

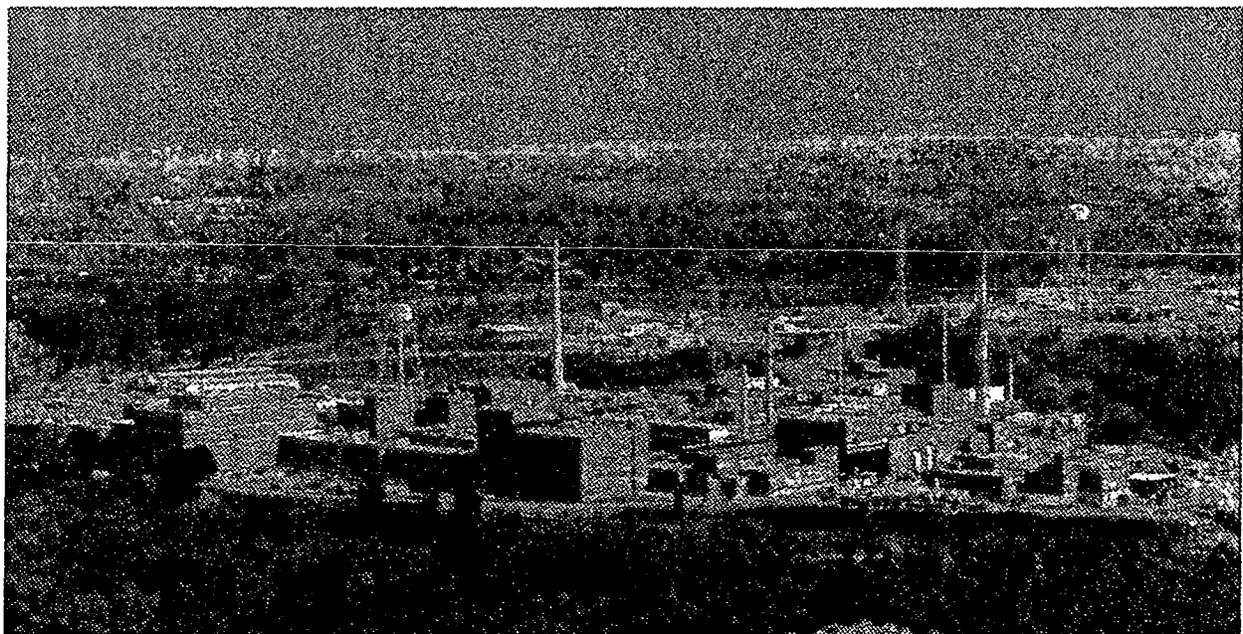
MOUND



**Environmental
Restoration
Program**

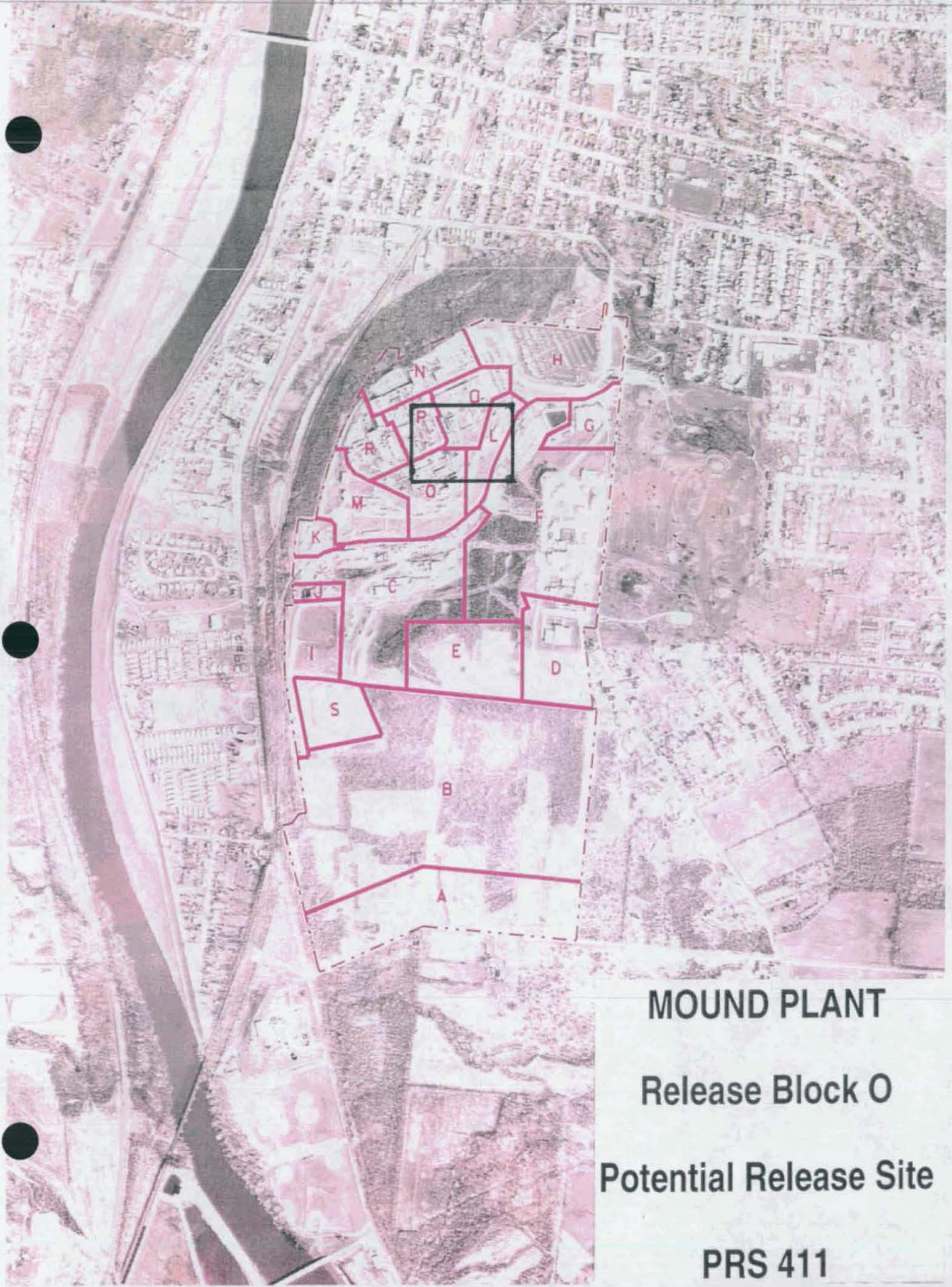


MOUND PLANT Potential Release Site Package PRS # 411



PRS 411

REV	DESCRIPTION	DATE
0 PUBLIC RELEASE	Available for comments.	Aug. 25, 1997
1 FINAL		

