TOXIC SUBSTANCES CONTROL AND SECTION 208 OF THE WATER POLLUTION CONTROL ACT

by

Jay B. Sorenson

WRRI ABSTRACT

The Toxic Substances Control Act of 1976 (TCSA) significantly increases the potential for federal action wherever and whenever toxic substances in water pose a threat to people or the environment. TSCA most notably broadens the scope of Section 208 of the Pollution Control Act Amendments of 1972, which covers diffuse source contamination. However, the new measure appears to be as ambiguous as it is powerful, and it will take some time to grasp its implications in full.

Because TCSA may bear heavily on the regulation of toxicity in ground and surface water, such 208-related fields as mining, agriculture and construction are likely to feel its impact. In New Mexico this means that pollution from pesticides in farm runoff and industrial waste deserves attention. However, the main issue, particularly in the northwest part of the state, is radiochemical contamination from uranium mining. There is a pressing need to clarify how TCSA will affect this activity. New Mexico researchers seeking ways to dispose of fluids used in solar heating and cooling and ways to use treated sewerage sludge as fertilizer and animal feed supplements also need to consider how 208 and TCSA will combine to influence their work.

New Mexico chemical standards for treating toxic substances should give the state some leverage in dealing with the federal government. Nonetheless, TCSA is very vague on a number of important points, and a certain amount of conflict between state and national agencies appears inevitable as officials seek to define areas of authority and make specific decisions.

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Jay B. Sorenson
Professor
Department of Political Science
University of New Mexico

INTRODUCTION

The main problem we examine at this session of the Water Resources Conference is that of the impact of toxic/hazardous substances in toxic amounts on water quality. We are particularly concerned with toxic substances as they apply to the diffuse sources of water pollution provisions under Section 208 of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) and as they may apply under the Toxic Substances Control Act of 1976 (PL 94-469).

Late in 1976 a new law, the Toxic Substances Control Act (TSCA), PL 94-469 was enacted. Its primary objective is to prevent human and environmental exposure to dangerous toxic substances. To this end, the law appears to be focused at the pre-manufacture stage as a preventive measure. The law permits the regulation of the production, processing, transportation, distribution, use, and disposal of any substance, be it a commercial substance, a by-product of a commercial operation, an impurity, or a naturally occurring substance. Some types of substances that are specifically regulated under other statutes and administrative regulations are formally exempted from the Toxic Substances Control Act, but the act appears to be very broad and powerful, and also ambiguous, and some of these exempted substances may actually end up regulated under TSCA.

When waters are contaminated by a toxic substance and pose population or environmental risks, they are subject to review under the Water Pollution Control Act. But they are also subject to the Toxic Substances Control Act.

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Thus, the toxic contamination/water quality situation falls within the purview of both Acts. Persons concerned with the Water Pollution Control Act should, therefore, be aware of the possible application of TSCA.

Because the Toxic Substances Control Act is new, its provisions still subject to interpretation, the specific nature of its implications in the area of water pollution is somewhat unclear. No final answer to a strict or a broad interpretation of the Act is possible yet. Uncertainty and unpredictability are more the rule than not at this early stage of intrepretation of the Act passed last October. Because of the possible implications of this Act, and its application to 208 problems and industrial mining involving toxic substances, most of the remainder of this paper is devoted to a discussion of these implications. Further, to realize a wide range of impacts under this Act a liberal and permissive examination has been attempted.

Toxicity

Before proceeding to a discussion of the interaction between these two acts, an area which is fundamental to this discussion is the nature and meaning of toxicity. Under TSCA the toxicity of a substance is determined by its effects on public health, the environment, and life forms, and by the risk assessments of undesirable events occurring in a given period of time. Standards may be prescribed on the basis of:

- carcinogenicity, mutagenicity, teratogenicity
- levels of human and environmental exposure (lifeforms: vertebrates, invertebrates, microorganisms, and plants)
- behavioral effects (very uncertain at times): acute, chronic, subacute, absorption, excretions, and metabolism
- synergistic and cumulative effects with the substances, and
- any other effects that may present an "unreasonable risk" to man and his environment.

There is no better illustration of the difficulty of doing this in a meaningful way in practice than the recent, well publicized regulation of saccharin by the FDA and associated public comments of the forms: "Caution; saccarin, when taken in very large quantities, may be harmful to the health of your Canadian rat!" The problem is clear; well defined human or environmental effects often stem from occurrences which we are attempting to avoid. Reliance on recognizing effects only as they occur in the "real world situation" poses problems of:

- Potential unexpected occurrences.
- Long term periods. For example, recognizing a carcinogen from population data may require decades.
- Recognition of an effect. For example, will a general increase in population irritability (behavior) be recognized as stemming from a pollutant?

- Large economic penalties. Large pollution control expenditures or restrictions on production of substances after large facility expenditures.

For these, and other reasons, a high degree of reliance is placed on experimental systems from which extrapolation to humans or complex ecological systems will be necessary. Such extrapolations are fraught with pitfalls and may require considerable judgment in assessing the "risk" potential of a given situation.

We are also concerned with workpoint numbers:

- 4, Nonpoint Source Assessment
- 8, Municipal Waste Treatment Systems Needs[3]

Parameters of interest include radium, selenium, PCBs, pesticides, manganese, gross alpha, arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, barium, boron, nickel, zinc, pathogenic organisms.

Water contaminants resulting from toxic substances in New Mexico may not be as serious as in other more industrialized states. New Mexico does not have the PCB problem of Michigan, nor the carbon tetrachloride problem of Mississippi. We do, however, have a toxic chemical substances problem as a result of mining in the northwestern part of the state and which the energy boom is exacerbating.

