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Fairbanks, Alaska 99701

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INSTITUTE OF ARCTIC BIOLOGY

April 24, 1981

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Radioisotope Licensing Branch
Division of Fuel Cycle and Material Safety
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Michael A. Lamastra

Gentlemen:

The present requested amendments to U.S.N.R.C. License No. 50-02430-07 issued to the University of Alaska, Fairbanks relates to the substitution of Robert D. Sackett for Larry R. Sweet as the administrative representative on the Radiation Safety Committee, the addition of a sealed source to the license inventory and the addition of two methods for the disposal of radioactive waste.

Robert D. Sackett, Executive Officer, Office of the Vice Chancellor for Research and Advanced Study, has recently replaced Larry R. Sweet in that position. Therefore, we request the substitution of Robert D. Sackett for Larry R. Sweet on the University of Alaska, Fairbanks Radiation Safety Committee as the administrative representative.

The addition of a sealed source to the license inventory is requested. The sealed source is a neutron moisture probe (Am-Be) similar to the one presently listed on the license inventory. Possession and use of this sealed source will be in accordance with the provisions of the present license, namely Amendment No. 23, NRC 50-02430-07. Leak test will be performed as stated in item 4.(9), letter to Michael A. Lamastra, NRC of January 4, 1980 signed Dan Holleman.

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The University is seeking alternatives to the use of commercial burial grounds for the disposal of radioactive wastes consistent with 10 CFR 20.302. The use of commercial burial sites is expensive, excessively inconvenient and possibly undependable in the future, especially for the Alaska situation. The requested amendments include disposal of radioactive material by incineration and by burial in the soil.

The primary use of radioactive materials under this license is in connection with tracer experiments involving laboratory plants and animals or plant and animal materials. As a result a relatively large quantity of waste is accumulated (approximately 10-20 barrels annually). This waste includes items such as absorbant paper, wipes, radioactive material labels, syringes, disposable pipets, bedding material of experimental animals, animal waste, and similar possibly contaminated or contaminated articles. These proposed disposal methods will only be used for the disposal of possibly contaminated or contaminated articles as opposed to the disposal of radioactive material per se. The disposal of radioactive material per se and liquids will continue to be by decay (short-lived radioisotopes) or in accordance with 10 CFR 20.303.

As of November 30, 1980 (the last 6 month summary period) the total inventory under NRC 50-02430-07 was 188 millicuries (mCi) of which 67 mCi was carbon-14 and 112 mCi was hydrogen-3. These radioactive materials are distributed among 16 authorized users. Approximately 15 mCi of radioactive materials, primarily carbon-14 and hydrogen-3 were disposed of by burial during 1980. In future years we estimate a total disposal by incineration and burial of less than 15 mCi per year if these methods are approved.

We propose that the combination of these two methods for disposal of radioactive waste is the most practical for the Alaska situation. Readily burnable material will be disposed of by incineration, e.g.,

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possibly contaminated and contaminated laboratory articles, primarily paper and plastics. Radioactive waste not readily burnable will be buried in the soil, e.g., contaminated animal waste and ash residue from the incineration of radioactive waste.

The requested amendments to NRC 50-02430-07 and their respective conditions are as follows.

- (1) Substitute Robert D. Sackett, Executive Officer, Office of Vice Chancellor for Research and Advanced Study for Larry R. Sweet as the administrative representative on the Radiation Safety Committee.
- (2) Add the following sealed source to the inventory of NRC 50-02430-07.

Americium-241 (sealed source)
Troxler Electronic
Model (105A) 1257
Serial No. H1638
Total activity 100 millicuries

- (3) Addition of disposal by incineration as a method for disposing of items contaminated with radioactive materials. Particulars concerning the incinerator are included in Appendix A of this letter. The specific conditions of disposal by incineration are as follows.

(a) The effluent from the incinerator stack will not exceed the limits specified for air in Appendix B, Table II, 10 CFR 20 when averaged over a twenty-four hour period. The concentrations of radioactive materials in the effluent will be calculated as given in "Note to Appendix B" 10 CFR 20 using the estimated daily airflow for the incinerator.

