



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Office of Waste, Air, Radiation & Remediation

TENORM Study

Solid Waste Advisory Committee Meeting

May 16, 2013

TENORM Study

Generation of technologically enhanced naturally occurring radioactive material (TENORM) has increased significantly. This is mainly due to the recent expansion in natural gas exploration and production in Pennsylvania.

There are many issues with TENORM that must be managed effectively.

These issues include:

- Potential worker radiation exposure
- Public radiation exposure
- Environmental (water, etc.) contamination
- Waste disposal



TENORM Study

Information is required to appropriately manage these issues

- Empirical data that documents the range of TENORM in these various media are required.
- These data will be collected, including independent quality assurance activities, and reported in accordance with specific protocols.
- Appropriate programs will be developed and communicated.
- This will be a transparent effort.

TENORM Study

We are going to collect the necessary data by performing a comprehensive study.

- The contractor for the study is Perma-Fix Environmental Services, Inc. (BRP's health physics consulting group).
- The study will also involve BRP, BWM, BPNPSM, BOGM, the BoL and others.

TENORM Study

We believe the data to be collected through this study will provide for the successful management of this issue, including future development.

- Industry is providing access to sites, media to sample and survey.
- The study will take 12-14 months to complete.

TENORM Study

- **With this study:**
 - The Department and Industry will be able to make informed decisions regarding long-term management options.
 - The Department and Industry will be able to address TENORM generation, transportation, effluents, and disposal more effectively at the point of generation.
 - The Commonwealth and Industry will be better prepared to manage TENORM-related issues as the Marcellus industry expands throughout the Mid-Atlantic states.
- **Funding, Payment and Management**
 - DEP is funding the study

TENORM Study

Drill cuttings with TENORM issues

- **This will allow us to manage the issue by:**
 - Keeping Form U data fields up-to-date
 - Determining if cuttings should be considered TENORM and are acceptable for disposal in approved waste disposal sites or for beneficial use
 - Disposal planning
 - Use as fill
 - Opportunities for beneficial uses

TENORM Study

Produced waters (e.g., flow back water and brines)

- **This will allow us to understand and manage treatment solids**
 - Total radium loading in treatment solids when barium is removed
 - Understand how treated flow back water and treated brine can be used/re-used other than for hydraulic fracturing

TENORM Study

Wastewater treatment solids relating to DOT transport and landfill limits

- **This will allow us to manage the issue by:**
 - Knowing what would need to be shipped out of state to RCRA-C
 - Updating Form U if necessary
 - Addressing waste disposal site planning and capacities
 - Determining level and type of ongoing on-site sampling
 - Determining if different plant operations influence levels

TENORM Study

Ongoing produced and flow back waters and brines

- **This will allow us to make decisions about:**
 - Use for De-icing and dust suppression
 - Sludges from other processes like salt production
 - Set appropriate effluent discharge levels

TENORM Study

Radon in natural gas levels

- **This will allow us to manage the issue by:**
 - Knowing Radon levels at the point of use or exposure will allow calculation of potential public and worker Radon exposure due to natural gas from the Marcellus shale

TENORM Study

Pipe scale causing worker exposure; metal recycle concern

- **This will allow us to manage the issues by:**
 - Determining what situations could lead to worker exposure
 - Adjust guidance accordingly
 - Determining what operations could lead to environmental contamination
 - Adjust guidance accordingly

TENORM Study

- The Final peer reviewed plans are available at:

http://www.portal.state.pa.us/portal/server.pt/community/oil___gas_related_topics/20349/radiation_protection/986697

- Sampling was initiated on April 15, 2013.
- Updates will be provided to the appropriate DEP Advisory Committees

Questions

Are there any Questions?



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