

The NORM Report

Naturally Occurring Radioactive Material Contamination Summer 96

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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 phosphorus. The status of NORM regulations in the federal government as well as in Canada is also summarized below. Each regulatory agency was contacted during the first two weeks of September 1996.

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 the control of NORM in zircon sands, 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 (see the letter to the editor on page 23 of this issue) and the OSHA radiation regulations.

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

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ALABAMA

Alabama is still redrafting their proposed NORM regulations. There is no timetable for the regulations to be adopted. There has been some interest in plugging wells, but there have been no request for NORM regulations.

ALASKA

Alaska's Department of Environmental Conservation is attempting to get funding for the

development of NORM regulations. They are hoping to get support from the petroleum industry so that they can go to the legislature for backing to hire one new temporary person to draft the regulations. The regulations are expected to be self-supporting (from fees, etc.) once they are enacted. Although not limited to the large petroleum companies operating in the state, NORM contamination

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ALASKA (continued)

problems are primarily associated with the large companies -- there are not many smaller independents in Alaska. Also, the industry is comparatively new in Alaska and they don't expect to have as many unremediated sites as are common in the oil production states in the lower 48. The major oil companies operating in the state are expected to cooperate with the Department of Environmental Conservation so that the resulting regulations are in a form that can be complied with at a minimum of cost and business disruptions.

ARIZONA

All radioactive materials, which would include NORM, are 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 in 1997.

ARKANSAS

The revisions to the Arkansas NORM regulations are presently being printed after the state legislature approved them. The Governor and the Director of Health must still sign off before the revised rules can become effective. They should be effective in about two months.

The revised NORM regulations are expected to be similar to the Louisiana rules. The exempt radiation dose is being changed from 25 microrem per hour above background to 50 microrem per hour including background. An important difference with the Louisiana rules is that Arkansas will not require NORM surveys. If available, the revised regulations will be summarized in the next issue of **The NORM Report**.

CALIFORNIA

The consensus report detailing the results from the survey of petroleum facilities for NORM contamination in California still has not been released to the general public. In addition to gamma radiation surveys, wastes, brines, soil and other appropriate samples were taken for laboratory analysis. The Health Department has approved the report for release. The Department of Conservation has not yet approved the report for publication.

COLORADO

There is no change in the status of NORM regulations in Colorado. NORM regulations are not expected to be enacted in the foreseeable future. The litigation between Envirocare of Utah and the Environmental Protection Agency concerning the disposal of radioactive waste which had been sent to a landfill in Colorado (See the Spring 96 issue of **The NORM Report**) is still active. Envirocare is currently trying to reach an out-of-court settlement.

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 1993. A revision of the general regulations became effective September 1, 1995. The revision tightened the compliance aspect of the regulations. NORM is consid-

ered 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 gate 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. 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 regulatory intervention needed to address phosphate NORM in the state.

The Florida Advisory Council on Radiation Protection's NORM Committee, formed in response to the state's request for recommendations on regulatory approaches to NORM, will report to the Council in October.

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 oil 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 no

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GEORGIA (continued)

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 Board in late 1996. However, there are no changes in the NORM rules in this revision.

HAWAII

Hawaii has no specific regulations for the control of NORM. The state has drafted revisions to their antiquated rules for the control of radiation. These rules which are expected to cover NORM are currently in the legal process. There is no timetable for finalization. They have been undergoing administrative review for over two years.

Hawaii doesn't 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 regu-

lations 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 those 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 latest (1994) CRCPD draft. 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

Iowa is reviewing the last Part N draft from the CRCPD. At the present time Iowa has not done anything on specifically regulating 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 citizens. The State is unsure as to how to proceed.

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.

KENTUCKY

The Kentucky Department of Environmental Protection is in discussions with Ashland Exploration to find a satisfactory long term disposal site for the NORM that needs to be remediated from the Martha Oil Field.

An article on the World Wide Web provides a little history of this NORM problem in Kentucky. The article by Terence Hamilton-Smith, Brandon C. Nuttal, and James A. Drahovzal is reproduced below in its entirety.

This project was initiated as a result of reported radioactivity associated with oil production in the Martha oil field in eastern Kentucky. Such associated radioactivity is referred to as NORM (Naturally Occurring Radioactive Materials) contamination. An interdisciplinary technical group was formed including representatives of the Kentucky Geological Survey, the Kentucky Department for Environmental Protection, the Kentucky Division of Oil and Gas, and the Kentucky Department for Health Services.

(Continued on page 4)

KENTUCKY (continued)

This committee met often in 1993 to evaluate the potential NORM hazard in the oil and gas fields of Kentucky.

Available data suggest that NORM contamination results from petroleum production in Kentucky. It is specifically associated with radium-bearing scale deposited in pipes, facilities, and pits resulting from brine production associated with oil, including both primary water production and waterflood stimulation. Gas and oil production without associated water is not expected to result in a NORM hazard. Results of NORM investigations to date have been presented at meetings in Kentucky sponsored by the University of Kentucky Department of Geological Sciences, the Kentucky Oil and Gas Association, and the Kentucky Geological Survey. Future work will depend on the initiative of the Kentucky Department for Health Services.

