

## APPENDIX

Sent 04/10/79

Form AEC-313 (2-73) 10 CFR 30	UNITED STATES ATOMIC ENERGY COMMISSION <b>APPLICATION FOR BYPRODUCT MATERIAL LICENSE</b>		Form approved Budget Bureau No. 38-80027
<p>INSTRUCTIONS.—Complete Items 1 through 16 if this is an initial application or an application for renewal of a license. Information contained in previous applications filed with the Commission with respect to Items 8 through 15 may be incorporated by reference provided references are clear and specific. Use supplemental sheets where necessary. Item 16 must be completed on all applications. Mail two copies to: U.S. Atomic Energy Commission, Washington, D.C., 20545, Attention: Materials Branch, Directorate of Licensing. Upon approval of this application, the applicant will receive an AEC Byproduct Material License. An AEC Byproduct Material License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the Licensee is subject to Title 10, Code of Federal Regulations, Part 20, and the license fee provisions of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 16 and the appropriate fee enclosed. (See Note in Instruction Sheet).</p>			
1. (a) NAME AND STREET ADDRESS OF APPLICANT. (Institution, firm, hospital, person, etc. Include ZIP Code and telephone number.)		(b) STREET ADDRESS(ES) AT WHICH BYPRODUCT MATERIAL WILL BE USED. (If different from 1(a), include ZIP Code.)	
Morton Salt Company 151 S. Industrial Ave. Rittman, OH 44270		Same as #1	
2. DEPARTMENT TO USE BYPRODUCT MATERIAL		3. PREVIOUS LICENSE NUMBER(S). (If this is an application for renewal of a license, please indicate and give number.)	
No byproduct		None at this location.	
4. INDIVIDUAL USER(S). (Name and title of individual(s) who will use or directly supervise use of byproduct material. Give training and experience in Items 8 and 9.)		5. RADIATION PROTECTION OFFICER. (Name of person designated as radiation protection officer if other than individual user. Attach resume of his training and experience as in Items 8 and 9.)	
Mill Supervisor		Alan Longstreth	
6. (a) BYPRODUCT MATERIAL. (Element and mass number of each.)		(b) CHEMICAL AND/OR PHYSICAL FORM AND MAXIMUM NUMBER OF MILLICURIES OF EACH CHEMICAL AND/OR PHYSICAL FORM THAT YOU WILL POSSESS AT ANY ONE TIME. (If sealed source, also state name of manufacturer, model number, number of source and maximum activity per source.)	
Cesium 137		One sealed source Kay Ray source holder No. 7063-P Max. activity per source 200 m Ci Source Mfg.: New England Nuclear.	
<b>RECEIVED BY LFMB</b> Date APR 13 1979 Log. Apr 8 1979 By [Signature] Orig. To ..... Action Compl. 4/13/79		Applicant. 29992 Check No. 29992 Amount/ Fee Category 110(32) Type of Fee APPLICATION Date Check Rec'd APR 13 1979 Received By [Signature]	
7. DESCRIBE PURPOSE FOR WHICH BYPRODUCT MATERIAL WILL BE USED. (If byproduct material is for "house use" under A (Form AEC-313a) must be completed. If byproduct material is in the form of a sealed source, attach the make and model number of the storage container used and/or device in which the source will be stored and/or used.)			
The source heads are manufactured by Kay Ray Inc. Information describing this equipment has been supplied by Kay Ray to the NRC for specific licensing. The source heads will be used in a level measuring system.			

