

Office Memorandum

DEPARTMENT Pollution Control Agency

TO : Terry Hoffman, Director
MN Pollution Control Agency
Mark W. Seetin, Commissioner
MN Department of Agriculture

DATE OCT 14 1980

FROM : ① Arsenic Task Force

MeH 10/9/80
JWB 10/13/80
TKS 10/14/80

PHONE: _____

SUBJECT: ② TASK FORCE REPORT

1980

Attached is the Arsenic Task Force final report and recommendations. We have attempted to fully respond to each of the tasks given us by your August 1, 1980 memo. If you have any questions concerning the report, the task force is ready to meet and discuss any aspect of our work.

MEH:lt

MINNESOTA POLLUTION CONTROL AGENCY/MINNESOTA DEPARTMENT OF AGRICULTURE
ARSENIC TASK FORCE REPORT

BACKGROUND

In the 1930's and 40's grasshoppers were a devastating crop pest in many areas of the state. Various arsenic compounds and sodium fluosilicate were mixed with sawdust, bran, and molasses to form a poisonous bait in an effort to control the grasshoppers. The bait was spread at a rate of 5-20 pounds per acre. Mortalities of 60-80% occurred due to grasshoppers eating the bait. Use of grasshopper bait was extensive in Minnesota. During the five year period 1935 to 1940, 36,590 tons (over 73 million pounds) were used in this state. The extensive and widespread use of the bait were factors that resulted in a significant amount of surplus bait on hand when the grasshopper threat was over. The development of new and better pesticides caused arsenic pesticides to be phased out and necessitated disposal of this surplus bait. This leftover bait from 40 to 50 years ago is causing our present problems.

The first serious incident involving arsenic contamination in Minnesota which was brought to the attention of state agencies occurred in Perham in 1972. In May of that year a newly installed well, used by employees of a construction company for drinking water, became contaminated with arsenic. The well had been placed adjacent to a burial site used for grasshopper bait laden with arsenic. The next arsenic incident was reported to the MPCA in October, 1979. A farmer near Warren, who had purchased his farm in the mid-1960's, discovered a corroded drum of liquid arsenic compound in an outbuilding. The incident which ultimately created wide public interest occurred on a farm west of Two Harbors. Twelve head of cattle died in April, 1980, from arsenic poisoning.

In response to the rising arsenic problem and the public concern, a task force of MPCA and MDA staff was formed on August 1, 1980. The MDA has been designated by the legislature as the lead state agency on pesticides and the MPCA is charged with protecting Minnesota's environment. The task force was given several tasks to perform and is required to submit recommendations for appropriate state action. The following are the task force responses to the tasks and our recommendations:

TASKS

- A. The work group shall study and analyse the scope and nature of the arsenic problem, identifying factors relative to risk, ability to handle, and the ability to dispose of the materials.

Response

At present between 50 and 60 grasshopper storage or burial sites have been reported. The type, total amount, and the concentration of the poison in the bait material are unknown at most burial sites and some above ground storage locations. The poison used is one complicating factor. Reports written in the 1930's and 1940's state that various arsenic compounds and sodium fluosilicate were used as poisons. The main arsenic compounds utilized and their toxicity are listed below along with sodium fluosilicate and some common chemicals for reference.

<u>Test Animal</u>	<u>Chemical</u>	<u>Concentration</u>	<u>Uptake Route</u>	<u>Effect</u>
Rat	Arsenic trioxide	13.0 mg/kg	oral	LD50*
Rat	Sodium arsenate	16.0 mg/kg	--	fatal dose
Rat	Sodium arsenite	4.5 - 42 mg/Kg	--	LD50
Rat	Calcium arsenate	20 mg/Kg	oral	LD50
Rat	Lead arsenate	80 - 100 mg/Kg	oral	LD50
Rat	Sodium fluosilicate	125 mg/Kg	oral	LD50
Rat	Sodium chloride (salt)	3000 mg/Kg	oral	LD50
Rat	Aspirin	1000-1600 mg/Kg	oral	LD50
Rat	DDT	113 mg/Kg	oral	LD50

* LD50 = Lethal Dose for 50% of the test animals

** Table References

- (a) Registry of Toxic Effects of Chemical Substances.
1978. NIOSH. US Dept. Health, Education and Welfare
- (b) Farm Chemicals Handbook. 1980. Farm Chemicals Magazine.
Meisler Publishing Co. 66th Edition.

