

LE:CGW
40-2286

File
MAY 11 1962

Westinghouse Electric Corporation
Lamp Division
Bloomfield, New Jersey

Attention: Mr. P. E. Murphy
Purchasing Department

Gentlemen:

Thank you for your letter of April 27, 1962, informing us that you have corrected those deficiencies in your AEC licensed program which were brought to your attention in our letter of April 17, 1962. These matters will be reviewed during the next inspection of your facilities.

Your cooperation with us is appreciated.

Very truly yours,

Eber H. Price
Assistant Director
Division of Licensing
and Regulation

bcc: Compliance Division, HQ)
Compliance Division, I) w/cpy ltr 4-27-62
Public Document Room)

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4/33

343 smear

East Pittsburgh Works

January 23, 1964

BLOOMFIELD WORKS

Section 343

Mr. L. W. Hoyer

cc: Bloomfield Works, Section 5401, Mr. A. A. Rapp
cc: Bloomfield Works, Section 343, Mr. J. F. Salmon

Nine smear samples taken on 1/17/64 in Section 343 were counted in the Industrial Hygiene Laboratory. The results are listed.

<u>Sample No.</u>	<u>Bldg.</u>	<u>Equipment</u>	<u>dpm/smear</u>
3	9	Tumbler #1	5.7
4	9	Blender #2	15.8 <i>specimen</i>
5	9	Front hood--Firing furnace	Insignificant activity
6	9	Steiner Ives drying oven	Insignificant activity
7	9	Top Sieving hood	5.7
8	6	General area sieving room	4.7
9	6	Hood--boat loading	2.9
10	9	Center aisle thorium doping area	1.4
11	6	Aisle opposite sieve room	4.3

Sample 4 shows a little more activity than is normal for this location and should be checked. The remaining samples are all within the permissible level.

George N. Stewart
George N. Stewart
Industrial Hygiene Engineer

A/34

East Pittsburgh Works

February 24, 1964

BLOOMFIELD WORKS

Section 343

Mr. L. W. Heyer

cc: Bloomfield Works, Section 5401, Mr. R. Williams

cc: Bloomfield Works, Section 343, Mr. J. F. Salmon

Sixteen smear samples taken on 2-19-64 in Section 343 were counted in the Industrial Hygiene Laboratory for alpha activity. The results are listed.

Sample No.	Bldg.	Floor	Equipment	Alpha disintegrations/min. per smear
1	8	3	Weighing thorium nitrate	4.2
3	9	--	Tumbler #1	8.3
4	9	--	Blender #2	11.2
5	9	--	Front hood - firing furnace	1.4
6	9	--	Steiner Ives drying oven	2.8
7	9	--	Top sieving hood	5.6
8	6	--	General area sieving room	11.2
9	6	--	Hood - boat loading	11.2
10	9	1	Center aisle - thoria doping area	5.6
11	6	1	Aisle opposite siev room	12.5
12	9	3	Floor around Hi Fire furnace	26.4
13	9	--	Floor in press room	11.2
14	6	--	Floor around reduction furnace	16.7
15 (1)	9	--	Press room cabinets	7.0
15 (2)	9	--	Press room cans	4.2
15 (3)	9	--	Press room chairs	2.8

We do not like to see the activity of these smear samples go much above 10 alpha dpm per smear; five of the above samples are slightly above this level of activity. Sample Nos. 12 and 14 are considerably above this level. It is recommended that these areas be checked to ascertain what measures are necessary to correct this situation.

George N. Stewart
Industrial Hygiene Engineer

2/26
J. Salmon
As it was high count
since 2/26/64 - will smear
after clean up. RTW

5 days

File F
343

East Pittsburgh Works

March 18, 1964

BLOOMFIELD WORKS

Section 343

Mr. T. W. Hayer

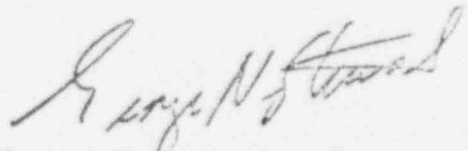
cc: Bloomfield Works, Section 5401, Mr. R. T. Williams

cc: Bloomfield Works, Section 343, Mr. J. Salmon

Twelve smear samples taken in Section 343 on 3-16-64 were counted. The results are listed.

Sample No.	Bldg.	Floor	Equipment	Alpha disintegrations per smear
3	9	--	Tumbler #1	10.6
4	9	--	Blender #2	6
5	9	--	Front hood - firing furnace	6
6	9	--	Steiner Ives drying oven	1.5
7	9	--	Top sieving hood	1.5
8	6	--	General area - sieving room	1.5
9	6	--	Hood - boat loading	1.5
10	9	1	Center aisle thorium doping area	1063 ← 1 hr/wk
11	6	1	Aisle opposite sieve room	38
12	9	1	Floor in press room	1240 ← 8 hr/wk
13	6	1	Floor around reduction furnace	29
14	9	1	Floor around Hi Fire Furnace	875 ← 29 hr/wk

Sample Nos. 10, 12 and 14 are extremely high and Nos. 11 and 13 are slightly higher than desirable. I reported these results by telephone to R. Williams.



George N. Stewart
Industrial Hygiene Engineer

East Pittsburgh Works

May 1, 1964

BLOOMFIELD WORKS

Section 343

Mr. T. W. Hoyer

cc: Bloomfield Works, Section 5401, Mr. R. T. Williams
cc: Bloomfield Works, Section 343, Mr. J. Salmon

Twelve smear samples taken on 4-28-64 in Section 343 were counted. The results are listed.

<u>Sample No.</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha disintegrations per minute per smear</u>
3	9	--	Tumbler #1	76.0 1 hr / wk
4	9	--	Blender #2	5.9
5	9	--	Front hood - Firing furnace	86.0 1 hr / wk
6	9	--	Steiner Ives drying oven	5.8
7	9	--	Top sieving hood	5.8
8	6	--	General area sieving room	700.0 20 hr / wk
9	6	--	Hood -- boat loading	7.3
10	9	1	Center aisle thoria doping area	279.0 1 hr / wk
11	6	1	Aisle opposite sieve room	236.0
12	9	--	Floor in press room	225.0 8 hr / wk
13	6	1	Floor around reduction furnace	101.0 20 hr / wk
14	9	1	Floor around H1 Fire Furnace	53.0 20 hr / wk

All these samples with the exception of Nos. 4, 6, 7 and 9 are extremely high. This is the second consecutive month in which the smear samples, as a whole, as well as the air samples have been far beyond the desirable range of activity. The air samples were reported in my letter of 4-30-64. Prompt remedial measures must be taken in this area.

