

The NORM Report

Naturally Occurring Radioactive Material Contamination in the Petroleum Industry
Spring 1993

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Please accept my apologies for the lateness of this Spring 1993 issue of **The NORM Report**. It was delayed by health problems which are hopefully behind me now.

---- Peter Gray

P. Gray & Associates

Please call with your questions, comments or for information on advertising in **The NORM Report**. Phone (918) 250-6042.

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The NORM Report
is published quarterly by

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Regulations for the Control of NORM - Update

The status of regulations for the control of NORM is summarized below for 30 states, including 27 of the important petroleum producing states. 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 last week of June, 1993.

Texas has joined Louisiana, Mississippi, and Arkansas as states that have enacted regulations for the control of NORM. The Texas regulations, except for NORM disposal options, became effective July 1, 1993. Several other states, e.g., Colorado, Kentucky, New Jersey, New Mexico, Oklahoma and possibly Illinois may have NORM regulations by the end of 1993. Clearly the pace of state regulations for the control of NORM is accelerating.

Although most states and Canada do not now have specific NORM regulations, NORM contamination is nominally regulated by each state's general regulations for the Control of Regulation that usually require licensing for the possession, use, transfer, etc. of radioactive materials, including NORM. However, these general regulations are largely ignored for NORM in the petroleum industry. (In many of the regulations it is not clear how licenses can be obtained for NORM contaminations.) Enactment of regulations specifically for the control of NORM will require compliance by companies operating within the state, not only with the NORM regulations, but also with the general regulations for the control of radiation.

Although there currently are no federal regulations specifically for the control of NORM, it is becoming increasingly evident that some federal regulations are forthcoming -- probably enacted by the Environmental Protection Agency.

A summary of the status of NORM regulations in the individual states, the federal government, and Canada follows:

ALABAMA

Alabama has an internal draft of NORM regulations prepared that are similar to the Texas regulations. However, the draft is essentially inactive at present. There has been some preliminary surveying of oil and gas fields in an attempt to assess the seriousness of NORM contamination in the state. There is no timetable for the enactment of NORM regulations in Alabama.

ALASKA

There has been no progress on the development of NORM regulations, but the Director of Radiological Health Programs, Charles Tedford, is thinking very seriously about drafting regulations in the "near future". Tedford did observe a pipe descaling - injection operation on Alaska's North Slope recently and liked what he saw. It should be a good disposal option in the future. (Continued on Page 2)

ARKANSAS

Arkansas enacted regulations for the control of NORM on June 26, 1992. The Arkansas regulations basically follow the Conference of Radiation Control Program Directors (CRCPD) guidelines. It was necessary to have regulations for the control of regulations in place as part of the process to becoming a licensing state. The regulations are not specific to NORM contamination. Arkansas will address NORM-contaminated scale, etc. in a later revision. The revised regulations will be more specific and better applicable to NORM contamination in the petroleum industry. To date, the regulations have not been revised.

CALIFORNIA

There hasn't been much progress in California in the drafting of NORM regulations. The regulations are in the very early drafting stage. Other more "urgent" projects are taking priority! California will eventually have regulations for the control of NORM. In the interim, the general regulations for the control of radiation can be used when necessary. However, the NORM regulations, when enacted, will have the advantage of being more specific.

COLORADO

Colorado Senate Bill 93-126, "Concerning Regulation of Naturally Occurring Radioactive Material," which was signed into law on April 24, 1993, modifies the Colorado Radiation Control Act (radiation act) to require the Colorado State Board of Health to adopt NORM regulations prior to January 1, 1994. The Colorado Department of Health, Radiation Control Division (CDH-RCD), has the responsibility for drafting the proposed NORM regulations. It is anticipated that draft rules will be placed before the Board of Health in September 1993 with rulemaking to occur in November

1993.

Under the Radiation Act, CDH-RCD is to use model regulations developed by the Conference of Radiation Control Program Directors in developing regulations for Colorado. Since no model regulations have been adopted by the CRCPD, CDH-RCD is proposing to use regulations recently adopted by the State of Texas as a model. Because of differences in statutory authority between CDH-RCD and the Texas Department of Health, certain modifications in the Texas rules will be necessary.

Persons or companies who are interested in or may be affected by the Department's NORM rulemaking actions are invited to submit comments or proposed regulatory language. CDH-RCD has scheduled a public meeting on July 16, 1993 at 1:00 p.m. at the Glendale Community Center to discuss regulatory control of NORM in Colorado. CDH-RCD will provide a brief description of the Texas rules, the Colorado rulemaking process, and then lead an open discussion.

