Terms

For the purpose of rules contained in Divisions 0400-51 through 0400-58 the terms set out herein shall have the meaning indicated.

(1) "Abandoned well" shall mean either of the following:

(a) A well that was not adequately plugged or closed at conclusion of operations such that it constitutes or may constitute a threat to public health or the environment; or

(b) A well that has no owner, operator or other responsible person (hereinafter called "responsible party") who can be located, or such responsible party has failed or refused to undertake actions, where required by law, to abate the threat.

(2) "Access Road" shall mean any road built and used exclusively by the operator (except public roads) which provides access to and/or ends at a wellhead, tank, pit or other facility related to oil and gas exploration and/or production.

(3) "Active Work Area" as it pertains to a well site, shall mean that portion of the initially disturbed area necessary for production-related equipment, materials, and facilities, as determined by the supervisor.

(4) "Aquifer shall mean a geologic formation or portion thereof which contains and is capable of yielding a sufficient quantity of groundwater to serve as a domestic or public water supply or other use.

(5) "Automatic Custody Transfer" shall mean that the liquid hydrocarbons is automatically measured as it is transferred from the producer to the carrier.

(6) "Barrel (or, Barrel of Oil or Condensate)" shall mean the amount of 42 standard United States liquid measure gallons of 231 cubic inches per gallon, computed at a temperature of 60 degrees Fahrenheit.

(7) "Base Fluid" shall mean the continuous phase fluid type, such as water or nitrogen gas, used in a hydraulic fracturing treatment.

(8) "Blooey Line" shall mean the discharge pipe from a well drilled by air drilling. The blooey line is used to conduct the air or gas used for circulation away from the rig to reduce the fire hazard as well as to transport the cuttings a suitable distance from the well.

(9) "Blow-Out" shall mean an uncontrolled escape of oil, gas and/or water from the well.

(10) "Blow-Out Preventer" shall mean a properly selected casinghead control fitted with special gates or discs which may be closed around the drill pipe, or which completely closes the top of the casing if the pipe or tools are withdrawn.

(11) "Board" shall mean the State Board of Water Quality, Oil and Gas as authorized and created by Title 69, Chapter 3, Tennessee Code Annotated.

(12) "Bonding Agent" shall mean any entity that issues a bond for an operator to submit to the state to assure the plugging of a well or reclamation of a well site.

(13) "Bottomhole Pressure" shall mean the pressure in pounds per square inch of an oil and/or gas well determined at the face of the producing horizon by means of a pressure-recording instrument, adopted and recognized by the oil and gas industry.

(14) "Brush and Rock Plug" shall mean an obstruction, made of wood and stone, and placed in the well bore to form an effective base for plugging material.

(15) "Casing Pressure" shall mean the pressure built up between the casing and the tubing when the casing and tubing are packed off at the top of the well.

(16) "Casinghead Gas" shall mean any gas or vapor, or both, indigenous to an oil stratum and produced from such stratum with oil. It shall be treated as gas, if sold, for the purpose of paying privilege tax.

(17) "Chemical(s)" shall mean any element, chemical compound, or mixture of elements and compounds that has its own specific name or identity such as a chemical abstract service number.

(18) "Chemical Abstracts Service" shall mean the division of the American Chemical Society that is the globally recognized authority for information on chemical substances.

(19) "Chemical Abstracts Service Number or CAS Number" shall mean the unique identification number assigned to a chemical by the Chemical Abstracts Service.

(20) "Chemical Disclosure Registry" shall mean the chemical registry website known as fracfocus.org developed by the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission. If such website becomes permanently inoperable, then chemical disclosure registry shall mean another publicly accessible information website that is designated by the Supervisor.

(21) "Chemical Family" shall mean a group of chemicals that share similar chemical properties and have a common general name.

(22) "Christmas Tree" shall mean an assembly of valves and fittings at the head of the casing of a well to control the flow. Also spoken of as "wellhead connections".

(23) "Circulation" shall mean the passing of approved fluid down through the drill stem and up to the surface, in the process of rotary drilling or in setting casing.

(24) "Common Source of Supply" shall comprise and include the area, which is underlain or that, from geological or other scientific data or from drilling operations or other evidence, appears to be underlain by a common accumulation of oil or gas or both; provided, that if any such area is underlain or appears from geologic or other scientific data or from drilling operations or other evidence to be underlain by more than one common accumulation of oil or gas, or both, separated from each other by strata of earth and not connected with each other, then such area, as to each said common accumulation of oil or gas, or both, shall be deemed a separate common source of supply.

(25) "Condensate" shall mean liquid hydrocarbons that were in the gaseous phase in the reservoir at initial reservoir condition. It shall be treated as oil for the purpose of paying privilege tax.

(26) "Conductor Pipe" or "Conductor Casing" shall mean the short string of casing that is not cemented in place and serves primarily to keep the top of the well bore open in unconsolidated material.

(27) "Conservation" shall mean conserving, preserving, guarding, or protecting the oil and gas resources of the State by obtaining the maximum efficiency with minimum waste in the production, transportation, processing, refining, treating, and marketing of the un-renewable oil and gas resources of the State.

(28) "Correlative Rights" shall mean that action or regulation by the Board, which affords a reasonable opportunity to each person entitled thereto to recover or receive the oil and/or gas under his tract or tracts without being required to drill unnecessary wells or incur other unnecessary expense to recover or receive such oil or gas or its equivalent.

(29) "Cubic Foot of Gas" shall mean the volume of gas contained in one cubic foot of space at a standard pressure base of 14.73 psi and a temperature base of 60 degrees Fahrenheit.

(30) "Department" shall mean the Tennessee Department of Environment and Conservation.

(31) "Developed Area" shall mean acreage assigned by the Board to a drilling or production unit on which a well has been completed that is capable of producing oil or gas.

(32) "Directional Drilling" shall mean the drilling of a well that deviated from the vertical by more than 5 degrees.

(33) "Disposal Well" shall mean a well drilled or converted for subsurface disposal of waste products or brine, and its related surface facilities.

(34) "Drilling Mud" shall mean any approved mixture of water and clay or other material as the term is commonly used in the industry.

(35) "Dry Hole or Dry Well" shall mean a well found incapable of producing either oil or gas in sufficient quantities to justify completion or continued production.

(36) "Equitable Share of the Production" shall mean, as to each person, that part of the authorized production from the pool that is substantial in the proportion that the amount of recoverable oil and gas, or both, in the developed area of his tracts in the pool bears to the recoverable oil or gas, or both, in the total of the developed area in the pool.

(37) "Exploitation Well" shall mean a well drilled or to be drilled to one or more pools of oil and/or gas with reasonable assurance of obtaining commercial production.

(38) "Exploration Well" shall mean a well drilled in unproven or semi proven territory for the purpose of ascertaining the presence of commercial oil and/or gas accumulations.

(39) "Field" shall mean the general area which is underlain or appears to be underlain by at least one pool and including the pool or pools beneath the area.

(40) "Flow Lines" shall mean the pipes that carry the fluids or gas from a wellhead to storage or processing equipment located at or near the well site.

(41) "Forced-change of operator" shall mean any oil or gas well being taken over by a new operator without the signatures from the original permittee or previous operator of record.

(42) "Fracturing" or "to fracture" shall mean the process of pumping fluids, gas or other substances with or without a proppant down a well under pressure expressly designed to initiate and propagate fractures or fracture networks in the target producing formation to facilitate oil or gas extraction.

(43) "Gas" shall mean all natural gas and all other fluid hydrocarbons not defined as oil, including condensate because it originally was in a gaseous phase in the reservoir, but excluding helium and other rare gases.

(44) "Gas/Oil Ratio (GOR)" shall mean the portion of a well bore drilled laterally into a common source of supply for production or injection purposes.

(45) "Gathering Line" means a pipeline that transports gas or oil from a well or current production facility to a transmission line, main meter, compressor station, or tank battery.

(46) "Health Professional" shall mean a physician, physician assistant, nurse practitioner, registered nurse, or emergency medical technician licensed by the State of Tennessee.

(47) "Horizontal Drainhole" shall mean the portion of a well bore drilled laterally into a common source of supply for production or injection purposes.

(48) "Horizontal Drainhole End Point" shall mean the terminus of a horizontal drainhole.

(49) "Horizontal (Lateral) Drilling" shall mean controlled directional drilling of wells with lateral penetration through productive reservoirs.

(50) "Hydraulic Fracturing Additive" shall mean any chemical substance or combination of substances, including any chemicals and proppants, which is intentionally added to a base fluid for puposes of preparing a hydraulic fracturing fluid for treatment of a well.

(51) "Hydraulic Fracturing Fluid" shall mean the fluid, including the applicable base fluid and all hydraulic fracturing additives, used to perform a hydraulic fracturing treatment.

(52) "Illegal Gas" shall mean gas that has been produced, transported, or sold in violation of any rule, regulation, or order of the Board.

(53) "Illegal Oil" shall mean oil that has been produced, transported, or sold in violation of any rule, regulation, or order of the Board.

(54) "Illegal Product" shall mean any product derived in whole or in part from illegal oil or illegal gas.

(55) "Interested Party" shall mean any person who owns an interest within the area of, or proximate to, the tracts directly affected by the permit application.

(56) "Intermediate Casing" shall mean the string of casing set with cement after the surface casing and before the production casing that is used in the well bore to isolate, stabilize, or provide well control.

(57) "Lease Tank" shall mean the tank or other receptacle into which the oil is produced either directly from a well or from a well through gas separator, gun barrel, or similar equipment.

(58) "Market Demand" shall mean the amount of oil reasonably needed for current consumption, use, storage, or working stocks, within and without the State, or the amount of gas of any type reasonably needed for current consumption, use, or storage, within and without the State.

(59) "Mechanical Plug" shall mean a manufactured device to seal the well bore or inside diameter of casing.

(60) "Multiple Completion" shall mean the completion of any well so as to permit simultaneous production from two or more common sources of supply with such common sources of supply completely segregated.

(61) "Neet Cement" shall mean a complex, finely ground, kiln-fired calcium carbonate silicate which, when mixed with water, forms a slurry that will harden in the well bore and casing and effectively seal formations penetrated by the well bore.

(62) "Nomination" shall mean the amount of oil or gas for which a purchaser has a definite and bona fide need during a given period.

(63) "Non-producing well" shall mean any well shown on the Annual Well Report (Form CN-1272) that indicates production of 12 barrels or less of oil per year or 25 mcf or less of gas per month.

(64) "Oil" shall mean crude petroleum that was originally in an oil phase in the reservoir.

(65) "Operator" shall mean the person to whom the drilling permit has been issued, whether owner or not, supervising or responsible for drilling, operating, repairing, abandoning or plugging of wells subject to this act.

(66) "Organization Report" shall mean the form (CN-0219) required by Rule 0400-52-02-.01 to be submitted with a permit application that names the responsible parties for the well.

(67) "Owner" shall mean the person who has the right to drill into and to produce from any pool, and to appropriate the production for himself or others.

(68) "Person" shall mean any natural person, corporation, association, partnership, receiver, trustee, guardian, executor, administrator, fiduciary, or representative of any kind, and includes any government or political subdivision or any agency thereof.

(69) "Pool" shall mean an underground reservoir containing a common accumulation of crude petroleum oil or natural gas or both. Each zone of the general structure which is completely separated from any other zone in the structure is covered by the term "pool" as used therein.

(70) "Pooled Unit" shall mean two or more tracts of land, of which their ownership may be different, that are consolidated and operated as a single tract for production of oil and/or gas, either by voluntary agreement between the owners thereof, or by exercising of the authority of the Board under the statute. When such tracts are consolidated by Board authority, the size of the consolidation tract shall not exceed the size, with permitted tolerance, of a "Drilling Unit" as herein defined. In no such case is there any actual change in the title or ownership of the original tracts.

(71) "Pollution" shall mean damage or injury from the loss, escape or unapproved disposal of any substance at any well or structure installation subject to these rules.

(72) "Pollution Control Structures" shall mean structures designed to prevent pollution, including but not limited to, berms, dikes, diversion drainage ditches, hay bales, pits, or tanks.

(73) "Producer" shall mean the owner or operator of a well or wells capable of producing oil or gas, or both, in paying quantities.

(74) "Producing Formation" shall mean a formation from which oil or gas is being or has been produced. In the context of plugging operations, producing formation shall mean a formation from which oil or gas has been produced in the general vicinity of a well to be plugged.

(75) "Producing Well" shall mean any well that produces quantities greater than 12 barrels of oil per year or 25 mcf of gas per month.

(76) "Product" shall mean any commodity made from oil or gas.

(77) "Production Casing" shall mean the string of casing that is run for the purpose of confining or producing hydrocarbons and associated fluids from one or more producing formations.

(78) "Production Unit or Proration Unit" shall mean a drilling unit on which a well producing oil and/or gas has

been completed, and which is recognized as such for the purpose of production by the Board.

(79) "Property Line" as used herein shall mean the boundary dividing tracts on which mineral rights, royalty, or leases are separately owned except that where conventional units shall have been created for the drilling of the well, the boundaries of the unit shall be considered the "property line".

(80) "Proppant" shall mean sand or any natural or man-made material that is used in a fracturing treatment to prop open the artificially created or enhanced fractures.

(81) "Purchaser" shall mean any person who directly or indirectly purchases, transports, takes, or otherwise removes production to his account from a well, lease, or common source of supply.

(82) "Reclamation" shall mean the regrading of all surface disturbed areas associated with oil and gas operations except water areas, replacement of the topsoil or substitution with suitable topsoil material, application of suitable mulch and soil nutrients where necessary, and the establishment of a vegetative cover that is in accordance with acceptable standards as set forth in the rules and regulations of the Board.

(83) "Represented Party" shall mean any person who is known to the applicant, after diligent search, to own an interest within the area of, or proximate to, the tracts directly affected by the application and who is also known to have either a consultant or attorney representing him in conservation matters.

(84) "Salt Water" shall mean water, commonly referred to as oil field brine, which is produced in association with oil and/or gas and which is generally considered unsuitable for human consumption or for irrigation because of its high content of dissolved solids.

(85) "Separator" shall mean an apparatus for separating oil, gas, water, etc., with relative efficiency, as it is produced.

(86) "Shut-In Pressure" shall mean the pressure noted at the wellhead when the well is completely shut-in. Not to be confused with bottomhole pressure.

(87) "Stripper Well" shall have the ordinary meaning as that term is generally understood in the oil and gas industry (well capable of producing 10 barrels or less per day).

(88) "Substitute Unit Well" shall mean any well already drilled to, or to be drilled to, completed or recompleted in the unitized reservoir which in the interest of good conservation practices should be designed to take the place of and become the unit well as determined by special order.

(89) "Supervisor" shall mean the State Oil and Gas Supervisor as designated by the Commissioner of Environment and Conservation.

(90) "Surface Casing" shall mean the string of casing set with cement to prevent contamination of groundwater from drilling fluids and water or hydrocarbons from producing formations.

(91) "Total Water Volume" shall mean the total quantity of water from all sources used in a hydraulic fracturing treatment, including surface water, ground water, produced water or recycled water.

(92) "Trade Secret" shall have the meaning set forth in T.C.A. § 47-25-1702(4) of the Tennessee Uniform Trade Secrets Act.

(93) "Transmission Line" means a pipeline, other than a gathering line, that transports gas from a gathering line or storage facility to a gas distribution center or storage facility.

(94) "Transporter" shall mean every person engaged in the transportation of oil or gas from tanks or other receptacles located at the place of production in this State.

(95) "Tubingless Completion" shall mean the completion of any well so as to permit the passage of production from one separate underground source through one production casing set in the well.

(96) "Waste" in addition to its ordinary meaning, shall mean "physical waste" as that term is generally understood in the oil and gas industry. It shall include: (1) underground waste and inefficient, excessive, or improper use or dissipation of reservoir energy, including gas energy and water drive, of any pool; and the locating, spacing, drilling, equipping, operating, or producing of any oil well or gas well in a manner which results, or tends to result, in reducing the quantity of oil or gas ultimately recoverable from any pool; and (2) surface waste and the inefficient storing of oil and the locating, spacing, drilling, equipping, operating, or producing of oil wells or gas wells in a manner causing or tending to cause unnecessary or excessive surface loss or destruction of oil or gas.

(97) "Well Cuttings" shall mean rock samples obtained from rotary or cable tool drilling operations. The Supervisor at his discretion, may determine the required frequency for collecting well cuttings.

(98) "Well Integrity" shall mean the containment of subsurface zones or formations containing hydrocarbons produced into a well, and the containment of that production within the well all the way to the surface.

(99) "Well Site Equipment" means the equipment, including but not limited to an associated tank battery, production and hydrocarbon equipment at an oil and gas lease or location.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-01
Bond

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0400-52-01-.01 Amount of Plugging Bond

(1) A Plugging Bond is required to be in force for a well from the time a drilling or re-entry well permit is granted until the well is plugged and abandoned. The bond shall be for the sum of $2000 for wells from 0 to 2500 feet in depth; $3000 for wells that are deeper than 2500 feet, but less than or equal to 5000 feet in depth; for all wells deeper than 5000 feet the bond shall increase $3000 at the rate of $1.00 for every foot deeper than 5000 feet. The bonds shall be written in such a manner that the Principal and Bonding Agent hereto are firmly bound to the Department, jointly and severally, for the payment of the full penal sum of the bond so that the well shall be plugged and abandoned in accordance with the rules and regulations of the Board. An individual well bond shall be released upon the proper plugging of the well and the filing with the Supervisor of a Plug and Abandon Report (Form CN-0217), driller's log, downhole surveys, well cuttings and cores, and other data as required, or if the permit has been canceled because of lack of proper activity.

(2) The Bonding Agent may notify the Supervisor in writing of its desire to terminate its liability under the bond by giving written notice to the Supervisor. The Supervisor shall thereupon require the Principal in the bond to file a new bond, or to effect a change of operators on the well within 60 days. If the Principal can no longer be contacted, then any interested party may seek a change of operators on the well in accordance with subparagraph (2)(a) of Rule 0400-52-02-.02. If a new bond is filed by the Principal, or a change of operators is approved by the Supervisor, liability under the original bond shall cease and terminate as to acts and operations occurring after the effective date of the new bond or approval of the change of operators, and the original bond shall be released upon written request by the Bonding Agent. If a new bond is not filed within the 60 days, or a change of operators has not been approved, the Supervisor shall revoke the permit secured by the bond and require the Principal to plug the well in accordance with the rules and regulations of the Board. In the event of the failure of the Principal to plug

the well, the supervisor may issue a notice of non-compliance to the Principal and the Bonding Agent requiring the Bonding Agent either to cause the well to be plugged, or forfeit the amount of the bond to the Department. The Bonding Agent shall then have 60 days in which to plug the well. If the well has not been plugged within that time limit, then a notice of forfeiture shall be issued, as provided for under Rule 0400-52-01-.06. The Bonding Agent shall then have 21 days in which to petition the Board for a hearing relative to the bond forfeiture, pursuant to the Administrative Procedures Act, T.C.A. § 4-5-101 et seq. If a hearing is requested, no further action shall be taken against the bond until such hearing has taken place and a final order given by the Board. If the well is plugged in the interim, then the notice of forfeiture shall be canceled and the bond released.

0400-52-01-.02 Blanket Plugging Bond

(1) In lieu of an individual bond per well, any well operator may file with the Supervisor a blanket bond in the sum of $20,000 covering a maximum of 10 wells from 0 to 5000 feet in depth; $30,000 covering a maximum of 10 wells that are deeper than 5000 feet, but are less than or equal to 10,000 feet in depth; and no blanket bonds for wells deeper than 10,000 feet either drilled or to be drilled by the Principal in the bond at any one time. Additional wells may be covered by the bond only if wells originally covered by the bond are plugged or transferred to another operator, on a one-for-one basis with the wells to be added to the bond. Otherwise, an additional bond shall be filed for each additional group of 10 wells. The terms of such blanket bonds shall be in full compliance with the requirements for an individual well bond. A blanket bond shall be released upon the proper plugging of all wells of the operator (Principal) covered by the bond, and the filing with the Supervisor of the Plug and Abandon Reports, driller's logs, downhole surveys, well cuttings and cores, and other data as required for such wells. A blanket bond may be canceled by the Bonding Agent, notifying the Supervisor in writing, delivered personally or by registered mail, that the operator is no longer authorized by the Bonding Agent to obtain permits under said bond. If or when all wells permitted under said bond have been plugged and abandoned according to the rules and regulations of the Board, or existing permits have been canceled because of lack of proper activity, the Supervisor shall release the bond.

(2) The Bonding Agent may notify the Supervisor in writing of its desire to terminate its liability under the bond by giving written notice to the Supervisor. The Supervisor shall thereupon require the Principal in the bond to file a new bond, or to effect a change of operators on the well(s) within 60 days. If the Principal can no longer be contacted, then any interested party may seek a change of operators on the well(s) in accordance with subparagraph (2)(a) of Rule 0400-52-02-.02. If a new bond is filed by the Principal, or a change of operators is approved by the Supervisor on all wells covered by the bond, liability under the original bond shall cease and terminate as to acts and operations occurring after the effective date of the new bond, or approval of the changes of operators, and the original bond shall be released upon written request by the Bonding Agent. If a new bond is not filed within the 60 days, or a change of operators has not been approved on all wells covered by the bond, the Supervisor shall revoke the permit(s) secured by the bond and require the Principal to plug the well(s) in accordance with the rules and regulations of the Board. In the event of the failure of the Principal to plug the well(s), the Bonding Agent may either cause the well(s) to be plugged, or forfeit the amount of the bond to the Department. This action shall be initiated by the issuance of a notice of noncompliance, as provided for under Rule 0400-52-01-.07. The Bonding Agent shall then have 60 days in which to plug the well(s). If the well(s) have not been plugged within that time limit, then a notice of forfeiture shall be issued, as provided for under Rule 0400-52-01-.06. The Bonding Agent shall then have 21 days in which to petition the Board for a hearing relative to the bond forfeiture, pursuant to the Administrative Procedures Act, T.C.A. § 4-5-101 et seq. If a hearing is requested, no further action shall be taken against the bond until such hearing has taken place and a final order given by the Board. If the well(s) are plugged in the interim, then the notice of forfeiture shall be canceled and the bond released.

0400-52-01-.03 Reclamation Bond

(1) A reclamation bond is required to be filed with the Supervisor at the time an operator's permit application is submitted, and shall be effective from the time the initial surface disturbances begin until the well is plugged and the site and access roads are reclaimed. The bond shall be for the sum of $1,500 per well site. The bond shall be in favor of the Department, and shall be a performance bond, conditioned that the well site and access roads shall be reclaimed in accordance with the rules and regulations of the Board. Upon satisfactory completion of regrading and revegetation of all disturbed areas except active work areas and access roads needed for oil or gas production, the Supervisor shall release one-third of the

reclamation bond, or reduce the amount of the reclamation bond by one-third. Access roads that will continue to be used by the landowner for other legitimate purposes and maintained in usable condition, which condition reduces erosion to a practical minimum, shall not have to be revegetated by the operator. Such usage shall be established by the landowner by sworn affidavit. After plugging of the well and final reclamation of the well site, and after plantings have survived two growing seasons with an established ground cover of at least 90% herbaceous and/or woody species of which at least 80% are perennial species, the supervisor shall release the remainder of the reclamation bond.

(2) This paragraph shall be applicable only when the same Bonding Agent is responsible for both the plugging and reclamation bonds on a well. The Bonding Agent may notify the Supervisor in writing of its desire to terminate its liability under the reclamation bond by giving written notice to the Supervisor. The Supervisor shall thereupon require the Principal in the reclamation bond to file a new bond, or to effect a change of operators on the well within 60 days. If the Principal can no longer be contacted, then any interested party may seek a change of operations on the well in accordance with subparagraph (2)(a) of Rule 0400-52-02-.02. If a new reclamation bond is filed by the Principal, or a change of operators is approved by the Supervisor, liability under the original bond shall cease and terminate as to acts and operations occurring after the effective date of the new bond, or approval of the change of operators, and the original bond shall be released upon written request by the Bonding Agent. If a new reclamation bond is not filed, or a change of operators has not been approved within 60 days, the Supervisor shall revoke the permit secured by the plugging and reclamation bonds and require the Principal to plug the well and reclaim the well site and access roads in accordance with the rules and regulations of the Board. In the event of the failure of the Principal to plug the well and reclaim the well site and access roads, the Bonding Agent may either cause the well to be plugged and the well site and access roads to be reclaimed, or forfeit the amount of the bonds to the Department. This action shall be initiated by the issuance of notices on noncompliance as provided for under Rule 0400-52-01-.07. The Bonding Agent shall then have 30 days in which to plug the well and reclaim the well site and access roads. If the well has not been plugged and the well site and access roads have not been reclaimed within that time limit then notices of forfeiture shall be issued as provided for under Rule 0400-52-01-.06. The Bonding Agent shall then have 21 days in which to petition the Board for a hearing relative to the bond forfeitures, pursuant to the Administrative Procedures Act T.C.A. § 4-5-101 et seq. If a hearing is requested, no further action shall be taken against the plugging and reclamation bonds until such hearing has taken place and a final order has been given by the Board. In the event the Bonding Agent causes the well to be plugged and the well site and access roads to be reclaimed the plugging bond shall be released, and the amount of the reclamation bond shall be reduced by one-third, to $1,000, unless such reduction has previously taken place. The remainder of the reclamation bond shall be released only after plantings have survived two growing seasons with an established ground cover of at least 90% herbaceous and/or woody species provided that at least 80% are perennial species.

0400-52-01-.04 Relief of Responsibility

A permittee's bonds and other responsibilities to a well or wells shall be relieved upon approval by the Supervisor of a successor's Application to Change Operators (Form CN-0237), furnishing bonds, and the tendering of authority on Form CN-0237 by the permittee requesting the Supervisor to approve the successor's application.

0400-52-01-.05 Execution

Any of the following shall serve as bonds:

(1) A surety bond executed by the well operator as principal and by a corporate surety authorized to do business in Tennessee; or

(2) Cash; or

(3) A certified check; or

(4) A Certificate of Deposit, if it is made out exactly as follows: "Operator Name and Tennessee Department of Environment and Conservation or Tennessee Department of Environment and Conservation"; and does not contain any terms or conditions that provide that the issuing bank may charge against the deposit any debt of the depositor(s) owing to it (set-off terms); or any terms or conditions that provide that anyone whose signature appears on the signature card may withdraw funds from the account. The

operator shall be entitled to any interest earned on a certificate of deposit as the same becomes due and payable. The treasurer of the State of Tennessee shall receive and hold the originals of such certificates in the name of the State of Tennessee, in trust, for the purpose for which such deposit is made, and shall at all times be responsible for the custody and safekeeping of such deposits; provided, however, that the certificate may be returned to the issuing financial institution as may be necessary for renewal from time to time; or

(5) An irrevocable letter of credit issued by any federally insured bank or savings and loan association. The letter of credit shall comply with the format shown on Form CN-0120 (Comprehensive Bond Identification).

0400-52-01-.06 Forfeiture

(1) The Supervisor shall cause a notice of noncompliance to be served upon the operator by certified mail, addressed to the permanent address shown on the application for a permit:

(a) If the requirements with respect to proper plugging upon abandonment of a well or wells and submission of all required records and data have not been complied with within the time limits set by the Board or Department, and/or,

(b) If the requirements with respect to proper reclamation of the well site(s) and access roads have not been complied with within the time limits set by the Board or Department.

(2) The notice shall specify in what respects the operator has failed to comply with this chapter or the regulations or orders of the Board or Department.

(3) If the operator has not reached an agreement with the Supervisor, or has not complied with the requirements set forth within 30 days after mailing the notice, the plugging bond shall then be forfeited to the Department, and the money used by the Department to properly plug the well(s), and/or the reclamation bond used to reclaim the well site(s) and access roads.

(4) In the case of the plugging bonds, such bonds are penal in nature, and the full amount of the bond shall be forfeited.

(5) In the case of reclamation bonds, such bonds are considered to be performance bonds, and any portion of a reclamation bond not expended to perform the reclamation work shall be refunded to the operator or his Bonding Agent if the conditions of the bond are fully satisfied.

0400-52-01-.07 Notice of Noncompliance

At any time the Supervisor causes a notice of noncompliance to be served upon an operator (principal), copies of such notice shall be mailed to the resident agent writing such bond (where the address is known) and to the Bonding Agent at the address provided to the Tennessee Department of Commerce and Insurance for receipt of notices. The Bonding Agent shall be afforded the opportunity to act in behalf of the operator (principal) within the time set forth in regard to the proper plugging of the well or wells and submission of required well records, down hole data, and plugging reports and/or reclamation of the well site and access roads. Should the operator (principal) and Bonding Agent fail to comply within the time provided, then and only in that event, the plugging bond shall be forfeited, and/or the reclamation bond used to reclaim the well site and access roads.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-02
Permits

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0400-52-02-.01 Permit Required

(1) A permit is required from the Supervisor before any person shall conduct operations described in Chapter 0400-52-01 through Chapter 0400-52-12. Each permit, when granted, shall expire 365 days after issuance unless the applicant has commenced operations and reasonably continues said operations pursuant to the permitted objective. Any permit now in force shall expire 365 days from the date of this rule unless permittee complies with this requirement. If a permitted location is to be abandoned without the commencement of any drilling activity, then the operator shall notify the Supervisor in writing within 30 days after expiration of the permit.

(2) No work shall begin on a well pursuant to this chapter before a permit for such work on the well has been issued by the Supervisor. Furthermore, any work the operator may do, or may have done, shall be at his own risk and with the full understanding that the Supervisor may find it necessary to require changing the well location or operation plans, or otherwise deny the permit because of noncompliance with applicable rules and regulations and require that the well be plugged. No requests for exceptions shall be considered for a well that was started before a permit was issued.

(a) A legible copy of this permit shall be displayed on location upon commencement of drilling operations and remain on display at said location until completion of the well.

(3) Fifteen day progress on drilling, upon request of the Supervisor, shall be mailed to the Supervisor describing well activities for the previous week.

(4) Organization Report (Form CN-0219) shall be made to the Supervisor prior to the issuance of a permit. The applicant shall name all parties responsible for the well and give contact information for them on the Organization Report consistent with the record submitted to the Secretaries of States for any corporation or limited liability company. If such persons have previously filed an Organization Report with the Supervisor, it shall not be necessary to submit another report, unless there has been a change in the information originally submitted.

(5) The operator shall indicate on the permit application, on a space provided, if the operator has the legal right to drill and produce the well.

(6) A notice to surface owners of oil and gas estates is required as follows:

(a) No later than the filing of the application with the Department for a permit to drill and prior to initiating any site preparation, the applicant shall give notice by certified mail, return receipt requested, of his intent to drill to the property owner or owners of the surface of the land to be drilled or to be affected by the surface disturbances listed in subparagraph (c) of this paragraph.

(b) The property owners to be notified under this paragraph shall be the property owners of record in the property tax assessor's office in the county where the property is located.

(c) The notice shall include a well location plat which shows the proposed location of the oil and gas well site, the proposed location of all new ingress and egress, the location of all diversions, drilling pits, dikes, and related structures and facilities, the location of proposed storage tanks and all other surface disturbances. Said plat shall comply with Chapter 0400-52-03.

(d) The notice shall state that the property owner and applicant have 15 working days from the date of mailing to discuss the location of surface disturbances in connection with the drilling operation. It shall also state that if the property owner and applicant are unable to resolve differences regarding the location of surface disturbances, either or both may request in writing a hearing before the Supervisor or his representative. The notice shall provide the name and address of the Supervisor.

(e) The applicant shall file with the Supervisor, as a part of the application, written certification that the notice required by subparagraph (a) of this paragraph has been given, including the name

and address of each property owner given notice and the date on which each notice was mailed.

(f) The applicant and the property owners given notice under subparagraph (a) of this paragraph shall attempt to resolve any differences between them regarding surface disturbances related to the proposed drilling operation. If those differences cannot be resolved, then a hearing and order may be obtained as follows:

1. Any property owners entitled to notice (or the applicant) may request, within 15 working days of the mailing of the notice required in subparagraph (a) of this paragraph, that the Supervisor or his representative conduct a hearing. A request for hearing under this paragraph shall be in writing to the Supervisor, and shall be mailed by certified mail, return receipt requested within 15 working days of the mailing of the notice required in subparagraph (a) of this paragraph. The purpose of the hearing shall be to minimize the impact of the proposed drilling operation on the surface of the land.

2. The hearing shall be conducted as a contested case pursuant to the Administrative Procedures Act under Title 4, Chapter 5, Part 3 and shall be held before a hearing officer sitting alone. For purposes of the hearing, the Supervisor or his representative shall be the hearing officer. The hearing shall be held within 10 working days of receipt of a request for hearing by the Supervisor or his representative, and shall be held in the county of the proposed oil and gas well. Notice of the hearing shall be given to all persons entitled to notice under subparagraph (a) of this paragraph and the applicant.

3. The hearing officer shall render a decision within 10 calendar days of the hearing. The decision shall be considered a final order not subject to further agency review pursuant to T.C.A. § 4-5-315(a)(1).

4. For purposes of this subparagraph, "working day" means all calendar days excluding Saturdays, Sundays, and legal holidays as designated in T.C.A. § 15-1-101.

(g) Notwithstanding any other requirement for a permit to drill, such a permit may only be issued:

1. If the applicant submits to the Supervisor statements of no objection signed by all property owners entitled to notice under subparagraph (a) of this paragraph; or

2. If a hearing is not requested as provided in part (f)1 of this paragraph; or

3. Upon the issuing of a final order pursuant to part (f)3 of this paragraph.

(h) For purposes of satisfying the requirements of subparagraph (g) of this paragraph for issuing a permit:

1. The Supervisor may treat the persons named in the applicant's certification of property owners, under subparagraph (e) of this paragraph, as being all of the property owners entitled to notice under subparagraph (a) of this paragraph, unless the Supervisor has actual notice to the contrary.

2. If a request for hearing as provided in part (f)1 of this paragraph is not delivered to the office of the Supervisor within 15 working days plus 3 additional days after the date notice-of-intent to drill was mailed to each property owner, as stated in the applicant's certification of notice, under subparagraph (e) of this paragraph, the Supervisor may assume that no hearing was requested, unless he has actual notice to the contrary.

(7) Inspection and approval of all access roads, surface disturbances, and pollution control structures at a proposed well site by the designated gas and oil field inspector is required prior to the issuance of any permit under this chapter.

(8) Permits shall not in any way be construed as a certification by the State of Tennessee that any property interest in the premises covered by a permit is vested in the permit; they are issued solely under the regulatory powers vested in the Board and the Department under the provisions set forth in Title 60 of the

Tennessee Code and the rules and regulations promulgated by the Board pursuant to Title 60.

(9) In the event of litigation over a particular tract of land, or in the event a tract of land is contested as to the ownership of oil and gas rights, the policy of the Board shall be to issue permits in order to preserve the physical integrity of that particular tract without prejudicing any claimants to the title of that land.

(10) In the case of any well that is proposed to be fractured using a cumulative total of more than 200,000 gallons of water-based liquids:

(a) The Supervisor shall give notice to the public by e-mail, including a list of interested persons and agencies who have requested such notification, and by posting on the Department website. The Public Notice shall include the following information:

1. Name, address, and telephone number of the Division contact where further information can be obtained.

2. Name and location of the applicant.

3. The location of the well proposed to be fractured.

4. A brief description of the well plan including information regarding the sources of water to be used as base fluid, fracturing methods, whether or not an Aquatic Resource Alteration Permit for water withdrawal will be required, and estimated amounts and methods of wastewater disposal.

5. A brief description of the procedures for the Supervisor to make a final determination of whether to issue the permit.

(b) Interested persons may submit written comments for 30 days from the date of Public Notice. Any comments received shall be considered by the Supervisor, and the Supervisor shall provide written responses to those comments. Prior to Public Notice, the Supervisor may require additional information from the applicant in these cases, including but not limited to information on water sources, fracturing methodologies, and methods of wastewater disposal. The Supervisor will notify the public of permit issuance or denial through the Division's website.

(c) The applicant shall provide the Department's Public Notice of the proposed well to owners of any property within ½ mile of the proposed well head or any residence that has any drinking water wells within a ½ mile radius of the proposed wellhead within 14 days of the date of the Public Notice. In the case of a horizontal well, the ½ mile radius shall be measured from the terminus of the horizontal well bore. The determination of the presence of any such drinking water wells shall include at a minimum the information available on the Division of Water Resources Well Log Tracking System. The applicant shall collect a sample of any such well at the request of the owner and have the sample analyzed for Total Petroleum Hydrocarbons (TPH), BTEX (benzene/toluene/ethyl benzene/xylene), pH, chlorides, Total Organic Carbon (TOC) and Total Dissolved Solids, to demonstrate the condition of the water well prior to the drilling of the well to be fractured. Landowners opting for their well to be sampled by the applicant must submit a written request to the applicant within 14 days of receiving the Public Notice from the operator or the applicant is under no obligation to sample the well. Sampling results shall be provided to the Supervisor and drinking water well owner as soon as results are obtained. Sample collection protocols shall be comparable to those specified in the Department's "Quality System Standard Operating Procedure for Chemical and Bacteriological Sampling of Surface Water". Sample analyses shall be conducted by a certified laboratory utilizing standard methods and minimum detection levels consistent with Tennessee Department of Health laboratories.

0400-52-02-.02 Drilling Permit.