Shallow ground water contamination results from infiltration of: 1) effluent from mill tailings ponds, 2) mine drainage water that is either discharged directly into arroyos or is introduced into settling ponds and then seeps into watercourses, and 3) discharge (tailings) from ion exchange plants. Deterioration of water quality results from conventional underground mining as a result of penetration disruption of the ore body. The effluents contain concentrations of dissolved uranium, radium, gross and trace chemical constituents. Available evidence indicates that radium concentrations in the discharge waters tend to increase substantially as the ore body is developed. While natural background radium concentrations are generally about several piocuries/liter (pCi/l), 100 to 150 pCi/l appear in the effluents of operating mines. The discharge of such highly contaminated mine effluents to streams and seepage from tailings creates a long-lived source of ground-water contamination.[4]

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[3]New Mexico Environmental Improvement Agency, Section 208 Detailed Work Plan, approved by EPA, Oct. 1976 (S.F.N.M.), P 5ff.

[4]Robert F. Kaufman, Gregory G. Eadie, and Charles R. Russell, "Effects of Uranium Mining and Milling on Ground Water in the Grants Mineral Belt, New Mexico," (Office of Radiation Programs - Las Vegas Facility, U.S. Environmental Protection Agency). Ground Water - Sept. - Oct. 1976, Vol. 14, No. 5

Radium, selenium, nitrate and, to a lesser extent, uranium, are of most value as indicators of ground-water contamination. Gross alpha results are not consistent indicators of radium or uranium in water, although uranium isotopes 234, 235, 238 appear to be the principal contributor of alpha activity. Accurate radium-226 analysis yield the most information for radiological evaluation of potable water. Sorptive or biouptake of radium in the Grants area is pronounced.[5] Hence, concentrations of radium now in ground water are not perceived to be representative of the ultimate concentrations.

We have a number of problems. For a water scarce region we are pumping radio-contaminated water from mines and mills at prodigous rates. One mine presently pumps 2,000 gallons a minute, and in areas planned for future mining predictions run as high as 8,000-10,000 gallons per minute. One mining operation (Ranchers Exploration) has turned an intermittent stream into a permanent one. On another level, while settling ponds capture radium dissolved in water. No regulations exist at present that require the companies to remove the radium. Kerr-McGee is now voluntarily using a Barium Chloride Precipatation Process at its Ion Exchange Plant to capture the radium that is discharged with excess water. However, an acceptable methodology for monitoring radium remains to be standardized. A related problem is that of toxic chemical spills resulting from the failure of containment ponds. While the spills have not been many and have been confined to company land, they have to be considered insults to the environment.

Another instance is that of United Nuclear, Churchrock, which at this very time is considering the construction of a secondary containment system to gain the insurance of an additional half mile should its primary radon containment system suffer a failure. What makes the United Nuclear, Churchrock, situation so significant is that a failure of the primary containment system without a backup system could lead to contaimination of the waters that flow into Shiprock, Space and secondary containment systems appear to be useful ways of dealing with the problem. The waste management of tailings is a critical problem. The average size of mill tailings piles is reported by the State Environmental Improvement Agency to be 50 acres. They report that 49 billion tons of tailings exist with one billion tons of uranium left in them. (Table I affords a picture of the companies and tailings up to 1976). Rainfall, stormwater, and seepage into water courses is a major contamination of shallow ground water and surface drainage courses in the state.

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[5]U.S. Environmental Protection Agency, Water Quality Impacts of Uranium Mining and Milling Activities in the Grants Belt, New Mexico, Sept. 1975, 906/9-75-002 P 3.

Clearly, radiochemical contamination, gross and trace chemical constituents is a prime concern in New Mexico and the lowest practical levels is a policy objective.[6] What is needed is clarification regarding: 1) mine discharges, 2) mine waste discharges, 3) stabilization of tailings. What remains unclear is the biopathways of radionuclides, and the possible somatic and genetic effects on people.

TABLE I

Tailings to January 1976

Company	Location	Status	Acres Tailings	Tailing Solids Tons 106	Total Ci
Foote Mineral	Shiprock	inactive (1954-1968)*	37	1.55	7,800*
Homestake	Milan	inactive	40	1.22	6,100
Phillips	Ambrosia Lake	inactive (1958-1963)**	55	2.68	13,500**
Kerr-McGee	Ambrosia Lake	active	200	20.18	100,927
Anaconda	Bluewater	active	260	13.00	65,225
United Nuclear-Homstake	Milan	active	105	14.89 51.97	74,657

* 950 Ci of Ra reported in pile

** 1,520 Ci of Ra reported in pile

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[6]New Mexico Water Quality Control Commission, New Mexico Water Quality Standards... P 3 and Amended Water Quality Control Commission Regulations, Jan 11, 1977, Pp 3, 15.

Other federal regulations

Much with which we in New Mexico are concerned under Section 208 as a toxic substance fails under one of federal acts. Paradoxically, this creates an ambiguous legal situation, and a rather complicated one for us.

In the area of chemical, federal regulatory authority up to 1976 related to highly specific uses of chemicals (i.e., drugs), or to chemicals related under rigidly specified conditions (i.e., into the work place).

