




UNIVERSITY OF MINNESOTA  
TWIN CITIES

Health Sciences Planning Office  
Physical Planning  
4103 Powell Hall, Box 75  
500 Essex Street S.E.  
Minneapolis, Minnesota 55455  
(612) 373-8981

January 24, 1978

TO: Unit B/C - Phase I File  
Unit K/E File

FROM: Robert Swanson   
Health Science Planning

SUBJECT: Health Sciences Complex  
Proposed Radioactive Waste  
Facilities

A. Radioactive Solid Waste Compaction Facility:

- This particular facility could be located on the first level of the existing Mayo garage, just west of the new animal receiving area currently under construction as part of Unit B/C - Phase I.
- The space required would equal approximately 120 gross square feet, consisting of a receiving area, compaction area and a barrel storage space.
- Currently 20 uncompactd 55-gallon drums of solid waste is collected each week; therefore, Jerry indicated that the use of a compactor would reduce the number of drums collected per week by 75%.
- Jerry indicated that this particular facility includes an anticipated growth of 10 to 15% per year for the next five-year period.
- Since the charcoal filter exhaust system offered as an option to the compactor unit is inadequate, it will be necessary to tie this particular facility's exhaust work, filters, etc. into the Unit B/C laminar flow fume hood exhaust riser located in mechanical core Number 33.

- For clean up, a hot and cold water hose station should be provided in the receiving area.  
(Note: The area shall not have a floor drain, so all spills or moisture on the floor should be picked up, using a liquid vacuum.)

- Finishes:

- A. Walls - concrete block with epoxy paint.
- B. Floor - concrete slab with epoxy paint.
- C. Ceiling - plaster with epoxy paint.

- Estimated costs:

A. Compactor	\$ 12,000
B. General Construction	5,000
C. Mechanical Construction	10,000
D. Electrical Construction	2,000

Total \$ 29,000

B. Liquid Waste Facility:

- This particular facility could be included in the existing solvent Storage Room #9 located on the Mezzanine level of Unit K/E.
- The space required would equal approximately 120 gross square feet, equally divided into two separate rooms. Each space shall be sub-divided by a 2-hour rated enclosure. One room will house the water soluble waste drum pouring operations, and the other will handle the solvent waste drum pouring operations.
- The waste drums should be grounded and all "waste chutes" should be bonded to the drums.
- Ventilation to achieve 20 air changes per hour is required during the transfer procedure, with 10 air changes per hour required during inactive periods.
- Each transfer room will require explosion proof wiring compatible with the existing building systems.
- Each room requires an exhaust hood over the pouring location. These particular hoods should be designed to handle up to seventy-five percent of the exhaust air in each room.

- Estimated Costs:

A. Design	\$ 3,000
B. General Construction	6,000
C. Mechanical Construction	6,000
D. Electrical Construction	2,000
Total	\$ <u>17,000</u>

- Finishes:

- A. Walls - concrete block with epoxy paint.
- B. Floor - existing concrete slab with epoxy paint.
- C. Ceiling - plaster with epoxy paint.

Height  
32 1/2"  
33 3/8"  
30 Amp  
1 1/2 Hp  
12,500 lbs.  
14 Secs.  
13 1/2"

# ACT WASTE IN A 55 GAL. DRUM

- Collect all your compactable waste in a 55 gal. drum and crush it in the same container.
- Reduce the bulk of your waste disposal by 75%.
- Save money on the cost of waste removal and land fill.
- Prevent the use of contaminated materials.
- Handle waste safely and efficiently.



## MODEL 55AR SPECIFICATIONS

Compaction Chamber Height	49 1/2"
Compaction Chamber Width	27"
Cycle Time	78 Secs.
Compaction Force	3000 pounds per sq. Inch
Electric Motor	10 HP ✓
Electrical Switch	60 Amp ✓
Machine Depth	36"
Machine Width	39"
Overall Machine Height	120"
Hydraulic Oil With Shipment	55 Gala.
Shipping Weight (incl. oil)	3700 lbs.

