

The Commonwealth of Massachusetts

RECEIVED BY
OFFICE OF CITY OF
FEB 1 9 15 AM
CAMBRIDGE MASS
Executive Office of Human Services

Department of Public Health

150 Tremont Street

Boston 02111

BAILUS WALKER, Jr, Ph.D, M.P.H.
Commissioner

SUBJECT: Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts

PERSONS
INTERVIEWED: Mr. D. Reid Weedon, Vice President
Mr. Scott Stricoff, Industrial Hygienist

BY: Elise M. Comproni
Chief, Environmental Hygienist
Division of Environmental Health Assessment

DATE: January 6, 1984

Accompanied by Gerald Parker and Elaine Krueger, Department of Public Health, a visit was made to this facility on November 2, 1983, to inspect the newly constructed toxic materials laboratory.

According to Mr. Weedon, Vice President, the laboratory was constructed primarily to handle highly toxic materials. A considerable part of the activity will be contract work for the military, as well as some contract work for private enterprise.

PROCESS DESCRIPTION

The company will develop analytical methods to detect very low levels of toxic chemical agents, some of which are used by the military. These techniques will be used mainly to analyze soil and water samples for low levels of contamination.

The vials of chemical agents are stored in the secure ventilated storage closet. The material is moved from storage to the ventilated dilution hood by two workers wearing full protective clothing and respiratory protection. After the dilution is made the material is moved to the second laboratory where the analytical chemistry is carried out. Liquid wastes are collected and treated as hazardous waste and rinse water goes to holding tanks for treatment before discharge.

The inventory of chemical agents on site will change from time to time, but the laboratory safety rules will remain in effect for all chemicals in the laboratory area at any time.

A total of one half liter of highly toxic chemicals and a maximum of ten gallons of flammable material will be allowed in the laboratory. In actual practice it is expected that the quantities of these materials present will be considerably less.

The toxic materials will be transported by the military from Bedford Airport to the laboratory in Cambridge by government vehicle and it is expected that no more than two such shipments will be made per year. This will be coordinated by the military with the Massachusetts State Police for escort vehicles, and local fire and police departments for emergency response in the event of a highway accident.

The material is packaged in 10 ml sealed vials which are in turn packed inside one quart cans provided with enough absorbant material to absorb all of the chemical in the event of a spill. The one quart cans are packed in absorbant material inside a locked steel pig. The pig is delivered to the laboratory by the military personnel. No biological agents or radioactive materials are allowed inside the laboratory.

The following materials are expected to be received in the foreseeable future:

- Soman - GD (nerve agent)
- Sarin - GB (nerve agent)
- VX (nerve agent)
- Mustard - HD (blister agent)
- Lewisite (blister agent)

PHYSICAL PLANT CONTROL EQUIPMENT

This is a third floor laboratory in a three story building that occupies approximately 1800 square feet. The space is partitioned into three separate laboratories provided with glass windows for viewing all activities from a separate observation area as well as from each laboratory.

This is a secure work area that is kept locked at all times. Only authorized personnel are allowed to enter under the direct supervision of the laboratory director. There is only one entrance which is through the clothing change area, and one exit which is through the shower and clothing change area.

Ventilation is provided for the three laboratories through the chemical hoods. The exhaust for the hoods is selfbalancing, which maintains a constant face velocity at the hood entrance and a constant ventilation rate for each laboratory. There are three levels of negative pressure for the three areas, with the highest degree of negative pressure for the storage and dilution laboratory.

The exhaust blowers and filter systems are located on the roof. There are two separate systems in parallel connected by a damper arrangement. One of the blowers is powered by natural gas and can be brought on line in less than thirty seconds.

The filter systems each consist of a roughing filter, an absolute filter and a charcoal filter bank. The backup system will be used during routine maintenance and filter changes. The filter changes will be made in a closed bag type arrangement, which is designed to prevent the escape of any contaminants.

FIRE PROTECTION

The laboratories are equipped with an automatic sprinkler system that activates at 165° F and utilizes an ethylene glycol water mixture to prevent freezing.

The fire alarms are connected directly to the Cambridge Fire Department as well as to the plant fire control office. Smoke detectors are also located in each of the laboratories.

The Arlington and Belmont Fire Departments have also been informed of the activities in this laboratory facility. The fire fighting personnel have been instructed not to enter the laboratory. In the event of fire they are instructed to let the laboratory burn and only contain the fire from the outside.

AIR QUALITY MANAGEMENT

Air monitoring will be carried out in the laboratory work areas at the beginning of each new project and repeated on a quarterly basis. More frequent monitoring will be carried out whenever the need arises.

The Threshold Limit Values provided by the military will be met in all work areas. These values meet and exceed all OSHA established standards.

The company is in the process of applying for plan approval for the ventilation controls for the laboratories. This was delayed somewhat due to a misinterpretation of the Division of Air and Hazardous Materials Regulations.

The discharge air from the exhaust system is tested quarterly. This is done by sampling the air between the two charcoal filter beds to detect any possible break through from the first charcoal filter. The filters are changed if any break through occurs.

WATER QUALITY MANAGEMENT

The laboratory hoods have a spill capacity of 40 liters each. This is far in excess of any expected use of these hoods. The floor drains are piped to two 360 gallon stainless steel holding tanks for treatment prior to discharge to the MDC sewer system. There are no direct connections to the sewer system. This requires the tanks to be pumped into the sewer after treatment. The MDC indicated that a permit will be issued for this installation in approximately two weeks.