(1) Applications for a permit to drill a well for oil and gas shall be made on Application for Permit to Drill (Form CN-0211) and submitted to the Supervisor's office for approval. The application shall be accompanied by a copy of a location plat, bond, Organization Report (Form CN-0219) and a fee of five hundred dollars ($500). The application shall give the name and address of the drilling contractor, if known; otherwise

notification shall be made by letter to the Supervisor as soon as determined. Information submitted with the application shall include the intent to fracture the well, as well as an estimate of the volume of fluids to be used to fracture. The application shall also include a plan for erosion control, prevention of pollution of surface waters, and reclamation of all areas disturbed by the operations, including access roads. The plan shall conform to the requirements of Rule 0400-52-09-.05. The plan shall be sufficiently detailed to allow a gas and oil field inspector to locate the site of the facilities to be constructed and estimate the expected environmental impact, but does not have to include detailed engineering design drawings. The plan shall also include identification of all drinking water wells within a ¼ mile radius of the proposed wellhead, except where a ½ mile radius is required, as specified in paragraph (10) of Rule 0400-52-02-.01. The Supervisor may require modifications in the operator's plan if such modifications are necessary to prevent pollution or to promote reclamation. Upon approval, the operator's plan shall be a condition of the permit. Failure to comply with the plan shall be grounds for revocation of the permit and forfeiture of the bond.

(2) A drilling permit shall be amended by filing an Application to Amend Well Permit (Form CN-0228) with the Supervisor and paying a fee of $100 if the well name, number, elevation, location, or proposed total depth is changed. If the well location is changed, 1 copy of a revised survey plat shall be filed with the application. The amended permit is subject to the same terms and conditions as a well permit, including erosion control requirements. A person who is granted a drilling permit can only transfer the permit and attendant rights to another person after submitting an Application to Change Operators (Form CN-237) and receiving approval of the application from the Supervisor. The person to whom the permit is being transferred shall file an Organization Report (Form CN-0219), post a well plugging bond and a reclamation bond, if needed, and pay a fee of $100. The transfer of a permit from the original permittee to another operator, with or without the approval of the Supervisor, does not relieve the original permittee of obligations occurring before the transfer, and the bond shall not be released until all material at the time of transfer has been submitted. Unless change of operator forms have been processed or approved by the office of the Supervisor, any operation conducted on the well in question is the responsibility of the original permittee, and his bond shall not be released until all State requirements have been met.

(a) If an Application to Change Operators (Form CN-0237) is to be submitted without the signature of the current permittee, it shall be considered a forced change of operator, then the following items shall also be submitted:

1. Copy of the lease and assignments, if any, under which the permit was originally issued, or subsequently transferred, if those documents are available, or an affidavit from the landowner that no prior oil and gas leases are still active. An affidavit from the original landowner that there are no other unexpired oil and gas leases, if the title to the land has changed hands since the Department issued the permit on the land in question, or, if the original landowner cannot be located, an affidavit by the new operator or his agent that he has checked the grantor index in the register's office and found no unexplained conveyance of the oil and gas rights by the original landowner.

2. Copy of the lease and assignments, if any, under which the permit shall be transferred to the new operator.

3. Copy of a certified letter to the current permittee requesting that an Application to Change Operators (Form CN-0237) be signed, and also stating that if the application is not signed, and no written objection to a change of operator without that signature is submitted to the Department in writing within 10 working days of receipt of said letter, the new operator shall seek approval from the Department of that Approval to Change Operators without said signature. In addition, the applicant shall send the certified mail notice to the current address that is registered with the Board or the Department as shown on the Organization Report (Form CN-0219).

4. A copy of a Court Order relative to the inactive or expired status of any prior oil and gas leases may be submitted in lieu of the items mentioned in parts 2 and 3 of this subparagraph.

5. If a written objection to approving the Application to Change Operators (Form CN-0237) is properly submitted to the Department, the staff shall administratively deny the

application. If the applicant seeks to have the application considered further, he may then apply for a hearing before the Board. The Board shall then consider approval of the application only when there is no doubt as to the ownership of the oil and gas rights of the applicant. If a cloud or a question as to the title is determined to exist by the Board, then the Board shall deny the application, and refer the applicant to the court for a ruling on the question of ownership.

(b) If a well or wells revert back to a landowner, whether by court action, or by lease expiration or other provisions, and the well shall remain in operation, then the landowner shall submit an Application to Change Operators (Form CN-0237), file an Organization Report (Form CN-0219), post a well plugging bond, post a reclamation bond if required, pay a fee of $100, and otherwise comply with well spacing regulations. If the well will be used for domestic gas only, then a plugging bond in the amount of $500 shall be required.

(c) Before a well can be turned over to a landowner for use as a fresh water well, the operator shall set a 100 foot plug within 300 feet of the surface, or a cement plug at 50 feet above the casing shoe, whichever is the deeper, and the well shall be completed as a water well, and approved by the Department's Division of Water Resources. No Organization Report (Form CN-0219) is required, and in lieu of a plugging bond the landowner shall submit a notarized letter agreeing to assume liability for any subsequent plugging which might be required.

(3) If drilling operations cease for a period of 30 days, the operator shall notify the Supervisor in writing of the reason for the shutdown and the date on which operations shall be resumed.

(4) All wells shall be either properly plugged or completed within a period of 6 months following cessation of drilling. Upon written request to the Supervisor by the operator, showing valid cause for requiring additional time, a reasonable extension of as much as 90 days additional may be granted.

(5) An applicant who requests a permit to drill on site which is closer than normal statewide spacing to the boundary of an offsetting oil and gas lease, or mineral or surface property, or on a tract of land which is contested as to the ownership of oil and gas rights, shall comply with the following procedures:

(a) Notify by certified mail all affected offset and/or separate owners of oil and gas leases and mineral and surface property, as can reasonably be determined, that he is applying for a permit to drill a well; and submit a copy of the drill-site location plat with the notice.

(b) Publish the operator's name, lease name, well number and description of the drill-site location in a newspaper of general circulation in the county where the well is to be drilled, with a statement that if any interested owner objects to the drilling of said well, they should make their objections known to the Supervisor.

(c) If, within 10 days after the notice, there are no objections to issuing the permit, then the Supervisor shall issue the permit, provided all other requirements have been complied with.

(d) If there is an objection or objections to issuing the permit, the objector or objectors shall furnish the applicant and the Supervisor the basis of the objection and support his contentions with documents, etc., within 10 days after the date of the notice.

(e) If the applicant, after receiving an objection, still wants the permit he shall then apply for a hearing before the Board. The Board shall then decide whether or not to issue the permit or refer the applicant to the court for relief.

(6) If more than one applicant applies for a permit to drill the same or a conflicting location on a tract of land at a permissible distance from an offset or offsetting well, the first application received in the Supervisor's office shall be issued the permit, provided the applicant complies with all other rules and regulations governing permits to drill a well. If the first applicant fails to exercise his permit privilege, then the next applicant of record, based on time submittal, shall receive the permit, provided he complies with all other requirements.

(7) If the ownership of the drill site tract of land is contested, all claimants shall be identified by an

accompanying letter.

(8) Requests for permits for a voluntary pooled drilling unit, or for two or more leases or tracts that have been pooled for exploration or development shall be accompanied by a notarized affidavit signed by the operator that has the right to pool these leases to form a drilling unit.

(9) The Supervisor has the right to withhold the issuance of a permit to any operator in violation of any rule or regulation of this order until such violation has been removed.

0400-52-02-.03 Reserved

0400-52-02-.04 Notification To Plug and Abandon.

Prior to plugging, notice shall be given the Supervisor in order that the Supervisor or his representative may witness the work. Work performed shall be reported to the Supervisor on the Plug and Abandon Report (Form CN-0217) within 30 days after completing the work. Form CN-0217 shall be accompanied by a copy of the drilling contractor's or the service company's ticket for work done unless the work was observed by the Supervisor or his representative.

0400-52-02-.05 Reserved.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-03
Well Location Plats

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0040-52-03-.01 Preparing Plats

0400-52-03-.01 Preparing Plats

(1) Well location plats shall be constructed and certified as accurate by a surveyor registered by the State of Tennessee. The following procedures and instructions shall be strictly complied with in preparing plats:

(a) Two legible copies of a well location plat shall be submitted for each proposed well and drawn on a sheet 8½" x 14" or larger, using bond paper.

(b) The plat shall be prepared to a scale of one inch equals one hundred, two hundred, three hundred, four hundred, five hundred or six hundred feet (1" = 100, 200, 300, 400, 500 or 600'). The scale set forth on the plat should be of a graphic type rather than so many inches equaling so many feet.

(c) The top or upper edge of the plat shall be oriented to the north, and a vector depicting magnetic north shall be placed on the edge or margin of the plat.

(d) The surface elevation of the proposed drill site, referenced to mean sea level, shall be determined and a reference benchmark established within 200 feet of each location and its elevation and description noted on the plat. If the surface elevation or drill site location is altered during location preparation, it shall be re-determined by the operator, and this information submitted to the Supervisor within 10 days.

(e) A description or diagram of the proposed drill site location shall be made with reference to a specific 7½-minute topographic quadrangle map (1 inch equals 2,000 feet) by the use of the Carter Coordinate System, and Latitude and Longitude and by bearing and distance in feet to two permanent landmarks or monuments that are readily identifiable on a 7½-minute topographic map.

(f) The location plat, in addition to other requirements, shall identify surface ownership on the tract of land where the permitted well is to be located and surface ownership on offsetting tracts of land, if within 3,000 feet.

(g) The plat shall show the amount of acreage in the drill site tract.

(h) The distance in feet between the proposed drill site and the two nearest property and lease lines, and the nearest dry, abandoned, drilling or producing well, if such exists within 3,000 feet, shall be shown on the plat.

(i) In cases where the tract to be drilled is composed of separately owned interests which have been pooled or unitized the property lines and the amount of acreage in each separately owned interest shall be shown. In addition, the unit lines and the distance to the two nearest unit lines shall also be shown.

(j) The plat shall also show the location of all existing or proposed access roads, the location of all dwellings, diversions, drilling pits, dikes, tanks, and all other surface disturbances, and the location of all streams, lakes, or other bodies of water within 200 feet of the well site and visible from the access roads, or apparent on a USGS topographic map. This information may be shown on more than one sheet if necessary, provided that on each sheet the name of the operator, well name and number, scale (of graphic type), a vector depicting magnetic north, and the location of the proposed drill site are shown along with the surveyor's certification and seal, and date on which the well location plat was constructed.

(k) All plats shall be submitted with a latitude and longitude for each well site location.

(l) Any well site submitted for a horizontal well shall show the locations for the well collar; entry point of the horizontal leg and the termination point. Each of these locations shall be shown on the plat with latitude, longitude and Carter Coordinate System.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-04
Vertical Well Spacing

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0400-52-04-.01 Vertical Well Spacing

0400-52-04-.01 Vertical Well Spacing

(1) No permits shall be issued for the drilling of wells in search of oil and gas and no well shall be drilled in search of oil or gas nor shall a well be abandoned in one pool and recompleted in another pool in which no spacing rules are prescribed by special fieldwide orders, unless the location of such well shall comply with the following requirements:

(a) Wells drilled in search of oil or gas to a depth of less than 1,000 feet shall be drilled on 10-acre spacing, and shall not be located closer than 660 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 330 feet from any property or unit line.

(b) Wells drilled in search of oil or gas to a depth of 1,000 to 2,000 feet or to the base of the Chattanooga Shale, whichever is deeper, shall be drilled on 20-acre spacing, and shall not be located closer than 660 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 330 feet from any property or unit line.

(c) Wells drilled in search of oil to a depth of more than 2,000 feet shall be drilled on 40-acre spacing,

and shall not be located closer than 660 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 330 feet from any property or unit line.

(d) Wells drilled in search of gas from a depth of 2,000 feet to 5,000 feet or to the top of the Conasauga Formation shall be drilled on 40-acre spacing, and shall not be located closer than 660 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 330 feet from any property or unit line.

(e) Wells drilled in search of gas to a depth of more than 5,000 feet or below the top of the Conasauga Formation shall be drilled on 160-acre spacing, and shall not be located closer than 1,320 feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than 660 feet from any property or unit line.

(f) Any existing well may be deepened and produced for oil or gas from whatever zone(s) production may be obtained on the presently permitted unit size, provided, however, that any exceptions to offsetting property lines or wells under current spacing rules shall comply with the provision of subparagraph (1)(k) of Rule 0400-52-04-.01.

(g) Where a permit is requested for a wildcat well to be drilled in an area in which the surface or mineral ownership is so divided that the well cannot be located in compliance with the requirement of a distance from property lines and well spacing and a drilling unit cannot be formed in advance of drilling because it is not known whether the well shall be completed as an oil well or a gas well, a permit may nevertheless be granted for the drilling of the well when the applicant presents evidence satisfactory to the Supervisor that the applicant has available for assignment to said well leases or acreage of area and size to constitute, in the judgment of the Supervisor, a reasonable producing unit for such well and such applicant agrees to create or to apply to the Board for creation of a reasonable producing unit within 45 days after completion of the well.

(h) Upon the completion of a confirmation well to a discovery well, the operator of the discovery well shall apply for a public hearing before the Board for the purpose of establishing temporary drilling and production units. When a pool has had 5 wells drilled to and completed therein or after 1 year has elapsed from the completion of the confirmation well in the field, whichever occurs first, the operator or operators of well in the field shall petition the Board for a public hearing for the purposes of establishing field rules and regulations and the creation of drilling and production units for the pools in the field. The right is reserved, however, to any interested party to apply for a public hearing at an earlier date and if the Board finds from an examination of the information furnished that temporary or permanent drilling and production units should be formed, it shall be so ordered.

(i) Where prior to the issuance of this order, a pool has already been partially developed with a greater density of wells than that prescribed herein, the Supervisor may, without additional public hearing, exempt such pools from the provisions of this order. The exemptions for these pools shall be granted only after application has been made to the Supervisor in writing accompanied by a map delineating the locations of all existing wells completed and producing from the pool for which exception is being asked.

(j) A poolwide unit is exempt, within its internal boundary, from well spacing rules as to the particular unitized pool, but all wells shall be located interior of the unit outline in compliance with the rules for distance from property lines.

(k) The Supervisor may grant administrative approval of exceptions to this chapter, or any order of the Supervisor establishing well spacing for a pool upon submission of an application showing all pertinent information and data and after due notice is given to all operators of interest.

1. The application shall be made to the Supervisor with a copy to each known offset operator of interest and such application shall include:

(i) Statement of reason and justification for requested relief.

(ii) Map or plat as described in Chapter 0400-52-03, which additionally shows:

(I) The location at which an oil or gas well could be drilled in compliance with this chapter, or applicable order;

(II) The location at which the applicant requests permission to drill;

(III) The outline of the drilling unit to be assigned to the proposed well site with a notation as to the amount of acreage contained therein;

(IV) The outline of all other drilling or production units currently assigned to the tract or lease upon which the proposed drilling unit is located, with a notation of the amount of acreage assigned to each unit.

(iii) Sufficient geological evidence that the proposed drilling unit shall be reasonably productive of oil and/or gas.

(iv) List of names and addresses of all interested persons notified of the application.

2. Each drilling unit should comply with the well density as described in this chapter, or the applicable order.

3. The acreage assigned to the proposed drilling unit should be reasonably expected to be productive of oil and/or gas from the common source of supply.

4. If the application meets with the approval of the Supervisor and no written protest is received by the Supervisor within 10 days following prescribed notice of application, the Board may grant the requested relief without the necessity of a public hearing.

5. If the application is accompanied by a written waiver from all known offset lease owners, the 10 day delay shall be unnecessary.

6. If the Supervisor does not elect to approve the application administratively, or if written protest is received within the 10 day period, the application may be set for public hearing.

(l) Any drilling being conducted in Overton, Clay, Pickett or Fentress Counties (this is portions of Fentress County that are west of Hwy 127 and North and West of State Hwy 154) is based on 400 feet to another well and 200 feet to the unit or property line down to a depth of 2500 feet. This is an exception to the current state wide drilling requirements.

(m) Exception not to exceed 10% in spacing distances on locations interior to property boundaries shall be allowed administratively by the Supervisor. Any exception adjacent to offset operators shall comply with subparagraph (k) of this paragraph.

(2) If it is necessary to drill a well below the depth bracket for the anticipated productive zone for stratigraphic information only, the Application for Permit to Drill (Form CN-0211), shall indicate the proposed total depth and anticipated depth bracket for productive zone and unit. Following drilling, logging and testing, the well shall be plugged back, or casing set to the legal total depth appropriate for the anticipated productive zone. The plug back depth shall be indicated on the Plug and Abandon Report (Form CN-0217), which shall be accompanied by a work ticket which indicates in detail how the work was done. If production is established below the depth bracket for the anticipated productive zone, appropriate spacing shall be established by the Supervisor or Board.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-05
Well Identification

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0400-52-05-.01 Posting a Sign

0400-52-05-.01 Posting a Sign.

No well shall be placed in production, shut-in, or left unplugged until a sign has been posted on the well location. All wells shall display a sign showing the operator name and telephone number, well name and number, and permit number. The mailing address and telephone number of the Department shall also appear on the sign. The sign shall be at a minimum 8½ inches in height by 11 inches in width, made of durable material and be legible. If the tank battery serving a particular well is not within sight of that particular well, then a sign shall also be posted at a good conspicuous location at the tank battery for each well for which production is gauged individually. Where a number of wells on the same lease produce into a common tank battery, only one sign is required, and should show the name of the lease and well numbers, rather than individual permit numbers. The obligation to maintain legible signs remains until the well is plugged and abandoned.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-06
Drilling Wells

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0400-52-06-.01 Drilling Equipment
0400-52-06-.02 Blowout Prevention
0400-52-06-.03 Casingheads
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0400-52-06-.01 Drilling Equipment

All drilling equipment shall be designed, constructed, and operated in such a manner so as to prevent accidents and insure safe operating practices. It is recommended that each operator require the drilling contractor to comply with the general rules and safety procedures of the industry.

0400-52-06-.02 Blowout Prevention

(1) The operator shall equip and operate all wells in such a manner as to prevent the uncontrolled emission of oil, gas, and water from the well.

(2) The operator shall equip all wells, other than those specified in paragraph (3) of this rule, with a minimum of the equipment specified in this paragraph:

(a) The operator shall install a blowout prevention system with 2 separate units capable of closing with the drill pipe in the hole or other equivalent control system as approved by the Supervisor or his representative. A minimum of 1500 psi working pressure or 110% of maximum surface pressure that would be reasonably expected based on the depth and location of the well is required, whichever is greater. In unknown or expected higher pressures a minimum of 5000 psi working pressure shall be required.

1. The blowout preventers shall be installed above ground level if possible but if a cellar is dug, the equipment shall be accessible during drilling operations. The entire control equipment shall be in good working condition at all times. All outlets, fittings, and connections on the casing, blowout preventers, choke manifold, and auxiliary wellhead equipment that may be subjected to wellhead pressure shall be of a material and construction that shall withstand the anticipated pressure and shall be resistant to fire. The lines from outlets on or below the blowout preventers shall be securely installed, anchored, and protected from damage.

2. Blowout preventers, accumulators, and pumps shall be used in accordance with the product manufacturer's rating and operational specifications. The operator is responsible for seeing that the blowout prevention equipment is in proper working order. This includes the proper operation of the closing unit valving, proper operation of the pressure gauges, and the presence of the manufacturer's recommended accumulator fluids. A combination of any 2 of the following secondary closing systems is acceptable:

   (i) Intrinsically safe electric-operated pump;

   (ii) Air-operated pump;

   (iii) Hand-operated pump; and

   (iv) Nitrogen-operated pump.

   Blowout preventer rams shall be of a proper size for the drill pipe being used or production casing being run in the well or shall be variable-type rams that are of the proper size range. Blowout prevention shall be installed before passing through any known production or high pressure zone in the well boring path.

3. Blowout prevention equipment and intermediate casing shall be tested to a pressure of 1,500 psi at surface for not less than 30 minutes. This shall be done prior to drilling the plug on the intermediate casing or at other intervals as approved or requested by the Supervisor. If, at the end of 30 minutes, the pressure shows a drop of 10% or more from the original test pressure, the casing shall be condemned until the leak is corrected. A pressure test demonstrating less than a 10% pressure drop after 30 minutes is proof that the condition has been corrected. A record of each test, including test pressures, times, failures, and each mechanical test of the casings, blowout preventers, surface connections, surface fittings, and auxiliary wellhead equipment shall be entered in the logbook, signed by the driller, and kept available for inspection by the Supervisor or his representative.

4. With the understanding that all permitting procedures have been followed, a well may be deepened to 200' below the bottom of the Chattanooga Shale without initiating other than the usual well control procedures. The casing shall withstand at least 1,500 psi with no more than 10% loss of pressure in 30 minutes.

(b) Accessible controls located both in the rig and at a safe remote location of at least 50 feet from wellhead.

(c) An annular choke valve.

(d) A drill pipe or power head valve capable of pump truck connection.

(e) A flow line or blooey line of the proper size and working pressure shall be installed in the most direct route practicable to pit and shall be anchored securely. The use of closed loop systems or mud tanks is acceptable.

(3) For non-Cumberland Plateau wells in areas of known lower pressures, the operator shall equip all wells with a minimum of the following equipment:

(a) An annular-type blowout preventer or other equivalent control system as approved by the Supervisor or his representative;

(b) Accessible controls located both on the rig floor and at a safe remote location at least 50 feet from wellhead;

(c) An Annular choke valve;

(d) A drill pipe or power head valve capable of pump truck connection;

(e) A flow line of the proper size and working pressure; and

(f) Blowout prevention equipment that has a rated minimum working pressure of 1500 psi.

1. The blowout preventers shall be installed above ground level if possible but if a cellar is dug, the equipment shall be accessible during drilling operations. The entire control equipment shall be in good working condition at all times. All outlets, fittings, and connections on the casing, blowout preventers, choke manifold, and auxiliary wellhead equipment that may be subjected to wellhead pressure shall be of a material and construction that shall withstand the anticipated pressure and shall be resistant to fire. The lines from outlets on or below the blowout preventers shall be securely installed, anchored, and protected from damage.

2. Blowout preventers, accumulators, and pumps shall be used in accordance with the product manufacturer's rating and operational specifications. The operator is responsible for seeing that the blowout prevention equipment is in proper working order. This includes the proper operation of the closing unit valving, proper operation of the pressure gauges, and the presence of the manufacturer's recommended accumulator fluids. Any of the following closing systems is acceptable:

   (i) Intrinsically safe electric-operated pump;

   (ii) Air-operated pump;

   (iii) Hand-operated pump; and

   (iv) Nitrogen-operated pump.

   Blowout preventers shall be of a proper size for the drill pipe being used or production casing being run.

3. Blowout prevention equipment and surface casing shall be tested to a pressure of 400 psi at surface for not less than 30 minutes before drilling the plug on the surface casing and at other intervals as approved or requested by the Supervisor. If at the end of 30 minutes the pressure shows a drop of 10% or more from the original test pressure, the casing shall be condemned until the leak is corrected. A pressure test demonstrating less than a 10% pressure drop after 30 minutes is proof that the condition has been corrected. A record of each test, including test pressures, times, failures, and each mechanical test of the casings, blowout preventers, surface connections, surface fittings, and auxiliary wellhead equipment shall be entered in the logbook, signed by the driller, and kept available for inspection by the Supervisor or his representative. If the casing is to be tested at the time of surface casing, cementing 150 psi for a period of ten minutes may be used. The annulus shall be filled with fluid and the plug shall have been landed prior to the test beginning. If a drop of over 10% or more from the original test pressure is found the casing shall be condemned until the leak is corrected. The previous criteria concerning recording of the test shall be followed.

4. The casing shall withstand at least 400 psi with no more than 10% loss of pressure in 30 minutes.

0400-52-06-.03 Casingheads.

All wells shall be equipped with casingheads with a test pressure in conformance with conditions to be anticipated in wells in which they are used. Casinghead bodies shall be equipped with proper connections and valves accessible to the surface as soon as installed. Reconditioning shall be required on any well leaking gas or oil.

0400-52-06-.04 Environmental Protection.

(1) Oil and gas wells shall be drilled and operated in a manner that protects aquifers and surface waters. Wells shall be designed to ensure the environmentally sound, safe production of hydrocarbons by containing them inside the well, isolating the productive formations from fresh water formations, and properly executing fracturing and other stimulation operations. Well design and construction must ensure that no leaks occur through or between casing strings. The fluids produced from the well (oil, water, gas) must travel directly from the producing zone to the surface inside the well conduit.

(2) All oil and gas operations shall be conducted in a manner that shall prevent or mitigate adverse environmental impacts such as soil erosion and water pollution. All areas disturbed by the operations, including access roads, shall be reclaimed as prescribed in Rule 0400-52-09-.05. Access roads shall be constructed in such a manner as to reduce erosion to a practical minimum. Sediment ponds, berms, diversion ditches, hay bales, and other measures designed to prevent erosion and discharge from well sites shall be taken to prevent or minimize soil erosion and pollution of surface waters. Erosion prevention and sediment controls at all oil and gas operations shall meet or exceed the following:

(a) The erosion prevention controls shall be designed and implemented to minimize the dislodging and suspension of soil in water. Sediment controls shall be designed and implemented to retain mobilized sediment on site.

(b) All control measures shall be properly selected, installed, and maintained in accordance with the manufacturer's specifications (where applicable) and standard engineering practices. All control measures selected shall be able to slow runoff so that rill and gully formation is prevented. When steep slopes and/or fine particle soils are present at the site, additional physical or chemical treatment of storm water runoff may be required. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the operator shall replace or modify the control for relevant site situations.

(c) If sediment escapes the drilling, production, and/or roadway areas, off-site accumulations of sediment that have not reached a stream shall be removed at a frequency sufficient to minimize offsite impacts. Fugitive sediment that has escaped the drill area and has collected in a drainage ditches or roadways shall be removed so that it is not subsequently washed into culverts and streams by the next rain and/or so that it does not pose a safety hazard. Permittees shall not initiate remediation/restoration of a stream without consulting the Department first.

(d) Sediment shall be removed from sediment traps, silt fences, sedimentation ponds, and other sediment controls as necessary.

(e) Upon attainment of stability, materials used for erosion prevention and sediment control should be removed or otherwise prevented from becoming a pollutant source for storm water discharges.

(f) Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than 30 days prior to grading or earth moving unless the area is seeded and/or mulched or other temporary cover is installed.

(g) Clearing and grubbing shall be held to the minimum necessary for drilling and/or production activities.

(h) Construction shall be sequenced to minimize the exposure time of graded or denuded areas.

(i) Erosion prevention and sediment control measures shall be in place and functional before drilling activities begin, and shall be properly maintained throughout the drilling and production phase.

(j) Permanent stabilization with perennial vegetation (using native herbaceous and woody plants where practicable) or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable.

(3) The operator shall notify the oil and gas inspector at least 24 hours prior to beginning fracturing or acid treatment activities. The operator shall maintain personnel on-site during fracturing activities, and during the initial flow back period, until such time as the well pressure returns to near pre-fracturing reservoir pressure. Unmanned flowback operations shall be checked routinely.

(4) For fracturing treatments using more than 200,000 gallons of water-based liquids, the operator shall conduct pressure monitoring during the fracturing treatment to monitor for a successful treatment and for protection of the groundwater. Annulus pressure shall be continuously monitored and recorded for all such fracturing treatments. If intermediate casing has been set, the pressure in the annulus between the intermediate casing and the production casing shall also be monitored and recorded. Records of pressure monitoring shall be included as part of the well history reporting requirements.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-07
Casing Program

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0400-52-07-.05 Isolation of Oil, Gas and Fresh-Water- bearing Strata, and Potential Minable Coal and Other Mineral Deposits

0400-52-07-.01 Casing Requirements

(1) Surface Casing

(a) The operator shall set surface casing at 100 feet below the lowest known fresh water aquifer. The Supervisor shall have the authority to require distances of less than 100 feet upon specific request from the operator if adequate technical justification can be made. The operator shall use casing that has an external collapse pressure rating great enough to handle the hydrostatic pressure of a class A cement from the casing shoe to surface and internal pressure rating to handle any anticipated down hole pressures. The operator shall use cement with a minimum 500 psi compressive strength and will allow a minimum of 8 hour wait, or until the cement has adequately set, prior to drilling the shoe out. Surface casing shall be used to protect fresh water aquifers. No casing shoe shall be drilled until a cement seal has been brought back to the surface and secured between the surface casing and the well bore, preventing any ground water contamination.

(b) In non-Cumberland Plateau wells in areas of known lower pressures, the operator shall set all surface casing 100 feet below the fresh water. The Supervisor shall have the authority to require distances less than 100 feet upon specific request from the operator if adequate technical justification can be made. The operator shall use casing with an external collapse pressure rating great enough to handle the hydrostatic pressure of a class A cement from the casing shoe to surface. A Float shoe or Baffle or Guide shoe with Wiper Plug along with annular cement volume plus 35% excess shall be required on all surface casing cement jobs. Cement shall have a minimum 500 psi compressive strength and have a minimum 8 hour wait, or longer if needed to ensure that cement has adequately set, prior to drilling the shoe out. No casing shoe shall be drilled until a cement seal has been brought back to the surface and secured between the surface casing and the well bore, preventing any ground water contamination. The operator shall present all cement and casing designs on a specifications sheet with permit application for approval.

(2) If intermediate casing is used, the operator shall set an intermediate string of casing prior to drilling into any known oil and gas producing zone. Casing shall have a minimum internal pressure rating of 110% of maximum formation pressure reasonably expected based on the depth and location of the well. The operator shall cement the intermediate casing at a minimum of 100 feet into the surface casing. Casing string shall be deep enough to prevent underground blowout from anticipated bottomhole pressures. Casing shall have an external collapse pressure rating to handle cement design from casing shoe to

surface. The operator shall use cement with 500 psi compressive strength and have a minimum 8 hour wait, or until cement has adequately set, prior to drilling the shoe out.

(3) The operator shall present all cement and casing designs on a specifications sheet with permit application for approval. A copy of cement tickets shall be kept on location to be viewed by the inspector until the drill rig is removed. In unknown or over pressured conditions a 5000 psi rating on casing shall apply. The operator shall attach a copy of all cement tickets to the well history tickets and shall include all volumes and pressures of job from start to finish. To ensure adequate annular space for cementing, the annular space outside the casing shall be at least as large as follows for the applicable casing size:

Up to 7" Outside Diameter (O.D.) Casing O.D. + 1 1/2"

More than 7" and less than 10 3/4" O.D. Casing O.D. + 2"

More than 10 3/4 "O.D. Casing O.D + 3"

(4) Any wells on the Cumberland Plateau drilled to depths above the Chattanooga Shale may be eligible for variances on the casing requirements in this rule by making a specific request to the Supervisor.

0400-52-07-.02 Conductor Pipe

Conductor pipe or conductor casing shall be used for the purpose of supporting unconsolidated surface deposits. The use and removal of less than 40 feet of conductor pipe during the drilling of any oil or gas well shall be at the option of the operator. If such conductor pipe is to be pulled it shall be pulled prior to the cementing of the surface casing. All conductor casing shall have a cement seal at the surface preventing the possibility of any groundwater contamination and shall remain in the well if not pulled prior to the surface casing cement job. If more than 40 feet of conductor pipe was installed, the conductor pipe may not be pulled.

0400-52-07-.03 Surface Casing.

(1) The operator shall submit a proposed casing program for approval by the Supervisor, on Application for Permit to Drill (Form CN-0211). If the Supervisor deems the casing program inadequate to protect fresh water zones and potential minable coal and other minerals, etc., he shall prescribe the casing program with which the operator shall comply. Unless an exception is granted by the Supervisor, suitable and sufficient surface casing shall be run and cemented to a depth not less than 100 feet below all fresh water strata encountered in the well and in a manner that shall protect such fresh water from contamination resulting from drilling operations. The Supervisor shall have the authority to require distances of less than 100 feet upon specific request from the operator if adequate technical justification can be made. The cement shall fill the annular space behind the surface casing from the base thereof to the surface of the ground. If cement returns are not received to the surface, then the annulus shall be cemented from the top.

(2) The Supervisor or his representative shall be given notice of cementing of surface casing at least 12 hours prior to conducting such operation. The Supervisor or his representative may witness the cementing operation. Form CN-0221 shall be accompanied by a copy of the drilling contractor's or service company's ticket for the work performed.

(3) The operator shall run a cement basket on the surface casing one joint below the conductor pipe, or between the first and second joints if no conductor pipe is utilized, or as directed by the Supervisor. The operator shall utilize a centralizer in order to center the casing in the well bore and ensure it will be completely surrounded or encased by cement and achieve the required isolation.

0400-52-07-.04 Production Casing.

The production, oil, or flow string, is that casing used for the purpose of segregating the zone from which production is obtained and affording a means of communication between such zone and the surface. If production casing is used in a vertical well, the operator shall cement the production casing at a minimum of 100 feet into the intermediate casing and extend the cementing across the producing formation, unless the casing is set on a packer or set and cemented above the production zone. Alternative casing and cementing designs may

be approved by the Supervisor upon request if adequate technical justification can be made. Casing shall have an external collapse pressure rating to handle cement design from total depth to surface. The operator shall use cement with 500 psi compressive strength and have a minimum 8 hour wait, or until cement has adequately set. The operator shall present all cement and casing designs on a specifications sheet with Permit Application for approval. A copy of cement tickets shall be kept on location to be viewed by the inspector until the drill rig is removed. In unknown or over pressured conditions a 5000 psi rating on casing shall apply. The operator shall attach a copy of all cement tickets to the well history tickets and shall include all volumes and pressures of job from start to finish. A description of the work done under this rule shall be reported to the Supervisor on Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221) within 60 days after completion.

0400-52-07-.05 Isolation of Oil, Gas and Fresh-Water-Bearing Strata, and Potential Minable Coal and Other Mineral Deposits.

Notwithstanding compliance with the foregoing requirements, all potential minable coal and other minerals shall be isolated from any possible communication through the annulus with oil-, gas- or water-bearing strata or deposits of other potential minable coal or other minable minerals. Pressure testing of casing as specified in Rule 0400-52-06-.02 and documentation of cementing as required in Rule 0400-52-07-.01 shall constitute the minimum requirements for maintaining isolation through well integrity. In order to ascertain whether cementing has been effectively performed, the operator may elect to either run a cement bond log, or block squeeze each stratum or zone which is required to be isolated. If the cement bond log indicates a minimum of 25 feet of cement bond above the top and 25 feet of bond below the base of each stratum or zone to be isolated, then the provision of this rule shall have been complied with. If such bonding is not shown by the bond log, the Supervisor may require the operator to perform the necessary work to assure the isolation of such above described strata zones.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-08
Directional Drilling

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0400-52-08-.01 Lateral Deviation

(1) No operator shall drill a well in which the well bore deviates laterally a resultant distance greater than that determined by a 5 degree angle from a vertical line passing through the center of the surface location of the well bore, without running a directional survey. If the operator desires to directionally control and thereby intentionally deflect a hole from the vertical (whether more or less than 5 degrees and unless done to straighten the hole or to side-track junk in the hole or because of other mechanical difficulties) a letter of approval shall be first obtained from the Supervisor. Nothing herein shall be construed to permit the drilling of any well in such a manner that it crosses property lines.

(2) Whenever a well is deviated from vertical, the point at which the well bore intersects the producing formation (pool) shall be protected to the surface and become the location of the well in determining if it complied with the spacing rules.

0400-52-08-.02 Inclination Surveys.

An inclination survey shall be made at the discretion of the Supervisor on all wells drilled with the first shot-point at a depth not greater than that of the surface casing seat and succeeding shot-points not more than 1,000 feet apart. Inclination surveys conforming to the requirements may be made either during the normal course of drilling or after the well has reached total depth. Such survey data shall be certified by the operator's representative and/or drilling contractor and shall indicate the resultant lateral deviation as the sum of the calculated lateral

displacement determined between each inclination survey point, assuming that all such displacement occurs in the direction of the nearest property line. If a directional survey determining the bottom of the hole is filed with the Supervisor upon completion of the well, it shall not be necessary to furnish the inclination survey date. Except as otherwise specified herein, all inclination and/or directional survey data shall be filed along with Well History (Form CN-0221).

0400-52-08-.03 Directional Survey

(1) A directional survey shall be run by a qualified contractor approved by the Supervisor and 2 certified copies thereof filed with the Supervisor on any well, if:

(a) The well is directionally controlled and is thereby intentionally deflected from the vertical; or

(b) The resultant level deviation as calculated from inclination survey data is a distance greater than the distance from the center of the surface location of the well bore to the nearest property or unit line and might violate the distance from property lines rule; or

(c) The well bore deviates a resultant distance greater than that determined by a 5 degree angle from a vertical line passing through the center of the surface location of the well bore.

(2) The Supervisor, on his own initiative or at the request of an offset operator, shall have the right to require the operator to run a directional survey on any well if there is reasonable cause therefore. Whenever a survey is so required, and the operator of the well and the offset operator are unable to agree as to the terms and conditions for running such survey, the Supervisor, upon request of either, shall determine such terms and conditions, after notice to all interested parties and a public hearing.

(3) Unless required by the Supervisor, a directional survey shall not be required for any well which is not directionally controlled and thereby intentionally deflected from the vertical and which has a surface location, maximum angle of deviation and total depth, in compliance with the provisions of Chapters 0400-52-01 through 0400-52-12.

(4) The provisions hereof shall not alter or affect the minimum spacing provisions of Chapters 0400-52-01 through 0400-52-12.

0400-52-08-.04 Horizontal Drilling.

(1) Wells drilled by horizontal methods shall comply with the following spacing requirements:

(a) For all oil wells, and for gas wells drilled to the top of the Conasauga Group, the surface trace of that portion of the well bore or any portion of the horizontal drainhole that penetrates the producing formation, including the horizontal drainhole end point, shall not be located closer than 330 feet from any property or unit line.