This regulatory authority was stipulated in the following Federal Statutes:

1. OSH Act (OSHA), PL 91-596 (1970),
   29 U.S.C. §§ 651 et seq.
   Standards, 29 U.S.C. § 655

2. Clean Air Act (CAA), PL 91-604 (1970),
   42 U.S.C. § 1957 et seq.
   Hazardous Pollutants, § 122, 42
   U.S.C. § 1857c-7

3. Federal Food, Drug, and Cosmetic Act (FFDCA),
   21 U.S.C. § 321 et seq.

4. Consumer Product Safety Act (CPSA), PL 92-573 (1970),
   15 U.S.C. § 251 et seq.

5. Federal Hazardous Substances Act (FHSA),
   84 Stat. 1673 (1970),
   15 U.S.C. § 1261 et seq.

6. Atomic Energy Act (AEA), 42 U.S.C. 2201 et seq.

7. Poison Prevention Packaging Control Act (PPPCA),
   84 Stat. 1670 (1970),
   15 U.S.C. § 1471 et seq.

8. The Federal Insecticide, Fungicide & Rodenticide Act (FIFRA),
   7 U.S.C. 136 et seq.

Regulation of chemicals, with the singular exception of FFDCA, occurred only after the chemical substance had already been introduced into commerce. An objective need existed for preventive regulatory authority to control toxic chemicals rather than merely corrective authority, The need for "before the fact" regulatory authority proved to be a major impetus to the creation of the Toxic Substances Control Act of October 1976, TSCA.

TOXIC SUBSTANCES CONTROL ACT (TSCA)[7]

Background

Congress had a difficult job with the Act. The issue of toxic chemicals touches on the very frontiers of the costs and benefits our society derives from an industry whose activities have become essential for enhancing, protecting, and extending our lives and whose earnings represent more than 6% of our Gross National Product.

The Act reflects a full awareness of those areas where we have a high level of technical understanding and knowledge as well as those areas of technical uncertainty and social and economic obdurance to improved practices.

In 1971 The President's Council of Environmental Quality (CEQ) issued a report which provided alarming prospectives on the serious regulatory deficiencies in the control of chemical substances which could pose an unacceptable hazard to human health and the environment.

The report revealed that approximately two million chemical compounds were known to exist and that 250,000 new chemical compounds were introduced globally each year. Although most of these chemicals were made in small quantities for research purposes, it was estimated that 300-500 new chemical compounds were introduced into commerce each year.

The Environmental Protection Agency (EPA) estimated that 10-20% of those being introduced would have adverse effects on human health and the environment and only a fraction of these were covered by existing regulatory authority.

Of primary concern was the observed long latent period in humans for the development of chemically induced cancer (20-30 years), and the possibility that without measures to preclude introduction of new chemicals or new uses of old chemicals society was faced with the potential for future epidemics of chemically related diseases.[8]

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[7]"Toxic Substances Control Act," Oct. 11, 1976 15 U.S.C. 2601

[8]Cited from the Inhalation Toxicology Research Institute & Sandia Laboratories' office of Environmental Policy Analyses, "Analysis of Potential Impact of Toxic Substances Control Act on the U.S. Energy Research & Development Administration," Vol. I Policy Overview, Feb. 1977. Sandia Laboratories, N.M. Limited Distribution.

The problem was clear.

The Act emerged as a product of several years of deliberations and hearings held by a number of committees of both houses of Congress.

Goals of TSCA

The general goal of TSCA IS:

- TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT FROM UNREASONABLE RISKS PRESENTED BY CHEMICAL SUBSTANCES NOW AND IN THE FUTURE.

This overall objective is to be secured by reducing the probability of chemical incidents harmful to man or the environment without unnecessarily raising the costs of products, retarding R&D, distorting the configuration of U.S. industry, or jeopardizing our international competitive position.

The purposes of TSCA's implementation activities are fourfold:

- to control toxic substances directly,
- to support other governmental and nongovernmental programs
- to control toxic substances,
- to stimulate new patterns of approaches to toxic chemicals in general, and
- to diversify strategies regarding buying, selling, and disposing of toxic materials.

The act applies control at the point of manufacture, distribution into commerce, processing, use, and disposal.

When necessary, EPA is authorized to take steps to limit manufacturing, processing, use, or disposal of a chemical substance which may present an unreasonable risk.

Of particular concern are chronic effects of toxic substances; thus the attempt to reduce the adverse health effects. TSCA represents an abatement strategy.

Major considerations of TSCA:

1. The first major intent of the legislation was to preclude the introduction into commerce of chemical substances or mixtures which would cause or significantly contribute to an unreasonable risk to public health or the environment.

2. The second major consideration related to pre-market testing to assure that if a chemical substance were introduced into commerce it would not pose an unreasonable risk to health and the environment. Congress assigned to the chemical industry the obligation of bearing the costs of health and environmental effects testing. The legislators used the FFDCA as a model in developing the provisions with TSCA. Thus the pre-market notification means prior to the introduction into commerce of a new chemical or an existing chemical for new uses. The act differs from FFDCA by requiring the EPA to specify acceptable tests before testing is required.

3. The third major intent of the act was to provide a Central Information, Storage and Retrieval System, available to all governmental agencies, which would maintain a current inventory on all chemical substances and mixtures with respect to: structure, potential human and environmental exposure, and toxicology.

4. The fourth intent of the act was to provide the EPA Administrator with broad regulatory authority for the prevention of "unreasonable" damage to health and the environment from chemical substances.

Congress added a qualifier. It stated that the EPA Administrator "should carry out this act in a reasonable and prudent manner" which meant consideration of the environment and health but also the economic and social impact of any action undertaken under the act.

Restrictions

The application of TSCA was also restricted to two stipulated conditions:

1. Where risk to environment and health may not be prevented or reduced to a sufficient extent by actions taken under other federal law administered by EPA.