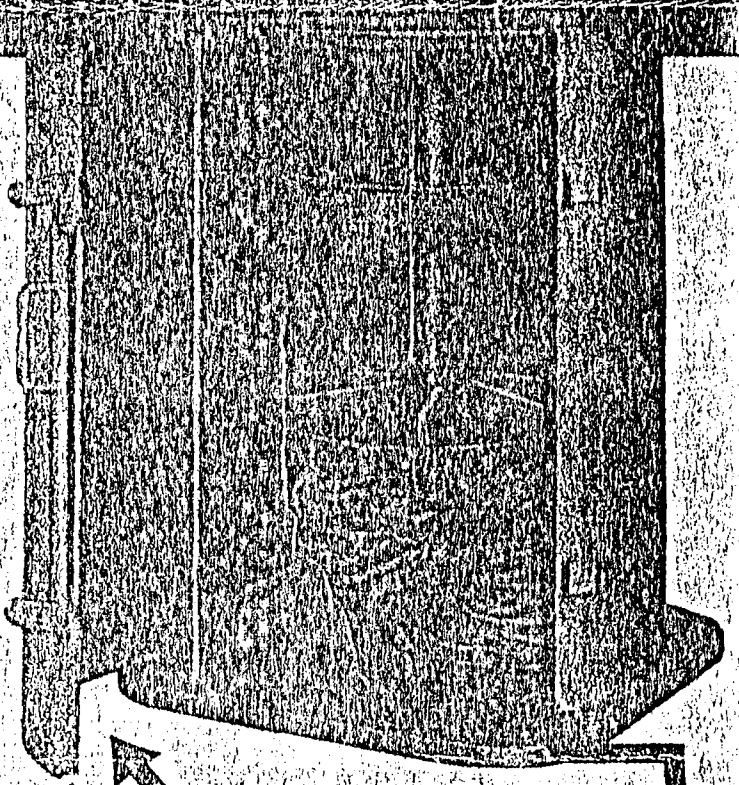
## MODEL 55AR ADDITIONAL SPECIFICATIONS

- Heavy duty electrical and hydraulic pressure relief valve
- Bronze Piston Heads
- Positive displacement high pressure piston pump
- Teflon seals and cylinder wiper collar
- Up stroke electrical limit switch
- Location blocks for positioning drum in chamber

## MODEL 55AR FEATURES

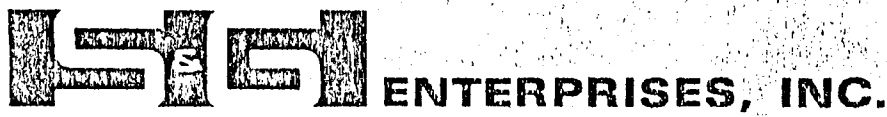
- 1 1/2" thick structural pressure base plate
- Emergency reverse and stop
- 1" x 2" Steel reinforcing bars
- 6" Cylinder with 5" chrome polished, high tensile shaft
- Compactor relief angles
- 50 Gallon Oil Reservoir
- Oil Filter Breathing Cap
- 7/8" Lateral Support Rods
- Lifting Eye
- Sealtite Electric Wiring
- Oil-Tite Pushbuttons
- 1" Thick Reinforced Steel Compacting Head

Available in 220V or 440V, 3 phase, 60 Hz as standard.  
Prices for other electrical services quoted upon request.



## SAFETY DOOR

3/8" thick steel plate door — Heavy Duty Hinges — Double Mechanical Locking Latches — Electrical Interlock, prevents operation, unless door is closed — Designed to meet OSHA requirements.



5626 N. 91st Street, Milwaukee, Wis. 53225 • (414) 464-5310

# Alpha - Omega Services, Inc.

NUCLEAR • MEDICAL • INDUSTRIAL • HEALTH SERVICES

## LOW LEVEL RADIOACTIVE WASTE COMPACTOR MODEL RC-55-1

### General Specifications

Height: 90 inches (Plan for Min. 8ft. or 96")

Weight: ~~1000~~ lb. Use 1500 lb.