(b) For gas wells drilled below the top of the Conasauga Group, the surface trace of that portion of the well bore or any portion of the horizontal drainhole that penetrates the producing formation, including the horizontal drainhole end point, shall not be located closer than 660 feet from any property or unit line.

(c) Any number of producing formations may be penetrated by lateral drainholes from a single vertical well bore.

(d) All of the producing portion of the well shall be in compliance with the spacing requirements of this paragraph. The horizontal portion of the well is the formation of record for production.

(2) For all horizontal wells, the operator shall at a minimum cement the production casing from the first packer up to 100 feet inside the intermediate casing. Alternatively, the operator may utilize an appropriate packer at the bottom of the intermediate casing instead of cement. Casing shall have an external collapse pressure rating to handle cement design from termination point to surface. If cement is used, the operator shall use cement with 500 psi compressive strength and have a minimum 8 hour wait, or until cement has adequately set. The operator shall present all cement and casing designs on a specifications sheet with

Permit Application for approval. A copy of cement tickets shall be kept on location to be viewed by the inspector until the drill rig is removed. When unknown or over pressured conditions are encountered a 5000 psi rating on casing shall apply. The operator shall attach a copy of all cement tickets to the well history tickets and shall include all volumes and pressures of job from start to finish.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-09
Well Plugging and Abandonment

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0400-52-09-.01 Plugging Wells

(1) All wells which are to be plugged and abandoned may be filled with a mud fluid of sufficient weight to offset the hydrostatic pressure of any formation penetrated. Sufficient cement plugs shall be efficiently placed in number and properly located as to prevent the commingling of oil, gas, salt water, and fresh water from one zone to another, and to isolate potentially minable coal beds and seams and other potentially extractable minerals. All downhole plugs may be "felt for" to insure that they have been properly placed.

(2) The specific method and procedure for plugging a well shall be as follows:

(a) A mechanical plug, or a brush-and-stone plug, and a neet cement plug of not less than 25 feet in length shall be placed between each geologic group or formation.

(b) A mechanical plug, or a brush-and-stone plug, and a neet cement plug of not less than 50 feet in length shall be placed below the base of the surface casing. The plug shall be placed so that at least 25 feet of cement is below the base of the surface casing and extends up into the casing 25 feet.

(c) A mechanical plug, or a brush-and-stone plug, and a neet cement plug of not less than 25 feet shall be placed at the surface of the well. The surface casing shall be cut off below plow depth at the request of the landowner or when determined appropriate by the Supervisor or his representative.

(d) In a well with casing that does not seal off the ground water, a mechanical plug, or a brush-and-stone plug, and a neet cement plug shall be set 100 feet below the deepest known ground water strata. The cement plug shall be adequate in length to reach at least 10 feet into the casing.

(e) In an uncased well, a mechanical plug, or a brush-and-stone plug, and a neet cement plug shall be set at least 50 feet below the deepest ground water strata and extend up to the surface or just below plow depth if appropriate.

(f) The mechanical plug or the brush-and-stone plug method may be replaced by filling the well from total depth to the surface with cement, provided, however, that such method shall be either prescribed or approved by the Supervisor.

(g) If there is fluid in the well, a dump bailer or tubing may be used to place the cement in the well.

(h) If drill water or mud is present it may be used as filler between the plugs.

(i) If any casing has been installed in the well and has not been cemented to the surface the casing shall be pulled prior to the plugging of the well. If the casing cannot be readily removed the casing shall be shot and then pulled.

(3) Any other methods not defined above, but approved by the Supervisor, may be used.

0400-52-09-.02 Inspection.

The Supervisor or his representative shall be given notice of intent to plug a well at least 12 hours prior to conducting such operation. The Supervisor or his representative may inspect the work of plugging and abandonment as it progresses, check the location and quality of plugs, check the amount of casing pulled, and check the demonstration of movement, if any, of oil, gas, or water. The operator shall submit a Plug and Abandon Report (Form CN-0217) covering the work performed to the Supervisor within 30 days after plugging and abandoning the well. This work may be observed by the Supervisor or his representative and that observance verified by his signature on the Plug and Abandon Report (Form CN-0217).

0400-52-09-.03 Deliverability Test.

Before any well shall be classified as a shut-in gas well, the operator shall furnish the results of a deliverability test. Such deliverability test shall be performed after the well has achieved a stabilized flow rate. If stabilization cannot be achieved, the maximum test period required is 24 hours. The results of the deliverability test shall be submitted on Gas Well Deliverability Tests (Form R-DT-1), and in the initial Production section of the Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221), and shall be complete as to stabilized flow rate, hours tested, choke size, and pressure in order to demonstrate that a stabilized flow rate was achieved. A copy of the chart on which the deliverability is based shall also be submitted. All deliverability tests shall be conducted once every 3 years. The well shall remain shut-in in accordance with the requirements of Rule 0400-52-09-.06. In addition, a gas well may be considered shut-in if the well has been cemented with 4½ inch casing and submitted with a report signed by a petroleum engineer or geologist.

0400-52-09-.04 Time Limit For Plugging Wells.

Except as provided in Rule 0400-52-09-.06, all wells drilled for oil and gas and found to be dry holes shall be plugged within 1 year from cessation of drilling. All wells that are non-producing or abandoned shall be plugged within 1 year from the date they cease producing 12 barrels of oil per year or 25 mcf of gas per month or are abandoned. Upon written request to the Supervisor showing good cause, an extension of up to 90 days additional may be granted. No operator or owner shall permit any well drilled for oil, gas, salt water disposal or any other purpose in connection with the production of oil and gas, to remain unplugged after such well is no longer used for the purpose for which it was drilled or converted. Nothing herein shall prevent utilizing a well for the purpose of introducing air, gas, fresh water or other liquid pressure into or upon the producing strata for the purpose of recovering oil and gas. All wells which are neither producing nor plugged shall comply with shut-in standards of oil and gas wells and shall be cased and capped in such a manner so as to protect all potential oil and/or gas zones, and fresh water in accordance with the requirements of Rule 0400-52-09-.06.

0400-52-09-.05 Surface Reclamation.

(1) Reclamation of well sites, oil or gas pipeline right-of-way, storage facility sites, and access roads.

(a) Except for active work areas, the operator shall drain and fill all surface pits that are not needed for production purposes, and shall grade and stabilize the well location and location road within 30 days of the initial disturbance, in order to minimize surface run-off and prevent excessive erosion and sedimentation. All drilling supplies and equipment, synthetic liners, trash, discarded materials and other refuse not contained and covered in the reclaimed pits shall be removed from the site. Temporary vegetative cover shall then be established on all graded areas.

(b) Within 90 days of the plugging and abandonment of any well, the operator shall remove all production and storage structure, supplies and equipment, any oil, salt water and debris, fill any remaining excavations, and grade any remaining disturbed areas, including access roads. Permanent vegetative cover shall then be established on all disturbed areas, excluding approved permanent, non-erosive facilities, and access roads which are to be turned over to the landowner.

Any access roads necessary for the operator to gain access to the well site in order to determine the adequacy of the vegetative cover or to perform additional re-vegetation may continue to be used by the operator until all of the Board's reclamation requirements have been met.

(c) Upon written request to the Supervisor showing good cause, an extension of up to 90 days additional may be granted to an operator to complete grading and/or vegetation of a well site or access roads.

(2) Re-vegetation - General Requirements.

(a) The operator shall establish, in accordance with paragraph (1) of this rule, on all surface disturbed areas except water areas and surface areas of access roads approved by the Supervisor as permanent roads, a vegetative cover that is in accordance with the approved permit and reclamation plan and that is as follows:

1. Diverse, effective, and permanent;

2. Comprised of species approved by the Supervisor that shall not impede natural vegetative cover; and

3. Capable of long term stabilization of the soil surface from erosion.

(b) The reclamation plant species shall have the following:

1. The same seasonal characteristics of growth as the original vegetation;

2. Be capable of self-regeneration;

3. Be compatible with existing plant and animal species existing in the areas; and

4. Meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws and/or regulations.

(c) Establishment of permanent vegetative cover shall conform with the standards set forth in the most recent version of the Tennessee Erosion and Sediment Control Handbook.

(d) The Supervisor may grant exceptions to the requirements of parts (b)1 and 2 of this paragraph when the species are necessary to establish a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved reclamation plan.

(3) Re-vegetation - Topsoiling, Mulching and Soil Amendments.

(a) Prior to the establishment of a permanent vegetative cover on disturbed areas where excavation activities have occurred, the operator shall replace the excavated topsoil or provide an approved topsoil substitute material suitable for supporting the long range re-vegetation goals.

(b) Suitable mulch and/or other soil stabilizing practice shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes unless the Supervisor waives this requirement based on a determination that seasonal, soil, or slope factors result in a condition whereby mulch or other stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetation cover.

(c) Nutrients and soil amendments shall be applied to the redistributed growth medium prior to re-vegetation when necessary to establish and maintain the vegetative cover.

(4) Diverse Vegetation Cover - Standards for Success.

(a) All previously disturbed and reclaimed areas shall be inspected by the Supervisor or his representative prior to final reclamation bond release in order to determine the level of success of permanent re-vegetation.

(b) Re-vegetation success shall not be determined until after at least two successfully completed spring or summer growing seasons have occurred.

(c) Standards for success shall be based on a ground cover of at least 90% consisting of herbaceous and/or woody species with a minimum of 80% being of perennial varieties.

0400-52-09-.06 Temporary Abandonment.

(1) An operator has the opportunity to place any non-producing well into Temporary Abandonment for 5 years if all of the following requirements are fulfilled:

(a) The operator shall submit a Temporary Well Abandonment Information form (CN-1368) for each well to be placed in Temporary Abandonment. This form can be obtained from Water Resources/Oil and Gas Program.

(b) The operator shall submit a $100 fee for each well per year to be placed in Temporary Abandonment.

(c) Each well shall be capped in such a manner as to have no open casing exposed to the environment (i.e., swedge with locked ball-valve or any other viable protection). The operator shall conduct a well integrity test prior to placing a well into Temporary Abandonment, if no such test has been conducted within the prior 15 years and there has been no oil or gas production from the well in that same time period. Integrity testing shall at a minimum consist of either a Mechanical Integrity Test (MIT) on the casing, or a pressure test on the casing using tubing and and a packer to a minimum of 500 psi. Alternative well integrity confirmation methods, including annual pressure monitoring at the well head, may be accepted at the discretion of the Supervisor.

(d) Any well shown on the Annual Well Report (Form CN-1272) that indicates no production shall be placed in Temporary Abandonment status or plugged.

(e) All fees received for Temporary Abandonment shall be placed in an account that shall be set aside to be used only for funding the plugging of abandoned oil and gas wells.

(2) At the end of the five year Temporary Abandonment period, each well submitted by the operator shall be reviewed by the Department. A determination shall be made on the validity of keeping the well(s) open. This determination for validity shall be based on whether the operator has a deliverability test for each gas well or if the well is producing oil. If the staff finds there is no valid reason to keep the wells open, the operator shall then have two years to plug the non-producing well(s).

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-10
Filing of Well Data, Reports and Maps

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0400-52-10-.01 Information Due Date

The required well data and reports shall be tendered to the Supervisor within 60 days from the date of drilling to total depth of the well. This date is defined as the termination of continuous drilling operations. The due date for

information submitted may not be postponed by the expressed intent to resume operations at some future date.

0400-52-10-.02 Information Required.

The following information is required within 60 days after drilling to total depth:

(1) Two final and unmarked prints of all electrical logs and other downhole surveys, if any. If no logs are run, then "NONE" should be entered in the "TYPE(S) OF GEOPHYSICAL LOGS RUN" section of the Well History Form (Form CN-0221).

(2) Driller's log - a driller's log shall be submitted in one of the following forms:

(a) On reverse side of Well History Form (CN-0221); or

(b) On a separate typed sheet (one copy).

(3) Drilling-time log - One copy for all wells drilled with rotary tools.

(4) Drill-stem test - One final copy of any.

(5) Core analysis - One copy if available.

(6) Completion Report - one copy of Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221) shall be completed, notarized and submitted for each well. All shows of oil and/or gas, water zones, and coal seams penetrated shall be reported on the reverse side of this form. If all the required information is not available at the end of the 60 day period the additional information shall be filed on a supplemental Form CN-0221 within 10 days after completion of the well.

(7) Samples and Cores-well cuttings are required at 10 foot intervals from the top of bedrock to total depth of each well, and shall be submitted to the Tennessee Office of Geology in Nashville according to the following guidelines if requested by the Supervisor:

(a) Well cuttings should arrive in sturdy containers, such as heavy cardboard boxes with sturdy bottoms. Burlap bags are acceptable, but plastic garbage bags are not.

(b) Well cuttings shall be completely dry when received.

(c) Each set of cuttings shall be in its own container. No two seats should be in the same box or burlap bag. If more than 1 container is required for a particular set of cuttings, this should be noted on all containers.

(d) Individual bags should be clearly marked and identified as to operator name, well name and number, permit number and interval. Each container shall be clearly marked with operator name, well name and number, permit number, and county.

(e) Bags should be marked with waterproof ink.

(f) Sets of well cuttings not meeting the requirements of subparagraphs (a) through (e) of this paragraph shall not be accepted by the Tennessee Office of Geology until those requirements are met. Cores which may be required by the Supervisor shall be submitted in adequate boxes clearly marked as to the name of the well and depth intervals.

0400-52-10-.03 Reserved

0400-52-10-.04 Field Map.

Persons or companies operating in a producing area shall furnish the Supervisor with a field map showing lease lines and well locations on request.

0400-52-10-.05 Information Confidential.

Upon request by the permittee to the Supervisor, the aforementioned well information shall be kept CONFIDENTIAL by the Supervisor for a period not to exceed 6 months from the date of drilling to total depth of the well, as defined in Rule 0400-52-10-.01.

0400-52-10-.06 Annual Well Report.

Operators shall file an annual report on each bonded well(s). The report shall include the well(s) name and number, permit number, location, current status of the well(s), any production for the past year, and future plans for the well(s). The annual report shall be due on the 15th of April each year. If the report is not received before May 1st, the well(s) shall be determined abandoned.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-11
Exceptions and Hearings

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0400-52-11-.01 Prevention of Waste

0400-52-11-.01 Prevention of Waste

If any operator can show to the Supervisor that the work procedures herein prescribed result in waste, or such operations are unreasonable, the Supervisor may enter such an order, as a special exception to the aforesaid rules and regulations, as shall prevent such waste or eliminate such unreasonable restraint as may result from the application of the aforesaid rules and regulations to the well or wells of such operators; provided, however, that before any operator shall be allowed the benefit of any order granting an exception as authorized by this chapter, such operator shall establish that such exception, if granted, shall not result in waste in the field as a whole or give him an inequitable and unfair advantage over another operator or operators in the field. No special exception shall be granted except upon written application, fully stating the alleged facts, which shall be acted upon within 20 days after filing the application. At least 10 days prior to acting upon such application, the Supervisor shall give e-mail notice to all operators in the Field. In addition to said notice by e-mail, the applicant shall give adjacent operators, where appropriate, at least 10 days notice by personal service or by Certified Mail. If the Supervisor denies such a request, the operator may appeal to the Board and a contested case hearing shall be scheduled as soon as possible. The Supervisor shall send e-mail notice of such hearing to all operators in the Field at least 10 days prior to the hearing.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-52-12
Violations, Penalties, Notice, Hearing

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0400-52-12-.02 Red Tagging of Wells

0400-52-12-.01 Violations, Penalties, Notice, Hearing

(1) The Supervisor shall have the authority to assess monetary penalties as provided in paragraphs (3), (4), and (5) of this rule for any violation of this chapter, rules and regulations, or any order adopted by the Board. In making such assessment, the Supervisor shall give due consideration to the appropriateness of the penalty with respect to the size of the business of the operator charged, the gravity of the violation, the good faith of the operator, and the operator's history of previous violations.

(2) If, upon an inspection or investigation, the Supervisor or his representative shall determine that any operator is not in compliance with any standard or regulation or rule of the Board promulgated by the Board pursuant to this chapter, he shall with reasonable promptness and in no event later than 6 months following the inspection, issue to the operator by certified mail a written citation that states the nature and, if appropriate, the location of the violation, including a reference to the provision of the chapter and the regulation alleged to have been violated. In addition, the citation shall fix a reasonable time for abatement of the violation. If the issuing Supervisor has reason to believe that such violation, or the failure to abate such violation, should result in the assessment of a penalty under paragraphs (3), (4), and (5) of this rule the citation may so state.

(3) Any operator who has received a citation of this chapter, rules and regulations or order of the Board, promulgated pursuant to this chapter, and has failed to correct such violation within the period of correction of this citation, shall be assessed a penalty of up to $1,000 for each day the violation exists. The period of correction may be suspended or lengthened by the assessing party upon a showing by the operator of a good faith effort to comply with the correction requirements, and that failure to comply with the correction requirements is due to factors beyond his reasonable control.

(4) Any operator who has received a citation for a violation of this chapter, or rules and regulations, or order of the Board and such violation is specifically determined not to be of a serious nature, may be assessed a penalty of up to $1,000 for each such violation.

(5) Any operator who willfully or repeatedly violates the requirements of this chapter, or rules and regulations, or order of the Board promulgated pursuant to this chapter may be assessed a penalty of up to $10,000 for each violation.

(6) Penalties provided for by paragraphs (3), (4), and (5) of this rule shall be imposed in the manner hereinafter provided. Whenever the Board, through the Supervisor, has determined that such a penalty should be assessed against an operator, a written notice and assessment of a penalty shall be issued to the operator by certified mail, return receipt requested, stating the amount of the penalty to be assessed and the reason therefore (which may be done by reference to citations issued prior to or simultaneously with such notification).

(7) Any citation or notice and assessment of a penalty issued pursuant to this rule shall inform the operator of his rights to appeal such citation or assessment of a penalty to the Board. Any such citation or notice shall become final 20 days after the receipt of such citation or notice and assessment of penalty by the operator unless the operator, within the period of 20 days, shall file a written notice of appeal with the Supervisor.

(8) If the operator files an appeal of such citation or assessment of a penalty as provided by paragraph (7) of this rule, the proceedings on such appeal shall be conducted in accordance with the provisions of the Uniform Administrative Procedures Act, as amended, compiled in Title 4, Chapter 5, and the rules of procedure of the Oil and Gas Board governing the conduct of contested cases. The Board shall afford the operator an opportunity for a hearing, after reasonable notice, The Board shall thereafter render a final order, in accordance with the provisions of § 4-5-314, affirming, modifying or vacating the Supervisor's citation or assessment of a penalty. A final order rendered pursuant to this rule shall be effective upon its entry unless a later effective date shall be stated therein. A petition to stay the effective date of a final order may be filed under the provisions of § 4-5-316. A petition for reconsideration of a final order may be filed under the provision *of* § 4-5-317. Judicial review of a final order may be sought by filing a petition for review under the provisions of § 4-5-322.

0400-52-12-.02 Red Tagging of Wells.

If, upon an inspection or investigation, the Supervisor or any of his authorized personnel shall determine that a well or tank battery is not in compliance with any standard or regulation or rule or order of the Board promulgated by the Board pursuant to this chapter, he shall with reasonable promptness and in no event later than 5 working days following the inspection, place a "red tag" (NOTICE THIS WELL CLOSED - Form CN-0110) on the well or tank battery, which notice shall state that drilling or plugging of the well or any further production of oil and gas from the well or tank battery is hereby ordered to be terminated until approval to proceed has been granted by the Supervisor. The notice shall further indicate the nature of the violation or threatened violation, including a reference to the provision of the chapter and the regulation which has been violated.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-53-01
Completion, Recompletion, and Related Downhole Work

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0400-53-01-.01 Time Limit for Well Completion

All wells drilled in connection with the production of oil and gas, unless plugged in accordance with well abandonment procedures as stated in Chapter 0400-52-09, shall be completed within 1 year from cessation of drilling unless the operator is following the procedures outlined in Rule 0400-52-09-.06 Temporary Abandonment.

0400-53-01-.02 Notification for Re-entry.

Notification to the supervisor is required prior to conducting work for the purpose of deepening a well pursuant to producing oil and/or gas.

The operator shall notify the Supervisor 24 hours in advance of conducting this proposed operation.

This rule shall not deter an operator from taking immediate action in an emergency to prevent damage when a service company, other than the drilling contractor, performs any work germane to this rule. The service company shall furnish the operator, and the operator upon request shall furnish the Supervisor with legible and exact copies of reports furnished the owner or operator of the well.

0400-53-01-.03 Report Filing.

The operator shall file a Well History, Work Summary and Completion or Recompletion Report (Form CN-0221) with the Supervisor within 60 days after completing, recompleting or working over a well pursuant to producing oil and/or gas. Wells shall be considered completed when they are capable of being turned into the tanks and/or gas transmission or gathering lines. Well history information shall include the actual materials and volumes used to fracture, the amounts and concentrations of any additives used, the amount of wastewater generated, and the method of disposal of wastewater, for the purpose of making this information easily available to the public.

1) Required disclosures. In the case of any well fractured using a cumulative total of greater than 200,000 gallons of water-based liquids, the following shall apply:

(a) Vendor and service provider disclosures. Service providers who perform any part of a hydraulic fracture using greater than 200,000 gallons of water based liquids and vendors who provide hydraulic fracturing additives directly to the operator for such a hydraulic fracture shall, with the exception of information claimed to be a trade secret, furnish the operator with the information required by subparagraph (b) of this paragraph., as applicable. Such vendors and service providers shall provide this information as soon as possible within 30 days following the conclusion of the fracturing activity and in no case later than 90 days after the commencement of the fracturing activity.

(b) Operator disclosures. Within 60 days following the conclusion of a hydraulic fracture using greater

than 200,000 gallons of water-based liquids, and in no case later than 120 days after the commencement of such hydraulic fracturing activity, the operator of the well shall complete the chemical disclosure registry form and post the form on the chemical disclosure registry, including:

1. the operator name;

2. the date of the hydraulic fracture;

3. the county in which the well is located;

4. the API number for the well;

5. the well name and number;

6. the longitude and latitude of the wellhead;

7. the true vertical depth of the well;

8. the total volume of water used in the hydraulic fracturing of the well or the type and total volume of the base fluid used in the fracturing, if something other than water;

9. each hydraulic fracturing additive used in the hydraulic fracturing fluid and the trade name, vendor, and a brief descriptor of the intended use of function of each hydraulic fracturing additive in the hydraulic fracturing fluid;

10. each chemical intentionally added to the base fluid;

11. the maximum concentration, in percent by mass, of each chemical intentionally added to the base fluid; and

12. the chemical abstract service number for each chemical intentionally added to the base fluid, if applicable.

(c) If the vendor, service provider, or operator claim that the specific identity of a chemical, the concentration of a chemical, or both the specific identity and concentration of a chemical is/are claimed to be a trade secret, the operator of the well shall so indicate on the chemical disclosure registry form and, as applicable, the vendor, service provider, or operator shall submit to the Supervisor a Claim of Entitlement Form notifying the Supervisor that the specific identity of a chemical, the concentration of a chemical, or both is being withheld as a trade secret. The operator shall nonetheless disclose all information required under subparagraph (b) of this rule that is not claimed to be a trade secret. If a chemical is claimed to be a trade secret, the operator shall also include in the chemical registry form the chemical family or other similar descriptor associated with such chemical.

(d) Unless the information is entitled to protection as a trade secret, information submitted to the Supervisor or posted to the chemical disclosure registry is public information.

(e) Inaccuracies in information. A vendor is not responsible for any inaccuracy in information that is provided to the vendor by a third party manufacturer of the hydraulic fracturing additives. A service provider is not responsible for any inaccuracy in information that is provided to the service provider by the vendor. An operator is not responsible for any inaccuracy in information provided to the operator by the vendor or service provider.

(f) Disclosure to health professionals. Vendors, service companies, and operators shall identify the specific identity and amount of any chemicals claimed to be a trade secret to any health professional who requests such information in writing if the health professional provides a written statement of need for the information and executes a confidentiality agreement. The written statement of need shall be a statement that the health professional has a reasonable basis to believe that (1) the information is needed for purposes of diagnosis or treatment of an individual, (2) the individual being diagnosed or treated may have been exposed to the chemical concerned,

and (3) knowledge of the information will assist in such diagnosis or treatment. The confidentiality agreement shall state that the health professional shall not use the information for purposes other than the health needs asserted in the statement of need, and that the health professional shall otherwise maintain the information as confidential. Where a health professional determines that a medical emergency exists and the specific identity and amount of any chemicals claimed to be a trade secret are necessary for emergency treatment, the vendor, service provider, or operator, as applicable, shall immediately disclose the information to that health professional upon a verbal acknowledgment by the health professional that such information shall not be used for purposes other than the health needs asserted and that that health professional shall otherwise maintain the information as confidential. The vendor, service provider, or operator, as applicable may request a written statement of need, and a confidentiality agreement from all health professionals to whom information regarding the specific identity and amount of any chemicals claimed to be a trade secret was disclosed, as soon as circumstances permit. Information so disclosed to a health professional shall in no way be construed as publicly available.

(2) Disclosures not required. A vendor, service provider, or operator is not required to:

(a) disclose chemicals that are not disclosed to it by the manufacturer, vendor, or service provider;

(b) disclose chemicals that were not intentionally added to the hydraulic fracturing fluid; or

(c) disclose chemicals that occur incidentally or are otherwise unintentionally present in the trace amounts, may be the incidental result of a chemical reaction or chemical process, or may be constituents of naturally occurring materials that become part of a hydraulic fracturing fluid.

(3) Trade secret protection. Vendors, service companies, and operators are not required to disclose trade secrets to the chemical disclosure registry or in the Well History Report. If the specific identity of a chemical, the concentration of a chemical, or both the specific identity and concentration of a chemical are claimed to be entitled to protection as a trade secret, the vendor, service provider or operator may withhold the specific identity, the concentration, or both the specific identity and concentration of the chemical, as the case may be, from the information provided to the chemical disclosure registry or in the Well History Report, in the manner provided by paragraph (1) of this rule.

(a) The vendors, service providers, or operators, as applicable, shall provide the specific identity of a chemical, the concentration of a chemical, or both of a chemical claimed to be a trade secret to the Board upon request from the Supervisor stating that such information is necessary to respond to a spill or release or a complaint from a person who may have been directly and adversely affected or aggrieved by such spill or release. Upon receipt of a written statement of necessity, such information shall be disclosed by the vendor, service provider, or operator, as applicable, directly to the Supervisor or his representative and shall in no way be construed as publicly available.

(b) The Supervisor or his representative may disclose information regarding the specific identity of a chemical, the concentration of a chemical, or both the specific identity and concentration of a chemical claimed to be a trade secret to additional Department staff members to the extent that such disclosure is necessary to allow the Department staff member receiving the information to assist in responding to the spill, release, or complaint, provided that such individuals shall not disseminate the information further. In addition, the Supervisor may disclose such information to any Board Member, the relevant county public health director or emergency manager, or to the Tennessee Department of Public Health or the Tennessee Department of Environment and Conservation Directors upon request by that individual. Any information so disclosed to the Supervisor, a Department staff member, a Board Member, a county public health director or emergency manager, or to the Tennessee Department of Public Health or the Tennessee Department of Environment and Conservation Directors shall at all times be considered confidential and shall not be construed as publicly available. The Tennessee Department of Public Health and the Tennessee Department of Environment and Conservation Directors, or his or her designee, may disclose such information to their respective staff members under the same terms and conditions as apply to the Supervisor.

(4) Any party who is adversely affected by a claim of trade secret that the party believes to be improper may file an action for damages pursuant to T.C.A. § 60-1-403 or for injunctive relief pursuant to T.C.A. § 47-25-1703(c).

0400-53-01-.04 Gas/Oil Ratio Tests.

(1) All oil wells drilled shall be equipped so that gas/oil ratios can be taken at any time. Production and gas/oil ratio tests shall be made when requested by the Supervisor, and shall be witnessed by the Supervisor or his representative.

(a) Gas production potential tests shall be made on the Gas Well Deliverability Tests (Form R-DT-1) and submitted as prescribed above to the Supervisor, and conducted every three years until the well is plugged and abandoned when requested by the Supervisor.

(b) Gas wells shall not be tested by the "open-flow" method. The back-pressure method of determining the open-flow, as outlined by the Bureau of Mines in their Monograph 1, "Back-Pressure Data on Natural Gas Wells", shall be used. When for any reasons, the completed back-pressure method is not feasible, an acceptable method, not entailing excessive physical waste of gas may be used upon recommendation of the Department.

(c) Gas/Oil (c: Gas/Condensate) ratios shall be reported on Form CN-0221.

(d) In the event any operator considers that, for the purpose of determining field allowable, his well has not had a fair determination of its gas/oil ratio, or that its gas/oil ratio has changed because of natural causes or corrective work on his well, he may make application in writing to the Supervisor for a re-test or a special test of the gas/oil ratio of his well, and for an adjustment of his well if applicable. If, upon re-testing a well, the Supervisor finds that the new gas/oil ratio justifies a change in the allowable, he is authorized to make such change.

0400-53-01-.05 Reserved

0400-53-01-.06 Gas Composition Analysis.

Gas Composition Analysis shall be completed and submitted to the Supervisor within 60 days after the Supervisor requests such data.

0400-53-01-.07 Bottomhole Pressure Tests.

Bottomhole Pressure Tests shall be conducted and submitted to the Supervisor within 60 days after the Supervisor requests such data.

0400-53-01-.08 Reserved.

0400-53-01-.09 Reserved.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-53-02
Tubing and Well Equipment

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0400-53-02-.01 Reserved
0400-53-02-.02 Connections
0400-53-02-.03 Separators
0400-53-02-.04 Safety Valves

0400-53-02-.01 Reserved.

0400-53-02-.02 Connections.

(1) When requested by the Supervisor or his representative, wellhead connections shall be tested prior to installation at a pressure indicated by the Supervisor in conformance with conditions existing in areas in which they are used.

(2) Whenever such tests are made in the field, they shall be witnessed by the Supervisor.

(3) Tubing and tubingheads shall be free from obstructions in wells used for bottomhole pressure test purposes.

0400-53-02-.03 Separators.

All flowing and gas-lift oil wells are to be produced through efficient operating separators, except in the case of low-pressure headings or gas-lift wells with low-gas output (less than 100 lbs. surface pressure).

0400-53-02-.04 Safety Valves.

(1) A safety valve is required on all flowing wells, with a surface pressure in excess of 1,000 pounds in the following categories.

(a) Any location inaccessible during period of storm or floods.

(b) Location within any wildlife refuges, parks or game preserves, or bodies of water used for recreation or navigation.

(c) Location within 600 feet of public roads or waterways, railroads, inhabited dwellings, or closer than 1,000 feet to any school or church.

(2) Where the use of safety valves would unduly interfere with normal operations of a well, the Supervisor may, upon submission of pertinent data in writing, waive the requirements of this rule.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-53-03
Prevention of Hazards and Pollution

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0400-53-03-.01 Safety
0400-53-03-.02 Environment

0400-53-03-.01 Safety

(1) Each operator shall so conduct his operations and maintain his equipment as to reduce to a minimum the danger of explosion, fire, or waste.

(2) All tests for production should be started and completed during daylight hours unless approval is obtained by the Supervisor.

(3) No boiler, open fire, or electric generator shall be operated within 100 feet of any producing oil or gas well or oil tank.

(4) Any rubbish, debris, or vegetation that might constitute a fire hazard shall be removed to a distance of at least 100 feet from the vicinity of wells to be tested.

(5) All waste shall be disposed of in such a manner as to avoid creating a fire hazard or polluting streams

and fresh water strata.

(6) No test oil, condensate, salt water, or any other fluid substance shall be discharged to or disposed of in any way into any stream, lake, or other body of water, or into any ditch or surface drainage depression leading to any stream, lake, or other body of water, except in compliance with the Water Quality Control Act T.C.A. §§ 69-3-101 et seq. and the regulations of the Board of Water Quality, Oil and Gas, Chapter 1200-04-03.

(7) All wells shall have the equipment and containers or lined pits necessary to prevent the spillage of oil, condensate, water, or any other fluids or substances produced or used during any production test. The equipment shall be in place prior to the start of the production test, and shall be large enough to contain any plausible spill.

(8) All wells shall be cleaned into a pit or tank, located at a distance of at least 100 feet from any fire hazard or dwellings. If it seems likely that a pit will overflow, additional pits shall be constructed, or else tanks shall be brought in to contain the surplus fluids.

(9) No oil or gas well shall be drilled closer than 200 feet from a dwelling or closer than 100 feet from a state highway or county road.

(a) That portion of this regulation concerning distance from a dwelling may be waived by the Supervisor upon submission of a notarized statement by the dwelling owner agreeing to the well location.

(10) No oil or gas well shall be drilled within 200 feet of any water well that is in active use. This requirement may be waived by the Supervisor upon submission of a notarized statement from the well owner agreeing to the location of the oil or gas well and a plan identifying the additional measures to be taken to prevent pollution of the water well.

(11) No oil or gas well shall be drilled within 100 feet of any stream, lake, or other body of water, so that an undisturbed riparian zone can be maintained, except that this requirement may be waived upon submission of a plan identifying additional measures acceptable to the Supervisor to be taken to prevent pollution of the waters of the State. No oil or gas well shall be drilled within 330 feet of any water body designated as an Outstanding National Resource Water (ONRW).

(12) The siting of wells, pits, or storage facilities in wetlands or in flood-prone areas (as indicated by the observed high water mark) of a stream is prohibited.

0400-53-03-.02 Environment

(1) All personnel, including operators and service personnel shall be trained in the prevention of spills and made aware of the consequences of spillage. There shall be a Site Coordinator designated for each well site who shall be the principle contact for all activities on the location and the responsible party for submitting an action and safety plan for each well site. The action plan shall include contingency measures to mitigate and minimize the risk of failure, spills, or releases due to unplanned events. Site Coordinators shall be certified by completing the Tennessee Site Coordinator Training Course. Equivalent training credentials may be temporarily accepted at the Supervisor's discretion until such time as the course certification can be obtained.

(2) Operators shall implement necessary procedures and safeguards during drilling and completion operations to prevent the uncontrolled flow of oil from wells, including, but not limited to:

(a) Follow reasonable procedures such as cleaning and lubricating pipe threads so that pipe can be made up to proper tightness.

(b) Lay flow and test lines on ground or install adequate supports for crossing streams and drainways with the lines.

(c) At truck loading terminals, provide containers to catch unrecoverable oil at the hose connections, and provide proper maintenance of valves and other equipment. Train personnel to take

necessary procedures to prevent spillage.

(d) During completion operations, produce and clean wells into tanks instead of pits if at all possible.

(e) At the same time that any pits or other diversion, transport, or storage facilities are constructed at ground level, dikes, diversion ditches, or other structures shall also be constructed to prevent any surface water from entering the pits or other facilities.

(f) Remove oil, salt water, or other fluids from pits as soon as practical after it has accumulated in them, and dispose of it in such a way that none can enter surface water or ground water, or otherwise adversely affect the environment or threaten public health and safety. Uncontaminated fresh water (free of salt, hydrocarbons or other potential pollutants) produced during drilling operations may be land applied on site.

(g) All pits or other diversion, transport, or storage facilities shall be constructed so that waste fluids do not discharge from them. There shall be no discharge pipe, overflow weir, trickle tube, or any other device allowing any discharge. The operator is responsible for maintaining adequate storage capacity at all times. No pit shall be located so that any part of it, including a dike or diversion structure, is within a horizontal distance of 100 feet of the normal high-water line of any stream or lake. All pits shall be lined using a synthetic liner of at least 10 mil thickness. If a rocky or uneven surface is encountered in pit construction, sand or sandy material shall be placed below the liner sufficient to protect the liner from damage. The synthetic liner shall be protected from deterioration, punctures, or other activity that may damage the integrity of the liner. As an alternative, compacted clay liners or other equivalent measures may be used at the discretion of the Supervisor. In areas where groundwater is close enough to the surface that it will be encountered in construction of a pit, pits shall be constructed above ground, or the operator shall use a closed-loop system.

(h) Containment at tanks shall equal at a minimum the storage capacity of 1½ times the capacity of the largest tank in the tank battery.

(i) All tanks shall be maintained to prevent corrosion which can lead to both fluid loss from the vessel and accelerated reduction in its useful life span.

(j) To prevent fire hazard, all tank batteries and tanks shall be kept free of brush or overgrowth within the berm surrounding the tank or tanks.

(k) Dikes and ditches designated in subparagraphs (e) and (g) of this paragraph should be constructed in a manner to accommodate permanent facilities such as pumping units and flow lines.

(l) Provide dikes and/or containment pits at storage tanks upon initial installation where such tanks are so located as to be deemed hazardous. If containment pits are to be used, they should be constructed according to the guidelines set forth in Rule 0400-54-01-.05.

(3) The following additional requirements shall apply to mud and reserve pits.

(a) The operator shall indicate in the drilling application that mud and/or reserve pits are to be constructed. The application shall include at a minimum the size and configuration of the pits, the liner to be used, the type of fluid system and drilling fluids to be used, and the method of disposal of all drilling fluids used at the site.

(b) Mud circulation and reserve pits shall be constructed with a synthetic liner of at least 20 mil thickness, with a 4 inch welded seam overlap, completely covering the pit bottom and inside walls. Other materials and methods used for liner construction must be approved by the Supervisor prior to use.

(c) Mud circulation and reserve pits shall be constructed and operated with a minimum of 2 feet of freeboard, and shall be designed so that only runoff from the immediate work area may enter the pit. Pits constructed above ground with bermed side walls shall be constructed with a minimum

of 2:1 side slopes on both interior and exterior walls. The top of the bermed walls must be a minimum of 2 feet wide.

(d) Closed loop systems may be used for mud and circulation, and must be maintained in a leak-free condition.

