We Have Solutions for Your NORM Problems

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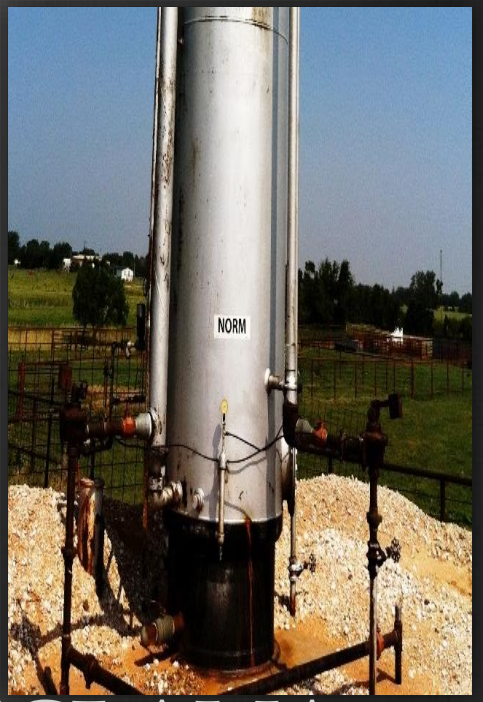
# NORM MANAGEMENT IN TX & NM

## ASSP CORPUS CHRISTI LUNCHEON

## JUNE 13, 2023

# HAZARDS & RISKS

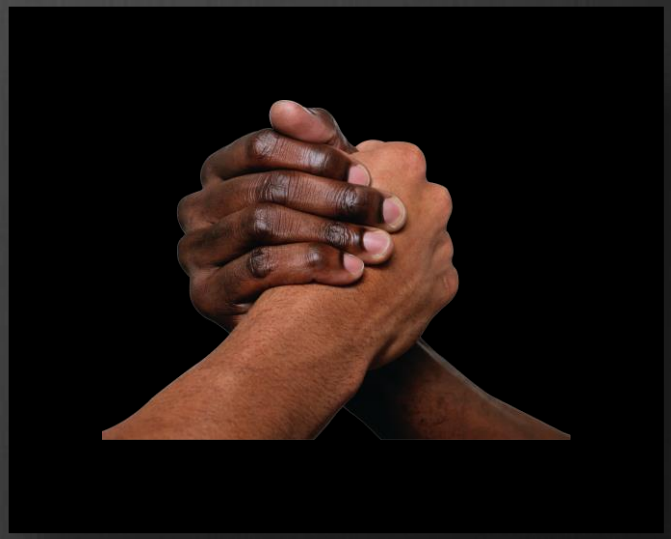
- IDENTIFY – SURVEY/SAMPLE
- POLICIES & PLANS
- DECON/MAINTENANCE
- TRANSPORTATION
- RELEASES
- DISPOSAL/RECOVERY/RECLAMATION/RECYCLING



# HAZARDS & RISKS

## ALARA

- Most fundamental concept when discussing radiation
- Regulations are in place to protect workers, general public, and the environment
- Involves a risk, no matter how small
- INHALATION & INGESTION



## LITIGATION/LIABILITY

- Lawsuits – Health/Property

## COMPLIANCE

- NORM/TENORM = Waste
- Avoid fines and/or enforcement

# ANALYZING RISKS

## 1) SURVEY READINGS

- Gamma Exposure Readings
- Surface Contamination Readings
- Time, Distance and Shielding

## 2) DOSIMETRY

- Dose Badges
- Direct Read Dosimetry

## 3) AIR MONITORING

- Field Samples and Air Pumps

# DOSE LIMITS

## OCCUPATIONAL WORKERS:

5 rem per year dose limit;

No adverse health effects for 50 years

## GENERAL PUBLIC:

0.1 rem per year dose limit, and not to exceed 2 mRem in a given hour.