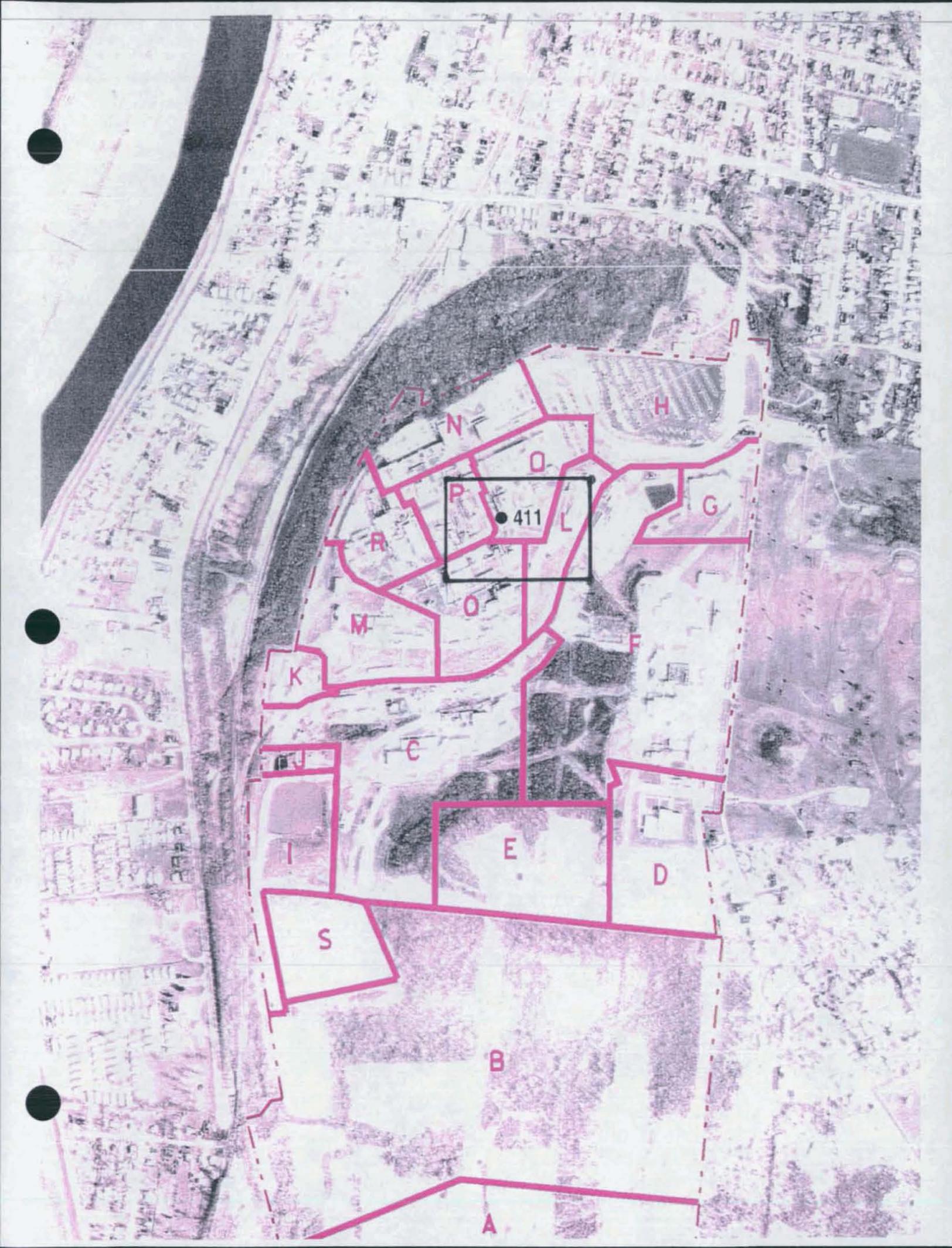


MOUND PLANT

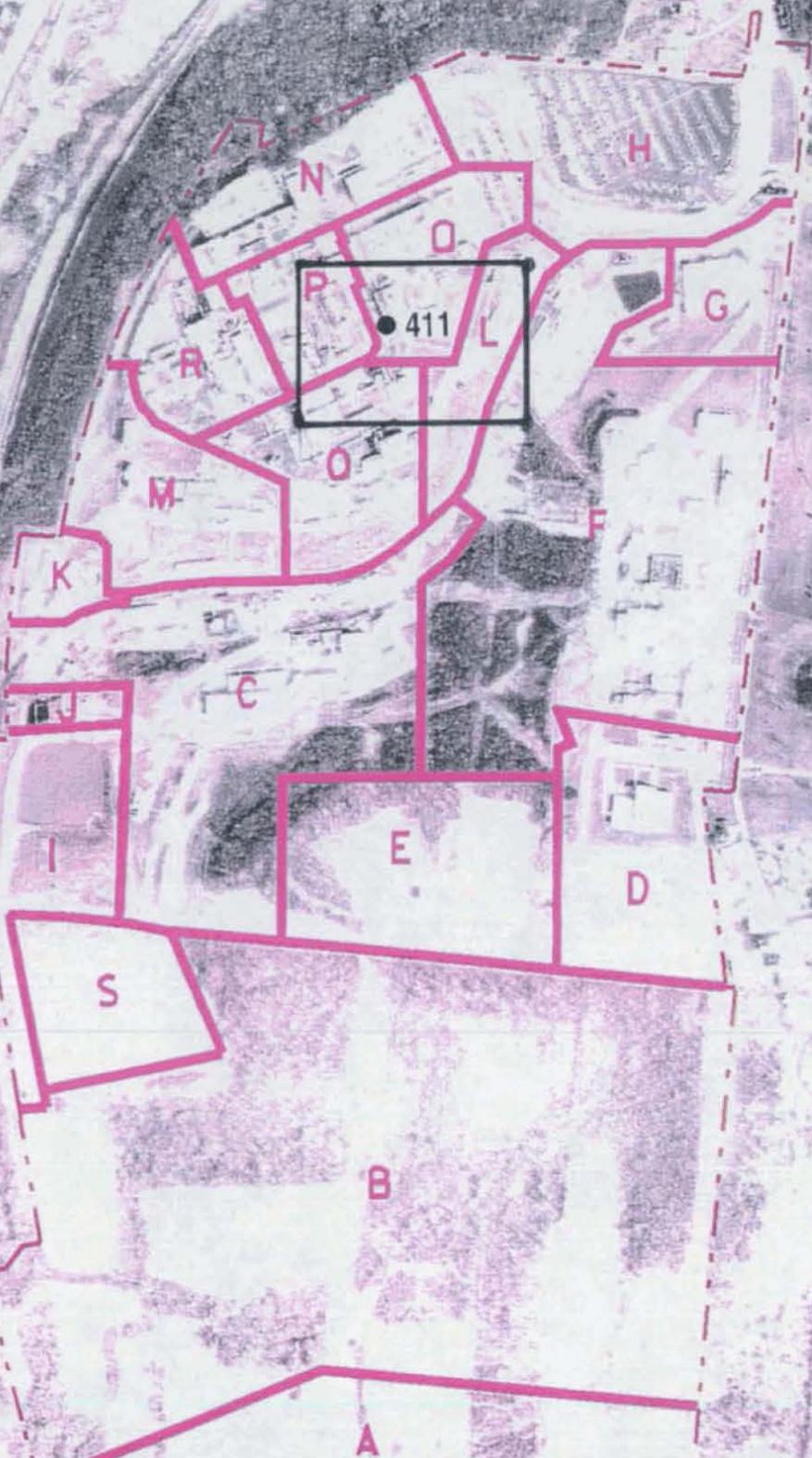
Release Block O

Potential Release Site

PRS 411



411

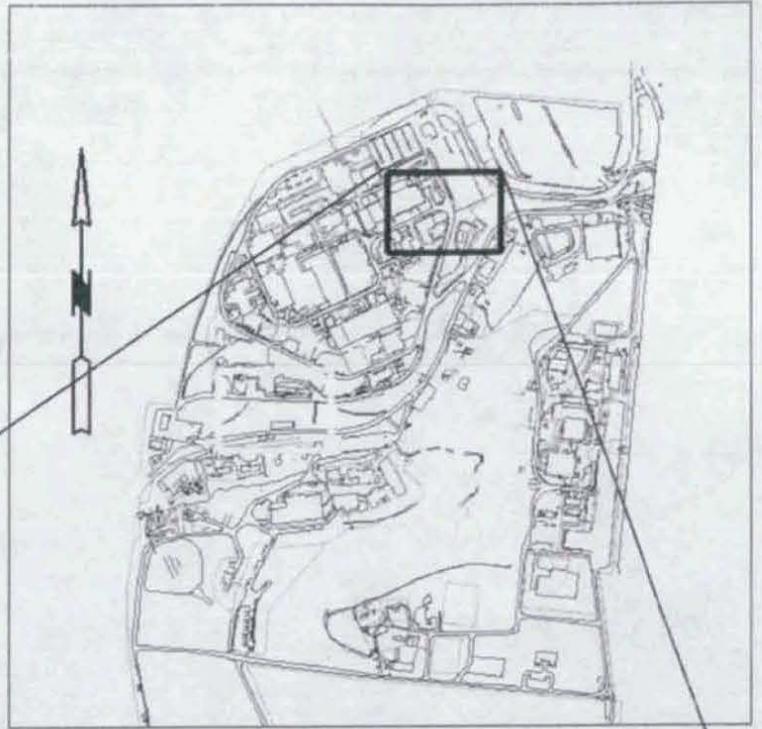


Mound Plant

Release Block O

Potential Release Site

PRS 411





PRS 411

PRS HISTORY:

Potential Release Site 411 are the two small patches (approximately 1.0 ft² each) of radiological contamination on the asphalt road located between the Paint Shop and the Powerhouse. This area was identified as a potential release site due to the elevated FIDLER readings that were discovered on October 14, 1996 by Phil Ryan during a Health Physics survey². This contamination area is posted as a Health Physics Control Area. The contamination patches are positioned at the edge of the roadway, adjacent to the Paint Shop's concrete sidewalk.

Prior to the discovery of PRS 411, the Environmental Restoration Program has addressed the Paint Shop area in the PRS 112/368 data package¹. The paint shop began operation in 1963 and was used for both maintenance and production parts painting. No radioactive processes are known to have occurred in the Paint Shop location¹.

CONTAMINATION:

PRS 112/368 DATA¹

OU3, Limited Field Investigation

During the OU3 Limited Field Investigation conducted in 1992/93 sampling was performed around the Paint Shop. This sampling included surface and subsurface soils analyzed for VOCs, Semi-Volatile Organic Compounds SVOCs, Pesticides/PCBs, inorganics, and tritium.

No samples exceeded guideline values. Magnesium, sodium and lead exceeded background values however, lead is below the USEPA residential soil guidance value of 400 mg/kg. Magnesium and sodium are necessary in our daily diet and do not have guideline values. Tritium was not detected above laboratory reporting limits. Plutonium -238 and Thorium-232 were below Mound ALARA guideline values of 25 pCi/g for Pu-238 and 5 pCi/g for Th-232.