(b) Radioactive waste will be disposed by incineration on a maximum of six (6) days per year. Therefore when averaged over a one year

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period, effluent concentrations from the incinerator stack will be less than 2% of the limits specified for air in Appendix B, Table II 10 CFR 20. A maximum of one burn will be conducted per week.

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(c) All procedures related to the radioactive waste disposal by incineration, including record keeping, actual disposal and ash residue analysis/disposal will be conducted by or under the direct supervision of the Radiation Safety Officer. Records will be kept as to the date of incineration, the calculated concentrations of radioactive materials in the stack effluent and the total radioactivity disposed.

Item 5
(d) Following each radioactive waste disposal by incineration, a sample of ash residue will be assayed using the appropriate methods based upon the particular radioactive materials disposed. If significant contamination of the ash residue is determined, then the ash residue will be treated as radioactive waste and disposed accordingly. Radioactive waste disposed by incineration will be exempt from this condition if the waste only contains readily oxidizable materials such as many of the carbon-14 and hydrogen-3 labeled compounds.

(e) The licensee will obtain permission from the appropriate state authorities (Department of Environmental Conservation, Air and Solid Waste Management) prior to the disposal of radioactive waste by incineration.

(1. a) (4) Addition of disposal by burial in soil as a method for disposing of radioactive waste. The specific conditions are as follows.

(a) The total quantity of licensed and other radioactive materials buried in the soil at any one location and time will not exceed at

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the time of burial, ten (10) times the amount specified in Appendix C, 10 CFR 20.

(b) Burial will be at a minimum depth of four feet, except that animal waste containing less than one (1) microcurie of radioactive material per kilogram may be disposed by surface spreading in areas not used for the growth of human food products. ?

(c) Successive burials will be separated by distances of at least six feet and not more than 12 burials will be conducted in any year.

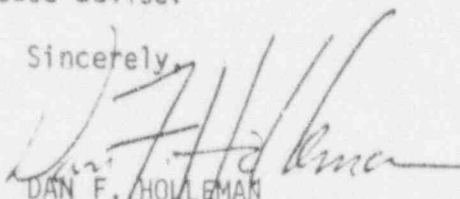
(d) Disposal by burial (or surface spreading) will only be conducted on University of Alaska or state owned land and in well drained areas where the water table is a minimum of ten (10) feet below the surface.

(e) All procedures related to radioactive waste disposal by burial in soil, including actual disposal and record keeping will be conducted by or under the direct supervision of the Radiation Safety Officer. Records will be kept as to the date of burial, quantity and volume of radioactive material disposed and the site.

(f) The licensee will obtain permission from the appropriate state authorities (Department of Environmental Conservation, Air and Solid Waste Management) and University authorities (Office of Land Management) prior to disposal of radioactive waste by burial.

We hope the enclosed information is adequate, however if additional information is necessary, please advise.

Sincerely,


DAN F. HOLLEMAN
Radiation Safety Officer
NRC 50-02480-07

Enclosures

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Appendix A - Incinerator

The incinerator is located in the southeast corner of the west wing of the Arctic Environmental Research Laboratory (AERL). The building is located on the west ridge, approximately one-half mile from the main campus (Figure 1). Figure 2 shows the location of the incinerator area in the AERL, while Figures 3 and 4 are diagrams of the incinerator and incinerator room.

The incinerator has main and secondary burning chambers and uses No.2 fuel oil. The capacity of the incinerator is approximately 250 pounds per hour on the basis of an eight hour per day operation. The incinerator is equipped with a semi-automatic hydraulic loader with a hopper capacity of one cubic yard.