2 mRem/hr = 2,000 µR/hr (1Rem:1R)

# TIME CALCULATIONED DOSE SCENARIOS

## 50 µR/hr x 2,000 hrs = 0.1 Rem/yr

- 1R:1REM (field method)
- 2,000 hrs (working year, 40 hours per week, 50 weeks per year)
- Create dose scenarios involving employees and contractors
- *DON'T FORGET ABOUT THE 2 MREM in ANY GIVEN HOUR!* APPROX. 2,000 µR/hr

# ASSESSING DOSE

## DOSIMETRY BADGES:

- Only worn by Occupational Workers***
- Measure beta particles and gamma rays
- Typically the only individual dose record kept on NORM decontamination workers

## AIR MONITORING:

- Occupational Workers & General Public
- Back calculated into mRem for TEDE
- Analyzed for gross alpha and beta (µCi/mL)

# SAMPLING FOR WASTE CHARACTERIZATION


- Responsibility of the Generator
- Sample Collection – EASY
  - Size of your Fist
  - First 15 centimeters ~ 6.5 inches
  - NOT Air-tight
  - NOT Preserved on Ice
- What do you do when you have an insufficient volume of waste to sample? SEND:
  - Wipe Test Smears to the Lab
  - Small Piece of Contaminated Equipment to Lab
  - Air Sample Filter Papers to Lab

# GAMMA & ALPHA SPECTROSCOPY

- Credible Disposal Facilities Use Profiling and Acceptance Procedures
- DO NOT ONLY USE EXPOSURE READINGS!
- Analytical Data – Gamma Spectroscopy & Alpha Spectroscopy
- Always Check with the Facility on which Radionuclides Need to be Represented on the Analytical Report!
  - Radium$^{226}$
  - Radium$^{228}$
  - Lead$^{210}$
  - Polonium$^{210}$
  - Bismuth$^{214}$
  - Thorium$^{228}$
  - Total Activity

= DEFAULT RADIONUCLIDES

# PRACTICAL TIPS FOR NORM SURVEYORS

## When conducting NORM surveys:

- Bring along an extra cable
- Use only meters calibrated in the last 12 months
- Check the meter response before and after the survey - ±20% accuracy
- Be aware of multiple sources
- Do not drop equipment
- Record all pertinent information
- Never use the meter in combustive atmospheres



# CREATING A STRATEGY

## DETERMINING THE NEED & USE FOR THE RADIATION PROTECTION PLAN

- WHY? - Hazards? Compliance? Liability?
- GENERAL LICENSE OR SPECIFIC LICENSE?
- WPP/RPP stand alone?
- Incorporate into a safety plan? SOP? Policy?
- Decommissioning Plan needed?

## REGULATIONS FOR ALL OPERATING AREAS

- One Facility? Multiple States? Multiple Countries?
- Structure depends on regulations and/or BMP



# ENSURING WORKERS UNDERSTAND NORM LIMITS

## STEP 1 – EFFECTIVE WPP/RPP

- Meets ALARA with social, economic and practical factors
- Meets Companies operational needs

## STEP 2 – EFFECTIVE TRAINING

- Complies with State requirements
- Company Specific
- Easy to Understand

## STEP 3 – EFFECTIVE REVIEWS

- Annual reviews are performed by qualified, competent responsible person with authority (NORM RSO trained)
- Maintain Checks/Balances and Enforce Corrective Actions

## ROUTINE MAINTENANCE: *CRCPD PART N.10(c)*

Employees or contractors under control and supervision of a general licensee may perform routine maintenance on equipment, facilities, and land owned or controlled by the general licensee.

## DECONTAMINATION:

*Maintenance that provides a pathway for exposure different from that found in periodic maintenance operations and that increases the potential for additional exposure is not considered routine maintenance.*

The decontamination of equipment, facilities, and land shall be performed only by persons specifically licensed by the Agency, an Agreement State, or another Licensing State to conduct such work.



