

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos. 040-05699 (Terminated)
 040-06870 (Terminated)
 040-00000 (Terminated)

License Nos. 34-05619-01 (Terminated)
 C-05200 (Terminated)
 STB-00663 (Terminated)
 C-04526 (Terminated)
 C-03245 (Terminated)
 C-04756 (Terminated)

Inspection Report No. 040-05699/96001(DNMS)

Former Licensee: TRW, Inc.

Facility: Argo-Tech Corporation

Location: 23555 Euclid Avenue
 Cleveland, OH 44117-1795

Dates: July 24-25, 1996

Inspectors: E. L. Kulzer, Radiation Specialist
 P. J. Lee, Ph.D, Radiation Specialist
 D. W. Nelson, Radiation Specialist

Approved By: J. W. McCormick-Barger, Chief
 Decommissioning Branch

EXECUTIVE SUMMARY

Formerly TRW, Inc., Currently Argo-Tech Corporation
NRC Inspection Report No. 040-05699/96001(DNMS)

This was a special inspection to conduct a scoping survey at Argo-Tech Corporation, buildings; 3, 12, 24, and 35.

The scoping survey data did not identify any areas in excess of the unrestricted use guidelines with the exception of one piece of sheet metal approximately 24 inches wide by 12 inches long located in the Metallurgical Laboratory in Room 2465C in Building 24 and abrasive cleaning compounds found in Building 35. The contamination originating from the abrasive cleaning compounds are considered to be exempt quantity, which is not regulated by the NRC.

DETAILS

1. Background

The former TRW, Inc., facility located at 23555 Euclid Avenue is presently owned by Argo-Tech Corporation. It is an approximately two million square foot facility. Mr. Chuck Bingham, Director, Environmental Projects for TRW, Inc., was familiar with the facility and assisted the NRC inspectors in locating areas where the previously licensed material had been used. Argo-Tech currently rents production and warehouse space to other companies. Marine Mechanical Manufacturing is a current renter who conducts work for the Nuclear Navy.

Former License No. 34-05619-01 authorized the possession of 32 used control rods with an estimated 5 millicuries each of cobalt-60 and iron-59. Decontamination and inspection of the control rods were to be done in buildings 12 and 24 (see Figures 3-4). The waste was planned to have been sent to Radiological Services, a disposal service. The license was issued in September 1961, and expired on September 1963. Mr. Bingham, a long time TRW employee, contacted other former employees and from what he knows and learned during his interviews, believes this work was planned, but never took place.

Former License No. C-05200 was issued on August 5, 1962, and expired on March 31, 1964. The license was for boring, milling, drilling, and deburring of magnesium-thorium alloy. The license authorized a total of 280 pounds of thorium. The waste from this operation was reported to have been sent to Dow in Madison, Illinois.

Former License No. STB-00663 was issued on November 2, 1962, and expired on November 30, 1968. The license authorized the spraying of thorium oxide on rocket nozzles. These nozzles were used in the Mercury, Minuteman, and Apollo rockets. This license authorized the use of 100 pounds of thorium oxide. The file did not indicate final disposition of waste material.

Former License No. C-04526 was issued on January 19, 1959, and expired on January 31, 1960. The license authorized the use of 1,000 pounds of magnesium-thorium alloy. The material was reportedly fabricated into shaped tubes that were installed in radar units. The file did not indicate final disposition of the material.

Former License No. C-03245 was issued on January 7, 1957, and expired on February 1, 1958. The license authorized the machining of 4,700 pounds of magnesium-thorium castings for use in the manufacture of jet engine component parts for General Electric Company, Aircraft Gas Turbine Division. Scrap from this operation was reportedly returned to the supplier, Rolle Manufacturing Company and Vane Belle Crank Support.

TRW, Inc., provided NRC Region III with data on approximately 32 cubic feet of radioactive waste removed from this site in 3 shipments dated 1961, 1963 and 1971. This waste was sent to Nuclear Engineering Company, Walnut Creek, California.

2. Independent Measurements

Independent measurements were conducted in and around the former licensed materials processing areas and the open areas of the site. Surface scans were conducted on floors, walls, and structural supports. The surveys emphasized cracks, crevices, wall/floor junctions, and areas where former licensed operations may have taken place.