FLORIDA

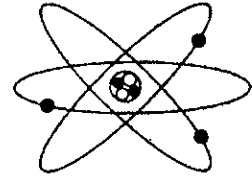
Florida is beginning to look at other states' regulations for the control of NORM, particularly trying to determine how these regulations would apply in Florida. Florida intends to start drafting their regulations in the near future

Florida's biggest NORM problem is in the phosphate industry, but they also have significant NORM contamination in the petroleum industry.

ILLINOIS

Illinois is working "full time" drafting regulations for the control of NORM. They anticipate publishing a draft of proposed rules and distributing them for comment by Fall 1993. It normally takes six

months to get a rule enacted. Illinois is proposing to use 5 pCi radium-226 per gram as the exempt concentration, but is still



discussing the use of 30 pCi/gram also. Illinois will probably not use the 5/30 pCi/gram exemptions as in the Texas regulations, but may exempt certain contamination, e.g., pipe scale, at the 30 pCi/gram concentration.

INDIANA

Indiana does not have regulations for the control of NORM. The status quo is being maintained. Changes have been made in Indiana's general radiation regulations, but not in areas affecting NORM contamination. There is no timetable for the state to address NORM.

KANSAS

Kansas is assembling an advisory committee to examine the issue of NORM contamination in Kansas. The committee will assess the magnitude of the problem and decide whether regulations or something else is needed. A NORM policy will be developed for Kansas.

KENTUCKY

The Radiation Control Branch has completed its technical review of the draft NORM regulations, and the draft awaits further action in the Department of Law of the Cabinet for Human Resources. The draft is being fine tuned and input will be encouraged from other agencies in Kentucky, for example, the environmental agencies. A meeting was held in the middle of June with the EPA to discuss how the regulations should be implemented. Immediate

(Continued on Page 3)

KENTUCKY (Continued)

NORM problems are being identified and addressed. Other NORM contaminated sites in the state will also be identified. It is planned to have the NORM regulations in place as soon as possible.

LOUISIANA

Although there have been many rumors there is nothing firm regarding changes in the Louisiana regulations for the control of NORM. However, there may be some changes towards the end of 1993. Compliance is being enforced for the regulations in affect.

MICHIGAN

Michigan has internal drafts of five NORM standards and two NORM guides. The standards in draft form are:

1. Radium exempt levels
2. Acceptable equipment contamination
3. Acceptable soil or land contamination
4. Disposal alternatives
5. Public dose limits

The two NORM guides are:

- N1. Screening survey
- N2. Detailed testing procedures to allow release for unrestricted use

There has been no action by the Michigan Department of Public Health on releasing these standards and guides.

Michigan's Department of Natural Resources has issued an agency order concerning P&A wells that may contain NORM. This agency order is not a regulation per se, but it has the effect of regulation. The order was issued in the fall of 1992.

A joint Michigan Department of Natural Resources -- Michigan Department of Public Health survey team looked at approximately 270 facilities serving approximately 1,000 oil and gas wells in 1990. The largest amount of waste containing radium

was found in sediment from the bottom of tanks on producing oil and gas leases. Results showed tank sediments had radium-226 concentrations up to 5,500 pCi/gram, while contaminated soil around tanks had radium-226 concentrations up to 2,100 pCi/g. Other preliminary field survey results include radiation exposure rates as high as 3,200 microrem per hour, while background rates typically ranged between 3 and 7 microrem per hour. Contaminated pipe scale contained radium in concentrations up to 160,000 pCi/g.

MISSISSIPPI

There has been no change in the Mississippi NORM regulations since they became effective in late 1992. Activity in this area is increasing, keeping the staff busy - there has been no increase in staff size. Applications are being received for decontaminating tubulars, land, etc.

MONTANA

There have been no new developments in Montana. The regulations for the control of radiation have not been revised since 1980. There are no specific regulations for NORM and NORM is not considered to be covered 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 at present.

NEBRASKA

The present status of NORM regulations in Nebraska is the same as previously reported. Nebraska believes that NORM is included in the current general regulations for the control of radiation. There are no plans for specific NORM regulations.

NEVADA

Several regulations are being adopted that relate to radiation safety, but nothing specific to NORM issues. For example, 10CFR20 is being incorporated in the radiation regulations..

NEW JERSEY

A meeting of all parties on the interested party draft regulations for the control of NORM was held recently. The many comments received are being studied and evaluated. The interested party draft precedes a draft proposal for formal NORM regulations. Environmental groups did not comment on the interested party draft -- so comments from them are being actively pursued. New Jersey believes the environmentalists are a key group to be contacted, especially before going to the proposal stage.