(4) Operators shall implement prudent production operations to prevent potential oil spills, including, but not limited to:

(a) Connect fill lines to storage tanks so that oil and gas shall not spray into the atmosphere.

(b) Install "equalizer" lines between adjacent tanks as a safeguard against overflow.

(c) Install oil and gas separators where gas is produced in sufficient quantities to be hazardous.

(d) Pump contaminated unsalable residual oil from storage tanks into an accumulator tank instead of open pits.

(e) Place locks, remove handles, or otherwise secure all valves, so vandals cannot open them to cause spills.

(5) The Supervisor should notify all oil industry related companies, including operators, service companies, drilling contractors, and crude oil gatherers and purchasers of their responsibility and liability in regard to oil spills. In the case of a spill of oil, saltwater, or other drilling or production associated materials, the operator shall contact the Supervisor or his representative within 12 hours upon knowledge of the spill.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-01
Pollution and Safety Controls

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0400-54-01-.01 Operator's Responsibility

Each operator shall so conduct his operations and maintain his equipment as to reduce to a minimum the danger of explosion, fire, or waste.

0400-54-01-.02 Proper Handling of Drilling Foam.

When it becomes necessary to use detergents during air-rotary drilling operations, the foam generated by such activity shall be directed into a containment pit and retained there until it has been degraded to a harmless form.

0400-54-01-.03 Proper Disposal of Waste.

No waste oil, oil field waste, or any other fluid substance shall be discharged to or disposed of in any way into any stream, lake, or other body of water, or into any ditch or surface drainage depression leading to any stream, lake,

or other body of water, except in accordance with a discharge permit obtained from the Department. No solid waste, including but not limited to contaminated soils at a well site, shall be disposed of except as allowed by the Solid Waste Disposal Control Act T.C.A. §§ 68-211-101 et seq.

Any Naturally Occurring Radioactive Material (NORM) or Technically Enhanced Naturally Occurring Radioactive Material (TENORM) produced at a well site shall be disposed of in accordance with the Tennessee State Regulations for Protection Against Radiation, Chapter 0400-20-05.

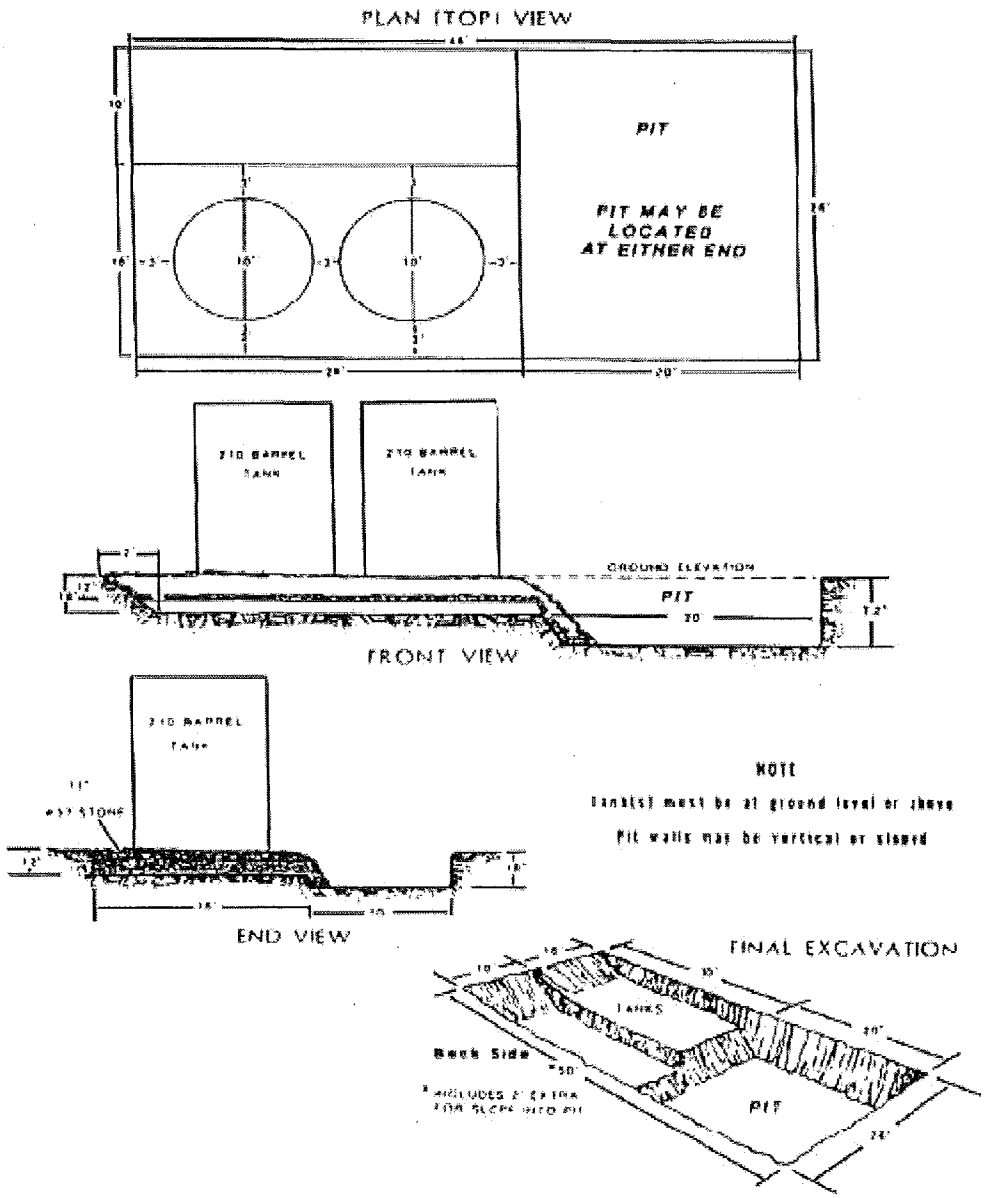
0400-54-01-.04 Removal of Debris.

Any rubbish or debris that might constitute a fire hazard shall be removed to a distance of at least 100 feet from the vicinity of wells, tanks and pump stations.

0400-54-01-.05 Containment Pit at Tank Batteries.

A containment pit is required at each permanent oil tank or battery of tanks, and such pits shall be surrounded by a retaining wall or suitably ditched to a collecting sump, each of sufficient capacity and construction to contain potential spillage. Tank batteries shall not be located closer than 100 feet from any state highway or county road.

CONSTRUCTION DETAILS FOR TANK PAD AND PIT



0400-54-01-.06 Vents Required.

All storage facilities shall be vented.

0400-54-01-.07 Improper Loading.

Oil transporters and producers shall not load oil from oil storage facilities into vehicles parked on public roads.

0400-54-01-.08 Gathering Lines.

All gathering lines shall be buried beneath the surface wherever no blasting is required, and shall be steel or weather resistant black plastic wherever outcropping, resistant rock makes it necessary to lay the pipe on top of the ground. Lines crossing streams, rivers, intermittent streams or other drainways shall be constructed in such a fashion as to bridge the drainage features and protect the gathering lines from damage due to lack of adequate support. Failure of support may result in rupture of or discharge from the line. If the line is to be installed below the stream bed or below ground level and shall cross state waters an Aquatic Resources Alteration Permit shall

be obtained prior to the activity occurring. Burial is not required, however, in those instances where this would conflict with the Natural Gas Pipeline Safety Act and rules at 40 CFR Part 192.

0400-54-01-.09 Improper Casing.

All producing wells that are not properly cased and/or cemented shall cease production. The operator is required to perform corrective work before production can be resumed.

0400-54-01-.10 Disposal of Salt Water.

(1) Underground injection is the preferred form of disposal of salt water, provided, however, that such injection is permitted by appropriate State and Federal agencies.

(2) Produced salt water may either be injected into a subsurface formation(s) productive of hydrocarbons, if part of an approved secondary recovery project, into a subsurface formation(s) not productive of hydrocarbons, if through an approved salt water disposal well, or else may be transported off-lease to an authorized salt water disposal facility if prior approval has been granted by the Department.

(3) Produced salt water shall not be put in any unlined pit, pond, lake or depression, or in any other place in a manner that shall constitute a pollution hazard to the waters of the State including ground water.

(4) No salt water or fracturing liquids shall be discharged to or disposed of at the land surface where they can enter surface water or ground water, unless such discharge is permitted by appropriate State and Federal agencies. Salt water or fracturing liquids discharged to and temporarily stored in lined pits shall be removed before they can leak into underground water.

(5) All pits or ditches used for temporary storage or transport of salt water shall be lined with an impermeable man-made liner in accordance with the liner requirements specified in subparagraph (2)(g) of Rule 0400-53-03-.02.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-02
Procedures and Equipment for Metering, Measuring and Producing Oil Condensate and Gas

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0400-54-02-.01 Gas/Oil Ratios Equipment

All leases are to be so equipped as to permit the determination of gas/oil ratios on individual flowing and gas-lift wells. Gas/oil ratio data on all wells shall be available to the Supervisor at all times.

0400-54-02-.02 Gauging.

Each lease shall be provided with sufficient tankage and/or meters to permit proper gauging of the oil/condensate and gas produced. The tanks or meters shall be identified by a sign showing the ownership of the tanks or meters and the name of the lease from which the oil/condensate or gas is being produced. In no case shall meters be the sole means of measuring oil runs from any field. There shall be used at least one gauge tank to check the readings of oil and condensate meters.

0400-54-02-.03 Testing.

All oil tendered to any transportation system shall be gauged and tested for Basic Sediment and Water and temperature. For each and every transfer of oil from the lease tanks the number of the "on-seal" observed temperature and the percent of Basic Sediment and Water shall be recorded on each and every run ticket, and the producer and purchaser of any transfer of oil from lease tanks shall receive a copy of the run or delivery ticket or tickets.

0400-54-02-.04 Improper Transfer.

There shall not be any simultaneous movement of oil into and out of any tank that is being used for delivering oil to a gatherer or transporter. Transfer of oil or gas from the possession of one lease to the possession of another lease, except when properly accounted for, is hereby prohibited. The possession of improper mechanical means for transferring oil from one lease tank or well to the lease tank or well of another lease is hereby prohibited.

0400-54-02-.05 Lease Tank Outlets.

All pipeline outlets from lease tanks shall be kept sealed at all times except when a pipeline is being made from the tank, and the number of the "on-seal" and "off-seal" shall be recorded on each and every run ticket. Additionally, all pipeline outlets from lease tanks shall be made secure to prevent the unauthorized discharge or transfer of oil.

0400-54-02-.06 Bleed-Off Lines.

Basic Sediment and Water bleed-off lines of lease tanks shall be sealed or locked at the time any pipeline run is being made.

0400-54-02-.07 Commingling Prohibited.

Oil produced from separately owned leases, not pooled, unitized, or consolidated shall not be commingled in lease tanks except as hereinafter provided for in this order.

0400-54-02-.08 Required Test Lines.

Reserved.

0400-54-02-.09 Reserved

0400-54-02-.10 Reserved.

0400-54-02-.11 Reserved.

0400-54-02-.12 Reserved.

0400-54-02-.13 Basic Orifice Coefficients.

Basic orifice coefficients used in the calculation of gas flow shall be those contained in the American Gas Association's Gas Measurement Committee Report No. 3 or some other basic orifice coefficients generally accepted in the industry and approved by the Supervisor, such as those published by the Foxboro Company, American Meter Company, and Pittsburg Equitable Meter Company. Corrections for base pressure and base temperature shall be made. Corrections for supercompressibility are recommended when available. Corrections

for Reynolds number and expansion factor are recommended only in cases where their combined correction is equal to or exceeds 1%.

0400-54-02-.14 Pilot Tubes.

Gas measurements with Pilot Tubes shall be based on Reid's formula and shall follow recommendations similar to those set forth in Appendix 4 of the Bureau of Mines Monograph 7. Corrections for base pressure and base temperature shall be made as in orifice measurements.

0400-54-02-.15 Gas Measurements.

Gas measurements with orifice well tests shall follow recommendations similar to those set forth in Bulletin No. E-7 of the American Meter Company. Corrections for base pressure and base temperature and gravity shall be made as in orifice measurements.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-03
Requirements for Reporting the Volume and Disposition of Oil and Gas Produced

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0400-54-03-.01 Time Reports

The length of time reports and other pertinent data, covered by this chapter, shall be kept on file by the operators and available for inspection by the Supervisor or members of his staff, for not less than a period of 3 years.

0400-54-03-.02 Month Defined.

A "month" and "calendar month" shall mean the interval of time from 7:00 a.m. on the first day of any month of the calendar to 7:00 a.m. of the first day of the next succeeding month of the calendar.

0400-54-03-.03 Reserved.

0400-54-03-.04 Reserved.

0400-54-03-.05 Reporting-Producers.

Each producer of oil and such producer of condensate from a gas well, where produced in liquid form at the wellhead by ordinary production methods or as Calculated Theoretical Condensate, defined as the amount of condensate (allocated back to lease) that normally would be separated by conventional methods from natural gas well volumes flowing full stream directly to a plant without any condensate separation having been made at lease or a plant, shall furnish for each year an Annual Well Report (Form CN-1272) pursuant to Rule 0400-52-10-.06

setting forth complete information and data indicated by such reports respecting oil produced from every lease operated by said producer and respecting condensate produced from gas wells at the wellhead in liquid form by ordinary production methods from each lease operated by said producer.

0400-54-03-.06 Monthly Reporting-Transporters.

Each transporter of oil and condensate shall furnish for such calendar month a Transporter's and Storer's Monthly Report for Crude Oil and/or Condensate (Form CN-0229) containing complete information and data indicated by such form including the quantity of oil removed from each lease and permit numbers of producing wells on each lease.

0400-54-03-.07 Reserved.

0400-54-03-.08 Report Filing.

The transporter's and storer's reports for each month shall be prepared and filed according to instructions on the form, on or before the 25th day of the next succeeding month.

0400-54-03-.09 Computing Method.

All quantities included in the reports provided for in this chapter shall be reported in barrels computed from 100% tank tables and based upon actual physical gauges.

0400-54-03-.10 Report Verification.

All reports provided for in this chapter shall be verified by affidavit in the form or forms indicated; any reports not so verified shall not be taken as filed in compliance with this chapter.

0400-54-03-.11 Monthly Report-Gas.

All gas produced within the State of Tennessee, excepting gas vented from stripper wells, shall be reported on the Annual Well Report (Form CN-1272) and Monthly Gatherer's and/or Transporters Natural Gas Report (CN-0244). Every producer shall complete the Annual Well Report (Form CN-1272) pursuant to Rule 0400-52-10-.06. Every transporter shall complete Form CN-0244. The transporter thus required to report, shall execute under oath and file in the manner hereafter directed on or before the last day of each month, Form CN-0244, setting forth fully the data and information indicated by such form, which shall be completed as to data covering the calendar month next preceding the date of filing.

0400-54-03-.12 Monthly Report-Plant.

Each operator of a gasoline plant, cycling plant, or any other plant at which gasoline, butane, propane, condensate, kerosene, oil or other liquid products are extracted from natural gas, shall be furnished for each calendar month. Such report for each month shall be prepared and filed before the last day of each month.

0400-54-03-.13 Report-Gas Gatherers.

Gas gatherers shall report the amounts of gas handled and disposed of on Monthly Producers Natural Gas Report (Form CN-0239). The gas which he has produced in the field shall be reported on Form CN-0239, under the section of the report entitled "Production." The gas gathered in the same field along with gas which he has gathered in nearby fields and transported to that field shall be reported on the same form, under the section entitled "Acquisitions." He shall indicate in this section the company from whom the gas was received, the field from which this gas was produced, and the amount of gas received. In the event the gatherer has produced no gas in the field from which he is gathering, then he shall indicate in the Production Section of Form CN-0239 that he has no gas production. His acquisition in that field shall be listed in the Acquisitions section.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-04
Ratable Take

Table of Contents

0400-54-04-.01 Taking Oil and Gas Ratably

0400-54-04-.01 Taking Oil and Gas Ratably

(1) It is required that oil and gas be taken ratably from wells producing from a common pool. The application of vacuum at the wellhead of a well, or upon any gas or oil-bearing reservoir is prohibited, except on application, notice and hearing. A copy of the application and notice of hearing shall be mailed by certified mail to each offset operator within 5 days after the application is filed. Wherever authority is granted to impose a vacuum, a continuous record thereof shall be kept by the operator as required by the order authorizing same. The record shall be made available to the Board on request. Should any operator, or a person with financial interest feel that oil and gas is not being taken ratably from well or wells in which he participates, then he may make that fact known through application for a public hearing and present and exhibit appropriate technical data to demonstrate such positions to the Board. A decision shall be made by the Board provided the applicant complies with the rule governing said hearings.

(2) At a minimum, consideration of approval for use of a vacuum pump shall include the following:

(a) A comprehensive presentation of the information pertinent to the request;

(b) Well histories of the well in question and surrounding wells;

(c) Electronic logs, if available, for each well;

(d) 7½ minute topographic quadrangle maps indicating the location of each well within one mile of the well site;

(e) A property map of the same area showing the surface owners, and mineral lease holders on surrounding properties; and

(f) A copy of a signed document, from each interested party, i.e., surrounding landowners and lease holders, stating that they have no objection to the well in question being pulled on a vacuum.

(3) Subparagraph (2)(f) of this rule may be waived if the gas that is pulled from the well is re-injected back into the same reservoir(s) as it is pulled from as a secondary recovery operation.

(4) All requests made to the Board shall include the requirements of paragraph (2) of this rule.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-05
Commingling and Automatic Custody Transfer of Hydrocarbons

Table of Contents

0400-54-05-.01 Permission to Commingle
0400-54-05-.02 Notice Publication
0400-54-05-.03 Granting Permission
0400-54-05-.04 Meter Calibrations
0400-54-05-.05 Operational Limitations
0400-54-05-.06 By-Pass Lines
0400-54-05-.07 Reserved
0400-54-05-.08 Retention of Reports

0400-54-05-.01 Permission to Commingle.

Permission to commingle gas and/or liquid hydrocarbons and to measure and transfer custody of liquid hydrocarbons by use of methods other than customary gauge tanks may be obtained without the necessity of a public hearing, in the absence of protest, as hereinafter provided, and upon strict compliance with the procedure set forth herein.

(1) Detailed schematic diagram of the mechanical installation to be used with adequate explanation of the flow of gas and/or liquid hydrocarbons and indicating locations of locking devices and seals to provide assurance against, or evidence of, tampering.

(2) Statement by the producer that in his opinion the use of the proposed method shall provide reasonably accurate measurement and shall not create inequities.

(3) A list of all known interested parties, including operators and royalty owners, affected by the application.

0400-54-05-.02 Notice Publication.

Notice of the filing of an application for projects applicable to this chapter shall be published in a newspaper of general circulation in the county wherein the field is located.

0400-54-05-.03 Granting Permission.

Upon the basis of application as herein provided, no permission for projects applicable to this chapter shall be granted if, in the judgment of the Supervisor, the data and information submitted does not warrant the approval of the application or if any party protests the application by filing written protest with the Supervisor within 15 days following the first publications of the notice of the application; however, in either of the foregoing events, the application may be set for public hearing at the election of the applicant or the Supervisor.

0400-54-05-.04 Meter Calibrations.

The applicant shall provide a suitable means of calibrating each meter used for measurement of hydrocarbons in order that its accuracy in operation can be proven, such calibration to be done before or at the time the meter is initially installed and at such intervals or other times as the Supervisor or his representative shall, after consideration of the inherent characteristics of the particular equipment, deem proper. The results of all meter calibrations required by this order shall be certified as being true and correct by the party performing the calibration. These results shall be available upon request to the Supervisor or his representative.

0400-54-05-.05 Operational Limitations.

The approved custody transfer or commingling installation shall be permitted to operate so as to transfer or commingle, as produced, the hydrocarbons produced from the well or wells served by such installation. The limitations on the operation of such installation are as follows:

(1) The daily production rate from any well or wells shall not cause waste.

(2) Unless otherwise permitted, no production from a well in a prorated pool in excess of the total monthly allowable may be transferred during a calendar month.

(3) The production from any given well in any one day shall not be increased more than 25% of the legally permissible hydrocarbon production from such well or wells.

0400-54-05-.06 By-Pass Lines.

Permission, in writing, from the Supervisor shall be obtained for all by-pass lines or other lines that shall permit flow around the regular meter, and each such line shall have a meter that shall permit individual well measurement.

0400-54-05-.07 Reserved

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

0400-54-05-.08 Retention of Reports.

Should approval be given, the applicant shall indicate in the "Remarks" column on the current CN-0239 form that appropriate well tests have been conducted. The applicant shall retain the actual reports of such tests and such reports shall be kept on file, and available for inspection by the Supervisor or any party at interest for a period of not less than 3 years.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-06
Limiting Production

Table of Contents

0400-54-06-.01 Prorating a Pool

0400-54-06-.01 Prorating a Pool

The Board, after public hearing, may prorate a pool for the purpose of protecting correlative rights and to minimize the waste of oil and/or gas. Prior to prorating a pool, its wells may be shut-in until subparagraph (1)(h) of Rule 0400-52-04-.01 is complied with, or in lieu thereof, a poolwide unit is established.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-07
Regulating High Gas/Oil Ratio Wells and Preventing Waste of Gas

Table of Contents

0400-54-07-.01 Classification
0400-54-07-.02 Escaping Gas
0400-54-07-.03 Unitization
0400-54-07-.04 Wells Regulated
0400-54-07-.05 Gas-Lifted Wells
0400-54-07-.06 Application of Rules

0400-54-07-.01 Classification.

An oil well with a gas/oil ratio in excess of 2,000 cubic feet of gas per barrel of oil (2,000:1) shall be considered a high gas/oil ratio well and may be limited by the Supervisor in the amount of gas permissible to produce.

0400-54-07-.02 Escaping Gas.

No gas shall be flared or permitted to escape into the atmosphere, but shall not be utilized without waste, except upon approval of the Supervisor or where special orders are operative. If necessary to prevent undue waste of gas or dissipation of reservoir energy, the Board may limit venting of gas.

0400-54-07-.03 Unitization.

An attempt shall be made to unitize all pools, or reservoir, with high gas/oil ratios.

0400-54-07-.04 Wells Regulated.

Production from wells in pools or reservoirs that have both oil and gas production shall be regulated by the rules

of this chapter.

0400-54-07-.05 Gas-Lifted Wells.

Wells that are gas-lifted with gas from gas wells shall be prorated in the same manner as are high-ratio naturally flowing oil wells after subtracting the input gas from the output gas. The uneconomical or unreasonable use of gas for gas-lifting shall not be permitted.

0400-54-07-.06 Application of Rules.

If gas is produced from an oil reservoir or common source of supply and is returned to the same source, only gas not returned or utilized for lease or unit operations shall be considered in applying the rules of this chapter.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-08
Subterranean Gas Storage

Table of Contents

0400-54-08-.01 Conditioned Usage

0400-54-08-.01 Conditioned Usage.

Application for usage of subterranean reservoirs for gas storage shall be submitted to the Board. The Board may, after public hearing, grant the applicant's request conditioned as follows:

(1) That the underground reservoir sought to be used for the injection, storage and withdrawal of natural gas is suitable and feasible for such use, provided no reservoir, any part of which is producing or is capable of producing oil and gas in paying quantities, shall be subject to such use, unless all owners in such underground reservoir shall have agreed thereto in writing; or

(2) Unless such reservoir has a greater value or utility as an underground reservoir for gas storage than for the production of the remaining volumes of original reservoir natural gas and condensate, and all owners, in interest shall have consented to such use in writing; and

(3) That the use of the underground reservoir for the storage of natural gas shall not contaminate other formations containing fresh water, oil, gas, or other commercial mineral deposits; and

(4) That the proposed storage shall not endanger lives or property; and

(5) That the storage reservoir may be drilled through, in a prudent manner, for the purpose of exploration for, or producing, underlying oil and/or gas pools.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-54-09
Pressure Maintenance Projects and Secondary Recovery

Table of Contents

0400-54-09-.01 Application
0400-54-09-.02 Administrative Approval
0400-54-09-.03 Approval by Special Order
0400-54-09-.04 Poolwide Unit-Formation
0400-54-09-.05 Casing and Sealing Wells

0400-54-09-.06 Input Well Procedure
0400-54-09-.07 Pro-rata Payment
0400-54-09-.08 Application for Hearing

0400-54-09-.01 Application.

Any person desiring to institute secondary recovery or pressure maintenance projects shall apply to the Supervisor by letter setting forth the request, and submit a Pressure Maintenance and Secondary Recovery Questionnaire (Form CN-0141).

0400-54-09-.02 Administrative Approval.

If the common source of supply, for which such operations are to be instituted, lies within a single lease, or all interested parties voluntarily agree, the project may administratively be approved by the Supervisor.

0400-54-09-.03 Approval by Special Order.

All other categories of secondary recovery and pressure maintenance projects shall be approved by special order, after a public hearing and by determination of the Board that waste shall be prevented and the unit operation shall increase ultimate recovery; that the unit operation is feasible; that each owner shall receive his just and equitable share; and that 50% or more of the owners have approved the unit operation.

0400-54-09-.04 Poolwide Unit-Formation.

When the common source of supply is not restricted to a single lease, a poolwide unit shall be formed prior to the Oil and Gas Board granting approval for secondary recovery and pressure maintenance projects.

0400-54-09-.05 Casing and Sealing Wells.

Wells drilled or reworked for use in the injection of fluids or gases shall be adequately cased and sealed to prevent injection or migration of injected substances into any strata or stratum other than the objective.

0400-54-09-.06 Input Well Procedure.

The drilling and plugging of any input well shall follow the same procedure that is employed in drilling or plugging oil and gas wells.

0400-54-09-.07 Pro-rata Payment.

The owners of working interest in secondary recovery and pressure projects are required to pay their pro-rata share of the cost of equipping and operating said project. If any working interest owner fails to tender this just and reasonable share of costs, the Board may provide that the operator shall withhold all proceeds and be reimbursed for the non-participating owner's share of the proceeds to the extent of 150% to 200% of the amount advanced.

0400-54-09-.08 Application for Hearing.

Any owner may apply for a hearing before the Board to obtain relief from unjust and unreasonable costs assessed by the project operation, provided he shows that he has either conferred or attempted to confer with the operator for the purpose of settling the dispute prior to making application to the Board.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-55-01
Unit Operations

Table of Contents

0400-55-01-.01 Unit Operation
0400-55-01-.02 Drilling and Production Units
0400-55-01-.03 Poolwide Units

0400-55-01-.01 Unit Operation.

(1) Unit operations shall be ordered by the Board only after notice and hearing and shall be based on findings that:

(a) The order is reasonably necessary to conserve the natural resources of the State; shall prevent waste of oil and gas, and the drilling of an unnecessary well or wells; shall appreciably increase the ultimate recovery of oil and gas from the affected pool; is economically feasible; and shall protect correlative rights of both landowners and owners of mineral rights.

(b) The order shall provide for the allocation to each separate tract within the unit a proportionate share of the unit production, thereby ensuring the recovery by the owners of that tract their just and equitable share of recoverable oil or gas in the unit.

(c) The order shall provide the designation of a unit operator, but only with the consent of the designated person, and approve the terms and plans of the unit operating agreement in the absence of a voluntary agreement among the owners.

(d) The order shall make provision for the proportionate allocation of cost to the producers, which allocation shall be in the same proportion that the separately owned tracts share in unit production. The cost of capital investment in wells and physical equipment and intangible drilling cost shall be shared in like proportion, provided that no such producer or owner who has not consented to the unitization shall be required to contribute to the cost or expenses of the unit operation, or to the cost of capital investment in wells and physical equipment and intangible drilling cost, except out of proceeds of production accruing to the interest of such owners out of production from such unit operation. However, no well costs credit allowable shall be adjusted on the basis of less than the average well costs within the unitized area. If any producer or owner fails to tender his just and reasonable share of cost, the Board may provide that the operator shall withhold and be reimbursed for the non-participant's share of cost of the proceeds to the extent of 350% of the amount advanced.

(e) It is provided, however, that the order requiring unit operation shall not vary nor alter any of the terms of the required written contract or contracts evidencing approval nor impose any terms or operations upon the nonsigners of said contract or contracts more onerous than the terms and operations set out in said contract or contracts.

(f) The order shall provide for the forced integration of separately owned tracts and other property ownership into drilling, production, or pool units. Continuous operations incident to the drilling of a well upon any portion of a unit shall be deemed, for all purposes, the conduct of such operations upon each separately owned tract in the unit. That portion of the production allocated to each separately owned tract included in a unit shall, when produced, be deemed for all purposes to have been actually produced from such tract by a well drilled thereon.

0400-55-01-.02 Drilling and Production Units.

(1) Any owner with interest in a tract of land offsetting production and who cannot comply with the spacing rules for drilling a well on said tract may make application for a hearing before the Board for the purpose of having the tract, or a portion thereof, included in a production unit.

(2) Drilling and production unit wells shall comply with the rules on spacing between wells and distance from property lines as prescribed in Chapters 0400-52-01 through 0400-52-12.

(3) The shape and pattern of production and drilling units should be designed to permit the attendant unit well to economically, efficiently and equitably drain the unit's pro-rata share of the pool's oil and/or gas, and shall be based on available geologic and engineering parameters. Length of any drilling unit shall not exceed twice its width.

0400-55-01-.03 Poolwide Units

(1) Poolwide units may be formed on a volumetric or surface area basis provided that sufficient data are available to determine the geometry and to define the physical characteristics of the reservoir.

(2) Drilling, production, or poolwide units can only be revised by the Board if new pertinent geological or engineering evidence becomes available which was not in existence at the time a unit was formed.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-56-01
Hearings and Administrative Approval

Table of Contents

0400-56-01-.01 Hearings
0400-56-01-.02 Administrative Approval

0400-56-01-.01 Hearings.

(1) Public hearings, after legal notice, shall be held by the Board as needed by the Board to implement its responsibility and upon applications made for such hearings. A notice of public hearing as provided by T.C.A. § 60-1-204 shall be given by publishing 1 notice of the time and place thereof in at least 3 newspapers of general circulation in at least 3 major cities in Tennessee, and such notice shall be published at least 10 days prior to the date of such hearing. Applicant shall pay the cost incurred in publishing legal notices. The time and place for each public hearing shall be fixed by the Board as soon as reasonably possible and each public hearing shall be conducted by the Board. If more than one hearing is to be held on a particular date, the Board conducting the hearings shall determine the order in which they shall be held.

(2) The applicant shall open the hearing and present the testimony and exhibits offered in support of the application. The applicant's witnesses shall then be subject to cross-examination by the Board and by any person with an interest in the subject matter of the application. The Board shall determine the order of appearance of the other participants in the hearing.

(3) Each person having an interest in the subject matter of the application and who has complied with the rules and procedures may present testimony and exhibits in support of or in opposition to the applicant. All witnesses shall be subject to cross-examination as set forth in paragraph (2) of this rule.

(4) The applicant may offer rebuttal testimony and exhibits, but the witness shall again be subject to cross--examination. Surrebuttal testimony and exhibits and subsequent testimony and exhibits may be permitted at the discretion of the person conducting the hearing.

(5) All witnesses shall testify under oath.

(6) Closing statements and statements of position may be made by the participants and all other interested parties before the hearing is closed or at such time as designated by the Board.

(7) The Supervisor shall record each hearing showing appearances, testimony and exhibits, statements, and all other records submitted at the hearing.

0400-56-01-.02 Administrative Approval.

(1) Administrative approval of certain matters of a routine nature may be granted by the Supervisor upon submission of an application showing all pertinent information and data and after due notice is given to all operators of interest.

(a) The application shall be made to the Supervisor with a copy to each known offset lease owner and such application shall include:

1. statement of reason and justification for requested relief,

2. map or sketch illustrating the information pertinent to the request relief,

3. list of names and addresses of all interested persons notified of the application.

(b) If the application meets with the approval of the Supervisor and no written protest is received by the Supervisor within 15 days following prescribed notice of the application, the Supervisor may grant the requested relief without the necessity of a public hearing.

(c) If the application is accompanied by a written waiver from all known offset lease owners, the 15 day delay shall be unnecessary.

(d) If the Supervisor does not elect to approve the application administratively or if written protest is received within the 15 day period, the application may be set for public hearing.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-56-02
Rules of Procedure for Hearing Contested Cases

For Rules of Procedure for Hearing Contested Cases see Rules of the Secretary of State, Chapter 1360-04-01.

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-57-01
List of Forms

Table of Contents

0400-57-01-.01 Report and Permit Forms

0400-57-01-.01 Report and Permit Forms.

(1) The report and permit forms designated below may be obtained from the Board, 401 Church St., Nashville, TN 37243-1534, and are hereby adopted and made a part of the rules set out in Chapters 0400-51-01 through 0400-57-01:

(a) Application to Amend Well Permit (Form CN-0228)

(b) Application to Change Operators (Form CN-0237)

(c) Application for Permit to Drill (Form CN-0211)

(d) Gas Well Deliverability Tests (Form R-DT-1)

(e) Monthly Gatherer's and/or Transporter's Natural Gas Report (Form CN-0244)

(f) Organization Report (Form CN-0219)

(g) Plug and Abandon Report (Form CN-0217)

(h) Pooling Affidavit (Form CN-0690)

(i) Pressure Maintenance and Secondary Recovery Questionnaire (Form CN-0141)

(j) Statement of No Objection to Proposed Surface Disturbance (Form CN-0691)

(k) Surface Owners Notification Certification (Form CN-0694)

(l) Transporter's and Storer's Monthly Report for Crude Oil and/or Condensate (Form CN-0229)

(m) Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221)

(n) Comprehensive Bond Identification (Form CN-0120)

Authority: T.C.A §§ 60-1-201 et seq., and 4-5-201 et seq.

Chapter 0400-58-01
Determinations Under Federal Natural Gas Policy Act of 1978

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0400-58-01-.01 Definitions
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0400-58-01-.03 Application and Filing Procedure
0400-58-01-.04 Evidence by Affidavit
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0400-58-01-.06 Attesting of Written Orders
0400-58-01-.07 List of Participants
0400-58-01-.08 Forms
0400-58-01-.09 Notice of Determination
0400-58-01-.10 Method of Determinations

0400-58-01-.01 Definitions.

(1) "F.E.R.C." means the Federal Energy Regulatory Commission.

(2) "F.E.R.C. Rules" means rules or regulations adopted by F.E.R.C. implementing the NGPA.

(3) "NGPA" means the Natural Gas Policy Act of 1978 enacted by the United States Congress on November 9, 1978, and as that Act may subsequently be amended, supplemented, or superseded by subsequent legislation by Congress.

(4) "Application" shall mean a written request for status determination in accordance with Rule 0400-58-01-.03 herein and shall also mean "petition" within the meaning of other rules, regulations, and orders by the Board, when applied to NGPA status determination proceedings by the Board.

(5) "Sections 102, 103, 107, and 108" or reference to any one or more of those sections shall mean and be in reference to those sections of the NGPA.

0400-58-01-.02 Applicability of Other Rules.

Except where the same conflict with these rules pertaining to NGPA Determinations, F.E.R.C. rules, or the NGPA, all other rules, regulations, and orders of the Board are applicable thereto.

0400-58-01-.03 Application and Filing Procedure.

Any interested person requesting the classification of a gas well under Sections 102, 103, 107 or 108 by the Board pursuant to the authority granted to the Board by Section 503 of the NGPA, in order to determine the applicable status for such wells, shall initiate such determination by:

(1) Filing with the Board NGPA Form No 121.

(2) Filing with the Board Forms TGP 102, TGP 103, TGP 107 or TGP 108, whichever is appropriate.

(3) Filing with the Board all forms, information, plats, exhibits, affidavits, documents, and evidence required by Part 274 of the F.E.R.C. rules, and other applicable F.E.R.C. rules, and required by these rules herein, and by Board Forms TGP 102, 103, 107 and 108.

(4) Attesting to the application in the manner required by Section 274 and other applicable rules of the F.E.R.C. rules for such filings.

(5) Paying a fee of twenty-five dollars ($25) to the State of Tennessee through the Supervisor for each application filed. Checks should be made payable to the State of Tennessee.

0400-58-01-.04 Evidence by Affidavit.

Applications may be considered and determined by the Board on the basis of information contained in the application provided such application complies with all other rules herein. If there are no objections to the applications by any interested parties, the Board may consider and act on sworn affidavits, as well as exhibits, forms and other matters filed with the Board and constituting a part of the record of the hearing of the application. If confidentiality applies (Rule 0400-52-10-.05) to any items submitted as evidence, a separate letter identifying the items and giving the period of confidentiality should be included with the application.

0400-58-01-.05 Intervention.

Any person may intervene in an application and become a proponent or opponent of any application.

0400-58-01-.06 Attesting to Written Orders.

Written orders of the Board concerning applications may be signed by the Chairman of the Board and such orders certified by the Chairman as an order duly promulgated by the Board shall have full force and effect as orders signed by the Board members.

0400-58-01-.07 List of Participants.

A list of participants in the proceedings, as well as any persons who submitted or sought an opportunity to submit written comment (whether or nor such persons participated in the proceedings) shall be made for each hearing.

0400-58-01-.08 Forms.

(1) Applications shall be made upon Forms TGP 102 (Application for New Natural Gas Determination), TGP 103 (Application for New Production Well Determination), TGP 107 (Application for High Cost Natural Gas Determination), and/or TGP 108 {Application for Stripper Well Natural Gas Determination), and any form required by F.E.R.C. The original and two copies of such application shall be filed with the Board, along with a self-addressed stamped envelope for return of one of the copies after the filing date and docket number have been noted by the Board. The F.E.R.C. 121 Form and Form TGP 102, 103, 107 and 108 may be submitted in lieu of the second complete copy of the application. All applications shall be fully completed as appropriate in conformance with Board rules as well as with F.E.R.C. rules, and the well for which a determination is being sought shall have been classified by the Tennessee Office of Geology before such applications may be heard by the Board. Upon receipt of an application, the Board shall notify the applicant of the receipt of such application and, should the application be incomplete in any respect, indicate the nature of the incompleteness. Upon the receipt of application, such application shall be considered filed with the Board, assigned a docket number, and notice duly published, provided all other rules referred to herein have been complied with.