LOUISIANA

A proposal was received recently from a petrochemical company looking for a disposal site for non-oilfield NORM. They wanted a rules change which would allow this kind of waste to go to a Class D landfill. The DEQ is studying the proposal. Other states that allow the disposal of these wastes in landfills are being contacted to determine their policies. One state contacted said they were using the Environmental Protection Agency's document on "Guidance for Disposal of Water Filtration Waste". Such wastes often contain radium-226. If a rule change is deemed necessary, it may be possible to change Section 1412 of the Louisiana regulations to allow industrial sources of wastes containing NORM less than some concentration to be disposed of into

some classes of landfills.

The DEQ also 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 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 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.

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 NARM 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.

MICHIGAN

Effective April 1, 1996, the Radioactive Materials Program formerly in the Michigan Department of Health was transferred to the Michigan Department of Environmental Quality. Although Michigan has guidelines and standards for NORM contamination, there has been no progress on the development of regulations for the control of NORM.

For the past two years, the Michigan Department of Radiological Health in the Department of Public Health has been dealing with luminous aircraft dials of World War II vintage. These dials contain radium-226 and many of the gauges are in deteriorated condition and show excessive radium leakage. There are tens of thousands of these leaking gauges in various parts of Michigan.

The decontamination of the two large warehouses (see the Winter and Spring 1996 issues of *The NORM Report*) is expected to take place this fall with the assistance of the EPA and Superfund funds. Following the first stage of decontamination, there will still be additional contamination that will have to be assessed and remediated at a later date.

Recently there were some incidents involving radiation alarms being triggered at scrap metal yards. The radiation was apparently due to

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MICHIGAN (continued)

radium-226 in pipe scale. The tubulars were of the type normally used for well waters rather than in oil and gas production. The level of contamination was about 100,000 picocuries per gram, typical of scale seen in oil production pipe in Michigan. A supplier of such pipe admitted that although designed for water usage, some oil and gas companies may have used them. The investigation is continuing.

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 end of 1996.

MISSISSIPPI

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

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.

In the interim the Department of

Health continues to function as it has in regard to NORM. Licenses are still being processed for remediation contractors, etc. There have been no changes in the Department of Health NORM rules and none are expected unless the Attorney General "rules" that the Department of Health has no NORM jurisdiction. The Health Department's attorney believes that any commercial remediation, etc. will still have to be licensed by the Department of Health. Although the Department of Health appears to be doing less with NORM, complaints are still being received about health problems associated with NORM exposures.

Very little is being done about these complaints since the Department of Health has been told they have no jurisdiction according to state law. The legislature enacted legislation that the Oil and Gas Board has 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 wellsite. It is expected that the Attorney General's opinion will state that the Oil and Gas Board will have jurisdiction over all of the NORM associated with oil and gas production. The Department of Health remains in limbo until the Attorney General acts.

Copies of the NORM surveys submitted to the Oil and Gas Board have been made available to the Department of Health. Since many of the surveys appeared to be of questionable value, the NORM Report editor asked if Mississippi had a licensing or certification program for NORM surveyors. They do not. When the Health Department NORM regulations, Rule 68, were promulgated, a one-page guideline was made available to prospective surveyors. These

guidelines outlined a recommended 24-hour NORM survey course, mandated types of radiation survey instrumentation to be used, and methods of plotting data and units to be used. When potential surveyors submitted their resumes and were "approved", their names, addresses, etc. were added to a list which was made available to anyone needing a NORM survey. The Department added a disclaimer stating that they did not endorse any one on the list. The surveys coming from the Oil and Gas Board often contain the names of surveyors who are unknown to the Department of Health. (Editor's comment: It is obvious that any facility using an outside surveyor should check the surveyor's credentials carefully, especially since there is always the possibility of future litigation).

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 oilfield 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 the State of Mississippi

A public hearing on Rule 69 was to have been held in January. 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 draft were summarized in the Winter 96 issue of **The NORM Report**.

Following the three-day public hearing, Rule 69 was adopted by the Oil and Gas Board with only a

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MISSISSIPPI (continued)

few minor technical changes. The ruling has been appealed but the rule is expected to be upheld. Oil and Gas Board rulings have been overturned only one time in the history of the Board. It could be two years before the results of the appeal are known.

Additional background on Rule 69 follows:

(1) Rule 69 passed by the Oil and Gas Board allows oil companies to use on-site storage of NORM. Under the rule, NORM, a byproduct of the drilling process, may be stored on site for as long as the site remains open, with oil companies having the option to apply for permission to use alternative methods of disposal if they show good cause for doing so.

(2) Rule 69 dictated new NORM disposal guidelines that could make at least that aspect of NORM handling a little easier. Before Rule 69, Mississippi producers had to send their NORM wastes to licensed NORM landfill sites as far away as Utah. Now, companies could bury NORM in leak-proof underground containers in old wells or other approved disposal sites that were dug and sealed off according to stringent regulations.