NEW MEXICO

A public meeting was held recently to discuss the draft regulations for the control of NORM. There was a good turnout at the meeting and good comments were received, many of which will be incorporated in the next draft of the regulations. Comments on the first draft are due by July 9. The next meeting of the NORM Committee will be July 19 with the NORM Regulation Task Force meeting August 3. New Mexico is in the process of amending all of the radiation protection regulations. The new NORM regulations will be Chapter 14 of the New Mexico Regulations for the Control of Radiation. It is hoped to have the NORM regulations in effect before the end of 1993.

NORTH DAKOTA

There has been no progress on enacting NORM regulations in North Dakota. Developments in other states are being closely watched. Exxon was recently given approval for the disposal of NORM wastes in a P & A well.

(Continued on page 4)

“To teach is to learn”

---- Japanese Proverb

NORTH DAKOTA (Continued)

The disposal took place May 4 after getting over several federal hurdles. North Dakota is looking at down hole disposal on a case-by-case basis.

Refinery tank bottoms were recently sent to the Synfuels plant at Beulah where the sludge was added to the coal as feedstock. For a two-month period, 50 tons of sludge was added to 18,000 tons of coal a day and gasified to natural gas. Previously these sludges were disposed of as waste and sent out of state for disposal. The sludge was analyzed and found to be free of NORM. This may be a disposal option for other refinery sludges.

OHIO

Ohio's Department of Health is waiting for legislation authorizing the Department to prepare regulations for the control of NORM. The Blue Ribbon Commission on Low Level Radioactive Wastes will submit their recommendations to the governor and the legislature in July, 1993. Ohio is also considering becoming a licensing state.

OKLAHOMA

The latest (final?) draft of *Subchapter 19, Licensing of Naturally Occurring Radioactive Materials (NORM)* was issued May 7, 1993. Oklahoma's Department of Environmental Quality (DEQ) came into being July 1, 1993. The DEQ will have responsibility for NORM regulations. The Radiation Management Council must meet and set a timetable for further action. The regulations could be effective before the end of 1993. The latest draft of the proposed regulations exempts soils and materials if they contain, or are contaminated at, concentrations of 30 pCi/gram or less of radium-226 or radium-228, averaged over 100 square meters and averaged over

the first 15 centimeters of soil below the surface. There is no reference to the radon emanation rate in the exempt radium-226 concentrations. Materials in the recycling process, including scale or residue not otherwise exempted, and other equipment containing NORM are exempt from the requirements of the rules if the maximum radiation exposure level does not exceed 50 microrentgens per hour including the background radiation level at an accessible point.

Each person subject to the general license in the regulations shall manage and dispose of wastes containing NORM:

1. by transfer of the wastes for disposal to a land disposal facility licensed by the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State;
2. in accordance with alternate methods authorized by the Department of Environmental Quality; or
3. by injection of fluids containing NORM from oil and gas production activities in a Class II Injection and disposal well, upon approval by the Corporation Commission of Oklahoma, provided the slurry can be pumped and the entrained solids are so fine-grained that they will not plug off the injection formation.

OREGON

Oregon has drafted NORM rules using the CRCPD guidelines. The draft won't be updated in the near term, but will be changed at sometime in the future.

PENNSYLVANIA

There are no specific regulations for the control of NORM. A study is beginning to determine if Pennsylvania should use different "numbers" than other states are using, e.g. in radium exempt levels.

SOUTH DAKOTA

South Dakota has regulations for the control of radiation, but nothing specific to NORM. There are no current plans for the development of NORM regulations.

TENNESSEE

NORM contamination in Tennessee is handled basically like any other radioactive material. If it is enhanced above background levels, they try to make an assessment as to whether it constitutes a problem or not. If it does, it is dealt with as they would any other radioactive material, i.e. by using their general regulation for the control of radiation. There are no specific regulations for the control of NORM and none are planned at present.

TEXAS

Texas Regulations for Control of Radiation (TRCR) *Part 46, "Licensing of Naturally Occurring Radioactive Material (NORM)* were adopted by the Board of Health in May, published in the Texas Register on June 1, 1993 and became effective July 1, 1993. The rule will be incorporated in the next change to the TRCR, which is scheduled for distribution in September 1993. These are regulations for handling and the possession of NORM and are under the jurisdiction of the Bureau of Radiation Control of the Texas Department of Health. See the article on the Texas NORM Regulations on page A of the newsletter for more discussion of the new NORM regulations.

House Bill 2623 was recently passed by the Texas Legislature. This bill defines NORM (See page B) and separates it from the definition of radioactive waste. Oil and gas NORM is defined as a separate subset of NORM. Jurisdiction for NORM disposal was transferred from the Texas
(Continued on page 5)

TEXAS (Continued)

Water Commission to the Texas Railroad Commission. The Railroad Commission now has the responsibility for the disposal of oil and gas NORM wastes as well as for oil and gas production. The Water Commission still has responsibility for other NORM wastes, e.g., the phosphate industry, water treatment NORM wastes, etc. This jurisdictional change takes place August 30, 1993. The Railroad Commission is required to adopt rules for the disposal of oil and gas NORM wastes by January 1, 1995. The Railroad Commission will begin formulating disposal regulations after August 30. Various disposal options will be considered, some of which have been discussed previously in the Department of Health and the Water Commission.