OU2, Soil Vapor Reconnaissance

With the exception of Freon and 1,2-Cis-Dichloroethene, all detected VOC's were below the calculated soil screening levels.

<u>Parameter</u>	<u>Soil Gas Reading</u>	<u>Calculated Acceptable Soil Gas Concentrations</u>
1,2-cis-Dichloroethene	5,808 ppb	5,000 ppb
Freon 11	15,892 ppb	NA

PRS 112/368 DATA¹ (continued)

OU9, Site Scoping Report: Volume 3 - Radiological Site Survey

As part of the Site Survey Project, soil samples were collected in the area of the Paint Shop in the mid-1980s. Values for plutonium-238 ranged from 0.11 to 1.19 pCi/g which are below the Mound Plant ALARA of 25 pCi/g for Pu-238; values for thorium-232 were below the 5 pCi/g regulatory limit for surface thorium.

PRS 411 Data^{2,3}

Direct survey readings for gamma emissions were measured with a planar hyperpure germanium detector. This instrument measured Plutonium-238 contamination and possible Am-241 contamination (ingrowth from Pu-241) that appears to be subsurface at a depth of 1-2 cm².

Additional field measurements with FIDLER instrumentation detected elevated gamma readings³:

Site	Channel 1 (Counts Per Minute)	Channel 2 (Counts Per Minute)
PRS 411 Spot #1	150,000	70,000
PRS 411 Spot #2	35,000	22,000
Background	~100	~5,000

NOTE: FIDLER Channel 1 denotes observed counts in a narrow window of low energy gamma emissions, typical of plutonium x-rays
FIDLER Channel 2 denotes observed counts in a broad window of higher energy gamma emissions, typical of many radionuclides including thorium.