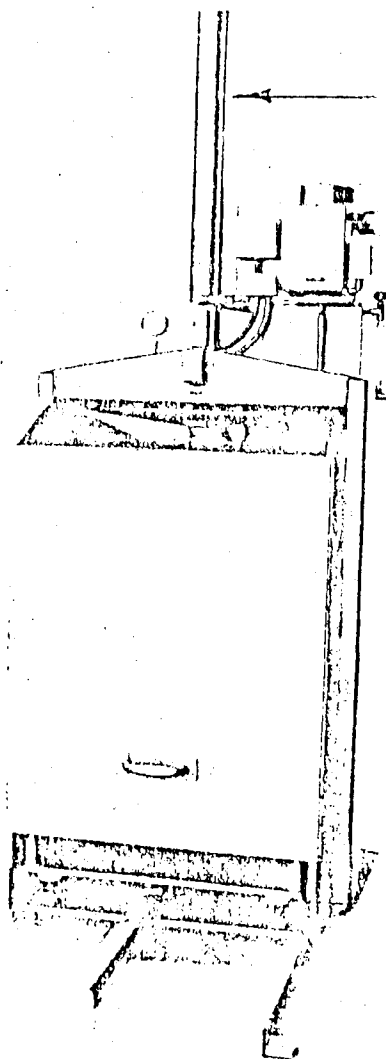
Floor Dimensions: ~~30~~ inches wide by ~~58~~ inches deep Use 36" x 96"

Inside Height: 46 inches

External power required: 220 Volt  
Normally ~~110 VAC~~. Other available at customer request.

Container employed: 55 gallon drum; D.O.T. 17H, or equiv.

Compaction: 4 to 1 in general university or hospital lab use. Very dependent on type of waste.



3 1/4" Dia. 8.3 inch Sq. area  
1 3/4 Rod Dia.  
36" stroke 1500 PSI Duty Service  
2250 PSI Non-Shock Service



Pump 1 HP. motor @ 1725 R.P.M.  
Approx. 1.25 GPM @ 1000 PSI

See reverse side for features.

# DESIGNED SPECIFICALLY FOR COMPACTING LOW LEVEL RADIOACTIVE OR HAZARDOUS WASTES FROM LABORATORIES, HOSPITALS OR REACTOR FACILITIES.

The NUPACTOR provides a means of compressing dry waste materials such as rags, paper, filters, glassware, and other expendables into a fraction of their original volume. This efficient compacting unit is complete with all components necessary to compress these waste materials into an open 55 gallon drum such as a DOT Specification 171H.

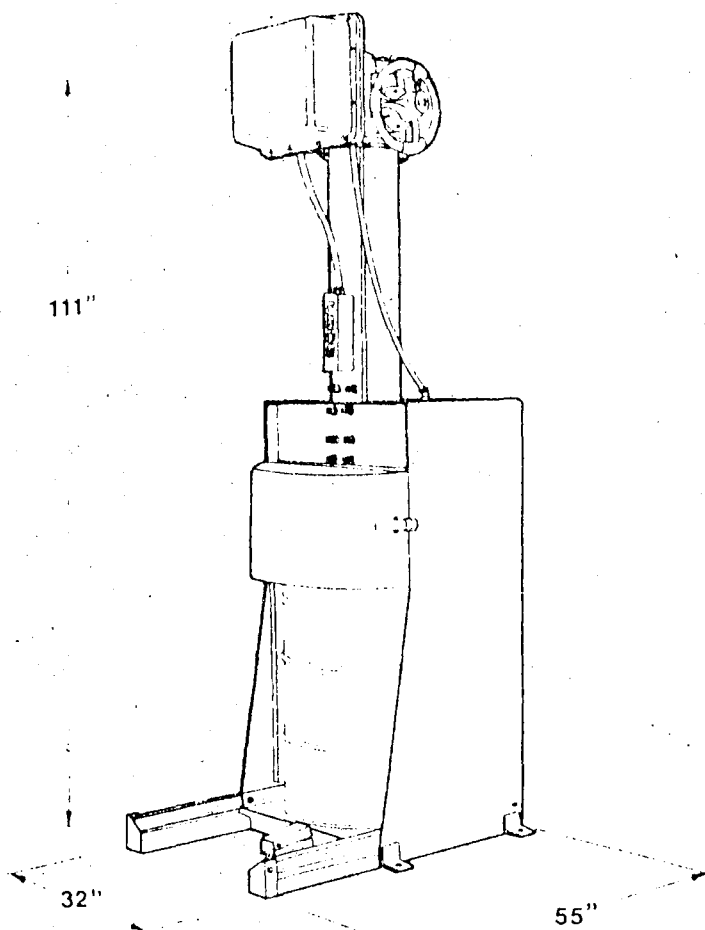
The NUPACTOR utilizes a low maintenance Limitorque electro-mechanical drive mechanism to provide the compressive force. Because of a unique torque control feature, the ram or compacting piston can deliver an adjustable compressive force to meet your design values from 9 to 18,000 pounds.