George N. Stewart

George N. Stewart
Industrial Hygiene Engineer

Mr. L. W. Hoyer

-2-

May 19, 1964

5/11/64

<u>Smear No.</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha dpm/smear</u>
10	--	--	Center aisle thorium doping area	36.8
11	6	--	Aisle opposite sieve room	38.5
12	--	--	Floor in press room	32.0
13		1	Floor around reduction furnace	18.2
14		1	Floor around Hi Fire furnace	31.3

These results indicate a marked improvement in this section when compared to those for the previous two groups of air and smear samples. Eight of the air samples still show concentrations slightly in excess of the permissible level of activity while we would like to maintain an upper limit of about 10 alpha dpm for the smear samples.

George N. Stewart

George N. Stewart
Industrial Hygiene Engineer

<u>Smear No.</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha dpm/smear</u>
3	9	--	Tumbler #1	17.4
4	9	--	Blender #2	36.8 <i>1 hr. test</i>
5	9	--	Front hood--firing furnace	21.7
6	9	--	Steiner Ives drying oven	33.5 <i>20 hr. test</i>
7	9	--	Top Sieving hood	29.0
8	6	1	General air-sieving room	21.0
9	6	1	Hood--boat loading	36.0

2 days



Sample
No.

Blkr.

Floor

Exhaust

June 22

Taken

June 30 1945

Counted

Alpha and
ray count

3

9

-

Tumbler #1

2.7

4

9

-

Blender #2

4.1

5

9

-

Front hood - firing furnace

2.0

6

9

-

Steiner Ives drying oven

2.0

7

9

-

Top sieving hood

0.7

8

6

-

General area sieving room

0.7

9

6

-

Hood - boat loading

1.3

10

9

1

Center aisle thorla doping area

1.3

11

6

1

Aisle opposite sieve room

1.3

12

9

1

Press room floor

63.2

13

9

1

Floor by firing furnace

4.1

14

6

1

Floor in front of reduction furnace

6.8

2 8 day

BLOOMFIELD WORKS
Section 343

L. W. Meyer

East Pittsburgh 2-G-46

September 9, 1934

cc: Bloomfield Works - Section 5401 - R. Williams
cc: Bloomfield Works - Section 343 - J. F. Salmon

Twelve smear samples and sixteen air samples, taken on August 26 and submitted to this laboratory, have been counted for alpha activity. The results are listed.

<u>Smear Sample No.</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha dpm per Smear</u>
3	9	--	Tumbler #1	
4	9	--	Bender #2	3.5
5	9	--	Front Hood	7.0
6	9	--	Steiner Ives Drying Oven	2.1
7	9	--	Top Sieving Hood	1.4
8	6	--	General Area Sieving Room	2.1
9	6	--	Hood - boat loading	3.5
10	9	1	Center aisle thorla doping area	1.4
11	6	1	Aisle opposite sieve room	0.7
12	8	3	Floor by igniting furnace	None detectable
13	9	--	Floor in press room	6.3
→ 14	6	--	Floor by reduction furnace	3.5
				18.9

14 day
1/5 0.4

BLOOMFIELD WORKS
Section 343

T. W. Hoyer

East Pittsburgh 2-G-46

October 14, 1934

cc: Bloomfield Works - Section 343 - J. P. Salmon
cc: Bloomfield Works - Section 5401 - R. Williams

Twelve smear samples and eighteen air samples taken in Section 343 on September 23, 1934 and September 25, 1934 respectively were counted for alpha activity. The results are listed:

<u>Smear Sample No.</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha Disintegrations per Smear</u>
3	9	--	Tumbler #1	No detectable activity
4	9	--	Blender #2	1.4
5	9	--	Front hood - firing furnace	No detectable activity
6	9	--	Steiner ives drying oven	No detectable activity
7	9	--	Top sieving hood	1.4
8	6	--	General area sieving room	0.7
9	6	--	Hood - boat loading	2.1
10	9	1	Center aisle thorium doping	0.7
11	6	1	Aisle opposite sieve room	1.4
12	9	1	Floor around igniting furnace	2.8
13	9	1	Floor of press room	1.4
14	6	1	Floor around reduction furnace	4.9

12 16.8
16 days



From: East Pittsburgh Works

Date: July 1, 1964

Subject:

BLOOMFIELD WORKS
Section 343
Mr. L. W. Heyer

cc: Bloomfield Works, Section 343, Mr. J. F. Salmon
cc: Bloomfield Works, Accident Prevention, Mr. R. T. Williams

The 12 smear samples received on 6-30-64 from Section 343 were counted for alpha activity. The results are listed.

<u>Sample</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha dpm/smear</u>
3	9	--	Tumbler #1	3.5
4	9	--	Blender #2	0.7
5	9	--	Front hood - Firing furnace	1.4
6	9	--	Steiner Ives drying oven	4.2
7	9	--	Top sieving hood	2.1
8	6	--	General area sieving room	0.7
9	6	--	Hood - boat loading	1.4
10	9	1	Center aisle thoria doping area	1.4
11	6	1	Aisle opposite sieve room	0
12	9	--	Floor by igniting furnace	0.7
13	9	--	Press room floor	1.4
14	6	--	Floor by #1 furnace	2.1

All these samples are well within permissible levels.

George N. Stewart

George N. Stewart
Industrial Hygiene Engineer

East Pittsburgh 2-G-15

BLOOMFIELD WORKS
Section 343

November 10, 1964

L. W. Hager

cc: Bloomfield Works - Section 343 - J. F. Salmon

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.

Twelve smear samples taken in Section 343 on November 3, 1964 have been counted for alpha activity. The results are listed.