When a grasshopper bait burial or storage site is reported the MDA and MPCA don't know what the poison is unless specific information or analytical data is available. At the time of this report we have no definite evidence that any of the sites contain sodium fluosilicate rather than arsenic, but it remains a possibility.

The MDA and MPCA staff feel that the grasshopper bait problem can be divided into two categories - above ground storage or below ground storage (burial). Each has its own elements which need to be considered. Arsenic stored above ground has a potential for human and animal exposure with resultant harmful effects. Above ground storage of the material allows for a relatively easy determination of the type (pure poison or bait) and amount of the material. In addition, the above ground material can be more easily contained and isolated than buried material. The primary problem relative to above ground storage is disposal and the primary concern is human exposure to the arsenic.

The primary concern regarding buried arsenic is the potential to contaminate groundwater. The initial problem relative to below ground storage is certainty of information regarding type, amount, and location of material. For example some present reports of arsenic burial are dependent on a person's memory 30 or 40 years ago. In these cases certainty of amount and location, in particular, may be limited. Written information produced at the time of burial giving the amount and site description would seem to be the most reliable information available. In cases where information is hazy or nonexistent the initial effort needed to generate data to reasonably assess the scope and seriousness of the problem at any one site may be substantial. The effort needed may include drilling, digging, sample collection and analysis. Below ground storage presents problems that will take a longer time period and a greater expenditure of resources to address.

- B. The work group shall consider additional information or data needed on arsenic situations already known to exist, or to be identified in future, that will assist in making decisions regarding resolution of problem situations.

Response

The ideal data needed for a complete assessment of arsenic situations are as follows:

- (a) Type of material (uncut or bait)
- (b) Type of poison
- (c) Amount
- (d) Party who has control over the material
- (e) Address and phone number of party
- (f) Location of the material
- (g) Condition of material
- (1) Above ground storage
 - a. Present containment and isolation of material
 - b. Exact storage location (garage, attic, basement)
- (2) Below ground storage
 - a. Exact location of burial
 - b. Type of containment upon burial (burlap bags, wooden barrels)
 - c. Depth of burial
 - d. Date of burial
 - e. Soil types
 - f. Depth of water table
 - g. Direction of groundwater flow
 - h. Depth of nearest well

- C. The work group shall consider and identify the safety measures that should be followed by the public and other parties that may come in contact or handle arsenic contaminated material.

Response

(a) Toxicity

A number of factors influence the toxicity of the arsenicals. These include the following: chemical form, physical form, mode of administration, species, and criterion of toxicity.

The acute toxic effects of arsenic are generally seen following ingestion. Cases of acute arsenical poisoning due to inhalation are exceedingly rare in industry. Acute arsenical poisoning due to inhalation results in severe inflammation of the mucous membranes.

Chronic arsenical poisoning due to ingestion is rare and generally confined to patients taking prescribed medications. Inhalation of inorganic arsenic compounds is the most common cause of chronic poisoning in industry. There is strong evidence that inorganic arsenic is a skin and lung carcinogen in man.

Trivalent arsenic compounds are corrosive to the skin. Brief contact has no effect, but prolonged contact results in a local hyperemia. The moist mucous membranes are most sensitive to the irritant action. Arsenic trichloride can be absorbed readily through the skin.

The present arsenic problem in Minnesota represents a potential for exposure to arsenicals which is different than that normally discussed.

(b) OSHA Standards

The task force considered the applicability of OSHA Standard 1910.1018 (Occupational Exposure to Inorganic Arsenic), but the standard states that it does not apply to employee exposures in agriculture or resulting from pesticide application.

(c) Guidelines for Respiratory and Dermal Protection When Handling Arsenic

1. Do not touch the mouth or rub the eyes while working with arsenic containing material.
2. Do not eat, drink, smoke, or chew gum while working with arsenic.
3. Wash hands and face before eating, drinking, smoking, or using the toilet.
4. Use the following protective clothing and equipment:
 - Goggles
 - Unlined rubber or neoprene gloves
 - Unlined rubber or neoprene boots
 - Properly fitted respirator (with high efficiency filter cartridge for fine dusts)
 - Protective clothes (long-sleeved shirt, long-legged trousers, raincoat, or waterproof suit)
5. At the end of each work day, decontaminate protective clothing and equipment by washing with a mild detergent in water. Never wash contaminated clothes with family laundry. Shower thoroughly with soap at the end of each working day.