Liquid scintillation analysis of six smear samples detected 1.89 DPM of alpha activity in one sample. This level is below the alpha activity Action Level of 20 DPM.

READING ROOM REFERENCES:

- 1) PRS 112/368 Data Package (pages 5-7) low energy

OTHER REFERENCES:

- 2) EG&G interoffice correspondence (pages 8-17)
- 3) Radiological Survey Data (pages 18-22)

PREPARED BY:

W. David Gloekler, Member of EG&G Technical Staff
Kenneth R. Hacker, Member of EG&G Technical Staff
Gary L. Coons, Member of EG&G Technical Staff (PRS 112/368)

MOUND PLANT
PRS 411
Soil Contamination – Asphalt Roadway (Radiological)

RECOMMENDATION:

Potential Release Site 411 was identified as a potential release site due to elevated FIDLER readings that were discovered during a Health Physics survey. FIDLER readings indicated two small areas of contamination in excess of 500,000 pCi of Plutonium-238. Fixed Plutonium-238 readings of 1,000,000 disintegrations per minute (dpm) per 100 square centimeters exceed the regulatory standard (10 CFR 835) of 500 dpm per 100 square centimeters.

Therefore, a RESPONSE ACTION is recommended for PRS 411.

CONCURRENCE:

DOE/MEMP: Arthur W. Kleinrath 8/6/97
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 8/6/97
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel 8/6/97
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

- No comments were received during the comment period.
- Comment responses can be found on page _____ of this package.

REFERENCE #1

PRS 112/368

PRS HISTORY:

PRS 112 was identified as a potential release site due to results associated with elevated lead in the soil as part of the OU3 Limited Field Investigation around the Paint Shop.² PRS 368 was identified as a potential release site due to results of Volatile Organic Compounds (VOC's) detected during the OU2 Soil Vapor Reconnaissance effort around the Paint Shop.⁶ Suspected leaks, spills, or dumping of paints and paint wastes, around the Paint shop, as obtained during a RCRA Facility visual inspection and assessment in 1988 also contributed to identifying this area as a potential release site.⁴

PROCESS DESCRIPTION:

The Paint shop, which began operation in 1963, was used for both maintenance and production parts painting. All painting was done inside using spray booths. Waste materials generated at the paint shop included unused paint, solvents, thinner, and solid trash. A waste drum containing waste material was stored outside on the north side of the building. Approximately one drum of waste was generated every three months. No radioactive processes are known to have occurred in or around the Paint Shop location.²

CONTAMINATION:

OU3, Limited Field Investigation²

During the OU3 Limited Field Investigation conducted in 1992/93 sampling was performed around the Paint Shop. This sampling included surface and subsurface soils analyzed for VOCs, Semi-Volatile Organic Compounds SVOCs, Pesticides/PCBs, inorganics, and tritium.

No samples exceeded guideline values. Magnesium, sodium and lead exceeded background values however, lead is below the USEPA residential soil guidance value of 400 mg/kg. Magnesium and sodium are necessary in our daily diet and do not have guideline values. Tritium was not detected above laboratory reporting limits. Plutonium -238 and Thorium-232 were below Mound ALARA guideline values of 25 pCi/g for Pu-238 and 5 pCi/g for Th-232.

OU2, Soil Vapor Reconnaissance⁶

With the exception of Freon and 1,2-Cis-Dichloroethene, all detected VOC's are above calculated soil screening levels.⁷

<u>Parameter</u>	<u>Soil Gas Reading</u>	<u>Calculated Acceptable Soil Gas Concentrations</u>
1,2-trans-Dichloroethene	6,818 ppb	35,700 ppb
1,2-cis-Dichloroethene	5,808 ppb	5,000 ppb
1,1-Dichloroethane	12,098 ppb	398,000 ppb
Freon 11	15,892 ppb	NA

OU9, Site Scoping Report: Volume 3 - Radiological Site Survey⁸

As part of the Site Survey Project, soil samples were collected in the area of the Paint Shop in the mid 1980s. Values for plutonium-238 ranged from 0.11 to 1.19 pCi/g which are below the Mound Plant ALARA of 25 pCi/g for Pu-238; values for thorium-232 were below the 5 pCi/g regulatory limit of 2 pCi/g.⁸

READING ROOM REFERENCES:

- 1) Operable Unit 9, Site Scoping Report, Volume 12 Final, (rev 0), December 1994.
(pages 6-13)
- 2) Operable Unit 3, Miscellaneous Sites, Limited Field Investigation, Volume I, sections 1-6, Final (rev 0), July 1993 (pages 14-24)
- 3) Operable Unit 9, Site Scoping Report, Volume 7, Waste Management, Final (rev 0), February 1993. (pages 25-28)
- 4) Preliminary Review/Visual Site Inspection for RCRA Facility of Mound Plant, July 1988.
(pages 29-31)
- 5) Comprehensive Environmental Assessment and Response Program (CEARP), Phase I, Draft, April 1986. (pages 32-33)
- 6) Operable Unit 2, Soil Vapor Reconnaissance, Main Hill, Phase I, Final (rev 0), February 1995. (pages 34-50)
- 8) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, Final, June 1993.
(pages 54-58)

OTHER REFERENCES:

- 7) Soil Gas and Soil Screening level calculations. (pages 51-53)

PREPARED BY:

Gary L. Coons, Member of EG&G Technical Staff

REFERENCE #2

From: George Liebson
To: DOE_OH.MOUND.Kleinrath Arthur, GENEJC, DOE_OH.MOUN...
Date: Monday, November 11, 1996 10:03 am
Subject: PRS 411?

The attached document from Doug Draper describes two new Potential Release Sites:

- 1). The two sites are located just outside the Paint Shop.
- 2). The contamination probably resides in cracks in the asphalt.
- 3). The estimated contamination concentration is in the range of 3-5 microcuries per gram.
- 4). The estimated total volume of contamination could probably be dug out with a spoon.
- 5) Contaminant is Pu-238 and Am-241

For more information contact Doug Draper x4501

This is the first of what may be a number of typical contamination findings at Mound were a very small quantity of a significant concentration of contamination resides in a hole or crack (drainage/runoff area).

In talking with Doug Draper, Doug and I felt that this finding may prove to be a good exercise in the process of:

- 1). How a PRS found by Health Physics is reported and placed (or not placed) into the baseline and PRS system.
- 2). Establishing what the Health Physics' role and responsibilities are when contamination is discovered (i.e. is health physics role only to detect contamination or are they to detect, quantify, post and report?)