Sample No.	Bldg.	Floor	Equipment	Alpha Disintegrations per Smear
3	9	-	Tumbler #1	None detectable
4	9	-	Blender #2	5.3
5	9	-	Front hood - firing furnace	2.3
6	9	-	Steiner Ives drying oven	0.75
7	9	-	Top sieving hood	3
8	6	-	General area sieving room	3
9	6	-	Hood - boat loading	1.5
10	9	1	Center aisle thorium doping area	0.75
11	6	1	Aisle opposite sieve room	4.5
12	9	-	Floor around igniting furnace	2.3
13	9	-	Floor of pressing room	12.8
14	6	-	Floor around reduction furnace	12
				<u>118.20</u>

All these samples are within permissible levels of activity although Samples 13 and 14 are around the upper limit of the range.

George N. Stewart
George N. Stewart,
Industrial Hygiene Engineer

GNS:cmh



East Pittsburgh 2-G-46

BLOOMFIELD WORKS
Section 343

April 27, 1965

L. W. Heyer

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.
cc: Bloomfield Works - Section 343 - J. F. Salmon

Twelve smear samples that were taken in Section 343 on April 15, 1965 have been counted. The results are listed.

Sample No.	Bldg.	Floor	Equipment	Alpha Disintegration per Smear
3	9	-	Tumbler #1	2.8
4	9	-	Tumbler #2	11.2
5	9	-	Front Hood - firing furnace	2.8
6	9	-	Steiner Ives drying oven	1.4
7	9	-	Top sieving hood	0.7
8	6	-	General area - sieving room	0.7
9	6	-	Hood - boat loading	0.7
10	9	1	Center aisle thoria doping area	None detectable
11	6	1	Aisle opposite sieve room	5
12	9	1	Floor of press room	1.4
13	9	1	Floor in front of firing furnace	4.2
14	6	1	Floor in front of reduction furnace	17.5

Sample No. 14 was a little higher than we like to see. It would be well to check this activity. The other samples were within permissible limits.

H. Wilbur Speicher, Administrator
Industrial Hygiene

per George M. Stewart

CMS:CMH

East Pittsburgh 2-G-46

September 2, 1965

BLOOMFIELD WORKS
Section 343

R. W. Hoyer

cc: Bloomfield Works - Section 343 - James Salmon

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.

Twelve smear samples taken in Section 343 on August 25, 1965 were counted for alpha activity. The results are listed.

<u>Sample No.</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha dpm/smear</u>
3	9	-	Tumbler #1	6
4	9	-	Blender #2	2
5	9	-	Front hood - firing furnace	3
6	9	-	Steiner Ives drying oven	1
7	9	-	Top sieving hood	1
8	6	-	General area - sieving room	0.7
9	6	-	Hood, boat-loading	3
10	9	1	Center aisle thorium doping area	0.7
11	6	1	Aisle opposite sieve room	1
12	6	1	Reduction furnace	5
13	9	-	Press room floor	5
14	9	-	Floor - front of high fire furnace	3

All of these samples are within permissible levels of activity.


George H. Stewart,
Industrial Hygiene Engineer

BLOOMFIELD WORKS
Section 343

T. W. Heyer

East Pittsburgh 2-G-46

November 5, 1965

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.
cc: Bloomfield Works - Section 343 - J. F. Salmon

Twelve smear samples, taken on October 26, 1965 in Section 343, have been counted for alpha activity. The results are listed.

<u>Sample No.</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha Disintegrations per Smear</u>
3	9	-	Tumbler #1	3.4
4	9	-	Blender #2	2.7
5	9	-	Front hood - firing furnace	1.4
6	9	-	Steiner Ives drying oven	0.7
7	9	-	Top sieving hood	1.4
8	6	-	General area of sieving room	1.4
9	6	-	Hood - boat loading	1.4
10	9	1	Center aisle - thorium doping area	1.4
11	6	1	Aisle opposite sieve room	No detectable activity
12	-	-	Floor by igniting furnace	3.4
13	6	-	Floor by reduction furnace	4.7
14	9	-	Floor of press room	12.5

All of these samples are within permissible levels of activity.

George N. Stewart
George N. Stewart,
Industrial Hygiene Engineer

East Pittsburgh 2-G-46

December 15, 1965

BLOOMFIELD WORKS
Section 343

A. Eberhard

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.
cc: Bloomfield Works - Section 343 - J. F. Salmon

Twelve smear samples taken in Section 343 on November 23, 1965 have been counted for alpha activity. The results are listed.

<u>Sample No.</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha cpm per smear</u>
3	9	-	Tumbler #1	2
4	9	-	Blender #2	2
5	9	-	Front hood - firing furnace	4
6	9	-	Steiner Ives oven	No detectable activity
7	9	-	Top sieving hood	1
8	6	-	General area sieving room	No detectable activity
9	6	-	Hood - boat loading	7
10	9	1	Center aisle thorium doping area	2
11	6	1	Aisle opposite sieve room	4
12	9	-	Floor - press room	10
13	9	-	Floor - front of igniting furnace	9
14	6	-	Floor in front of furnace #1	18

2157

The last smear is slightly higher in activity than we like to see.
All of the others are within permissible limits.

George N. Stewart
George N. Stewart,
Industrial Hygiene Engineer

GMH

21 day - 5



BLOOMFIELD WORKS
Accident Prevention Dept.

R. T. Williams, Div. Admin.

From: East Pittsburgh 2-C-46

Date: January 6, 1966

Subject:

cc: Bloomfield Works - Section 343 - J. F. Salmon
cc: Bloomfield Works - Section 343 - A. Eberhard

Twelve smear samples taken in Section 343 have been counted for alpha activity. The results are listed.

Sample No.	Bldg.	Floor	Equipment	Alpha Disintegrations per minute/smear
3	9	3	Tumbler #1	9
4	9	3	Blender #2	15
5	9	-	Front hood - firing furnace	14
6	9	-	Steiner Ives drying oven	10
7	9	-	Top sieving hood	7
8	6	-	General area sieving room	15
9	6	-	Hood - boat loading	6
10	9	1	Center aisle - thorium doping area	10
11	6	1	Aisle opposite sieve room	15
12	8	3	Floor - press room	16
13	9	-	Floor - front of igniting furnace	14
14	6	-	Floor - front of furnace #1	16

Although none of these smear samples showed extremely high activity, seven of them exceeded 10 disintegrations per minute. We feel that the activity can be kept under ten disintegrations per minute per smear.

George N. Stewart

George N. Stewart,
Industrial Hygiene Engineer

BLOOMFIELD WORKS
Section 343
A. Eberhard

East Pittsburgh 2-3-46

February 7, 1966

cc: Bloomfield Works - Section 343 - J. F. Salmon
cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.

