



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

INSPECTION REPORT NO. 80-01  
Minnesota Mining and Manufacturing Co.  
(Licensee name/address)  
3M Center  
St. Paul, MN 55101

Telephone No: \_\_\_\_\_

License No. 22-00057-61 Last amendment & date: Initial (2/2/79)

Docket No. 030-14999

Category: E & Priority: IV, as of last amendment.

Inspection date(s): 11/6-7/80 Type of inspection: Initial Safety (Announced)

SUMMARY OF FINDINGS AND ACTION

- ☒ No noncompliance, clear 591 ☐ Noncompliance, 591 issued  
☐ Noncompliance, Appendix A ☐ Regional action ☐ Hq action  
☐ Action on previous n/c, App B ☐ Supplemental info, App C

RECOMMENDATIONS

See basis in Appendix C or attached memo.

- ☐ Change Category to: \_\_\_\_\_ ☐ Change Priority to: \_\_\_\_\_  
☒ Next inspection date: 11/83

PERSONS CONTACTED  
(NAME AND TITLE)

- \* Duane Hall; Manager, Ionizing Radiation; Corporate Health Physics Service.  
\* Elroy Seydel; RSO, Manager, Product Sterilization  
\* John Buahs; Corporate Health Physics Services  
Eldon Aho; Maintenance General Supervisor  
\* Ralph Brich; Inspector, South Dakota Dept. of Health

\* Indicates those attending management meetings

Inspector: Robert E. Burgin 11/14/80  
(signature) (date signed)  
Approved: W. H. Schultz 11-14-80  
(signature) (date signed)

\* Inspection of 3M Gamma Sterilization Facility,  
Brinkley S. D.

B604100318 B60109  
PDR FOIA  
ROBINOWS-77A PDR

## INDUSTRIAL - ACADEMIC INSPECTION REPORT

Licensee: 3M Lic. No. 22-00057-61 Amendment No. (Initial)  
Date of Inspection: 11/6-7/80

## 1. INSPECTION HISTORY

- a. Items of noncompliance or safety items noted during last inspection

conducted on N/A Yes      No     

- | b. Requirement | Corrected | Not Corrected |
|----------------|-----------|---------------|
|----------------|-----------|---------------|

c. If any items of noncompliance or safety items noted during the last inspection were not corrected, explain: \_\_\_\_\_

## 2. ORGANIZATION

- a. Organizational structure as described in application or letter

Dated 2/2/79, Or \_\_\_\_\_ (15)

- b. List primary licensee contact: Elroy Seydel, RD Telephone No.: (603) 922-9433

c. Comment: \_\_\_\_\_

3. SUMMARY OF LICENSED PROGRAM (Kind of program, number of people, rate of use or quantities on hand, places and frequency of use, type, quantity and use as authorized).

License authorizes up to 3 Million Curies Co-60 in AECL wet source storage irradiator for sterilization of medical products (primarily sutures, tapes and surgical drapes). Currently possess approx. 530,000 Curies. NRC inspector observed the loading of 192,000 curies Co-60 during this inspection.

Category and priority of this license is appropriate: Yes No

If "No" state new Category \_\_\_\_\_ Priority \_\_\_\_\_.

4. INTERNAL AUDITS OR INSPECTIONS

a. Required by L/C or application: Yes No If "Yes":

- 1) By whom Plant RSD and Corporate Health Physics Services
- 2) Frequency quarterly / semi-annually Announced: \_\_\_\_\_ Unannounced: \_\_\_\_\_
- 3) Scope Records review

4) Records maintained: Yes ✓ No

5) Records reviewed: Yes ✓ No

6) Period Reviewed: 1979 → 11/80

b. Comment (responsibility of auditor or committee, management control): \_\_\_\_\_



## 5. TRAINING RETRAINING AND INSTRUCTION TO WORKERS

- a. Training program specified in L/C or application: Yes No
- b. If training program is required, describe scope of program: Authorized users attend 40 hour training session; includes written exam. Exams kept in St. Paul office. Auxillary Personnel ("non-users") attend 1 hr. session. (Security, Material Handlers, maintenance, emergency teams)

c. Retraining required: Yes No

If "Yes" is retraining: Complete ☒ Incomplete ☐

- 1) Are tests and/or examinations required: Yes \_\_\_\_\_ No
- 2) If "Yes" are records available: Yes \_\_\_\_\_ No \_\_\_\_\_
- 3) Reviewed test results: Yes \_\_\_\_\_ No \_\_\_\_\_
- 4) Period reviewed: \_\_\_\_\_