Exclusions

Quite noteable were the chemical substances or mixtures excluded under the act. They are regulated under other federal statutes. These include:

1. Any nuclear source material, special nuclear material, or by-product material regulated by the Atomic Energy Act (AEA), 42 U.S.C. 2201, et seq.

2. Any pesticide regulated by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), 7 U.S.C. 136, et seq.

3. Tobacco or any tobacco product.

4. Firearms and ammunition subject to taxes under sections 4181 of the Internal Revenue Code 26 U.S.C. 4181.

5. Food, food additives, drugs, cosmetics, or devices regulated by the FFDCA, 31 U.S.C. 301, et seq.

6. Meat and meat products regulated by the Federal Meat Inspection Act (FMIA), F 31 U.S.C. 601 et seq.

7. Eggs and egg products regulated by the Egg Products Inspection Act (EPIA), 21 U.S.C. 1031, et seq.

8. Poultry and poultry products regulated by the Poultry Products Inspection Act, 21 U.S.C. 451, et seq.

Problem areas

TSCA leaves us facing many uncertainties and problems of law due to the exclusions, to vagueness of language and clauses, and to its newness and general lack of interpretation. The central element of TSCA implementation is the concept of "unreasonable risk." Yet, the term is used in an ambiguous, if not in a contradictory manner.

Congress recognized that some level of risk must be accepted. It also recognized that the welfare of future generations as well as the needs of the present generation must be of concern. Congress put all this in the act, and further specified that for a risk to be determined unreasonable a balancing of the following considerations had to occur:

1. the adverse effects of the chemical on health and the environment;
2. the magnitude of human occupational and non-occupational exposure;
3. the magnitude of exposure of the environment;
4. societal benefits for various uses and the availability of substitutes;
5. the economic consequences of any restrictive rule with respect to the national economy, small business, technological innovations, national security, the environment and public health.

Points four (4) and five (5) certainly provide an escape clause, but even more serious are a set of other problems:

1. If the term "unreasonable risk" is used, so is the term "substantial risk" (section 8 (3)). So too is the concept "imminent hazard," (7 (a)).

2. The "burden of proff" for establishing the degree of risk varies in different sections. The less severe risks would appear to require levels of testing or information gathering activities of a different order. Further, sections 4 (a) and 5(a) require the proponent of "use" to establish that the new chemicals on a risk list do not constitute an unreasonable risk. Yet, section 6(a) requires that the EPA must make an explicit finding of risk to take regulatory action.

3. Compounding the problem, is the "overreaching requirement," mentioned above, that social and economic impacts, as well as environmental impacts, be taken into consideration under any provision of TSCA. How is this to be done? What is the priority?

4. The criteria when evaluating risks also vary. Some provisions, including the legislative history, emphasize the importance of considering carcinogenesis, teratogenesis, and mutagenesis when evaluating risks. On the other hand, while there are no specific references to acute toxicity, there is no reason for not considering such risks.

5. Marginal cases are a particular problem. What happens when risks are marginal? What happens when assessment of the same chemical or the same environmental problems lead to marginally conflicting determinations? Is regulatory action warranted?

"Toxicity" tests also leave many questions to be answered:

1. What types of toxicity tests (oral inhalation, aquatic, phytotoxicity, or dermal penetration) should be required?

2. Should a single test or a battery of toxicity tests be required?

3. What quantitative toxicity data are available on wastes or leachates of wastes?

4. Should toxicity level or LD 50, LC 50, ILm, TLm, be neglected to define toxic wastes?

5. What is the level of risk associated with a particular toxicity level?

6. What methods or test procedures can be utilized as predictive tools to estimate toxicity -- the tendency to bioconcentrate, carcinogenicity, mutagenicity, or teratogenicity of leachates?

7. What are the effects of low level exposures to individuals vs. populations?

8. How should chronic exposures be reflected in identifying the characteristics of hazardous waste and listings of particular hazardous waste?

Other uncertainties

A number of other uncertainties exist that are important and that can have a direct bearing on the influence of TSCA:

1. The interpretation of the word "commerce" is vague. By the language of the act, anyone who processes or manufactures chemicals or mixtures for shipment across state lines, even

though a sale is not involved, would fall under the provisions of the act. Virtually all ERDA laboratories could fall under this provision, especially those processing isotopes for other users.

2. Chemicals used in small amounts for research purposes could conceivably be jeopardized by this act. What chemicals will be available for research purposes will depend upon the EPA administrator's determination as to what chemicals are to be on a research list.

3. It is not clear whether all agencies of government like ERDA and its laboratories fall under the jurisdiction of the EPA Administrator. Nor is it clear whether they have to submit ERDA toxicological and relevant scientific data to EPA. It would appear, however, that all ERDA labs would have to comply with the regulations issued by EPA under TSCA.

4. Confusion also exists on how the EPA is to handle the problem of "impurities", "intermediate byproducts", and the "commercial" production of research chemicals.

5. Protection of the environment is more nebulous than it is the protection of human health which itself suffers from problems described earlier. The basic policy consideration is the protection of man and the environment, but Congress appears not to have been able to be as definite in the protection of the environment and its life forms as it was in its provisions for public health. The provisions on disposal are almost non-existent.

6. A national defense waiver exists in the act. It makes possible to set aside the provisions of the law regarding any chemical or substances that are deemed essential for national security.

There are other uncertainties in the act, but the above are the ones that touch on the key provisions of the law, and that will cause difficulties in enforcing it and make its impact on 208 activities uncertain. We surely will witness much interesting litigation. The act seems to be written to guarantee it.