Twelve smear samples, taken in Section 343 on January 25, 1966,
have been counted for alpha activity. The results are listed.

<u>Sample No.</u>	<u>Bldg.</u>	<u>Floor</u>	<u>Equipment</u>	<u>Alpha Disintegrations per Smear</u>
3	9	-	Tumbler #1	2
4	9	-	Blender #2	No detectable activity
5	9	-	Front hood - firing furnace	2
6	9	-	Steiner Ives drying oven	No detectable activity
7	9	-	Top sieving hood	No detectable activity
8	6	-	General Area sieving room	No detectable activity
9	6	-	Hood - boat loading	3
10	6	1	Center aisle - thorium doping area	2
11	6	1	Aisle opposite sieve room	No detectable activity
12	9	3	Floor, press room	No detectable activity
13	9	1	Floor - front of igniting furnace	No detectable activity
14	6	-	Floor - front of furnace #1	10

All of these samples are within permissible levels of activity.

George H. Stewart
George H. Stewart,
Industrial Hygiene Engineer

343

East Pittsburgh 2-G-46

March 25, 1966

BLOOMFIELD WORKS
Section 343

Alfred Eberhard

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.
cc: Bloomfield Works - Section 343 - J. F. Salmon

Twelve smear samples taken in Section 343 on March 8, 1966 have been evaluated. The results are listed.

Sample No.	Bldg.	Floor	Equipment	Alpha Disintegrations per Smear
3	9	-	Tumbler #1	3
4	9	-	Blender #2	5
5	9	-	Front hood - firing furnace	2
6	9	-	Steiner Ives drying oven	2
7	9	-	Top sieving hood	4
8	6	-	General area - sieving room	2
9	6	-	Hood - boat loading	6
10	9	1	Center aisle - thorium doping area	5
11	6	1	Aisle opposite sieve room	6
12	8	3	Floor - press room	No detectable activity
13	9	1	Floor - front of igniting furnace	2
14	6	-	Floor - front of furnace #1	9

All these smear samples exhibited less than the permissible limit of activity.

George N. Stewart
George N. Stewart,
Industrial Hygiene Engineer

cm

343 air

East Pittsburgh Works

February 10, 1934

~~BLOOMFIELD WORKS~~
Section 343
Mr. L. W. Meyer

cc: Bloomfield Works, Section 343, Mr. H. C. Milbank
cc: Bloomfield Works, Section 82019, Mr. R. Corth
cc: Bloomfield Works, Section 5401, Mr. A. A. Rapp

The results on the 15 air samples taken for the thorium operations in Section 343 on 1-22-34 are listed.

<u>Sample #</u>	<u>Operation</u>	<u>Microcuries per cc of air</u>
1	Mixing $\text{Th}(\text{NO}_3)_4$ Sol. $\frac{1}{2}$ hr/wk	4.2×10^{-11}
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$ 1 hr/wk	0.7×10^{-11}
3	Transferring doped oxide to furnace $\frac{1}{2}$ hr/wk	0.7×10^{-11}
4	Loading doped oxide into furnace 2 hr/wk	Insignificant activity
5	Unloading doped oxide from furnace	0.14×10^{-11}
6	Crushing fired doped oxide	1.0×10^{-11}
7	Loading oxide into reduction furnace	0.3×10^{-11}
8	Unloading oxide from reduction furnace	1.4×10^{-11}
9	Sieving metal after reduction	0.3×10^{-11}
10	Tumbling metal $\frac{1}{2}$ hr/wk	0.14×10^{-11}
11	Sieving metal before pressing $\frac{1}{2}$ hr/wk	0.6×10^{-11}
12	Pressing metal $\frac{1}{2}$ hr/wk	1.6×10^{-11}
14	Center aisle - Thorium doping area	0.4×10^{-11}
15	Center aisle - Sieve room, Bldg. #6	1.83×10^{-11}
17	Exhaust stack - roof thorium doping area	0.3×10^{-11}

Encl #10

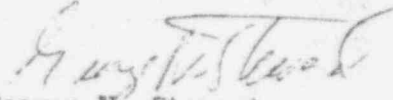
A/35

Mr. L. W. Hoyer

-2-

February 10, 1954

Sample No. 1 exceeds the permissible level of 3×10^{-11} microcuries per cc of air. This operation should be checked and corrective measures taken. The other samples are all within the permissible level.



George N. Stewart
Industrial Hygiene Engineer

East Pittsburgh Works

April 3, 1964

BLOOMFIELD WORKS

Section 343

Mr. L. W. Hoyer

cc: Bloomfield Works, Section 343, Mr. J. Salmon

cc: Bloomfield Works, Section 5401, Mr. R. T. Williams

Thirteen air samples collected in Section 343 on 3-20-64 were counted for alpha activity. The individual results are listed.

Sample No.	Operation Description	Microcuries per cc of air
1	Mixing $\text{Th}(\text{NO}_3)_4$ Sol.	101×10^{-11} <i>10/10</i>
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$	21.3×10^{-11} <i>11/10</i>
3	Transferring doped oxide to furnace	67.8×10^{-11} <i>10/10</i>
4	Loading doped oxide into furnace	1.6×10^{-11} <i>20/10</i>
5.	Unloading doped oxide from furnace	20.2×10^{-11} <i>20/10</i>
6	Crushing fired, doped oxide	6.3×10^{-11} <i>20/10</i>
7	Loading oxide into reduction furnace	1.0×10^{-11}
8	Unloading oxide from reduction furnace	1.0×10^{-11}
9	Sieving metal after reduction	1.1×10^{-11}
11	Sieving metal before pressing	1.8×10^{-11}
12	Pressing metal	81.2×10^{-11} <i>20/10</i>
14	Center aisle - thorium doping area	54.8×10^{-11} <i>"</i>
15	Center aisle sieve room - Bldg. #6	0.8×10^{-11} <i>"</i>

The Permissible Level of activity is 3×10^{-11} microcuries per cc of air. Seven of the above samples exceed this level by multiples of two to thirty-five. These results are cause for concern and immediate investigation is indicated. Mr. Williams was notified by telephone on 4-3-64.