UTAH

NORM regulations are considered to be included in Utah's comprehensive radiation control regulations. A state license is required for anyone with material containing more than 15 pCi radium per gram of material.

WASHINGTON

Washington State continues to review the various state and federal guidelines related to the control and disposal of NORM. They have no state plan for enacting NORM regulations and are waiting for the CRCPD guidelines to be finalized before determining the appropriateness of adopting similar regulations.

WEST VIRGINIA

There are no specific regulations for the control of NORM in West Virginia. NORM is thought to be adequately covered by other regulations that require registration of facilities that own, possess, transfer, etc. NORM. There are no plans at present for the specific regulation of NORM.

WYOMING

Wyoming has no regulations for the control of NORM and none have been proposed at this time. There is a restriction on produced water. Produced water cannot be discharged if it contains more than 60 pCi radium per liter. Wyoming no longer has legislation which requires the registration of radioactive materials.

U. S. ENVIRONMENTAL PROTECTION AGENCY

The EPA has recently issued two reports on NORM. The first of these is a second draft of *Diffuse NORM Wastes - Waste Characterization and Preliminary Risk Assessment*. This report was issued in April 1993, and was distributed to EPA's Radiation Advisory Committee at its April 27 meeting. The report will be discussed at the July 19 meeting of the Radiation Advisory Committee. After the July meeting, the report will probably be revised before being submitted to the Radiation Advisory Board and the Administrator of the EPA with recommendations for action. As stated in the introduction to the report's Executive Summary -- "As with the earlier reports, the analyses presented here are only intended to help EPA decide whether regulations for diffuse NORM need to be developed. If EPA decides regulation is warranted, much more detailed and complete analyses will be developed and presented in a Background Information Document that will accompany proposed regulations."

The second report *A Preliminary Risk Assessment in Management and Disposal Options for Oil Field Wastes and Piping Contaminated with NORM in the State of Louisiana* was released at the end of March 1993. As stated in a memorandum accompanying the report, Margo Oge, Director of EPA

EPA's Office of Radiation and Indoor Air wrote --- "Although the EPA is not going to publicize this report, its release could result in some media attention, especially in light of the high risks found. The issues most likely to be raised regarding the release of this report are 1) individual cancer risks from some disposal scenarios are quite high, 2) why the Agency does not have a regulatory program that addresses NORM in the oil and gas industry, and 3) why the Agency hasn't issued radium clean-up standards. Our response to these questions is that, as this study exemplifies, we are in the fact gathering phase and decisions relative to the need for any regulatory effort would be premature."

EPA believes radon is one of the highest risk entities they are dealing with. Although the EPA "action level" for radon in homes and other inhabited structures is 4 pCi/liter, there isn't sufficiently good data available to support this concentration; i.e., it is not known if it should be 2 or 20 pCi/liter.

EPA's concerns about radon are directly relative to the radium exempt levels expected in any NORM regulations or standards proposed by EPA. EPA believes that radon emanation from NORM is the greatest hazard from NORM exposure.

Editorial: I believe there is at least a 90% probability that the EPA will issue regulations for the control of NORM within 2 to 5 years; if not for the "complete" control of NORM, certainly for some aspects such as the disposal of NORM wastes and other contaminated equipment, etc. Standards for the clean-up of contaminated soil and land are expected. At the very least, EPA standards will be necessary to provide adequate control over
(Continued on page 6)

EPA (Continued)

NORM contamination at federal facilities, since authority under state laws does not generally apply to those facilities.

The EPA has also prepared another draft Issues Paper on the *Environmental Protection Agency's Radiation Site Cleanup Regulations* (May 5, 1993 Draft). The Issues Paper was prepared to present issues, options, and preliminary analyses that are relevant to the development of radiation site cleanup regulations. The paper focuses solely on the development of cleanup regulations, which will establish criteria and procedures for cleaning up sites contaminated with radionuclides. The development of waste management regulations for the disposal of radioactive waste generated during site remediation is not discussed in the Issues Paper and will be pursued under a separate effort. The opening paragraph of the Introduction in the Issues Paper says --- "The total number of sites contaminated with radionuclides in the U.S. may be in the thousands. Across these sites, the contamination extends to all environmental media as well as to onsite buildings and equipment. Proper cleanup of these sites will be a massive undertaking, but is needed in order to protect human health and the environment from exposures to ionizing radiation."