(2) The date the application is received by the Board shall be considered the filing date or record, unless after a determination has become final it is determined that the application did not, in fact, qualify for the request status in the first place, in which case the Board shall consider the filing date of record of a new application to be the date the disqualified application for a price determination for a particular reservoir

was received by the Board. This exception shall be allowed between categories as well as within a particular category, but shall only apply to those wells for which commercial sale of natural gas has occurred after the original determination was filed. Written notice shall be given to the F.E.R.C. and to the applicant for any determination for which this exception shall apply.

0400-58-01-.09 Notice or Determination.

After making a determination that an application does or does not qualify for the requested status under the NGPA, the Board shall give written notice of such determination to F.E.R.C. in accordance with F.E.R.C. rules.

0400-58-01-.10 Method of Determinations.

(1) The Board hereby certifies that it shall take such steps as are reasonably necessary or appropriate to perform its function in accordance with Part 214 of the implementing rules of F.E.R.C.

(2) The method by which the Board shall make determination is as follows:

(a) Applicants for determination shall file on forms required by the F.E.R.C. and by the Board in order to receive a hearing. Forms required by the Board are:

1. Form CN-0211 (Application for Permit to Drill)

2. Form CN-0228 (Application to Amend Well Permit)

3. Form CN-0237 (Application to Change Operators) if applicable

4. Form CN-0219 (Organization Report)

5. Form CN-0221 (Well History, Work Summary, and Completion or Recompletion Report)

6. Form R-DT-1 (Gas Well Deliverability Tests)

7. Form CN-0244 (Monthly Gatherer's and/or Transporter's Natural Gas Report)

8. Form No. TGP 102 (Application for New Natural Gas Determination), TGP 103 (Application for New Production Well Determination), TGP 107 (Application for High Cost Natural Gas Determination), or TGP 108 (Application for Stripper Well Natural Gas Determination), whichever is appropriate.

(b) Notice of filing by applicants is required by the rules of the Board to be given by applicants to identified purchases, as required by Section 274.201(e) of the said Regulations of F.E.R.C. (paragraph (3) of Rule 0400-58-01-.03).

(c) Public notice of the filing, pending hearing, and pending determination of applications for determinations shall be given by the Board at least ten (10) days prior to such hearing, giving the date, time, and place of such hearing. Such public notice shall be given by publication at least once in a newspaper of general circulation published in Nashville, Knoxville, and Chattanooga.

(d) All such rules and regulations and orders of the Board are required to be in writing, T.C.A. § 60-1-204(d). Petitions shall be filed at least fifteen days prior to the hearing thereon. When a proceeding is instituted, the Board assigns a docket number to the application and records the fact and the dates of the filing of the application in a docket book provided for such purpose (subparagraph (g) of this paragraph). Testimony is recorded, transcribed, and preserved as a part of the permanent record of the hearing. Any person testifying is required to do so under oath; however, relevant unsworn statements, comments, and observations by any interested person may be heard and considered by the Board and included in the record. In matters where there are no objections of record, sworn affidavits of witnesses may be received in evidence (Rule 0400-58-01-.04). The relevancy of any testimony or other evidence is subject to challenge by any party to the hearing or any member of the Board. When so interposed, such objections are acted upon by the Chairman, his ruling being subject to challenge and overturning by a majority vote of

the Board.

(e) Full opportunity is afforded all interested parties at a hearing to present evidence and to cross-examine witness.

(f) The Board maintains data files which contain the records on each individual well in the State. Such well records consist of the following:

1. Application to Amend Well Permit (Form CN-0228).

2. Application to Change Operators (Form CN-0237).

3. Application for Permit to Drill (Form CN-0211).

4. Gas Well Deliverability Tests (Form R-DT-1).

5. Monthly Gatherer's and/or Transporter's Natural Gas Report (Form CN-0244).

6. Organization Report (Form CN-0219).

7. Plug and Abandon Report (Form CN-0217).

8. Pressure Maintenance and Secondary Recovery Questionnaire (Form CN-0141).

9. Transporter's and Storer's Monthly Report for Crude Oil and/or Condensate (Form CN-0229).

10. Well History, Work Summary, and Completion or Recompletion Report (Form CN-0221).

11. Application for New Natural Gas Determination (Form TGP-102).

12. Application for New Production Well Determination (Form TGP-103)

13. Application for High Cost Natural Gas Well Determination (Form TGP-107).

14. Application for Stripper Well Natural Gas Determination (Form TGP-108).

Further, the Board maintains a library of drill cuttings, cores and logs from wells in the state. Records of the Board include extensive geologic and engineering data, such as geologic structure, isopach, and cross-section maps, production data, well potential test results, bottom hole pressure surveys, fluid analyses, gas analyses, and other similar data.

The Board maintains field or reservoir base maps and all wells completed in or penetrating a reservoir are identified.

A monthly activity report is published by the Board for all wells being drilled or completed in the State and a monthly production report is available giving monthly production from all producing wells in the State.

(g) Applications for determinations shall be filed and assigned a docket number upon receipt. The professional staff of the Board shall then study the application and data submitted in conjunction with records of the Board as identified in subparagraph (f) of this paragraph. Information contained in the application shall be verified to the extent possible with information on file with the Board. The staff of the Board includes professional engineers, geologists, and attorneys, as well as other support staff. The application and relevant data shall be considered and discussed in a joint meeting of the professional staff, prior to the public hearing of the application before the Board. Requests for clarification of data or for additional data may be made, where deemed necessary by the staff. Unresolved questions may be asked of the applicant at the hearing.

(h) The initial authority of the Board for making determination in accordance with the NGPA was

established by an emergency order of the Board, which was made at a scheduled hearing under the Uniform Administrative Procedures Act. This action was properly advertised in accordance with the state law and Board rules.

After studying the application, all data submitted by the applicant, all data available in the files of the Board, and hearing any additional evidence submitted at the hearing, the staff of the Board shall make a recommendation to the Board. Where there is no objection, evidence may be submitted by affidavit without oral testimony. Regarding uncontested applications, the Board shall hear them en masse and, where appropriate, grant the same by one order. A list of applications recommended for approval shall be made available prior to the hearing so that comments or objections may be expressed when the applications are considered by the Board.

(i) The Board shall give written notice to the F.E.R.C. of any change in the procedures described in these rules.

Authority: T.C.A §§60-1-105, 60-1-201 et seq., and 4-5-201 et seq.; Natural Gas Policy Act of 1978, Public Law No. 95-621, 92 Stat. 3350 (November 9, 1978).

* If a roll-call vote was necessary, the vote by the Agency on these rulemaking hearing rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)
Pete Claussen				✓	
Derek Gernt	✓				
Ken Haislip	✓				
Chuck Head	✓				
Brian Hensley	✓				
Jim Washburn	✓				

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Oil & Gas Board on 09/28/2012, and is in compliance with the provisions of TCA 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 05/03/12

Rulemaking Hearing(s) Conducted on: (add more dates). 07/10/12

Date: September 28, 2012

Signature: Chuck Head

Name of Officer: Chuck Head

Title of Officer: Chairman

Subscribed and sworn to before me on: September 28, 2012

Notary Public Signature: Marcus D. Williams

My commission expires on: 08·11·2013

MARCUS D. WILLIAMS STATE OF TENNESSEE NOTARY PUBLIC WILLIAMSON COUNTY

All rulemaking hearing rules provided for herein have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

R E Cooper Jr

Robert E. Cooper, Jr.
Attorney General and Reporter

3-19-13
Date

Department of State Use Only

Filed with the Department of State on: 3/20/13

Effective on: 6/18/13

Tre Hargett

Tre Hargett
Secretary of State

RECEIVED 2013 MAR 20 PM 1:56 DEPARTMENT OF STATE

Public Hearing Comments

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A. § 4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

A public hearing was held on July 10, 2012 at the Knoxville Environmental Field Office, 3711 Middlebrook Pike Knoxville, Tennessee. Approximately 35 people attended this public hearing. Sixteen (16) people offered oral comments during the hearing. The initial public comment period ended at 4:30 p.m. on July 20, 2012.

The public comment process for the draft rules was extended until 5:30 p.m. August 3, 2012. The extension was granted as a result of overwhelming public participation. The hearings were attended by interested citizens, government agencies, local media, and representatives of numerous groups, institutions, and public and private organizations. The list of attendees represented the following organizations:

American Petroleum Institute (API)
America's Natural Gas Alliance (ANGA)
Atlas Energy LP
CONSOL Energy Inc. (CNX)
Environmental Standards
Knoxville Activist Collective
League of Women Voters of Tennessee (LWV)
Sierra Club
Statewide Organizing for Community eMpowerment (SOCM)
SOCM E3 Committee (Energy, Ecology, and Environmental Justice)
Southern Environmental Law Center
Spectra Energy
Tennessee Citizens for Wilderness Planning (TCWP)
Tennessee Clean Water Network (TCWN)
United Mountain Defense (UMD)

One hundred and eleven (111) private citizens responded with written comments. The following organizations also responded with written comments regarding the proposed rule changes:

American Petroleum Institute (API)
Atlas Energy, LP
Beverage & Diamond for Halliburton Energy Services, Inc.
CONSOL Energy Inc. (CNX)
Harpeth River Watershed Association
Historic Rugby
League of Women Voters of Tennessee (LWV)
LightWave Solar
Natural Resource Services
Perkins & Trotter, PLLC
Plugmill Systems, Inc.
Saint Joseph Petroleum, LLC
Sierra Club
Southern Environmental Law Center
SOCM E3 Committee (Energy, Ecology, and Environmental Justice)
Swan Conservation Trust
Tennessee Citizens for Wilderness Planning (TCWP)
Tennessee Clean Water Network (TCWN)
Tennessee Oil and Gas Association (TOGA)
TMD Energy
Walden Resources, LLC

A number of comments (both written and oral) are not included in this document because: 1) they were not directly related to the proposed rules, 2) stated a belief, opinion or request that did not specifically ask for a response, 3) required a response that would be speculative or unrelated to the rules or 4) requested information or involved matters subject to control or regulation by other government agencies.

Comments and Responses

Subjects included in the comments or questions follow: (Several of the public comments that represent similar concerns and issues are grouped together under specific categories).

A. General Issues about Fracturing (Fracking)

Comment: **A-1) The most common comments received in this process were many variations of the following:**

Why does Tennessee need to allow fracking at this time?

Please do not allow fracking to come to our beautiful state.

The environmental risks of fracking are well known, therefore fracking should be banned.

A moratorium should be placed on all fracking until the effects can be further studied.

Response: Fracturing involves using high pressure to create fissures or fractures in a rock formation to allow oil or gas to flow more easily up a well. It has been practiced in many forms since the 1940s. Currently, in Tennessee the methods used for well fracturing are one of the following: CO_2, N_2, mixed with sand and some water as a surfactant, or HCL. These recorded methods for fracturing have been in place and used extensively since 1969 so fracturing is not a new process in Tennessee. All oil and gas wells are fractured one way or another, and have been for decades. In Tennessee we have no record of any groundwater contamination or safety issues associated with the fracturing process. To ban all fracturing would be not only unwarranted, but would be in effect the same as making oil and gas production illegal in our state without any evidence of harm caused.

TDEC recognizes that the current public concerns over fracturing began with the advent of large-scale hydraulic fracturing in the Marcellus Shale in Pennsylvania and Ohio in the last decade, as well as in other deep shale formations in other parts of the country. The advent of horizontal drilling techniques combined with new methods of hydraulic fracturing made these deep shales viable sources of natural gas. These fracturing methods use large amounts of liquids (as much as 1 to 5 million gallons per well) to fracture, along with some chemical additives, and create issues with chemical handling, wastewater disposal, and water withdrawals from streams.

No hydraulic fracturing of this type and volume has yet occurred in Tennessee; these methods are counter-productive in the Chattanooga Shale. However, we share the commenters' concerns that a more robust regulatory structure may be desirable in the event that hydraulic fracturing methods like those practiced in the Marcellus Shale were to ever be attempted in Tennessee. Our intent with this rulemaking is to provide a regulatory framework for future fracturing using large amounts of water without introducing unnecessary regulatory burdens on those operators using current methods that have not been proven harmful.

Comment: **A-2) Several commenters asked for the 200,000 gallon number to be removed from Rule 0400-52-02-.01(10) and fracking regulations to cover all amounts of fluid.**

Response: As stated above, the intent of this rulemaking is to be able to adequately regulate large volume hydraulic fracturing should it ever be attempted here without affecting current methods of fracturing using nitrogen gas or small water volumes. The amount of 200,000

gallons was initially proposed by environmental groups as part of a 2011 legislative initiative. Here it is used as a trigger for applying new requirements for such fracturing, such as public notice.

TDEC well history information indicated that two wells in the state have been fractured with large volumes of a water-based treatment. One well was treated with 145,000 gallons of water and another well was treated with 175,000 gallons of water. Accordingly, TDEC agreed that the 200,000 gallon threshold, while not a technically derived number, was a logical and reasonable boundary for distinguishing between the acceptable existing practices and large hydraulic fractures that represent a change in methods that the public should be made aware of.

B. Board Makeup

Comment: **How many people who represent the general public service are on the regulatory board and how many people are actually on it?**

Response: The make-up of the Oil and Gas Board is set by legislative statute, and TDEC cannot alter this by the process of rulemaking.

The current Oil and Gas Board is made of six members. Three members are Ex Officio that represent environment, conservation and economic and community development; one member represents the oil and gas industry; one member represents mineral test hole industry; and one member represents landowners with oil and gas wells located on their property. All members are appointed by the Governor's office and are given four year terms.

Effective October 1, 2012 2012 Public Chapter 986 of 2012 merged the Tennessee Oil and Gas Board into the Water Quality Control Board to form the Board of Water Quality Oil and Gas. This will add an Oil and Gas industry representative and a landowner representative to create a twelve member board.

C. American Petroleum Institute (API) standards

Comment: **Many commenters want to know why the proposed regulations do not adopt the standards of the American Petroleum Institute:**

The use of these industry accepted standards is the minimum needed and a foundation from which to create more specific rules.

From what I understand, the proposed regulations fall short of reaching the standards of the American Petroleum Institute. Why would you discuss fewer regulations for this practice which is just now beginning to be studied?

Why in the world would we want to adopt something that is even below these standards [API]?

Response: The American Petroleum Institute (API) publishes guidance on all aspects of oil and gas drilling activities, and TDEC recognizes and depends on their excellent standards and recommendations. Our regulations are indeed consistent with API guidance. API in their comments state that "Tennessee itself already references API standards 26 times in their state regulations..."

However, no states have adopted API standards universally into their rules, nor does API itself recommend that states do so. Their standards are broadly based to cover all kinds of drilling in a variety of geologies, depths, and pressures. To adopt all API guidance would be to impose significant costs on the industry with little additional environmental protection. For example, this might require an operator to spend 5 times as much for a certain grade of steel casing pipe, when a much cheaper pipe would be more than adequately protective for a shallow, low pressure well.

Accordingly, TDEC has chosen to adopt API **performance-based best practices** as a solid foundation for Tennessee field operations. These performance-based practices allow the flexibility to implement the appropriately protective methods and materials based upon the real depths and pressures that will be encountered at a well site. For example, rather than specify a strength of casing pipe that must always be used in every situation, we have adopted performance based-language: "The casing shall have a minimum internal pressure rating of 110% of the maximum formation pressure reasonably expected based upon the depth and location of the well."

D. Definitions

Comment: **D-1) Several suggestions were submitted for revision of definitions.**

Response: We agree with many of the comments made regarding definitions by American Petroleum Institute (API), America's Natural Gas Alliance (ANGA), Consol Energy, TMD Energy, Tennessee Clean Water Network (TCWN) and the Tennessee Oil and Gas Association (TOGA). Accordingly, we have added definitions for or revised our definitions for:

Aquifer
Base Fluid
Blooey Line
Chemical Abstract Service
Chemical Abstract Service Number
Chemicals
Chemical Disclosure Registry
Chemical Family
Conductor Pipe
Flow Lines
Fracturing
Health Professional
Hydraulic Fracturing Additive
Hydraulic Fracturing Fluid
Intermediate Casing
Production Casing
Proppant
Surface Casing
Total Volume Storage
Trade Secret
Well Integrity

Comment: **D-2) In your document when you refer to fracturing, are you including vertical wells treated by fluid volumes less than 200,000 gallons per treatment?**

Response: The definition of fracturing refers to any kind of fracturing methodology, liquid or gas, of any volume. Under the proposed rules, wells to be fractured using greater than 200,000 gallons of water-based liquids will require public notice and other new requirements, and this will include both vertical and horizontal wells.

E. Public Disclosure

Comment: **E-1) A commenter expressed a specific concern that citizens, especially those living near oil and gas operations, have access to timely information about these activities, such as pre-drilling water quality data, geologic infrastructure, the timing and nature of any chemicals that will be pumped into the ground or disposed of in their communities and the procedure and results for ongoing monitoring of surface and groundwater. This presumes that such data is being collected in the first place?**

Response: We concur with the commenter that our draft language concerning disclosure was non-specific. Commenters from both industry and environmental groups referenced the State of Colorado's regulations for fracturing chemical disclosure. Accordingly we have incorporated language adapted from the State of Colorado's regulations on disclosure for water volumes and chemical additives for hydraulic fracturing of any well to use greater than 200,000 gallons of liquid. The rules will specify the use of the website *FracFocus* as the chemical disclosure registry site, which is accessible free on the internet. See subparagraphs (1)(b), (1)(c), (1)(d) and paragraph (3) of Rule 0400-53-01-.03.

Comment: **E-2) Notify the land owner of the well location property, surrounding land owners, TDEC and local news media when the fracking operation is complete. This must be done within 30 days of the completion.**

Response: While there have been occasions when environmental or safety issues have occurred at oil or gas well sites in Tennessee (fires, significant oil spills), no impacts have been documented from the fracturing activities themselves. Fracturing of oil and gas wells in the State of Tennessee has been a common practice with no reported contamination or unsafe event since permitting began in 1969. Accordingly TDEC believes this level of notification for fracturing activities requested by the commenter to be unwarranted.

Currently all operators are required to submit a Well History to report the condition of the well and what type of fracturing treatment has taken place at the permitted well site. The information from a fracture can be obtained from the files of the oil and gas program in approximately 60 to 90 days after the fracturing event.

In addition, the new rules specify that any fracture using greater than 200,000 gallons of water-based liquids must be advertised in a 30-day public notice period prior to drilling and fracturing.

Comment: **E-3) Prescribe a time limit to have the post drilling information entered into the public website by the operator.**

Response: We concur with the commenter that a time limit is needed. These revised regulations will require an operator to enter information onto a national chemical disclosure registry if the operator performs a hydraulic water based fracture using greater than 200,000 gallons of liquid within 60 days of the conclusion of fracturing activity. For all other fracturing activities, existing rules require the operator to submit to the Tennessee Oil and Gas Program a Well History demonstrating what kind of treatment, if any, was conducted on a well within 60 days.

F. Geology

Comment: **F-1) Several commenters asked about the safety of drilling through karst geology as it relates to changing groundwater flows and contaminate transport.**

Drilling karst, whether it is in close proximity to a surface water body or not, should not be permitted. An arbitrary distance from a surface water area will not necessarily be a protective measure in karst environments.

Response: The karst features known as sinkholes, caves, swallets, and collapse features generally occur within the first two hundred feet of the surface. There are some recorded instances where some cave systems extend to as deep as six hundred feet beneath the surface, but not in areas where our oil and gas drilling occurs. In areas where oil and gas deposits and extensive karst features overlap such as Overton, Pickett, Clay and Western Fentress Counties, these karst features occur within the first two hundred feet of the surface.

We believe that the rules we are proposing will continue to be effective in protecting the groundwater in karst areas from contamination. The rules require all oil and gas operators to have a casing program that includes steel pipe to be placed in the boring and cement placed from the bottom of the casing to the surface of the ground. The cement must come back to the surface to ensure that groundwater is protected. In all cases 7 inch steel casing is placed in the boring down to the Chattanooga Shale to insure that all shallow aquifers are isolated.

There are some instances where the operator may drill through a void. In these cases, the operator must cement up to the void with excess cement and then place cement down between the steel casing and the boring and place cement from the cement basket to the surface, thus sealing off both holes bored into the void. All operators are required

to have a cement basket and centralizers on their 7 inch casing to ensure proper placement of the casing and cement. This process has and does protect the ground water that occurs within the karst area.

Comment: **F2) A commenter asked about the relationship between fracturing and earthquake activity.**

Response: Drilling in karst is not related to any earthquake activity in Tennessee. While some earthquakes in other parts of the country have been tentatively linked to the long-term use of underground injection wells for waste disposal along fault zones, extraction of oil and gas deposits is unrelated to earthquake activity.

Comment: **F-3) Several comments were submitted about why TDEC will allow fracturing west of the plateau if there are no viable gas deposits in the shallow Chattanooga shale.**

The proposed rules need to include a prohibition on any drilling in the Chattanooga Shale west of the Cumberland Plateau because according to TDEC's information, the formation does not and will not contain gas because a confining layer does not exist.

Response: In general, the Chattanooga Shale in Middle Tennessee is not worthwhile for oil or gas extraction - there are only limited areas east of Nashville that have any productive potential in the Chattanooga Shale Formation. For most of the state, a geologic structure known as the Nashville Dome uplifted these older rocks so that the Chattanooga Shale was completely eroded away in the area from Monteagle, Tennessee to the southeast of Nashville to Celina, Tennessee (northeast of Nashville) in a band over 60 miles across. The Chattanooga Shale either outcrops or is too shallow to contain producible quantities of natural gas in a wide swath beyond the edges of the Dome.

West of Nashville, natural gas from the Chattanooga Shale has no real commercial potential, as demonstrated by the small number of wells drilled between Nashville and Memphis since permitting began in 1969. The Chattanooga Shale and younger formations west of Nashville are too shallow to be sustainably productive. Without an impermeable rock layer above to seal in the volatile hydrocarbons under pressure, there cannot be any viable hydrocarbons trapped in the shale to recover.

However, there could be small localized areas that contain oil deposits that could conceivably be produced. Because of that remote possibility, TDEC will not impose a ban that would take away a landowner's right to develop their mineral rights. It is also possible that mineral right owners in the future may attempt drilling down to much deeper shale layers than the Chattanooga Shale.

TDEC does not intend to ban all such future exploration with no environmental or safety basis to do so.

Comment: **F-4) A specific, major question for us is whether or not the rock layers above and below the shale gas formations can contain the methane and any unrecovered fracturing fluids to the shale.**

Response: The presence of producible hydrocarbons in a shale layer demonstrates that the surrounding rock layers are sufficient to prevent the hydrocarbons and any other potential pollutants (naturally occurring brine, fracturing fluids) from migrating upward thousands of feet to drinking water aquifer formations. Otherwise the volatile hydrocarbons would have escaped eons ago. Our regulations are designed specifically to prevent migration or leakage of hydrocarbons, brine or other pollutants to other formations via the well bore itself.

Comment: **F-5) A commenter asked about requiring pre-drilling geologic surveys.**

Response: The term "geologic survey" is broad and we are not clear about the intent of the commenter in this context. Certainly the geologic characteristics from the surface to the Chattanooga Shale are well understood in Tennessee. If the commenter is referring to a survey for caves, voids, the exact location of fractures that will be encountered, etc., then there is no way to survey for these features other than to drill an exploratory test hole. This is sometimes done, and this activity is permitted by TDEC under Mineral Test Hole permits (T.C.A. § 60-1-501 et seq.). Therefore we do not see a need for this requirement.

G. Permitting, Penalties

Comment: **G-1) Several comments were submitted asking why there is not a 30 day notice on permits much like other Water Pollution Control permits.**

The 30 day public notice for a fracking permit should be required with no exceptions. Permitting the fracking process should have no less a public process than what is established for an individual ARAP.

I do think the comment period must be more than 15 days..... while there may be other ways for people to follow this complex issue, I think many do still depend on traditional media and we often need more time to consider issues.

Response: TDEC utilizes different lengths of public notice and comment period for different kinds of permits, and the sole intent of this particular public notice is to insure that no fractures of greater than 200,000 gallons of liquid can occur in Tennessee without the public being made aware. However, in the interests of consistency with the most common notices utilized by the Division (NPDES and ARAP), we agree to change the notice period to 30 days. See subparagraph (10)(b) of Rule 0400-52-02-.01.

Comment: **G-2) The term fluid should be changed to liquid to avoid gas (also referred to as fluid in physics).**

Response: We concur with changing the term 'fluid' to 'liquid' to avoid regulatory ambiguity. Our original intent was to apply the new public notice and disclosure rules only to water-based liquid fracturing using greater than 200,000 gallons. Accordingly, the wording has been changed to 'water-based liquids'.

Comment: **G-3) Several commenters stated: There should be very substantial fines/penalties above the current ones applicable that MUST be paid for each offense. These fines/penalties must be paid immediately upon finding of guilt of the infraction.**

Response: The assessment of civil penalties is a discretionary function of the Department. Because of the broad range of scenarios and variables that can occur relating to a violation, penalties are assessed on a case-by-case basis. This policy is consistent with all the other regulatory programs in TDEC.

Comment: **G-4) Several commenters asked about storm water plans:**

Approved storm water and wastewater plans are to be submitted, available to the public, reviewed and adopted by TDEC prior to any site preparation or hydrofracking activity is initiated.

Establish comprehensive construction storm water runoff permit requirements to protect surface water runoff during well construction.

Response: The Federal Government exempted the oil and gas industry from the requirement to apply for coverage under NPDES Construction Storm water permits, and Tennessee has followed the federal lead in not requiring such permit coverage or storm water pollution prevention plans (SWPPPs) associated with those permits. However, the Tennessee Oil and Gas Rules require erosion controls and best management practices to control storm

water runoff from well sites. In addition, discharges of sediment from a well site are regulated under the Tennessee Water Quality Control Act.

Comment: **G-5) The amendment as written below, designated in red, in paragraph (1) of Rule 0400-52-02-.02 are not clear that they are intended for fracturing volumes greater than 200,000 gallons of water based liquids as listed in Rule 0400-52-02-.01(10). They would not be practical and would be a burden to normal operations in Tennessee for volumes equal to or smaller than 200,000 gallons.**

(1)..... Information submitted with the application shall include the intent to fracture the well, if known, as well as an estimate of the volume of fluids to be used in the fracture..... The plan shall also include identification of all drinking wells within ½ mile radius of the proposed wellhead.....

Response: We concur with the commenter that the draft wording was not completely clear. It was our original intention to limit the new rules concerning public notice, disclosure, water well sampling, etc. to apply only to wells to be fractured using greater than 200,000 gallons of water-based liquids. The rule language has been changed to eliminate the ambiguity.

H. Blowout Prevention (BOP)

Comment: **H-1) The addition of a 3000 psi working pressure is well above levels adequate for many shallow O&G and CBM wells and may create an undue hardship. Recommend minimum of 1500 psi or 110% of maximum anticipated surface pressure.**

Response: We concur with the commenter. The rule language has been changed to "a minimum of 110% of the maximum surface pressure that would be reasonably expected based on the depth and location of the well" instead of the 3000 psi working pressure requirement, as per the recommendation of API.

Comment: **H-2) The casing policy requiring only one BOP, should be expanded to include wells on the parts of the plateau known to have low pressure formations.**

Response: We agree with the commenter that the draft rule language differentiates wells requiring a single BOP from those requiring redundant BOP on the basis of geographical descriptions written in legislation rather than by actual pressures that would be encountered. Accordingly, we have changed the rule language to read "For non-Cumberland Plateau wells in areas of known lower pressures" instead of referencing by county.

In addition, the rules provide operators the option to apply for a variance to the blowout prevention on the plateau area if warranted, provided there is an established pressure associated to the depth to be drilled. For wells drilled in areas of unknown pressures and below the Chattanooga Shale, variances for blowout prevention will not be granted.

Comment: **H-3) The addition of paragraph (2) of Rule 0400-52-06-.02 requiring secondary closing systems do not address intrinsically safe electrical pumps that should be required for gas drilling.**

Response: We concur with the commenter. Rule language has been changed accordingly, inserting the words "intrinsically safe" before all references to electric pumps.

I. Environmental Protection, Safety

Comment: **I-1) Flow-back after shale gas well fractures may be several days to several weeks in duration. Suggest change to the operator shall maintain personnel on-site during fracturing activity and beginning of flow back activity.**

Response: We concur with the commenters. The rule language has been changed to read "The operator shall maintain personnel on-site during the fracturing or other treatment activity, and during the initial flow back period, until such time as the well pressure returns to near pre-fracturing reservoir pressure. Unmanned flow back operations shall be checked routinely."

Comment: **I-2) There needs to be a definite plan for closure of the well when gas extraction is complete.**

Response: The closure for any oil and gas well is addressed under the rules, depending on the condition and intended use of that well. For example, the operator may desire to leave the well open for a period of time and has the option to place the well on temporary abandonment. If an operator plans to close the site, closure is addressed under plugging requirements and environmental protection.

Comment: **I-3) The used waste water from the fracking process must be contained such that it cannot run off into adjacent water sources or seep into underground water tables. If the used waste water does run off into surface or underground water sources then TDEC, surrounding land owners and the local news media must be notified within 24 hours.**

Response: Currently all operators are required to obtain the proper permits prior to releasing any liquids that may have any elevated contaminates. All fluids are required to be contained and then placed in an underground injection well or other disposal arranged. These activities must be reported as part of well history reporting requirement, and in the case of fractures using greater than 200,000 gallons of water-based liquids, the disposal plans for wastewater must be submitted as part of the application and included on the public notice. We have also added a requirement under "Environment" that the Supervisor must be notified within 12 hours of knowledge of any spill. TDEC would then notify the media and surrounding landowners if warranted.

Comment: **I-4) A commenter suggested the addition of: Rule 0400-53-03-.02(5)..... If spills of oil, saltwater or chemicals occur the operator shall contact a representative of the Oil and Gas Board. In addition, if a spill of oil and/or chemicals occurs, the National Response Center at 1-800-424-8802 must be contacted. This notification must be in the form of a phone call, e-mail and/or fax and must occur within 12 hours upon knowledge of the spill.**

Response: We concur with the commenter. Language will be placed into the regulations to address the reporting of spills to TDEC, see item I-3 above. Notification to the National Response Center is a federal requirement not administered by the state.

Comment: **I-5) Several commenters expressed concern about wastewater and if it can be land applied.**

Response: Drilling water produced during the drilling activities associated with a permitted well can be land applied if the fluids do not contain excessive brine or salt water. Any wastewater produced at a site that cannot be land applied must be disposed of by underground injection, meeting all applicable requirements, or other regulated methods.

J. Casing Requirement

Comment: **J-1) We received various comments about casing depths:**

Setting surface casing more than 50 feet below fresh water can create a control problem in air drilled wells. Recommend the following: Surface casing shall be set a minimum of 50 feet below the lowest known fresh water aquifer.

In some cases oil or gas zones occur less than 100' below fresh water zones. I would recommend that the wording (unless production zones occur less than 100' from freshwater zones.

Response: We concur with the commenters that when air-drilling in some Tennessee formations, the aquifer water encountered is often difficult to control in order to set casing at 50 feet below the water level, and that attempting to set it at 100 feet below could prove to be impractical given the volumes and pressures of water to handle. It was also pointed out that in some locations west of the Plateau, there can be less than 100 feet depth between the aquifer water and the producing formation. We agree that provisions must be made to deal with these situations.

Accordingly, rule language under Casing Requirements has been changed to read as follows: "The operator shall set surface casing at 100 feet below the lowest known fresh water aquifer with class A cement only. The Supervisor shall have the authority to require distances of less than 100 feet upon specific request of the operator if adequate technical justification can be made." This request can be made directly to the Supervisor in the application; no appeal or presentation to the board will be required.

We also restructured the provisions on casing requirements that apply on and off the Plateau to make them clearer.

Comment: **J-2) We propose a change in surface casing with a change in pressure rating to cover shallow depths associated with many wells in Tennessee (110% of maximum anticipated formation pressure).**

Response: We concur with the commenter. Rule language has been altered to read "Casing shall have a minimum internal pressure rating of 110% of maximum formation pressure reasonably expected based on the depth and location of the well", as per API recommendations.

Comment: **J-3) Production casing: This proposed rule is unclear as to whether it includes casing on packers and/or tubing production strings.**

Response: We concur with the commenter that this issue is unclear in the rule. Accordingly we have added language stating that where production casing is used, all production casing for vertical wells shall be cemented in place and through the zone being produced. A well with tubing or production casing on a packer will be considered an open-hole completion and not a completely cased boring. In these cases a variance must be applied for and received prior to conducting such activity.

Comment: **J-4) Production casing is defined as casing set through the producing formation. In some cases production casing is set and cemented in place above the producing formation.**

Response: While the definition of production casing does not include mention of cementing, the commenter is correct that in horizontal drilling the cement is set at a point above where the bore turns horizontally into the producing formation. The rule language under Production Casing has been changed to address cementing into the production formation for vertical wells. Language has also been added under the section on Horizontal Drilling that addresses cementing in horizontal wells.

K. Cement Bond Logs (CBL)

Comment: **K-1) We propose this be restricted to wells fractured with greater than 200,000 gallons of water based liquids or wells being temporary abandoned where Mechanical Integrity Tests cannot be performed to establish isolation.**

Response: We have reconsidered the use of cement bond logs as a well integrity standard. See response under K-2 below.

Comment: **K-2) The state received several comments not in favor of making cement bond logs a requirement:**

Cement bond logs are subject to interpretation and the state should not be in a position of analyzing them. What constitutes a good bond; 90% bond over 10' or 80% bond over 20' etc.?

Bond logging results can vary based on actual well conditions and in most circumstances a mechanical integrity test would yield a higher degree of integrity and be the preferred method.

The cost of running a CBL outweighs the cost of plugging a well.

Response: We concur with the commenters that a CBL is not the best choice for a well integrity standard. API guidance 10TRI section 5.5 is very specific: "This practice (CBL) is not recommended as a best practice for cement evaluation". Accordingly we have elected to use the pressure testing of casing proposed under "Blowout Prevention" and the documentation of the cement job required under "Casing Requirements" as the minimum standard for well integrity testing.

After consideration of comments and consulting with API guidance, we have decided to use the following language for our minimum well integrity standard, under the section on Isolation of Oil, Gas, and Fresh-Water-Bearing Strata: "Pressure testing of casing as specified in Rule 0400-52-06-.02, and documentation of cementing as required in Rule 0400-52-07-.01 shall constitute the minimum requirements for maintaining isolation through well integrity."

In addition, we have added a section under Temporary Abandonment that will require operators to conduct a Mechanical Integrity Test or other pressure testing on any well proposed to be placed into Temporary Abandonment, if that well has not been tested or produced within the last 15 years.

L. Pit and Tank Batteries

Comment: **L-1) A commenter needs clarification on the definition of a "public road" or a reduction in the spacing of 100 feet.**

Response: TDEC concurs that clarification is needed. Rule language has been changed from 'public road' to 'any state highway or county road'.

Comment: **L-2) A commenter stated that the addition subparagraph (2)(e) of Rule 0400-52-06-.02 requiring flowlines to be constructed in a straight line to a pit would circumvent the use of a closed loop system or use of mud tank.**

Response: TDEC concurs that the use of closed systems and mud tanks are acceptable. Rule language has been changed accordingly to state this. In addition, subparagraph (2)(e) of Rule 0400-52-06-.02 has been changed to read 'flow lines or blooey lines' to be more accurate and definitions for these terms have been added.

Comment: **L-3) Several commenters expressed concern that lining tank battery pits is not realistic due to animal destruction and environmental degradation and asked for no liner to be required.**

Response: While TDEC acknowledges the difficulties of maintaining synthetic liners in some situations, all tank battery pits should be lined with a synthetic liner. The need for containing drips and spills in the pits and preventing soil and groundwater contamination applies everywhere.

M. Water Wells, Lakes, Streams, Floodplains

Comment: **M-1) There is no time limit specified for the water well owner to comply with the request for a sample analysis and there is no requirement that any notification be in writing leaving no documented history for the process.**

Response: TDEC concurs with the commenter. Accordingly a time deadline of "within 14 days of the date of the Public Notice" has been added to the rule language and a requirement that the water well owner/landowner must submit a written request to the applicant for the water well to be tested.

Comment: **M-2) The industry should only have to identify wells in the public record within the proposed ½ mile radius of a proposed well. This is all the EPA requires for injection wells.**

Response: The ½ mile radius in the draft rule language applies only to hydraulic fractures using greater than 200,000 gallons of water-based liquids. The operator's responsibility to identify those wells is limited to those wells available in TDEC records. However, if an unrecorded water well owner comes forward, that individual may request his or her well to be tested.

Comment: **M-3) Prohibiting all drilling locations in flood plains is too broad. I suggest the well site and tank batteries be sited above the 50 year floodplain.**

Response: No regulations have been written to specifically address flood plains. The revised regulations state that no oil or gas wells or associated equipment shall be located in a flood prone area. This language, although not as specific as "flood plain", was necessary due to the fact that floodplains are not often calculated or designated in the areas where most drilling occurs.

