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MANAGEMENT OF HAZARDOUS SUBSTANCES

Good afternoon. It is a pleasure to be able to speak to you today on "Management of Hazardous Substances". This subject appears destined to be one of the major environmental issues of the early 1980's. The types of concerns which serve to heighten the public anxiety about this subject are exemplified in a recent cartoon which crossed my desk and which we have reproduced on the first slide.

What do we mean by the term "Hazardous Substances" or "Hazardous Wastes" or "Toxic Substances" or any number of equally catchy phases which are used commonly and yet which have different meanings to many different people. To illustrate what I mean, let me tell you that there is a Federal-Provincial-Industry task force which has met on three occasions over the past year with the express purpose of defining the words "Hazardous Waste". The first discovery was that this group had trouble even agreeing on the meaning of the word "waste" much less "Hazardous Waste".

After considerable effort a dictionary-type of definition was produced which was satisfactory to the task force and which stated that:

a) A waste is any substance for which the owner/generator has no further use and which he discards.

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b) Hazardous wastes are those wastes which due to their nature and quantity are potentially hazardous to human health and/or the environment and which require special disposal techniques to eliminate or reduce the hazard.

This still does not tell a waste generator whether or not his waste is perceived by a regulatory authority to be a "Hazardous Waste" and subject to special regulatory controls. Clearly, the regulatory authorities must be more specific about the waste streams which should receive special consideration with regard to transport and disposal. This is a challenge facing this province and all of the others in Canada today. I point this example out, not to be critical of the task force, but to illustrate the difficulty in reaching agreement on the meaning of two commonly used words particularly without reference to any specific legislative or regulatory intent.

For the next while in my talk, I would like you to consider the word hazardous as a general adjective in the phase "Hazardous Substances" rather than as a very specific type of matter.

There is a considerable amount of legislation in existence Provincially and Federally bearing on hazardous substances. For your information I intend to make a quick review of the significant statutes.

A. Provincial

1. The Pollution Control Act was established primarily to control discharges of effluents, contaminants and refuse to the environment. Section 26 was added approximately 3 years ago to provide special powers to deal with spills.

2. The Pesticide Control Act regulates transportation, storage and handling, use and disposal of those substances named on the Schedules in the regulations. There are five schedules on which the pesticides are listed as a function of their toxicity.

3. The Fire Services Act and regulations is concerned with the sale, installation, carriage, storage and use of compressed gases and inflammable liquids. The legislation relates to fire hazard rather than toxicity considerations.

4. Regulations made under the authority of the Worker's Compensation Act deal in part with storage and handling of "harmful substances" in the work place.

5. The Health Act and regulations has a broad application in many areas affecting man's environment. Of particular interest are the Radiation Protection Service programs and the requirements of Section 70A of the B.C. Sanitary Regulations regarding notification of toxic spills to the nearest Medical Health Officer.

B. Federal

1. The Environmental Contaminants Act is the major piece of Federal legislation under which the manufacturing importation and use of toxic substances may be regulated. The most important use of this act to date has been in regulating the allowed uses of P.C.B.'s.

2. The Hazardous Products Act is aimed at consumer protection and one section of the regulations deals with the packaging and labelling of consumer quantities of hazardous substances.

3. The proposed Transport of Dangerous Goods Act is a Federal Act which is to be administered by Provincial Agencies. When implemented it will regulate labelling, packaging and transportation in all modes of transport of bulk shipments of dangerous goods. This is a badly needed piece of legislation particularly with respect to highway transport of dangerous commodities.

4. The Atomic Energy Control Act is the authority by which the Atomic Energy Control Board regulates the use and disposal of radioactive materials.

There are a large number of other Federal and Provincial Acts with a bearing on some aspect of using hazardous substances. I would note at this time that there is in existence a Federal-Provincial task force on Toxic Substances which has been assigned the task of reviewing all Federal and Provincial legislation to identify areas of duplication

and areas of neglect in the application of the legislation to manufacture, importation, transport, storage and handling, use, waste disposal and secondary effects of toxic substances.

Up to this point in my presentation I have talked about hazardous substances in general and some of the legislation that has been established over the years to deal with specific problems. For the next few minutes I would like to narrow the field to two of the problems before us today.

These are:

a) Spills of hazardous materials.

b) Hazardous Waste disposal.

The difficulty with spills as you can well imagine is that they are generally unpredictable as to time, location, substance, quantity, and effect. The only partial exception to this rule is that we can say with some certainty that our two major railway companies will manage to spill considerable quantities of sulphur, coal and potash in the Fraser Canyon each winter.

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For those of you who may not have had any direct involvement in a transportation accident involving hazardous substances, I would like to show some slides of an accident which occurred near Kamloops on January 10, 1978 in which a truck load of 43,000 lbs. of Sodium Cyanide was spilled across highway 5.

Slide 1 - Scene at time of accident

2 & 3 - Spill site after clean-up of Sodium Cyanide pellets.

