

SITING A HAZARDOUS WASTE FACILITY

A Success Story in Retrospect

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As the result of an intensive 4-year program, an integrated hazardous-waste treatment facility was successfully sited in the Province of Alberta. No other public jurisdiction in Canada or the U.S. has succeeded in siting and subsequently constructing such a major integrated facility to properly manage organic and inorganic hazardous wastes. Mistakes were made, but real blunders were avoided. At the end of the 4 years Alberta had agreement on not only one but two sites, both highly acceptable to the immediate public.

When failure is the norm, what were the main factors that led to success in Alberta? The person most responsible for conceiving and directing the public part of the siting process has had subsequent health problems, and on account of this his retrospective statement for archival purposes has not been composed. Unfortunately then, the definitive first-hand analytical account of events concerning this exceptional siting success will not be written. My impression is that the several principal participants in the process have drawn somewhat diverse conclusions as to the activities and operational philosophy that were central to success. Some external analysts have produced reports that seem hardly recognizable in the context of what actually went on.

This retrospective overview is presented by a physical scientist who was one of the major participants and who was associated with the program from the beginning and throughout the process, including being involved in about 100 public

meetings carried out border to border in Alberta. It is hoped that this account will be of value to those elsewhere involved in siting activities without at the same time implying that it includes a recommendation for a siting recipe that can be widely applied. As a result of 20-20 hindsight some things to do and others to avoid in a siting program nevertheless became clear.

Because perceptions and analyses vary even among the major participants, this presentation is intentionally restricted to mostly factual matters, and only moderate attempts are made to present an analysis from a social or philosophical perspective. Having said that it does appear that the Alberta siting experience illustrates the crucial importance of honesty, openness, trustworthiness, and integrity. It also became clear that it is well to avoid seeking purely technical fixes for a mainly social-psychological-political problem, to cooperate with local citizens, and not to target a jurisdiction.

CHRONOLOGY

In 1979 a private company proposed building a treatment facility for wastes in the Fort Saskatchewan area (near Edmonton, Alberta). In August they held a public meeting. It turned into a huge protest with cancer, birth defects, dioxin, and lethal chemicals in the forefront of comments by the protesters.

In response to the meeting the government declared a moratorium on siting activities for the establishment of hazardous-waste facilities. Furthermore, throughout the process that followed no jurisdiction was targeted as the site and the Government of Alberta committed funding and a number of staff to work on the problem of management of

hazardous wastes.

In September 1979 the Minister of Alberta Environment named a Hazardous Waste Management Committee, which operated for 4 months. It comprised three members from government and three private citizens: a farmer, a fireman, a sociologist, two technical persons, and a bureaucrat. Public relations and other assistance to the committee were provided. It was an uncommonly effective committee with the highest level of mutual trust and respect among the members. In my role as a technical member it was important to avoid going off on tangents, to observe basic technical honesty, and to adhere to undistorted science.

This government-public committee set out the main features of the waste problem including the need to take into consideration public involvement, legislation, financing, ownership, storage, transportation, transboundary movement, definition, classification, technology, gathering, siting criteria, risk, detection limits, toxicity matters, public safety, and environmental impacts. One objective was to provide information suitable for an accurately informed public. The public component of the program was largely directed by an experienced sociologist. Throughout the years the position taken by him was one of cooperation: "We will not come into your district without invitation." Simple honesty and openness was expressed in the statement, "We jointly have a problem to solve."

It was critical to be frank and informative with the media, and accordingly, personnel were attached to the program who were experienced in working with them. At the information meetings organized throughout the province, public input was invited. A number of information bulletins were prepared and distributed along with the

committee and other reports.