CC: BRADDC, WILLMA, DRAPDG, FERGCR, RYANPE, STAPJS, MO...

From: Douglas Draper
To: liebgn
Date: Monday, November 11, 1996 8:22 am
Subject: Contamination, PS Vicinity

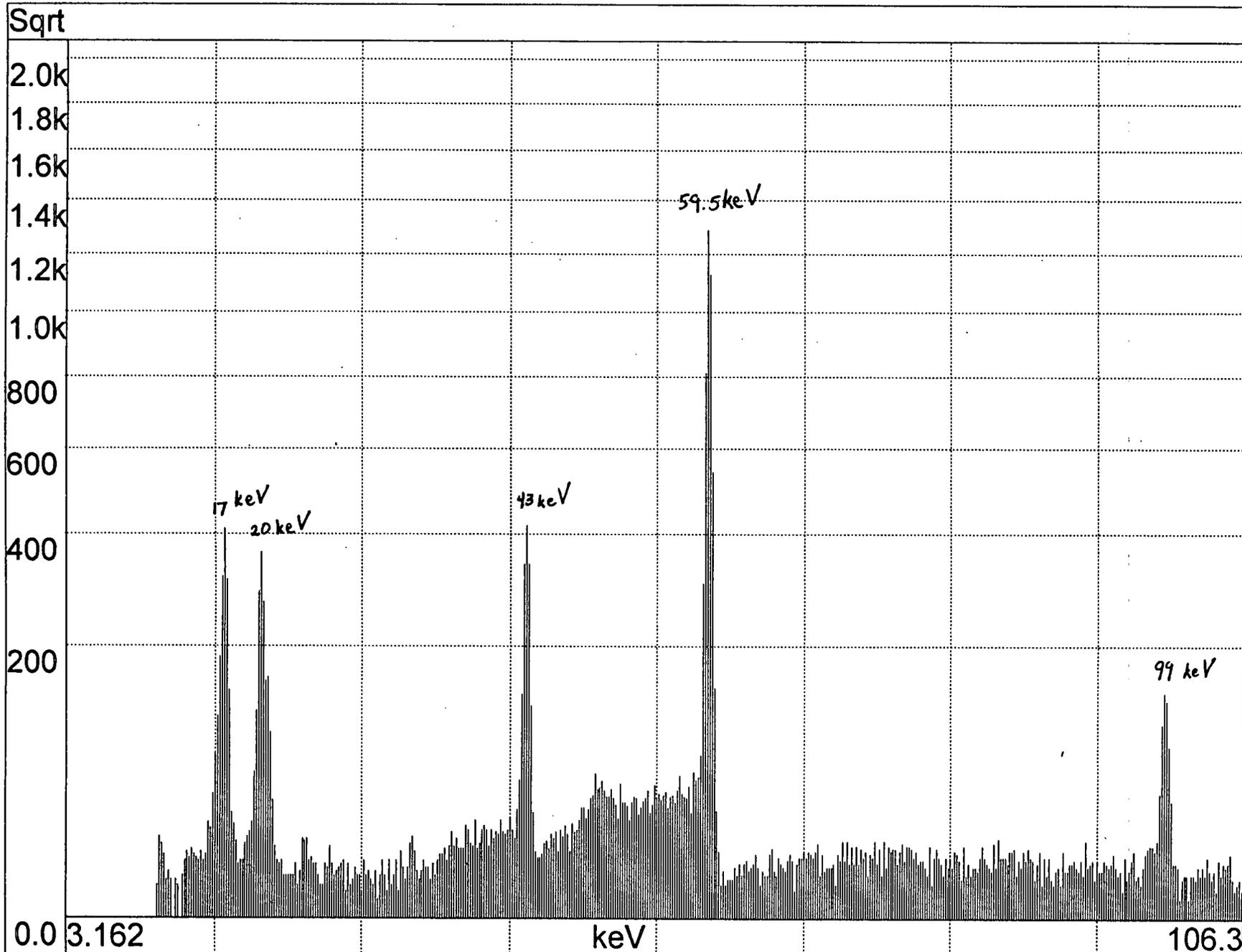
George,

Phil Ryan showed me two elevated FIDLER readings outside the Paint Shop on October 14, 1996. These locations were marked with yellow spray paint. Jeff Stapleton used the planar hyperpure germanium detector on October 16, 1996 to determine that both spots, each approximately 15 cm in diameter, were Pu-238 with some Am-241 (probably ingrowth). These spots were both within small cracks in the asphalt. Based on the ratio of the peaks from the Pu-238 and Am-241 it appears that the contamination is approximately 1- 2 cm subsurface.

If you would like to discuss this further, please contact me at x-4501.