(d) A list of safety equipment firms is available from the MDA or MPCA.

- D. The work group shall consider and develop criteria that can be used to prioritize the situations so that reasonable decisions regarding use of limited monetary or staff resources can be made.

Response

Criteria for prioritizing situations so that the greatest benefit may be achieved at the least effort and cost are as follows:

(a) Above Versus Below Ground Storage

1. Above ground situations in general should be handled immediately given the ease of determining amount and type of material. Those above ground sites in which the material is not contained or isolated should be handled before other above ground situations.
2. Below ground sites should also be acted upon immediately as a general group, but sites in which well water or ground water contamination has been documented should have the highest priority.

(b) Individual Site Considerations

1. After the above ground and problem below ground investigation is completed the information from Task B will be used to determine the seriousness of individual burial situations and each will be handled in order of concern. The prioritizing factors will include amount of material, type of material, depth to groundwater and others.

- E. The work group shall consider various means of collecting and/or consolidating the arsenic contaminated materials so as to facilitate interim storage and, final disposal.

Response

Alternatives for collection, storage and disposal responsibility are as follows:

1. On-site collection and immediate disposal by the state.
2. State collection and consolidation of material and immediate disposal by the state.
3. State collection and consolidation at a storage site with disposal at a later date.
4. Drop off at a collection site by party with control of the material, with subsequent storage or disposal by state.
5. Total responsibility for handling and disposal by party having control over the material.

- F. The work group shall determine and evaluate various alternatives of disposing of the arsenic contaminated material, where disposal is deemed necessary.

Response

Alternatives for disposal of the material are as follows:

- (a) Shipment out of Minnesota - This alternative solves the arsenic problem in Minnesota by transferring the material to another state. It is a feasible alternative because some states already have acceptable hazardous material disposal sites and are capable of handling the material.
- (b) The task force considered several alternatives that fall under the instate disposal option. The alternatives with discussion of feasibility are as follows:
 - (1) Incineration is one form of disposal but will not work with arsenic. Arsenic is an element and can not be destroyed by burning. Burning of bait material may cause some consolidation of the material but may release arsenic to the air.
 - (2) Landfilling is another disposal method which is not feasible at present because Minnesota does not have a hazardous waste disposal landfill. The Waste Management Act, passed by the 1980 Minnesota Legislature, creates a mechanism that will lead to establishment of a hazardous waste disposal site in a few years. Storage of the arsenic until the site is established is an alternative.
 - (3) Landspreading is a third disposal alternative. Land application is the intimate mixing or dispersion of wastes into the upper zone of the soil-plant system with the objective of microbial stabilization, adsorption, immobilization, or selective dispersion, leading to an environmentally acceptable assimilation of the waste. Landspreading is a feasible disposal method for arsenic if certain conditions are met:

1. Soils

- (i) Soil pH should be near neutral
- (ii) Soil should be loam texture or heavier
- (iii) Soils should be well drained and aerobic
- (iv) Land slope should be 0-6%
- (v) The water table should be greater than 5 feet below the surface

2. Sites

- (i) Site should be level to prevent runoff
- (ii) No standing water should be allowed on the site
- (iii) Extensive buffer zones from dwellings or surface water must be maintained

3. Crops

- (i) Oats or corn are acceptable
- (ii) Alfalfa can not be used
- (iii) Grass is also acceptable

4. Application

- (i) Even distribution over entire site
- (ii) Material must be incorporated into the soil after application

5. Application rates

- (i) Rate may be as high as 50 pounds per acre as arsenic
- (ii) One application for each site
- (iii) Should be applied at acceptable agronomic rate of up to 20 pounds per acre sodium arsenite or 11 pounds per acre arsenic.

6. Unknowns

- (i) The level of existing arsenic in soils treated in the 1930's versus soils which did not receive arsenic
- (ii) The total versus extractable arsenic levels in soil
- (iii) Levels of other heavy metals complexed with arsenic

Landspreading raises the following concerns:

- (1) How to assure that individuals handling the arsenic material do so in a safe manner utilizing the proper equipment
- (2) How to assure that an application method will give an even, accurate spreading of the material will be utilized.
- (3) How to locate a publicly and environmentally acceptable disposal site or sites