Instrumentation used to conduct surveys is identified in Table 1. Due to the surface attenuation, most of the particles detected were expected to be high energy beta, only a very small percentage of alpha was expected to be detected. Therefore, based on the ratio of alpha to beta activity, beta measurements were used to determine the alpha surface activities of source materials.

A total of 72 wipes were collected from locations throughout the facility.

3. Survey Results and Laboratory Analyses

Direct survey measurements were conducted for gross alpha/beta and gamma radiation. Where surface readings indicated levels in excess of approximately two times background, wipes were taken to determine the reason for the elevated readings. Random wipes were also collected.

A germanium detector was used for qualitative identification and quantitative determination of the level of contamination found in the abrasive cleaning compound. Licensed material was not identified in any area which had elevated readings, except in the metallurgical laboratory located in Room 2465C of Building 24.

The results of areas with elevated readings are listed below:

(1) Metallurgical Laboratory

In a cabinet under a sink there was one piece of sheet metal that had not been used by the metallurgical laboratory, and was believed to have been polished by the material in (2) below. Surveys of the metal sheet indicated 250 microrontgens per hour ($\mu R/h$) on contact; background was 5-13 $\mu R/h$.

(2) Building 35

Building 35 was where the spraying operations took place. There were 4 forty gallon drums of cleaning powder that were used for polishing metal parts. These were reading

approximately 4000 disintegration per minute at the surface of the drums. The compound was an abrasive cleaning compound (G12-HD) from Stanley Industries of Warrenville Heights, Ohio. Stanley Industries was contacted and a material safety data sheet (MSDS) was obtained for the product which had not been made in years. The MSDS had no radioactive materials listed under product ingredients.

The analysis of the cleaning compound found contained 3 pico curies per gram (pCi/g) of radium, and uranium each, and 13 pCi/g of thorium. Based upon 10 CFR 40.13(c)(i)(vi) the material is considered to be an "Unimportant Quantity of Source Material." This regulation covers rare earth metals and compounds, mixtures, and products containing not more than 0.25 percent by weight thorium, uranium, or any combination of these.

The wipe samples were analyzed by a Gas flow proportional counter (Gamma Products G-5000) and the results reported in disintegrations per minute per 100 square centimeters (dpm/100 cm²). The locations where wipes were collected are described on the maps in Figures 1, 2, 3 and 4. Analysis of the 72 wipes collected showed that the gross alpha/beta was less than the minimum detectable activity (MDA) which is 5 dpm/100 cm².

The NRC's unrestricted use guidelines for thorium on building surfaces is 1,000 disintegrations per minute (dpm) (17 becquerels (Bq))/100 square centimeters (cm²) activity averaged over an area not to exceed one square meter; 3,000 dpm (50 Bq)/100 cm² maximum activity over an area not to exceed 100 cm²; and 200 dpm (3.4 Bq)/100 cm² removable activity. These guidelines are found in the NRC's "Guideline for Decontamination of Facilities and Equipment prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated August 1987.

With the exception of the metallurgical lab mentioned above, the NRC survey found no areas in excess of the NRC guidelines.

4. Exit Meeting

At the conclusion of the onsite inspection on July 25, 1996, the preliminary results of the inspection were discussed with the individual identified below.

Persons Contacted

- C. T. Bingham, P. E., Director Environmental Projects, TRW, Inc.
* F. M. Robel, P. E., Manager, Engineering & Facilities, Argo-Tech Corporation

* Indicates those present at the exit meeting on July 25, 1996.

Attachments:

Table 1 - Survey Instruments

Table 2 - Survey Data

Figures 1, 2, 3 and 4 - Locations where wipes were collected

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TABLE 1
Survey Instruments

Instrument	Model No.	Serial No.	Probe	Last Calibration
Ludlum	2221	115135	Ludlum 239-1F	07/27/95
Ludlum	12	105745	Ludlum 44-9	05/10/96
Ludlum	12	105718	Ludlum 44-10	02/09/96
Ludlum	19	15522		09/01/95
Ludlum	19	014809		11/17/95