5) Comment (per cent completed, test results, etc.):

Initial training 3/79 → 10/79. All training is documented. ✓

- d. Training provided, but not covered above: \_\_\_\_\_

- e. Instructions to workers in accord with 10CFR 19.12: (Yes)            No



6. RADIOLOGICAL PROTECTION PROCEDURES

a. Operating and emergency procedures

- 1) Required by L/C or application: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_
- 2) Provided, but not required by L/C or application: Yes \_\_\_\_\_ No \_\_\_\_\_
- 3) Procedures reviewed: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_
- 4) Appeared Adequate: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_
- 5) Comments (personnel's understanding of procedures): OK

b. Changes in procedures since last inspection: Yes \_\_\_\_\_ ☒ No \_\_\_\_\_

- 1) Were changes authorized: Yes \_\_\_\_\_ No \_\_\_\_\_
- 2) Comments: \_\_\_\_\_

7. INSTRUMENTATION

a. Type(s) of radiation survey instruments on hand as per L/C, application or equivalent: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

- 1) If "No" list changes: \_\_\_\_\_

b. Capability of radiation survey instruments adequate for program:

☒ Yes \_\_\_\_\_ No \_\_\_\_\_

c. Calibration of instruments required: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

d. If "Yes" instruments calibrated in accord with requirements:

☒ Yes \_\_\_\_\_ No \_\_\_\_\_

e. Comment: Semi-annual calibration of GM meters 5/79-10/80.  
Area detectors (with alarms) calibrated routinely.

## 8. MATERIALS

a. Radioactive material secured to prevent unauthorized removal from:

1) Restricted area: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

2) Unrestricted area (20.207): ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

b. Method of control appears adequate: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

c. Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## 9. FACILITIES

a. Facilities described in letter or application: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

b. Facilities inspected: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

c. Comment: Facility consists of large, thick-walled room,  
with maze entrance. The irradiator itself consists  
of 8 panels which are raised from the 18' deep  
pool. Presently, only 4 panels are in use, with  
a capacity of 42 "pencil sources" per panel (Each  
pencil source is approx. 10,000 curies. "Dummy rods"  
are used to space the hot sources to obtain the necessary  
geometries.

10. POSTING AND LABELING

a. Posting and labeling in accord with 10CFR 20.203: Yes No

b. Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. RECEIPT AND TRANSFER OF MATERIAL

a. Procedures for picking up and receiving packages (10CFR 20.205 (b)(c)):

Yes No

1) Incoming shipments monitored: Yes No

2) Records of monitoring maintained (10CFR 20.401(b)): Yes No

3) Records reviewed by NRC inspector: Yes No

4) Period reviewed: 6/15/79 → 11/6/80

b. Procedures for opening packages (10CFR 20.205(d)): Yes No

c. Comment: \_\_\_\_\_

The only "packages" received are the source shielding casks. Only 3 shipments have been made to date.

Cask surveys are performed upon receipt, when empty, and prior to return shipment.

All shipment paperwork was well documented.



d. Records of receipt and transfer of material available (30.51(a); 40.61(a);

70.51(b)(1)): ☒ Yes ☐ No

1) If "Yes" review of records was made by inspector: ☒ Yes ☐ No

2) Period Reviewed: 6/15/79 — 11/6/80

3) Comments: 3 shipments (approx. 197,000 Ci each) were on 6/15/79, 10/31/79, and 11/6/80 (This inspection was planned for 11/6/80 loading observation).

e. Packages on hand meet labelling requirements (49CFR 173.399):

☒ Yes ☐ No

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

f. Reports to commission required by L/C or regulation submitted:

☒ Yes ☐ No

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. PERSONNEL RADIATION PROTECTION - EXTERNAL

a. Film or ☒ TLD badge supplier Eberline

b. Badge exchange frequency Quarterly

c. Reports reviewed by Corp. RSO, Plant RSO, users

e. Records reviewed for period 1979 to 9/30/80 by NRC inspector

f. NRC forms or equivalent

1) NRC-4 (20.102(b)): ☒ Yes ☐ No Complete: ☒ Yes ☐ No

2) NRC-5 (20.401(a)): ☒ Yes ☐ No Complete: ☒ Yes ☐ No

Maximum whole body quarterly exposure: 69 mR (3rd Q, 1980)

Maximum extremity quarterly exposure: N/A

Ave. ~ 10 mR, Most were "0" for 1980.

All 1979 results were "0"

3) Comment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

g. Pocket dosimeters used: ☒ Yes ☐ No

- #862
- 1) Type used: Direct Reading Pocket Dosimeter (Dosimeter Corp. of America)
  - 2) Frequency of recharging: no schedule, approx. quarterly
  - 3) Frequency of reading: after each use
  - 4) Comment: pocket dosimeters are issued to anyone entering the irradiator room. Reviewed dosimeter log 6/15/79 → 9/2/80. Max. reading 3mR. Most were "C".

h. Direct radiation surveys of restricted and/or unrestricted areas being made:

☒ Yes ☐ No

- 1) Records of surveys being maintained: ☒ Yes ☐ No
- 2) Records of surveys reviewed: ☒ Yes ☐ No
- 3) Period reviewed: 6/79 → 11/80
- 4) Comments: Approx. monthly GM survey

13. PERSONNEL RADIATION PROTECTION - INTERNAL

a. Potential for exposure of individuals to airborne radioactive materials exists: Yes ☐ ☒ No

- 1) If "Yes" does program for monitoring and control exist: Yes ☐ No ☐
- 2) Program for monitoring and control appears adequate: Yes ☐ No ☐

b. Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

c. Respiratory protection program required by L/C or application:

Yes \_\_\_\_\_ No           

1) If "Yes" were respiratory protection procedures reviewed:

Yes \_\_\_\_\_ No \_\_\_\_\_

2) Respiratory protection procedures appear adequate: Yes \_\_\_\_\_ No \_\_\_\_\_

3) Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

d. Bioassay program required: Yes \_\_\_\_\_ No           

1) If "Yes" was bioassay program reviewed: Yes \_\_\_\_\_ No \_\_\_\_\_

2) Bioassay program appear adequate: Yes \_\_\_\_\_ No \_\_\_\_\_

3) Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

e. Smears and air samples

1) Monitoring for airborne radioactivity is conducted (20.103):

Yes            No (Air filters counted)

a. Records of monitoring reviewed: Yes            No \_\_\_\_\_

b. Period reviewed: 6/79 - 11/80

c. Records of monitoring appears adequate: Yes            No \_\_\_\_\_

2) Smear surveys being conducted (20.201, b): Yes            No \_\_\_\_\_

a. Records of smear surveys reviewed: Yes            No \_\_\_\_\_

b. Period reviewed: 6/79 - 11/80

c. Records appeared adequate: Yes            No \_\_\_\_\_

3) Comments: Wipe tests are conducted during source  
loading procedures



14. LEAK TESTS

a. Leak tests required: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

b. If "Yes" leak tests conducted: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

c. Records of leak tests maintained: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

d. Leak tests records reviewed: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

e. Period reviewed: 6/79 → 11/80

f. Records of leak tests appear adequate: ☒ Yes \_\_\_\_\_ No \_\_\_\_\_

g. Comments: Sources are "dry wiped" by AECI prior to shipment. Semi-annual leak tests are conducted by spectroscopic analysis of pool water as per Lic. Cond. 14d.