TSCA applicability to 208

To return to the relevant applicability of TSCA to water pollution. For the most part, toxic substances as water contaminants are treated under PL 92-500. However, TSCA directs the Environmental Protection Agency (EPA) administrator to use PL 92-500 unless the administrator determines that it is in the public interest to protect against such risks under TSCA.

How does TSCA specifically bear on 208 mining, agriculture and construction problems? How inclusive is it in terms of toxic substances -- including nuclear materials and byproducts? What can we expect, if anything, from TSCA?

While it is the case that PL 92-500 is the law that more closely applies to most instances of water pollution control, it may very well be the case that TSCA will prove to have great utility in treating ground and surface water contaminated by toxic substances from point and non-point sources. TSCA deals more specifically and comprehensively with chemicals, risks, and controls, allowing regulation of man-made or naturally occurring chemical substances at various steps including processing, transportation, use, or disposal than does Pl 92-500. EPA appears to be moving cautiously, yet EPA will most likely apply TSCA to point and non-point radio-active mine contamination and toxic agricultural pollution.

One of the most critical points regarding radio-chemical contaminated mining activities is that the definition of nuclear waste under the Atomic Energy Act (AEA) or Nuclear Regulatory Commission (NRC) guidelines is unclear.

The AEA covers nuclear source material, special material, and by-product material. However, the AEC (now the NRC) never perceived or defined byproducts as wastes, or included wastes as part of byproducts. Waste products like tailings were considered to be special problems, and ignored for years. The U.S. Regulations 10CFR20 provides that all persons "who receive, possess, use or transfer source material "shall be controlled by general or specific license issue by the U.S. AEC (NRC) or any state conducting a licensing program." Under the regulations ion exchange plants and mills are licensed. The regulations set forth the maximum concentrations of various radionuclides which are permitted in effluents "to unrestricted access." An unrestricted area is defined as any area to which access is not controlled by the licensee to protect individuals from exposure to radiation and radio-active materials. Personnel badge monitoring is not required in unrestricted areas. The maximum allowable concentration of radium 226 in a water effluent to an unrestricted area is 30 pCi/1. All mills and plants are controlled by this regulation from the initial start up of the facility. Tailing piles and wastes are not mentioned.[9]

Wastes thus remain a concept in limbo. The NRC is now refining its position. It is particularly sensitive to the tailings problem. It is claiming jurisdiction over them as "special material", and covered by the AEA. Since the nuclear waste issue remains unresolved and as it impacts on health and the environment as a toxic substance, the door appears open to the EPA effort to apply TSCA, should EPA proponents who favor this course of action succeed in having their way. The NRC will probably resist and a conflict is in the making.

Two points are of interest; a U.S. Supreme Court decision giving EPA authority over radium and a New Mexico chemical standard to treat a toxic substance improved the state's bargaining position.

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[9]Quoted in EPA 906/9-75-002, Pp 16-18.

The U.S. Supreme Court in June of 1976, in the case of Train vs. Colorado Public Interest Research Group (PIRG), ruled that while nuclear source material, special material, and byproduct material were all under the exclusive jurisdiction of the Nuclear Regulatory Commission (NRC) pursuant to the Atomic Energy Act, radium and accelerator produced isotopes were not, and that the EPA had jurisdiction over them.[10] The legislative history cited by the Court also establishes that the EPA, under its definition of water pollution in the Federal Water Pollution Control Act could regulate radium and accelerator produced isotopes.

With this legal precedent and authority over radium EPA should have little difficulty applying TSCA to nuclear wastes and toxic water problems.

New Mexico, in addition, may treat the problem of toxic contamination of water under an agreement with the federal government and its own statute.[11] The uranium standard as supported by NM EIA is a chemical standard dealing with picuries (pci/L).[12] Unless preempted by the federal government, New Mexico can treat a toxic substance which "alters the physical, chemical or biological qualities of water" and which with "reasonable probability injures human health, animal or plant life, or... unreasonably interferes with the public welfare or use of property."[13] While the New Mexico chemical interpretation has legal implications which are still uncertain, and while the toxicity of radium as a chemical is unimpressive to some, the chemical interpretation has strengthened New Mexico's bargaining position in environmental matters. It is not inconceivable some TSCA provisions could be applied to the regulation of other dimensions of selected radionuclide problems.

Major points apply to various clauses and DPA judgments. One important interpretation relates to TSCA's application to minerals, including uranium ore, on its list of candidate chemicals to be excluded from TSCA coverage on the grounds of no immediate toxological concern. However, in the Federal Register of April 12, 1977, the EPA commented, regarding the placement of uranium on its candidate list, that because of its "toxological effects...uranium ore...may be considered inappropriate for Appendix A."[14] The net effect would appear to be that uranium as a mineral will fall under EPA jurisdiction to be regulated under TSCA.

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[10]Train V. Colorado PIRG, 8 ERC 2058, No. 74-1270 (June 1, 1976).