A drum carrier allows the drum to be filled outside the compactor and then rolled in for compaction. Once waste has been placed within the drum and the drum rolled into

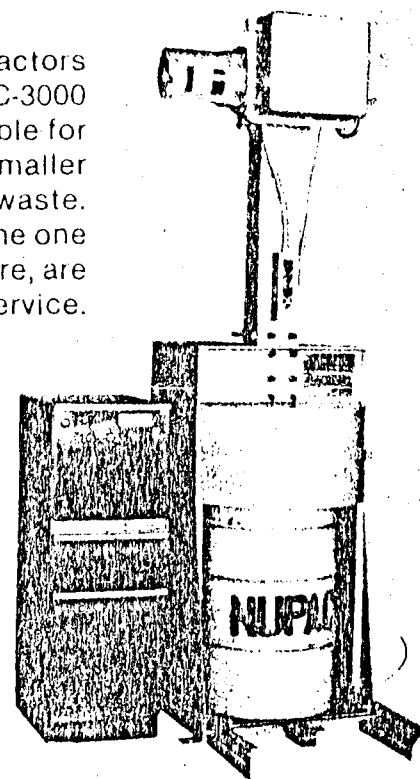
place, the operator need only close the protective door and depress the "CYCLE START" button. The process is automatic and he is then free for additional duties.

Upon reaching its maximum compaction force of 9 tons, it stops and holds its position for approximately 30 seconds (adjustable) allowing the waste to fully yield under the load. The ram then automatically withdraws to await the addition of more material. The full cycle time is less than 90 seconds.

A HEPA (High Efficiency Particulate Air) filter and blower assembly are incorporated providing a positive air flow up and around the drum for removal of potential airborne contaminants. This system provides a minimum filtration efficiency of 99.97% of 0.3 micron particles. Filters can easily be removed for compaction and disposal. Many safety features are inherent with the unit and it meets all OSHA requirements.



Other size compactors such as the WC-3000 are available for processing smaller volumes of waste. Units such as the one shown here, are currently in service.



**NUCLEAR  
PACKAGING, INC.**

1733 Fawcett  
Tacoma, Washington 98402  
(206) 572-7775



UNIVERSITY OF MINNESOTA  
TWIN CITIES

Boynton Health Service  
410 Church Street S.E.  
Minneapolis, Minnesota 55455

RECEIVED

SEP 22 1977

UNIV. OF MINN.  
HEALTH SCIENCE  
PLANNING OFFICE

September 19, 1977

Memorandum

To: Mr. Paul Maupin, Coordinator, Health Science Planning Office, 4104 Powell Hall, East Bank Campus

From: Jerome W. Staiger, Health Physicist, Department of Environmental Health and Safety, Boynton Health Service *J. W. Staiger*

Subject: Radioactive Solid Waste Compaction; Need for Assistance in Locating an Appropriate Area for a New Drum Compactor

This memo is to seek your advice and assistance in determining a location and sources of financing for a radioactive waste compaction facility. Because 90% or more of the solid radioactive waste generated at the University is from the Hospital and Health Sciences Complex, it seemed logical to consider the Health Sciences Complex as the preferred location of a compaction facility.

Over the past three years, the volume of solid non-combustible radioactive waste has increased very significantly (~40%), and the cost for shipment and ultimate disposal has also increased. This year alone the cost per cubic foot of solid waste disposed has increased by approximately 30%, and a similar increase occurred in the previous year. Because the shipment and disposal cost paid is based on a fixed amount per unit volume (Ft<sup>3</sup>), we have investigated the feasibility of compaction of this type of radioactive waste. We found that a number of universities and other research institutions have already, or are in the process of purchasing, a compactor for their solid radioactive waste. There are several commercial manufacturers of the type of compactor used for this type of waste (55 gallon drum compactor), and experience has shown a minimum compaction ratio of 4 to 1 can be realized with the type of waste we generate as low level solid radioactive waste.