U.S. MINERALS MANAGEMENT SERVICE

No new NORM regulations are being formulated at present. MMS is working on approving an application from ARCO for the injection of 2,000 barrels of NORM waste material sub-sea in Block 175. ARCO's program is somewhat different from the Shell injection program in late 1992. ARCO will mix the material offshore and inject downhole as they mix. It is anticipated they will

have better control at less cost. The program is expected to be approved in the near future.

NUCLEAR REGULATORY COMMISSION

The NRC has nothing new on NORM per se, but continues with enhanced participation in rule making. NRC has set up an electronic bulletin board to provide information and accept public comments about the Enhanced Participatory Rulemaking process. This bulletin board will provide updated information about ongoing events, access to related files of information, and allow anyone to provide comments on the rulemaking directly to the NRC. Federal Register notices, background information, meeting notices, etc. associated with the rulemaking process will be available. Questions about the bulletin board can be answered by calling (301)492-3999 or (301)492-3790 weekdays, between 10:00 a.m. and 3:00 p.m.

ATOMIC ENERGY CONTROL BOARD OF CANADA

Although there appears to be significant NORM contamination in Canada, e.g., scrap yards require gate monitors, etc. to prevent NORM contaminated material from being accepted, the federal government probably won't propose regulations for the control of NORM. NORM control is being left to the provincial governments.

ALBERTA, BRITISH COLUMBIA, AND SASKATCHEWAN

These three western provinces have jointly formed a committee of government and industrial representatives to develop guidelines for the control of NORM. Six guidelines are being drafted:

1. Overview of NORM issues
2. Transportation
3. Worker protection

4. NORM management (NORM wastes, disposal options, etc.)
5. NORM monitoring and instrumentation
6. Classifications of NORM

The guidelines are still being developed by the committee who met recently. It is hoped to get the second drafts completed in the fall of 1993 and at that time public reviews of the guidelines are planned.

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS (CRCPD)

The CRCPD is not a regulatory agency, per se, but they are developing guidelines to be used by the states in the development of regulations for the control of NORM. *Part N - Regulation and Licensing of Naturally Occurring Radioactive Materials (NORM)* has gone through seven drafts to date and has not yet been approved by the Directors of CRCPD. *Notes on Radiation Instrument Calibration and Radiochemical Analysis Facilities* provides references to publications, electronic bulletin boards and contact persons for current information on instrument calibration and radioassay facilities and their accreditation. The notes are available without charge from CRCPD.

The Institute of Scrap Recycling Industries, Inc. (ISRI) recently published *Radioactivity in the Scrap Recycling Process. Recommended Practice and Procedure*. The CRCPD Committee on Scrap Metal Contamination made substantial contributions to this booklet, and several CRCPD products and services are cited. Copies of the document are available at \$10 each by calling 202/466-4050. ■

NORM contamination must be respected, but not feared.

Stan A. Huber Consultants, Inc. (SAHCI)

Stan A. Huber Consultants, Inc. (SAHCI) has specialized for 25 years in providing full health physics support services to industrial facilities that use or may be contaminated with radioactive materials or NORM. We offer a full range of professional services including, but not limited to:

1. Providing professionally recognized radiological surveys of materials and facilities to define the true scope of any NORM contamination that may exist.
2. Preparing or assisting with licensing, permits, and regulatory compliance needs and documentation.
3. Providing health physics services, such as:
 - a. Decontamination/decommissioning projects. Termination of licensed facilities require that a close-out radiation survey be made to ensure that the facility is free of NORM contamination and can be released for unrestricted use.
 - b. Certified calibration of NORM survey meters (required by regulations to be done every 6 or 12 months).
 - c. Soil and water analyses.
 - d. Routine radiation surveys.
 - e. Radiation safety programs.
4. Drum or container packaging and transport arrangements (including manifesting, labeling, load preparation, etc.) can be done for each shipment of NORM wastes.
5. Providing on-the-job training for your personnel to assume the radiation survey requirements and the shipping functions for continuing NORM disposal projects.
6. Coordinating decontamination projects and acting as liaison between waste removal personnel, facility management, and regulatory agencies.

We can provide references of previous projects.

If any of these services are of interest, or if you would like a no-obligation discussion or additional information, please contact our office by phone (815/485-6161), FAX (815/485-4433), or by letter to:

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Advertisement

Naturally Occurring Radioactive Materials in the Oilfield: Changing the NORM by James R. Cox

The following was taken from an article published in the Tulane Law Review, Volume 67, Number 4, March 1993, pages 1197-1230. The article discusses the recently settled Street vs. Chevron suit in which Chevron and Shell were sued by Street Inc. the owners of an oilfield pipe cleaning facility near Laurel, Mississippi. Street alleged that Street and its employees suffered personal injury and property damages as a result of defendants' failure to warn Street of the presence of NORM on its tubing and of the dangers associated with the cleaning and milling of NORM-contaminated equipment.

