Whirlpool CORPORATION

The Elisha Gray II
Research and Engineering Center

MONTE ROAD, BENTON HARBOR, MICHIGAN 49022

March 31, 1987

Ms. Evelyn R. Matson
Materials Licensing Section
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Ms. Matson:

The following information is being sent in reply to your request for a closeout survey relative to termination of our NRC License No. 21-01784-01. Please refer to Control Number 82519.

The survey was conducted as stated in your letter by C. William Mutch, Ph.D., Associate Professor of Chemistry at Andrews University. Duplicate copies of his findings are enclosed. In addition, a diagram of all laboratories surveyed for radiation is also enclosed. All the information requested in your letter is presented in the report.

If you have any questions relative to this information, please contact me at (616) 926-5308.

Cordially,

R W Ifkovits

Richard W. Ifkovits
Senior Research Microbiologist

RWI:ce

cc: D. Robach
J. Wuepper
N. Roth

ANDREWS
UNIVERSITY

March 25, 1987

Dr. Richard Ifkovits
Senior Research Microbiologist
Whirlpool Corporation
Elisha Gray II Research and Engineering Center
Monte Road
Benton Harbor, MI 49022

Dr. Ifkovits:

The following is a report of procedures used and results obtained in the radiation survey of three laboratories of the Whirlpool Corporation in the Elisha Gray II Research and Engineering Center on March 12, 1987.

Procedures:

1. General monitoring: Each room was surveyed (floor, bench top deck, fume hood) using an Eberline Model E-140 Gieger-Mueller counter, which was calibrated by Stan A. Huber Consultants, Inc., in December, 1986.

2. Swipe test: Several locations in each room were checked by the swipe test using approximately 1 inch squares of Kim Wipes rubbed over a surface trail of 3 to 5 feet. Each square was put in a scintillation vial along with 15 mls of aquasol and counted on a Packard Tri-Carb Liquid Scintillation Spectrometer. This instrument was operating at 70% efficiency as determined by using a standard C-14 sample from Packard.

Results:

1. General monitoring: There were no areas in any room surveyed that indicated more than background radiation.

2. Swipe test: Data below is for a 5 minute counting interval.

Sample	Area	Actual Count	Corrected Count*	Standard Deviation**
Blank 1		247	353	19
Blank 2		245	350	19
Room 1053				
1	floor drain	261	373	19
2	bench top	223	319	18
Room 1058				
1	steel work box	278	397	20
2	floor	265	379	19
3	south bench top	251	359	19
4	north bench top	264	377	19
Room 1033				
1	north bench top	271	387	20
2	floor	292	417	20

*Corrected count is based on a counter efficiency of 70%. **Standard deviation, $S = (\text{corrected count})^{1/2}$

The low count rate makes a statistical analysis of the data unnecessary. If the difference between the highest count rate (417 counts per 5 minutes) and background is assumed to be statistically significant, then the amount of radioactivity (C-14) on the surface is about 1 pico curie ($1pCi = 1 \times 10^{-12}$ Ci), and is clearly insignificant. The three laboratories, therefore, are clean and free of radioactivity.

Cordially,

G. William Mutch

G. William Mutch, Ph.D.
Associate Professor of Chemistry
Radiation Safety Committee, Chairman

dmh

ELISHA GRAY II
R&E CENTER
FIRST FLOOR LAB WING

First Floor Offices

1001	Paul Bernett
1002	P.S. Roy
1003	Jean Banks
1004	John Nelson
1005	SCI.RES.P.C. TERM
1006	Ed Peterson
1007	William Powe
1008	OPEN
1008A	John Wuepper
1009	Wayne Peterman
1011	Delbert Helling
1012	Shannon Madison
1013	OPEN
1014	A.M.E. DESIGN
1015	OPEN
1016	OPEN
1029	Tony Hardaway
1065	Doug Workinger
1067	Marty Immoos
1071	Dick Jones

First Floor Labs

1020	LUBRICATION LAB
1021	DISHWASHER DETERGENT CHEM.
1022	PHYSICAL CHEMISTRY
1023	GAS CHROMATROGRAPHY
1024	WATER CHEMISTRY
1025	CHEM and FLOOR CARE
1026	DISTILLED WATER
1027	DETERGENT COMP. LAB
1030	DETERGENT CHEMISTRY
1031	ORGANIC CHEMISTRY
1032	TEXTILE CHEMISTRY
1033	TEXTILE CHEMISTRY
1035	HOME ECON LNDRY APP LAB
1036	HOME ECON LNDRY APP LAB
1038	SPECTROSCOPY
1039	SPECTROSCOPY
1040	PHOTOMICROSCOPY
1041	PHOTOMICROSCOPY
1042	PHOTOMICROSCOPY
1042A	PHOTOMICROSCOPY
1043	ATOM ABSORP EMIS SPECTRO
1044	CORROSION
1045	SCAN ELEC MICROSCOPE
1046	SCAN ELEC MICROSCOPE
1050	POLYMER CHEMISTRY
1051	RHEOLOGY

First Floor Labs (cont)

1052	GEL PERMEATION
1053	APPLIANCE MICROBIOLOGY
1055	INCUBATOR ROOM
1056	STERILE ROOM
1057	MEDIA PREPARATION
1058	MICROBIOLOGY
1059	FLAMMABILITY TEST LAB
1061	MODEL SHOP
1065	STOCKROOM and SHOP CRIB
1066	HAZARDOUS CHEM STOREROOM
1068	PAINT ROOM
1068A	PAINT STORAGE
1069	MFG. RESEARCH LAB
1070	MODEL SHOP
1070A	PATTERN SHOP
1071	SHIPPING/RECEIVING
1072	REFRIGERATOR TEST ROOMS
1072A	TENNEY TEST ROOMS
1072B	COMPUTERIZED REF CONTROL ROOM/ Doug Lecleer
1073	MFG RESEARCH
1073A	STORAGE BALCONY
1073B	R.A.C. TEST ROOM
1073C	R.A.C. COMPUTERIZED CONTROL ROOM
1073D	C.N.C. MACHINING CENTER

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