DEQE does not require a permit for this facility because the discharge is less than 2000 gallons per day. However, the agency has asked the company for information for their review.

WASTE MANAGEMENT

Waste materials from the laboratories will be disposed of as hazardous waste. The filters from the ventilating system will also be disposed of as hazardous waste. These materials will be handled and stored in compliance with DEQE/EPA hazardous waste regulations. The disposal contractor is Chemical Waste Management of Massachusetts, Inc., Natick.

PERSONNEL PROTECTION

There are four workers presently employed in this laboratory and the staff is expected to increase to six in the near future. The workers are given preemployment physical examinations that will be repeated annually. This includes a complete blood study, EKG, chest x-ray and serum cholinesterase test. The cholinesterase test will be repeated semi-annually. The workers will have to be approved by the occupational health physician after each physical examination before returning to work.

The workers at the dilution hood will be required to wear respiratory protection Tyvek garments, head covers, shoe covers, safety glasses, two pairs of gloves, and a rubber apron. Workers at the regular hoods will not be required to wear an apron or respirator, and will be required to wear only one pair of gloves.

Each laboratory is equipped with a safety shower and an eye wash fountain. The inter-communication system is on at all times so that voice contact outside the laboratory is maintained.

The military requires that the company provide a laboratory safety manual. This document is available for review on the premises but cannot be taken off site.

SUMMARY/CONCLUSION

The primary function of this laboratory is to develop chemical analytical methods to detect low concentrations of highly toxic materials in soil and water samples. These materials include nerve agents and blistering agents used by the military.

Protection of the general public and the workers at the facility requires an adequate control program and protective equipment.

The laboratory is provided with three stage collection on the laboratory exhaust system. This consists of a primary filter, an absolute filter and a two bed charcoal filter. Any break through on the first charcoal bed triggers a complete filter change. A redundant system is provided for emergencies and filter changes. The laboratory hoods are of self balancing type to insure adequate ventilation in the laboratory.

The fire departments of Cambridge, Arlington and Belmont are fully informed of the activities at this laboratory. They have been instructed not to enter the laboratory in the event of a fire. Fire suppression is to be from the outside.

Air sampling is provided in the laboratory at the beginning of each project and quarterly thereafter unless more frequent sampling is indicated. The exhaust system discharge is sampled between the charcoal filter on a quarterly basis.

All water discharges go to holding tanks for treatment prior to discharge into the MDC sewer.

Laboratory waste is treated as hazardous waste and is disposed of by a DEQE licensed hazardous waste contractor. (Chemical Waste Management of Massachusetts, Inc., Natick)

The workers are provided with and are required to wear protective equipment. These include headcovers, respirators, Tyvek garments, shoe covers, safety glasses, gloves and rubber aprons. Each worker is given a complete physical examination annually including a complete blood study, EKG, chest x-ray, and serum cholinesterase test. The cholinesterase test is repeated semi-annually. The occupational physicians must approve the return of any worker to his/her job.

It is concluded from the review of the design of this facility that utilization of state of the art equipment should minimize contamination of the environment and reduce the risk of hazard to human health.

EM/lap

RECEIVED BY
OFFICE OF CITY CLERK

FEB. 1 9 16 AM '84

CAMBRIDGE, MASS.

RECEIVED BY
OFFICE OF CITY CLERK

FEB 1 9 16 AM '84

CAMBRIDGE, MASS.

 Arthur D. Little, Inc.

January 31, 1984

Mr. Paul E. Healy
City Clerk
Cambridge City Council
City Hall
795 Mass. Avenue
Cambridge, MA 02139

Dear Mr. Healy:

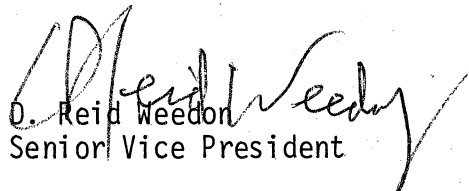
I have been given a copy of Councillor David E. Sullivan's communication of January 27, 1984 to the City Council to which the report of the State Department of Public Health concerning our toxic materials laboratory was attached.

The report, attached to Councillor Sullivan's communication is dated December 22, 1983 and is likely a draft although it is not so labeled. The report lacks the Summary and Conclusion section. Enclosed is a copy of the Department's report dated January 6, 1984 which is somewhat modified and contains two additional pages.

The important item to observe is the concluding paragraph of that report which states: "It is concluded from the review of the design of this facility that utilization of state of the art equipment should minimize contamination of the environment and reduce the risk of hazard to human health."

I would appreciate your seeing that the appropriate people receive a copy of the most recent Department of Public Health Report.

Sincerely,


D. Reid Weedon
Senior Vice President

/lsb

Enclosure

cc: Robert W. Healy

Brussels	Madrid	São Paulo	Wiesbaden
Houston	Paris	Tokyo	
London	Rio de Janeiro	Toronto	
Los Angeles	San Francisco	Washington	

1.

S-66

Comm. from D. Reid Weedon, Senior Vice-Pres.,
Arthur D. Little, Inc., transmitting a copy
of the State Dept. of Public Health report
of January 6, 1984 Re: ADL's toxic mater-
ials laboratory.

*Copy put aside into referral envelope
to be sent to Scientific Advisory Committee
when constituted 2/7/84 m*

In City Council,

February 6, 1984

2/6/1984

*Referred to the
Scientific Advisory
Committee when
constituted.*