George H. Stewart
George H. Stewart

Industrial Hygiene Engineer



East Pittsburgh Works

April 30, 1934

BLOOMFIELD WORKS

Section 343

Mr. T. W. Hoyer

cc: Bloomfield 343, Mr. J. Salmon

cc: Bloomfield 5401, Mr. R. T. Williams

cc: Bloomfield 82019, Mr. R. Corth

Fourteen air samples taken in Section 343 on 4-27-34 have been counted and the results are listed.

Sample No.	Operation Description	Microcuries per cc of air
1	Mixing $\text{Th}(\text{NO}_3)_4$ Sol.	82×10^{-11} $\frac{1}{2}$ hr./wk.
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$	16×10^{-11}
3	Transferring doped oxide to furnace	56×10^{-11} $\frac{1}{2}$ hr./wk.
4	Loading doped oxide into furnace	17×10^{-11} $\frac{1}{2}$ hr./wk.
5	Unloading doped oxide from furnace	52×10^{-11} $\frac{1}{2}$ hr./wk.
6	Crushing fired, doped oxide	29×10^{-11} $\frac{1}{2}$ hr./wk.
7	Loading oxide into reduction furnace	20×10^{-11} $\frac{1}{2}$ hr./wk.
8	Unloading oxide from reduction furnace	47×10^{-11} $\frac{1}{2}$ hr./wk.
9	Sieving metal after reduction	109×10^{-11}
11	Sieving metal before pressing	61×10^{-11} $\frac{1}{2}$ hr./wk.
12	Pressing metal	23×10^{-11} $\frac{1}{2}$ hr./wk.
14	Center aisle -- Thorium doping area	23×10^{-11} ?
15	Center aisle sieve room, Bldg #6	44×10^{-11} ?
17	Exhaust stack -- roof thorium doping area	39×10^{-11}

All of these results are far in excess of the permissible level of 3×10^{-11} $\mu\text{c}/\text{cc}$ of air. Until recently we did not, to the best of my knowledge, obtain any results that approached the excessive values indicated by these counts. Our counting equipment is standardized on a weekly schedule and in view of the fact that air samples from sections 342 and 346 have not shown any significant change in the order of magnitude of activity, I have no reason to suspect our counting equipment of erroneous results.

A thorough investigation of the conditions which contribute to such excessive activity in these air samples is definitely in order.

George E. Stewart
George E. Stewart
Industrial Hygiene Engineer

East Pittsburgh Works

May 19, 1964

Bloomfield Works
Section 343
Mr. L. W. Heyer

cc: Bloomfield works, Section 5401, Mr. R. T. Williams
cc: Bloomfield Works, Section 343, Mr. J. Salmon

Fifteen air samples, taken on 5-8-64, and 12 smear samples, taken on 5-11-64, from Section 343 were counted. The results are listed.

<u>Air Sample No.</u>	<u>Operation Description</u>	<u>Microcuries per cc of air</u>
1	Mixing $\text{Th}(\text{NO}_3)_4$ Solution	2.4×10^{-11} 1/2 hr / wk
2	Doping Oxide with $\text{Th}(\text{NO}_3)_4$	2.8×10^{-11}
3	Transferring doped oxide to furnace	2.8×10^{-11}
4	Loading doped oxide into furnace	2.0×10^{-11}
5	Unloading doped oxide from furnace	3.9×10^{-11}
6	Crushing fired doped oxide	5.3×10^{-11} } 2-3 hr / wk
7	Loading oxide into reduction furnace	3.2×10^{-11}
8	Unloading oxide from reduction furnace	3.2×10^{-11}
9	Sieving metal after reduction	1.9×10^{-11}
10	Tumbling metal	4.7×10^{-11} 1 hr / wk
11	Sieving metal before pressing	6.4×10^{-11}
12	Pressing metal	3.8×10^{-11} 8 hr / wk
14	Center aisle--thoria doping area	1.7×10^{-11}
15	Center aisle sieve room Bldg. #6	4.2×10^{-11} 2-3 hr / wk
17	Exhaust stack--roof thoria doping area	1.6×10^{-11}

343

East Pittsburgh Works

July 15, 1964

BLOOMFIELD WORKS

Section 343

Mr. L. W. Hoyer

cc: Bloomfield Works, Section 343, Mr. J. F. Salmon

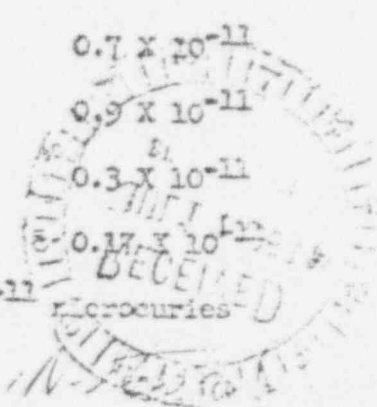
cc: Bloomfield Works, Industrial Relations, Mr. R. T. Williams

The fourteen air samples taken in Section 343 on 6-30-64 were counted for alpha activity. The results are listed.

<u>Sample No.</u>	<u>Operation Description</u>	<u>Microcuries per cc of air</u>
1	Mixing thorin sol.	0.4×10^{-11}
2	Doping oxide with $\text{Th}(\text{WO}_3)_4$	0.3×10^{-11}
3.	Transferring doped oxide to furnace	0.3×10^{-11}
4	Loading doped oxide into furnace	0.5×10^{-11}
5	Unloading doped oxide from furnace	0.6×10^{-11}
6	Crushing fired doped oxide	0.4×10^{-11}
7	Loading oxide into reduction furnace	0.3×10^{-11}
8	Unloading oxide from reduction furnace	0.5×10^{-11}
9	Sieving metal after reduction	0.4×10^{-11}
10	Tumbling metal	0.3×10^{-11}
11	Sieving metal before pressing	0.7×10^{-11}
12	Pressing metal	0.9×10^{-11}
14	Center aisle--thorin doping area	0.3×10^{-11}
15	Center aisle -- sieve room Bldg #6	0.17×10^{-11}

These samples are all below the permissible limit of 3×10^{-11} microcuries per cc of air.

