

The *NORM* Report

Naturally Occurring Radioactive Material Contamination WINTER 1997

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Regulations for the Control of NORM - Update

The status of regulations for the control of NORM is summarized below for all 50 states. Since NORM contamination is not limited to the petroleum industry, some of the non-petroleum states are also drafting or preparing to draft NORM regulations to control NORM in other industries, e.g., mineral extraction and phosphates. The status of NORM regulations in the federal government as well as in Canada is also summarized below. Each regulatory agency was contacted during February.

The last states to enact NORM regulations were New Mexico and South Carolina. Their regulations were summarized in the Summer 1995 issue of **The NORM Report**. Louisiana, Mississippi, Arkansas, Texas and Georgia have previously enacted regulations for the control of NORM. Oregon enacted regulations in January 1990. Although the Oregon regulations were specifically written for control of NORM in zircon sand, the Oregon regulations do apply to all NORM contamination in the state. The Oregon regulations were summarized in the Winter 1996 issue of **The NORM Report**.

There currently are no federal regulations specifically for the control of NORM.

Enactment of regulations specifically for the control of NORM will require compliance by industries and companies with NORM contamination and NORM waste materials. Companies should also be in compliance with state general regulations for the control of radiation and the OSHA radiation regulations.

Summaries of the status of NORM regulation in all 50 states, the federal government and Canada follow:

ALABAMA

Alabama is waiting for the CRCPD recommendations for the control of NORM before finalizing their redraft of Alabama's proposed NORM regulations. There is no timetable for the regulations to be adopted. There has been some interest in plugging and abandoning wells, but there have been no requests for NORM regulations from industry.

ALASKA

Alaska intends to use the CRCPD recommendations as enacted by

other states as a basis for their regulations. A paralegal working with health physicists has been assigned to draft the regulations. The draft will then be available for comments. The regulations do not have to be approved by the state legislature, but the legislature has to approve the collection of fees to support the program.

ARIZONA

All radioactive materials, which would include NORM, are

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ARIZONA (continued) addressed in Arizona's general radiation regulations. At present, NORM is not specifically addressed, but consideration is being given to enacting NORM regulations at a later date, possibly late in 1997.

ARKANSAS

The revisions to the Arkansas NORM regulations have been completed and certified. They will become effective as soon as they are printed and available, probably in two or three months.

The Arkansas NORM regulations constitute *Section 7* of the *Arkansas Rules and Regulations for Control of Sources of Ionizing Radiation*. The revised regulations were summarized in the last issue (Fall 96) of *The NORM Report*.

CALIFORNIA

In 1987, the California oil and gas industry conducted a statewide survey of production facilities to determine the extent of elevated levels of Naturally Occurring Radioactive Material (NORM), if any. The industry survey consisted predominantly of external gamma radiation meter readings. Of the 10,000 measurements taken, about 93 percent were at background levels. The remaining readings were above background levels, but low enough that only routine safety measures were considered necessary to minimize employee exposure and protect human health and the environment.

In 1993, California underwent a peer review of its oil and gas exploration and production waste-management regulatory programs. The review was coordinated by the Interstate Oil and Gas Compact Commission (IOGCC), in cooperation with the U.S. Environmental Protection Agency and other inter-

ested groups. One recommendation of the review team was for a thorough evaluation of the industry NORM survey data by the appropriate State agencies to verify the extent of oil and gas field NORM in California.

Subsequent to the IOGCC peer review, and following increased public and governmental interest in NORM issues, the Department of Conservation, Division of Oil, Gas, and Geothermal Resources and the Department of Health Services, Radiological Health Branch (RHB) conducted a more comprehensive survey of selected sites. This effort was in cooperation with the oil and gas industry. The sites chosen for the study were selected because they were points where NORM was expected to occur; the sites were not selected randomly.