Comment: **M-4) The terms wetlands and floodplains can be ambiguous and lead to conflict. A better wording could be: Wells shall be drilled only on sites approved by oil and gas inspectors and any that are subject to dispute may be brought before the proposed committee of geoscientists/engineers assigned to arbitrate such things.**

Response: The term wetland is not an ambiguous term; it is well-defined in both federal and state regulation. The term 'flood plain' has not been used in the current revised regulations. Only flood prone areas are mentioned to address the areas that are very susceptible to flooding and should be evaluated by operators and our inspectors on a case by case basis prior to receiving a permit to drill. The intent of this clause is simply to avoid placing wells, pits, storage, etc. in an area where it could be damaged in a flash flood and cause spill. We consider the creation of a professional committee to be unnecessary at this time, but an operator always has the option to appeal a disputed call to the Board. We do not anticipate this being a significant issue; we believe operators and inspectors have been working together effectively to avoid wetlands and flood prone areas.

Comment: **M-5) Identification of water wells should be limited to those within 1500' and only for wells that are to be fractured with more than 200,000 gallons of fluid. Testing of water wells should be left up to the well operator. Multiple commenters have suggested varying distances.**

Response: This half mile radius will apply only to wells proposed to be fractured using greater than 200,000 gallons of liquid. A search of the data base within a half mile of the well head of the hydraulic fracture is consistent with other states implementing these types of regulations such as Pennsylvania, New York, Texas, Arkansas, Colorado, etc. For all other wells a ¼ mile radius will be used.

Comment: **M-6) Several commenters suggested a greater spacing from streams and other water bodies to match the greater distances other states use.**

Response: There is a high density of numerous small intermittent streams on the Cumberland Plateau, Ridge and Valley, and Highland Rim areas in Tennessee. To compare states with differences in rainfall, topography, and Eco region characteristics is therefore inappropriate. To require a greater set back than 100 feet would unnecessarily limit the number of drilling locations in the most active areas of drilling in the state, and may eliminate the ability for some land owners to develop their mineral rights.

However, we have added rule language that increases the setback distance from Outstanding National Resource Waters from 100 feet to 330 feet.

Comment: **M-7) Several commenters asked about procedures and results for ongoing monitoring of surface and groundwater:**

Baseline monitoring of wells, surface waters and groundwater must be a preliminary safeguard established in the permitting process and performed before issuance of a fracking permit. This is a good and necessary scientific process which will establish some track record for the fracking method process and could be an assurance established for those proposing to use the fracking process as a safe method.

I think it is very important to establish a baseline so that the chemical composition of soil and water in the area can be tested and compared.

Test the water quality of all water sources adjacent to and on the property where the Fracking operation is to be performed. This would include creeks, streams, rivers, lakes, underground aquifers, ponds and wells. The test results must be provided to the owners of the well location property, surrounding land owners, TDEC and the local newspapers.

Comment: We agree that a baseline sample of an adjacent landowner's drinking water well is appropriate, and we have provided for this in Rule 0400-52-02-.01 Permit Required. This language will require an applicant to collect and analyze a sample from any drinking wells within a ½ mile radius of any well proposed to be fractured using greater than 200,000 gallons of liquids, if the landowner so requests.

We can find no examples of any states that require pre-, during- and post-drilling monitoring of groundwater and surface waters around all wells. States monitor surface water quality via non-oil and gas related programs. Tennessee's surface water monitoring programs have not shown water bodies to be impaired by hydrocarbons or fracturing chemicals from oil and gas drilling. The state of Texas, for example, has groundwater aquifer monitoring programs, but they are designed to monitor the aquifers as a whole resource, and not targeted at detecting potential contaminants from individual wells.

The concentrations of chemical additives used in large-volume hydraulic fracturing in other parts of the country are low enough that detection of such additives in surface water or groundwater would be unlikely even if a subsurface leak were to occur. In addition, the potential sources to surface and groundwater of petroleum and other chemicals are ubiquitous in a watershed such that tying any 'hit' back to a given well would be problematic. Given the difficulty of achieving any meaningful results from such monitoring, TDEC cannot justify the cost imposed by such requirements.

N. Spacing, Forced Pooling

Comment: **N-1) We received numerous comments to repeal the forced pooling option.**

Response: It was clear that many commenters believed that the force pooling rules are a way for an operator to 'steal' a portion of their mineral rights, or force them to sign an agreement against their will. In reality the force pooling requirement is intended as a protection for the minerals owner when the surrounding mineral owners have leased their property for

development for extraction of oil and gas. If drilling occurs adjacent to your property, this rule prevents them from extracting the resource that you share without paying you for your share.

If a minerals owner desires to lease and permit their minerals and the adjacent minerals owner declines to enter into an agreement, the force pooling option provides an avenue for development. This prevents an adjoining mineral rights owner from "blocking" your ability to drill on your land. To develop a field for oil and gas production the operator (leasor) has to have greater than 50% of the leases to receive a permit to drill; has to go before the oil and gas board to receive approval and meet certain requirements for notification to all affected adjacent mineral owners. The mineral owner who chooses not to sign a lease does not have to, but may be force pooled with their minerals. However, the minerals owner who chooses not to sign can receive more for his produced oil and gas minerals based on current law.

All decisions are based on current spacing requirements for oil and gas wells permitted in the state. Because force pooling requirements are mandated by a statute, any change to this would have to be made by the General Assembly.

Comment: **N-2) I suggest this addition; Special spacing of 5 acres and wells drilled not closer than 466 ft. can be permitted if approved by regulatory authorities.**

Response: This is a former spacing requirement that is no longer considered due to the current geologic information available. However, different spacing requirements can be considered by the board and staff if compelling scientific information is presented for review.

O. Chemical Additives, Waste Water

Comment: **O-1) Where is the list of approved chemical additives that may be used in fracking?**

Response: At this point we have chosen not to promulgate such a list. The EPA is currently studying the issue and is expected to pass down minimum rules for fracturing to the states in the near future. We have elected to wait to see what the EPA does on this issue before we put a list into the rules.

However, the Supervisor does have the authority to consider the chemical additives proposed in a fracturing treatment and request modifications if warranted before issuing a permit.

Comment: **O-2) A commenter wants clarification of dealing with wastewater, there needs to be wording separating water produced during drilling operations that is uncontaminated freshwater and water produced from well treatments or production operations.**

Response: We concur with the commenter and clarification has been added to the regulations to distinguish uncontaminated freshwater and water produced from well treatments or production operations, under subparagraph (2)(f) of Rule 0400-53-03-.02 Environment.

Comment: **O-3) Several commenters wanted clarification of the phrase the actual materials and volumes used to fracture, [and] the amounts and concentrations of any additive used" that is reported on the Well History, example: should it be hand written, Chemical Abstract Number, MSDS, etc.**

Response: We concur with the commenters that the draft rule language was not specific enough. Rule language has been added to address specifically what should be reported on the Well History and on an internet disclosure registry.

Comment: **O-4) Several commenters want protection of trade secrets in respect to additives used in the fracking process.**

Response: Clarification on trade secret protection has been added using wording adapted from the Colorado Oil and Gas regulations for disclosure of chemical additives for a hydraulic fracture.

Comment: **O-5) Several commenters want disclosure of the timing and nature of any chemicals that will be pumped into the ground or disposed of in their communities.**

Response: The rule language specifies that the operator must include as part of their application their plan for disposal of wastewater if they propose to fracture using greater than 200,000 gallons of water-based liquids. This information will also be made part of the public notice for such a fracturing activity. The timing of such disposal is not addressed since the date of disposal will not be known at the time of application and public notice. However, if wastewater were to be disposed of via underground injection well, this activity would be permitted by the Division of Water Resources under UIC regulations, and this information would be available in that permitting process.

P. Tennessee Clean Water Network (TCWN) proposed regulatory language

The Tennessee Clean Water Network submitted suggested regulatory language that will be responded to within the context of the proposed language. The TCWN suggestions are designated by "{ }" at the beginning and end of the proposed language and will underlined if it is to be added and struck through if proposed to be deleted. The Department's response will be designated by "[ ]" at the beginning and end of the response and in bold.

To 0400-51-01-.01:

{( ) "API" shall mean the American Petroleum Institute.}

[This definition will not be needed because the term API will not be utilized in the rule language.]

{( ) "Aquifer" shall mean a geologic formation, portion thereof, or group of formations (including overlying unconsolidated material) which contains and is capable of yielding a sufficient quantity of ground water to serve as a domestic or public water supply or other use.}

[TDEC concurs that a definition is needed. A definition very similar to this one has been added as suggested.]

{( ) "Well Integrity" means the containment of subsurface zone(s) or formation(s) containing hydrocarbons produced into a well, and the containment of that production within the well all the way to the surface for the life of that well.}

[We concur with the need for this definition, and have incorporated it into the rules as requested.]

To 0400-52-02-.01:

{~~1040-02-02-.01~~ 0400-52-02-.01 Permit Required} **[We appreciate the identification of this typo, and have made the correction as suggested.]**

To 0400-52-02-.01(10):

(10) In the case of any well that is proposed to be fractured {~~using a cumulative total of >200,000 gallons of liquids:~~} **[We propose to keep the 200,000 gallon threshold. See TDEC response under Comment A-2) of the Response to Comments document.]**

{(a)} The Supervisor shall give notice to the public by e-mail {to a list of interested persons who have requested TDEC notify them of Oil and Gas permit applications} **[We concur and have added this clause as requested]** and posting on the department web site, and the public shall be allowed to submit comments for {~~15~~ 30} **[We concur. See TDEC response to comment G-1 in the Response to Comments document]** days from the date of notification. Any comments

received shall be considered by the Supervisor, and the Supervisor shall provide written responses to those comments. {~~Prior to Public Notice, the Supervisor may require additional information from the applicant in these cases, including but not limited to information on water sources, fracturing methodologies, and methods of wastewater disposal~~}. **[We believe this clause has definite regulatory value, allowing the Supervisor to take additional review time as needed for fracturing proposals that are new to TN, and using that time to steer the applicant towards safer methods.]**

{(b)} The public notice shall contain the following information:

a. Name, address, and telephone number of the applicant;
b. Name, address, email, and telephone number of TDEC contact person;
c. A brief description of the proposed activity;
d. The purpose of the proposed activity;
e. The location of the well proposed to be fractured;
f. A map of the proposed location including in which watershed the activity would take place and all state waters within a 1 mile radius of the well;
g. Information regarding the sources of water, fracturing methods to be used, and amounts and methods of wastewater disposal
h. The procedure to submit comments on the proposed activity;
i. The procedure for requesting a public hearing; and
j. A brief description of the procedure for the Supervisor to make a final determination of whether to issue the permit.}

[We concur that our draft language was not specific concerning the content of the public notice. Accordingly, we have inserted language under subparagraph (a) of this paragraph that is consistent with TDEC Public Notice rules for NPDES Permits, and very similar to your suggested language above.]

{(c)} The applicant shall provide the Department's public notice of the proposed well to the owners of any residence that have any {~~active domestic~~} **[We concur that our term was awkward, and have adjusted the language to read "drinking water wells'.]** water well{~~s~~} within a ½ mile radius of the proposed wellhead at least 60 days {~~2 weeks~~} **[The commenter provides no justification for such an expanded notification period. We have changed the wording to '14 days', which is consistent with other oil and gas landowner notifications, which have worked well to date.]** prior to the beginning of drilling operations. In the case of a horizontal well, the ½ mile radius shall be measured from the terminus of the horizontal well bore. The determination of the presence of any such domestic wells shall include at a minimum the information available on the Division of Water Supply's Water Log Tracking System {and door-to-door surveys where owner or occupants are contacted in person}. **[The Department has no program currently that requires door-to-door surveys, and we see no no need to implement one in this case.]** The applicant shall collect a sample of any such well at the request of the owner in accordance with the requirements in Rule 0400-52- -.05 Baseline Assessment.} ~~and have the sample analyzed for Total Petroleum Hydrocarbons (TPH), BTEX (benzene/toluene/xylene) and Total Dissolved Solids, to demonstrate the condition of the water well prior to the drilling of the well to be fractured.~~ **[See TDEC response under Baseline Assessment. The intent of the baseline well monitoring was to collect enough water quality indicator information to allow for detection of any significant changes to well quality that could be associated with drilling. If an indicator parameter suggests possible contamination, then the well owner can collect more detailed information as needed. We have, however, added pH, TOC, and chlorides to this list of parameters.]** Sampling results shall be provided to the Supervisor and domestic well owner as soon as results are obtained. Sample analyses shall be conducted by a certified laboratory utilizing standard methods and minimum detection levels consistent with Tennessee Department of Health laboratories.

{(d)} The applicant shall publish a copy of the Department's Public Notice required by subsection (b) above in a newspaper of general circulation local to the proposed well site. The text of the Notice shall be in at least 12 point type. **[We find this proposed requirement to be impractical and of dubious value – many areas where drilling occurs have no local distribution newspaper nearby, and others only publish at infrequent intervals. We believe that the digital public**

notice and notification to adjacent landowners will be adequate.]

{(e)} Permit applicants shall notify the public of the application by posting a sign containing the information in the Public Notice required by subsection (b) above near the point of entrance to the proposed well site and within view (or adjacent to the right shoulder) of a public road. Where possible, the sign must be located so that a vehicle may safely stop to allow the sign to be read and to record information. In any case, the sign must be within ten (10) feet of the nearest edge of the public right of way. The sign must be perpendicular to the road and be readable from either direction. The letter size of the first line, "PUBLIC NOTICE" shall be at least 7 inches high. The remainder of the lettering shall be at least 3" high. Letter width should be at least one-fifth the height of the letter. The typeface shall be sans serif (block type) and one of the following color combinations: black type on yellow background, black on white, yellow on black, or white on blue. The minimum sign size shall be sufficient to allow all required information to be presented in the minimum allowable type size with a boarder of not less than 3 inches around the lettered portion of the sign. The sign shall be maintained for at least thirty (30) days following distribution of the approved Public Notice. The applicant shall provide certification to the Supervisor of compliance with this requirement. **[We believe that a sign posting at the proposed well location is unlikely to be seen by many in the remote areas where most drilling is done. In some cases the point of entrance from the nearest public road will be so far from the actual well site that it may create a false impression about the location. The well location will be indicated in the public notice.]**

{(f)} A copy of the Public Notice shall be sent to any person who specifically requests one. **[The Public Notice is part of the public record. TDEC will of course provide a copy of the public notice to any who request it, but there is no need to state it in rule language.]**

{(g)} By the time of Public Notice issuance the Department will have posted the permit application and draft permit in the Division's existing online permit database. **[Such a requirement would be more appropriate in a TDEC internal procedural document.]**

{(h)} The Supervisor will notify the public of permit issuance or denial through the Division's website and e-mail. All interested parties will be notified directly. Interested parties include anyone who provided written comments during the public comment period or as testimony during a public hearing, water well owners within a ½ mile radius of the wellhead to be fractured, and any other person known by the Division to be directly affected by the permit. **[We concur with the first statement that the Supervisor will notify the public of our decision via the website and e-mail, and have added this clause to subparagraph (b) of this paragraph.]**

To 0400-52-02-.02(5):

(c) If, within ~~ten ({10}~~{60}~~)~~ days after the notice, there are no objections to issuing the permit, then the Supervisor shall issue the permit, provided all other requirements have been complied with. **[The commenter provides no justification for such an extension of the notification. The current 10 day period has functioned without complaint or incident to date.]**

(d) If there is an objection or objections to issuing the permit, the objector or objectors ~~must~~ shall furnish the applicant and the Supervisor the basis of the objection and support his contentions with documents, etc., within ~~ten ({10}~~{60}~~)~~ days after the date of the notice. **[The commenter provides no justification for such an extension of the notification. The current 10 day period has functioned without complaint or incident to date.]**

To 0400-52-04-.01(1):

(a) Wells drilled in search of oil or gas to a depth of less than ~~one thousand (~~1,000~~)~~ feet shall be drilled on {~~10~~} {40} -acre spacing, and shall not be located closer than ~~six hundred sixty (~~660~~)~~ feet from any other well completed in, drilling to, or for which a permit shall have been granted to drill to the same pool; and not closer than ~~three hundred thirty (~~330~~)~~ feet from any property or unit line. **[The commenter provides no justification for increasing the spacing requirement from 10 acres to 40 acres. The current spacing requirement has worked well to date without incident or complaint. A forty acre spacing could limit the ability of some**

landowners to develop their mineral rights.]

{~~(l) Any drilling being conducted in Overton, Clay, Pickett or Fentress Counties (this is portions of Fentress County that are west of Hwy 127 and North and West of State Hwy 154) is based on 400 feet to another well and 200 feet to the unit or property line down to a depth of 2500 feet. This is an exception to the current state wide drilling requirements.~~} **[We disagree that we have the authority to delete the statutory spacing requirements.]**

To Chapter 0400-52-04:

{NOTE: Specific authority to regulate well spacing is at T.C.A. § 60-1-202(a)(4)(L). Specific authority to delete (1)(l) is at T.C.A. § 60-1-106 and 2010 census data for Overton (22,083), Clay (7,861), Pickett (5,077), and Fentress (17,959) Counties.} **[We disagree that we have the authority to delete the statutory spacing requirements.]**

To Chapter 0400-52-06:

{0400-52-06-.01 General Requirements}
{0400-52-06-.02} Drilling Equipment
{0400-52-06-.03 Well Logging}
{0400-52-06-.04 Cased Hole Logging}
{0400-52-06-.05} Blowout Prevention
{0400-52-06-.06} Casingheads
{0400-52-06-.07} Environmental Protection

{0400-52-06-.01 - General Requirements

Oil and gas wells shall be drilled and completed in a manner that protects the geologic formations and aquifers from material inside the well bore during subsequent drilling operations and, in combination with other steel casing and cement sheaths that are subsequently installed:

1. protects the groundwater with multiple layers of protection for the life of the well;

2. maintains well integrity for the life of a well;

3. ensures that operations proceed within established parameters and in accordance with the well design, well plan, and permit requirements; and

4. includes testing prior to well construction, during well construction, and over the life of a well to ensure its integrity is maintained.}

[This language consists of general statements of intent, but provides no specific regulatory value. However, we have added similar general language under Rule 0400-52-06-.04, as a lead-in to the section on 'Environmental Protection'.]

0400-52-06-.0{2} Drilling Equipment

All drilling equipment shall be designed, constructed, and operated in such a manner so as to prevent accidents and insure safe operating practices. It is recommended that each operator require the drilling contractor to comply with the general rules and safety procedures of the industry.

{0400-52-06-.03 Well Logging

(a) General

Well logs shall be completed to log subsurface conditions noted during drilling and mechanical integrity tests and hydraulic pressure tests shall be used to assess well integrity during the construction of the well.

(b) Open-hole Well Logging

After drilling of the hole is completed, and before casing is installed and cementing operations begin, open hole well logging shall be completed prior to setting casings to: locate and evaluate the hydrocarbon producing formations; achieve the well design objectives; and properly achieve the isolation benefits of the casing and cement. Logging tools shall include one or more of the following log types: Gamma Ray; Resistivity; Density; and/or Caliper.}

[We do not see any value in testing the borehole prior to setting casing and cement.]

{1040-02-06-.04 Cased Hole Logging

After cementing the casing, "cased-hole" logs shall be run inside the casing to know the exact location of the casing, casing collars, and quality of the cement job relative to each other and relative to the subsurface formation locations. These logs shall include the gamma ray, a collar locator, and a cement bond log that measures the presence of cement and the quality of the cement bond or seal between the casing and the formation.}

[We believe that the casing integrity testing and cement documentation that we have proposed under Rule 0400-52-06-.02 Blowout Prevention and Chapter 0400-52-07 Casing Program are adequate to assure isolation of strata. See TDEC response in the Response to Comments document to comment K-2) concerning the use of cement bond logs and well integrity testing.]

0400-52-06-.~~02~~{.05} Blowout Prevention

{(1)} All wells shall be equipped and operated in such a manner as to prevent the uncontrolled emission of oil, gas, and water from the well.

{(2) Any applicant for a permit for a gas well proposed for drilling less than 1,000 feet deep that is proposed within two (2) miles of an outcrop of a gas formation shall survey the outcrop prior to drilling to determine whether there are gas seeps and springs or water seeps that discharge from the gas formation in the area. The potential for a blowout of fracturing fluids and gases shall be addressed in the Drilling Plan submitted during the permit application.}

[This Colorado requirement is intended to prevent fracturing that occurs near the edge of an escarpment from 'blowing out' the side of the hill or mountain in places where the producing formation is elevated enough to be exposed on a hill or mountainside. This language is unnecessary in Tennessee. The elevations and topography of our state are such that none of the formations that would be fractured or otherwise pressurized from the surface are exposed on the side of a mountain or escarpment where a 'blow out' could occur.]

{~~(2)~~(3)} Blowout prevention for regular state spacing requirements for all wells shall be equipped with a minimum of the following equipment:

(a) A blowout prevention system with 2 separate units capable of closing with the drill pipe in the hole or other equivalent control system as approved by the supervisor or authorized representative of the supervisor. A minimum of 3000 psi working pressure is required;

(b) Accessible controls both in the rig and at a safe remote location of at least 50 feet from wellhead;

(c) An annular choke valve;

(d) A drill pipe or power head valve capable of pump truck connection;

(e) A flow line of the proper size and working pressure shall be installed in a straight line to pit and shall be anchored securely; and

(f) Blowout prevention equipment that has a rated minimum working pressure of 3000 psi. In unknown or expected higher pressures a 5000 psi working pressure shall be required.

1. The blowout preventers shall be installed above ground level if possible but if a cellar is dug, the equipment shall be accessible during drilling operations. The entire control

equipment shall be in good working condition at all times. All outlets, fittings, and connections on the casing, blowout preventers, choke manifold, and auxiliary wellhead equipment that may be subjected to wellhead pressure shall be of a material and construction that shall withstand the anticipated pressure and shall be resistant to fire. The lines from outlets on or below the blowout preventers shall be securely installed, anchored, and protected from damage.

2. Blowout preventers, accumulators, and pumps shall be used in accordance with the product manufacturer's rating and minimum operational specifications. The permittee is responsible for seeing that the blowout prevention equipment is in proper working order. This includes the proper operation of the closing unit valving, proper operation of the pressure gauges, and the presence of the manufacturer's recommended accumulator fluids. A combination of any 2 of the following secondary closing systems is acceptable:

   (i) Electric-operated pump.

   (ii) Air-operated pump.

   (iii) Hand-operated pump.

   (iv) Nitrogen-operated pump.

   Blowout preventer rams shall be of a proper size for the drill pipe being used or production casing being run in the well or shall be variable-type rams that are of the proper size range. Blowout Prevention shall be installed before passing through any known production or high pressure zone in the well boring path.

3. Blowout prevention equipment and intermediate casing shall be tested to a pressure of 1,500 psi at surface for not less than 30 minutes. This shall be done prior to drilling the plug on the intermediate casing or at other intervals as approved or requested by the supervisor. If, at the end of 30 minutes, the pressure shows a drop of 10% or more from the original test pressure, the casing shall be condemned until the leak is corrected. A pressure test demonstrating less than a 10% pressure drop after 30 minutes is proof that the condition has been corrected. A record of each test, including test pressures, times, failures, and each mechanical test of the casings, blowout preventers, surface connections, surface fittings, and auxiliary wellhead equipment shall be entered in the logbook, signed by the driller, and kept available for inspection by the supervisor or authorized representative of the supervisor.

4. With the understanding that all permitting procedures have been followed, a well may be deepened to 200' below the bottom of the Chattanooga Shale without initiating other than the usual well control procedures. The casing shall withstand at least 1,500 psi with no more than 10% loss of pressure in 30 minutes.

{(~~3~~)}{(4)} Blowout prevention for wells in accordance with special well spacing requirements as per subparagraph (1)(l) of Rule 0400-52-04-.01. All wells shall be equipped with a minimum of the following equipment:

(a) An annular-type blowout preventer or other equivalent control system as approved by the supervisor or authorized representative of the supervisor;

(b) Accessible controls both on the rig floor and at a safe remote location at least 50 feet from wellhead;

(c) An Annular choke valve;

(d) A drill pipe or power head valve capable of pump truck connection;

(e) A flow line of the proper size and working pressure; and

(f) Blowout prevention equipment that has a rated minimum working pressure of 1500 psi.

1. The Blowout preventers shall be installed above ground level if possible but if a cellar is dug, the equipment shall be accessible during drilling operations. The entire control equipment shall be in good working condition at all times. All outlets, fittings, and connections on the casing, blowout preventers, choke manifold, and auxiliary wellhead equipment that may be subjected to wellhead pressure shall be of a material and construction that shall withstand the anticipated pressure and shall be resistant to fire. The lines from outlets on or below the blowout preventers shall be securely installed, anchored, and protected from damage.

2. Blowout preventers, accumulators, and pumps shall be used in accordance with the product manufacturer's rating and minimum operational specifications. The permittee is responsible for seeing that the blowout prevention equipment is in proper working order. This includes the proper operation of the closing unit valving, proper operation of the pressure gauges, and the presence of the manufacturer's recommended accumulator fluids. Any of the following closing systems is acceptable:

   (i) Electric-operated pump.

   (ii) Air-operated pump.

   (iii) Hand-operated pump.

   (iv) Nitrogen-operated pump.

   Blowout preventer shall be of a proper size for the drill pipe being used or production casing being run.

3. Blowout prevention equipment and Surface casing shall be tested to a pressure of 400 psi at surface for not less than 30 minutes before drilling the plug on the surface casing and at other intervals as approved or requested by the supervisor. If at the end of 30 minutes the pressure shows a drop of 10% or more from the original test pressure, the casing shall be condemned until the leak is corrected. A pressure test demonstrating less than a 10% pressure drop after 30 minutes is proof that the condition has been corrected. A record of each test, including test pressures, times, failures, and each mechanical test of the casings, blowout preventers, surface connections, surface fittings, and auxiliary wellhead equipment shall be entered in the logbook, signed by the driller, and kept available for inspection by the supervisor or authorized representative of the supervisor. If the casing is to be tested at the time of surface casing, cementing 150 psi for a period of ten minutes may be used. The annulus shall be filled with fluid and the plug shall have been landed prior to the test beginning. If a drop of over 10% or more from the original test pressure is found the casing shall be condemned until the leak is corrected. The previous criteria concerning recording of the test shall be followed.

4. The casing shall withstand at least 400 psi with no more than 10% loss of pressure in 30 minutes.

All wells shall be equipped and operated in such a manner as to prevent the uncontrolled emission of oil, gas, and water from the well.

~~1040-02-06-.03~~ 0400-52-06-.03 Casingheads.

All wells shall be equipped with casingheads with a test pressure in conformance with conditions to be anticipated in wells in which they are used. Casinghead body shall be equipped with proper connections and valves accessible to the surface as soon as installed. Reconditioning shall be required on any well leaking gas or oil.

~~1040-02-06-.04~~ 0400-52-06-.04 Environmental Protection.

(1) All oil and gas operations shall be conducted in a manner that ~~will~~ shall prevent or mitigate adverse environmental impacts such as soil erosion and water pollution. All areas disturbed by the operations,

including access roads, shall be reclaimed as prescribed in ~~rule 1040-02-09-.05~~ Rule 0400-52-09-.05. Access roads shall be constructed in such a manner as to reduce erosion to a practical minimum. Sediment ponds, berms, diversion ditches, hay bales, and other measures designed to prevent erosion and discharge from well sites shall be taken to prevent or minimize soil erosion and pollution of surface waters.

{(2) Oil and gas wells shall be drilled and operated in a manner that protects aquifers and surface waters.

(3) Wells shall be designed to ensure the environmentally sound, safe production of hydrocarbons by containing them inside the well, protecting groundwater resources, isolating the productive formations from other formations, and properly executing hydraulic fractures and other stimulation operations. The well design and construction must ensure no leaks occur through or between any casing strings. The fluids produced from the well (oil, water, and gas) must travel directly from the producing zone to the surface inside the well conduit.}

[We concur with this language as a general lead-in to Environmental Protection. Accordingly we have inserted this language as the new paragraph (1) of this rule, and moved the old paragraph (1) to paragraph (2) of this rule.]

{(4) All well designs and well plans shall include contingency plans to mitigate and eliminate the risk of failure due to unplanned events to ensure the protection of people and the environment.}

[We concur with this addition, and have incorporated this language into paragraph (1) of Rule 0400-53-03-.02 Environment.]

{(5) Erosion prevention and sediment controls at all oil and gas operations shall meet or exceed the following requirements:} **[We agree that this is a wording improvement and have made this change as suggested, under paragraph (2) of this rule.]**

(a) The erosion prevention controls shall be designed {and implemented} to minimize the dislodging and suspension of soil in water. Sediment controls shall be designed {and implemented} **[We agree that this is a wording improvement, and have made this change as suggested.]** to retain mobilized sediment on site. {These erosion prevention and sediment controls shall be developed and submitted to the Supervisor in a site-specific Stormwater Prevention and Sediment Control Plan ("SWPPP"), which shall be prepared in accordance with good engineering practices and the latest edition of the Tennessee Erosion and Sediment Control Handbook.} **[We do not intend to require SWPPPs for oil and gas facilities at this time. See TDEC response in the Response to Comments document to comment G-4).]**

(b) All control measures ~~must~~ shall be properly selected, installed, and maintained in accordance with the manufacturer's specifications (where applicable) and standard engineering practices. All control measures selected ~~must~~ shall be able to slow runoff so that rill and gully formation is prevented. When steep slopes and/or fine particle soils are present at the site, additional physical or chemical treatment of storm water runoff may be required. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the operator ~~must~~ shall replace or modify the control for relevant site situations.

(b) If sediment escapes the drilling, production, and or roadway areas, off-site accumulations of sediment that have not reached a stream ~~must~~ shall be removed at a frequency sufficient to minimize offsite impacts. Fugitive sediment that has escaped the drill area and has collected in a drainage ditches or roadways ~~must~~ shall be removed so that it is not subsequently washed into culverts and streams by the next rain and/or so that it does not pose a safety hazard. Permittees shall not initiate remediation/restoration of a stream without consulting the Department first. {Discharged water must not cause an objectionable color contrast with the receiving stream. The storm water discharge must result in no materials in concentrations sufficient to be hazardous or otherwise detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life in the receiving stream.} **[This language is already part of TDEC rules, as part of narrative water quality standards. Any such discharge would be regulated under the TN Water Quality Control Act, and repeating this language in the oil and gas rules is redundant.]**

(d) Sediment shall be removed from sediment traps, silt fences, sedimentation ponds, and other sediment controls as necessary.

(e) Upon attainment of stability, materials used for erosion prevention and sediment control should be removed or otherwise prevented from becoming a pollutant source for storm water discharges.

(f) Pre-construction vegetative ground cover shall not be destroyed, removed or disturbed more than ~~thirty (30)~~ days prior to grading or earth moving unless the area is seeded and/or mulched or other temporary cover is installed.

(g) Clearing and grubbing ~~must~~ shall be held to the minimum necessary for drilling and or production activities.

(h) Construction ~~must~~ shall be sequenced to minimize the exposure time of graded or denuded areas.

(i) Erosion prevention and sediment control measures ~~must~~ shall be in place and functional before drilling activities begin, and ~~must~~ shall be properly maintained throughout the drilling and production phase.

(j) Permanent stabilization with perennial vegetation (using native herbaceous and woody plants where practicable) or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable.

{~~(3)~~(5)} The operator shall notify the oil and gas inspector at least {14 days ~~24 hours~~} prior to beginning fracturing activities. The operator shall maintain personnel on-site during the fracturing activity and during the back flow period. **[Oil and gas site notifications to the inspectors are consistently either 12 hours or 24 hours, and are intended solely to allow the inspector to be on-site if they choose. This time frame has worked well in the past. Furthermore, the operator will not usually know 14 days in advance the exact day that the fracturing activity will begin.]**

To Chapter 0400-52-07:

{0400-52-07-.01 Casing Program, General Requirements}
{0400-52-07-.02 Casing Program, Prior Approval Required}
{0400-52-07-.03 Cement Selection}
(0400-52-07-.04 Casing Centralizers}
{0400-52-07-.05} Casing Requirements
{0400-52-07-.06} Conductor Pipe
{0400-52-07-.07 Surface Casing Construction}
{0400-52-07-.08 Intermediate Casing Construction}
{0400-52-07-.09} Production Casing
{0400-52-07-.10 Completion Reports}
{0400-52-07-.11} Isolation of Oil, Gas and Fresh-Water bearing Strata, and Potential Minable Coal and Other Mineral Deposits

{0400-52-07-.01 Casing Program, General Requirements

(1) Well Design.

Each well design and construction shall address each casing string used, including conductor, surface, intermediate, and production. Groundwater protection through zone isolation shall be maintained. All casing setting depths shall be determined in advance as part of the Drilling Plan to assure isolation, meet regulatory requirements, achieve a well system with integrity to support the rest of the drilling operation, and contain any pressures that might occur inside the well. The actual length of the casing strings should adjusted as the well is drilled based on measurements and data from the drilling process, including the results of logs, drill cuttings analysis, and analysis of pressures and drilling loads while drilling.

(2) Casing used in oil and gas wells that will be hydraulically fractured shall meet API standards, including

API Spec 5CT - including requirements for compression, tension, collapse, and burst resistance, quality, and consistency. The casing used in a well should be designed to withstand the anticipated hydraulic fracturing pressure, production pressures, corrosive conditions, and other applicable factors. If used or reconditioned casing is installed in a well that will be hydraulically fractured, it should be tested to ensure it meets API performance requirements for new built casing. Casing and coupling threads should meet API standards and specifications to ensure performance, quality, and consistency, including API Spec 5B. If proprietary casing and coupling threads from a specialized supplier are used, these threads must also pass rigorous testing done by the supplier and should adhere to applicable subsets of the API qualification tests.

(3) After the casing has been run into the drilled hole, it shall be cemented in place to provide zonal isolation between different formations (including full isolation of the groundwater) and to provide structural support of the well. Top and bottom rubber wiper plugs shall be used to minimize mixing of cement with drilling fluid while it is being pumped.}

[Much of this language is redundant to that already found in our Casing Program requirements. Paragraphs (1) and (3) of this rule are general statements rather than specific technical requirements, and thus add no regulatory value. Under paragraph (2) of this rule, TDEC would not directly reference API Specs in a rule, since those specs may be revised periodically. For TDEC's response to the universal application of API standards in the rules, see comment C-1) of the Response to Comments document.]

{0400-52-07-.02 Casing Program, Prior Approval Required}

(1) The operator's proposed casing program must be submitted for approval by the Supervisor, on Application for Permit to Drill (Form P-AD-1). If the Supervisor deems the casing program inadequate to protect fresh water zones and potential minable coal and other minerals, etc., he shall prescribe the casing program with which the operator will comply. {~~Unless an exception is granted by the Supervisor,~~} **[We prefer to keep this clause to provide the flexibility to address site-specific circumstances if needed. The commenter will note that there is nothing in this wording that requires the Supervisor to grant an exception.]** Suitable and sufficient surface casing shall be run and cemented to a depth not less than one hundred (100) feet below all fresh water strata encountered in the well and in a manner that will protect such fresh water from contamination resulting from drilling operations. The cement must fill the annular space behind the surface casing from the base thereof to the surface of the ground. If cement returns are not received to the surface, then the annulus must be cemented from the top.

{(2) The Application for Permit to Drill shall include a Drilling Plan for approval by the Supervisor that shall: identify all plugged and abandoned wells within 1,000 feet of any vertical well or 1,000 feet from any horizontal well component; identify all private and public water drinking water aquifer and surface water sources within 2,000 feet of any vertical or horizontal well component; and describe the proposed method for fracturing.} [We believe that these issues are adequately addressed under Rule 0400-52-07-.03 Surface Casing, Rule 0400-52-03-.01 Preparing Plats, and Rule 0400-52-02-.02 Drilling Permit. Plugged and abandoned wells are identified by the Supervisor from our records as part of our review. The commenter provides no justification for increasing the radius for identifying surface water from the current distance of 200 feet to 2000 feet.]

{(3) The Application for Permit to Drill shall include a Waste Control and Disposal Plan that includes a chemical inventory of expected additives and fuels to be used; describes methods and procedures that will be used to control spillage; and describes methods and procedures planned for waste treatment of disposal, including at a minimum drill cuttings and muds, drilling fluids, fracturing fluids, flowback liquids, and downhole equipment contaminated with Technically-Enhanced Naturally-Occurring Radioactive Materials (TENORMs).} **[Most of these items will be required to be part of the Public Notice for any fracture >200,000 gallons of water-based liquids. The requirement for applications to include an action plan containing contingency measures for spills or other releases has been added under 0400-53-03-.02 Environment as per your comment under item (4) under Environmental Protection. The handling of TENORMS has been addressed under 0400-54-01-.03 Proper Disposal of Waste.]**

{(4) The Application for Permit to Drill shall include a Casing and Cementing Plan that discusses the expected casing depths; expected or possible geologic hazards such as caves, faults, and mines; the formations that will be encountered by depth; formations expected to be confining layers of fracturing fluids;

proposed types of cements and additives and their expected amounts; borehole conditioning procedures; locations of centralizers; types of casings; methods for determining depths to aquifers and methods planned for protection; and fracture model height and length geometry.} **[We believe that casing plans are adequately addressed under Rule 0400-52-07-.03 Surface Casing.]**

{(5) The Application for Permit to Drill shall include a Water Use and Supply Plan that discusses where source water will be obtained, the local and regional effects of that withdrawal, and the permitting activities associated with such withdrawal.} **[Source water information and any permitting activities associated with water withdrawals would be required as part of the application and Public Notice for any fractures using >200,000 gallons of water-based liquids. The potential impacts of such a withdrawal would be a necessary part of TDEC's review of an ARAP permit for water withdrawal.]**

{(6) The Supervisor or his representative shall be given notice of cementing of surface casing at least {14 days ~~12 hours~~} prior to conducting such operation. The Supervisor or his representative may witness the cementing operation. Form R-WH1 must be accompanied by a copy of the drilling contractor's or service company's ticket for the work performed. **[The commenter offers no justification for increasing the notification time to the inspector.]**

{0400-52-07-.03 Cement Selection

(1) API Spec 10A and API RP 10B-2 shall be consulted in the selection and use of cementing products. Selected cements, additives, and mixing fluid shall be laboratory tested in advance to ensure they meet the requirements of the well design.