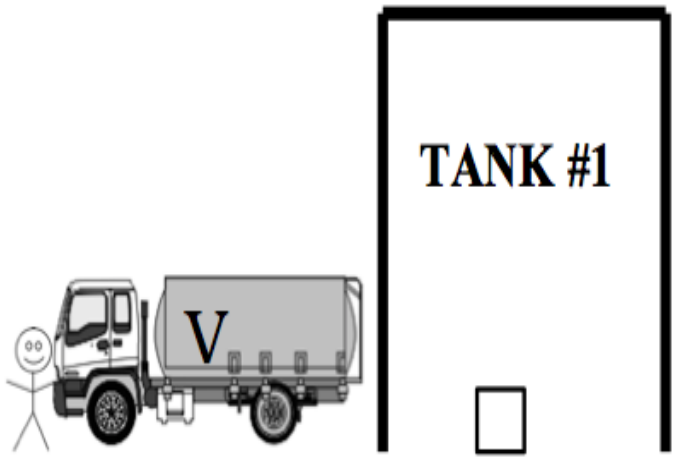
# PREVENT AIRBORNE EXPOSURES

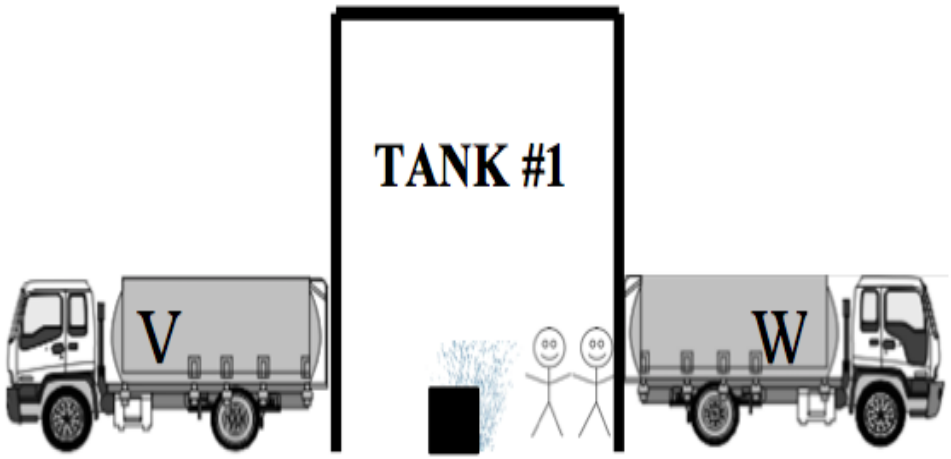
## ALPHA AND BETA INHALATION:

- Alpha and beta particles are not an issue while equipment is in-service
- Perform work in closed-loop systems when possible
- Use wet methods to reduce dusts
- WEAR APPROPRIATE RESPIRATOR***

# MAINTENANCE VS. DECONTAMINATION

| MAINTENANCE | DECONTAMINATION |
| --- | --- |
| NO ADDITIONAL AIRBORNE PARTICULATES | ADDITIONAL AIRBORNE PARTICULATES |
| NO RESPIRATORS | RESPIRATOR USAGE |
| NO VESSEL ENTRY | VESSEL ENTRY AND CONFINED SPACE ENTRY |
| | SOIL REMEDIATION |



| TEXAS EXEMPTION LIMITS | NEW MEXICO EXEMPTION LIMITS |
| --- | --- |
| - 50 µR/hr including background at any accessible point | - 50 µR/hr including background at any accessible point |
| - 30 pCi/g of $Ra^{226}$ or $Ra^{228}$, or 150 pCi/g of any other radionuclide | - 30 pCi/g of $Ra^{226}$, above background, or 150 pCi/g of any other daughter radionuclide, above background. |
| - 30 pCi/g of $Ra^{226}$ and $Ra^{228}$ combined, or 150 pCi/g of any other daughter radionuclide (Disposal Permits) | |
| - Soils are averaged over 100 $m^2$, in the first 15 cm. | - Soils are averaged over 100 $m^2$, in the first 15 cm. |
| - Surface Contamination Limits:<br>  - Average 5,000 dpm/100$cm^2$<br>  - Maximum 15,000 dpm/100 $cm^2$<br>  - Removable 1,000 dpm/100 $cm^2$ | - Surface Contamination Limits:<br>  - Average NONE<br>  - Maximum NONE<br>  - Removable 1,000 dpm/100 $cm^2$ |