All six oil and gas districts in the State were sampled in this study. Four hundred seventy-five radiation measurements were taken in 70 oil and gas fields. In addition to gamma radiation meter readings, 124 samples of pipe scale, produced water, tank bottoms, and soil were collected and analyzed by the Sanitation and Radiation Laboratory of the Department of Health Services to assess the actual concentrations and radionuclides present.

The results of this study indicate that NORM is not a serious problem in California oil and gas producing operations -- confirming findings in the 1987 study. Seventy-eight percent of the measurements in this study were at background levels. A few sites had elevated levels of NORM. Further study of those sites or facilities should be considered. Routine protective measures may be all that is necessary to minimize exposure to radiation in these particular areas.

Survey results and laboratory analysis of samples are reported in: *A Study of NORM Associated with Oil and Gas Production Operations in California*. The report was issued by:

Department of Health Services
Radiological Health Branch
and
Department of Conservation
Division of Oil, Gas and
Geothermal Resources

Elevated levels of NORM were found in material from some of the production facilities. The NORM was found in water filters and softeners, gas processing equipment pipe scale, and tank bottoms. However, these elevated levels were not high enough to be of immediate health concern.

Copies of the report are available from:

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A summary of the report recommendation was included in the Fall 96 issue of *The NORM Report*.

There is nothing new in the possible development of NORM regulations in California.

COLORADO

Senate Bill 97-154 has been introduced into the Colorado General Assembly. The bill, *Controlling Regulation of Radioactive Material*, is summarized below:

(Note: This summary applies to the bill as introduced and does not
(Continued on page 3)

COLORADO (continued)
necessarily reflect any amendments which may be subsequently adopted.)

Senate Bill 97-154

Modifies the definition of "low-level waste" in the Rocky Mountain Low-level Radioactive Waste Compact and implementing statutes to exclude:

- Wastes derived from mining, milling, smelting, and other processing of ore and mineral-bearing material to obtain radium, in addition to wastes derived from such activities intended to obtain other materials; and
- Naturally occurring radioactive material.

Modifies the definition of "radioactive material" for the purposes of radiation control to exclude naturally occurring radioactive material with an activity level of less than 50 picocuries per gram.

Provides that the requirement that sites for the concentration, storage, or disposal of radioactive material, and all radioactive material received at such sites, be owned by the state does not apply to the following material:

- Radioactive material with an activity level of 2,000 picocuries per gram; and
- Naturally occurring radioactive material.

Directs the Department of Public Health and Environment to impose deed restrictions, easement provisions, and financial assurance mechanisms on any non-state owned site and facility for the storage or disposal of radioactive materials.

Allows the Department of Public Health and Environment and the governing body of the county or municipality having jurisdiction to approve the disposal of naturally occurring radioactive material prior to the adoption of rules on such subject by the state board of health.

Allows the disposal of radioactive materials, materials contaminated by radioactive substances, or naturally occurring radioactive material in a solid wastes disposal site and facility only if the certificate of designation specifically allows such disposal or if the Department of Public Health and Environment and the governing body of the county or municipality having jurisdiction approves such disposal on a case-by-case basis, rather than only if the site or facility is specifically designated for that purpose.

In the litigation between Envirocare of Utah and the State of Colorado and the EPA (see the Spring 96 and Summer 96 issues of **The NORM Report** for a summary of the litigation), Envirocare lost in District Court and is now appealing.

CONNECTICUT

The Connecticut Department of Environmental Protection (DEP) has prepared a proposal to have a contractor draft proposed regulations for the control of low level radioactive wastes, including NORM and NARM. The proposal is currently undergoing review within the DEP.

DELAWARE

There are no specific regulations for NORM in Delaware. NORM, NARM and other radioactive materials are considered to be covered in the general regulations for the control of radiation enacted in 1983. A revision of the general regulations became effective

September 1, 1995. The revision tightened the compliance aspect of the regulations. NORM is considered to be covered in *Sections C and D, Radioactive Materials*, in the regulations. NORM contamination appears to be minimal in the state. Occasionally a call is received from a salvage yard or steel mill reporting that their gamma radiation monitors had detected gamma radiation above background on a load of scrap metal.