(c) Reuse

- (1) Arsenicals are still registered as agricultural chemicals, some uses are as follows: apples, asparagus, blueberries, celery, cherries, grapes, cranberries, loganberries, peaches, pears, peppers, plums, strawberries, tomatoes, turf and ornamentals. Recent recommended rates of application are:
 - a. Lead arsenate at 3-60 lbs/acre for fruits, vegetables, nuts, turf and ornamentals.
 - b. Paris green at 1-16 lb/acre as baits and mosquito larvacide
 - c. Sodium arsenite at 1-20 lb/acre in baits and as a nonselective herbicide
- (2) Concerns with reuse are numerous. Obtaining someone to use the material on their crops may be difficult. None of the above listed uses for arsenicals are significant parts of Minnesota's agricultural production. Many of the arsenic reports we have received are for different types of arsenicals. Extensive analyses would have to be performed to determine the specific compound and concentration of arsenic in a mixture.
- (3) Reuse of the arsenic does not appear to be a feasible alternative.

(d) Recycling

1. Major recycling centers and waste exchanges have been contacted and exhibit no interest in this arsenic material.
- G. The work group shall consider and develop a listing of other parties, governmental and non-governmental, that have capabilities and resources to assist the State agencies in dealing with these problem situations. The listing shall identify the specific capabilities and resources of the parties that are relevant to the problem.

Response

The task force has identified the following governmental or non-governmental units which could possibly provide assistance. However, the task force has not contacted all of these to see if or how they could commit to assist.

(a) Federal

1. U.S. Environmental Protection Agency
 - (1) Site investigation
 - (2) Disposal information
 - (3) Money
2. U.S. Department of Agriculture
 - (1) Information on historical use and research

(b) State (Other than MDA and MPCA)

1. Minnesota Department of Transportation
 - (1) Heavy equipment and trucks
 - (2) Handling and storage

2. Minnesota Department of Natural Resources
 - (1) Land for landspreading
3. Minnesota Department of Health
 - (1) Health Risk Assessment particularly of buried sites
4. University of Minnesota
 - (1) Research data
 - (2) Information on past or present use
5. National Guard
 - (1) Heavy equipment and trucks
 - (2) Handling and safety equipment
 - (3) Manpower

(c) Local

1. Pick up and storage
2. Interim storage sites
3. Site investigations
4. Heavy equipment and handling
5. Information source regarding historical use in area and exact burial site locations

H. The work group shall develop cost figures relative to each task areas identified above; the cost figures should include staff time related items as well as cost figures for services that cannot be provided by agency employees.

Response

(a) Safety Equipment

- (1) Safety equipment listed in task C. (c) would cost approximately \$75.00

(b) Out of State Disposal

- (1) Example one requires manpower inputs from the party controlling the material or from the state. This means someone other than the pickup and disposal agent would have to do the following tasks.

1. Handle and pack all material
2. Place drum at dock height
3. Label each drum with type and amount of material

Allowing inexperienced people to handle a hazardous waste could result in their exposure to dangerous levels of contamination.

If each site was viewed separately cost through this example would be:

		<u>Average Total Site Cost</u>
Safety equipment	\$ 75 per group	\$75
Drum	\$ 25 per drum (2)	50
Disposal	\$150 per drum (2)	300
Pickup charge	\$ 65 per stop	65
Packing	\$ 10 per drum (2)	20
Analysis (Total Arsenic)	\$ 20 per analysis (2)	<u>40</u>
		\$550

- (2) Example 2 requires no manpower from the state or from the party controlling the material. A consultant performs all tasks. The estimated cost for this action is estimated to be between \$10,000 and \$30,000 for all reported above ground sites. This cost will rise as new sites are reported. Costs also increase rapidly if more than two drums are used per site.

c. Landspreading

Landspreading costs are analysis costs, equipment costs and manpower costs.

- (1) Equipment costs may include:

- Safety equipment
- Either dry or liquid application equipment
- Land for the application

- (2) Analysis costs (\$20 per test for total arsenic) could be quite extensive if a large number of separate containers were stored. The exact concentration and amount of material to be spread must be known so that correct application rates may be adhered to. Analysis of the land prior to spreading would be necessary to determine the correct application rate. Analyses would have to be conducted during and after the application to insure that correct rates were being applied. If any problem occurred future site monitoring could require a great number of analyses.
- (3) Manpower costs could be the most significant cost to any landspreading effort. A great deal of state staff time could be tied up in coordinating, overseeing, sampling and inspecting application sites and procedures.