George W. Stewart
Industrial Hygiene Engineer



September 9, 1964

Air Sample No.	Operation Description	Microcuries per cc of Air
11	Sieving metal before pressing	No detectable activity
12	Pressing Metal	0.6×10^{-11}
14	Center Aisle - Thoria doping area	1.2×10^{-11}
15	Center Aisle - Sieve Room Elbg. #5	0.3×10^{-11}
17	Exhaust stack - roof of thoria doping area	0.6×10^{-11}
18	Pressing - 342	15.9×10^{-11}

Smear sample No. 14 is slightly higher in activity than we like to see, and air sample No. 18 is more than five times the permissible level of 3×10^{-11} microcuries of alpha activity per cc of air. This condition should be remedied. The other samples are all within permissible levels of activity.

9/11/64

Tom Meyer will re sample. Exhaust system cleaned out since this sample was taken.
RW

George N. Stewart
George N. Stewart
Industrial Hygiene Engineer

Air Sample No.	Operation Description	Microcuries per cc of air
1	Mixing $Ta(WO_3)_4$ solution	0.5×10^{-11}
2	doping oxide with $Ta(WO_3)_4$	0.9×10^{-11}
3	Transferring doped oxide to furnace	0.6×10^{-11}
4	Loading doped oxide into furnace	0.5×10^{-11}
5	Unloading doped oxide from furnace	0.6×10^{-11}
6	Crushing fired doped oxide	1.1×10^{-11}
7	Loading oxide into reduction furnace	1.4×10^{-11}
8	Unloading oxide from reduction furnace	0.8×10^{-11}
9	Sieving metal after reduction	0.6×10^{-11}
10	Tumbling metal after reduction	0.2×10^{-11}

October 14, 1964

collected Sept 25, 1964

<u>Air Sample No.</u>	<u>Operation Description</u>	<u>Microcuries per cc of air</u>
8	Unloading oxide from reduction furnace	0.47×10^{-11}
9	Sieving metal after reduction	0.2×10^{-11}
10	Tumbling metal	0.4×10^{-11}
11	Sieving metal before pressing	0.2×10^{-11}
12	Pressing metal	0.54×10^{-11}
13	Pressing metal - 3/2	0.54×10^{-11}
14	Center Aisle - thorium doping area	0.6×10^{-11}
15	Center aisle sieve room - Bldg. #6	0.2×10^{-11}
17	Exhaust stack - roof of thorium doping area	0.54×10^{-11}
18	Rear of swager	0.2×10^{-11}
19	Feed end of swager	0.27×10^{-11}

All the smear samples are within permissible limits and all the air samples are less than the Maximum Acceptable Concentration of 3×10^{-11} microcuries per cc of air.

<u>Air Sample No.</u>	<u>Operation Description</u>	<u>Microcuries per cc of air</u>
1	Mixing $Ta(NO_3)_5$ solution	0.6×10^{-11}
2	Doping oxide with $Ta(NO_3)_5$	0.13×10^{-11}
3	Transferring doped oxide to furnace	0.27×10^{-11}
4	Loading doped oxide into furnace	0.07×10^{-11}
5	Unloading doped oxide from furnace	0.4×10^{-11}
6	Crushing fired doped oxide	0.6×10^{-11}
7	Loading oxide into reduction furnace	0.4×10^{-11}

U.S. Navy
Naval Facilities Engineering Command
San Diego, California
October 14, 1964

BLOOMFIELD WORKS
Section 343

East Pittsburgh 2-G-46

December 3, 1934

L. W. Hoyer

cc: Bloomfield Works - Section 343 - J. F. Salmon
cc: Bloomfield Works - Section 82019 - R. H. Corth
cc: Bloomfield Works - Accident Prevention - R. Williams, Div. Admin.

Thirteen air samples from the thorium operations in Section 343 were received for the purpose of determining the alpha activity. The form which accompanied the samples indicated two other samples which were not received; these were for operations 14 and 15. The results of the individual counts are listed:

Sample No.	Operation Description	Microcuries Per cc of Air
1	Mixing $\text{Th}(\text{NO}_3)_4$ solution	0.13×10^{-11}
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$	0.7×10^{-11}
3	Transferring doped oxide to furnace	0.3×10^{-11}
4	Loading doped oxide into furnace	0.4×10^{-11}
5	Unloading doped oxide from furnace	0.3×10^{-11}
6	Crushing fired doped oxide	0.13×10^{-11}
7	Loading oxide into reduction furnace	0.1×10^{-11}
8	Unloading oxide from reduction furnace	0.2×10^{-11}
9	Sieving metal after reduction	0.7×10^{-11}
10	Tumbling metal	0.3×10^{-11}
11	Sieving metal before pressing	0.3×10^{-11}
12	Pressing metal	0.5×10^{-11}
17	Exhaust stack - roof thorium doping area	0.4×10^{-11}

All these samples were below the permissible limit of 3×10^{-11} microcuries per cc of air.

GNS
George H. Stewart,
Industrial Hygiene Engineer

GHS:cmh

DEC 01 1934

East Pittsburgh 2-G-46

April 13, 1965

BLOOMFIELD WORKS
Section 343

L. Hoyer

cc: Bloomfield Works - Section 343 - J. F. Salmon
cc: Bloomfield Works - Section 22019 - R. Corth
cc: Bloomfield Works - Section 343 - A. Wisco
cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.

Seven air samples taken on April 8, 1965 in the thorin operations, Section 343, were counted for alpha activity. The results are given:

<u>Sample No.</u>	<u>Operation</u>	<u>Microcuries/cc of Air</u>
1	Mixing $\text{Th}(\text{NO}_3)_4$ solution	1.1×10^{-11}
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$	0.5×10^{-11}
7	Loading oxide into reduction furnace	0.3×10^{-11}
8	Unloading oxide from reduction furnace	0.3×10^{-11}
9	Sieving metal after reduction	1.1×10^{-11}
14	Center aisle - thorin doping area	0.6×10^{-11}
15	Center aisle - sieve room Bldg. #6	0.2×10^{-11}

All of these samples are below the maximum acceptable concentration of 3×10^{-11} microcuries per cc of air.

George H. Stewart
George H. Stewart,
Industrial Hygiene Engineer

cmn

APR 13 1965

East Pittsburgh 2-G-46

BLOOMFIELD WORKS
Section 343

June 8, 1965

T. W. Heyer

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.
cc: Bloomfield Works - Section 343 - J. F. Salmon
cc: Bloomfield Works - Section 82019 - R. Corth

Ten air samples taken in Section 343 on May 28, 1965 have been counted for alpha activity. The results are listed.

