TENORM Policy and Guidance, Revision 2013

Policy Statement
It is the policy of the Department of Public Health and Environment to limit the potential annual exposures resulting from the radiations associated with TENORM and unimportant quantities of source material to a maximum of 25 mrem for any individual member of the public.

Overview
In February 2007, the Department issued the Final Draft Interim Policy and Guidance Pending Rulemaking for Control and Disposition of Technologically-Enhanced Naturally Occurring Radioactive Materials in Colorado, Rev 2.1 (2007 Policy). Subsequent rulemaking did not address technologically-enhanced naturally occurring radioactive material (TENORM) issues and the anticipated guidance for oil and gas-related TENORM was not developed. However, in the intervening time, significant experience has occurred in applying the TENORM policy to water treatment residuals, contaminated soils, and other materials. As a result of this experience and regulatory changes, the policy document requires updating and revision.

One significant regulatory change was the alignment of Colorado regulatory definition for source material with that used by the Nuclear Regulatory Commission. The previous Colorado definition excluded materials that contains by weight one-twentieth of 1 percent (0.05 percent) or less of uranium, thorium or any combination. However, to be compatible with the NRC, the broader NRC definition was accepted that specifies uranium or thorium, or any combination thereof, in any physical or chemical form. The TENORM definition excludes source material, thus low levels of uranium or thorium could not be included. The NRC addresses the low level uranium and thorium through their definition as “unimportant quantities” of source material (UQ). This policy intends to include unimportant quantities of source material along with TENORM to allow the department to consider alternative mechanisms for management of the material without invoking radioactive materials licensing and still providing for the protection of public health and safety.

Another change is the shifting of the focus of the policy from a material-specific (for example, drinking water residuals) approach to a media-specific (diffusely contaminated soil-like materials, liquids, surface-contaminated objects) approach. The guidance will be developed specific to an industry or situation, such as drinking water residuals, oil and gas (O&G) produced water, wastewater biosolids, etc. It is expected that the guidance may expand over time as more information is gleaned from experience and from the identification of additional TENORM or UQ sources.

The basic concept of the policy document has not changed: Develop mechanisms to address radiation protection requirements while minimizing additional regulatory structure or burden.

The policy continues to utilize a regulatory process that is simple, equitable, consistent and predictable. It provides generic steps for TENORM and UQ management and disposal. The previously identified
stepwise approach for the evaluation of the potential dose posed by the residuals and materials will be retained with modifications to define default management options for a wider range of materials. In addition, the current case-by-case approach has been retained as an option for those entities with the resources to pursue a more detailed and facility or site specific evaluation of the potential dose.

Definitions
From Colorado Rules and Regulations Pertaining to Radiation Control:

**Naturally occurring radioactive material** (NORM) means any radioactive material that is not byproduct, source or special nuclear material; produced in an accelerator; or byproducts of fossil-fuel combustion, including bottom ash, fly ash and flue-gas emission byproducts.

**Technologically enhanced naturally occurring radioactive material** (TENORM) means naturally occurring radioactive material whose radionuclide concentrations are increased by or as a result of past or present human practices. "TENORM" does not include:
1. Background radiation or the natural radioactivity of rocks or soils;
2. "Byproduct material" or "source material," as defined by Colorado statute or rule; or
3. Enriched or depleted uranium as defined by Colorado or federal statute or rule.

**Byproduct material** means:
1. Any radioactive material, except special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material;
2. The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes (underground ore bodies depleted by these solution extraction operations do not constitute “byproduct material” within this definition);
3. Any material produced, extracted, or converted after extraction, for use for a commercial, medical, or research activity, that:
   a. Is a discrete source of radium-226; or
   b. Has been made radioactive by use of a particle accelerator; or
4. Any discrete source of naturally occurring radioactive material, other than source material, that:
   a. Is extracted, or converted after extraction, for use for a commercial, medical, or research activity; and
   b. Is determined by NRC to pose a threat to the public health and safety or the common defense and security similar to the threat posed by a discrete source of radium-226.

**Source material** means uranium or thorium, or any combination thereof, in any physical or chemical form, including ore that contains by weight one-twentieth of 1 percent (0.05 percent) or more of uranium, thorium or any combination thereof. Source material does not include special nuclear material.