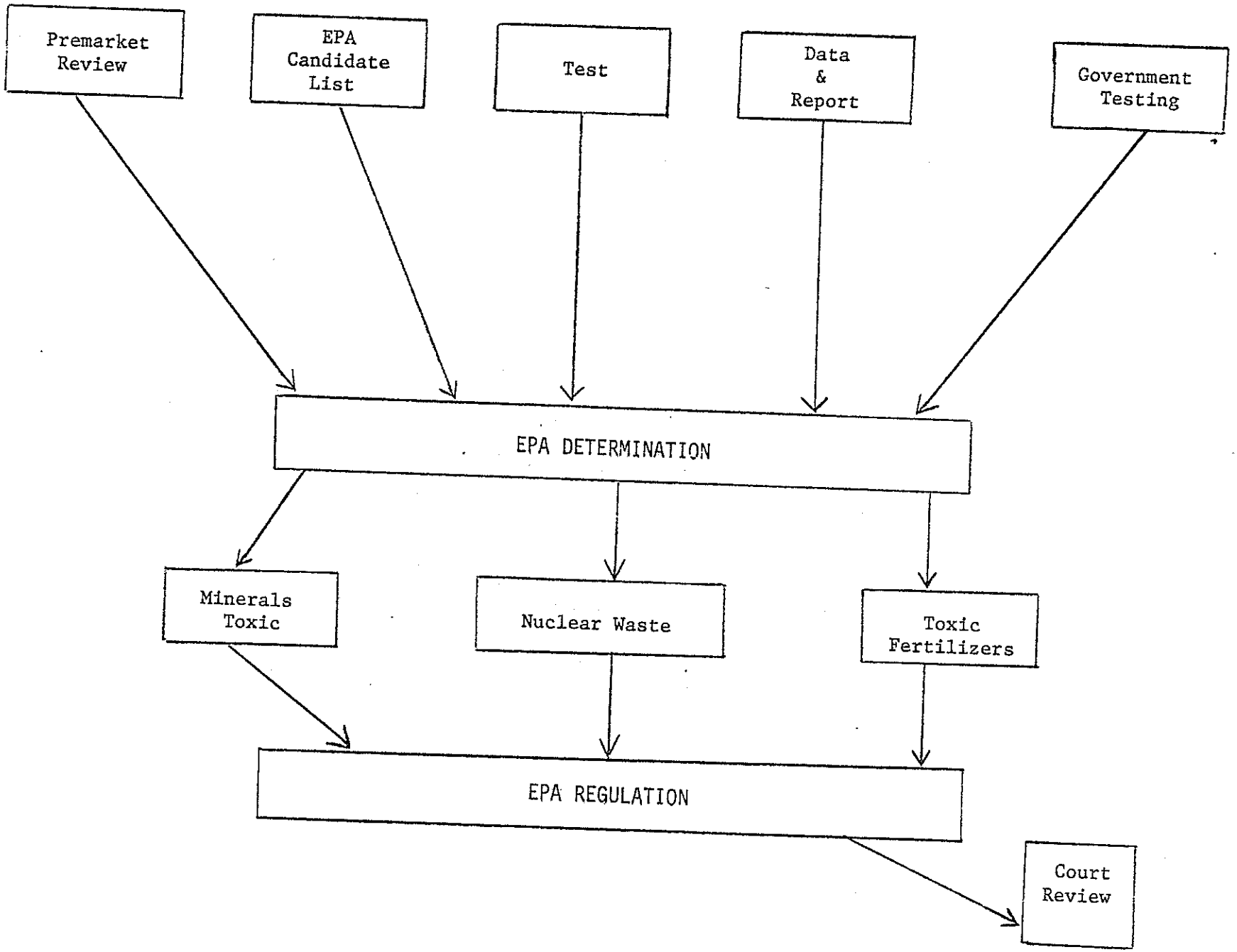
[11]Radiation Protection Act Chapter 284, Laws of 1971 12-9-1 through 12-9-11 NMSA 1953 Compilation.

[12]Environmental Improvement Agency, "Statement for the Record, Water Quality Control Commission Authority to Adopt Groundwater Standards for Uranium, Radium 226 and Radium 228" (S.F., 1976), P 2. Also, New Mexico Water Quality Standards...P 3. Aug. 1973.

[13]§§ 75-39-2 (A), N.M.S.A., 1953 Comp.

[14]Federal Register, Vol. 42, No. 70, Tuesday, April 12, 1977, P. 19308

EXPANDED EPA JURISDICTION



Other points lead to the conclusion that the act will be interpreted broadly, and EPA will claim jurisdiction over many toxic substances even though the act excludes substances covered by other legislation. Some of the more pertinent points are:

- Chemical "substance" is very broadly defined. It applies to anything that is a chemical. So too with "byproducts"; if a manufacturer of a substance produces toxic byproducts that pose an unacceptable risk his activities can be regulated or shut down.

- Regulation or control is to occur not only at the point of processing and manufacture, distribution, use, but also disposal. There is nothing in the act that deal with disposal. In this area EPA could perceive it has a free hand.

- The major requirement for record keeping and reporting turns on the exposure of workers to adverse health and environmental effects. Thus, EPA can apply its authority under the record keeping and reporting sections of the act.

Regarding the criteria for pesticides and the application TSCA to agricultural activities the following statement in the Federal Register would appear to open the door to EPA's application of TSCA: "a chemical substance is not a 'pesticide' within the meaning of FIFRA until its value for pesticide purposes has been established."[15]

These provisions, like the candidate list, are considered by EPA to be tools and to be open to change at any time. In the final analysis it is EPA that makes the final determination, and if EPA has a problem, TSCA applies.[16]

In short there is a real possibility EPA will apply TSCA to mining and agriculture, particularly in the case of 208 pollution, if a toxic substance migrates into the water table.

If a broad interpretation of the Toxic Substances Control Act is adopted, the accompanying tables summarize those areas of 208 concern which would also fall under the meaning of TSCA and outlines specific areas where impact could occur.

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[15]Conversation at Kerr McGee, Grants, New Mexico, May 4, 1977. Kerr McGee executive reported this was the view of the EPA Kansas office. On the other hand, an EPA authority believes the act will be ineffective. It is so vague little will be accomplished under it. Everyone will bog down as attempts are made to apply it.

[16]Federal Register, Vol. 42, No. 46 - Wed., March 9, 1977, P. 13132.