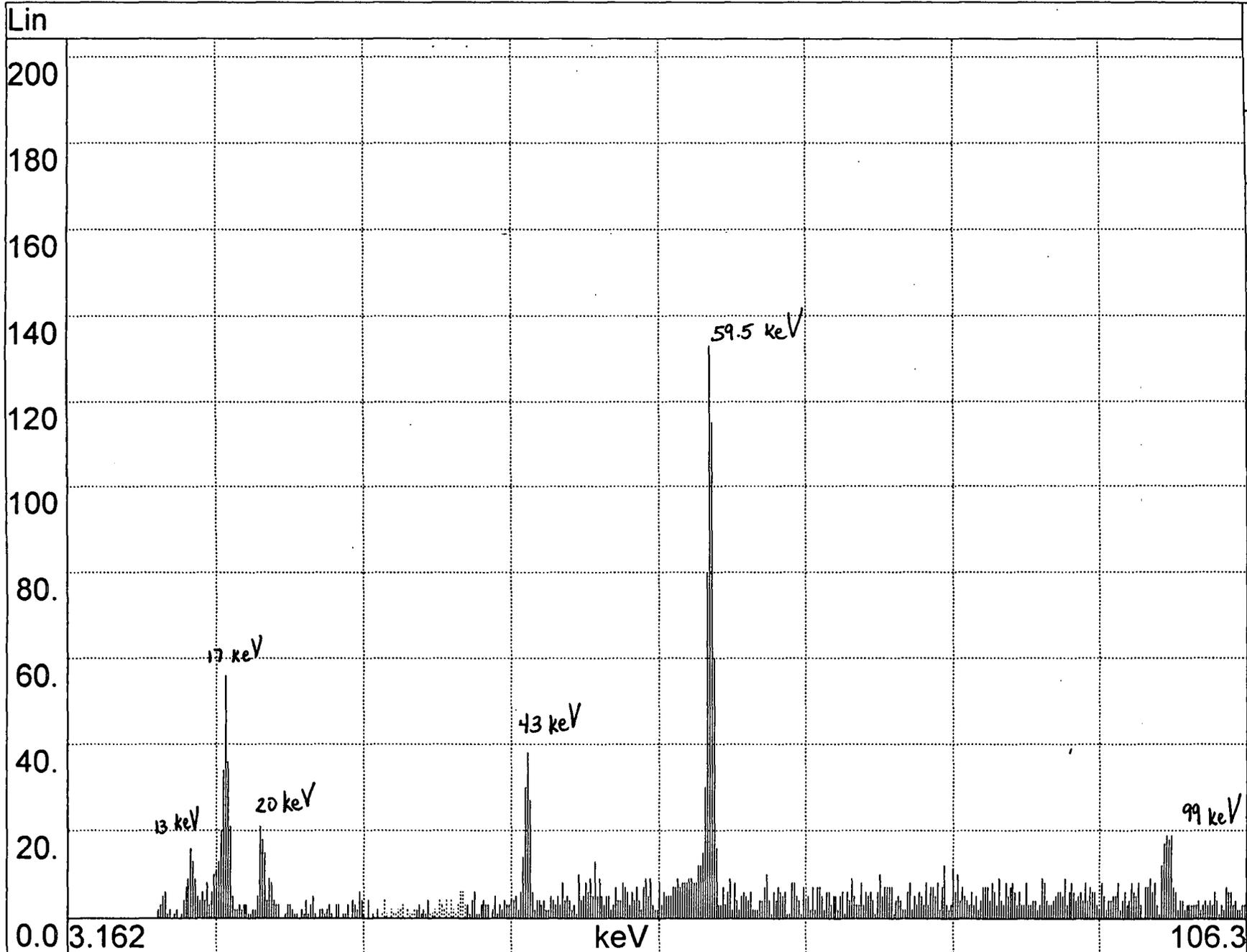
Doug
d:\es&h\soils\961111-5.asc

CC: ryanpe, mowerl, qual tj, siroke, ogurag, tlv

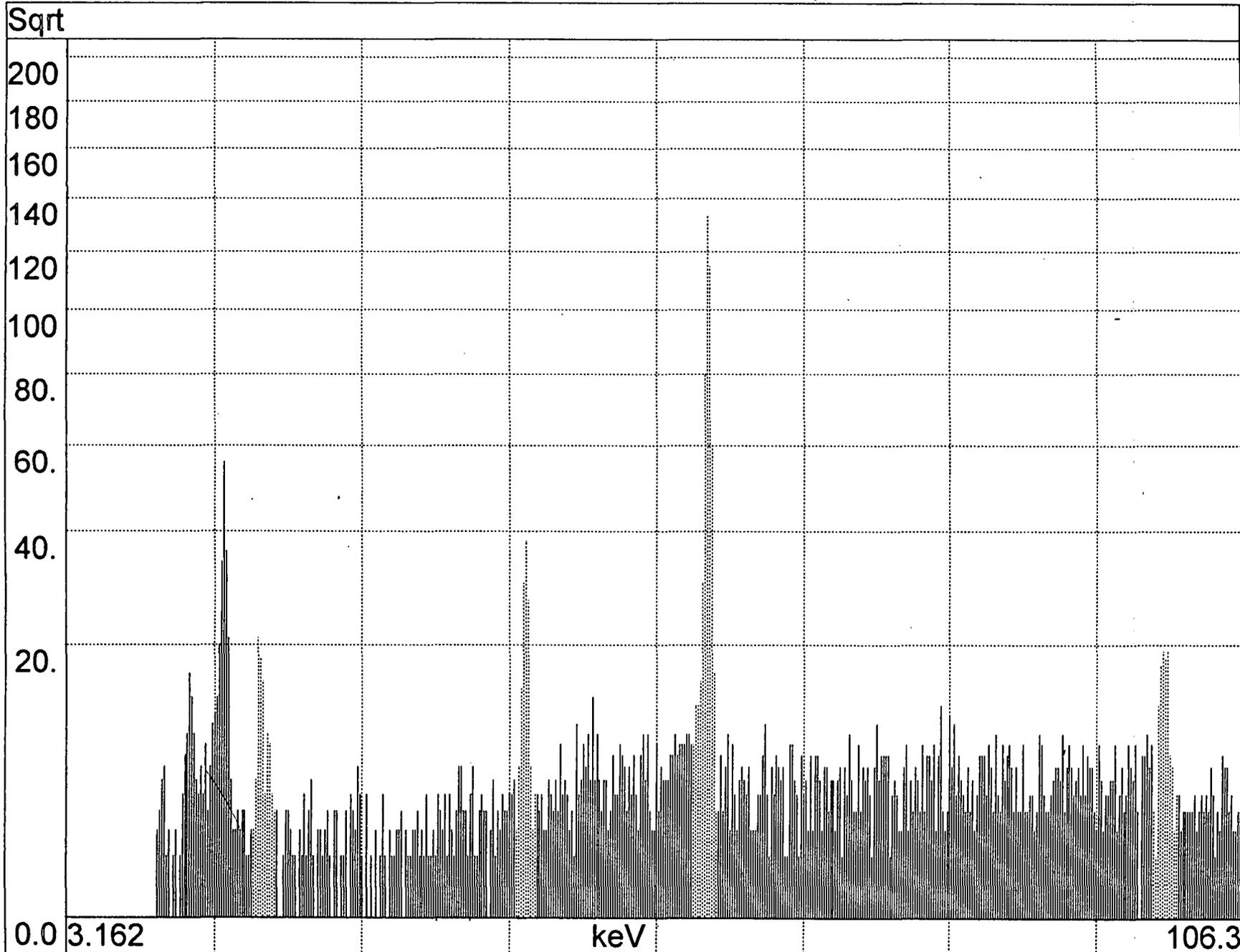


Preset-L	600.000
Stopped	
True Time	236.490
Live Time	236.180
% Dead	0.13
Gross Count	17359
Counts/sec	73.499
Start Time	Oct/16/1996 3:19:29PM
Stop Time	Oct/16/1996 3:23:25PM
User ID	

PS Location 1 Outside of Paint Shop



Preset-L	600.000
Stopped	
True Time	174.656
Live Time	174.568
% Dead	0.05
Gross Count	4538
Counts/sec	25.9956
Start Time	Oct/16/1996 3:15:35PM
Stop Time	Oct/16/1996 3:18:29PM
User ID	