"Natural thorium" means thorium with the naturally occurring distribution of thorium isotopes (essentially 100 per cent thorium-232 by weight).
"Natural uranium" means uranium containing a mixture of the uranium isotopes 234, 235 and 238 (approximately 0.7 percent uranium-235 by weight and the remainder essentially uranium-238 by weight) that is neither enriched nor depleted in the isotope uranium 235.

From U.S. Nuclear Regulatory Commission Regulations (10 CFR 40.13):
Unimportant quantities of source material (UQ) means source material in any chemical mixture, compound, solution or alloy in which the source material is by weight less than one-twentieth of one percent (0.05 %) of the mixture, compound, solution or alloy.

TENORM and UQ Materials
Radioactive materials can be present in a wide variety of media due to contamination, inadvertent concentration or through natural processes. In some cases, these media can contain radioactivity at a level that creates a potential for worker or public exposure. The more common media potentially containing TENORM or UQ materials include diffusely contaminated soil-like materials, liquids and surface-contaminated objects.

Diffusely contaminated soil-like materials generally are solids with TENORM or UQ materials spread throughout the material. As solids, these materials can be handled and packaged using common techniques and equipment, and may be generated from treatment of liquids containing radioactive materials, unintentional concentration through refining, combustion or other processes. Risk pathways associated with these materials include direct exposure, dispersal through handling, wind or water erosion and leaching into surface or ground waters. These soil-like materials may be managed for beneficial reuse in compost, inert fill or agriculture, and often are disposed in solid waste landfills. Each of these activities may be subject to solid waste regulation, and agricultural beneficial reuse may be subject to water quality regulation.

Liquid materials are generated through groundwater extraction and water treatment. Drinking water regulations have driven greater removal of contaminants from domestic and industrial water supplies, and some treatment options generate liquid wastes that contain concentrated TENORM or UQ. Often the efficiency of the process results in materials that exceed TENORM or UQ specifications and require a radioactive materials license for management and disposal. Other materials may have levels of TENORM and UQ that allow for discharge or beneficial reuse. Risk pathways associated with the materials include direct exposure, dispersal through discharge to surface or ground waters, and contamination of solid materials subject to disturbance or wind dispersal. These materials may be discharged to surface water, groundwater or sanitary sewers, or beneficially reused for dust control, irrigation or other applications. Discharges are regulated through water quality regulations, and radiation regulations in some cases. Beneficial reuse may be regulated through water quality, solid waste or radiation regulations.

Surface-contaminated objects generally are equipment or piping where TENORM or UQ has been deposited due to pressure, temperature, or chemical changes. The materials are typically found at oil and gas operations, water treatment systems, mining facilities, and power plants where the naturally occurring radioactive materials can concentrate on interior surfaces of processing equipment. The materials are in solid form and often strongly fixed to the contact surface; therefore risks are largely due to direct exposure or possibly disturbance and inhalation. These materials are often detected in scrap piping and equipment by gate or portal alarms at landfills and metal recycling facilities. Depending on the degree of concentration, the objects may require disposal at a radioactive materials facility. In other
cases, disposal at a landfill or use as scrap may be allowed. Surface-contaminated objects may be regulated through either solid waste or radiation regulations.

Applicable Regulations
The U.S. Environmental Protection Agency (EPA) has federal jurisdiction over TENORM, but has chosen to not promulgate specific regulations yet for these wastes. The U.S. Nuclear regulatory Commission does not regulate NORM or TENORM materials except in narrowly defined cases. Under the Radiation Control Act, Colorado has authority over all forms of radioactivity, including NORM and TENORM. Colorado exercises discretion on regulating materials that do not pose a health or environmental risk and may rely upon other existing regulatory authorities to provide address radiation, if those programs meet the protectiveness required.

