Love Canal Study Attracts Criticism

The handling of a report on chemical contamination near the waste dump renders it less than convincing

Two years ago, amid considerable public concern, the Environmental Protection Agency (EPA) set out to conduct an ambitious study of the hazards associated with a chemical waste dump in the Love Canal neighborhood of Niagara Falls, New York. Agency officials should have realized then that the study results would escape criticism only if the work was meticulously performed and fully approved by eminent scientists outside the agency. Their credibility already suffered from criticism of a health study of Love Canal residents. A careful study of chemical contamination near the dump was intended to end the confusion over health risks and restore the credibility of EPA's research.

EPA has just completed the report, at a cost of about $8 million. It concludes that the chemicals deposited in Love Canal have not migrated much beyond a ring of adjacent homes. The primary exceptions were storm sewers and creeks downstream from the sewers, and even in these areas the level of contamination was considered to be low. Significantly, the study did find that some adjacent homes are contaminated with high levels of dioxin, one of the most toxic substances known.

There is wide agreement that the study failed to live up to its promise as a definitive work. At a series of recent hearings in the Senate and the House of Representatives, it came under sharp attack from politicians and scientists alike. Senator Daniel Moynihan (D–N.Y.) has termed it "messy and inconclusive," and Senator Alfonse D'Amato (R–N.Y.) has described its authors as careless, slipshod, and irresponsible. Representative John LaFalce (D–N.Y), who represents the Love Canal area, says that doubts about the canal's hazards still linger. Representative James Florio (D–N.J.), who chaired some of the hearings, says that the study is not an encouraging benchmark for monitoring toxic wastes. Ellen Silbergeld, a neurotoxicologist representing the Environmental Defense Fund, suggested that the study be judged a failure and withdrawn by the federal government. Her comments were echoed by the Love Canal Homeowners Association, which said the effort resulted in "questionable data, unsubstantiated conclusions, and an immense waste of taxpayers' money."

These would appear to be overstatements. The picture that emerged from the hearings is of a report that is generally sound but that deviates from prudent scientific practice in several important respects. This viewpoint was reflected in the testimony of scientists at the National Bureau of Standards (NBS) and public health experts from the Department of Health and Human Services (HHS), who were persuaded by the report that the risks to nearby homeowners are not great, but who expressed some misgivings about the manner in which the study was conducted and the results reviewed.

Most of the apparent problems in the report can be traced to the emotionally charged atmosphere in which it was conceived. It was begun on 21 May 1980, the day that President Jimmy Carter declared a state of emergency at Love Canal and announced the temporary relocation of 2500 residents. To calm their fears, EPA said that results of the study would be available by the following January, a highly unrealistic deadline. "The deadline was not fixed from a scientific viewpoint," says John Deegan, who left the University of Rochester to coordinate the EPA study.

Deegan and Courtney Riordan, the acting assistant administrator for research at EPA, both agree that initial samples of chemical contamination should have been used as a guide to the quantity and location of additional samples. "This would have been much more reasonable than the approach that was forced on us" by the crisis atmosphere at Love Canal, Riordan says. With a short deadline, the agency could only sample in one enormous effort, guided by untested theories about the likely routes of migration for chemical contaminants. Contractors were dispatched to gather 6853 samples from homes, ground water, and soil near the canal. Particular attention was paid to buried storm sewers and low-lying areas where chemicals might collect. Oatmeal and potatoes were placed in the basements of 16 homes, in an ill-fated attempt to see if they would accumulate airborne chemical contaminants.

Two mistakes were made, both owing to the agency's haste. Only 8 percent of the samples were gathered in so-called "control areas," sufficiently distant from Love Canal so that a comparison could be drawn with the areas nearby. Of 11 scientists who reviewed a draft of the study for HHS, five described this imbalance between sites near to and distant from the canal as one of the study's major drawbacks. Silbergeld says that it substantially weakened the study's ability to discern more worrisome contamination near the canal site. Deegan says that the number of "controls" was adequate, but that he would have collected more if time had permitted.

The second major problem was created by the sheer quantity of samples, which made it difficult for EPA to obtain quick and meticulous data from contractor laboratories. As it later developed, some laboratories detected minimum levels of contamination ten times higher than others. Two labs analyzing identical samples frequently produced different results. Some labs could detect chemicals that others could not. In the end, one-fifth of the samples were discarded because they had spoiled, or because the analysis had been skewed.

The seriousness of these problems became apparent to EPA only after the initial drafts of its report were subjected to scathing reviews by its scientific advisory board and by NBS. At one point, NBS said the report was "incomplete and of limited usefulness." In response, EPA initiated a major effort to explain exactly how well each lab had performed. Although NBS initially expressed some reservations about this effort, it withdrew them after extensive discussions with EPA, at which the agency presented its viewpoint.