The AERL is located on an east-west ridge with elevation of approximately 600 feet above sea level (MSL). The surrounding area (including Fairbanks which is 5 miles to the west) has an elevation of approximately 440 feet MSL. The incinerator's base is at an elevation of 606 feet MSL (Figure 3). The chimney (18 inch I.D. Van Packer) extends to an elevation of 640.5 feet MSL. The AERL is a two story building, thus the 36.5 foot exhaust chimney extends 12 feet above the roof of the building. The nearest building to the exhaust chimney is approximately 400 feet to the north (Figure 1). The nearest residential area is located approximately 1 mile to the south at an elevation of 440 feet MSL.

FIGURE 1 - UNIVERSITY CAMPUS

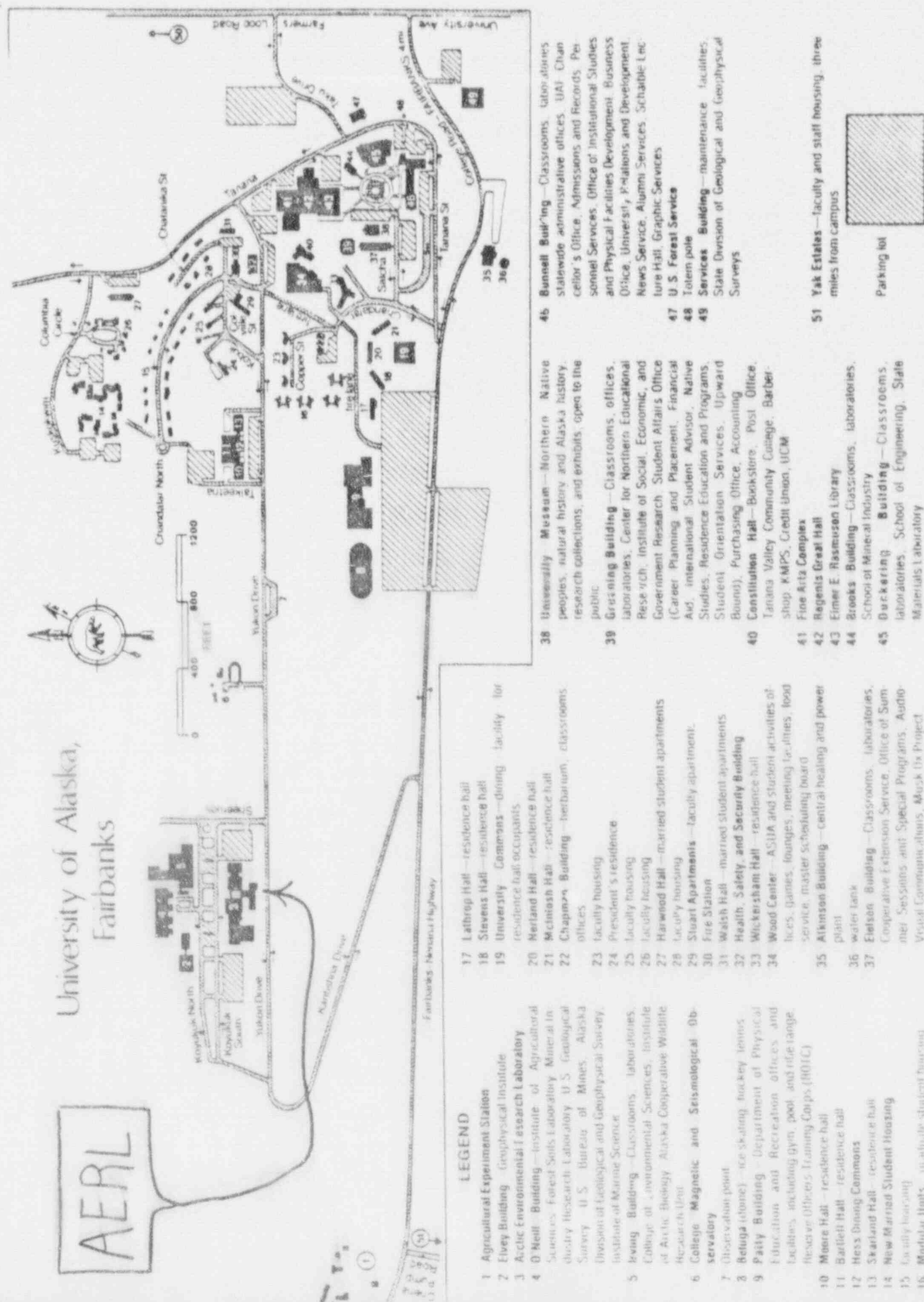
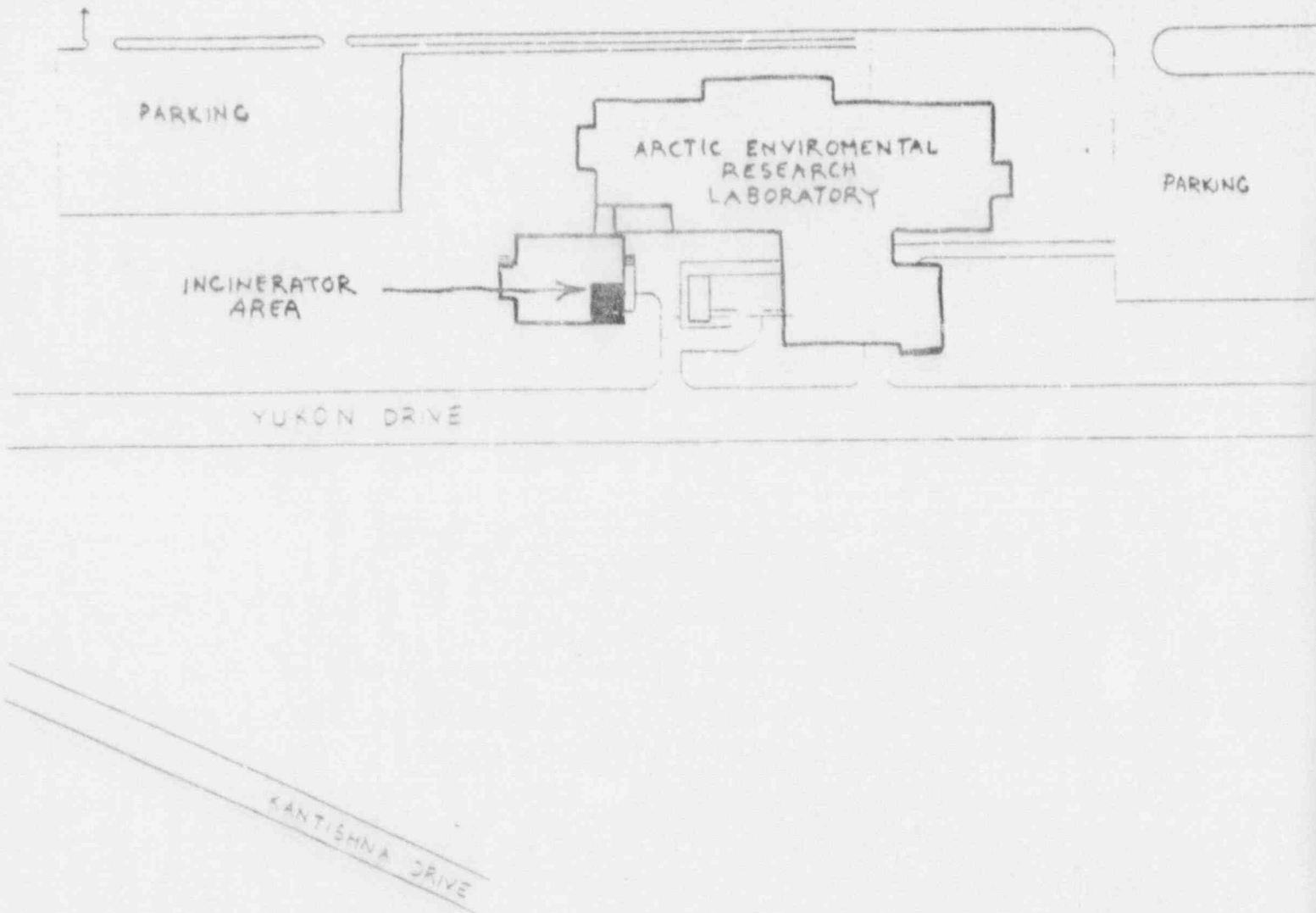