I have enclosed a copy of an April 14, 1977 memorandum which summarizes the projected cost savings from compaction of solid radioactive waste. An approximate savings of \$14,000.00 could be realized by the University during fiscal 1977-78 based on a 75% reduction in waste volume, and a similar reduction in the total number of steel drums required for packaging of the waste. With increasing volumes and cost of disposal, this annual savings would only increase in future years.

During the month of August we have met on two occasions with representatives of Physical Plant as an ad hoc committee to discuss solid radioactive waste compaction. I have enclosed a copy of literature showing illustrations and specifications for three types of drum compactors that are being considered. The range in price on the units varies from ~\$7,000.00 to \$11,500.00. The

Mr. Paul Maupin

-2-

September 19, 1977

actual space required for the compactor itself is quite minimal, however, space would also be needed for storage of empty steel drums, and for a limited number of drums filled with compacted wastes. If possible, the location should be near an existing exhaust ventilation system for venting the compactor, and an existing 3 phase electrical service. Possible locations suggested for the compactor were Mayo Garage Area, Unit K-E near the solvent storage room (or a separate room within this room), and the new Unit F Building. The preferred site from the standpoint of central location to buildings in the complex and to existing radioactive waste storage areas is the Mayo Garage Area.

If you would like additional information on the compaction units, or on the type of radioactive waste and quantity generated at the University, feel free to call me. Perhaps we and representatives of Physical Plant could meet with you to discuss this question after you have had a chance to consider the possibility of location of the compactor in the Health Sciences-Hospital Complex. Thank you for your assistance with and consideration of this matter.

JWS:mlo

Enclosure

cc: Donald Holberg  
Richard Hendricks  
Robert Reid  
Roger DeRoos



April 14, 1977

Memorandum

To: Roger L. DeRoos

From: Jerome Staiger

Subject: Projected Cost Savings from Compaction of Solid Radioactive Waste

The cost savings realized by the University, as a result of compaction of solid radioactive waste, would be substantial from two respects.

1. The total volume of solid radioactive waste could be reduced by 75% or more, and because disposal costs are based on a unit charge per Ft<sup>3</sup>, the cost of disposal would be reduced by the same percentage. Based on solid radioactive waste volume projections for fiscal 1977-78 (see March 15, 1977 memo), the total cost savings would be approximately \$8,500.00 for that period.

2. There would also be a 75% or more reduction in the number of DOT approved steel drums required for shipment of the solid radioactive waste. At present the number of steel drums required is approximately 600 drums/year. Compaction would decrease the number of drums by about 450 per year, and at a present cost of \$12-\$15/drum, the cost savings would be \$5,400-\$6,750/year.

For this reason I believe that a drum compaction unit should be purchased and be made operational as soon as possible. Commercially available drum compactors are presently manufactured. Information on this type of compactor has been forwarded to Mr. Robert Reid, Physical Plant, in previous correspondence.

JWS:tg

# Alpha-Omega Services, Inc.

NUCLEAR • MEDICAL • INDUSTRIAL • HEALTH SERVICES

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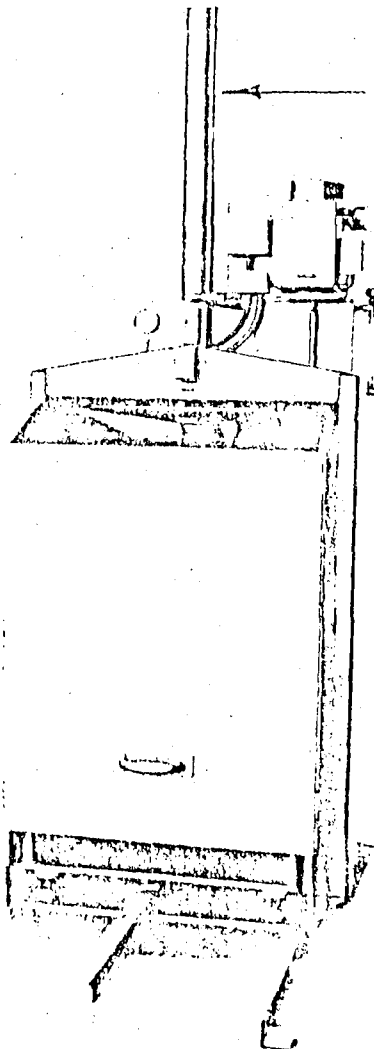
Floor Dimensions: ~~XX~~ inches wide by ~~XX~~ inches deep Use 36" x 96"

Inside Height: 46 inches

External power required: Normally ~~XXX~~ ~~XXX~~. 220 Volt  
Other available at customer request.