The meters and probes were serviced and calibrated on an annual basis. Calibrations were performed with National Bureau of Standards (NBS) traceable sources. Daily background checks were performed during the inspection to verify detector constancy and determine efficiencies. Source checks were performed using a strontium-90/yttrium-90 check source, Serial Number S-2134 (NRC Tag No. 013251). The average beta efficiency for the Ludlum count rate meters (Model 12) with the Model 44-9 probes was about 25 percent. The average efficiency for Ludlum 2221 with the 239-1F detector was about 40 percent. The gamma scintillation detectors (Ludlum 44-10) were checked for constancy only. Average background for the GM pancake probes (Ludlum 44-9) was 40 to 50 counts per minute (cpm). Average background for the gas flow proportional detector (Ludlum 239-1F) varied from about 1000 to 1250 cpm. The Model 19 meters varied from 5 to 13 microroentgens per hour background radiation ($\mu\text{R/h}$) (1.3 to 3.4 nanocoulombs per kilogram per hour (nC/kg/h)).

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TABLE 2
Survey Data

Wipe #	Location	Total Activity Gross α/β (dpm/100 cm ²)*	Removable Activity Gross α/β (dpm/100 cm ²)
1 - 20	See Figure 1-BLDG 35	< MDA1	< MDA2
21 - 39	See Figure 2-BLDG 3	< MDA1	< MDA2
40 - 44	See Figure 3-BLDG 12	< MDA1	< MDA2
45 - 72	See Figure 4-BLDG 24	< MDA1	< MDA2

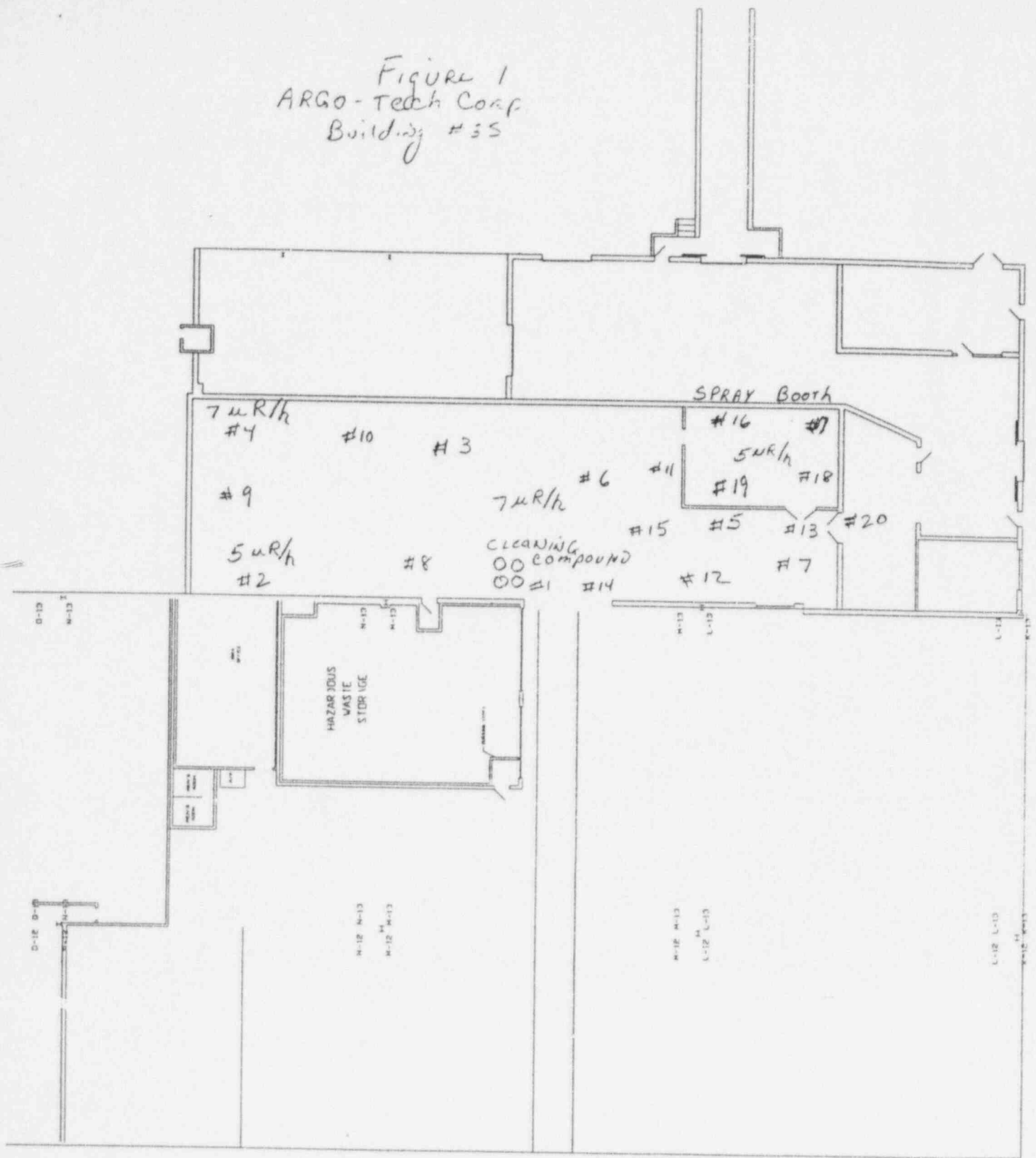
NOTES:

MDA1: 850 dpm, minimum detectable activity of GM (Ludlum 44-09) at 1-minute count.

MDA2: 5 dpm, minimum detectable activity of Gas proportional counter (Gamma Products G-5000) at 5-minute count.

* Total activity is the sum of fixed and removable activity

FIGURE 1
ARGO-Tech Corp
Building #35



= Approximate location of wipe spl.

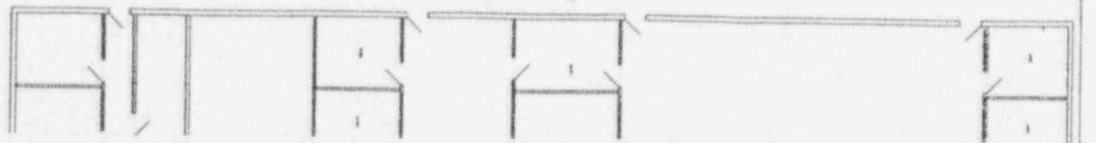


FIGURE 2
ARGO Tech Corp
Building 3

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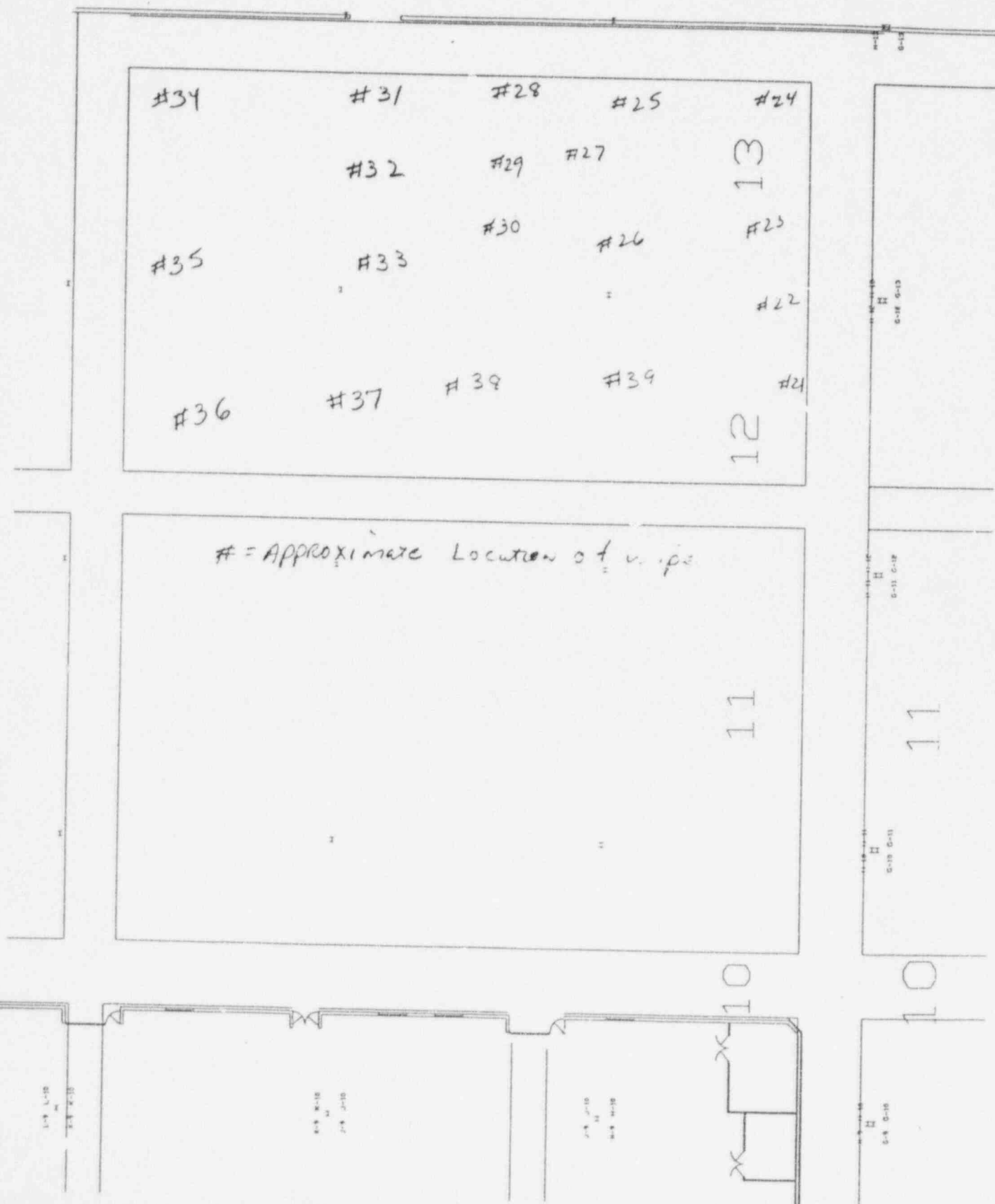
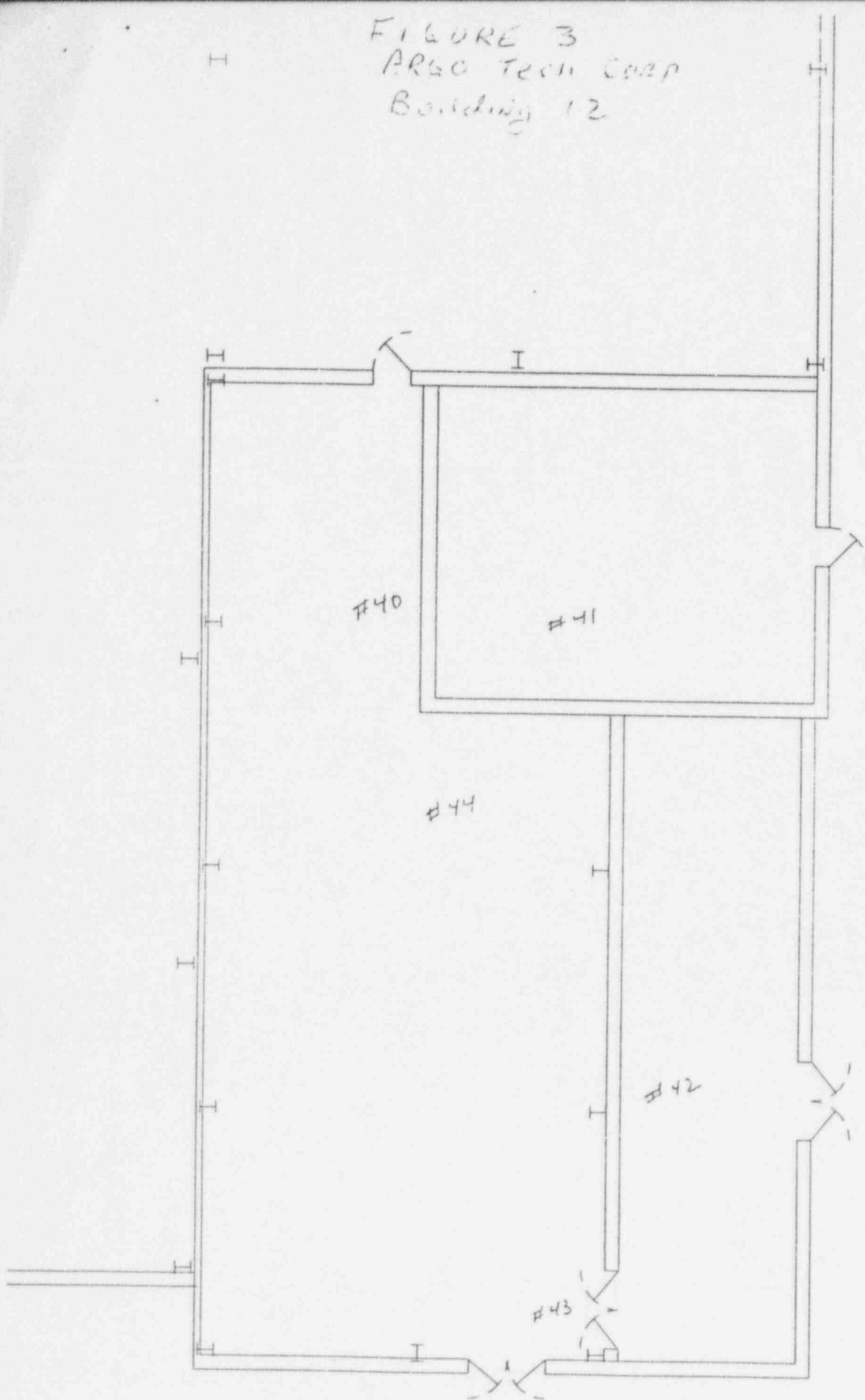
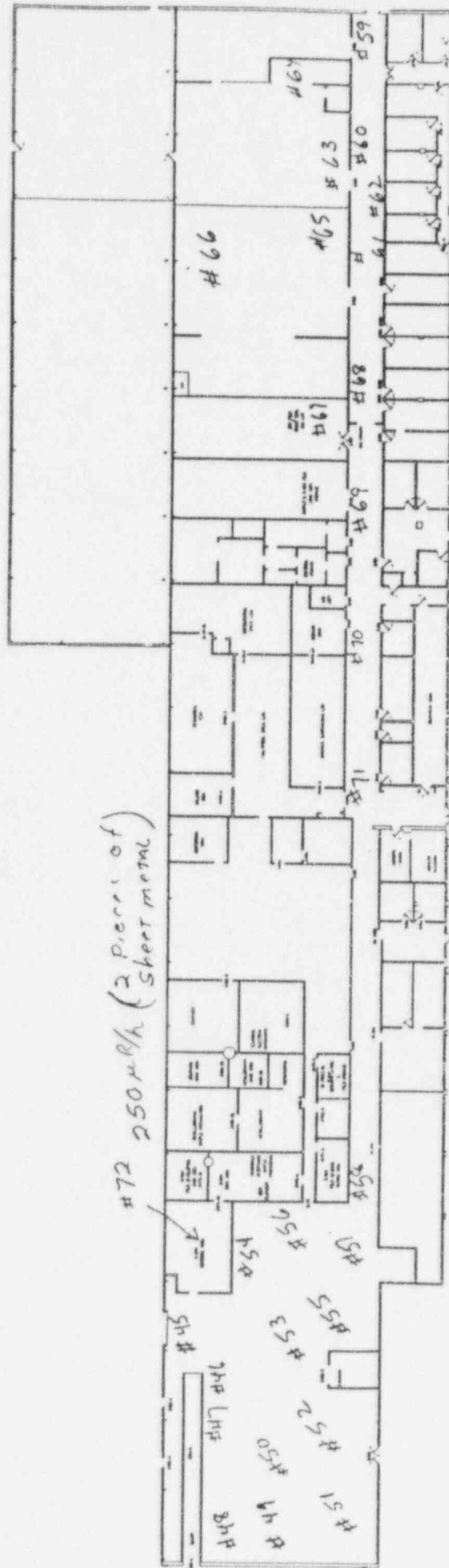


FIGURE 3
ARCO Tech Corp
Building 12



12

= APPROXIMATE LOCATION of wipe



#72 250 μ R/A (2 pieces of sheet metal)