4 - Spill site after spraying with Sodium Hypochlorite to neutralize residual NaCN.

5 & 6 - Temporary storage site to where Sodium Cyanide was moved using trucks and front end loaders.

7 - Spilled material was loaded into rented commercial garbage disposal bins and moved to a remote location pending a decision on disposal, use, neutralization, etc.

8 - Labells on bins.

After approximately 3 months of effort aimed at finding a user for the contaminated Sodium Cyanide and evaluating disposal options the material was transferred into specially constructed containers for shipment to a hazardous waste disposal site at Arlington, Oregon. The next few slides show this disposal site and that will lead into a few comments on hazardous waste disposal.

9 - The general landscape near Chem-Nuclear hazardous waste disposal site at Arlington, Oregon.

10 - Part of the disposal site equipment.

11 - Surface view of the active disposal trench for dry chemicals and P.C.B. contaminated wastes.

12 - Inside view of the trench showing the concrete tomb with containers containing Sodium Cyanide inside. This concrete tomb was later covered over with concrete.

13 - Close-up of containers.

14 - View of asphalt lined evaporation trench for sludges such as paint wastes.

15 - Entrance to caustic and acid pond area.

16 - View of acid or caustic liquids evaporation pond.

These last few slides represent what is commonly referred to as a secure chemical waste landfill. This type of facility is fairly common in the United States and unfortunately many have not been too secure such as Love Canal at Niagra Falls.

This particular facility at Arlington enjoys a fine combination of natural geological and meteorological features which together with certain engineering features appears to be very secure with regard to preventing the escape of deposited wastes. This is of more than passing interest to us in British Columbia since this facility is the

repository for most of the hazardous wastes being generated in this province at the present time. There is not a single facility in Western Canada in operation which has been designed and licensed for the specific purpose of disposing hazardous wastes on a commercial scale. Many and possibly most hazardous wastes are being discharged to the regular sanitary landfills as part of the overall stream. This then is the other major problem facing us - to design and implement a program to control the collection, storage, transportation and disposal of hazardous wastes and to achieve the design and construction of proper facilities for the disposal of the hazardous wastes.

What then is the Ministry of Environment doing about spills and hazardous waste disposal? The major thrust of the Waste Management Branch in these areas is our Environmental Safety Program (E.S.P.).

In general the E.S.P. addresses the following needs:

- response actions to spills of petroleum products and hazardous materials;
- development of spill prevention measures with industrial operations;
- development of coordinated spill response contingency plans by industry and government bodies;

- development of disposal facilities and control programs for non-radioactive hazardous wastes;

On April 6, 1977, Section 26 of the Pollution Control Act came into force. This section provides for the Minister to declare a pollution emergency where:

a) pollution has been, is being, or is likely to be caused on land or in water or in air;
b) the pollution is not being or is unlikely to be prevented, controlled, removed or abated;
c) immediate action is required to prevent, control, remove or abate the pollution.

The pollution emergency declaration authorizes the Minister to require any person to provide labour, services, material or equipment to deal with the situation that precipitated the declaration. Money required for the purpose of this section may on the requisition of the Minister and with the approval of the Minister of Finance be paid out of the Consolidated Revenue Fund.

Money expended by the Province in controlling the Pollution incident may be recoverable, if necessary, through filing a certificate of expenses incurred with the Supreme Court.

The Provincial Emergency Program previously of the Provincial Secretary's Ministry has for a number of years fulfilled the Province's response role to spills of petroleum products and hazardous chemicals and have relied upon technical advice from the Waste Management Branch. In light of the new section of the Pollution Control Act an agreement was formulated between the Deputy Provincial Secretary and the Deputy Minister of Environment in late December, 1977, for a cooperative spill prevention and response program.

Under this agreement the Provincial Emergency Program (P.E.P.) is to provide the lead role in the response to spill incidents with technical advice from W.M.B. and at the request of P.E.P., the Waste Management Branch will assume the lead role. Normally P.E.P. will request that W.M.B. assume the lead response role in any hazardous chemical spill or in large petroleum products spills due to the highly technical nature of spill response in such situations. P.E.P. will maintain a 24-hour spill reporting system. W.M.B. is responsible for legal actions against a spiller if necessary and may take action to recover spill cleanup costs in accordance with Section 26 of the Act. The Waste Management Branch is responsible for insuring adequate disposal of non-radioactive hazardous wastes from spill cleanup operations and from industry, institutions and the general public. The Waste Management Branch has responsibility for spill prevention measures including requirements for contingency planning by industry.

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- Response Actions

In 1977 there were 320 spills of all types reported.
Of this total there were 171 oil slick reports, 26 trucking accidents, 62 land spills, 8 train derailments, 49 water spills and 4 miscellaneous spills.

Of the spills reported in 1977, 43 involved some expenditure of Waste Management Branch staff time, 8 involved a fairly large expenditure of time and one emergency declaration was made under Section 26 of the Act.