In early 1980 this first committee was followed by one from the Environment Council of Alberta (ECA). Presumably, ECA concluded that the problem was mainly in the technical arena, since three of the four members were technical people. After holding public hearings throughout Alberta, they produced a report that was for the most part technically oriented. Central to their philosophy was that a facility not only be safe but be seen to be safe. From the point of view of being seen to be safe they concluded and recommended that the facility should best be sited at the center of 9 sections of land. In public meetings over the next couple of years this recommendation caused considerable anguish, since any facility that needs to be sited in the center of a block 3 miles square was understandably perceived by the public to be incredibly dangerous technically. A number of hazardous-waste facilities in Europe that were visited by the writer were typically sited, with high levels of public safety, on about 10 to 20 acres.

In 1981 the Hazardous Waste Management Team was formed. It considered such matters as legislation, transportation, management, and site selection. A government policy paper outlined the framework for the Special Waste Management System. With no obligation, implied or otherwise, on their part about fifty municipalities requested local information on constraint mapping that was provided by a geographer. My impression is that constraint mapping has significance for responsible hazardous waste management and was important in the public process. During the next couple of years information meetings were held border to border in the province. The chairmen for these meetings were usually local citizens or field workers, and rarely regular employees of government.

A 2-day seminar was held for about 70 delegates from across the province. The delegates were selected by those who attended the information meetings. The seminar itself was an expanded information meeting, including an opportunity for interaction among the delegates.

In 1982 the information meetings were changed to a more formal structure, in contrast to earlier ones where a panel was available to answer questions posed by members of the audience. The new format helped to focus questions on topics on which there had been a presentation. For example, questions relating to technical, regulatory, or transportation matters would follow presentations on those topics. In my part of the presentation that dealt with technical matters, hazardous wastes were described - such as used oil, spent acid, solvents, sludges. The chemistry and technology of their destruction and the management of the products formed were discussed. Slides of a number of European facilities were shown. Technically, it was necessary to come to grips with matters such as zero, absolute safety, toxicity, and the detection limit-regulation problem. When explained, most people recognize and accept that zero is unattainable and that absolute safety can never actually be proven. My impression is that most of the public responds positively to straightforward honesty and the use of qualitative judgment terms when considering risks.

Following a series of three information meetings, the town of Ryley (near Edmonton and near the major centers for the production of industrial hazardous wastes) held a plebiscite in August 1982. Ryley is in Beaver County, where there was violent opposition. In September Swan Hills also voted on the matter (Swan Hills is about 200 km NW of Edmonton). In both towns responsible informed citizens voted strongly (about 80%) in

favor of hosting the hazardous-waste facility. In both jurisdictions there was no attempt to gain public acceptance through "host fees" proposals (or more bluntly bribery). In April 1983 the Special Areas region (in SE Alberta) voted to reject the possibility. Strathcona county (adjacent to Edmonton) made the most sense for a site from nearly all points of view. Even though there were many supporters, an invitation to examine the possibility of siting a facility there was regrettably either not received or not acted upon. In keeping with not targeting a jurisdiction, that county was not investigated.

Late in 1982 a nonpartisan, international proponent-selection committee reviewed applications and recommended to government a short list of four companies from the nineteen who submitted proposals to build and operate a facility. For the record, there was also a short-lived advisory committee. The Special Waste Management Corporation Act was passed with the objective of ensuring that facilities would be developed for the management of hazardous wastes.

In March 1984 Swan Hills was chosen by the government² as the site, with Ryley publicly disagreeing² with the Minister of Environment. of the two sites Swan Hills is the one more remote from Edmonton, outside the large region recommended for a site by the Hazardous Waste Management Committee, and farther from the centers of production of hazardous wastes.

In April the Special Waste Management Corporation of seven members was formed. They were told by a Government Minister that the choice of Swan Hills instead of Ryley as the site was a political decision. Swan Hills did not have opposition from a surrounding rural population such as was the case in Ryley.

Chem-Security was named as the proponent. In December 1984 Bow Valley Resource Services took over Chem-Security.

