



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

February 23, 1981

OFFICE OF THE  
ADMINISTRATOR

MEMORANDUM FOR: COURTNEY RIORDAN, Ph.D.

FROM: DOUGLAS B. SEBA, Ph.D.

SUBJECT: Recommendations of the Sampling  
Protocols Study Group

Enclosed for your use are the recommendations of the Sampling Protocols Study Group that were developed as a result of the December 11th meeting in Denver, Colorado.

cc: Dr. Dowd

Enclosure

## RECOMMENDATIONS OF THE SAMPLING PROTOCOLS STUDY GROUP

The Study Group has followed the efforts of EPA during the summer and fall sampling and analyses conducted in the Love Canal area. We commend the efforts of the personnel involved in this assay. Considering the constraints of time and money with which they were presented, they used the best available technology and worked with a good deal of willingness. The Study Group does, however, strongly make the following recommendations:

1. This project has been allowed to proceed from several points of origin and with imposed budget and time limits, and the problems occurring subsequent to the beginning of the study are based upon this and the lack of clear objectives. Therefore, it is recommended that there be set up, immediately, an authority for the planning of objectives, statistical, analytical and sampling protocols, quality assurance, and a significant useable end product. To do so would require the following:
  - a. Inventorying groups involved in emergencies in other federal agencies.
  - b. Interfacing with these agencies.
  - c. Setting up a central authority either within EPA or a special office between agencies for the sole purpose of dealing with emergency problems.

- d. Charging this authority with construction of an overall statistical plan or plans dealing with these problems. Actual problems will or can be subsets of the overall plans.
  - e. Equipping this authority so that ready response to emergencies is available.
  - f. Acting immediately to organize this authority, since the occurrence of these emergency situations is neither parochial nor political. There is a present requirement for basic information on imminent situations.
  - g. Involving overseeing groups (e.g., Science Advisory Board) at the beginning of each operation not after it is underway and committed to action, as in the case of the Love Canal Study.
  - h. Generally making a critique of the actions of all participating and overseeing parties at the end of the Love Canal study, i.e., the phase involving collection and disbursing of data. This type of critique or debriefing should be instituted at the end of all emergencies dealt with by the Agency.
2. Under no circumstances should the Agency either accept or impose an investigative problem--such as the one under discussion--without adequate

knowledge of the probability of conclusion. The latter phrase should include an intelligent estimate of the time required and the funds necessary to reach each systematically outlined objective.

3. All existing regulations point out the restrictions which are enforceable and capable of being monitored where waste dumps cannot be tolerated. There are no areas designated or composite situations where such facilities should be. Available data should be screened to indicate such locations and conditions of use. This should be done immediately as an anticipatory measure.
4. The Study Group notes that the monitoring function of EPA has always involved measurement and exposure study without direct approach to the most important aspect indicated of the Agency. Obvious effects such as cancer inducement or LC50 toxicity have been approached, but the realities of the contact of organisms with their environment, the activity of substances at low levels, and the latter's effects on the spectrum of organisms is the end product of real impact. Without this as the prime and major objective, monitoring studies have little value. In addition, we can expect there to be substances of low level concentration and of high toxicity to some part of the living organism spectrum which are detectable to the organism but not to existing chemical instrumentation.

Therefore, the Study Group recommends the priority initiation of bioassay matrices. We recommend that the existing methodology within and outside the

Agency be collated and brought to bear immediately on the problem of toxic wastes. The Study Groups recommends that all necessary data and protocols for obtaining data be collated for use in risk assessment in all anticipated toxic waste events.

The Study Group understands that the Love Canal Study is ordered to proceed toward exposure assessment. We urge that this be done and regret most strongly that the determination of risk assessment is, thus far, in doubt. The Study Group wishes to be informed of the final disposition of the treatment of the data and recommends its use in some form of final critique of the Love Canal situation.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF  
RESEARCH AND DEVELOPMENT

February 11, 1981

TO THE CITIZENS OF LOVE CANAL

Last fall, I indicated that the Environmental Protection Agency (EPA) would release the results of its monitoring studies of Love Canal within six to eight weeks after completion of all sampling activities. The sampling was concluded on October 31, 1980, and we still have considerable work to complete before the results of the project will be ready for public release.

