The Texas Commission on Environmental Quality (TCEQ, agency, commission) adopts new §336.227 *without change* to the proposed text as published in the February 15, 2013, issue of the *Texas Register* (38 TexReg 779), and will not be republished.

Background and Summary of the Factual Basis for the Proposed Rule

The commission adopts this rule to establish an exemption from the TCEQ low-level radioactive waste (LLRW) licensing requirements for the disposal of certain radioactive tracers used in the exploration, development or production of oil and gas resources. On October 8, 2012, the executive director received a Petition for Rulemaking request from Baker Botts L.L.P., on behalf of ProTechnics Division of Core Laboratories LP. ProTechnics provides oil and gas diagnostic services to well operators to optimize reservoir performance and maximize hydrocarbon recovery from producing fields. These services include the use of radioactive tracers that are introduced into hydraulic fracturing fluids that enable well operators to take well log measurements to identify the intervals where the fluids are placed. ProTechnic's petition requested that the commission establish an exemption in rule for the disposal of the radioactive tracers used in the hydraulic fracturing operations. After considering the petition on December 5, 2012, the commission directed the executive director to initiate this rulemaking.

Occasionally, the fracking fluids and tracer material can be released back out of the well during a "sandout" and is returned to the surface. The Texas Department of State

Health Services (DSHS) and the Railroad Commission of Texas (RRC) have authorized the disposal of the returned material in earthen pits at the well site or in a Class II injection well. The DSHS granted this exemption under Texas Health and Safety Code (THSC), §406.106(a) through the radioactive material license issued by DSHS to authorize the use of radioactive tracers for disposal in the earthen pits and in 25 TAC §289.253(u)(3) for disposal in a Class II injection well. Both of these exemptions have also been granted on the radioactive material licenses issued by the Nuclear Regulatory Commission (NRC). In 2007, Senate Bill 1604 of the 80th Legislature conferred TCEQ with the authority to exempt a source of radiation from the licensing requirements under the TCEQ's jurisdiction. Because the commission has jurisdiction over the disposal of radioactive substances in THSC, §401.011(b)(1), the authority to exempt radioactive substances from disposal requirements in THSC, §401.106(a) rests with the commission.

An analysis by DSHS and the NRC determined that the disposal of the radioactive tracers would not result in a significant risk to public health and safety or to the environment. The radioactive tracers have a half-life of less than 120 days and are in a form that will not leach into and migrate with the groundwater. The on-site disposal pits must be covered with at least two feet of clean soil. The commission has reviewed various pit disposal dose models, including worst-case-scenarios that show that the total effective dose equivalent to individual members of the public from the closed pit is well

below the 0.1 rem per year dose limit. Class II injection wells are permitted by the RRC after a determination that groundwater and surface water are protected from pollution. According to the petition, the disposal of radioactive tracers in earthen pits has occurred without any reported or known harm to public health and safety or the environment since May 12, 1992. The commission agrees with the determinations of both the DSHS and the NRC and finds that the proposed exemption for the on-site pit disposal and Class II injection well disposal of the tracers will not constitute a significant risk to the public health and safety and the environment.

Section Discussion

The commission adopts new §336.227 to exempt radioactive tracers from the radioactive licensing and disposal rules in Chapter 336 if the waste meets the criteria specified in §336.227(b): 1) the possession, transportation, and use of the radioactive tracers are licensed or otherwise authorized by the DSHS; 2) the tracers are in fluids that have been retrieved from a well that is used in the exploration, development, or production of oil, gas, or geothermal resources and the well is authorized by the RRC; 3) total concentration of radioactivity for all isotopes does not exceed 1,000 picocuries per gram (pCi/g) and the half-life of each isotope is 120 days or less; and 4) the radioactive tracers are non-water soluble.

Section 336.227(c) authorizes the disposal of qualifying radioactive tracer material in an

on-site shallow earthen pit that is permitted by the RRC for the disposal of oil and gas waste with at least two feet of clean soil, or by §336.227(d) in a Class II injection well permitted by the RRC if the permit specifically authorizes disposal of radioactive tracers.

Section 336.227(e) requires any person who disposes of radioactive tracers under this proposed rule to maintain records related to the disposal.