<u>Sample No.</u>	<u>Operation</u>	<u>Microcuries per cc of Air</u>
→ 1	Mixing $Ta(NO_3)_4$ solution	11.9×10^{-11}
7	Loading oxide into reduction furnace	0.13×10^{-11}
8	Unloading oxide from reduction furnace	0.45×10^{-11}
9	Sieving metal after reduction	0.13×10^{-11}
10	Tumbling metal	0.39×10^{-11}
11	Sieving metal before pressing	0.77×10^{-11}
12	Pressing metal	0.51×10^{-11}
14	Center aisle - thorium doping area	0.45×10^{-11}
15	Center aisle - sieve room - Bldg. #6	0.06×10^{-11}
17	Exhaust stack - roof - thorium doping area	0.39×10^{-11}

Sample No. 1, mixing $Ta(NO_3)_4$ solution, is four times the permissible limit of 3×10^{-11} microcuries per cc of air. The reason for this excessive activity should be investigated and corrective measures instituted.

George N. Stewart
George N. Stewart,
Industrial Hygiene Engineer

ccmm

BLOOMFIELD WORKS
Section 343

East Pittsburgh 2-G-46

June 30, 1965

T. W. Hoyer

cc: Bloomfield Works - Section 343 - J. F. Salmon
cc: Bloomfield Works - Section 82019 - R. Corth
cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.

Twelve air samples and twelve smear samples taken from Section 343 on June 17, 1965 and June 22, 1965 respectively were analysed for alpha activity. The results are listed.

<u>Air Sample No.</u>	<u>Operation Description</u>	<u>Microcuries per cc of Air</u>
1	Mixing $\text{Th}(\text{NO}_3)_4$ solution	0.5×10^{-11}
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$	0.4×10^{-11}
3	Transferring doped oxide to furnace	0.5×10^{-11}
7	Loading oxide into reduction furnace	0.3×10^{-11}
8	Unloading oxide from reduction furnace	0.4×10^{-11}
9	Sieving metal after reduction	0.3×10^{-11}
10	Tumbling metal	0.3×10^{-11}
11	Sieving metal before pressing	0.5×10^{-11}
12	Pressing metal	0.7×10^{-11}
14	Center aisle - thorium doping area	0.2×10^{-11}
15	Center aisle sieve room Bldg. 46	0.7×10^{-11}
17	Exhaust stack - roof thorium doping area	0.3×10^{-11}

T. W. Hoyer

- 2 -

June 30, 1955

All the air samples were below the permissible level of 3×10^{-11} microcuries per cc of air including sample No. 1 from which a higher activity sample was obtained at the previous sampling. One smear sample, No. 12, from the press room floor, showed high activity. This area should be decontaminated.

G. H. Stewart

G. H. Stewart,
Industrial Hygiene Engineer

cmh

207 0 0 1955

East Pittsburgh 2-G-46

BLOOMFIELD WORKS
Section 343

September 16, 1965

T. W. Heyer

cc: Bloomfield Works - Section 343 - J. P. Salmon
→ Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.

Fourteen air samples, taken in Section 343 on August 30, 1965, have been counted for alpha activity. The results are listed.

<u>Sample No.</u>	<u>Operation</u>	<u>Microcuries per cc of Air</u>
1	Mixing $\text{Th}(\text{NO}_3)_4$ sol.	0.5×10^{-11}
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$	1.5×10^{-11}
3	Transferring doped oxide to furnace	0.6×10^{-11}
4	Loading doped oxide into furnace	0.7×10^{-11}
5	Unloading doped oxide from furnace	0.27×10^{-11}
6	Crushing fired, doped oxide	0.27×10^{-11}
7	Loading oxide into reduction furnace	0.34×10^{-11}
8	Unloading oxide from oxide furnace	0.27×10^{-11}
9	Sieving metal after reduction	0.2×10^{-11}
10	Tumbling metal	0.54×10^{-11}
12	Pressing metal	0.7×10^{-11}
14	Center aisle - thorium doping area	0.34×10^{-11}
17	Exhaust stack - roof of thorium doping area	0.34×10^{-11}

The activity of each of these samples is below the permissible limit of 3×10^{-11} microcuries per cc of air.

George N. Stewart

George N. Stewart,
Industrial Hygiene Engineer

cm

East Pittsburgh 2-G-46

November 5, 1965

BLOOMFIELD WORKS
Section 343

T. W. Eyer

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.
cc: Bloomfield Works - Section 343 - J. F. Salmon
cc: Bloomfield Works - Section 82019 - R. Corth

Fifteen air samples, taken on October 13, 1965 in Section 343, have been counted for alpha activity. The results are listed.

<u>Sample No.</u>	<u>Operation</u>	<u>Microcuries per cc of Air</u>
1	Mixing $\text{Th}(\text{NO}_3)_4$ Solution	0.7×10^{-11}
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$	0.4×10^{-11}
3	Transferring doped oxide to furnace	0.4×10^{-11}
4	Loading doped oxide into furnace	0.2×10^{-11}
5	Unloading doped oxide from furnace	0.3×10^{-11}
6	Crushing fired doped oxide	0.3×10^{-11}
7	Loading oxide into reduction furnace	0.5×10^{-11}
8	Unloading oxide from reduction furnace	0.8×10^{-11}
9	Sieving metal after reduction	0.5×10^{-11}
10	Tumbling metal	0.2×10^{-11}
11	Sieving metal before pressing	0.13×10^{-11}
12	Pressing metal	0.4×10^{-11}
14	Center aisle - thorium doping area	0.13×10^{-11}
15	Center aisle, sieve room, Bldg, #8	0.3×10^{-11}
17	Exhaust stack - roof of thorium doping area	0.3×10^{-11}

All of these samples are below the maximum permissible limit of 3×10^{-11} .

George N. Stewart
George N. Stewart,
Industrial Hygiene Engineer

REC-11822-3
BLOOMFIELD WORKS
Section 343

A. Eberhard

East Pittsburgh 2-G-46

December 15, 1965

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.
cc: Bloomfield Works - Section 343 - J. Salmon
cc: Bloomfield Works - Section 82019 - R. Corth

Fifteen air samples taken on November 29, 1965 in Section 343 have been counted for alpha activity. The results are listed.