FIGURE 2 - ARCTIC ENVIRONMENTAL
RESEARCH LABORATORY



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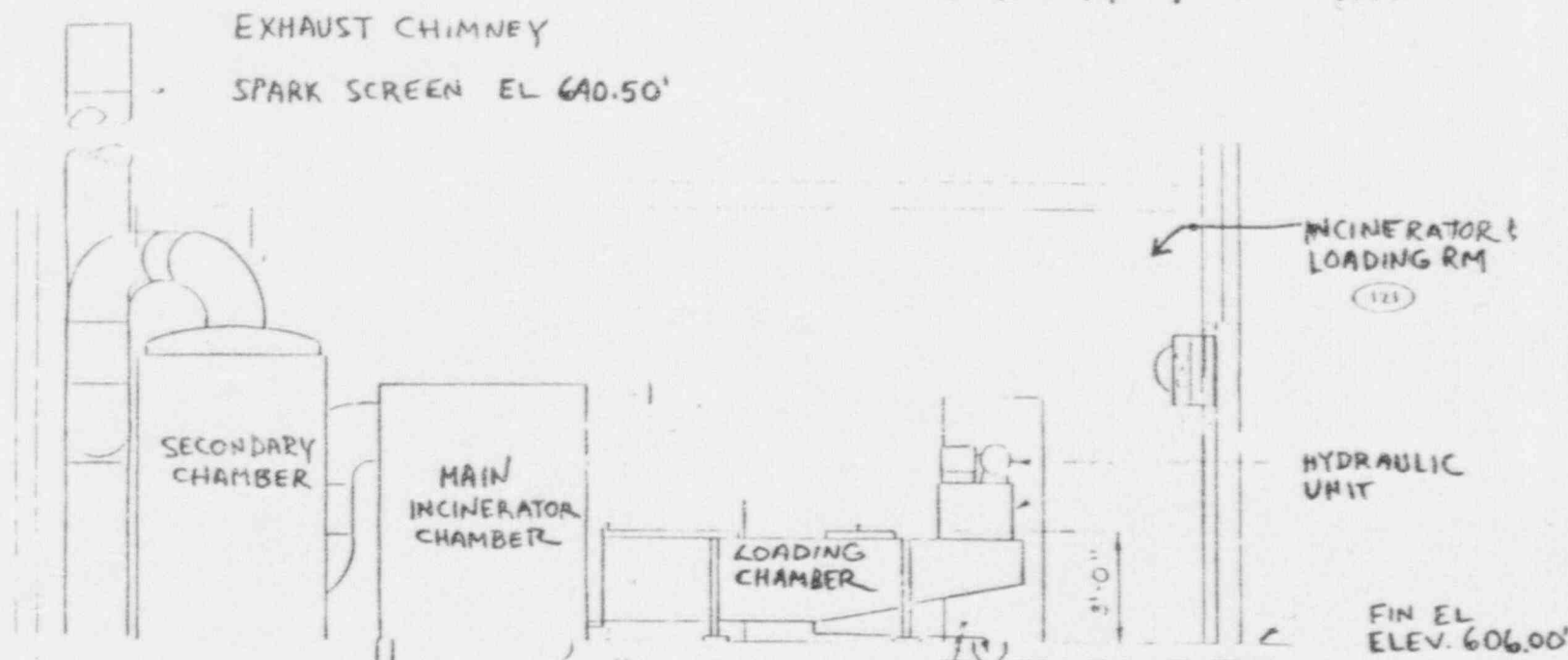
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PLAN
SCALE 1" = 100'-0"



FIGURE 3 - INCINERATOR ROOM (SIDE VIEW)

SECTION 1
SCALE 1/4" = 1'-0" M-1



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FIGURE 4 - INCINERATOR ROOM (TOP VIEW)