Final Draft Regulatory Impact Analysis Determination

The commission adopts the rulemaking under the regulatory analysis requirements of Texas Government Code, §2001.0225, and determined that the rulemaking is not subject to Texas Government Code, §2001.0225 because it does not meet the definition of a "major environmental rule" as defined in the act. "Major environmental rule" means a rule the specific intent of which is to protect the environment or reduce risks to human health from environmental exposure and that may adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. The adopted rule is not anticipated to adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state because the adopted rule exempts from TCEQ licensing requirements disposal of certain radioactive materials, whose possession, use and transportation are authorized by the DSHS and whose disposal is

authorized by the RRC as oil and gas waste. The commission adopted this rule to exempt minimal amounts of DSHS licensed radioactive tracers used in the exploration, development or production of oil and gas resources from the TCEQ low-level radioactive licensing and disposal requirements. In order to exempt these radioactive materials the commission finds that the exemption will not constitute a significant risk to the public health and safety and the environment. Radioactive tracers that are not eligible for an exemption would have to be disposed of as LLRW.

Furthermore, the adopted rule does not meet any of the four applicability requirements listed in Texas Government Code, §2001.0225(a). Texas Government Code, §2001.0225 only applies to a major environmental rule, the result of which is to: 1) exceed a standard set by federal law, unless the rule is specifically required by state law; 2) exceed an express requirement of state law, unless the rule is specifically required by federal law; 3) exceed a requirement of a delegation agreement or contract between the state and an agency or representative of the federal government to implement a state and federal program; or 4) adopt a rule solely under the general powers of the agency instead of under a specific state law. The adopted rule does not exceed a standard set by federal law, an express requirement of state law, a requirement of a delegation agreement, nor adopt a rule solely under the general powers of the agency.

THSC, Chapter 401, authorizes the commission to regulate the disposal of most

radioactive material in Texas. THSC, §401.106(a) authorizes the commission to adopt rules to exempt a source of radiation from the licensing requirements of the Texas Radiation Control Act if the commission finds that the exemption of the source of radiation will not constitute a significant risk to the public health and safety and the environment. In addition, the State of Texas is an "Agreement State," authorized by the NRC to administer a radiation control program under the Atomic Energy Act. The adopted rule does not exceed a standard set by federal law. The adopted rule implements an exemption that is consistent with exemptions approved by the NRC for the disposal of radioactive tracers.

The adopted rule does not exceed an express requirement of state law. THSC, Chapter 401 establishes general requirements for the licensing and disposal of radioactive materials. THSC, §401.106 specially authorizes the commission to exempt a source of radiation from the requirements to obtain a license for disposal.

The commission has also determined that the adopted rule does not exceed a requirement of a delegation agreement or contract between the state and an agency of the federal government. The State of Texas has been designated as an "Agreement State" by the NRC under the authority of the Atomic Energy Act. The Atomic Energy Act requires that the NRC find that the state radiation control program is compatible with the NRC's requirements for the regulation of radioactive materials and is adequate

to protect health and safety. The commission determined that the adopted rule does not exceed the NRC's requirements nor exceed the requirements for retaining status as an "Agreement State."

The commission also determined that these rules are adopted under specific authority of THSC, Chapter 401. THSC, §§401.051, 401.103, 401.104, and 401.106 authorize the commission to adopt rules for the control of sources or radiation and the licensing and exemption of the disposal of radioactive materials.

The commission invited public comment regarding the draft regulatory impact analysis determination during the public comment period. No comments were received regarding the draft regulatory impact analysis.

Takings Impact Assessment

The commission evaluated the adopted rule and performed a preliminary assessment of whether the adopted rule constitutes a taking under Texas Government Code, Chapter 2007. The commission's preliminary assessment is that implementation of the adopted rule would not constitute a taking of real property. The purpose of the adopted rule is to exempt minimal amounts of DSHS-licensed radioactive tracers used in the exploration, development or production of oil and gas resources from the TCEQ low-level radioactive licensing and disposal requirements. The adopted rule would substantially advance this

purpose by implementing new provisions in rule to establish the requirements for eligibility of the exemption. To qualify for the exemption, the use, possession and transportation of the radioactive material must be authorized by the DSHS and the disposal of the oil and gas waste must be authorized by the RRC. No requirements are imposed by the commission in the adopted rule that would constitute a taking of real property.

Promulgation and enforcement of the adopted rule would be neither a statutory nor a constitutional taking of private real property. The adopted rule does not affect a landowner's rights in private real property because this rulemaking does not burden (constitutionally), nor restrict or limit, the owner's right to property and reduce its value by 25% or more beyond which would otherwise exist in the absence of the rule. The adopted rule establishes an exemption from commission licensing and disposal for certain activities authorized by the DSHS and the RRC.