1. The work group shall identify and consider, working with staff from the Attorney general's offices, the various legal implications of the issues and alternatives identified by the work group as a result of dealing with tasks a-h.

Results

A Special Assistant Attorney General (SAAG) attorney has been assigned to provide legal advice to the task force when a course of action has been determined.

- J. The work group, as it develops and considers alternatives for eliminating or mitigating various elements of the arsenic problem, shall evaluate the implications of proposed administrative action by the agencies on other program activities; specifically the work groups shall evaluate the precedent implied or directly established if alternatives are implemented.

Response

The primary precedent setting issue related to the arsenic problem involves whether the state should accept responsibility for handling, transportation and disposal of above ground materials and for investigations, excavation and disposal of buried materials. The precedent would arise because the state would be accepting responsibility for resolution of a waste problem. Further, if the state assumes responsibility for hazardous waste from agriculture, which is an industry, the question will arise as to whether it will accept responsibility for other hazardous waste from other state industries.

The state has three different paths it may take when dealing with the arsenic bait disposal problem. The first is to deny any responsibility or liability for the handling and disposal of the pesticide bait. This denial would be supported by the fact that the extensive state involvement with arsenic bait in the past (such as storage and distribution) was at the request of the agricultural community at that time. Farmers asked the state to obtain and distribute to them the arsenic bait. The program was voluntary and no one who didn't want to participate in the baiting program was forced to do so.

The second path would involve the state accepting responsibility for all aspects of the arsenic bait problem, while still maintaining a position of nonresponsibility for other industrial hazardous wastes. This alternative means the state would accept the responsibility for the arsenic bait only because of the extensive involvement in the baiting program. The state would need to base its action on some facts and discussion that differentiated this situation from others. The state would not accept responsibility for other pesticides that were not specifically involved in the grasshopper baiting program.

A third option, and one recommended by the work group, is for the state to accept limited responsibility for some portion of the arsenic problem. The state would provide technical assistance to help individual parties to resolve on their own the specific arsenic handling or disposal problem that they have. However, the state would not actually get involved in disposal of material.

- K. The work group shall consider activity and procedures needed to comply with federal and state hazardous wastes rules and procedures if and when various alternatives for resolution of the arsenic problem are implemented.

Response

(a) Assumptions

In order to determine the applicability of the Federal and State Hazardous Waste Rules some assumptions need to be made.

1. All waste arsenic compounds and baits have greater than 500 ppm arsenic.
2. There is less than 1000 kg (2,200 lbs.) of the bait at any one location.

(b) Waste Classification

The waste grasshopper bait would be classified as a hazardous waste according to the State Hazardous Waste Rules 6 MCAR § 4.9001 B. 40. a. (an oral LD₅₀ of less than 500 mg/kg) and 6 MCAR § 4.9002 B. 1. (a concentration greater than 500 ppm arsenic).

The waste grasshopper bait would most likely be classified as hazardous according to the Federal Regulations. 40 CFR 261.11 references Appendix VIII as a criteria for listing hazardous waste. Appendix VIII identifies arsenic and its compounds as hazardous constituents. 40 CFR 261.33 e list arsenic acid, arsenic pentoxide and arsenic trioxide as acute hazardous wastes and 40 CFR 261.24 identifies an extraction procedure concentration of 5.0 mg/l of arsenic as a hazardous threshold level.

(c) Waste Management Requirements

The State Rules essentially require; (1) the use of shipping papers in accordance with 6 MCAR § 4.9008 if the waste is transported off site, (2) the waste be transported and containerized in accordance with requirements in 6 MCAR § 4.9005 and (3) that the waste be transported to a hazardous waste facility permitted in accordance with 6 MCAR § 4.9006. 5 MCAR § 4.9002 C. 12. allows the Director to exempt wastes resulting from the clean up of spills from any or all the provisions of the State Rule.

According to the Federal Rule 40 CFR 261.5 (a) quantities less than 1000 kg are not subject to regulation under 40 CFR 261 through 265 and 40 CFR 122 through 124. This means that the waste is not subject to the notification and many of the management requirements of the U.S. EPA. Certain commercial chemical products and manufacturing chemical intermediates, 40 CFR 261.33 (e), are subject to Federal Regulation in quantities as small as 1 kg. The task force is assuming that the bait is not categorized as a pure commercial chemical product (referenced to "Pesticide & Toxic Chemical News" Volume 8, Number 36, July 30, 1980, pages 3 and 4).