Regulations that impact TENORM include:
- Regulations Pertaining To Solid Waste Sites and Facilities (6 CCR 1007-2)
- The Colorado Primary Drinking Water Regulations (5 CCR 1003-1).
- Surface Water Quality Classification and Standards (5 CCR 1002-31) (Regulation 31)
- Basic Standards for Ground Water (3.11.0) 5 CCR 1002-41 (Regulation 41)
- Beneficial Use of Water Treatment Sludge and Fees Applicable to the Beneficial Use of Sludges
- Pretreatment Regulations (Regulation 63) (5 CCR 1002-63)
- Biosolids Regulations (Regulation 64) (5 CCR 1002-64)
- Statewide Water Sampling and Monitoring (new COGCC Rule 609 and amended Rule 318A.e.(4)) (2 CCR 404-1)
- [possibly more added as identified]

TENORM/UQ Approval Process
Situations involving TENORM/UQ determinations can arise in various ways, and result from different circumstances. The need for a determination can result from permitting activities, remedial actions, incidents or routine operations. Application of the TENORM/UQ policy can be initiated in several ways:
- Direct request to the Radioactive Materials Unit
- Referral to the Radioactive Materials Unit from another department entity (solid waste, drinking water, wastewater)
- Identification by department staff from inspection, incident report or other means

In all cases, the initial contact should include, to the extent available:
- the current state, condition and location of the material
- any chemical or radiological characterization information
- the origination of the material through process knowledge or documentation
- contact information for the possessor and/or owner of the material
- The planned disposition of the materials (disposal, beneficial reuse, storage, transfer, etc.)
The driving force for an action related to the materials is also needed. For example, the material is waste and requires disposal; the material requires handling to accommodate other activities; or the material has been discovered and inadvertently possessed.

If insufficient information is available to characterize the material, additional characterization is necessary. Existing regulatory requirements in solid waste and water quality may specify characterization details; however, both the policy and attached guidance documents will seek to provide both the existing requirements as well as some generic sampling and analysis approaches. These may include, as an example, the sampling requirements for any land application from the Biosolids regs 64.16 or the EPA’s SW-846 Chapter 9 “test methods for evaluating solid waste.”

The characterization information will be compared to the generic criteria discussed below for appropriate actions related to the material, and staff will determine acceptable options. Recommendation will be made by staff, and consultation with other potentially affected department staff will follow. The determination will be relayed to the owner/possessor of the material with direction for subsequent actions. Documentation may vary for different programs, but will be shared among affected staff. Staff will be available to discuss the evaluation and results with the owner/possessor, as appropriate.

It should also be made clear that any acceptable concentrations or levels established within this policy shall not be construed as provisions for the disposal or disposition of higher-activity materials by mixing and dilution with clean material.

Beneficial Reuse
Compost feed was the only beneficial reuse previously addressed in the last revision of the TENORM policy. It is the intention to incorporate the beneficial reuse of both biosolids and oil and gas exploration and production materials including produced waters into the revised policy.

It is the Department’s intention to structure the policy such that any beneficial reuse of materials that would be used for land application would have to not only meet an activity concentration limit prior to application but also may be subject to application site characterization and periodic monitoring in order to verify that there has been no cumulative impact to an application site over time.

Disposal By Land Burial
Any facility or site that intends to dispose of TENORM-impacted materials by land burial will be required to revise its engineering, design and operations plan to include details regarding the acceptance or possession of materials and have that plan approved by the Department prior to the acceptance of materials.

Potential Exposure Pathways
In order to evaluate acceptable management options for various materials, an understanding of exposure pathways and levels is necessary. Consideration of exposure pathways utilizes a conceptual
model where material presence and movement through the environment is mapped. Once pathways are determined, exposure levels can be defined. This approach and results are discussed below for each media.

Diffusely contaminated soil-like materials may exist in the form of soil, water treatment residuals (alum sludge, raw sludge, resins), cuttings from well drilling, ash or slag from incineration or smelting processes, tailings from (non-uranium or thorium) milling and wastewater treatment residuals (grit, biosolids). As solids, each of these materials has differing characteristics that affect the potential pathways of exposure. Potential pathways for solids are discussed below:

- External exposure is essentially when one comes into contact or is in close proximity to the material allowing for the radiations to interact with tissues of an individual. While external exposure is time dependent, in some cases the materials may contain enough activity that external exposure presents a health impact.
- Direct contact: an additional concern is that if one comes in direct contact with materials, transfer of the material may occur resulting in inhalation or ingestion of the material. Some materials are more susceptible to degradation with contact, such as soil, raw sludge, ash, cuttings, grit and biosolids.
- Wind erosion can disperse materials making them more likely to be contacted, inhaled or ingested, or disseminated further, leading to movement in the environment and increased chances of exposure.
- Water erosion can also disperse materials making them more likely to be contacted, or disseminated further, leading to movement in the environment and increased chances of exposure.
- Contaminants in the solids in contact with moisture can leach out and move into surface water, making them more likely to be contacted, or disseminated further, leading to movement in the environment and increased chances of exposure.
- Contaminants in the solids in contact with moisture can leach out and move into groundwater making them more likely to be contacted, or disseminated further, leading to movement in the environment and increased chances of exposure.
- Handling or spills of the material can change the degree of movement of the material and introduce it into other pathways of exposure. Spills of solid materials can be readily addressed; however, dissemination can be accelerated if ignored.
- Some solids may be applied to land surfaces, which can create additional pathways as described above. In addition, vegetation may absorb contaminants from the soil that are incorporated into the vegetative matter, making it available for human or animal consumption.