FLORIDA

The 18 month study of phosphate NORM, funded by the Florida Institute of Phosphate Research at the state's request, began in July 1996. The study's goal is to identify and evaluate the extent of occupational and public radiation exposure risks related to phosphate NORM. The Institute, located in Bartow and affiliated with the University of South Florida, selected the Polk County Public Health Unit and a private consulting firm to conduct the study as a joint project. Florida hopes the data provided by the study will provide guidance on the extent of regulator intervention needed to address phosphate NORM in the state.

In an on-going effort to improve the characterization of NORM in Florida, state personnel have been conducting informal site surveys of NORM generators. Surveys of fields located in the Panhandle and southwest part of the state remain in the planning stage.

GEORGIA

Georgia's regulations for the control of NORM became effective in October 1994. There have been changes in the rules since. Revisions to the general rules and regulations for the control of radiation have been drafted and are expected to be adopted by the

(Continued on page 4)

GEORGIA (continued)
Board in early 1997. However, there are no changes in the NORM rules in this revision.

HAWAII
Hawaii has drafted revisions to their antiquated rules for the control of radiation. The informational phase of the proposed rules on radiation control (which includes NORM) began in February 1997. All entities who are affected by the proposal will have the opportunity to submit written comments. The rule is not expected to be in place before July, 1998.

Hawaii does not have any particular problems with NORM at this time. Although Hawaii does not have petroleum production, it does have geothermal wells on the big island. Possible NORM contamination in these geothermal wells has not been addressed.

There is also some concern about radioactivity and radiation contamination in the state's military posts and bases, including old radium gauges and instruments. Additionally, there may be some NORM associated with the dry dock activities in the state.

IDAHO
Idaho has no regulations for the control of NORM and none are planned for the near future. There has been no indication from the state legislature or anybody else concerning interest in the regulations. There are provisions in the general regulations for the control of radiation that can be used for NORM problems if the need arises.

ILLINOIS
Illinois's approach to NORM regulations is being reviewed to decide if general NORM regulations should be proposed. Or as an alternative, should rules be written to

address the NORM problems in selected industries where the potential exists for NORM contamination. No decision as to the approach to be proposed has been made yet. The Department of Nuclear Safety may go with the approach of identifying known NORM problems and writing specific rules for these problems. As new NORM problem areas are identified, new rules will be written to cover them. This approach may be preferable to generic rules which cover the whole world of NORM and results in too much unnecessary regulations without much benefit. This approach to NORM rule making is the result of reviewing the in-depth comments made on the 1994 CRCPD draft of Part N. There is no time schedule for NORM rule making in Illinois.

INDIANA
No new regulations for the control of NORM have been enacted or proposed in Indiana. There have been a few incidents involving NORM-contaminated materials in scrap yards, etc.

IOWA
At the present time Iowa has not done anything to specifically regulate NORM and has no timetable for action on rules and regulations.

There is a situation in Iowa that originally goes back to the 1950's at Ames Laboratory. The Bureau of Radiological Health recently released some land for unrestricted use, specifically for a soccer complex. A medical doctor in the area complained about the hazards of radioactive dust from the land, even though the background levels of radioactivity was essentially the same in the released land as the background radioactivity in the city itself. The 84-year old doctor is a pillar in the community, and has raised the concerns of some citi-

zens.

As of this date (2-18-97) the project is proceeding and the community should be using the soccer field this spring.

KANSAS
Regulations for the separate and specific control of NORM have not been proposed. Regulations for the control of all radioactive materials in Kansas implicitly include NORM. NORM problems that do arise are handled on a case-by-case basis taking into consideration radiation exposures to the public and workers.

Kansas regulators have been working closely with the scrap industry, but there is no indication of probable legislation concerning NORM issues.