September 1987 saw the official opening of the plant at Swan Hills. The facility is jointly owned by Bow Valley Resource Services Ltd (now Rovar) and government through the Alberta Special Waste Management Corporation and operated under contract by Chem Security (Alberta) Ltd. The town of Swan Hills receives no "host fees" from the plant and furthermore the tax revenue from the plant goes elsewhere since the plant is outside the town boundaries.

IMPRESSIONS

In both the positive and negatives senses, the media were significant players in the siting process. In the positive vein, a number of thoughtful, knowledgeable editorials did appear, and the editor of one local paper was certainly well informed and played an important role. On the negative side, some reporters are too busy to be excessively concerned with validation of information. For example, typical headlines in the early period were, "Alberta Proposed as a Chemical Waste Dump," "Chemical Dump Hearings," and later "Ryley Threatened by Disposal Plant." The word dump was prominent in the early news items, even though dumping of hazardous wastes was never considered or proposed. Other words that instill dread were also prominent - deadly PCB, cancer-causing PCB, dioxin, birth defects, poison plant, like an atom bomb, spew. Reporters know that fear has a high potential to entertain. There is evidence that our attempt to educate had some success in that the word dump appeared less frequently at later stages. Throughout, there were repeated calls in the media to move ahead quickly, to pass regulations, to choose a site - focusing

on the problem and not the solution. The activities of positive local leaders were rarely seen as newsworthy, while negative voices would receive media attention.

A number of town councils and chambers of commerce extended invitations for their district to be considered as the site. Such invitations were usually followed by the formation of a protest group, "Friends of" Along with heavy-handed intimidation, one group imported an activist of Love Canal fame and an "expert" who was formerly an EPA employee. Another group imported a veterinarian from out-of-province. As a generalization, the leaders of "concerned citizens" protest groups were usually ones who would be viewed as knowledgeable professionals - Dr. A an optometrist, Dr. B a veterinarian, Mr. C a high-school principal. They dispensed dread, misinformation, irrelevancies, and twisted information from reports. Nevertheless, to be duped into correcting items of misinformation is a mistake, since more quickly surfaces. My recommendation is that one simply continue to describe the important features of the problem and a solution as accurately as possible.

Throughout the province there was widespread recognition that hazardous wastes are an inevitable component of modern society - such wastes being generated by those ranging from large corporations to individual householders. It was recognized that there are such wastes even with efforts to reduce their amounts and with recycling of some. It was widely recognized that an integrated treatment facility was needed. However, a treatment facility should be somewhere else - the NIMBY (not in my back yard) attitude. That wastes can be responsibly managed from a technical point of view was recognized by many including the majority of citizens in Ryley and Swan Hills.

Late in the process we learned of the existence of "how to" manuals that give directions and advice on how to protest and forestall decisions. Advice on protesting techniques from such sources in part goes as follows:

Raise enough hell politically and through the media to get the plan postponed "for further study."

Stay on the attack. You select the issues.

Keep them tied up denying you information ... it's minimal effort on your part and maximal on theirs.

Get help - import professionals.

Discredit with "latest studies show that ..." or "That's controversial."

Conduct guerrilla warfare ... seek publicity.

Fabricate fear through the use of words such as spew, birth defects, toxin, supertoxin, and of course cancer.

For the most part, politicians were invisible and silent in the public meetings, a situation that probably helped in the running of the program. An industrial association that might have helped obtain the economically more favorable site (that is, Ryley) became slightly visible only after the political decision was made.

In the minds of the media and much of the public (including many scientists) there is an almost universal and instinctive belief in zero ... that any level of a "toxin" is too much. The Minister of the Environment was blasted in the media when he attempted to defend current regulations that allow for levels above detectability. In attempts to defend regulations the claim may be made that "We have the strictest regulations" or a promise that there will be less discharge than the regulations allow.

A minor problem in the program came from overeager supporters who in their zeal went well outside their areas of competence. Also, some unfortunate conflicts arose among members of a community and even within a single family. The commitments on both sides tended to be high and become emotional.