| TEXAS REGULATIONS | NEW MEXICO REGULATIONS |
| --- | --- |
| - EQUIPMENT MARKING: Mark with the letters "NORM" in areas conspicuous to the worker | - EQUIPMENT MARKING: NONE |
| - STORAGE TIME LIMIT: NONE | - STORAGE TIME LIMIT: 365 days, file for an extension for an additional 365 days, up to 10 years |
| - SURVEYOR TRAINING: None required by regulation | - SURVEYOR TRAINING: Required to perform surveys |
| - PRODUCED WATER EXEMPTION: YES | - PRODUCED WATER EXEMPTION: YES |
| - CRUDE OIL AND NATURAL GAS PRODUCT EXEMPTION: YES | - CRUDE OIL AND NATURAL GAS PRODUCT EXEMPTION: YES |



# IS NORM HAZARDOUS?

## NORM/TENORM IS NOT INHERENTLY HAZARDOUS!

- **HAZARDOUS WASTE** - any material that is subject to the Hazardous Waste Manifest requirements of the U.S. EPA specified in 40 CFR 262.

- **HAZARDOUS MATERIAL**- a material designed as hazardous in the Hazardous Materials Table found in 49 CFR 172.101. The term includes Hazardous Substances and Hazardous Wastes. Material meeting the DOT definition for Radioactive Material is considered a "Hazardous Material".

- **HAZARDOUS SUBSTANCE** - a material, including its mixtures and solutions, that is listed in 49 CFR 172.101, Appendix A, Table 2 and is in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in Table 2.



# TEXAS DISPOSAL OPTIONS

## Authorized by Rule

- Disposal in plugged & abandoned wells
- Burial (at the same site where the NORM was generated)
- Land farming (the same site where NORM was generated)
- Disposal at a licensed facility
- Injection (if waste is NOW)

## Permit Required

- Non-retrieved Flowlines/Pipelines
- Commercial or Centralized Surface Waste Management Facilities
- Disposal in plugged & abandoned wells
- Injection
- Injection in Enhanced Oil Recovery Injection Wells



# COMMERCIAL DISPOSAL FACILITIES

- 1) Is the Facility Permitted to Accept this Waste?
  - 1) Hazardous or Non-hazardous?
  - 2) RCRA-Exempt or Non RCRA-Exempt?
  - 3) Is the Disposal Permitted for NORM/TENORM?
- Is the Waste Acceptable for this Facility?
  - 4) Does the Analytical Data Show that the Waste Falls Under the Maximum Concentration Limits for the Facility?
  - 5) Is the Media of the Waste Acceptable for the Facility's Processing Procedures?
- What Information and Paperwork Does the Disposal Facility Need From You?



# DISPOSAL AUTHORIZATIONS

- 1) Find a Disposal Facility In Close Proximity
- 2) Verify that the Disposal Facility is Permitted to Accept the Waste
- 3) Send Appropriate Analytical to the Disposal Facility for Waste Profiling Purposes
  - If the Facility DOES NOT REQUEST Analytical Results, You Should Not Use Them!
  - Always Perform Due Diligence on Any Disposal Facility You Use!
  - Use Third-Party Laboratory Analysis - DO NOT RELY ON THE DISPOSAL
- ALWAYS SCHEDULE A GATE TIME!



# NORM SOLUTIONS

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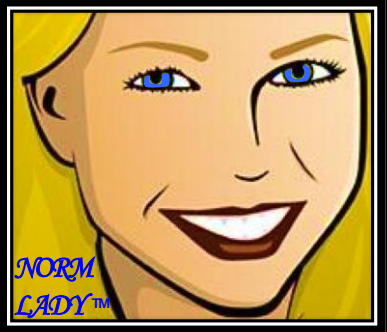


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