Liquid materials such as water treatment backwash, water treatment brines, oil & gas produced water and other produced water can move more quickly in the environment if inadequately contained. Pathways for liquids are similar to those for solid materials; however, intermediate steps may be abbreviated. Pathways of concern include:
• External exposure may occur; however, high levels of contaminants are necessary for this to result in significant exposure.
• Direct contact: Ingestion and inhalation can result from direct contact with liquids.
• liquids can move directly into surface water, enhancing the dispersion and potential for exposure.
• Liquids can move directly into ground water, enhancing the dispersion and potential for exposure.
• Liquids may be applied to land surfaces for dust control or irrigation, or as soil amendment. As the water component of the liquid evaporates, contaminants may be collected on or concentrated in the soil, which leads to the pathways described above. In addition, vegetation may absorb contaminants from the soil that are incorporated into the vegetative matter, making it available for human or animal consumption.

Surface-contaminated objects include piping, equipment and other items where TENORM or UQ material has been deposited. Normally, changes in pressure, temperature or chemistry cause metals to plate out on the interior of these devices, much like calcium deposits in a shower stall. These metals may include both TENORM and UQ, but also decay progeny of these materials such as lead or polonium. Exposure pathways include external exposure and direct contact causing a disturbance of the material that could result in inhalation or ingestion. Other pathways described above are unlikely exposure routes for this material.

Generic dose assessments to determine activities and dispositions acceptable to the Department will be developed over time for some of the scenarios described below to determine what activity level of the material would limit an exposure to less than 25 mrem per year. Conservative estimates that are consistent with ALARA will be used to account for exposure. The assessment details will be included in either the appendices or the associated guidance volumes of the policy.

Activities likely to be evaluated for each matrix or medium include:

Liquids:
Storage and evaporation
Discharge to sewer
Discharge to surface water
Discharge to groundwater
Deep well Injection
Beneficial reuse: Land application: road dust suppression
Beneficial reuse: Land application: agricultural irrigation

Solids:
Beneficial reuse: Land application: agricultural application
Disposal in RCRA D solid waste landfill
Disposal in RCRA C hazardous waste landfill
Disposal by land burial on-site
Beneficial reuse: Compost feed

Surface contaminated objects:
Disposal in RCRA D solid waste landfill
Disposal in RCRA C hazardous waste landfill
Descaling activities and management of solids

Generic Evaluation Criteria
The 2007 policy relied on exposure assessments and practice knowledge to develop a tiering system suitable for a generic determination of disposal options for TENORM. This information will be used along with additional analyses and research as described above to revise the tier system to address the most practical and acceptable options for a broader range of materials and additional disposition alternatives. The tables within the policy will define generic levels for natural uranium, natural thorium and combined radium 226/228.

The values will be based on conservative assumptions as described within the details of each assessment; however, site- and material-specific conditions could change the appropriate values. A site- and/or materials-specific dose assessment may be conducted to generate different numbers and be provided to the Department for consideration. Consultation with the Department before completing the assessment is recommended to ensure that the approach and scope would satisfy Department expectations.

Materials that do not exceed the following limits may be managed without consideration of the radioactive constituents:

Combined Ra-226/Ra-228 3 pCi/g above background
Natural Uranium 30 pCi/g above background
Natural Thorium 3 pCi/g above background

Materials that exceed the following limits will require a radioactive materials license and will be directly regulated by the Radioactive Materials Unit:

Combined Ra-226/Ra-228 50 pCi/g above background
Source materials greater than 0.05% by mass:
   Natural Uranium 339 pCi/g above background, or
   Natural Thorium 55 pCi/g above background
If both U Nat and Th Nat are present unity applies. (i.e. the sum of the fractions of the limits for U Nat and Th Nat may not exceed 1.)
Appendix A
Regulatory Basis for TENORM Policy and Guidance [in development]

Radiation Control Act
The U.S. Environmental Protection Agency (EPA) has federal jurisdiction over TENORM, but has chosen to not promulgate specific regulations yet for these wastes. Colorado has authority over all forms of radioactivity, including NORM and TENORM. Colorado exercises discretion on regulating materials that do not pose a health or environmental risk.