15. RADIOACTIVE EFFLUENT CONTROL AND WASTE DISPOSAL

a. Byproduct material released to atmosphere and/or sewer (20.106 and 20.303):

Yes \_\_\_\_\_ ☒ No \_\_\_\_\_

b. Records of releases or radioactive effluents maintained (20.401):

Yes \_\_\_\_\_ No \_\_\_\_\_

1) Period reviewed: \_\_\_\_\_

2) Records appear adequate: Yes \_\_\_\_\_ No \_\_\_\_\_

c. Solid waste disposal method: N/A

1) Records of disposal maintained (30.51): Yes \_\_\_\_\_ No \_\_\_\_\_

2) Surveys of waste prior to disposal made (20.201): Yes \_\_\_\_\_ No \_\_\_\_\_

3) Period reviewed: \_\_\_\_\_

4) Records of surveys appear adequate (20.401): Yes \_\_\_\_\_ No \_\_\_\_\_

d. Comments: \_\_\_\_\_

No waste generated

16. SHIPPING INCIDENTS

- a. Have any shipping incidents occurred since (date) N/A
- 1) Was incident documented: Yes \_\_\_\_\_ No \_\_\_\_\_
- 2) If "Yes" documentation appears adequate: Yes \_\_\_\_\_ No \_\_\_\_\_
- b. Comments (reports to DOT, etc.): \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

17. NOTIFICATIONS AND REPORTS

- a. Licensee in compliance with 10CFR 19.13 (reports to individuals):
- ☒ Yes \_\_\_\_\_ No \_\_\_\_\_
- b. Licensee in compliance with 10CFR 20.405 (over exposures):
- ☒ Yes \_\_\_\_\_ No \_\_\_\_\_
- c. Licensee in compliance with 10CFR 20.403 (incidents):
- ☒ Yes \_\_\_\_\_ No \_\_\_\_\_
- d. Licensee in compliance with 10CFR 20.402 (theft or loss):
- ☒ Yes \_\_\_\_\_ No \_\_\_\_\_
- e. Comments: \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

18. POSTING OF NOTICES

a. Licensee in compliance with 10CFR 19.11(a) or (b): Yes No

b. Licensee in compliance with 10CFR 19.11(c): Yes No

c. Comments: \_\_\_\_\_

GAVE Licensee NEW Form NRC-3 and Parts 19.1 & 20

19. ENVIRONMENTAL MONITORING PROGRAM

a. Environmental Monitoring Program required: Yes No

b. If "Yes" records reviewed: Yes No

c. Period reviewed: \_\_\_\_\_

d. Records appeared adequate: Yes No

e. If Environmental Program is not required, briefly describe any existing program: \_\_\_\_\_

20. CONFIRMATORY MEASUREMENTS

a. Independent measurements made by inspector: Yes No

b. Comments (describe type, results, comparison with licensee results): \_\_\_\_\_

All readings < .05 m/hr general area.  
Shipping cask ~ 5 m/hr @ 3', ↑ 45 m/hr contact.  
Levels inside facility never exceeded .05 m/hr  
during source unloading and mounting procedure  
(performed under 18' of water, with ~24' remote  
handling tools.)



21. INDEPENDENT INSPECTION EFFORT

a. Comment on type of independent inspection effort conducted:

Inspector arrived and observed entire operation from cask unloading (from truck), to final wipes following source panel re-installation. Other areas of the plant, as well as plant buildings were toured.

22. CONTINUATION FROM PREVIOUS PARAGRAPHS - USE BACK OF PAGE IF NECESSARY

FOLLOW-UP ON BULLETIN 79-19

1. If the licensee has received Bulletin 79-19 but does not ship waste, check this line   ✓   and fill out response form 1.
2. If the licensee ships waste for offsite burial:
- a. Does the licensee have current copies of DOT and NRC shipping regulations? Yes    No
- b. Does the licensee have on hand a set of current requirements placed on waste burial firms by the States of Nevada, South Carolina or Washington or the waste collector if a contractor is used? Yes    No
- c. Procedures
- (1) Written and management approved procedures? Yes    No
- (2) Procedures insure that waste shipped will conform to limits at burial site with respect to chemical and physical form and quantity of radioactive material in consignee's license? Yes    No
- (3) Procedures include requirements of applicable NRC and DOT regulations? Yes    No
- d. Training
- (1) Licensee has provided training for personnel involved in the transfer of radwaste? Yes    No
- (2) This training is documented? Yes    No
- e. Does the licensee have an audit program for his radwaste shipping activities? Yes    No
- f. Has the licensee conducted an audit of waste shipment activities? Yes    No

When? \_\_\_\_\_

Describe audit scope and findings.