In 1978 there were approximately 400 spill reports received. Fifty-five spills required the expenditure of significant amounts of W.M.B. staff time and 12 required a major expenditure of time. During 1978, one emergency declaration was made under Section 26 of the Pollution Control Act.

The incident requiring a pollution emergency declaration in 1978 was the trucking accident mentioned earlier in which 43,000 lbs. of Sodium Cyanide was spilled near Kamloops on January 10, 1978. Subsequent cleanup and interim storage of the debris cost the Province approximately $50,000 which has been recovered from the party responsible for the spill. The final disposal of the chemical and debris was billed directly to the insurance company for an amount of approximately $90,000. In addition to the large financial requirements, an incident of this type places an extremely heavy requirement on staff time in supervising response action, documentation of the incident and maintaining records for authorized expenses, etc. This incident demonstrated clearly

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the benefits of Section 26 of the Pollution Control Act and the importance of having a response organization capable of taking quick and effective corrective moves in a spill situation involving hazardous materials.

In Decemeber 1978 a major spill of wood preservative occurred at a lumber mill in Penticton, B.C. resulting in severe contamination of groundwater supplies and treatened fish kills in Okanagan River. The spill occurred on property located on an Indian Reservation which according to present policies dictated a lead response role by the Federal Government. The Waste Management Branch provided a major support role in providing all monitoring services and coordination of provincial agency involvement. The Waste Management Branch costs associated with this support role were approximately $48,000. The response action involved the recovery and treatment of contaminated groundwater. Over a period of three months, 3,021,700 gallons of water was recovered, analyzed, treated and re-analyzed before releases on a 24 hour/day basis.

In 1979, the frequency of spill reports was much like 1978. There were two emergency declarations in 1979 with one being made on February 24, 1979 in connection with a serious gasoline leak into the sewers of Salmon Arm. For this case the emergency powers were required to obtain the necessary testing equipment on a weekend, to determine the source of the leak, as the Petroleum companies were not prepared to take response measures until Monday morning. The situation was extremely dangerous since there was up to six inches of gasoline in the sewer running under

No. 1 Highway through Salmon Arm and any spark could have triggered explosions and fires.

Activities are also carried out under the E.S.P. to prevent or minimize the impact of hazardous material spills. While the natural tendency is to think only of contingency planning for cleanup of spills, it is obvious that an active prevention program aimed at identifying and eliminating potentially hazardous situations before accidents can happen will have a much more desirable cost to benefit ratio than cleanup activities. The prevention activities are intended to encompass two basic approaches - (a) the preparation of spill response contingency plans by industry and for certain government activities and (b) the development of spill prevention procedures and facilities for operations utilizing hazardous substances.

As mentioned earlier, the need to provide satisfactory disposal for non-radioactive hazardous wastes is increasing steadily. At the present time under the E.S.P. shipments of such hazardous wastes as P.C.B.'s and pesticides are made to Arlington, Oregon. The Waste Management Branch provides this service free of charge to private citizens and on a cost basis to commercial generators of small volumes of wastes. Advice and assistance is given to large volume generators enabling them to make their own arrangements for direct shipments to suitable disposal facilities.

Since the continued acceptance of hazardous wastes for disposal at the site in Oregon is subject to the political policy of the day it was considered advisable that British Columbia should begin the process of locating, designing and authorizing a non-radioactive hazardous waste disposal site in this Province.

To this end the province is participating in a major feasibility study into the establishment of Hazardous Waste Disposal facilities in Western Canada. This is a cooperative venture between the Federal Government and the Western Canada provinces and is due for completion in October of this year. I should add at this point that as a matter of policy we hope to avoid significant reliance upon the "secure chemical landfill" concept of disposal and instead utilize more sophisticated incineration and physical chemical facilities. The principal is that destruction of the waste is much superior to simple burial and in the long term may result in less expense.

A final aspect of the hazardous waste disposal program which is in the planning stage is the waste transportation manifest. The purpose of this document is to produce information on waste volumes and to control the movement of certain wastes to only those facilities capable of properly destroying the waste. The Manifest is a type of shipping document which a waste generator must complete when wastes are transported to disposal. The transporter and the disposal site operator must also complete portions of the document showing the final destination of the Waste. This system is currently in practice in Ontario and is a U.S.

Environment Protection Agency requirement to be implemented by all State agencies.

I would like to close my talk with a few words on the role of the Medical Health officers in these areas. With regard to hazardous waste disposal we would welcome any comments or suggestions you may have arising from your concern for the impact of this problem on public health. Certainly your involvement and support will become increasingly important as the difficult tasks of siting and designing the waste destruction facilities begins.

In the area of spill response we would like you to know that it is the policy of our branch to ensure that Medical Health officers are advised of any spill with a potentially significant public health impact. In fact, in such cases the active assistance of the Medical Health officer is required in the decision making processes during the spill response and clean-up. Under such circumstances I would request you to offer your assistance as expeditiously and to the maximum extent possible - the health and welfare of the response teams and the public may depend on it.