The authority is found in the Radiation Control Act (RCA) (CRS 25-11-101 et. seq.), which states:

“The department shall develop and conduct programs for evaluation and control of hazards associated with the use of any and all radioactive materials and other sources of ionizing radiation, including criteria for disposal of radioactive wastes and materials to be considered in approving facilities and sites pursuant to part 2 of this article.”

TENORM is regulated under Part 1 of the RCA.

The regulatory scheme is not discrete, but rather is distributed throughout the RCA and the implementing regulations. The RCA requires that the Department issue licenses pertaining to radioactive materials, and all radioactive material be disposed of in a licensed facility. However, the implementing regulations provide for relief from the regulations when public health can be protected using other methods.

There was a previous effort to promulgate specific state regulations for disposal of NORM; however, the rulemaking died, and a provision was inserted into the RCA that remains:

§25-11-104 (1)(b): “The state board of health may adopt regulations concerning the disposal of naturally occurring radioactive materials at any time after the promulgation by the federal Environmental Protection Agency or its successor of rules for the disposal of naturally occurring radioactive materials.”

US Nuclear Regulatory Commission
[being developed]

Colorado Rules and Regulations Pertaining to Radiation Control (6 CCR 1007-1)

The RCA is implemented by the Radiation Program of the CDPHE Hazardous Materials and Waste Management Division through the Colorado Rules and Regulations Pertaining to Radiation Control (radiation regulations), specifically Parts 1, 3, 4, 10 and 17. The radiation regulations address licensing, protection of the public and workers from radiation, disposal, worker education and transportation requirements.

Of particular importance is an exemption found in § 1.5 Exemptions:
Section 1.5.1 General Provisions. “The Department may, upon application or upon its own initiative, grant such exemptions or exceptions from the requirements of these regulations as it determines are authorized by law and will not result in undue hazard to public health and safety or property.”

This provision provides the Department with the discretion to manage TENORM, if alternative approaches are protective of public health and the environment. Conversely, the Department has the authority to impose requirements to protect health.

Section 1.9 Additional Requirements. “The Department may, by rule, regulation, or order, impose upon any licensee or registrant such requirements in addition to those established in these regulations, as it deems appropriate or necessary to minimize danger to public health and safety or property.”

Unimportant Quantities of Source Material
This means uranium that is less than about 350 pCi/g or natural thorium that is less than about 50 pCi/g does not require a license to possess or transfer. It is not a health-based exemption, and the Department evaluates each waste stream for protection of workers and public health and the environment.

Part 4 of the regulations addresses dose limits to members of the public and to occupationally exposed radiation workers. The majority of workers who encounter TENORM are considered members of the public and are limited to an annual exposure of 25 mrem per year. In addition,

Section 4.5.2 “The licensee or registrant shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA).”

Dose must be reduced as low as is practical below the regulatory limits.

Part 4 also has requirements for disposal of radioactive material (§4.35), with respect to disposal into sewers and for the limits used in determining if material is radioactive with respect to NPDES permitting requirements. In addition, the discharge must be allowed and approved by the local sewerage agency.

Regulations Pertaining To Solid Waste Sites and Facilities (6 CCR 1007-2)

Solid waste management is regulated by the Solid Waste and Materials Management Program in the CDPHE Hazardous Materials and Waste Management Division through the Solid Wastes Disposal Sites and Facilities Act (C.R.S. 30-20 Part 1 et. seq., the Act) and the Regulations Pertaining To Solid Waste Sites And Facilities (solid waste regulations), specifically Sections 1, 2, 3, 9, 12, 13, 14 and 17.