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\_\_\_\_\_

Medicine  
Health Physics  
Industrial Hygiene  
Toxicology  
Medical Department/3M

3M Center  
St. Paul, Minnesota 55144  
612/733 1110

RECEIVED

*Minnesota Mining + Mfg. Co.*

NOV 10 AM 11 30

**3M**

November 12, 1980

U.S. NRC  
REGISTRATION

Licensing Management Branch  
Division of Fuel Cycle and Material Safety  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Gentlemen:

SUBJECT: U. S. NRC License 22-00057-61

In accordance with the provisions of condition 17 of the subject license, attached is a copy of the radiation survey report for the survey conducted by Atomic Energy of Canada, Ltd. (AECL) personnel on November 7, 1980, at 3M's Brookings, South Dakota, gamma sterilization facility subsequent to installation of an additional 195,000 curies of Cobalt-60. It is noted that external to the facility with the Cobalt-60 source rack in the irradiate position (1) almost all of the radiation levels are less than 0.03 millirem per hour and 2) where detectable levels were observed, the maximum level is below the design criteria of 2 millirem per hour and the average is well below the design criteria of 0.25 millirem per hour. With the source in its storage position in the storage pool, it is noted that radiation levels in the sterilization room are less than 0.03 millirem per hour.

The above survey information was confirmed in an independent, comprehensive survey performed on November 7, 1980, by D. C. Hall and J. A. Bauhs of 3M Health Physics Services. Details of this survey along with a copy of AECL's survey report are being maintained in the 3M Health Physics Services files in St. Paul, Minnesota, and in the 3M Plant Radiation Safety Officer's files in Brookings, South Dakota.

Should you have any questions regarding the radiation survey report, please contact Duane C. Hall of our office at 612/733-7316.

Sincerely,

*Robert G. Wissink*  
Robert G. Wissink,  
Licensing Administrator  
Radioactive Materials