It has taken longer than we had originally planned to analyze the data and prepare the narrative description of the extent and relative degree of contamination of the Declaration Area. We now plan to complete the report on the results of the monitoring studies in the latter part of March.

This report will contain the total set of validated data as well as various summaries and narrative statements. The summaries and narratives will describe how the data were obtained and indicate the extent and relative degrees of chemical contamination of the Declaration Area. It is our plan to provide as much characterization of the data as can be scientifically justified. In addition to this report, a site-specific report will be provided to each resident whose property was sampled.

EPA scientists will be at Love Canal when the reports are released in order to provide you with personal explanations of the findings.

A handwritten signature in cursive script that reads "Courtney Riordan".

Courtney Riordan  
Deputy Assistant Administrator  
for Monitoring Systems and Quality Assurance

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Re: "Love Canal—what really happened" (December 1980, p. 740)

Your guest editorial by D. L. Baeder of Hooker's parent company, Occidental Petroleum, while undoubtedly reflecting true facts regarding selected past events, is incomplete in recent and current facts and actions. We feel that publishing editorials verbatim as received without verification by your editors of the facts in context is a disservice to your readers and would like to convey to them in this letter the current events and actions taken by the U.S. Environmental Protection Agency to put future conclusions and decisions on a scientifically acceptable basis, thereby doing exactly what various criticisms quoted in the editorial said should be done.

First of all, it is clear from Baeder's remarks that we are not dealing with a glaring case in which the outcome is obvious: All shotgun, short-term, isolated studies to date have been criticized for a variety of inadequacies concerning scientific measurement or conclusions based thereon. Therefore, it would be naive to think that yet another "quickie study" involving dollars only, without careful scientific design, will fare any better.

Secondly, it must be realized that the combination of measurements and conclusions involves a huge matrix of sciences and disciplines. One must assess:

1. presence of toxic chemicals (for many chemicals, accurate measurement methods and standards must still be developed)
2. actual exposure to the toxins (involving, in addition to biological models of human physiological functions, knowledge of behavioral aspects)
3. health effects resulting from this exposure (epidemiological studies).

Thus, we are dealing with physics, chemistry, biology, behavioral sciences, physiology, and medicine, as well as meteorology (variations of toxic levels with humidity, temperature, barometric pressure) and, importantly, different aspects of statistical design and data treatment.

Baeder's editorial makes no mention of the fact that, realizing these givens, EPA has launched a coordinated

monitoring effort with guidance from its Science Advisory Board (SAB). In fact, several public meetings of the board, advertised in the *Federal Register*, have been held in the last eight months, including one meeting that was also moved to Las Vegas to coincide with the last annual meeting of the ACS because many society members are serving on the board. This is an important development because it represents a first effort toward a systematic, coordinated measurement approach to sampling impurity levels in air, water, soil, and biota. This effort has already resulted in a documented data set that will be available for public use, that is based on consistent and controlled measurement protocols, and that has been scrutinized for quality control.

Not only is such a data source available on a major dump site for the first time, but, based on the gained experiences, and with input from the EPA's SAB and the NAS/NRC Numerical Data Advisory Board, this system will be modified and expanded, to be in place as other crisis areas require attention.

Anticipatory and baseline monitoring is one more level removed from the inadequate mode of fire fighting, popularly used in the past. This subject is next in line for increased attention.

These are the recent developments on the measurements front, where Baeder left off. Science is being brought into the decision making. The vast complexity of the problem does not allow for instant success; in the short time since Baeder's last observations, a significant amount of progress has already been made.