(2) Cement shall be placed completely around the casing and at the proper height above the bottom of the drilled hole (cement top) to achieve successful zone isolation and well integrity.

(3) Cement practices shall be completed to ensure that isolation is achieved. These practices should include, at a minimum:
- (a) Prior to drilling, operators should investigate and review the history of nearby wells for cementing problems encountered, e.g. lost returns, irregular hole erosion, poor hole cleaning, poor cement displacement, etc.
- (b) Computer simulation and other planning should be carried out in order to optimize cement placement procedures.
- (c) Operators should use established, effective drilling practices to achieve a uniform, stable well bore with desired hole geometry.
- (d) Operators should ensure that the drilling fluid selection is appropriate for the designed well and the geologic conditions likely to be encountered.
- (e) Casing hardware, including float equipment, centralizers, cement baskets, wiper plugs (top and bottom), and stage tools should be selected as necessary as part of the well design that will meet the cement design objective and challenges and ensure isolation.
- (f) Casing centralizers should be selected to help center the casing in the hole and provide for good mud removal and cement placement, especially in critical areas, such as casing shoes, production zones, and groundwater aquifers.
- (g) Appropriate cement testing procedures should be properly carried out by the service company personnel.
- (h) Cement slurry design shall include testing to measure the following parameters depending on site-specific geologic conditions:
  - (i) Critical parameters shall include: slurry density, thickening time, fluid loss control, free fluid, compressive strength development, fluid compatibility (cement, mix fluid, mud, spacer).
  - (ii) Secondary Parameters recommended for use as appropriate to address specific well conditions include: sedimentation control, expansion or shrinkage of set cement, static gel strength development, mechanical properties (Young's Modulus, Poisson's Ratio, etc.).
- (i) Cement job design shall include proper cement spacer design and volume.
- (j) The operator shall ensure proper well bore preparation, hole cleaning, and conditioning with wiper trips prior to the cement job.
- (k) Rotation and reciprocation of casing should be considered where appropriate to improve mud removal and cement placement.

(l) Service providers shall ensure proper mixing, blending, and pumping of the cement in the field.

(4) After the cement is set and prior to commencing further drilling or completion operations, the cement surrounding the casing shoe shall have a compressive strength of at least 500 psi and should achieve 1200 psi in 48 hours at bottomhole conditions. Production casing cement shall be tested to ensure it is adequate to withstand the anticipated hydraulic fracturing pressure. In addition, each casing string, except the conductor casing, shall be pressure tested prior to "drill out."}

[Cement requirements are covered under Rule 0400-52-07-.01 Casing Program, and are similar to the language proposed by the commenter.]

{0400-52-07-.04Casing Centralizers

Casing centralizers shall be used in all wells. The casing shall be centralized in the hole in order to ensure it will be completely surrounded or encased by cement during cementing operations and achieve the required isolation. API RP 10D-2 and API TR 10TR4 shall be used to determine the number and placement of centralizers in vertical and deviated well bores and centralizer selection guidelines, respectively.}

[We agree, and have added a version of the above language under item (3) of 0400-52-07-.03 Surface Casing. As previously stated, TDEC will not directly reference an API standard or Spec in the rules, since the API standards will be occasionally revised.]

0400-52-07-{~~.01~~}{.05} Casing Requirements

{(1) Conductor Casing – conductor casing shall be used for the purpose of supporting unconsolidated surface deposits. A conductor casing shall be installed when groundwater is present in unconsolidated sediments overlying the most shallow bedrock formation and shall extend at least 10 feet into competent bedrock. The conductor casing shall be designed and installed to: hold back the unconsolidated surface sediments as the drilling operations proceed; isolate shallow groundwater within unconsolidated sediments; prevent surface water runoff from entering the subsurface boring; prevent shallow groundwater from migrating down the continued borehole once the conductor pipe is set; and protect the subsequent casing strings from corrosion and to structurally support some of the wellhead load.

NOTE: API and preexisting rule moved from proposed 0400-52-07-.02}

[We have added the first sentence in your paragraph (1) above to the beginning of Rule 0400-52-07-.02 Conductor Pipe as suggested. Most of the remaining language consists of defining the purpose of conductor pipe rather than stating regulatory requirements. Conductor casing must be installed whether shallow groundwater is present or not, if needed to keep unconsolidated sediments out of the well bore, but we believe a requirement to extend the conductor casing 10 feet into bedrock in all cases is excessive – the intent is to extend the conductor casing into stable consolidated material.]

(2) Surface Casing - surface casing shall be set at 100 feet below the lowest known fresh water aquifer with class A cement only. The casing used shall have an external collapse pressure rating great enough to handle the hydrostatic pressure of a class A cement from the casing shoe to surface and Internal pressure rating to handle any anticipated down hole pressures. Cement shall have a minimum 500 psi compressive strength and have a minimum 8 hour wait prior to drilling the shoe out. A blowout preventer shall be installed at all times for emergencies, but casing shall not be used as pressure control. Surface casing shall be used to protect fresh water aquifers. No casing shoe shall be drilled until a cement seal has been brought back to the surface and secured between the surface casing and the well bore, preventing any ground water contamination. {The Supervisor or Supervisor's representative shall be given notice of cementing of surface casing at least 14 days prior to conducting such operation.}

[The commenter offers no justification for extending the notification period to the inspector. The current 12 hour notification to the inspector has worked without incident or complaint to date.]

{(3)} Intermediate Casing - an intermediate string of casing shall be set prior to the drilling into any known oil and gas producing zone. Casing shall have a minimum internal pressure rating of 3000 psi. Casing shall be cemented at a minimum of 100 feet into the surface casing. {The Supervisor or Supervisor's representative shall be given notice of cementing of surface casing at least 14 days prior to conducting

such operation.} **[The commenter offers no justification for extending the notification period to the inspector. The current 12 hour notification to the inspector has worked without incident or complaint to date.]** Casing string shall be deep enough to prevent underground blowout from anticipated bottomhole pressures. Casing shall have an external collapse pressure rating to handle cement design from casing shoe to surface. Cement shall have 500 psi compressive strength and have a minimum 12 hour wait prior to drilling the shoe out. All cement and casing designs shall be presented on a specifications sheet with Permit Application for approval. A copy of Cement Tickets shall be kept on location to be viewed by inspector until drill rig is removed. In unknown or over pressured conditions a 5000 psi rating on casing shall apply. A copy of all Cement Tickets shall be attached to the well history tickets and shall include all volumes and pressures of job from start to finish. To insure adequate annular space for cementing, the annular space outside the casing shall be at least as large as follows for the applicable casing size:

Up to 7" Outside Diameter (O.D.) Casing O.D. + 1 1/2"

More than 7" and less than 10 3/4" O.D. Casing O.D. + 2"

More than 10 3/4 "O.D. Casing O.D + 3"

{(4)} In wells with special well spacing requirements (off-Plateau) as per subparagraph (1)(I) of Rule 0400-52-04-.01, all surface casing shall be set 100 feet below the fresh water and use class A cement only. {The Supervisor or the Supervisor's representative shall be given notice of cementing of surface casing at least 14 days prior to conducting such operation.} **[The commenter offers no justification for extending the notification period to the inspector. The current 12 hour notification to the inspector has worked without incident or complaint to date.]** Casing shall have an external collapse pressure rating great enough to handle the hydrostatic pressure of a class A cement from the casing shoe to surface. A Float shoe or Baffle or Guide shoe with Wiper Plug along with annular cement volume plus 35% excess shall be required on all surface casing cement jobs. Cement shall have a minimum 500 psi compressive strength and have a minimum 8 hour wait prior to drilling the shoe out. No casing shoe shall be drilled until a cement seal has been brought back to the surface and secured between the surface casing and the well bore, preventing any ground water contamination. All cement and casing designs shall be presented on a specifications sheet with Permit Application for approval.

~~{(4) Any wells on the Cumberland Plateau drilled to depths above the Chattanooga Shale may be eligible for variances on the previous casing requirements by making a specific request to the Supervisor.}~~

[We prefer to keep this clause in order to provide some flexibility for shallower, lower pressure wells if warranted. The commenter will note that the Supervisor is under no obligation to grant any such variance.]

~~1040-02-07-.01~~ 0400-52-07-.{06} Conductor Pipe

{The surface hole shall be drilled using air, freshwater, or freshwater-based drilling fluid. Oil-based drilling fluids are prohibited. The conductor pipe shall be a steel casing inserted into the hole and cemented in place using proper cementing practices and in accordance with the well design. ~~That pipe ordinarily used for the purpose of supporting unconsolidated surface deposits, is termed conductor pipe. The use and removal of conductor pipe during the drilling of any oil or gas well shall be at the option of the operator. If the conductor pipe is to be pulled it must shall be pulled prior to the cementing of the surface casing.~~} All conductor casing shall have a cement seal at the surface preventing the possibility of any groundwater contamination and shall remain in the well. {~~if not pulled prior to the surface casing cement job. If more than 40 feet of conductor pipe was installed, the conductor pipe may not be pulled.~~} **[Much of this language is redundant to that already found in our Casing Program requirements. In reference to prohibiting oil-based drilling fluids, see our response to comment O-1) in the Response to Comments document.]**

~~1040-02-07-.02~~ 0400-52-07-.{07} Surface Casing {Construction}

(1) ~~{The operator's proposed casing program must shall be submitted, for approval by the Supervisor, on Application for Permit to Drill (Form P-AD-1). If the Supervisor deems the casing program inadequate to protect fresh water zones and potential minable coal and other minerals, etc., he shall prescribe the casing program with which the operator will shall comply. Unless an exception is granted by the~~

~~Supervisor, suitable and sufficient surface casing shall be run and cemented to a depth not less than fifty (50) 100 feet below all fresh water strata encountered in the well and in a manner that will shall protect such fresh water from contamination resulting from drilling operations. The cement must shall fill the annular space behind the surface casing from the base thereof to the surface of the ground. If cement returns are not received to the surface, then the annulus must be cemented from the top.~~ The surface casing shall be designed and installed to isolate groundwater and to contain pressures that might occur in the subsequent drilling process.}

(2) ~~The Supervisor or his representative shall be given notice of cementing of surface casing at least 12 hours prior to conducting such operation. The Supervisor or his representative may witness the cementing operation. Form R-WH1 must shall be accompanied by a copy of the drilling contractor's or service company's ticket for the work performed.~~ The surface casing shall be drilled to a depth based on the deepest groundwater resources depths identified during development of the Drilling Plan and based upon observed depths of groundwater while drilling and reported aquifer elevations of nearby wells. The surface hole shall be drilled using air, freshwater, or freshwater-based drilling fluid. Oil-based drilling fluids are prohibited. Drilling shall move slowly and pause periodically to allow time for groundwater to infiltrate into the borehole to ensure recognition of each groundwater-bearing zone. At a minimum, the surface casing shall be set at least 100 feet below the deepest aquifer encountered while drilling the well.}

(3) ~~A cement basket and centralizer are to be run on the surface casing between the first and second joints of surface casing or as directed by the supervisor.~~ The surface casing shall be cemented from the bottom to the top, completely isolating groundwater aquifers. After the surface casing cement has achieved the appropriate compressive strength and prior to drilling out, the surface casing shall be pressure tested using a casing pressure test. This test shall be conducted at a pressure that will determine if the casing integrity is adequate to meet the well design and construction objectives. In addition, immediately after drilling out of the surface casing plus a short interval of new formation below the surface casing shoe, a formation pressure integrity test (also known as a "shoe test" or "leak-off test") shall be performed. If the test results of the formation pressure integrity test are inadequate, remedial measures shall be undertaken as appropriate.}

{(4) A Cement Bond Log and/or other diagnostic tool(s) shall be completed prior to continuing the boring to determine that cement integrity is adequate to meet the well design and construction objectives.}

{(5) A cement basket shall be run on the surface casing between the first and second joints of surface casing or as directed by the supervisor. Centralizers are required for the entire depth of the surface casing in accordance with the spacing requirements established by the API.}

{0400-52-07-.08 Intermediate Casing Construction}

{Intermediate casing shall be designed and installed to isolate subsurface formations that may cause borehole instability and provide protection from abnormally pressured subsurface formations. The intermediate casing shall be cemented to the surface, and a CBL and/or other diagnostic tool(s) shall be run for the entire length of the casing to determine that the cement integrity is adequate to meet the well design and construction objectives. After the intermediate casing cement has achieved the appropriate compressive strength and prior to drilling out, the intermediate casing shall be pressure tested. This test shall be conducted at a pressure that will determine if the casing integrity is adequate to meet the well design and construction objectives. In addition, immediately after drilling out of the intermediate casing plus a short interval of new formation below the intermediate casing shoe, a formation pressure integrity test (also known as a "shoe test" or "leak-off test") should be performed. If the test results of the formation pressure integrity test are inadequate or indicate a failure, remedial measures shall be undertaken as appropriate. In the case of a failure, remedial cementing operations shall be undertaken as appropriate.}

~~1040-02-07-.03~~ 0400-52-07-.{09} Production Casing, {Vertical Component}

The production, oil, or flow string, is that casing used for the purpose of segregating the zone from which production is obtained and affording a means of communication between such zone and the surface. ~~A description of the work done under this section must rule shall be reported to the Supervisor on Well History, Work Summary, and Completion or Recompletion Report (Form R-WH-I) within sixty (60) days after completion.~~ {After the production hole is drilled and logged, production casing shall be run to the total vertical depth of the well and cemented in place using proper cementing practices to provide zonal isolation between the producing zone

and all other subsurface formations and for pumping the hydraulic fracturing fluids and other stimulation techniques from the surface into the producing formation without affecting any other geologic horizon in the well.}

{At a minimum, tail cement shall be brought at least 500 ft above the highest formation where hydraulic fracturing will be performed. In all cases, the casing shall be cemented to achieve the required subsurface isolation between zones. Prior to perforating and hydraulic fracturing operations, the production casing shall be pressure tested at a pressure that will determine whether casing integrity is adequate to meet the well design and construction objectives. A Cement Bond Log and/or other diagnostic tool(s) shall also be run to determine that the cement integrity is adequate to meet the well design and construction objectives. Remedial cementing operations shall be considered if there is evidence of inadequate cement integrity.}

[We have revised our Casing Program language under 0400-52-07. We believe it is superior in terms of specificity and enforceability to address casing and cementing quality, and operators have used it for a number of years without issues. In reference to prohibiting the use of oil-based drilling fluids, see our response to comment O-1 of the Response to Comments document. In reference to the use of CBLs and other integrity tests, see our response to comment K-2).]

{0400-52-07-.10 Completion Reports}

A description of the work done under this ~~section~~ Chapter shall be reported to the Supervisor on Well History, Work Summary, and Completion or Recompletion Report (Form R-WH-I) within sixty (60) days after completion.

~~1040-02-07-.04~~ 0400-52-07-{.11} Isolation of Oil, Gas and Fresh-Water-Bearing Strata, and Potential Minable Coal and Other Mineral Deposits.

Notwithstanding compliance with the foregoing requirements, all potential minable coal and other minerals ~~must~~ shall be isolated from any possible communication through the annulus with oil-, gas- or water-bearing strata or deposits of other potential minable coal or other minable minerals. Cement bond logs or other integrity tests shall be required on all wells proposed to be fractured and on any wells to be placed into Temporary Abandonment as per Rule 0400-52-09-.06 In order to ascertain whether or not such work has been reasonably performed, the operator may elect to either run a cement bond log, or block squeeze each stratum or zone which is required to be isolated. ~~{If the cement bond log indicates a minimum of twenty-five (25) feet of cement bond above the top and twenty-five (25) feet of bond below the base of each stratum or zone to be isolated, then the provision of this rule shall have been complied with.}~~ **[We believe this minimum standard has utility in making regulatory decisions.]** If such bonding is not shown by the bond log, the Supervisor may require the operator to perform the necessary work to assure the isolation of such above described strata zones.

To 0400-52-08-.04:

~~1040-02-08-.04~~ 0400-52-08-.04 Horizontal Drilling.

{(1) Operators shall minimize the number of vertical wells and pads in favor of centralizing wells on a single pad with multiple horizontal wells from a single surface location, where feasible, to reduce the cumulative surface impact of the development operation. The considerations for setting conductor, surface, intermediate, and production casing strings are the same as those for vertical wells.}

[While this statement explains one of the main advantages to be gained from horizontal vs. vertical wells, TDEC cannot require an operator to drill a horizontal well instead of a vertical one, making this language unenforceable.]

{(2)} Wells drilled by horizontal methods shall comply with the following spacing requirements:

(a) For all oil wells, and for gas wells drilled to the top of the Conasauga Group, the surface trace of that portion of the well bore or any portion of the horizontal drainhole that penetrates the producing formation, including the horizontal drainhole end point, shall not be located closer than ~~three hundred thirty (~~330~~)~~ feet from any property or unit line.

(b) For gas wells drilled below the top of the Conasauga Group, the surface trace of that portion of the well bore or any portion of the horizontal drainhole that penetrates the producing formation, including the horizontal drainhole end point, shall not be located closer than ~~six hundred sixty~~

~~(660)~~ feet from any property or unit line.

(c) Any number of producing formations may be penetrated by lateral drainholes from a single vertical well bore.

(d) All of the producing portion of the well ~~must~~ shall be in compliance with the spacing requirements of this paragraph. The horizontal portion of the well is the formation of record for production.

Proposed new Chapter 0400-52-__:

{Chapter 0400-52-_____
Fracturing

0400-52-_-.01 General
0400-52-_-.02 Water Use and Supply Plan
0400-52-_-.03 Waste Control and Disposal Plan
0400-52-_-.04 Use of Additives
0400-52-_-.05 Baseline Assessment
0400-52-_-.06 "Mini frac" Treatment and Analysis
0400-52-_-.07 Treatment Parameter Monitoring
0400-52-_-.08 Pressure Monitoring
0400-52-_-.09 Tiltmeter and Microseismic Monitoring
0400-52-_-.10 Post-Fracturing Monitoring
0400-52-_-.11 Post-Completion Monitoring

0400-52-_____-.01 General

The well operator or the operator's designated representative shall be on site throughout the hydraulic fracturing process. Prior to beginning the hydraulic fracture treatment, all equipment shall be tested to make sure it is in good operating condition. All high-pressure lines leading from the pump trucks to the wellhead shall be pressure tested to the maximum treating pressure. Any leaks must be eliminated prior to initiation of the hydraulic fracture treatment. Fracturing with oil-based additives of any type is prohibited.

0400-52-_____-.02 Water Use and Supply Plan

Operators of wells that will be fractured shall submit a Water Use and Supply Plan upon submittal of the well Permit Application. The Plan shall address how the operator plans to proactively communicate with local water planning agencies to ensure oil and gas operations do not constrain the resource requirements of local communities and to ensure compliance with all regulatory requirements. The planning effort shall include a review of potential water resources and wastewater management options that could be used to support hydraulic fracturing operations. This review shall address: anticipated volumes of water required for basin-wide fracturing; competing water requirements and constraints such as the location and timing of water withdrawal; water source; water transport; fluid handling and storage requirements; flow back water treatment/disposal options; permitting requirements (including, if applicable, the requirement to obtain an Aquatic Resource Alteration Permit from the Division of Water Pollution Control for withdrawals from surface waters); and potential for water recycling.
If water supplies are to be obtained from surface water sources, operators shall address potential issues associated with the timing and location of withdrawals, including, but not limited to: sensitive watersheds; historical droughts; low flow periods during the year; periods of the year when activities such as irrigation and other community and industrial needs place additional demands on local water availability; potential to maintain a stream's designated uses; potential impacts to downstream wetlands and end-users; potential impacts to fish and wildlife; potential aquifer depletion; and any mitigation measures necessary to prevent transfer of invasive species from one surface water body to another.

If water supplies are to be obtained from groundwater sources, operators shall consider the use of non-potable water where feasible and possible.}

[Source water information and any permitting activities associated with water withdrawals would be required as part of the application and Public Notice for any fractures using >200,000 gallons of water-based liquids. The potential impacts of such a withdrawal would be a necessary part of TDEC's review of an ARAP permit for water withdrawal.]

{0400-52-____-.03 Waste Control and Disposal Plan

The waste management plan to be submitted by the operator shall address management of solid waste and disposal practices for fluids within the hydraulic fracturing program, including planned flowback water characterization and disposition and description of the preferred transport method from the well pad (*i.e.*, truck or piping). Operators shall review and evaluate practices regarding waste management and disposal from the process of hydraulic fracturing, including: the preferred disposition of waste/wastewater (*e.g.*, treatment facility, disposal well, potential reuse, centralized surface impoundment or centralized tank facility); permit requirements; and the location, construction, and operation of proposed centralized flow back impoundments. The waste management plan shall also include the following information: design and capacity of storage impoundments and/or tanks; liners of any impoundment or secondary containment and why the proposed liner is sufficiently capable of containing a release; depths to the uppermost groundwater beneath the site; the number and individual and total capacity of receiving tanks on the well pad for flow back water; planned public access restrictions, including physical barriers and distance to edge of well pad; and placement of liners to prevent possible leakage from such impoundments.

The waste management plan completed by the operators should also include a transportation plan within their hydraulic fracturing program. The transportation component of that plan shall discuss the estimated truck volumes within a basin, designation of appropriate off road parking/staging areas, and approved transportation routes. Measures to reduce or mitigate the impacts of transporting large volumes of fracture fluids should be considered.

Liquid waste disposal shall follow a detailed chain-of-custody from origination to final disposal. Operators should consider options for the recycling of fracture treatment flow back fluid for use in future fracturing operations.

If the operator plans to dispose of any wastewater from the fracturing operations, including flowback, by indirect discharge to an existing wastewater treatment plant, the operator shall ensure that the treatment plant can effectively treat the waste without upsetting their system or causing a problem in the receiving water and comply with all requirements of T.C.A. Title 69 Chapter 3 and TDEC Rules Chapter 1200-4-14 Pretreatment Requirements. Pre-approval by the Division of Water Pollution Control is required prior to discharge of wastewater from fracturing to an existing wastewater treatment plant and the treatment plant sampling requirements modifications to the POTW's permits to ensure water quality standards in receiving waters are maintained at all times.}

[Information on waste disposal will be required and included as part of Public Notice for fractures using >200,000 gallons of water-based liquids, as specified in Rule 0400-52-02-.01(10)(a) Permit Required. Wastewater disposal at NPDES-permitted wastewater treatment plants or underground injection facilities is already regulated under existing rules, as the commenter has indicated.]

{0400-52-__-.04 Use of Additives

Operators shall strive to minimize the use of additives and should assess the feasibility of using more environmentally benign additives. Operators should evaluate potential opportunities for beneficial reuse of flowback and produced fluids from hydraulic fracturing in preference over surface discharge or reinjection.}

[This language states general goals to strive for rather than specific, enforceable requirements, and therefore we see no value as rule language.]

{0400-52-____.05 Baseline Assessment

A well operator who wishes to preserve its defense that the pollution of a private or public water supply existed prior to the drilling or alteration of the well shall conduct baseline monitoring prior to drilling and land alteration at a proposed well site. An operator electing to preserve its defenses that well operations did not contaminate a water supply shall complete baseline monitoring of any water supply within a one-half mile radius of the vertical well and horizontal well component. A copy of the results of the baseline assessment shall be provided to the Supervisor and the landowner or water well owner or operator within 10 business days of receipt of the results. Any test results not received by the Supervisor within 10 business days may not be used to preserve an operator's presumption of innocence should a contamination claim be made after drilling and fracturing operations are completed. Operators of wells that will be fractured should review the available information describing water

quality characteristics (surface and groundwater) in the area and, if necessary, proactively work with state and local regulators to assess the baseline characteristics of local groundwater and surface water bodies.

Once the location for a well has been selected and before it is drilled, water samples from any source of water located within a 1/2-mile radius shall be obtained and tested. Sources of water to be tested include rivers, creeks, lakes, ponds, and water wells. The area of sampling should be based on the anticipated fracture length plus a safety factor.

Operators shall analyze baseline water samples for parameters that are typical in hydraulic fracturing and its additives, which shall include, but not be limited to:

Total Dissolved Solids (TDS)	Total Suspended Solids (TSS)	Chlorides
Carbonates	Bicarbonates	Sulfate
Surfactants	Thermogenic Methane (dissolved)	Biogenic Methane (dissolved)
Barium	Strontium	Arsenic
NORMs	Total Petroleum Hydrocarbons (TPH), Diesel and Gasoline Range Organics	Flow rate (cubic feet per second)
pH (field)	Methane (as a gas)	Iron
Color, Odor, Sediment, and Bubbles Observations	Nitrates and Nitrites	PAHs (polynuclear aromatic hydrocarbons)

Operators should also analyze baseline water for additional parameters depending on site-specific geology and hydrology.}

[While the new rules will offer nearby water well owners the opportunity to have the operator provide a baseline water quality analysis of their well prior to drilling, we do not intend to require extensive groundwater and surface water monitoring around every oil and gas well. See TDEC response to comment M-7.]

{0400-52-_ -.06 "Mini frac" Treatment and Analysis

Prior to beginning a fracturing job, the owner or operator shall complete a diagnostic study, called a mini frac analysis, to determine any needed adjustments to the planned job are made and the results are used to refine computer models.}

[API defines this type of treatment and analysis in their Guidance Document HF1, and states only that sometimes this process is conducted to collect data to refine computer models and gain additional information on conditions that might bear on the fracturing treatment. API does not recommend this practice be done, nor suggest that it be a requirement for all wells. Operators are welcome to avail themselves of these surveys, but we have no justification for requiring them under rule.]

{0400-52-__.07 Treatment Parameter Monitoring

Process monitoring and quality control during the hydraulic fracture treatment is required to monitor for a successful treatment and for protection of the groundwater. Certain parameters shall be continuously monitored. These include surface injection pressure (psi), slurry rate (bpm), proppant concentration (ppa), fluid rate (bpm), and sand or proppant rate (lb/min). The data collected should be used to refine computer models used to plan future hydraulic fracture treatments.}

[During fracturing treatments most operators monitor these parameters, but it is not TDEC's intent to require operators to collect data to "refine computer models used to plan future hydraulic fracture treatments". We would consider that level of information to be better left to industry innovation and on-site best professional judgement, not as regulatory requirements.]

{0400-52-__.08 Pressure Monitoring

Pressure shall be measured at the pump and in the pipe that connects the pump to the wellhead. If the annulus

between the production casing and the intermediate casing has not been cemented to the surface, the pressure in the annular space shall be monitored and controlled. Pressure behavior throughout the hydraulic fracture treatment shall be monitored so that any unexplained deviation from the pretreatment design can be immediately detected and analyzed before operations continue. Pressure exerted on equipment shall not exceed the working pressure rating of the weakest component. The intermediate casing annulus shall be equipped with an appropriately sized and tested relief valve. The relief valve shall be set so that the pressure exerted on the casing does not exceed the working pressure rating of the casing. The flow line from the relief valve shall be secured and diverted to a lined pit or tank.}

[Pressure monitoring of this type is typically conducted during fracturing operations. We concur that this language is appropriate for inclusion for fractures using >200,000 gallons of liquids, and have added this section as suggested under 0400-52-6-.04(4) Environmental Protection.]

{0400-52-_-.09 Tiltmeter and Microseismic Monitoring

Fracture monitoring using microseismic and tiltmeter surveys shall be used on every well to evaluate new techniques, refine the effectiveness of fracturing techniques in new areas, and calibrating hydraulic fracturing computer models. A tiltmeter or a micoseismic mapping shall be used to achieve real time mapping of a hydraulic fracture treatment in progress.}

[The suggested language above is paraphrased from API's guidance on Hydraulic Well Fracturing section 10.4.3, which states that microseismic monitoring and tiltmeter surveys are NOT (emphasis added) used on every well, but are commonly used to evaluate new techniques or the effectiveness of a technique in a new area. While an operator may choose to conduct such surveys when attempting a hydraulic fracture in an area for the first time to assess and modify a fracture method, TDEC will not require such surveys to be conducted on every well, as per API's guidance.]

{0400-52-__-.10 Post-Fracturing Monitoring

Monitoring shall be conducted to determine which perforations accepted proppant and to determine the fracture growth beyond the perforation. Either a tracer test or a temperature log shall be run. Prior to a hydraulic fracturing treatment, the proppant shall be "tagged" with a tracer. After the proppant has been pumped into the formation, a cased-hole log, capable of detecting the tracer, shall be run to further confirm that placement of the proppant was as intended. A temperature log shall be run if a tracer test is not performed.}

[These tests are designed for operators to evaluate the success of their fracturing treatment at each perforation. These tests do not evaluate the areal extent of a given fracture or whether or not the fracture has created a pathway for fracture fluids to migrate to fresh water aquifers. Therefore, such testing does not provide additional environmental protection.]

{0400-52-__.11 Post-Completion Monitoring

Throughout the life of a producing well, conditions shall be monitored on an annual basis to ensure integrity of the well and well equipment. Mechanical integrity pressure monitoring shall be used to determine the mechanical integrity of tubulars and other well equipment when the well is producing and during fracturing operations.

During well fracturing, casing integrity shall be inferred by showing there is no leakage into the "A" annulus (if a frac string is used), or between the "A" annulus and "B" annulus by monitoring these pressures. After fracturing and upon final completion, the tubing/packer integrity shall be demonstrated by showing there is no leakage of injected fluids through the tubing or packer into the "A" annulus causing pressure buildup. Monitoring of these annular pressures is required during production to determine whether there are leaks. Maximum and minimum allowable annular surface pressures should be assigned to all annuli based on the gradient of the fluid in each. These upper and lower limits establish the safe working range of pressures for normal operation in the well's current service and shall constitute "do not exceed" limits.

Wellhead seal tests shall be conducted to test the mechanical integrity of the sealing elements (including valve gates and seats) and determine if they are capable of sealing against well pressure. If non-normal pressures are noted in an annulus, a re-pressure test of the wellhead seal system shall be conducted to determine if the source of communication is in the surface in the wellhead system.

When equipment is removed from a well or depressurized for maintenance, a breakdown or visual inspection shall be conducted to document the condition of the equipment after being in service.}

[We have no basis for requiring annual well integrity testing. The question of whether periodic well integrity testing is appropriate or at what intervals can be addressed in a future rule-making. However, we have added a requirement under Rule 0400-52-09-.06 for well integrity tests to be conducted on wells that have not been tested or produced in the last 15 years if they are proposed to be placed in Temporary Abandonment.]

To 0400-52-09-.05:

~~1040-02-09-.04~~ 0400-52-09-.04 Time Limit For Plugging Wells.

Except as provided in Rule ~~1040-02-09-.06~~ 0400-52-09-.06, all wells drilled for oil and gas and found to be dry holes shall be plugged within {~~one (1) year~~ 6 months} from cessation of drilling. All wells that are non-producing or abandoned shall be plugged within {~~one (1) year~~ 6 months} **[The one year time limit is consistent with other states and with the STRONGER review. The commenter provides no justification for reducing this time limit by half.]** from the date they cease producing ~~twelve (~~12~~)~~ barrels of oil per year or ~~twenty five (~~25~~)~~ mcf of gas per month or are abandoned. Upon written request to the Supervisor showing good cause, an extension of up to ~~ninety (~~90~~)~~ days additional may be granted. No operator or owner shall permit any well drilled for oil, gas, salt water disposal or any other purpose in connection with the production of oil and gas, to remain unplugged after such well is no longer used for the purpose for which it was drilled or converted. Nothing herein shall prevent utilizing a well for the purpose of introducing air, gas, fresh water or other liquid pressure into or upon the producing strata for the purpose of recovering oil and gas. All wells which are neither producing nor plugged ~~must~~ shall comply with shut-in standards of oil and gas wells and shall be cased and capped in such a manner so as to protect all potential oil and/or gas zones, and fresh water in accordance with the requirements of Rule ~~1040-02-09-.06~~ 0400-52-09-.06.

To 0400-52-09-.05(1)(a):

(a) Except for active work areas, the operator shall drain{, remove liners,} **[We concur that synthetic liners should be included in reclamation language. Accordingly we have added the words 'synthetic liners' in this subparagraph in the second sentence of this paragraph, after 'All drilling supplies and equipment.]** sentence and fill all surface pits that are not needed for production purposes, and shall grade and stabilize the well location and location road within ~~thirty (~~30~~)~~ days of the initial disturbance, in order to minimize surface run-off and prevent excessive erosion and sedimentation. All drilling supplies and equipment, **[synthetic liners,]** trash, discarded materials and other refuse not contained and covered in the reclaimed pits shall be removed from the site. Temporary vegetative cover shall then be established on all graded areas.

To 0400-52-09-.05(2)(c):

(c) Establishment of permanent vegetative cover shall conform with the standards set forth in the most recent version of the Tennessee Erosion and Sediment Control Handbook. ~~Suggested seeding mixtures, rates, and dates are shown in the following table:~~

~~Seeding Group~~	~~Rate-Pounds Per Acre~~	~~Rate-Pounds Per 1,000 Square Feet~~	~~Seeding Dates~~
~~For Temporary Cover:~~			
~~cereal wheat or rye (100%)~~	~~20-25~~	~~0.5-0.6~~	~~10/15-11/30~~
~~sudan grass hybrid (100%)~~	~~20~~	~~0.5~~	~~04/15-08/15~~

~~Seeding Group~~	~~Rate-Pounds Per Acre~~	~~Rate-Pounds Per 1,000 Square Feet~~	~~Seeding Dates~~
~~For Permanent Cover:~~			
~~tall fescue (100%)~~	~~30~~	~~0.7~~	~~02/15-04/15~~ ~~08/15-10/15~~

~~tall fescue (90%)~~	~~30~~	~~0.7~~	~~02/15-04/15~~
~~white (ladino) clover (10%)~~	~~3~~	~~0.1~~	~~08/15-10/15~~
~~tall fescue (86%)~~	~~30~~	~~0.7~~	~~02/15-04/15~~
~~crownvetch (14%)~~	~~5~~	~~0.1~~	~~08/15-10/15~~
~~sericea lespedeza (scarified) (60%)~~	~~30~~	~~0.7~~	~~03/01-04/15~~
~~tall fescue (30%)~~	~~15~~	~~0.3~~	~~03/01-04/15~~
~~annual lespedeza (10%)~~	~~5~~	~~0.1~~	~~03/01-04/15~~
~~sericea lespedeza (79%)~~	~~30~~	~~0.7~~	~~03/01-04/15~~
~~weeping lovegrass (8%)~~	~~3~~	~~0.1~~	~~03/01-04/15~~
~~annual lespedeza (13%)~~	~~5~~	~~0.1~~	~~03/01-04/15~~

~~1. Seeding rate should be increased by 20 percent on sites where a seedbed cannot be prepared.~~

~~2. Temporary cover should be disked or mowed before permanent vegetation is established.~~

~~3. Where more than 90 percent of a mixture is composed of tall fescue, annual fertilizing should be done to maintain an adequate cover.~~

~~4. Crown vetch may be used in Middle and East Tennessee and the northern half of West Tennessee, but should not be used on areas that will receive heavy traffic.~~

~~5. Sericea lespedeza and weeping lovegrass are both suitable for sites that are subject to drought.~~

~~6. Disturbed areas on which temporary cover must be established between December 1 and February 15 should be mulched, and then seeded with permanent vegetation as soon as possible.~~

~~(c)~~ The Supervisor may grant exceptions to the requirements of parts (b)1 and 2 of this paragraph when the species are necessary to establish a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved reclamation plan. {~~All items under subparagraph (c)~~ <u>of this paragraph</u> ~~are suggested guideline measures~~.}

[We concur that this sentence is no longer applicable now that subparagraph (c) has been revised. Sentence will be deleted as suggested.]

To 0400-52-09-.06:

~~1040-02-09-.06~~ <u>0400-52-09-.06</u> Temporary Abandonment.

(1) An operator has the opportunity to place any non-producing well into Temporary Abandonment for {~~five (5)~~ <u>2</u>} years if all of the following requirements are fulfilled: **[The 5 year requirement for Temporary Abandonment was passed into rule in late 2011, and is just now being implemented under Notices of Non-Compliance and Orders. TDEC has no justification for reducing the time span at this time, and we would prefer to wait some time to gauge the effectiveness of these new rules before making further changes.]**

(a) The operator shall submit a Temporary Abandonment form for each well to be placed in temporary abandonment. This form can be obtained from Water Pollution Control/Oil and Gas Program.

(b) The operator shall submit a ~~one hundred dollar ($100)~~ fee for each well per year to be placed in temporary abandonment.

(c) Each well shall be capped in such a manner as to have no open casing exposed to the environment (i.e., swedge with locked ball-valve or any other viable protection).

(d) Any well shown on the Annual Well Report that indicates no production ~~must~~ shall be placed in temporary abandonment status or plugged.

(e) All fees received for temporary abandonment ~~will~~ shall be placed in an account that ~~will~~ shall be set aside to be used only for funding the plugging of abandoned oil and gas wells.

{(f) Site stabilization activities are completed within 30 days of cessation of drilling to prevent erosion and protect surface water. Those activities must meet or exceed the minimum standards established in the Tennessee Erosion & and Sediment Control Handbook and those standards established in TDEC Rule 0400-52-09-.05.