The claims by Street are apparently the first of their kind to allege damages as a result of exposure to oilfield NORM. Nevertheless, the absence of clear and consistent regulatory guidelines --- coupled with the petroleum industry's failure to establish procedures designed to protect workers and the public from NORM exposure --- makes a proliferation of such tort claims likely. This paper by Cox will first attempt to provide helpful scientific background material regarding the possible modes of exposure to NORM and the nature and probability of resulting health effects. It will then explore current regulatory efforts

to control and monitor exposure to NORM. Finally, this paper will discuss the tort issues that arose in Street and that are likely to arise in future cases. (This paragraph is from the Introduction to the paper.)

(The following is from the Conclusions of the paper.) Consideration of the facts in Street v. Chevron in the context of the still-existing regulatory void that gave rise to the action has enormous implications for the petroleum industry, regulators, and the increasingly environmentally conscious public. This is because the
 (Continued on page 8)

NORM in the Oilfield: Changing the NORM

(Continued)

The factual record that weighs so heavily in favor of a finding of negligence on the part of Chevron substantiates arguments that (1) the entire oil and gas industry has had notice of NORM phenomena for some time; (2) essentially all in-service oilfield production and refining equipment has the potential to accumulate NORM deposits; and (3) the existence of NORM is sufficiently widespread to demonstrate that industry procedures have been and remain grossly inadequate.

In all likelihood, Street and its progeny will focus considerable public attention on NORM issues. This attention will, I hope, pressure states to enact regulations designed to prevent such occurrences in the future. Nevertheless, an equal likelihood exists that the past decades of unregulated NORM disposal practices have already created many contaminated facilities such as those belonging to Street, Inc., and that numerous oilfield workers and employees of salvage contractors have already suffered exposure to potentially damaging quantities of NORM. Clearly,

there is no reason to delay further the enactment of state regulations designed to address NORM issues. Alternatively, by redefining the scope of existing federal regulations, such as the NRC and RCRA provisions, consistent and enforceable measures for the detection, monitoring, safe handling and disposal of NORM could be ensured. Until federal regulators become involved or state regulatory proposals are enacted into law, the proliferation of tort claims such as those arising in Street remains a virtual certainty.

James R. Cox, a recent graduate of Tulane Law School, participated actively in the trial of Street v. Chevron USA, Inc.

Copies of the Tulane Law Review are available from:

Business Director
Tulane Law Review
Tulane University Station
New Orleans, Louisiana 70118

“When a bureaucracy such as the EPA depends upon environmental risks to justify its budget, it is natural for it to exaggerate the risks, as for example, from radon.”

NORM Cleaning and Disposal in Alaska

An integrated NORM cleaning processing and disposal operation was commissioned in May 1993. The facility for tubular cleaning is located at the Tuboscope Vetco International (TVI) plant in Prudhoe Bay, Alaska. The facility is owned and operated by Central Environmental, Inc. (CEI). This single source service removes both internal and external NORM scale from oilfield tubulars in a fully contained system. The removed NORM is particle sized reduced, the cleaning fluid is partially recovered and the NORM slurry transferred to the CEI injection skid where it is injected into the class II well which has been permitted for NORM disposal. The first 3,000 joints are now being cleaned and the NORM slurry treatment unit has achieved a particle size reduction with 97% less than 80 mesh. NORM is injected from the CEI injection skid to the Class II wellhead where it is co-mingled with other Class II materials being injected. The system design is modular and portable. No solid wastes are produced; all contamination is injected downhole.

An open day for oil company and government agency personnel was held on June 10. Some 24 persons participated in the visit to the CEI NORM facility in Deadhorse, Alaska. Visitors were also shown a number of new innovations to oilfield waste treatment and disposal technology being jointly developed by ARCO/BPX. A fully recovered revegetated drill site was also examined with minimum disturbances to the now prolific wild life in the local area.

Accumulations of NORM

Many newer wells which are operated by the major oil companies have chemicals added to their produced fluids on a regular basis to retard any precipitate formation and, thus, are apparently (based on survey measurements) not accumulating significant amounts of radioactive precipitate or sediments in their tanks. This is an indication that it may be possible to decrease the rate of radium solid accumulation through the use of chemicals. A factor which makes it more difficult to interpret which fluids and which wells, in particular, have accumulated precipitates containing radium is that, in some of the older fields, the tanks have been replaced since the well was placed into production and have often had sediments removed.