**Douglas B. Seba**  
Executive Secretary  
Science Advisory Board  
Office of the Administrator  
U.S. EPA

**Courtney Riordan**  
Deputy Assistant Administrator  
for Measurements and Monitoring  
Office of Research and Development  
U.S. EPA

**Leonard Greenfield**  
Environmental Consultant  
Chairman, Environmental  
Measurements Committee  
U.S. EPA

*Ed.: Though it's difficult to agree with the objectives outlined by the three signers of this letter, one would hope if they really relate to Mr. Baeder's editorial. We read it as having to do not with the existence of a problem, nor with assessment of its magnitude, nor with what's required next, but rather with Hooker's culpability. We thus, find this correspondence exemplary of the kind of consequence that arises when two groups persist in talking past each other. Read this and Mr. Baeder's comments side by side to see whether you find yourself in agreement with this contention.*

"The last epidemic" by H. H. Hiatt (January 1981, p. 17) was well intentioned and quite frightening. It bothers me, and I am sure others, about nuclear disarmament of the U.S.S.R. promises. We must place the trust in the U.S.S.R. promises.

During the Cuban missile crisis, Mr. Gromyko came to the White House, looked President Kennedy straight in the eyes, and denied the presence of Soviet missiles in Cuba. The president had photographic evidence of their presence.

I am sure the Soviets have published the letter by the U.S. scientists from the *N.Y. Times*. But have you ever seen any letters from Soviet scientists demanding a halt to nuclear armament in the Soviet Union?

Our adversaries do not live by the same codes as we do. In order to avoid nuclear war, it is necessary for the U.S. to be armed. Only a strong U.S. will give the Soviets enough reason to eschew war.

A weak and unarmed free world, prior to World War II, was an invitation to Hitler to start war. Such is the bitter fruit of a weak, unarmed free world.

**Harry Jacin**  
Norwalk, Conn.

I am sure that Donald Losman's article, "Deflation of quality" (March 1981, p. 140), made many readers aware that quality deterioration raises effective prices. Thus, his contention that the consumer price index understates real

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MEETINGS OF THE SAB AND SAB/EXECUTIVE COMMITTEE REPRESENTATIVES  
AT EMSL-LV ON AND DURING FEB. 9-13, 1981

Attendees: Leonard J. Greenfield, Ph.D.  
John Krobock, Ph.D.  
James Kittredge, Ph.D.  
Clifton Brooks, Ph.D.  
William Rea, Ph.D.  
Amanullah Khan, Ph.D.  
Cynthia Carter, Ph.D.  
Jules Cohen, Ph.D.  
Douglas Seba, Ph.D.

Memorandum/Letter of Record

During February 9-13, 1981, the Sampling Protocol Study Group of the Science Advisory Board and members of the Environmental Measurements Committee of the Science Advisory Board met in Las Vegas to attend sessions dealing with the approach to Love Canal problems, review hazardous waste monitoring protocols, and also discuss some of their intrinsic problems with S & A regional officers. SAB Members were chosen to attend on the basis of

1. participation with all three groups of attendance at only one or more meetings;
2. convenience and economy of travel; and
3. personal scheduling times.

Thus the full membership of each group was not present. Actual attendance was approximately as follows:

Present for the full week:

1. Dr. Douglas Seba
2. Dr. Leonard Greenfield
3. Dr. John Krobock

Present for four days:

1. Dr. James Kittredge
2. Dr. Jules Cohen

Present for three days:

1. Dr. Cynthia Carter
2. Dr. Clifton Brooks

Present for one day:

1. Dr. Amanullah Khan
2. Dr. William Rea

For the first two days, there was discussion and critique of some of the aspects of the past summer/fall sampling and analysis of soil, sediments, biota, and water in the Love Canal area. It was evident that there were a number of approaches which needed rethinking at all planning levels. Among these were:

1. Administrative input as to what the information was to be used for;
2. Planned observation/experiment from the outset with considerable statistical input;
3. Communication/feedback at all levels;
4. Preliminary "reading" of the area so that methods and immediate objectives could be changed as necessary and as dictated by initial results;
5. Etc.

The group also heard about the nature of the relationships between the people of the Love Canal area and some of the personnel at EPA and some of the contractors present in the area. It is obviously important to hear all of their points of view since they were obtained at different levels, and before dealing with the people of the area, as much understanding of their attitude, as possible, should be learned.