Container employed: 55 gallon drum; D.O.T. 17H, or equiv.

Compaction: 4 to 1 in general university or hospital lab use. Very dependent  
on type of waste.



3 1/2" Dia. 8.3 inch Sq. area  
1 3/4 Rod Dia.  
36" stroke 1500 PSI Duty Service  
2250 PSI Non-Shock Service



Pump 1 HP. motor @ 1725 R.P.M.  
Approx. 1.25 GPM @ 1000 PSI

See reverse side for features

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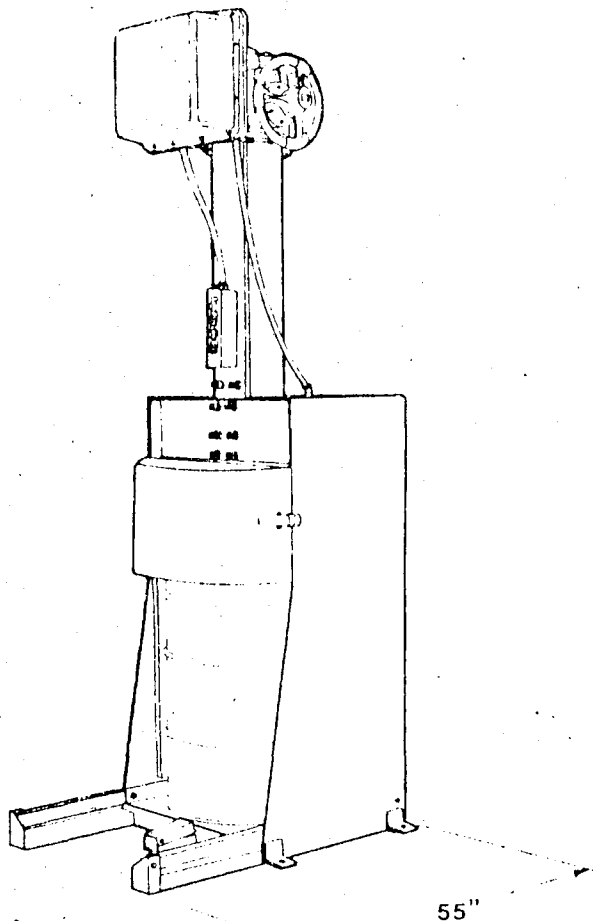
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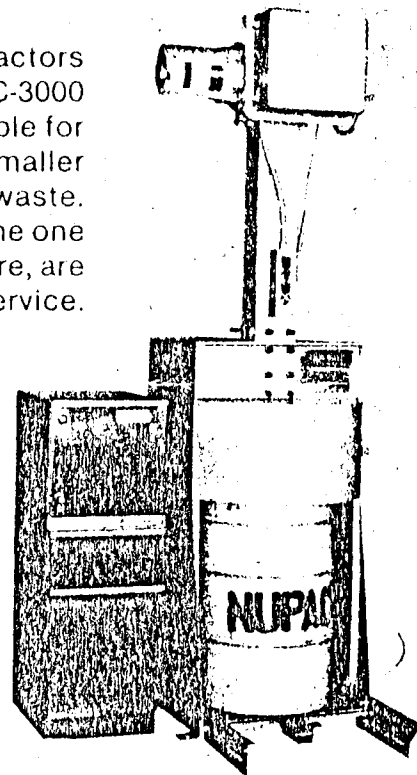
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111"



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1733 Fawcett  
Tacoma, Washington 98402  
(206) 572-7775