Texas Regulations for the Control of NORM

Part 46, Licensing of Naturally Occurring Radioactive Material (NORM) of the Texas Regulations for Control of Radiation (TCRC) was adopted and published in the Texas Register on June 1, 1993 and became effective July 1, 1993.

These regulations are for the handling and the possession of NORM and are under the jurisdiction of the Bureau of Radiation Control of the Texas Department of Health. Jurisdiction for the disposal of NORM wastes was transferred to the Texas Railroad Commission who will be responsible for drafting NORM disposal regulations.

Some of the pertinent parts of the regulations are given below:

NORM are exempt from the Part 46 regulations if the materials contain, or are contaminated at, concentrations of:

1. 30 pCi/g or less of technologically enhanced radium-226 or radium-228 in soil, averaged over any 100 square meters and averaged over the first 15 cm of soil below the surface, provided the radon emanation rate is less than 20 pCi per square meter per second,
2. 30 pCi/g or less of technologically enhanced radium-226 or radium-228 in media other than soil, provided the radon emanation rate is less than 20 pCi per square meter per second; or
3. 5 pCi/g or less of technologically enhanced radium-226 or radium-228 in soil, averaged over any 100 square meters and averaged over the first 15 cm of soil below the surface, in which the radon emanation rate is equal to or greater than 20 pCi per square meter per second,
4. 5 pCi/g or less of technologically enhanced radium-226 or radium-228 in media other than soil, in which the radon emanation rate is equal to or greater than 20 pCi per square meter per second; or
5. 150 pCi or less per gram of any other NORM radionuclide in soil, averaged over any 100 square meters and averaged over the first 15 cm of soil below the surface, provided that these concentrations are not exceeded at any time,
6. 150 pCi or less per gram of any other NORM radionuclide in media other than soil, provided that these concentrations are not exceeded at any time; or
7. Materials in the recycling process contaminated with scale or residue not otherwise exempted, and other equipment containing NORM are exempt from the requirements of these rules if the maximum radiation exposure level does not exceed 50 microroentgens per hour including the background radiation level at any accessible point.

The possession, storage, use, transportation, and commercial distribution of natural gas and natural gas products and of crude oil and crude oil products containing NORM are exempt from the requirements of these rules. The processing of natural gas and crude oil and the manufacture of natural gas products and crude oil products containing NORM are subject to the general license requirements.

Possession of produced waters from crude oil and natural gas production are exempt from the requirements of these rules if the produced waters are reinjected in a well approved by the authorized agency or if the produced waters are discharged under the authority of the authorized agency.

Facilities contaminated with NORM in excess of levels set forth in

Appendix 46-A and equipment not otherwise exempted shall not be released for unrestricted use. The decontamination of equipment, facilities, and land shall be performed only by persons specifically licensed by the Agency or another licensing state to conduct such work, including contractors of a general licensee, except that a general licensee or a contractor under the control and supervision of a general licensee can perform routine maintenance on equipment, facilities, and land owned or controlled by the general licensee.

The handling or processing by a general licensee of NORM-contaminated materials not otherwise exempted from these rules for the purpose of recycling is authorized by the Agency if the radiation level 18 inches from the NORM-contaminated material does not exceed 2 millirem per hour.

Each person subject to these NORM regulations shall conduct operations in compliance with the standards for radiation protection established Texas Regulations for the Control of Radiation.

Regulations which must be complied with before selling, abandoning, etc, NORM-contaminated facilities, land, equipment, etc, are also included in Part 46.

Copies of Part 46 Licensing of Naturally Occurring Radioactive Material (NORM) are available from:

Cynthia Cardwell, Administrator
Standards Branch
Division of Licensing, Registration
and Standards
Bureau of Radiation Control
1100 West 49th Street
Austin, TX 78756-7111
(512) 834-6688

NORM Training Course Offered by OGCI

OGCI (Oil & Gas Consultants International, Inc.), a world leader in petroleum training, has scheduled training courses in NORM control for 1993. The course *NORM Contamination in the Petroleum Industry* will cover all aspects of NORM contamination and its control, including:

- Fundamentals of Radiation
- Fundamentals of NORM
- NORM (Radium) Contamination
- NORM (Radon) Contamination
- State and Federal Regulations
- NORM Surveys including hands-on practice
- Maintenance Procedures
- Disposal of NORM Wastes
- Decontaminations
- Release of Facilities
- Recommended Programs

This in-depth course is taught by Peter Gray who has a background in nuclear and radiochemistry and 25 years experience in the petroleum industry. Dr. Gray has a Ph.D. in Nuclear Chemistry from the University of California at Berkeley. He took early retirement from Phillips Petroleum Company in 1985 after 25 years with the company. Since 1985, Dr. Gray has been a consultant in NORM contamination in the petroleum industry. During his tenure with Phillips, Dr. Gray was in charge of the company's NORM control program from the discovery of NORM contamination in natural gas and natural gas liquids in 1971 until his retirement in 1985. This background uniquely qualifies Dr. Gray as an instructor of the course -- an instructor who understands the origins of NORM, why it contaminates nearly every oil and gas facility, where the contamination occurs, how to set up programs which protect employees, company facilities, the environment and the public, how to survey for NORM contamination, the available options for the disposal of NORM contaminated wastes, and the federal and state regulations for the control of NORM. The course meets all requirements for Radiation Safety Officer training as outlined by Louisiana's DEQ.