KENTUCKY
The Kentucky Department of Environmental Protection continues to work on a satisfactory long term disposal site for NORM. In the meantime, remediation activities continue as weather and field conditions permit. Remediated materials are being stored in a temporary site pending the resolution of discussions on long term storage.

LOUISIANA
The DEQ has an application from an oil company for permission to dispose of their own NORM in an injection well. This is the first proposal for injection received by the new administration in Louisiana and it is not known what the Secretary of the DEQ will do. The issues have been outlined for him but there has been no decision yet. It is not known whether a general rule for injection will be enacted or if such requests will be decided on a case-by-case basis. If a company

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LOUISIANA (continued)

has a permit from the Department of Natural Resources and a license from the DEQ, the company could proceed with the injection of the NORM wastes. The oil company must conduct a public hearing before a license can be issued by the DEQ.

The DEQ is proposing some modifications to several chapters of the Radiation Protection Regulations, e.g., mammography, and radiography. A few suggestions have been submitted for revisions to the NORM rules, e.g., non-oil field NORM and adding a paragraph to Section 1412. Treatment, Transfer, and Disposal.

MAINE

Maine has general regulations for the control of radiation, but does not have specific NORM rules. Maine does have NORM - contaminated water treatment wastes. Many water supplies in Maine contain significant concentrations of radium and radon. Ion exchange resins used in water treatment can become "hot" with radium. Carbon filters used to remove radon from water become contaminated with the radon decay products, lead-210, bismuth-210, and polonium-210.

MARYLAND

Maryland has no specific regulations for the control of NORM. NORM is handled under the general radiation regulations. These general regulations were recently revised to bring the rules into line with 10 CFR 20 as well as making other changes deemed advisable. The revisions became effective October 9, 1995.

MASSACHUSETTS

Massachusetts does not have specific regulations for the control of NORM. NORM is a subset of

NARM and NORM is considered to be regulated in the Massachusetts general radiation regulations. The most recent revisions to the general radiation rules became effective in February 1996. NORM is not a major problem in the state.

Massachusetts has submitted a proposal to the NRC to become an Agreement State. The proposed agreement would permit Massachusetts to assume portions of the NRC's regulatory authority over certain nuclear materials. If the agreement is accepted, Massachusetts will become the 30th state to sign such an agreement with NRC.

MICHIGAN

There have been no changes in the draft of the Michigan guidance documents for the control of NORM.

Most attention at present is still focused on radium luminous products of military origin and radium contaminated warehouses. EPA has allotted over 12 million dollars toward the cleanup of the warehouses and other contaminated buildings. It is expected that after the removal of the gauges the building contamination will be small and much of the remaining debris might be able to be disposed of in a landfill under new landfill guidelines. The Michigan guidelines for disposal in a type 2 municipal solid waste landfill allow up to 50 pCi/gm radium-226 to be disposed. This can be a large cost saving. Analyses have shown that this level shows insignificant risk to the public.

The EPA superfund cleanup of the warehouses should begin at any time.

Michigan continues to find high

concentrations of NORM in pipe scale. Concentrations over 100,000 pCi/gm are commonly seen. The highest level seen has been 200,000 pCi/gm.

MINNESOTA

There has been no legislative action with regard to the disposal of radium and other NORM-type materials. Minnesota has no regulations for the specific control on NORM. The general regulations for the control of radiation are currently being revised. Specifically the revisions cover the regulations dealing with x-ray and other devices that may use NORM as a source of radiation. These revisions may be effective by the middle of 1997.

MISSISSIPPI

Responsibility for NORM in Mississippi is currently divided between the Department of Health and the Oil and Gas Board. The Oil and Gas Board has authority for NORM at the well site (effective July 1, 1995). After the petroleum leaves the well site the Department of Health has jurisdiction for any NORM contamination.