Functions	Work Point	Areas of 208 Concern	Problem	Chemical Substances by-product Y= Yes N= No ?=Uncertain P=Probably	TSCA IMPACT	SPECIFIC IMPACT										
						Pre-MKT	Inventory	R&D	Processing	Districts	Disposal	Monitor	Data	Report	Unreasonable Risk	Regulation
Industry Mining a) Uranium	9,11,12	Mines - Pumping / Discharging } surface water	Radium Contaminated Water	Y	P/Y	N/?	N/?	N	P	?	P	Y	Y	Y	P	Y
		Ion Exchange Surface and ground water	Radium Contaminated Water	Y	Y	N/?	N	N	Y	P	Y	Y	Y	Y	P	Y
		Waste stabilization ponds Wells - surface & sub surface Surface and ground water	Effluent Seepage	Y	Y	N/?	N/?	N	Y	N	Y	Y	Y	Y	Y/P	Y
		Tailings surface and ground water	Effluent Seepage	Y	Y	N/?	N/?	N	N	N	Y	Y	Y	Y	Y	Y
		Stormwater	Effluent Seepage	Y	Y	N	N	N	N	N	Y	Y	Y	Y	Y	Y
		Boomtown	Effluent Seepage	Y	Y	N	N	N	?	N	Y	Y	Y	Y	Y	Y
b) Copper	11	Mining, Milling, Leaching Smelting-Refining Wastes, tailings, chemicals and oil, slag Surface and ground water	Effluent Seepage	Y	Y	N/?	N	N	N	?	Y	Y	Y	Y	Y	Y
Agriculture Civiculture	466	Irrigation, timber harvesting, Roads, sediments perscribe (chemical stage)	Seepage	Y	Y	N	N	?	N	Y	Y	Y	Y	Y	Y	Y
		Surface and ground water		Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
Municipal Waste Treatment	8	Sludge Stormwater Sediments Bacteria & Viruses Bio-Life Systems Surface and ground water	Heavy metals, toxic chemicals	Y	Y	N/?	N/?	N	?	N	Y	Y	Y	Y	Y	Y
Industrial Waste Treatment	9	208 area-wide uptake & concentration in aquatic/terrestrial food chains in Middle Rio Grande Surface and ground water	Heavy metal chemical and toxic substances	Y	Y	N/?	N/?	N	N	N	Y	Y	Y	Y	Y	Y
Urban & Industrial Stormwater	12	Rainwater, Cumulative Concentrations, Sediments, Etc. Surface and ground water	Heavy metals chemicals, solids, oil, grease, etc.	Y	Y	N/?	N/?	N	N	N	Y	Y	Y	Y	Y	Y

Research into water quality and toxicity

What of other problems regarding toxic substances and water contamination? It is at this point I'd like to turn to some of the research at some ERDA laboratories, particularly in New Mexico, that is underway.

Solar

One of the most significant environmental concerns of Solar Heating and Cooling (SHAC) is associated with heat transfer and storage media. Sandia Laboratories' Divisions of Environmental Research and Biosystems Studies have undertaken a study of this problem as part of the Laboratories' assigned responsibility in the solar area.[17]

Ordinary water cannot be used as a heat transfer or storage fluid in most cases because of freezing temperatures encountered in many parts of the country. Many of the materials used for these purposes are toxic and combustible, hence creating health hazards to the user and his environment if system leaks develop or if the liquids are discarded improperly. The heat transfer fluids are commonly classified into three broad categories; hydrocarbon and silicon oils, and glycol-water mixtures.

The toxicity of the hydrocarbon oils or fluids are similar to but less than those of ordinary unused motor oil. The toxicity is also less because the working fluids have fewer additives. The oils are usually stable compounds as long as they are not used near their cracking temperatures or catalytic metals are not present. They are generally biodegradable, but in some cases this may be a slow process. In sum, the toxic effects of these compounds will be much the same as ordinary motor oil, but human and environmental exposure may be much greater. A total risk determination has yet to be made.

The silicon oils are much more stable than the hydrocarbons and are very difficult to biodegrade. They are assumed to be practically nontoxic since similar compounds are used in cosmetics. The difficulty in biograding these compounds makes them of particular concern to the environment if they are improperly discarded. Their persistence is particularly interesting in light of the current environmental concern with other similar long lived materials such as PCB's, DDT, and the flourocarbons.

Unlike automobile motor oils which are conveniently recycled through service stations, there is no readily available means of disposing of silicone oils except by recycle.

Glycol-water mixtures are probably the least stable and most toxic of the three types of fluids considered. Their estimated lifetimes are less than two years because of the relatively rapid breakdown of the glycol. Hence, they must be changed periodically. The two compounds presently being considered are ethylene- and propylene-glycol. Ethylene glycol is the major ingredient in ordinary automobile antifreeze.

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[17] The Environmental Issued Associated with Heating and Cooling of Residential Dwellings Pp 1-4.

Ethylene glycol is currently the most widely used heat transfer fluid. It is a sweet-tasting poisonous fluid which could be an immediate ingestion hazard to small children and animals if a leak developed in the SHAC system. The lethal dosage is less than a pint for a small child.

Since this fluid has to be changed periodically, a disposal problem arises as to what to do with the old fluid. Disposal through the sewage system reduces the direct environmental dangers because of the large dilution factor, but the effects on waterways and sewage treatment systems are unknown and may still be significant.

Since it is most probable that people will replace the fluid seasonally during a period no longer than one or two months, there are likely to be significant seasonal variations in its concentration in the sewage system. The actual concentration could be higher since the fluids would normally be changed during the daylight hours.