Rule 69 was designed to work in tandem with Rule 68 to eliminate or reduce to acceptable levels the exposure of workers at Mississippi's oil and gas production facilities. The rules also are designed to protect the public and the environment from NORM radiation derived from production activities. Essentially, Rule 69 states that any oil field exploration and production sites must be operated and, when the time comes, released for general use in a way that ensures that workers and the public receive no more than 100

millirem of radiation per year.

Under Rule 69, wells permitted by the Board before the effective date of Rule 69 would have to make property surveys within one year. Wells permitted after the effective date would have to have surveys done before the start of their operations, with another survey conducted in two more years. If a site's last survey recorded a maximum exposure rate of over 50 microR per hour above normal background radiation, that site would be re-surveyed every five years, while others would be re-surveyed once every 10 years. The operator will be required to maintain survey and material transfer reports in his local office for 10 years after the property is released.

Next, the rule's criteria for site operations require that site personnel be trained regarding radiation hazards and stay at or near contaminated sites only for short periods of time. Sites with radiation over a certain level must have warning signs and, in some cases, fences must be constructed.

Coupled with Rule 68, Rule 69 allows operators to apply for approval for alternative means of disposal such as drilling a NORM well or transporting it to another storage facility. The only difference is that the operator must now survey to make sure there are no NORM hotspots.

Finally, the rule also spells out procedures that may be used to bring the radiation levels of equipment and property under certain levels so that it can be transferred to another producer.

Rule 69 has been a source of confusion for some at the Department of Health's Division of Radiological Health as to which

sites would be regulated by them and which by the Board under the rule.

However, a law passed by the Mississippi Legislature in 1995 gives the Oil and Gas Board express jurisdiction over all oilfield sites. Under Rule 69, the only sites governed by Department of Health regulations would be those with any operations or operating site conditions that may cause people to receive a dose of over 100 millirem of radiation per year.

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. NORM is not considered to be included in the 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. Nebraska believes that NORM is included in their general regulations for the control of radiation. There are no plans for specific NORM regulations.

NEVADA

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

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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 ledge 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 which have been adopted by such states as Louisiana, Texas and Arkansas.

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 Materials*. There is no estimated schedule set for publication of the rule proposal in the New Jersey Register.

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.

A task force from the Oil Conservation Commission proposed a rule for the disposal options that were addressed in the Part 14 NORM regulations. On March 14, 1996, the Final Report

of the Task Force's proposed NORM disposal rule was submitted to the Chairman of the Commission. A background discussion of the proposed rule accompanied the report. Topics covered in the latter report were the New Mexico Environmental Improvement Board NORM regulations, the Task Force process in developing the rule, the jurisdiction of the Oil Conservation Division over NORM disposal and the rationale for the major provisions of the rule.

A public hearing was held before the Oil Conservation Commission of New Mexico on April 11, 1996 and on June 20, 1996 the Commission adopted Rule 714 for the disposal of naturally occurring radioactive material (NORM) associated with the oil and gas industry. Rule 714 became effective July 15, 1996.

Some of the history of the NORM regulations, the content of Rule 714, and the rationale for the report follow.

In August 1995, after more than four years of effort by representatives of the OCD, the New Mexico Environment Department, the oil and gas industry and environmental groups, NORM regulations were adopted by the Environmental Improvement Board (EIB). Only "Regulated NORM" is subject to the EIB NORM regulations. "Regulated NORM" is defined as NORM at concentrations of greater than 30 picocuries per gram of radium-226 above background, or NORM with a maximum radiation exposure reading at any accessible point greater than 50 microrentgens per hour, including background levels.

The EIB NORM regulations apply to any person who engages in the

extraction, transfer, transport, storage or disposal of NORM.

The regulations also apply to sludges and scale deposits in tubulars and equipment and to NORM deposits in soil, water and the environment.

Section 1407 of these EIB regulations, "*Disposal and Transfer of Regulated NORM for Disposal*," provides the regulatory framework for the NORM disposal rule. Several of the NORM disposal options discussed in that section require that disposal be pursuant to "applicable Division (OCD) rules and regulations." The Task Force examined each NORM disposal option in Section 1407 requiring OCD approval and presented testimony which addressed each disposal option:

1. Disposal of Regulated NORM On or Near the Surface of the Ground.
2. Blending or Discing Regulated NORM Contaminated Soils in Place
3. Disposal in Non-retrieved Flowlines and Pipelines
4. Disposal at Commercial or Centralized Facilities
5. Disposal in Plugged and Abandoned Wells
6. Disposal by Injection
7. Alternative Disposal Methods

NORM is not a hazardous waste regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA). 42 U.S.C. B 6901, et. seq. This conclusion is based upon legal analysis by the Task Force and confirmed by conversations with representatives of the U.S. Environmental Protection Agency.

NORM, as oilfield waste, is excluded from the definition of

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