However, the Mississippi legislature has enacted legislation that gives the Oil and Gas Board jurisdiction over all oil and gas wastes. The Oil and Gas Board's NORM rules which became effective July 1, 1995 assumes jurisdiction only over NORM at the well site.

The Department of Health has asked the Attorney General for an opinion as to who will have jurisdiction for NORM in the future. This has been challenged in court by an attorney who has been very active in NORM litigation in the state. The Attorney General has stated he will not render his opinion until the court challenge is settled.

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MISSISSIPPI (continued)

It is expected that the Attorney General will find that the Oil and Gas Board has jurisdiction over all NORM associated with oil and gas production in Mississippi.

In the interim, the Department of Health continues to function. Licenses are still being processed for remediation contractors, etc. Complaints are being received by the Department of Health concerning health problems associated with exposures to NORM. However, very little is being done about the complaints since the Department of Health has been told they have no jurisdiction over NORM. The attorney for the Department of Health believes that any commercial remediation, etc. will still have to be licensed by the Department.

On August 11, 1995, the Oil and Gas Board issued a proposed **Rule 69: Control of Oil Field NORM**. The rule provides the regulations for the control of oil field NORM to ensure that radiation exposures of workers and members of the general public are negligible. The rule applies to NORM that has been derived from the exploration and production activities of oil and gas operations within Mississippi.

A public hearing on Rule 69 was to have been held in January 1996. This was postponed until March and at the request of attorneys on both sides of the issue, the hearing was again postponed until April 2-4, 1996. The changes made to the August 1995 draft were summarized in the Winter 96 issue of **The NORM Report**.

As of February 6, 1997, the Mississippi Department of Health's Part 801 Section N is still in effect. Section N is entitled *Licensing of Naturally Occurring Radioactive*

*Materials (NORM).***MISSOURI**

There are no specific NORM regulations in Missouri and none are planned at present. Occurrences of NORM problems are handled under the state's general regulations for the control of radiation.

MONTANA

There have been no new developments applicable to NORM regulations in Montana. The regulations for the control of radiation have not been revised since 1980 and NORM is not considered to be included in these general radiation regulations. The Montana Department of Health and Environmental Sciences does have the statutory authority for NORM regulations, but there is no funded program for their development.

NEBRASKA

There has been no change in the status of NORM regulations in Nebraska. The state believes NORM is included in their general rules for the control of radiation. There are no plans for specific NORM regulations at this time.

Like many other states, Nebraska receives comments and questions from recyclers. Some of these recyclers have "requested" NORM rules so they can use NORM limits, e.g., 50 $\mu\text{rem/hr}$, to know when they can refuse or accept contaminated scrap.

In another incident which illustrates the public's fear of anything radioactive, a transient broke into a storeroom and broke a 500 gram bottle of uranyl acetate. A hazmat team went in with full protective gear, respirators, etc. to clean it up. The incident was the lead story on three television stations on the five o'clock news. Some people were near panic until the authorities

were able to get on the ten o'clock news reporting there was no health hazard. It was only very low-level radiation and nothing to worry about.

NEVADA

Nevada has no specific NORM regulations and none have been proposed. Comprehensive statutes for the control of radiation address NORM and NARM similarly.

NEW HAMPSHIRE

New Hampshire considers NORM to be a subset of NARM and the state has always regulated NARM in the same manner as by-product, source, and special nuclear materials are regulated as an Agreement State. One area that may not presently be regulated and may have to be is water treatment systems. There are significant quantities of radon in New Hampshire water supplies. Some water treatment facilities actually become quite "hot". Another potential NORM problem area is the inadvertent exposure to the radiation hazards associated with construction involving granite containing uranium and thorium.

Future regulatory activities may consider the need to adopt regulations similar to the draft of Part N of the Conference of Radiation Control Program Directors, Inc. (CRCPD), and the specific NORM regulations which have been adopted by several states.