13 1/2  
14 Secs.  
12,500 lbs.  
30 Amp  
1 1/2 HP  
32 1/2  
33 3/8

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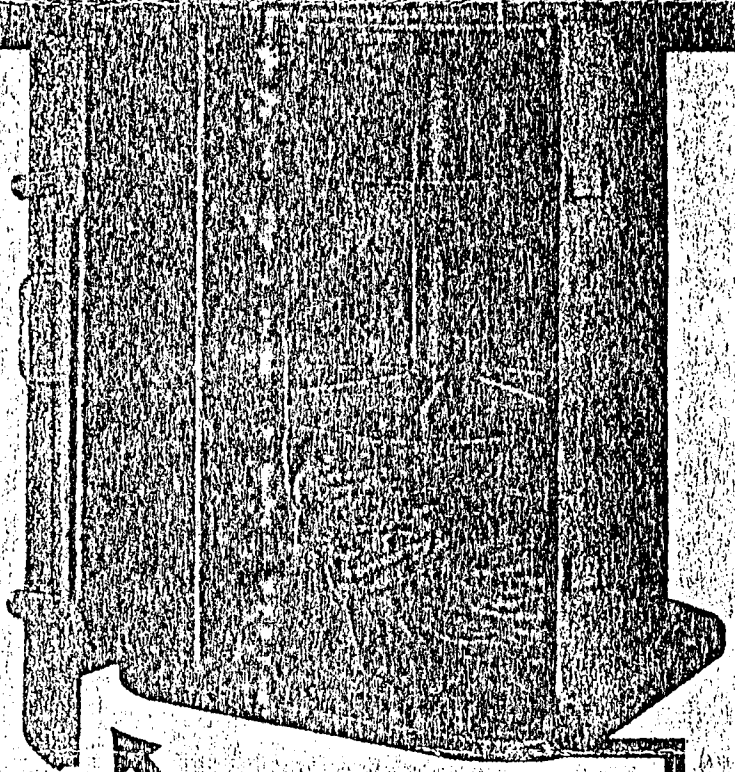
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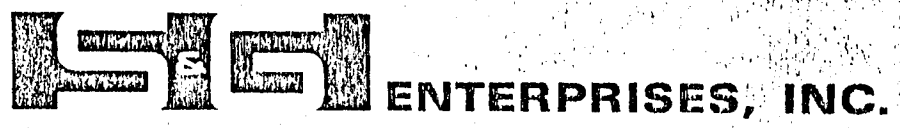
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TWIN CITIES

Boynton Health Service  
410 Church Street S.E.  
Minneapolis, Minnesota 55455

RECEIVED

MAR 30 1978

UNIV. OF MINN.  
HEALTH SCIENCE  
PLANNING OFFICE

March 24, 1978

Memorandum

To: Robert Swanson, Health Sciences Planning Office, 4102 Powell Hall

From: Jerome W. Staiger, Health Physicist, Department of Environmental Health and Safety, Boynton Health Service *Jerome W. Staiger*

Subject: Unit K/E Liquid Radioactive Waste Transfer Facility

As requested in our telephone conversation of March 23, the following is a brief summary of the need for a liquid radioactive waste transfer facility in the K/E building.

1. We are presently in violation of Department of Transportation (DOT) Regulations because it is necessary to transport liquid radioactive waste in laboratory containers, via truck, to our Rosemount Radioactive Waste Storage Facility before the waste can be transferred to DOT approved shipping drums. The new transfer area would provide a properly designed facility on campus for this type of liquid radioactive waste transfer which would eliminate the violation of DOT Regulations.
2. Adequate personnel protection is not provided by present facilities during liquid radioactive waste transfer. The liquid radioactive waste is at present, transferred outdoors from the laboratory containers to the DOT drums, because no ventilated transfer station is available. Although adequate ventilation is at times provided by standing in the correct position relative to the wind, it is by no means a satisfactory situation with respect to personnel protection. This problem has become of even greater concern to the radiation protection staff with increased use of volatile  $^{125}\text{I}$  radioactive materials by University research laboratories. Respirators are presently worn by personnel handling the radioactive waste which contains volatile chemicals and radioactive materials, however, a more adequate solution such as the proposed K/E transfer facility is needed.
3. The present transfer situation does not provide adequate facilities for contamination control. Drums and, on occasion, the ground area around the drums can become contaminated due to outdoor weather conditions.

In addition to the concerns, we have, from the standpoint of personnel radiation protection, Mr. Don Herron, Safety and Health Professional, has included the following justification for the K/E transfer facility.

Robert Swanson

-2-

March 24, 1978

1. There are no washing or emergency first aid facilities at the Rosemount Facility. No water or electrical service is available. In the transfer of hazardous or radioactive liquid wastes, it is important to have such services readily available to personnel.