CURRENT SITUATION (1992)

Ryley, which was the first town to vote in favor of hosting the hazardous waste plant now has a facility to collect, store, and transfer hazardous wastes to Swan Hills.

In 1984 a Swan Hills Special Waste Liaison Committee was formed and continues to be active. Information bulletins are regularly prepared and distributed by the owners of the facility. There are a large number of both national and international visitors to the site. Public tours are also well received. The general attitude in Swan Hills is probably accurately reflected in the statement³, "We don't need Edmonton or Calgary telling us we have a hazard here ... we haven't got a bloody hazard here." A recent Wall Street Journal report⁴ quoted the Swan Hills Mayor "I wouldn't come into town and protest too hard on a real cold day. You might not get a room or a meal."

A backlog of Alberta wastes that needs destruction by way of high-temperature incineration is accumulating. Companies have been forced to stockpile wastes and are not now getting the service they need from the Swan Hills plant. There was a proposal to quadruple the capacity for high-temperature incineration of Alberta wastes. Public information meetings were held to describe the proposed expansion. The Minister of Alberta Environment ordered a Natural Resources Conservation

Board review of the proposed expansion, and game playing amongst vested interests appeared to be resuming. Permission to build a rotary kiln incinerator has been granted and the kiln is under construction.

Pressure is increasing from other provinces for Alberta to take out-of-province wastes. Technically that would not be a problem and there would be economic implications. The possibility of treating out-of-Alberta wastes would, however, be a political decision and one to be taken only after consultation with the public.

At the present time, some appear to want to shut down the facility. Their position seems not to be simply a case of the NIMBY attitude that was met in many districts. While their sincerity is not in doubt, their motives are unclear, since they propose no alternative solution other than storage. As stated earlier, the belief in zero is almost universal. Zero is something that can never be measured analytically. Emissions are probably not and can never be provably zero. Yet for example, according to a Greenpeace spokesman anything above zero is unacceptable. To me it now appears fortunate, from the point of view of appropriate and responsible management of Alberta's hazardous wastes, that such groups were not active on the siting question during the siting activities. Alluding to the proposed incinerator expansion, a spokesman⁶ for the Alberta Medical Association (and not from Swan Hills) stated concerning the public information meetings, "They're just going through the motions to make the industry look good. It's laughable. It really is."

CONCLUSIONS

In my judgment in the Alberta program three blunders were avoided:

1- To select or target a jurisdiction prematurely.

2- To pass regulations without the means to meet them. For example, when appropriate facilities are not in place, to pass a regulation prohibiting liquid dumping after some announced future date. It leads to the Environment Minister's being increasingly discredited for permitting illegal dumping.

3- To assume that the problems to be solved are mainly technical, to undertake a siting program that is mostly technical, and accordingly appoint inappropriate program management. Although attractive, to think of a siting process as a reasoned and rational process would reflect an unreal and overly technical view of society.

In my judgment also the important (and essential) factors in the siting program were the following:

1- The declaration of a moratorium on site selection. No jurisdiction was targeted.

2- Regulations were not formulated and passed until the means to meet them were in hand. Thus a conscious decision was made to postpone the passage of regulations. Pressures are always there to pass tough regulations and then assume that a problem has been solved.

3- The appointment of the government-public committee to outline the problem, and early recognition by that committee that the problem was mainly outside the technical arena. Although sound technology is of course essential, siting is mainly a social-psychological-political problem. Persons who are technically competent, trusted, and trustworthy need to interact with the public

on technical matters. Nevertheless, to endlessly seek technical fixes for social-political problems is futile.

4- To have had the direction of the public part of program mainly in the hands of a mature and experienced sociologist.

5- Having personnel who were experienced in working with the media and being frank and informative with them.

6- Organizing information meetings border to border and inviting input.

7- The 2-day seminar for delegates selected by residents. (This was the single most important operational factor.)