It should be noted that the disposal of toxic effluents into public sewer systems is specifically prohibited by the Water Pollution Control Act. However, if one potential method of SHAC fluid disposal is through sewers which run directly into bodies of water or through waste treatment facilities, the effects of these fluids on the appropriate life forms and on the treatment works must be studied.

In addition, the biological conversion of these fluids in such treatment works (whose effluent is regulated) should be understood.

Disposal directly into the environment (backyards, e.g.) could have serious environmental consequences.

The total effect of SHAC fluid disposal on a community basis will need to have continued serious study.

Waste management

Another Sandia Laboratories project on toxic substances concerns work with surplus radio-active materials to modify sewage sludge for safe disposal with possible safe application as a soil conditioner, fertilizer or an animal food supplement.[18] By the application of radiation and/or heat and radiation combinations, rapid inactivation rates for salmonella species, coliforms and fecal streptococci were attained. The treated sludge was then applied as a food supplement for sheep and rats and a fertilizer. These application studies were performed at New Mexico State University. Rat experimentation after five months of feeding treated sludge at 25% of the diet indicated no evidence of

[18]Waste Management & Environmental Programs Dept., Waste Resource Utilization Program, Interim Report, June 30, 1976, SAND 76-0350 Unlimited Release.

toxicity. Sheep feeding indicated a nutritive value that could sell amount to an economic value at about half the value of cottonseed meal when used to supplement fibrous, low quality forage diets for ruminants. The potential economic impact on New Mexico could be very large. The initial fertilizer trials with heat and radiation treated digested sewage sludge, using grain sorghumsas a test crop demonstrated significant quantities of available plant nutrients, with no symptoms of toxicity.

Though I have not seen the final results, it would appear at this point that this disinfection process of toxic wastes as compared to pasteurization or more severe heat treatment systems is a question of trade-offs. The critical questions turn on the costs of drying, transportation, and tolerance for odor. Dry treatment - a concomitant of radiation - is cost effective if transportation is more than ten miles, though much depends on the city and area involved. Unless the seage and treatment plants are right next door to the farms, wet use of the sludge offers no advantage over dry treatment. Further, pasteurization and the more severe heat treatment systems have the disadvantage of accentuating odors that are unpleasant to humans. Radiation is a faster process than pasteurization, and "bagging" the treated substance maintains its integrity. Aside from these questions, however, there is the larger one of whether the sludge can be left around and untreated at any cost.

Other ERDA lab's R&D

Current research spans many aspects of toxic substances and water research. Much of its is duplicative and some of it has only indirect bearing on 208 problems. One of the main effects of TSCA is that is certainly will lead to more research on every spectrum of toxicity, including water research.

Some of the other ERDA labs are doing some interesting and very relevant research. Let me briefly cite some key projects.

Argonne National Laboratory is a lead laboratory in assessment of impacts to aquatic ecosystems due to Uranium milling. It is presently responsible for "The Uranium Milling Operations Generic Environmental Statement." The area covered runs from the headwaters of the San Juan to the confluence of the Rio Grande, including the Rio Puerco drainage.

Pacific Northwest Laboratories is more involved in water research than any other of ERDA's laboratories. It is currently proposing a study of: "Analysis of the Impacts of Water Pollution Control Levels and Programs on the Development and Use of Energy Production Technologies."

Los Alamos Laboratories has just been assigned a major responsibility for water resources and quality studies. Entitled "Water in Energy" LASL will undertake an assessment of water resources in the West for the development of energy. They will cover everything from legal and institutional considerations to inegrated decisions on water uses. Work is to begin on parts of this study this summer.

The Lovelace Inhalation Toxicology Research Institute, one of the few toxicological labs in the nation, is presently undertaking many and various studies in the area of toxicity, though none in the area of 208 water research. It has just joined with Sandia Laboratory's new Office of Environmental Policy Analysis, and the two have been assigned major responsibilities in all aspects of toxic substances, including those that bear on the Southwest region of the U.S.

Thus, we can see an immediate promise of TSCA for our region and perhaps water research as well.

Conclusion

To sum up some of the pertinent comments on 208 water quality -- while it may be that water contaminants resulting from toxic chemicals and substances are not as serious as in other states, we do face problems of considerable concern regarding radionuclides as well as gross and trace element constitutents as a result of the impact of mining and milling. Because of our general scarcity of water and our potential for energy production with heavy water requirements, Section 208 problems deserve our utmost attention. In all probability, degradation of water cannot be prevented as water is used and recycled; but we in New Mexico cannot afford to allow any of our scarce water or its quality to go unattended, if we have any choice.

A potential new tool, the Toxic Substances Control Act, has been passed by Congress to assist in assuring maintenance of water quality. Since the act is new, there is considerable ambiguity in the interpretation of its immediate applicability. TSCA by statute applies to water pollution problems. Where it is applicable, TSCA offers a law with greater utility than PL 92-500, for its permits federal action, including control before the fact rather than after pollution has occured at the stage of production, processing, transportation, use, or disposal of nearly any chemical substance - man made or naturally occurring. From the point of view of public health and environmental protection, the act offers numerous advantages, and it is difficult to believe attempts will not be made to apply TSCA on a broad basis. The pertinent question is what impact will TSCA have on mining and milling activities and ultimately on energy resource development in New Mexico? While the act is not supposed to cause economic disruption, and while a shutdown of the industry is unlikely, it certainly will pose greater difficulties than in the past. What the level of acceptability is, cannot be stated at this early stage. Conflict over the act would appear to be unavoidable, and the final judgment is not yet in.

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