2. Materials handling conditions at Rosemount are unsatisfactory (mud, snow conditions) and could result in employee injury.

3. There are no provisions for splash or blast protection from the radioactive and/or chemical contents of the liquid waste. Such protection would be included in the proposed K/E facility.

It is important to note that the proposed liquid radioactive waste transfer facility may also be able to serve a dual purpose of allowing for the safe transfer of non-radioactive hazardous liquid wastes which require shipment for final disposal.

If you require any additional information, please call Mr. Herron or myself.

JWS:pjc  
cc. Don Herron



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TWIN CITIES

Health Sciences Planning Office  
Physical Planning  
4103 Powell Hall, Box 75  
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(612) 373-8981

*Solid Waste Handling* UNIT B/C - FILE

April 3, 1978

TO: Paul Maupin  
FROM: Robert Swanson *RS*  
Health Sciences Planning  
SUBJECT: Health Sciences Complex  
Proposed Radioactive Waste  
Facilities

Attached please find single copies of the following memorandums prepared by Mr. Jerome Staiger, which justify the need plus describes the basic design intent for providing the Health Sciences Complex with the appropriate radioactive waste facilities:

- Mr. Staiger's September 9, 1977 memorandum regarding the construction of a Solid Radioactive Waste Compaction facility.
- Mr. Staiger's March 24, 1978 memorandum regarding the construction of a Liquid Radioactive Waste Transfer Facility.
- A copy of the Health Sciences Planning Office meeting notes dated January 24, 1978, which describes the basic program intent, estimated cost and location for each of the above facilities.
- Equipment brochures on the following Solid Radioactive Waste Compactors:
  - A. Alpha-Omega Services, Inc.
  - B. Nuclear Packaging, Inc.
  - C. H & H Enterprises, Inc.

RS:mg  
Enc.



UNIVERSITY OF MINNESOTA  
TWIN CITIES

Physical Plant Maintenance and Operations  
200 Shops Building  
319 15th Avenue S.E.  
Minneapolis, Minnesota 55455

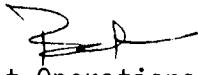
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**MAY 22 1978**

**UNIV. OF MINN.  
HEALTH SCIENCE  
PLANNING OFFICE**

May 19, 1978

TO: Mr. Paul J. Maupin  
Health Service Planning Coordinator

FROM: Robert Reid   
Physical Plant Operations

SUBJECT: Health Service Complex  
Proposal Radioactive Waste Facilities

Recently I received from you an attachment of memorandums concerning the above subject.

The establishment of these facilities has previously been reviewed by Physical Plant personnel, and found to be desirable from the waste disposal aspects. We would like to support its development.

If we may provide further assistance in its development, please contact me at your convenience.

RAR:jme

cc: D. L. Holberg  
R. L. DeRoos





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TWIN CITIES

Health Sciences Planning Office  
Physical Planning  
4103 Powell Hall, Box 75  
500 Essex Street S.E.  
Minneapolis, Minnesota 55455  
(612) 373-8981

May 25, 1978

TO: Roger Moe  
FROM: Paul Maupin *Paul Maupin*  
SUBJECT: Radioactive Waste

The attached materials are for your information, and should be self-explanatory.

The Health Sciences administration sincerely believes the cost of these two items are a maintenance and operations item. Obviously, this carries the endorsement of Roger DeRoos' office and Vice President Al Linck.

Thank you in advance for giving this your attention.

PJM:rt

Attachments



UNIVERSITY OF MINNESOTA  
TWIN CITIES

Health Sciences Planning Office  
Physical Planning  
4103 Powell Hall, Box 75  
500 Essex Street S.E.  
Minneapolis, Minnesota 55455  
(612) 373-8981

October 16, 1978

TO: Clinton Hewitt  
FROM: Paul J. Maupin *Paul*  
SUBJECT: Radioactive Waste Facilities

The attached memorandums concerning the radioactive waste problems have been passed from department to department for over one and a half years. While all parties concerned agree with the the requested action, the estimated \$50,000 funding does not seem to be available.

We believe that this is a service and safety problem that should have the immediate attention of Vice-President Brown's office.

We would appreciate your assistance in securing the funding necessary to implement this request.

cc: Roger DeRoos

PJM:jmm