8- The eventual adoption of structured information meetings so that comments and questions were focused on particular topics. The "sitting-duck" format with a panel to answer questions should be avoided. That format lends itself to manipulation and plays into the hands of protesters.

9- Cooperation with local leading citizens. A base of accurately informed and committed local support and leadership was essential. It was important to work with the informal as well as formal leaders of a community and to openly provide information.

10- An attitude of respect for the public and basic honesty, openness, and cooperation. "We have a problem to solve jointly."

References

- 1- P. Slovic, J.H. Flynn, and M. Layman, *Science*, 254, **1991**, 1603 - 1607.
- 2- *Edmonton Journal*, June 7, **1984**.
- 3- *Edmonton Journal*, April 10, **1991**.
- 4- *Wall Street Journal*, December 27, **1991**.
- 5- Brian Killen, *West*, April **1990**, 15. "That's not zero and that's not good enough."
- 6- *Edmonton Journal*, April 4, **1991**.

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NWTRB Meeting - Questions posed

1- For the particular facility discussed, what were the primary scientific issues considered to be the most important when the site was first proposed? What were these perceptions based on?

Response The Swan Hills site was specifically targeted only after the community had voted overwhelmingly in favor of hosting the facility. As I have indicated I consider that it would have been a blunder to have targeted any jurisdiction prematurely . It was considered essential that any site have a clay base of low permeability - both the Ryley and Swan Hills met the basic criteria applied province wide.

2- How did these perceptions change as site assessment proceeded? If there were significant changes, what specific scientific studies were critical in bringing about these changes?

Response My (WEH) personal preceptions changed radically when I quickly realized that siting was not mainly a technical/scientific problem.

3- For underground facilities, how critical was underground testing as compared to surfacebased testing?

Response For disposal of the liquids resulting from the treatment operations a deep well was needed to a presumed permeable formation at about 2.5 km. Both the underground and surface testing were critical. Drilling confirmed that permeability and the surface clay base.

4- If the facility went through a licensing procedure, how different was the level of proof required in the licensing process from that assumed in the site evaluation or in "normal science.?"

Response To begin operations the facility had to meet the effluent regulations set by Alberta Environment.

5- If the site was subject of a legal hearing, how well were the participants prepared for the hearing? Were there any surprises?

Response The expansion 5 y. later required public input.

6- How clear were regulatory criteria? How did the level of detail in these criteria (too much or too little) affect site assessment and licensing?

Response Had to meet the general criteria and regulations.

7- How important were pre-licensing interactions between the regulator and applicant? To what extent were they helpful or burdensome?

Response The interactions were post-site selection and were non-confrontational.

8- How well were science and engineering integrated in the specific project? Did a lack of integration cause any problem?

Response The science/engineering were closely integrated with the sociology and that integration was critical to the successful siting.

9- Were there any non-regulatory oversight groups involved? To what extent were they helpful or burdensome?

Response Ad hoc NIMBY groups formed to fight in other areas. The dominant groups in Ryley and Swan Hills fought for the facility.

10- Was scientific and engineering input used that was external to the program and its contractors? If so, how? How helpful was it?

Response Data from European experience was important from my technical point of view.

11- How well focussed were scientific site investigations? Were there any particular techniques used that were successful in improving this focus?

Response After successful siting baseline data on groundwater, vegetation, air, wildlife, and benthic was gathered. Independent consultants were used and all data were made publicly available.

12- How did non-technical issues and public perception influence site assessment and the ultimate disposition of the project?

Response The choice of Swan Hills over Ryley was a political decision. After the vote in favor of hosting the facility the local public wanted tests to be done and to be made available. The local public continues to be highly supportive.

13- To what extent are the answers to the above questions applicable to the Yucca Mountain program?

Response It will be well to avoid seeking purely technical fixes for the siting problem that is mainly in the sociol-psychologicalpolitical realm.

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