Consistency with the Coastal Management Program

The commission reviewed this adopted rule and determined that the adopted rule is neither identified in, nor will it affect, any action/authorization identified in Coastal Coordination Act Implementation Rules in 31 TAC §505.11, relating to Actions and Rules Subject to the Texas Coastal Management Program (CMP). Therefore, the adopted rule is not subject to the CMP.

Public Comment

The commission held a public hearing on March 5, 2013. The commission did not receive any comments at the public hearing. The comment period closed on March 18, 2013. The commission received written comments from an individual and Baker Botts L.L.P, on behalf of ProTechnics. Both comments supported the rulemaking and one of the comments recommended changes to the rule and had questions on the implementation of the rule. After the close of the comment period, the TCEQ received a letter from the NRC stating that the NRC reviewed the proposed rule for federal compatibility and health and safety requirements, and as a result of the review, had no comments on the commission's proposed rule.

Response to Comments

The individual asked how does this rule compare to the Decay in Storage rule in §336.211(a)(3).

The Decay in Storage rule in §336.211(a)(3) authorizes a licensee to store waste containing radionuclides which have a short half-life for a period typically equal to ten times the half-life value until the waste is no longer considered radioactive and can then be disposed of as non-radioactive waste. This rulemaking would authorize the disposal of radionuclides which have a short half-life, are in an insoluble form, and are used for

licensed radioactive tracer studies without the requirement of storing the waste for a period of time for the radioactivity to decay to insignificant levels. Under this rulemaking, the exempted tracers may only be disposed in disposal pits or Class II injection wells that are permitted by the RRC.

The individual asked what specific isotopes are included in the 1,000 pCi/g limit in the proposed §336.227(b)(3) and stated that these isotopes should be identified in the rule. The individual also asked if daughter isotopes will be included in the 1,000 pCi/g limit for radioactive tracers. ProTechnics commented that it is unnecessary for TCEQ to add details regarding specific isotopes and daughter isotopes in the rule, and that the record-keeping requirement includes information on the types of isotopes and concentrations. ProTechnics commented that the rule's half-life limitation and the recordkeeping requirements strike an appropriate balance of specifying which types of isotopes can be used while allowing for flexibility for additional isotopes to be included under the rule.

The specific isotopes included in the 1,000 pCi/g limit are those used as radioactive tracers as authorized and identified on the radioactive material licenses issued by DSHS. The commission respectfully disagrees that the specific isotopes be identified in the rule since these isotopes are identified on the DSHS license and have a negligible effect on the environment or public health when used as tracers and consequently also when disposed in

an earthen pit or a Class II injection well. The isotopes named in the petition were iridium-192, scandium-46, and antimony-124. But any other isotope with a half-life of 120 days or less used as a radioactive tracer could qualify under the exemption if all of the other criteria for the exemption are met. If a radioactive tracer has a radioactive daughter, the activity of the daughter would be considered as part of the 1,000 pCi/g limit since the limit is for the total concentration of radioactivity of the tracer material.

The individual asked how the concentration values would be determined (laboratory analysis or process knowledge) and with what precision. The individual stated a preference for laboratory measurement and asked if there are any National Environmental Laboratory Accreditation Conference (NELAC) certified methods for these measurements. The individual also stated that the typical assumptions should be stated if process knowledge is to be used to determine the concentration. ProTechnics commented that it is unnecessary for TCEQ to add details on how the radioactive concentrations will be measured.

The commission respectfully disagrees that the methodology for how the concentration values are determined needs to be codified in the regulations. Process knowledge, field measurements, and laboratory analysis are all suitable tools that could be used to determine that the

radioactive tracers do not exceed the 1,000 pCi/g limit. The commission considers that the person disposing the exempted material is best-suited and responsible for determining the method for assuring that the exempted tracers do not exceed the 1,000 pCi/g concentration limit. Similarly, the person disposing the exempted material should determine the level of precision needed for any measurements. The person disposing the exempted material must maintain records relating to the disposal including the estimated volume of the radioactive tracers and the total concentration of radioactivity for the isotopes disposed. The executive director may request and review those records at any time.

The individual asked at what time the waste will be sampled to determine the concentration values to verify that it does not exceed the 1,000 pCi/g limit. ProTechnics commented that it is unnecessary for TCEQ to add details on when radioactive concentrations will be measured.

The waste cannot exceed 1,000 pCi/g when it is disposed, which is defined in §336.2(36) as the isolation or removal of the waste from mankind and mankind's environment without intent to retrieve the waste later. From this definition, the 1,000 pCi/g limit would apply when the waste is placed in the pit or when it is injected into the well. The waste can be assessed,

sampled or analyzed prior to disposal. If it does not exceed 1,000 pCi/g prior to disposal, it will not exceed 1,000 pCi/g when disposed. When the radioactive tracers are measured to determine the activity value does not need to be codified in the rule.

