

Naturally Occurring Radioactive Material in North American Oilfields

A FACT SHEET FROM THE AMERICAN PETROLEUM INSTITUTE

Naturally Occurring Radioactive Material (NORM)

The acronym NORM is used to describe low-level, naturally occurring radioactive material. This radioactive material was created when the earth was formed. Our natural environment contains many naturally radioactive substances that emit low levels of radiation. Natural radioactivity is present in rocks and soils, in the air we breathe, in public water supplies and mineral waters. It is even in the foods we eat. These materials emit low-level radiation, but radiation at these levels does not present a health hazard to anyone. The total average background dose to each person from all natural radiation sources each year is approximately 300 millirem [a millirem is a unit of radiation dose].



NORM in the Oilfield

Radioactive materials, such as radium, may occur naturally in underground rock formations that also contain oil and gas. NORM that becomes concentrated in the production process may also be referred to as Technologically-Enhanced, or TENORM. NORM/TENORM (hereafter simply referred to as NORM) has been found in oil-water separators, pipes, tubing and other oilfield equipment. When it is found, it is typically found in the deposits (like sludges/scale/films) that sometimes accumulate on the inside of production piping and equipment.

Exposures to Oilfield NORM

Oilfield NORM does not generally create exposures to oilfield workers because it accumulates inside pipe and other equipment that usually remain at production sites or equipment yards that are not open to the public. The pipe and equipment themselves are usually sufficient to shield anyone nearby from any radioactive hazard. Typically, such equipment is stored and cleaned only at facilities subject to licensing standards that strictly limit access. The practices followed at these cleaning facilities are designed to protect workers and the public from possible exposures.

Protection of the Public from Oilfield NORM

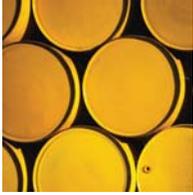
Generally speaking, NORM located inside pipe and equipment does not pose a risk to the public at large or even those who work in close proximity to the pipe and equipment.



The oil and gas industry, like any industry that generates NORM as part of its routine production operations, is subject to general radiation standards issued by federal and/or state agencies, such as state health departments that also regulate medical and other uses of radiation. Regulations of those agencies follow Environmental Protection Agency guidance on radiation protection of the public.

(continued on back)

Other provisions to limit exposures to the public include licensing requirements for facilities handling equipment and materials with NORM concentrations over a certain level, and waste management requirements.



One of the most effective ways to protect the public from oilfield NORM is the proper management and disposal of equipment containing NORM and other NORM waste. Many major oil and gas

producing states, including Texas and Louisiana, have adopted standards and procedures for handling oilfield NORM ensuring that it is disposed of safely and efficiently.

Protection of Oilfield Workers from NORM

NORM contained in pipe and other equipment normally does not create a hazard for oilfield workers. However, when pipe is cleaned or equipment is opened, certain precautions are taken to ensure the safety of workers. Regulations of the Occupational Health and Safety Administration (OSHA) require all employers to evaluate radiation hazards and post caution signs where radiation doses could exceed 5 millirem in one hour or 100 millirem in any five consecutive days. Generally, the radiation levels found in oil and gas operations produce radiation doses that are well below these limits.

The petroleum industry protects oilfield workers when working with oilfield NORM through traditional safety practices and work procedures, which may include:

- Flushing separators and other production equipment before cleaning them.
- Using self-contained breathing apparatus or other appropriate respirators and goggles while working inside equipment.
- Using dust respirators and goggles while performing small scale grinding and chipping operations.
- Using wet processes for large scale cleaning of equipment to minimize dust.
- Using protective clothing.
- Avoiding eating, drinking or smoking around open equipment or uncontained NORM.

NORM in Pipe and Equipment that Requires Special Handling

Identification of equipment containing NORM is a relatively simple process that takes place in the oilfield. Trained operators use portable radiation measurement instruments to measure radiation emitted by NORM. Because any location will have natural background radiation, the surveyor first measures background radiation levels in a nearby area. Radiation measurements are then made close to the external surface of equipment to determine if there are any elevated levels of radiation. Measurements are made at areas where NORM solids may accumulate, such as at pipe elbows and tank bottoms/separators, exchangers etc. Operators typically survey field equipment when operations change in ways that could cause or increase the amount of NORM in the pipe or equipment. Equipment is also surveyed when it is taken out of service. When operators measure NORM at levels over the action level set by state NORM regulations, they follow applicable rules and regulations for labeling the equipment to ensure that it receives special handling when it is to be taken out of service.

“The Bottom Line”

NORM is a naturally occurring material that is all around us and may also be present at oilfield sites in varying amounts. With proper detection, measurement, along with the use of appropriate work practices, the potential risks from oilfield NORM to oilfield workers and the public can be effectively managed to ensure their safety and health.



API[®]

American Petroleum Institute

1220 L Street, NW
Washington, DC
20005-4070

202-682-8000

www.api.org

Copyright 2004 – American Petroleum Institute. All rights reserved. API and the API logo are either trademarks or registered trademarks of the American Petroleum Institute in the United States and/or other countries.

Printed in the U.S.A. | API Creative Services | 24022 | 03.04