RGW/DCH:fml

Attachment

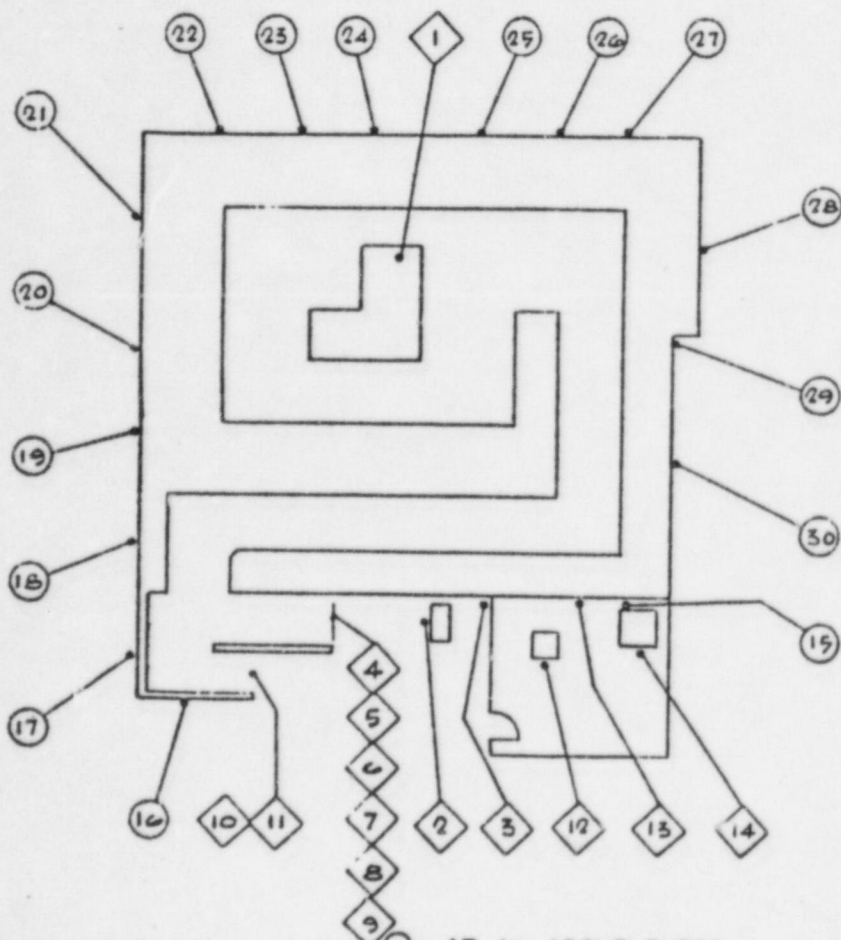
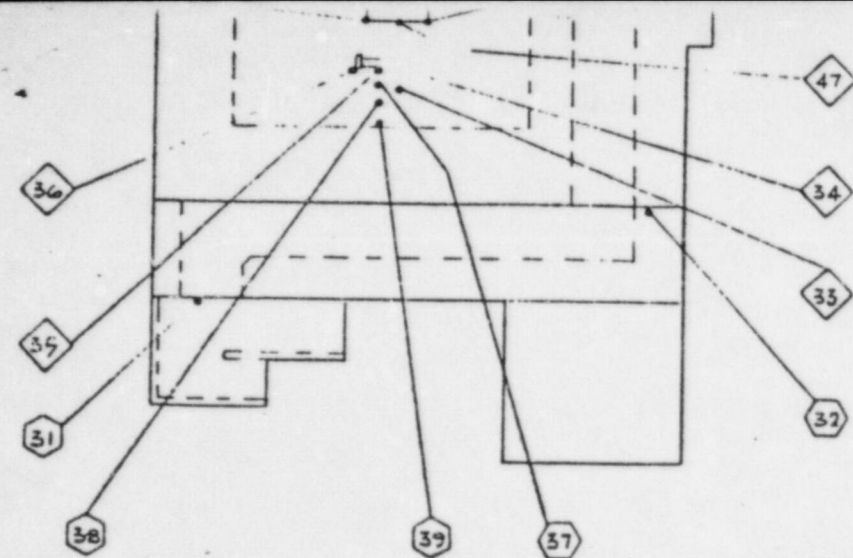
cc: U. S. Nuclear Regulatory Commission, Region III  
Atomic Energy of Canada, Ltd.  
E. C. Seydel, 3M Medical Products - Brookings, S.D.

05910

841230364  
1012310561 2pp.

JAN 9 1981





○ AT 1m ABOVE FLOOR  
 ○ AT FLOOR OR ON ROOF  
 ◇ ON NAMED FEATURE  
 (SURVEYOR TO ADD AS NECESSARY)

MAXIMUM RADIATION DESIGN LEAKAGE SO THAT  
 NO ONE SHALL RECEIVE MORE THAN 10 mrem IN  
 A 40 HOUR WORK WEEK WITH  $3 \times 10^6$  CURIES  
 OF COBALT-60 INSTALLED.

OCCUPANCY HOURS/WEEK	DOSE RATE IN mrem/h IN AREA	
	MAXIMUM	AVERAGE
40	2.0	0.25

SURVEY PERFORMED BY *PMOLRUGINEY*  
 DATE *2/11/80*

SURVEY INSTRUMENT MODEL *Reshield B-10 F*

10	*	UPPER CONV.
11	*	LOWER CONV.
12	*	AIR FILTER
13	*	FLOOR TRASH
14	*	DEIONIZER
15	*	
16	*	
17	*	
18	*	
19	*	
20	*	
21	*	
22	*	
23	*	
24	*	
25	*	
26	*	
27	*	
28	*	
29	*	
30	*	
31	*	
32	*	
33	NA	AIR LINE
34	*	GUIDE CABLE
35	1.2	HOIST CABLE
36	*	GUIDE CABLE
37	*	
38	*	
39	*	
40	0.4	PLUG CRACK
41	1.0	PLUG CRACK
42	0.4	PLUG CRACK
43	0.12	PLUG CRACK
44	0.02	PLUG CRACK
45	0.06	PLUG CRACK
46	0.05	PLUG CRACK
47	*	PLUG CRACK
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A: ATOMIC ENERGY OF CANADA LIMITED  
 OTTAWA COMMERCIAL PRODUCTS CANADA

RADIATION SURVEY REPORT