The remaining 1993 schedule for the course *NORM Contamination in the Petroleum Industry* is:

Nov 2 - 5	Dallas
Nov 16 - 19	Calgary

In-house courses can be arranged by contacting Joseph Goetz at OGCI..

For information about the course, contact Joseph Goetz, Vice President, OGCI, 4554 South Harvard Avenue, Tulsa, OK 74135, 800-821-5933. Or contact Peter Gray at 918-250-6042 for information about the course content. ■

There is no likelihood that man can ever tap the power of the atom ---- Milliken, Nobel Prize in Physics 1923

Definition of NORM Wastes

Texas House Bill 2623, recently passed by the Texas Legislature defined "Oil and gas NORM waste" as solid, liquid, or gaseous material or combination of materials, excluding source material, special nuclear material, and by-product material, that:

- (A) in its natural physical state spontaneously emits radiation:
- (B) is discarded or unwanted:
- (C) is not exempt by department rule adopted under Section 401.106 of this chapter: and
- (D) constitutes, is contained in, or has contaminated oil and gas waste as that term is defined in Section 91.1011 of the Natural Resources Code.

House Bill 2623 also states that "notwithstanding any other provision of this chapter, the Railroad Commission of Texas has sole authority to regulate and issue licenses, permits, and orders for the disposal of oil and gas NORM waste. The Railroad Commission of Texas may adopt any rules reasonably necessary to exercise its authority under this section." ■

Campbell Wells Corporation

Louisiana's Department of Environmental Quality (DEQ) issued a license on June 3, 1993 to Campbell Wells Corporation, a unit of Sanifill, Inc., Houston, that allows the company to treat oilfield waste containing as much as 200 pCi/g of NORM. The license is subject to an appeal process. DEQ's Secretary Midboe said that -- "The Campbell Wells facility will be protective of human health and the environment by providing the state's oil and gas industry with a safe treatment option for NORM wastes." ■

US Ecology Provides NORM Disposal Services

US Ecology operates the Richland, Washington Low-Level Waste Disposal Facility and has been receiving limited quantities of NORM waste for permanent disposal since the 1980's. Under the Washington Administrative Code (WAC 246-249-080) and the State of Washington Radioactive Materials License, US Ecology can receive NORM packaged in dry solid form in metal containers (drums), boxes, or with a State approved variance, sacks.

The Washington Administrative Code allows annual quantities of less than 1,000 cubic feet per year (cf/yr) to be shipped without specific State approval. If the concentration of radium is greater than 2,000 pCi/gm, annual quantities in excess of 1,000 cf can be accepted. US Ecology will accept NORM waste volumes as small as one drum.

The Washington facility cannot accept any wastes which exhibit hazardous characteristics under the Washington dangerous waste regulations (WAC 173-303). Washington State's regulations do not exempt oilfield production waste from their requirements. In practice this means that waste which contains any of the characteristic metals or elevated levels of organics cannot be disposed of without treatment to stabilize these wastes so they will pass the toxic characteristic leaching procedure (TCLP) tests.

Each cubic foot of NORM waste that is received is priced at competitive rates and include fees paid to the State of Washington for perpetual care and maintenance and business and occupation tax. Fees for perpetual care and maintenance are held in escrow by the Washington State treasurer. Currently the perpetual care and maintenance and site closure funds total over \$35M.

US Ecology arranges for transportation service for NORM wastes via common carrier for less than truckload quantities and can provide exclusive use services for truckload quantities.

For further information contact US Ecology at 1-800-999-7160. ■

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In addition to Instrument Calibration and Repair, RTS offers the following instruments for daily or weekly rental:

Instrument Sales and Rentals: _____

- ◆ Ludlum Model 3 NaI(Tl) scintillation detectors
- ◆ Ludlum Model 2 with Geiger Mueller "pancake" probes
- ◆ Ludlum Model 9 Ion Chamber
- ◆ Ludlum gas proportional alpha frisker
- ◆ Victoreen X-Ray Scatter detector
- ◆ F&J Air Sampling Pumps
- ◆ Sigma Auto Sampling System
- ◆ Sun Nuclear Radon Emanation Monitor

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