(d) Conclusions

1. Shipping papers are required if the waste is transported off site, 6 MCAR § 4.9008.
2. The waste must be transported to a permitted hazardous waste facility unless it is disposed of by on site resource recovery (land application).
3. Proper DOT containers must be used for waste shipment and other transportation requirements of 6 MCAR § 4.9005 must be complied with.

- L. The work group shall consider the extent to which various options and alternatives identified for the handling of the arsenic situations represent reasonable and feasible means of dealing with other agricultural chemical accumulation and disposal problems. To the extent possible, criteria should be developed to differentiate various categories of problems, type and magnitude.

Response

The problem of other pesticides being present when arsenic baits are reported must be considered. Also, the task force is aware of several above ground reports involving 1-20 lbs of pure arsenic compounds which were probably never connected with the grasshopper problem but were used for other small scale chewing insect problems or as a herbicide. Accepting responsibility for these non-grasshopper bait arsenicals would set a precedent for accepting other surplus or waste pesticides.

Criteria for dealing with other chemicals may include the following items:

- (a) Quantity of other pesticides or chemicals
- (b) Period of time in which the chemical was used (e.g. 1900's, 1930's 1970's)
- (c) Party controlling the material - Private or business
- (d) The administrative status of the chemical
 1. Banned or restricted use chemical
 2. Classified as hazardous waste or not

The task force concludes that each of these new categories should be considered on a case by case basis, with the same factors described herein (e.g. disposal option, cost) considered in making the decision.

MDA-MPCA ARSENIC TASK FORCE RECOMMENDATIONS

1. The elimination of the above ground arsenic storage sites should be given priority.
 - a. Arsenic stored above ground has a potential for human and animal exposure with resultant harmful effects.
 - b. Above ground sites should be given priority because the amount, type, and condition of the material is easily discernible.
2. Below ground sites should be investigated.
 - a. The investigations should have the following priorities:
 - (1) The Perham, Wadena, and Morris sites should have the same priority as above ground sites because they contain the largest amount of arsenic and pose the greatest potential threat to groundwater quality and health.
 - (2) Below ground sites which pose a potential health hazard should receive next priority.
 - (3) All other sites should receive the lowest priority.
 - b. Resources
 - (1) The US EPA should be asked to investigate the buried sites listed in a-(1) above because the state agencies do not have resources to undertake these extensive investigations.
 - (2) The state should utilize its limited resources to investigate the smaller burial sites. These are estimated to take two man-days per location.
3. Landspreading and out-of-state shipment are the most feasible disposal alternatives.
 - a. The arsenic grasshopper bait obtained from above ground storage or recovered from buried locations can be disposed of instate by landspreading.
 1. If proper equipment and procedures are utilized, the arsenic can be handled safely.
 2. Conditions for landspreading have been developed to insure environmental safety and balance.
 3. Financial cost of the landspreading would be borne by the party controlling the material.

- b. Out-of-state shipment of the material with all work performed by a consultant is the fastest and safest method of eliminating the arsenic problem.
 1. Only experienced professional people handle the arsenic material.
 2. This alternative eliminates public concern regarding placement of the material on land.
 3. Financial cost of the disposal would be borne by the person controlling the material.
- c. Interim storage of the material by the responsible party is a feasible interim alternative that could be used in conjunction with disposal alternatives identified in 3 (a) and 3 (b) above. Disposal of the material could then occur instate when a hazardous waste disposal site is available.
 1. Storage of the material must be in a manner that removes all concern for human and animal exposure and environmental release.
 2. MPCA and MDA will determine proper storage procedures, sites and containers.
 3. Financial cost of the storage would be borne by the person controlling the material.
4. The State of Minnesota should commit technical resources to allow for proper disposal of arsenic grasshopper bait by the party controlling the material.
 - a. The MDA and MPCA should assume technical commitment to insure proper land application of arsenic compounds discovered above ground or recovered from below ground. This commitment may include such things as sample collection, sample analysis, and site investigations.
 - b. The MPCA should assume technical commitment for the investigation of buried sites and their effect on groundwater. This commitment may include such things as sample collection, sample analysis and site evaluations.
 - c. No increase in agency staff will be necessary in order to provide technical advice and guidance.
5. On August 1, 1981, the MPCA and MDA should evaluate and report on the success of the programs to resolve the arsenic problems. New disposal alternatives, financial responsibilities, and potential enforcement actions should be considered at that time, if deemed necessary.