The individual asked whether there is concern about interference from naturally occurring radioactive material (NORM).

Radioactive tracers have been used for over 20 years and the tracer users have developed methods to distinguish the tracers from NORM. The tracers utilized are not naturally occurring so they can be distinguished from NORM and should not be present in the background radioactivity of the soil or groundwater. Therefore, the commission is not concerned about NORM interfering with the measurement of tracer concentration values.

The individual commented on whether it would be appropriate to tie this rulemaking with the licensee's isotope inventory requirement to verify the accounting of all the radioactive material. ProTechnics commented that any tie-in to a licensee's isotope inventory requirement would be unmanageable and burdensome and that recordkeeping requirements related to tracer volume is sufficient.

The possession, transportation, and use of radioactive tracers must be authorized by the DSHS. The commission does not believe it would be appropriate to tie this rulemaking to the isotope inventory on a DSHS license. Radionuclides with a short half-life and in an insoluble form are used in the studies because not all of the radioactive tracers will be recovered. Therefore, it would not be feasible to verify the accounting of all of the radioactive material.

SUBCHAPTER C: GENERAL LICENSING REQUIREMENTS
§336.227

Statutory Authority

The new rule is adopted under the Texas Radiation Control Act, Texas Health and Safety Code (THSC), Chapter 401; THSC, §401.011, which provides the commission authority to regulate and license the disposal of radioactive substances, the commercial processing and storage of radioactive substances, and the recovery and processing of source material; §401.051, which authorizes the commission to adopt rules and guidelines relating to control of sources of radiation; §401.103, which authorizes the commission to adopt rules and guidelines that provide for licensing and registration for the control of sources of radiation; §401.104, which requires the commission to provide rules for licensing for the disposal of radioactive substances; §401.106, which authorizes the commission to adopt rules to exempt a source of radiation from the licensing requirements provided by the Texas Radiation Control Act. The adopted new rule is also authorized by Texas Water Code, §5.103, which provides the commission with the authority to adopt rules necessary to carry out its powers and duties under the water code and other laws of the state.

The adopted new rule implements THSC, Chapter 401, relating to Radioactive Materials and Other Sources of Radiation, including §401.011, relating to Radiation Control Agency; §401.051, relating to Adoption of Rules and Guidelines; §401.057, relating to

Records; §401.103, relating to Rules and Guidelines for Licensing and Registration; §401.104, relating to Licensing and Registration Rules; §401.106, relating to Exemption from Licensing Requirements; and §401.412, relating to Commission Licensing Authority.

§336.227. Radioactive Tracers Used in the Exploration, Development or Production of Oil or Gas or Geothermal Resources.

(a) Disposal of radioactive tracer materials used in the exploration, development or production of oil or gas or geothermal resources is exempt from licensing requirements for the disposal of radioactive substances under this chapter if the radioactive tracer materials are disposed of in accordance with this section.

(b) Radioactive tracers are eligible for exemption under this section if:

(1) the possession, transportation, and use of the radioactive tracers are licensed or otherwise authorized by the Texas Department of State Health Services;

(2) the non-water soluble radioactive tracers are in fluids that have been retrieved from a well used in the exploration, development or production of oil or

gas or geothermal resources and such well is permitted or otherwise authorized by the Railroad Commission of Texas;

(3) the total concentration of radioactivity for all isotopes disposed does not exceed 1,000 picocuries per gram (pCi/g), and the half-life of each isotope is 120 days or less; and

(4) the radioactive tracers are non-water soluble.

(c) A person may dispose of radioactive tracers that are eligible for exemption under subsection (b) of this section in an on-site disposal pit that is permitted by the Railroad Commission of Texas for the disposal of oil and gas waste and is covered by at least two feet of clean soil.

(d) A person may dispose of radioactive tracers that are eligible for exemption under subsection (b) of this section in a Class II injection well permitted by the Railroad Commission of Texas for the disposal of oil and gas waste if the permit specifically authorizes the disposal of radioactive tracers.

(e) Any person who disposes of radioactive tracers exempted from licensing requirements under this section must maintain records related to the disposal,

including method and location of disposal, identity of specific isotopes, estimated volume of the radioactive tracers, and total concentration of radioactivity for the isotopes disposed, and dates of disposal. The executive director may request records related to disposal of tracer materials under this section at any time.