It became apparent as conversations went on that the SAB was being used by someone(s) to express reasons for some of the difficulties of management within the project; e.g., the SAB was blamed for the decision not to trap raccoons - after traps had been purchased and a survey plan set up; the SAB was involved in changing the "objectives" of the project and therefore kept throwing the project off balance; etc. Apparently no one ever bothered to trace the origin of these statements or to check their truth. Our suggestion is the one made several times at executive meetings:

1. That the involvement of the SAB be at the beginning of a project - rather than when it is well underway.
2. That there be full communication and feedback at all levels.

On Thursday evening, the Study Group again recommended to the SAB that the initial display of data to the public be devoid of strata lines or other judgmental implications until correlative situations (or lack of them) could be ascertained. Personal appearance of EPA personnel during the week of data presentation and narrative explanation of the reason for tests, their quality, and their potential value for correlative testing were

strongly recommended, and a memo to Dr. Dowd stating this was sent the next morning. In subsequent discussion with Director Schweitzer of EMSL-LV and Dr. Courtney Riordan and John Deegan (Thursday morning) the following was noted: .

1. We now know much more about the Love Canal area than we did at the start of the survey. It appears that the situation may be quite different from what is implicated by the setting up of strata. Since the latter are based upon a statistical hypothesis, it is better to set aside the strata lines rather than have the residents draw conclusions not properly based. (It is better to be conservative with the written material than with that which is spoken.)
2. The data are rather strange and do not follow smooth distributions. Therefore, at this time the data should be presented as they are so that the Love Canal people may get their experts to look at them. In the meantime we will do the same. We can then meet at some time, e.g., within 90 days, to discuss correlations.
3. Stress the quality assurance and point out how much data were obtained in the short time allowed.

For the remainder of our time at Las Vegas, we examined the validated data with the idea of exploring methods of graphic portrayal that would be significant and easily understood. We presented some of these ideas to Director Schweitzer for his perusal. While examining the data, there were certain aspects that became apparent to us.

1. Earthworms in the control area showed evidence of pesticide concentration.
2. Oatmeal and potatoes showed evidence of uptake of methylene chloride and other substances.
3. There appear to be hot spots of substances, but they are not immediately correlative with strata lines. For instance, some of the high readings in air, soil, and drains were outside the declaration area. Control drains showed higher values than those in the declaration area. There may be some evidence to show that air values are more significant at night than during the day.

4. Air analyses and soil-water-biota analyses do not show chemical relationship.
  - a. Possibly the taking of soil samples (and water) is such that the technique allows for the escape of volatiles to the extent that they do not show up in soil or water.
  - b. Possibly, the volatiles noted in the air samples - including the control area and outside controls are from elsewhere upwind. Therefore, it would be necessary to know the exact day of the sampling, the weather for the day, and if any plants that produce the gases found are operative upstream.
  - c. The major chemicals found in the air are laboratory solvents or contaminants. Therefore, it should be checked whether the laboratories doing the gas/air analyses checked their own lab atmospheres with a tenax cartridge every time they ran a Love Canal sample. Leakage from vents and air conditioning conduits could have been responsible for positive errors. Hopefully, contamination was minimal and measurable. If not, the strata lines for air sampling should definitely not be used.
5. Data at this point need extensive checking before any release -- in whatever format.

Members who attended the hazardous waste meetings stressed that most of the concern dealt with just how superfund was to be treated. S & A Members were also encouraged to become involved in biomonitoring, and there was considerable support for Operation Wormwatch which discussed the use of the organisms as bioconcentrators. Members of our Committee did not meet with S & A Members since we were not placed in their schedule. A memorandum was sent to Dr. Dowd explaining this situation.

Finally, it should be noted that the report of Dr. Khan on analyses of voles taken from the Love Canal area vs. those taken from the control area is to be submitted as part of the report concerning the area. Editorial changes were in progress while the meetings were going on. Both Dr. Khan and Dr. Rea explained the value of preventive long-range analyses of early measurable reactions to adverse ecological conditions.