"EPA believes that although the quality control and quality assurance . . . was neither perfect nor the stringent ideal specified by NBS, it was acceptable and generally more detailed than most field studies where trace levels of organic chemicals are analyzed," said Richard Dewling, EPA's administrator for New York State. The agency acknowledged that it could not ascertain the limits of detection for soil and sediment samples; that it failed to audit the analysis of air samples; and that it derived the limits of detection for water contamination from a chemical textbook, rather than from the performance

0036-8075/82/0820-0714$01.00/0

of each lab. But Raymond Kammer, the NBS deputy director, declared that these were reasonable and generally acceptable approaches, so long as EPA carefully described these procedures in its final report.

Shortly thereafter, the report was released without the benefit of an additional NBS examination. This sequence of events has raised questions about whether EPA actually met all NBS objections. At a House hearing on 9 August, NBS officials said that they had not yet had time to study the final report, and thus had no opinion about whether their criticisms had been adequately addressed. Kammer says that NBS wanted to examine the final report, but that pressures from Love Canal residents and New York politicians were too strong to permit any further delay. He says that the EPA report has "not yet been given a full peer review," and that it needs one.

The reason that such uncertainties seem important is that contamination was not detected in 90 percent of the samples and was at or near the limit of detection in many others. The degree of chemical migration was determined by comparing the frequency, not the amount, of chemical detection in various areas.

EPA says that it is untroubled by the methodological peccadillos because the contamination was rare and consistently low. Silbergeld and several of the consultants to HHS worry about the health effects of exposure to even low amounts, which EPA may not have uncovered.

—R. JEFFREY SMITH

Next week: The risks of living near Love Canal.

Reagan Alters Makeup of Ethics Panel

New appointees named to commission slated to go out of business in December

The White House recently named four Republican scientists to the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research which is slated to go out of business at the end of the year. In the few months remaining, the commission must complete reports on five sensitive subjects including decisions to forgo life-sustaining treatment, and genetic screening. The appointment of new commissioners at this stage of the game raises questions about what they can usefully contribute to a body that has been debating the issues for the past 2½ years. The fact that the four new Reagan appointees appear to have been chosen as much for their Republican connections as for their scientific qualifications has also raised apprehension that the newcomers will try to infuse the deliberation with stereotypically "conservative Republican" views.

The President's commission is the intellectual successor to the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, which issued influential guidelines on topics including fetal research and experimental psychosurgery. The present commission, which came into being in January 1980 as an advisory group to President Jimmy Carter, has also had its influence felt, particularly with its report on the definition of death, which has been adopted by more than a dozen state legislatures.

The new members bring to eight the number of Reagan Administration appointees to the 11-person commission whose makeup is somewhat altered as individuals with strong academic affiliations are replaced by commissioners whose backgrounds tend more to business and private medical practice. In addition, some of its sexual and racial diversity has been lost as the panel is now principally composed of white male physicians ranging in age from their mid-fifties to mid-seventies. Among those previous commissioners whose terms expired were four women—a nurse, a sociologist, a psychologist, and a health economist.

The newest Reagan appointees will attend their first commission meeting this month; the previous Reagan commissioners came on board in February.

In addition to reports on sustaining the lives of the terminally ill and on genetic screening, the commission's agenda includes the issuance of reports, now in draft, on informed consent, genetic engineering, and access to health care. Whether the Reagan commissioners will wish to substantially alter the tone or substance of the reports is difficult to predict. However, conversations with those who were available to be interviewed indicate that the Reagan appointees are as diverse (and sometimes as liberal) in their thinking as those who came before them. The one apparent difference is that many of the Reagan people have more explicit ties to Republican Party politics than did their Democratically appointed predecessors.

One of the new commissioners is John J. Moran, 62, who recently sold a chemical company he had built up over 25 years. He then established the Moran Foundation in Houston to support scientific research. The majority of its funds which, he says, come to approximately $100,000 a year, are awarded to investigators at Baylor College of Medicine. Moran's résumé identifies him as being "independently wealthy" in "eight figures." He has, he told *Science*, actively supported every Republican presidential candidate since Goldwater but believes that his nomination to the commission most likely came from someone at Baylor or at Harvard where he has been asked to serve as an adviser to the biochemistry department.

Although he has no graduate degree in science (he says he left a graduate program at UCLA in 1950 because of scientific disagreements with a senior researcher), Moran has "some 50 patents" to his name and his company was active in the field of developing diagnostic reagents. Perhaps for this reason, he is particularly interested in the commission's forthcoming report on genetic screening, an endeavor he favors as long as the costs do not outweigh the benefits. "With my business background, I look at the economics of things," he says. "If we go into widespread genetic screening, we have to ask questions about the cost." He thinks, for example, that amniocentesis for Down's Syndrome is warranted when there is a family history, and for women over 40, but "is not so sure" about routine screening of women over 35. His views on abortion, which he prefers not to discuss at length, are, he says, known to the White House. Moran does not support the Right-to-Life view.

Kay Toma, president of the Bell Medical Center and of the Bell Shopping

0036-8075/82/0820-0715$01.00/0