Preset-L	600.000
Stopped	
True Time	174.656
Live Time	174.568
% Dead	0.05
Gross Count	4538
Counts/sec	25.9956
Start Time	Oct/16/1996 3:15:35PM
Stop Time	Oct/16/1996 3:18:29PM
User ID	

ROI # 1 Centroid=16.87 Gross =214 Activity= 0.973833±18.90%cps
 Pu-238 FWHM = 0.54 Net =170 MDA = 0.192297 cps
 err=18.90% FWTM = 1.54 Bkgnd= 44

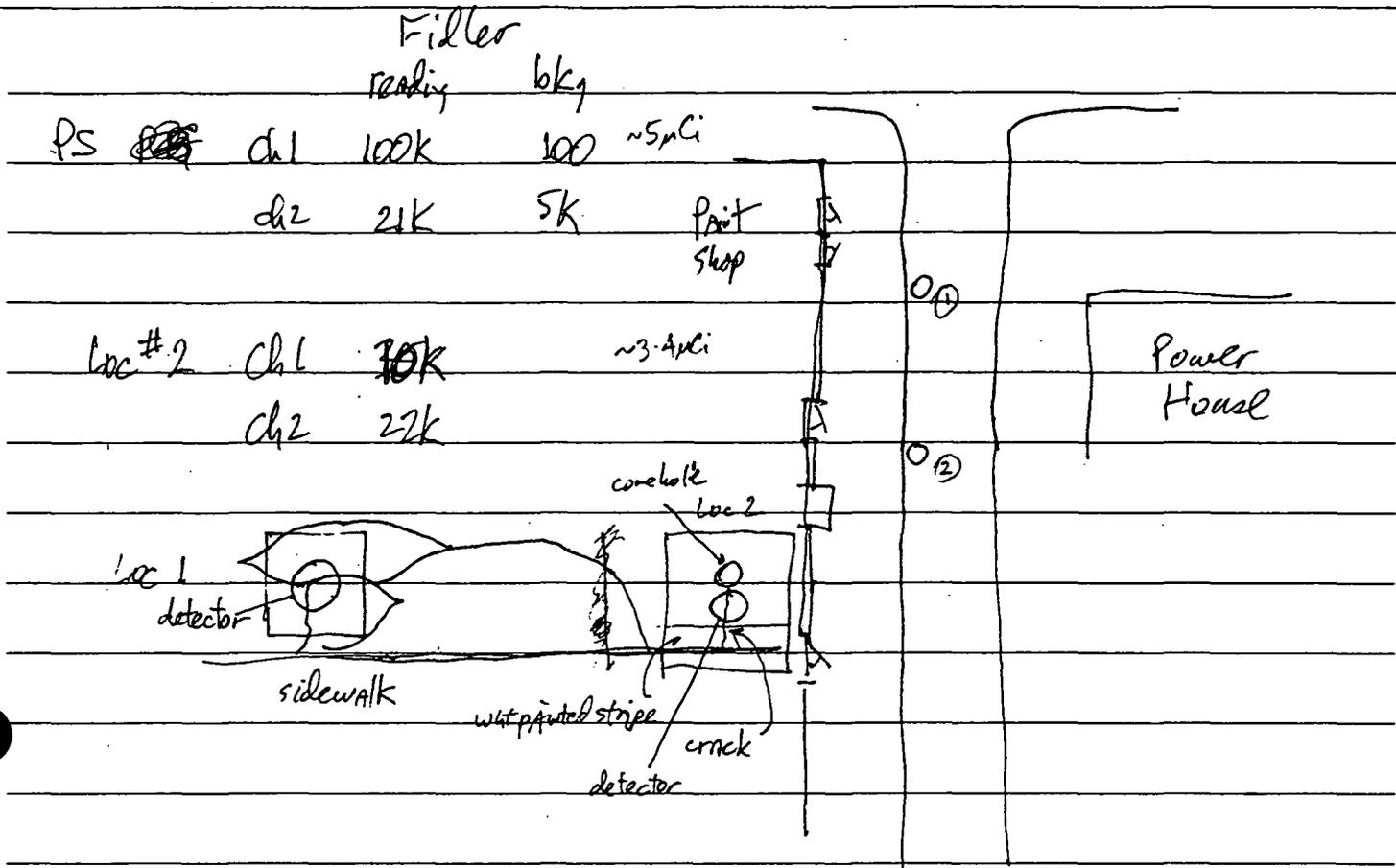
TO: _____

SUBJECT: _____

Hot spots outside Paint Shop

FROM: Phil Ryan

DATE: 9/6/14



Jeff Stapleton, REGE/OB/SSA 9761016

BA 133 STD, G60, G137

Loc 1

YSCAN - Pu238, Am241 low 17Kev/43Kev ratio indicates subsurface Also 99Kev; Nothing really higher erg

Loc 2

YSCAN - Pu238, Am241 low 17Kev/43Kev ratio. Also 99Kev Nothing higher erg

From: George Liebson
To: HACKKR
Date: 2/25/97 2:09pm
Subject: PRS 411? -Forwarded

Here is all the info I have (and maybe all the info available at this time) for PRS 411.

CC: GAULDJ

Phil

I need someone assigned to do PRS 411.

Ken Hacker

From: George Liebson
To: DOE_OH.MOUND.Kleinrath Arthur, GENEJC, DOE_OH.MOUN...
Date: 11/11/96 10:03am
Subject: PRS 411?

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If you would like to discuss this further, please contact me at x-4501.