<u>Sample No.</u>	<u>Operation</u>	<u>Microcuries per cc of Air</u>
1	Mixing $\text{Th}(\text{NO}_3)_4$ solution	No detectable activity
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$	0.3×10^{-11}
3	Transferring doped oxide to furnace	No detectable activity
4	Loading doped oxide into furnace	No detectable activity
5	Unloading doped oxide from furnace	1.5×10^{-11}
6	Crushing fired doped oxide	0.3×10^{-11}
7	Loading oxide into reduction furnace	0.4×10^{-11}
8	Unloading oxide from reduction furnace	No detectable activity
9	Sieving metal after reduction	0.2×10^{-11}
10	Tumbling metal	0.3×10^{-11}
11	Sieving metal before pressing	No detectable activity
12	Pressing metal	0.2×10^{-11}
14	Center aisle - thorium doping area	0.2×10^{-11}
15	Center aisle of sieve room - Bldg. #6	No detectable activity
17	Exhaust stack - roof of thorium doping area	0.6×10^{-11}

All of these samples are below the permissible limit of 3×10^{-11} microcuries per cc of air.

George N. Stewart
George N. Stewart,
Industrial Hygiene Engineer

CHM

BLOOMFIELD WORKS
Section 343

A. Eberhard

East Pittsburgh 2-G-46

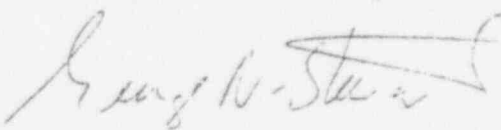
January 13, 1966

cc: Bloomfield Works - Section 343 - J. Salmon
cc: Bloomfield Works - Section 22019 - R. Corth
cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.

Fifteen air samples, collected in Section 343 on December 30, 1965, have been counted. The results are listed.

<u>Sample No.</u>	<u>Operation</u>	<u>Microcuries per cc of Air</u>
1	Mixing $\text{Th}(\text{NO}_3)_4$ solution	2.3×10^{-11}
2	Doping Oxide with $\text{Th}(\text{NO}_3)_4$	0.5×10^{-11}
3	Transferring doped oxide to furnace	0.4×10^{-11}
4	Loading doped oxide into furnace	1.6×10^{-11}
5	Unloading doped oxide from furnace	0.7×10^{-11}
6	Crushing fired doped oxide	0.9×10^{-11}
7	Loading oxide into reduction furnace	0.5×10^{-11}
8	Unloading oxide from reduction furnace	1.4×10^{-11}
9	Sieving metal after reduction	1.1×10^{-11}
10	Tumbling metal	2.4×10^{-11}
11	Sieving metal before pressing	1.0×10^{-11}
12	Pressing metal	1.8×10^{-11}
14	Center aisle - thorium doping area	1.5×10^{-11}
15	Center aisle - sieve room, Bldg. 6	1.1×10^{-11}
17	Exhaust stack-roof, thorium doping area	1.2×10^{-11}

All of these samples are below the permissible limit of 3×10^{-11} microcuries per cc of air.


George H. Stewart,
Industrial Hygiene Engineer

BLOOMFIELD WORKS
Section 343

A. Eberhard

East Pittsburgh 2-G-46

February 17, 1966

cc: Bloomfield Works - Accident Prevention - R. T. Williams, Div. Admin.
cc: Bloomfield Works - Section 343 - J. Salmon
cc: Bloomfield Works - Section 82019 - R. Corth

Fifteen air samples collected in Section 343 on January 31, 1966 have been counted for activity. The results are listed.

<u>Sample No.</u>	<u>Operation</u>	<u>Microcuries per cc of A</u>
1	Mixing $Ta(NO_3)_4$ Sol.	No detectable activity
2	Doping oxide with $Ta(NO_3)_4$	No detectable activity
3	Transferring doped oxide to furnace	No detectable activity
4	Loading doped oxide into furnace	0.2×10^{-11}
5	Unloading doped oxide from furnace	No detectable activity
6	Crushing fired doped oxide	No detectable activity
7	Loading oxide into reduction furnace	No detectable activity
8	Unloading oxide from reduction furnace	No detectable activity
9	Sieving metal after reduction	No detectable activity
10	Tumbling metal	No detectable activity
11	Sieving metal before pressing	No detectable activity
12	Pressing metal	No detectable activity
14	Center aisle - thorium doping area	0.25×10^{-11}
15	Center aisle - sieve room, Bldg. #6	No detectable activity
17	Exhaust stack - roof of thorium doping area	No detectable activity

All of these air samples are below the permissible limit of activity which is 3×10^{-11} microcuries per cc of air.

George N. Stewart
George N. Stewart,
Industrial Hygiene Engineer

343

East Pittsburgh 2-G-46

BLOOMFIELD WORKS
Section 343

April 4, 1956

A. Eberhard

cc: Bloomfield Works - Section 343 - J. F. Salmon
cc: Bloomfield Works - Section 82019 - R. Corth
cc: Bloomfield Works - Accident prevention - R. T. Williams, Div. Admin.

Fifteen air samples, collected on March 29, 1956 from Section 343, have been counted for activity. The results are listed.

<u>Sample No.</u>	<u>Operation</u>	<u>Microcuries per cc of Air</u>
1	Mixing $\text{Th}(\text{NO}_3)_4$ solution	0.4×10^{-11}
2	Doping oxide with $\text{Th}(\text{NO}_3)_4$	1.1×10^{-11}
3	Transferring doped oxide to furnace	0.1×10^{-11}
4	Loading doped oxide into furnace	0.8×10^{-11}
5	Unloading doped oxide from furnace	1.1×10^{-11}
6	Crushing fired doped oxide	No detectable activity
7	Loading oxide into reduction furnace	1.7×10^{-11}
8	Unloading oxide from reduction furnace	1.4×10^{-11}
9	Sieving metal after reduction	0.6×10^{-11}
10	Tumbling metal	0.9×10^{-11}
11	Sieving metal before pressing	0.7×10^{-11}
12	Pressing metal	1.1×10^{-11}
14	Center aisle - thorium doping area	0.7×10^{-11}
15	Center aisle - sieve room - Bldg. #6	0.8×10^{-11}
17	Exhaust stack - roof of thorium doping area	1.7×10^{-11}

All of these samples have less than the permissible limit of activity.

George N. Stewart,
Industrial Hygiene Engineer