NEW JERSEY

The Bureau of Environmental Radiation continues to address the comments received on the interested party draft of N.J.A.C. 7:28-12, *Remediation Standards for Radioactive Mater*. There is no estimated schedule set for publication of the rule proposal in the New Jersey Register.

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NEW MEXICO

The New Mexico NORM regulations, *Subpart 14: Naturally Occurring Radioactive Materials (NORM) in the Oil and Gas Industry* became effective August 3, 1995.

Rule 714, Disposal and Transfer of Regulated NORM for Disposal provides the regulatory framework for the disposal options addressed in the Part 14 NORM regulations. Rule 714 became effective July 15, 1996. Rule 714 was summarized in the Summer 96 issue of **The NORM Report**.

Mexico is currently finalizing a guidance document for use with the NORM regulations.

New Mexico has received the first application for a specific license for NORM decontamination.

NEW YORK

New York State continues its gamma spectroscopy analysis of samples from oil and gas wells in the state. Samples include brines, crude oils, tank bottoms, oily sludges, sediments, soils, pipe scale, and paraffins. The results indicate relatively low levels of NORM constituents (<10 pCi/g) in a medium tested. Data processing continues and a final report will be issued in 1997.

NORTH CAROLINA

Nothing presently is being proposed on NORM regulations for North Carolina. The state recognizes that NORM is an issue that may need attention, but there are many other priorities, not the least of which is the low level waste disposal facility. North Carolina is the host state for the Southeast Compact.

The state is aware of NORM contamination within the state, particu-

larly in scrap metal yards. For the present, North Carolina is on the sidelines and is advocating a constructive relationship between the regulated community and the would-be regulations.

NORTH DAKOTA

North Dakota has just completed an IOGCC review of their handling of exploration and production wastes. They have received the draft report, and four different state agencies responded; three within the Health Department and one from the Industrial Commission.

All commented on the IOGCC initial report. The report should be finalized in May or June. There were no significant findings, but the report will include the handling of E&P NORM wastes.

The following is a little background on these IOGCC studies. Several years ago the EPA was considering drafting NORM regulations. In order to help EPA evaluate the need for NORM regulations, the Interstate Oil and Gas Compact Commission (IOGCC) put together a set of guidelines for the control of E&P wastes. Teams of people (in the North Dakota study, the team consisted of a DOE representative, an EPA representative, an industry representative, and two or three other state regulatory people) come into the state for several days and conduct a review of the state's E&P waste handling policies, including solid waste disposal, site reclamation, handling of NORM wastes, contaminated salvage equipment, control of produced water, etc. Based on that review, a report is prepared. The state can use the report as a guideline for implementing guidelines or regulating the handling of E&P wastes. At some point the EPA is expected to review the state reports to determine how adequately the states are

controlling E&P wastes. A number of state "inspections" have been completed with several left to review. The IOGCC review of North Dakota did recommend that the state develop specific NORM regulations. The state is waiting to review the new CRCPD draft before proceeding.

The state was approached in late 1996 by a company in North Dakota to look at adopting some specific E&P waste regulations. The state has taken the request under advisement.

OHIO

The state of Ohio has prepared and submitted to the Public Health Council for consideration rules governing the control of radioactive materials, including NARM (in Ohio, NARM includes NORM). These rules, under Chapter 3701-39 of the Administrative Code, govern the requirements for licensure for "persons who receive, possess, use, process, transfer, transport, store or commercially distribute NARM or products that contain NARM or are contaminated with NARM...". De minimus levels are provided for exemption from licensure under these rules.

Values of concentrations, amounts, or contaminations were derived from radionuclide values in Title 10 Code of Federal Regulations Parts 30.15, and 30.71 and from similar rules and regulations passed by other states where the licensure and control of NARM is a statutory requirement.

The rules submitted to the Public Health Council are not in a final form, but will serve to provide guidance to persons in the state of Ohio who use NARM. Work continues on the final version of the rules, however the values cited in

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