Doug
d:\es&h\soils\961111-5.asc

CC: ryanpe, mowerl, qual tj, siroke, ogurag, tlv

REFERENCE #3

RADIOLOGICAL SURVEY DATA SHEET

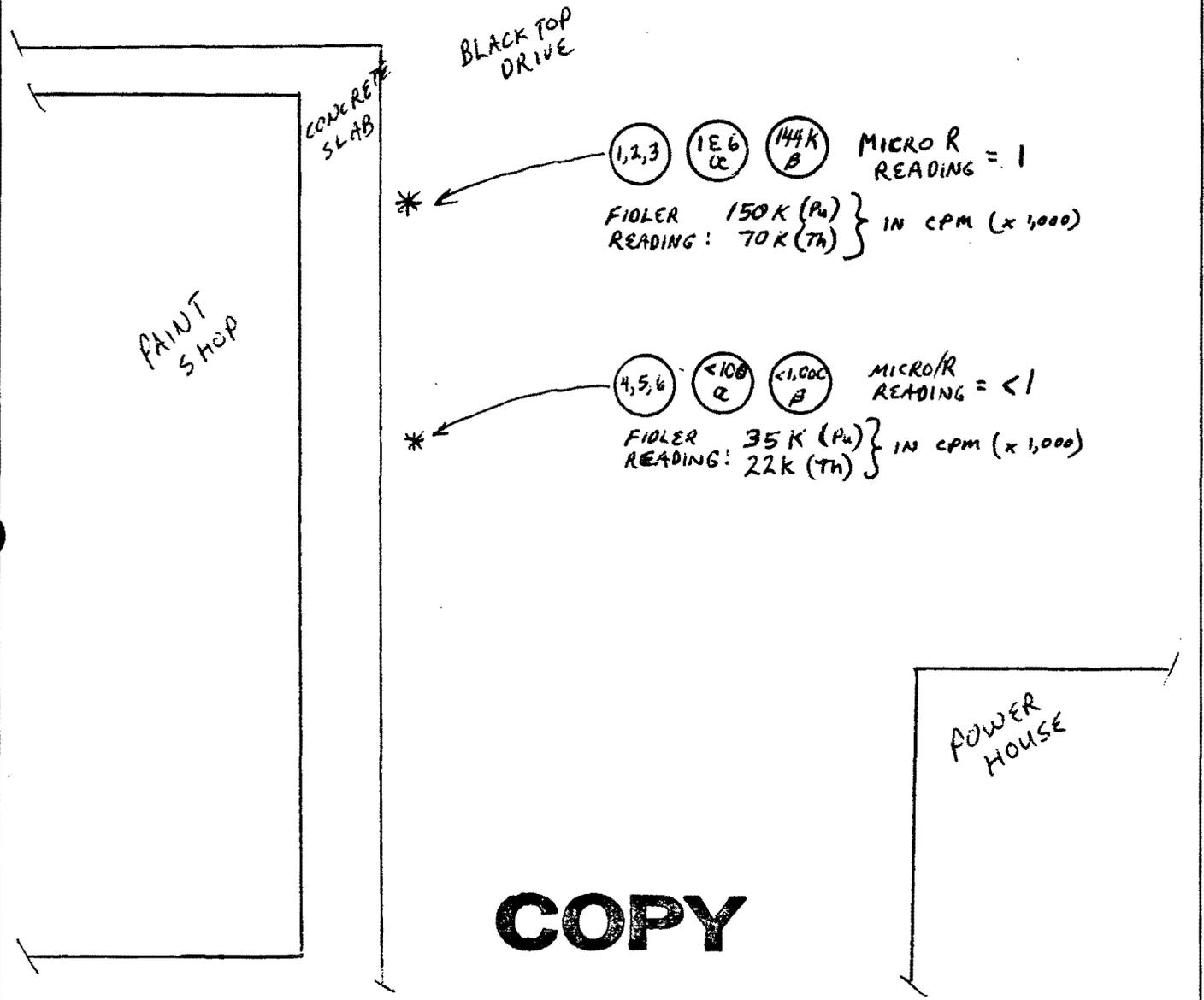
LOCATION: (BLDG./AREA/ROOM) *N. SIDE OF PAINT SHOP (ON BLACK TOP NEAR EDGE OF SLAB)* SURVEY NO. *97-0A-0006*

PURPOSE: *EVALUATION OF POTENTIAL RELEASE SITE* RWP NO. *R-022-96*

DATE: *040297*

TIME: *PM 1300*

MAP/DRAWING



COPY

LEGEND: # = mrem/hr (γ) whole body
 # E = mrem/hr (β+γ) extremity on contact
 * = POTENTIAL RELEASE SITE

△ # = mrem/hr neutron
 □ # = air sample number

○ # = swipe number
 ○ #/α or β = direct cont. measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
ELECTRA	5268/5284	070997
MICRO/R METER		
FIDLER	3881/3870	070997

Completed by: (Signature/HP#)	Date:
<i>P. Ryan</i>	<i>040297</i>
Counted by: (Signature/HP#)	Date:
<i>Trish A. Stuyvesant</i>	<i>04-02-97</i>
Reviewed/Approved by: (Signature/HP#)	Date:
<i>Carol S. [Signature]</i>	<i>4/8/97</i>

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Red
Data file name: SMEAR000
Batch Ended: 4/2/97 13:52

Alpha activity action level (DPM): 20
Beta activity action level (DPM): 200

Certainty level for MDA and flags: 95%

Crosstalk correction performed.

Batch ID: T 97-0A-0006 RYAN [6] 04-02-97 TAS

Recalibration Date: 7/19/97
Serial number: 26966-2

Detector ID	Sample ID
A2	A2-01
A3	A3-01
A4	A4-01
B2	B2-01
B3	B3-01
B1	0

Alpha Activity		
DPM	σ	flags
0.00	2.03	<MDA
1.89	2.06	<AL
0.00	1.90	<MDA
0.00	2.10	<MDA
0.00	1.90	<MDA
0.00	1.96	<MDA

Beta Activity		
DPM	σ	flags
0.00	1.18	<MDA
0.00	1.30	<MDA
0.07	1.69	<MDA
1.93	2.29	<MDA
0.00	1.23	<MDA
0.00	1.25	<MDA

COPY

A: 1 Name: Pw H3 #401393 02-Apr-97 14:37

: LL-UL= 0.5-18.6 Lcr= 0 Bkg= 0.00 %2 Sigma=0.00

B: LL-UL= 2.0-18.6 Lcr= 0 Bkg= 0.00 %2 Sigma=0.00

C: LL-UL=20.0-2000 Lcr= 0 Bkg= 0.00 %2 Sigma=0.00

= 2.00 QIP = tSIE/AEC ES Terminator = Count

7-OA-0006 [R1-R6] RYAN 4-2-97 RLH

ventional DPM

Slide 1 = 800

luminescence Correction On

S#	TIME	LUM	FLAG	CPMA	CPMB	CPMC	tSIE	DPM1	2Sigma
-1	10.00	9	B	6.70	6.30	26.00	644.		0.00
0	2.00	0		455.30	429.20	0.00	659.	946.58	95.33
1	2.00	6		2.30	2.70	0.00	667.	4.74	9.82
2	2.00	0		0.00	0.00	0.00	662.	0.00	0.00
3	2.00	0		2.80	2.20	0.00	640.	5.89	9.81
4	2.00	25		1.80	0.70	0.00	618.	3.82	11.57
5	2.00	13		0.80	1.20	0.00	644.	1.68	9.79
6	2.00	26		1.30	2.70	0.00	619.	2.76	11.36

COPY