(2) The operator shall drain all surface pits, remove liners, and shall grade and stabilize the well location and location road within thirty (30) days of beginning temporary abandonment to minimize surface run-off and prevent excessive erosion and sedimentation. All drilling supplies and equipment, trash, discarded materials and other refuse shall be removed from the site. Temporary vegetative cover shall then be established on all graded areas.

(3) Within ninety (90) days of beginning temporary abandonment, the operator shall remove all production and storage structure, supplies and equipment, any oil, and salt water and debris and shall grade any remaining disturbed areas, including access roads. Permanent vegetative cover shall then be established on all disturbed areas, excluding approved permanent, non-erosive facilities, and access roads. Any access roads necessary for the operator to gain access to the well site to determine the adequacy of the vegetative cover or to perform additional re-vegetation may continue to be used by the operator until all reclamation requirements have been met.}

[Site reclamation requirements under Rule 0400-52-09-.05 Surface Reclamation will apply to Temporary Abandonment well sites also. There is no need to restate the requirements here.]

(4) At the end of the {2 ~~five~~} **[The 5 year requirement for Temporary Abandonment was passed into rule in late 2011, and is just now being implemented under NONCs and Orders. TDEC has no justification for reducing the time span at this time, and we would prefer to wait some time to gage the effectiveness of these new rules before making further changes.]** year Temporary Abandonment period, each well submitted by the operator shall be reviewed by the Department. A determination ~~will~~ shall be made on the validity of keeping the well(s) open. This determination for validity ~~will~~ shall be based on whether the operator has a deliverability test for each gas well or if the well is producing oil. If the staff finds there is no valid reason to keep the wells open, the operator ~~will~~ shall then have {six (6) months ~~two years~~} **[Some operators have a large number of wells that will be affected by the rules on plugging and abandonment just passed in late 2011. To plug all of these wells in 6 months is not possible. We prefer to wait some time to gage the effectiveness of these recent rule changes before making further changes.]** to plug the non-producing well(s).

To Chapter 0400-52-11-.01:

0400-52-11-.01 Prevention of Waste – {Repealed}

~~{1040-02-11-.01 0400-52-11-.01 Prevention of Waste~~

~~If any operator can show to the Supervisor or Oil and Gas Board that the work procedures herein prescribed result in waste, or such operations are unreasonable, the Supervisor may enter such an order, as a special exception to the aforesaid rules and regulations, as will shall prevent such waste or eliminate such unreasonable restraint as may result from the application of the aforesaid rules and regulations to the well or wells of such operators; provided, however, that before any operator shall be allowed the benefit of any order granting an exception as authorized by this chapter, such operator must shall establish that such exception, if granted, will shall not result in waste in the field as a whole or give him an inequitable and unfair advantage over another operator or operators in the field. No special exception will shall be granted except upon written application, fully stating the alleged facts, which shall be the subject of a hearing to be held no earlier than ten (10) days after filing the application. Prior to the hearing upon such application, at least ten (10) days notice thereof shall be given by publication to all operators in the Field. In addition to said notice by publication, the applicant must shall give adjacent operators, where appropriate, at least ten (10) days notice of said hearing by personal service or by~~

~~Registered Mail.~~}

[Although we cannot agree with deletion, we do agree that changes are needed to clarify the procedures to be followed, and have done so. Although it has never been utilized, TDEC recognizes that new technologies can be attempted, and a wide variety of scenarios can be encountered by operators. The Supervisor should retain the discretion to consider unusual circumstances or new, potentially beneficial methods that may not fit cleanly under the current wording of the rules.]

To 0400-53-01-.03:

~~1040-03-01-.03~~ 0400-53-01-.03 {Completion and Disclosure} Report Filing.

The operator shall file a Well History, Work Summary and Completion or Recompletion Report (Form R-WH-1) with the Supervisor {and post the form on the chemical disclosure registry (www.FracFocus.org)} within ~~sixty (60)~~ days after completing, recompleting or working over a well pursuant to producing oil and/or gas. Wells shall be considered completed when they are capable of being turned into the tanks and/or gas transmission or gathering lines. {~~Well History information shall include the actual materials and volumes used to fracture, the amounts and concentrations of any additives used, the amount of wastewater generated, and the method of disposal of wastewater, for the purpose of making this information easily available to the public.~~ The} Well History, Work Summary and Completion or Recompletion Report {shall include:

(i) the operator name;
(ii) the date of the hydraulic fracturing treatment;
(iii) the county in which the well is located;
(iv) the API number for the well;
(v) the well name and number;
(vi) the longitude and latitude of the wellhead;
(vii) the true vertical depth of the well;
(viii) the total volume of water used in the hydraulic fracturing treatment of the well or the type and total volume of the base fluid used in the hydraulic fracturing treatment, if something other than water;
(ix) each hydraulic fracturing additive used in the hydraulic fracturing fluid and the trade name, vendor, and a brief descriptor of the intended use or function of each hydraulic fracturing additive in the hydraulic fracturing fluid;
(x) each chemical intentionally added to the base fluid;
(xi) the maximum concentration, in percent by mass, of each chemical intentionally added to the base fluid; and
(xii) the chemical abstract service number for each chemical intentionally added to the base fluid, if applicable.

A vendor, service provider, or operator is not required to:

(1) disclose chemicals that are not disclosed to it by the manufacturer, vendor, or service provider;
(2) disclose chemicals that were not intentionally added to the hydraulic fracturing fluid; or
(3) disclose chemicals that occur incidentally or are otherwise unintentionally present in trace amounts, may be the incidental result of a chemical reaction or chemical process, or may be constituents of naturally occurring materials that become part of a hydraulic fracturing fluid.}

[We concur in part with the commenter. Both industry and environmental interests expressed a desire for a chemical disclosure registry on a public website such as Fracfocus, and both cited Colorado's regulations as a preferred example. Accordingly we have adapted the Colorado rules to our formatting and imported them into this section as suggested. We are aware that the Colorado rules were the subject of thorough negotiations, and the final product included a process for protecting trade secrets while disclosing the family name of some chemicals. We have also included a version of that provision of the Colorado rules as well. However, as per our original intent, this language will apply only to fractures using >200,000 gallons of water-based liquids.]

To 0400-53-03-.01:

~~1040-03-03-.01~~ 0400-53-03-.01 Safety

(1) Each operator shall so conduct his operations and maintain his equipment as to reduce to a minimum the

danger of explosion, fire, or waste.

(2) All tests for production should be started and completed during daylight hours unless approval is obtained by the Supervisor.

(3) No boiler, open fire, or electric generator shall be operated within ~~one hundred (~~100~~)~~ feet of any producing oil or gas well or oil tank.

(4) Any rubbish, debris, or vegetation that might constitute a fire hazard shall be removed to a distance of at least ~~one hundred (~~100~~)~~ feet from the vicinity of wells to be tested.

(5) All waste shall be disposed of in such a manner as to avoid creating a fire hazard or polluting streams and {~~fresh water strata~~ groundwater}. **[We prefer to keep the existing language to clearly distinguish drinking water quality aquifers from deeper non-potable sources.]**

(6) No test oil, condensate, salt water, or any other fluid substance shall be discharged to or disposed of in any way into any stream, lake, or other body of water, or into any ditch or surface drainage depression leading to any stream, lake, or other body of water, except in compliance with the Water Quality Control Act T.C.A. § 69-3-101 and the regulations of the Water Quality Control Board 1200-04-03.

{(7) No well that will be hydraulically fractured may be drilled within 1,000 feet of any previously abandoned or orphaned well that was not constructed consistent with these rules and not properly abandoned to prevent the upward migration of oil, gas, or fracturing additives through either the inside of the casing or the area outside of the casing to adjoining the geologic formations.} **[The commenter provides no justification for requiring a 1000 foot setback. Under the existing rules in Rule 0400-52-04-.01 Vertical well Spacing, an operator cannot drill closer than 660 feet from an existing oil or gas well.]**

{(8) No well may be drilled within 1,000 feet of any sinkhole in any area designated as "karst" or an "area of high density of karst features" as illustrated on the Geologic Hazards Map of Tennessee, 1977, Environmental Geology Series No. 5, by Robert Miller.} **[See response to Comment F-1.]**

{(9)} All wells shall have the equipment and containers or lined pits necessary to prevent the spillage of oil, condensate, water, or any other fluids or substances produced or used during any production test. The equipment shall be in place prior to the start of the production test, and shall be large enough to contain any plausible spill.

{(10)} All wells shall be cleaned into a pit or tank, located at a distance of at least {~~one hundred (100)~~ 500} feet from any fire hazard or dwellings. **[Commenter provides no rationale for increasing the setback distance by 400 feet. We are aware of no problems with the current setback.]**

(a) If pits are to be used, the sides and bottoms of the pits ~~must~~ shall be lined with {a composite liner system that meets or exceeds the standards given in 0400-53-03-.02 Environment, 2.(h) ~~with heavy gauge seamless plastic sheets~~,} or other artificial liner approved by the Supervisor. **[The language in subparagraph (2)(g) under Environment requires a synthetic liner of at least 10 ml, or a compacted clay liner upon approval by the Supervisor.]**

(b) If it seems likely that a pit will overflow, additional pits must be constructed, or else tanks must be brought in to contain the surplus fluids.

{(11)} No oil or gas well shall be drilled closer than {~~two hundred (200)~~ one thousand (1,000)} feet from a dwelling or closer than ~~one hundred (~~100~~)~~ feet from a public road. **[The commenter offers no justification for such a large increase in the setback distance. To apply such a setback would result in many landowners being unable to develop their mineral rights.]**

(a) That portion of this regulation concerning distance from a dwelling may be waived by the supervisor upon submission of a notarized statement by the dwelling owner agreeing to the well location.

{(12)} No oil or gas well shall be drilled within {~~two hundred (200)~~ one thousand (1,000)} feet of any water well

or surface water body that is used for drinking, {commercial,} irrigation, or livestock {~~that is in active use. This requirement may be waived by the Supervisor upon submission of a notarized statement from the well owner agreeing to the location of the oil or gas well and a plan identifying the additional measures to be taken to prevent pollution of the water well.~~} [The commenter offers no justification for such an increase in the setback distance. Again, this would seriously limit the ability of many landowners to develop their mineral rights. We do not intend to take away landowners rights to allow drilling closer than 200 feet to their own well if they so choose.]

{~~(13)~~} No oil or gas well shall be drilled {within a flood plain or ~~one hundred (100) feet~~ one thousand (1,000) feet} of any stream, lake, or other body of water, so that an undisturbed riparian zone can be maintained, {~~except that this requirement may be waived upon submission of a plan identifying additional measures acceptable to the Supervisor to be taken to prevent pollution of the waters of the State.~~} **[The commenter offers no justification for such an increase in the setback distance. Given the density of jurisdictional streams in east TN geology/topography, this would limit the ability of many landowners to develop the mineral rights on their own property.]**

{~~(14)~~} No oil or gas well shall be drilled within {2,000 ~~330~~} feet of any water body designated {as a State Scenic River, Exceptional Tennessee Water or} an Outstanding National Resource Water (ONRW). **[The commenter provides no justification for such an increase in the setback distance.]**

{~~(15) The siting of wells, pits, or storage facilities in wetlands or in flood-prone areas (as indicated by the observed high water mark) of a stream is prohibited.~~} **[We prefer to keep this clause as proposed. While the siting of wells, etc in wetlands and flood prone areas has not been a problem in TN to date, it allows the Supervisor more latitude to make changes to a site plan to avoid such features if needed.]**

To 0400-53-03-.02(2):

(2) Implement necessary procedures and safeguards during drilling and completion operations to prevent the uncontrolled flow of oil from wells, including, but not limited to:

(a) Follow reasonable procedures such as cleaning and lubricating pipe threads so that pipe can be made up to proper tightness.

(b) Lay flow and test lines on ground or install adequate supports for crossing streams and drainways with the lines.

(c) At truck loading terminals, provide containers to catch unrecoverable oil at the hose connections, and provide proper maintenance of valves and other equipment. Train personnel to take necessary procedures to prevent spillage.

(d) During completion operations, produce and clean wells into tanks instead of pits if at all possible.

(e) At the same time that any pits or other diversion, transport, or storage facilities are constructed at ground level, dikes, diversion ditches, or other structures shall also be constructed to prevent any surface water from entering the pits or other facilities.

(f) Remove oil, salt water, or other fluids from pits as soon as practical after it has accumulated in them, and dispose of it in such a way that none can enter surface water or ground water, or otherwise adversely affect the environment or threaten public health and safety.

(d) All pits or other diversion, transport, or storage facilities shall be constructed so that waste fluids do not discharge from them. There shall be no discharge pipe, overflow weir, trickle tube, or any other device allowing any discharge. The operator is responsible for maintaining adequate storage capacity at all times.

(h) No pit shall be located so that any part of it, including a dike or diversion structure, is within a horizontal distance of ~~one hundred ({100)~~ 1,000} feet of the normal high-water line of any stream or lake. {All pits shall have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent

the liner's rupture or tear. The operator shall construct a temporary pit so that the slopes are no steeper than two horizontal feet to one vertical foot (2H:1V).} All pits shall {~~be lined using a synthetic liner of at least 10 ml thickness~~ have a composite liner system consisting of a welded seam geomembrane liner of at least ~~10 ml~~ 60 mil ~~pi~~ thickness High Density Polyethylene (HDPE) liner and a two (2)-foot compacted layer having a permeability no greater than $1x10^{-7}$ centimeters per second. The geomembrane liner shall be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions. The liner material shall be resistant to ultraviolet light. Liner compatibility shall comply with EPA SW-846 method 9090A.} As an alternative, compacted clay liners or other equivalent measures may be used at the discretion of the Supervisor~~.~~,{as long as the permeability requirement of the composite liner system is met or exceeded.}

{(i) The operator shall minimize liner seams and orient them up and down, not across a slope. The operator shall use factory welded seams where possible. Prior to field seaming, the operator shall overlap liners four to six inches and orient seams parallel to the line of maximum slope, *i.e.*, oriented along, not across, the slope. The operator shall minimize the number of field seams in corners and irregularly shaped areas. Qualified personnel shall perform field seaming. The operator shall weld field liner seams.

(j) The operator shall anchor the edges of all liners in the bottom of a compacted earth-filled trench. The anchor trench shall be at least 18 inches deep.

(k) Pits shall be constructed such that the bottom of the liner will be no closer than ten (10) vertical feet separation between the uppermost groundwater.}

[We concur with several of the above suggestions. Accordingly we have added language to subparagraph (g) of this paragraph that specifies smoothing of the pit to prevent liner damage and a requirement to construct pits above ground if groundwater is near the surface. Liner specifications that are comparable to those used in a Class I landfill are not appropriate for a temporary pit.]

{(l)} Containment at tanks ~~must~~ shall equal at a minimum the storage capacity of ~~one and one half (1.5)~~ 1½ times the capacity of the largest tank in the tank battery.

{(m)} All tanks ~~must~~ shall be maintained to prevent corrosion which can lead to both fluid loss from the vessel and accelerated reduction in its useful life span.

{(n)} To prevent fire hazard, all tank batteries and tanks shall be kept free of brush or overgrowth within the berm surrounding the tank or tanks.

{(o)} Dikes and ditches designated in subparagraphs (e) and (g) of this paragraph should be constructed in a manner to accommodate permanent facilities such as pumping units and flow lines.

{(p)} Provide dikes and/or containment pits at storage tanks upon initial installation where such tanks are so located as to be deemed hazardous. If containment pits are to be used, they should be constructed according to the guidelines set forth in Rule ~~1040-04-01-.07~~ 0400-54-01-.07.

(3) All surface pits ~~must~~ shall be drained of water {, the liner removed,} and back filled with dirt as soon as they are no longer needed for drilling or testing. {Water must be sampled in accordance with the Waste Control and Disposal Plan for constituents of concern, results submitted to the Department for approval, and the disposal method approved by the Department prior to disposal.} **[The removal of synthetic liners has been addressed under Rule 0400-52-09-.05 Surface Reclamation, and this paragraph (3) has been moved to that rule. Disposal of wastewater is already regulated under existing water pollution rules.]**

{(4) Soil sampling must be completed upon closure of any pit or containment area to confirm that no soil contamination has occurred due to unintended leakage. The parameter list for sampling must include

constituents of concern that are representative of the fluids stored. The results of the sampling activities must be provided to the Department and approved prior to closure and stabilization of the closure containment structures.} **[We have clarified that contaminated soils at a wells site must be disposed of in accordance with Solid Waste Management rules – see Rule 0400-54-01-.03 Proper Disposal of Waste.]**

{(5)} Implement prudent production operations to prevent potential oil spills, including, but not limited to:

(a) Connect fill lines to storage tanks so that oil and gas ~~will~~ shall not spray into the atmosphere.

(b) Install "equalizer" lines between adjacent tanks as a safeguard against overflow.

(c) Install oil and gas separators where gas is produced in sufficient quantities to be hazardous.

(d) Pump contaminated unsalable residual oil from storage tanks into an accumulator tank instead of open pits.

(e) Place locks, remove handles, or otherwise secure all valves, so vandals cannot open them to cause spills.

{(6)} The Supervisor should notify all oil industry related companies, including operators, service companies, drilling contractors, and crude oil gatherers and purchasers of their responsibility and liability in regard to oil spills.

To 0400-54-01-.06:

~~1040-04-01-.07~~ 0400-54-01-.06 Containment Pit at Tank Batteries.

A containment pit is required at each permanent oil tank or battery of {tanks ~~located within corporate limits or where such tanks are less than six hundred (600) feet from any highway or inhabited dwelling, or less than one thousand (1,000) feet from any school or church or within one hundred (100) feet of a stream or where such tanks are so located as to be deemed hazardous by the Supervisor.~~} Tanks {~~not falling in the aforementioned categories~~} ~~must~~ shall be surrounded by a retaining wall or suitably ditched to a collecting sump, each of sufficient capacity and construction to contain potential spillage. Tank batteries shall not be located closer than 100 feet from any state highway or county road. **[We concur with this comment. The language above has been deleted as suggested. Containment pits should be required around all tank batteries regardless of location.]**

To 0400-54-01-.12:

~~1040-04-01-.12~~ 0400-54-01-.12 Disposal of Salt Water.

(1) Underground injection is the preferred form of disposal of salt water, provided, however, that such injection is permitted by appropriate State and Federal agencies.

(2) Produced salt water may either be injected into a subsurface formation(s) productive of hydrocarbons, if part of an approved secondary recovery project, into a subsurface formation(s) not productive of hydrocarbons, if through an approved salt water disposal well, or else may be transported off-lease to an authorized salt water disposal facility if prior approval has been granted by the Department.

(3) Produced salt water shall not be put in any unlined pit, pond, lake or depression, or in any other place in a manner that ~~will~~ shall constitute a pollution hazard to the waters of the State including ground water.

{(4) Produced water or fracturing fluids containing chlorides shall not be land applied unless the operator first determines the depth to the uppermost groundwater, the complete list of constituents in the water, and the soil type and its ability to absorb contaminants. Further, the operator shall establish a groundwater monitoring well system capable of determining if the groundwater has been contaminated by land application activities and the rate and direction of groundwater flow. The groundwater monitoring system shall depend on site-specific factors and shall include no less than three (3) groundwater monitoring wells in the uppermost groundwater-bearing zone.} **[Existing rules already prohibit the land application of**

salt water, therefore no monitoring requirement is needed. The words 'or fracturing fluids' have been added to paragraph (4) of this rule.]

{(5)} No salt water **[or fracturing fluids]** shall be discharged to or disposed of at the land surface where it can enter surface water or ground water. Salt water discharged to and temporarily stored in lined pits shall be removed before it can leak into {~~under~~}ground water. **[We prefer to leave the wording as currently written in order avoid excluding interflow water from protection.]**

{(6)} All pits or ditches used for temporary storage or transport of salt water shall be lined with an impermeable {~~man-made~~} liner {in accordance with the liner system and permeability requirements in 0400-53-03-.02 Environment, subparagraph (2)(g).} **[We concur, and will make this change.]**

Addendum to Public Hearing Comments

At the Oil and Gas Board meeting on September 28, 2012, the Board decided to hear oral comments from any members of the public present who wished to speak after the staff presentation on the rule proposal before the board began its deliberations. Twenty-six commenters addressed the Board. Any new comments made at this meeting that were not previously addressed in the Response to Comments document are addressed in this Addendum.

Comments and Responses

Comment: Many commenters asked that the Board take no action on these rule changes to give the public more time to study and comment on this. Some noted that no hearing was held in middle Tennessee.

Response: The Board considered these comments by questioning TDEC staff about the public participation process for this rule-making effort. TDEC summarized this information for the Board and explained that several stakeholders meetings with both industry and environmental groups were held over a year-long process, in addition to following the normal procedures for public notice and comment. Staff noted that the two public hearings on these rules were held in Knoxville as that is closer to the area where most oil and gas drilling is occurring. When the board began its deliberations, it considered first whether to act on the rules. The board voted unanimously to proceed to consider the rules. The board then went through the rules section by section, considering the changes that had been made in response to comments made during the comment period as well as those made at the board meeting. The board made a number of changes in response to the comments as well as a few other changes as noted below.

Comment: Commenters also asked that the Board take no action on these rule changes to let the new Board of Water Quality, Oil and Gas consider the rules.

Response: The Board recognized that the law (Public Chapter 986 of 2012) merging it into the Water Quality Control Board to create the new Board of Water Quality, Oil and Gas was going to take effect on October 1. However, the Board has been aware of the issues involved in this rulemaking for several years. Many comments were made about fracturing during a previous rulemaking by the Board in 2011 and those commenters were informed then that the subject would be addressed in a separate rulemaking. The board has been familiar with the particulars of the proposed rule since it approved starting the formal rulemaking process last spring. Because of the Board's in-depth knowledge of the issues and because there is a need to move ahead with the improvements for environmental protection provided by these rules, the Board voted to proceed.

Comment: There are certain to be spills and releases to the environment from fracturing, and the regulations are inadequate to protect the environment and public health.

Response: There are currently no surface water or groundwater impairments documented in Tennessee from fracturing activities, nor any fracturing-related health issues that we are aware of. Part of the intent of these rule changes is to strengthen the rules in order to prevent such problems from occurring in the future.
New requirements for pits, notification to the Supervisor in the case of a spill, casing, cementing, and blowout prevention requirements are all being added as part of this rulemaking to address these very issues. Although the risk of spills or other releases in any industry or transport system can never be completely eliminated, these provisions are needed and reasonable improvements in the current rules to minimize those risks.

Comment: The rule language is dense and hard for citizens to follow. Commenter doesn't like the sound of the wording "Supervisor's discretion" in the rules.

Response: We recognize that it can be very difficult for the public to read and understand rule language. Unfortunately rule language for an industry like this must often use language that is not only highly technical but also be legally enforceable and as unambiguous as possible. In an effort to make rule-making more understandable, we included an Executive Summary document that explains the nature of the changes and their intent in simpler terms.

The wording "at the Supervisor's discretion" is indeed used in the rules in several sections. Conditions of depth and pressure encountered in a given well can vary considerably, and we think it is necessary to retain some flexibility for regulators and operators to adapt to field conditions. It is not intended as a way around safe drilling practices, and the Supervisor has no obligation to agree to any alternatives methods requested by an applicant.

Comment: Commenter does not like the way the procedures for the Board meeting are organized. Commenter would prefer that TDEC present proposals to the public, while the Board listens from the gallery.

Response: It is the Board that was given the authority and responsibility to adopt rules under Tennessee Code Annotated, Title 60, Chapter 1. It is appropriate for the Board, not the public to be in charge of its meetings. It is also appropriate for the public to be able to attend the meeting. The commenter should note that there is no legal requirement for the Board to allow the public to address them, but the Board consented to hear testimony.

Comment: Commenter suggested that the later portion of a paragraph on page 36 of the rules under 'Intermediate Casing' should be moved to become a separate item (3) under that section. This would have the effect of making the requirements for cement job documentation apply to all kinds of casings, not just intermediate casing.

Response: During deliberations, the Board asked TDEC technical staff about this comment and they confirmed that the suggested change reflected the original intent of the rule. The Board made this change.

Comment: Commenter requested that a clause be added to item (4) on page 57 of the rules under 'Disposal of Salt Water' as follows:

(4) No salt water or fracturing liquids shall be discharged to or disposed of at the land surface where they can enter surface water or groundwater (insert) *unless such discharge is permitted by the appropriate State and Federal agencies.*
Response: The Board considered this comment during deliberation. TDEC technical staff had no objection to this change. This addition merely acknowledges that there are other rules and regulations both State and Federal under which a discharge might be legally permitted. The Board made this change.

Comment: Commenter expressed that a public notice period of 30 days as proposed in these rule changes was atypical, noting that no other states had any public notice or time delay in permitting a well site that was comparable to this time period.

Response: The Board debated this comment during deliberations, and asked several questions of TDEC staff related to the mechanics of the public notice period. After some debate, the Board moved to support the 30 day notice period for fractures more than 200,000 gallons of water-based liquids as proposed, and did not make this change.

Comment: Commenter stated that a consortium of environmental groups had submitted extensive comments, and that TDEC had "ignored virtually all of their comments".

Response: The staff stated in the presentation at the meeting that many of the changes made as a result of public input during the comment period were based on comments from environmental interests. The above Responses to Comments show the same thing. Several of these changes were significant, including specifications for public notice content, increasing the public notice period from 15 to 30 days, chemical disclosure on the Fracfocus website, and pressure monitoring and recording during fracturing.

Comment: Commenter stated that EPA should have a "needs assessment program" to ask why something, like fracturing, is needed at all.

Response: The Board has no authority to make requirements of EPA.

Comment: Commenter requested that the rules be amended so that Tennessee Wildlife Resources Agency (TWRA) would also receive public notice for a well permit in cases where high-quality waters, waters with noted fisheries, or waters containing threatened and endangered species were within a certain distance of the proposed well.

Response: We agree that TWRA should always be included in any public notice from TDEC, regardless of the nature or classification of the waterbodies involved. TWRA is automatically placed on all of TDEC's public notice lists of interested parties. These rules do provide that any interested agencies be given notice of the large volume fractures. Accordingly there is no need to mention TWRA specifically in the rules.

Comment: Commenter requested that adjoining land owners within a 2 mile radius should receive TDEC's public notice.

Response: The Board discussed this comment during deliberations, and moved to add language to the rule to address this comment. The sentence under 0400-52-02-.01 (10)(c)) was amended to read: "The applicant shall provide the Department's public notice of the proposed well to the owners *of any property* or any residence that has any drinking water wells within a ½ mile radius of the proposed wellhead..." Consistent with a change made earlier, in this same subsection, the board changed "domestic well" to "drinking water well."

Comment: Commenter requested that the time period for the applicant to provide the Department's public notice to a drinking water well owner within a ½ mile radius be changed from 14 days to 7 days of the date of the public notice, and that the time period for a drinking well owner to request that the applicant sample his water well be changed from 14 days to 21 days.

Response: The Board debated this comment during deliberations, and asked staff for clarification on the meaning and intent of the rule change as written. One concern was that these time frames were chosen to be sure that they can run concurrently with the 30 days public notice period and the samples be taken prior to drilling to represent a baseline condition. The commenter provided no rationale for changing the proposed time deadlines. After some discussion, the Board did not make a change in response to this comment.

Comment: Commenter expressed concern that the rule changes not be applied retroactively to previously permitting sites, and asked that language be added to the rules to state this.

Response: The Board examined this issue during deliberations. TDEC counsel stated that the general legal interpretation of any rule is that it is not retroactive unless it specifically states that it is, and that it was not TDEC's intent to make these changes retroactive or to interpret the rule changes to be so. Therefore it was not necessary to include a clause in the rules as requested.

Comment: Commenter asked if TDEC has a water well database and if so, was it available for public use on-line.

Response: TDEC staff clarified to the commenter and the Board that TDEC does indeed have a database of drinking water wells, but that this database is not yet available for use on-line. TDEC committed to making this information available on-line in the near future, and also promised to make interim arrangements to allow for identifying water wells in applications if the database has not been made available on-line when these rule changes take effect.

Comment: Commenter requested additional language under 0400-52-09-.06 that would specify some alternative methods of confirming well integrity for wells to be placed in Temporary Abandonment that have not been produced or tested in the last 15 years.

Response: The Board discussed this at some length during deliberations. After some consultation with TDEC technical staff, the Board moved to make a change in response to this comment. The language on page 41 of the rules under 0400-52-09-.06(1)(c), last sentence, was amended to read: "Alternative well integrity confirmation methods, *including annual pressure monitoring at the wellhead*, may be accepted at the discretion of the Supervisor."

Comment: Commenter pointed out that the rule language under Casing Requirements on page 34 sets forth casing and cementing requirements for intermediate casings, even though some shallow Highland Rim wells do not need or commonly utilize intermediate casings.

Response: The Board discussed this comment during deliberations, and moved to make a change in response to this request. TDEC technical staff agreed with the change. The language under 0400-52-07-,01 Casing Requirements, section (2) was amended to read: *"If intermediate casing is used,* the operator shall set an intermediate string of casing prior to the drilling..."

Comment: A board member pointed out that in some vertical wells, packers are appropriately utilized with production casing instead of cementing through the production zone. Requested that language allowing this methodology as an option be added to the rule similar to that allowed under Horizontal Wells.

Response: The Board considered this issue during deliberations TDEC staff had no objection to the change. The rule language under 0400-52-07-.04 Production Casing was amended to read: "If production casing is used in a vertical well, the operator shall cement the production casing at a minimum of 100 feet into the intermediate casing and extend the cementing across the producing formation, *unless the casing is set on a packer or set and cemented above the production zone."*

Comment: Commenter stated that applicants should be required to disclose all information on chemical additives to be used and their concentrations prior to conducting fracturing activities rather than upon well completion, and that this information should be included in the public notice.

Response: The Board debated this comment during deliberations, and asked TDEC staff for more information. Operators do not know with accuracy exactly what additives and in what volumes/concentrations they will use to fracture a given well prior to drilling, and so prior disclosure at the time of public notice could include only rough estimates that are subject to change. This raised the questions of, "If the operator makes a change in their fracturing plan that differs from what was placed on public notice, would the permit have to be re-noticed to the public? If the operator varies in any way in their fracturing process from the projected plans that were noticed, would this constitute a permit violation?" After some discussion, there was no motion made to make a change requiring prior disclosure.

Comment: Commenter expressed concerns that operators would use the trade secret protections in the rules as a way to keep the most toxic of the chemical additives they use hidden from the public.

Response: These rules do not create trade secret protections, they specify a process for how claims of trade secret protection made by an operator will be handled by TDEC in the context of fracturing chemicals. Trade secret protections are established under statutes and case law in this state. Rule 0400-53-01-.03(4) refers to existing statutory provisions allowing for a court action for an injunction or damages as the method to be followed if someone wishes to challenge a claim of trade secret as improper.

Comment: Commenter inquired about the intent of changing "will" or "must" to "shall."
Response: Counsel responded that "shall" is generally understood to mean a mandatory requirement and other terms introduce ambiguity. The Board in its deliberations noted a few places where this had not been done and made the change.

Comment: Commenters and board members noted some typographical errors and suggested some clarifications in wording.

Response: The Board made these corrections.

Comment: Commenters expressed concern about whether the rules would be adequately enforced.

Response: Enforcement is a separate matter than rulemaking and such a comment does not call for a change in the rules.

Comment: One commenter expressed appreciation that TDEC has shared its final proposal on the rules with the public when it was sent to Board members in advance of the meeting and noted that this had not been done in other states when rules on fracturing were adopted.

Response: No response necessary.

Comment: Commenters stated that the majority of comments made during the comment period were against the practice of fracturing.

Response: The Board noted that fracturing in one form or another has been occurring in Tennessee for many decades. The board is aware of the strength of feeling about these rules, but determined that the rules were appropriate to better regulate the practices currently occurring in Tennessee as well as establish requirements applicable to the large volume fracturing that is not yet occurring here.

Regulatory Flexibility Addendum

Pursuant to T.C.A. §§ 4-5-401 through 4-5-404, prior to initiating the rule making process as described in T.C.A. § 4-5-202(a)(3) and T.C.A. § 4-5-202(a), all agencies shall conduct a review of whether a proposed rule or rule affects small businesses.

(1) The type or types of small business and an identification and estimate of the number of small businesses subject to the proposed rule that would bear the cost of, or directly benefit from the proposed rule.

There are approximately twenty to twenty five active small businesses of this type in the oil and gas exploration and drilling sector in Tennessee that would be affected by these rule changes.

(2) The projected reporting, recordkeeping, and other administrative costs required for compliance with the proposed rule, including the type of professional skills necessary for preparation of the report or record.

The changes in reporting and record keeping requirements in these rule changes is minimal, and would affect only fracturing jobs using >200,000 gallons of liquids. So far no such fracturing jobs have occurred in the state, and none are expected in the near future.

(3) A statement of the probable effect on impacted small businesses and consumers.

There should be little additional economic costs to small businesses. Requirements for slightly thicker synthetic liners for pits and for containment pits around all tank batteries should add relatively small costs, and these costs are generally passed on to the investors rather than consumers. The new provisions that are being added to the rules for blowout prevention and casing requirements represent codification of existing policies into rule, and therefore do not represent new requirements.

(4) A description of any less burdensome, less intrusive or less costly alternative methods of achieving the purpose and objectives of the proposed rule that may exist, and to what extent the alternative means might be less burdensome to small business.

None. We have endeavored to keep rule changes applicable to current drilling and fracturing methods minimal. Most of the rule changes are targeted at potential future fracturing practices not currently in use in Tennessee.

(5) A comparison of the proposed rule with any federal or state counterparts.

The rules proposed are consistent with federal guidance to the states from Department of Energy, federal Bureau of Land Management regulations, and are adapted from State of Colorado and State of Arkansas oil and gas rules pertaining to fracturing and chemical disclosure. The rules proposed are less burdensome than state rules in OH, WV, NY, TX, OK, and PA, where large water-volume fracturing of deep strata wells is the common practice. This methodology is currently not practiced in Tennessee. The requirement for extending surface casing 100 feet below the lowest fresh water aquifer (changed from 50 feet) is consistent with most other states. In reference to synthetic liners for pits, no other states had a rule requirement for liners less than 10 ml in thickness.

(6) Analysis of the effect of the possible exemption of small businesses from all or any part of the requirements contained in the proposed rule.

Most of the proposed rule changes were targeted towards large-volume water-based fracturing methods that to date have not been practiced in Tennessee. The intent was to have little or no effect on existing businesses and current drilling and fracturing practices. While the proposed rules do not exempt a category of business, most of them apply only to certain fracturing methods not currently in use in the state.

Impact on Local Governments

Pursuant to T.C.A. §§ 4-5-220 and 4-5-228 "any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments." (See Public Chapter Number 1070 (http://state.tn.us/sos/acts/106/pub/pc1070.pdf) of the 2010 Session of the General Assembly)

The Department does not anticipate an impact on local governments from this rulemaking.

Additional Information Required by Joint Government Operations Committee

All agencies, upon filing a rule, must also submit the following pursuant to T.C.A. § 4-5-226(i)(1).

(A) A brief summary of the rule and a description of all relevant changes in previous regulations effectuated by such rule;

The primary purposes of these rule changes are to address large-volume hydraulic fracturing practices, to incorporate existing casing and blowout prevention policies into the rules, and to update some other specifications for all oil and gas wells including those for siting restrictions, pits, and tanks. The most significant provisions are as follows:

- Adding requirements for public notice and public chemical disclosure registry for water-based fractures using more than 200,000 gallons. Includes trade secret protection process for proprietary chemical information.
- Adding an option for drinking water well owners within a ½ mile radius of a proposed well to request the operator to collect and analyze a sample to establish baseline water quality of the water well prior to drilling. This would only apply if the proposed oil/gas well will be fractured using more than 200,000 gallons of water-based liquids.
- Adding a requirement to monitor well pressures during water-based fracturing treatments using more than 200,000 gallons.
- Adding requirements for operators to notify inspectors at least 24 hours prior to fracturing or other well treatment activities, and to maintain personnel on-site during those activities.
- Additional well siting restrictions, prohibiting well sites in wetlands or flood-prone areas, and increasing the setback from Outstanding National Resource Waters to 330 feet.
- Incorporation of the Division's Casing and Blowout Prevention Policies into rule language, and clarifying revisions to casing and blowout prevention language. This includes minimum standards for integrity testing and documentation of casing and cementing.
- Adding a requirement for well integrity testing for wells that are proposed to be placed into Temporary Abandonment if the well has not been produced or tested in the last 15 years.
- Increasing the standard requirement for surface casing to be extended below aquifers from 50 feet to 100 feet.
- Additional minimum specifications for pits and pit liners, including a minimum standard of 10 mil thickness for synthetic liners and a new section of requirements for pits associated with mud drilling. Includes the requirement for containment pits around all tanks, regardless of location.
- Addition of and revisions to several definitions.
- Moving the rules from Rule Divisions 1040-01 through 1040-08 to Rule Divisions 0400-51 through 0400-58.

(B) A citation to and brief description of any federal law or regulation or any state law or regulation mandating promulgation of such rule or establishing guidelines relevant thereto;

There is no federal law relevant to this program. These rules are adopted pursuant to T.C.A. § 60-1-201 et seq. The Tennessee House of Representatives adopted HR 98 regarding the process for input to the development of these rules, which the Department followed.

(C) Identification of persons, organizations, corporations or governmental entities most directly affected by this rule, and whether those persons, organizations, corporations or governmental entities urge adoption or rejection of this rule;

Oil and gas drillers and associated contractors and operators are most affected by these rule changes and they had no objection to the final version of these rules.

(D) Identification of any opinions of the attorney general and reporter or any judicial ruling that directly relates to the rule;

The Department is not aware of any such opinions or rulings.