The Act specifies in Section 30-20-101(6)(b) that:

“Solid waste” does not include...(V) Materials handled at facilities licensed pursuant to the provisions on radiation control in article 11 of title 25 C.R.S
This provision requires that the facilities managing radioactive materials are appropriately regulated, but not required to comply with overlapping regulations for the same activities. Further Section 30-20-110(1)(c) states:

“No radioactive materials or materials contaminated by radioactive substances shall be disposed of in sites or facilities not specifically designated for that purpose.”

These statutory requirements ensure appropriate management and care of radioactive solid wastes or solid wastes contaminated with radioactive substance such that they do not present an unacceptable risk to human health or the environment.

Section C.R.S. 30-20-119 et. seq. prevents the disposal of low-level radioactive wastes at solid waste disposal sites and facilities without “the express written permission of the appropriate governmental entity which has the authority to grant a certificate of designation...” This section of the statute further states “the appropriate governmental entity “shall require a technical review by the department of the low-level radioactive waste proposed to be disposed... and the department shall make a written recommendation to the governmental entity as to whether such waste shall be accepted.” These statutory requirements preserve the dual solid waste regulatory authorities consistent with other section of the Act.

The regulations address administrative requirements, minimum standards, solid waste landfills, waste impoundments, water treatment plant sludge, composting, and commercial exploration and production waste impoundments.

Section 2 and other sections require waste characterization:
§2.1.2(C) “All sites and facilities, requiring a certificate of designation, shall have a waste characterization and disposal plan approved by the Department and in use for such site and facility. The plan shall outline waste screening methodologies, appropriate waste handling procedures, and waste exclusion procedures which shall be implemented at each facility.”

There are numerous provisions of this requirement. The more heterogeneous the facility’s waste stream, the more rigorous the facility’s waste screening methodologies will need to be in order to have an appropriate statistical power and confidence in waste characterization.

Section 9 includes procedures for classifying impoundments based on their potential hazard. This process uses site features and waste characterization for comparison to groundwater standards. An Engineering Design and Operation Plan, Closure Plan and financial assurance will be required in most cases that include TENORM.

Section 12 provides the requirements for disposal of drinking water treatment plant sludge. Surface and groundwater monitoring may be required, and alum sludge from drinking water treatment plants in excess of 40 pCi/g gross alpha requires notification of the Radiation Program.

Section 14 of the Solid Waste Regulations regulates composting facilities. Composting facilities that accept Type 3 feedstocks (which include sludges) are required to maintain a CD, a Design and Operation
Plan and financial assurance. There are also provisions for surface and groundwater protection, windblown and other operational parameters.

Section 17 addresses commercial oil and gas exploration and production waste impoundments. All such impoundments are subject to the stricter requirements of Section 9.

**CDPHE Water Quality Control Division**

The Colorado Primary Drinking Water Regulations (5 CCR 1003-1).
- Monitoring for rads in produced water
- Residual management plans in design process for new facilities or significant modification to existing facilities

Surface Water Quality Classification and Standards (5 CCR 1002-31) (Regulation 31)
- The Basic Standards and Methodologies for Surface Water
  - Sets requirements for discharges to surface water
  - Includes radionuclides

Basic Standards for Ground Water (3.11.0) 5 CCR 1002-41 (Regulation 41)
- Sets limits applied by Implementing Agency decisions
- Includes radionuclides

Beneficial Use of Water Treatment Sludge and Fees Applicable to the Beneficial Use of Sludges
- Beneficial Use Plan
- Monitoring to include total alpha activity, (and others as directed by the Department)

Pretreatment Regulations (Regulation 63) (5 CCR 1002-63)
- Sets requirements for industrial process water discharges to sanitary sewer collection systems including prohibitions, effluent limits, monitoring, etc.
- Incorporates parts of 40 CFR 403 by reference.
- May require notice of discharge requirements from the WQCD (similar to a permit).
- May require periodic discharge monitoring reports.

Biosolids Regulations (Regulation 64) (5 CCR 1002-64)
- Notice of Authorization for the Use and Distribution of Biosolids
- Biosolids Management Plan
- Monitoring to include sludge and soils at application site
- Radionuclides not specified, but additional monitoring may be directed by the Division
- Annual Self-Monitoring Report

**Colorado Oil and Gas Conservation Commission**
Statewide Water Sampling and Monitoring (new Rule 609 and amended Rule 318A.e.(4)) (2 CCR 404-1)
Requires baseline and post activity monitoring of ground water
Radionuclides not specified