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## TRAINING AND EXPERIENCE OF EACH INDIVIDUAL NAMED IN ITEM 4 (Use supplemental sheets if necessary)

8. TYPE OF TRAINING	WHERE TRAINED	DURATION OF TRAINING	ON THE JOB (Circle answer)	FORMAL COURSE (Circle answer)
a. Principles and practices of radiation protection	)		Yes No	Yes No
b. Radioactivity measurement standardization and monitoring techniques and instruments	) See attached sheet.		Yes No	Yes No
c. Mathematics and calculations basic to the use and measurement of radioactivity	)		Yes No	Yes No
d. Biological effects of radiation	)		Yes No	Yes No

## 9. EXPERIENCE WITH RADIATION (Actual use of radioisotopes or equivalent experience)

ISOTOPE	MAXIMUM AMOUNT	WHERE EXPERIENCE WAS GAINED	DURATION OF EXPERIENCE	TYPE OF USE
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## 10. RADIATION DETECTION INSTRUMENTS (Use supplemental sheets if necessary)

TYPE OF INSTRUMENTS (Include make and model number of each)	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE (mr/hr)	WINDOW THICKNESS (mg/cm <sup>2</sup> )	USE (Monitoring, surveying, measuring)
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## 11. METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED ABOVE

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## 12. FILM BADGES, DOSIMETERS, AND BIO-ASSAY PROCEDURES USED (For film badges, specify method of calibrating and processing, or name of supplier)

Film badges or other personnel monitoring equipment are not required for installation area. Refer to item No. 14 for justification.

## INFORMATION TO BE SUBMITTED ON ADDITIONAL SHEETS IN DUPLICATE

13. FACILITIES AND EQUIPMENT Describe laboratory facilities and remote handling equipment, storage containers, shielding, fume hoods, etc. Explanatory sketch of facility is attached. (Circle answer) Yes No -----

14. RADIATION PROTECTION PROGRAM Describe the radiation protection program including control measures. If application covers sealed sources, submit leak testing procedures where applicable, name, training, and experience of person to perform leak tests, and arrangements for performing initial radiation survey, servicing, maintenance and repair of the source.

See attached Radiation Protection Program

15. WASTE DISPOSAL If a commercial waste disposal service is employed, specify name of company. Otherwise, submit detailed description of methods which will be used for disposing of radioactive wastes and estimates of the type and amount of activity involved.

Kay Ray will provide this service if required.

CERTIFICATE (This item must be completed by applicant)

16. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE APPLICANT NAMED IN ITEM 1, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PART 30, AND THAT ALL INFORMATION CONTAINED HEREIN, INCLUDING ANY SUPPLEMENTS ATTACHED HERETO, IS TRUE AND CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF.

Licence Fee Category: 3L

Fee Enclosed: 110.00

Date: 4-4-79

Morton Salt Company

Applicant named in item 1

By:

Alan Longstreth

Admin. Services Mgr.

Title of certifying official

WARNING:—18 U. S. C., Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U.S. GPO: 1973-843-128/818

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Attachment for Item 8.

At the time of the system installation and set up, Kay Ray will provide training required in the safe utilization of the equipment.

This training will follow the following outline:

1. A discussion of the worst case dosage that an operator will receive versus the allowable limits.
2. Explain any special posting requirements or restricted access area requirements to the gauge if applicable to the application.
3. Provide instructions on the limitations of the specific license that was granted for equipment. In most cases this would involve telling the customer not to remove, relocate or perform any maintenance on the source head.
4. Discuss the emergency procedures to be followed in the event of damage to the source head.
5. Describe the structure of the source holder itself. This shall include discussion of where the beam exists and the mechanical aspects of the shutter mechanism.
6. Describe the ruggedness of the source capsule and the source holder itself.
7. Fully evaluate the lockout procedure, if applicable, to insure conformance to the procedure submitted for the licensing of this equipment.

A copy of this outline is provided in the instruction manual supplied with the gauge and will be followed in operation of the gauge.

## Radiation Protection Program

### I. Sketch of installation.

The enclosed sketch gives the specifics of the installation. All equipment will be located and mounted in accordance with the recommendations of the manufacturer.

### II. Radiation survey, servicing, maintenance, etc.

Initial radiation survey, servicing, maintenance, relocation and repair of the source holder will be performed by Kay Ray. The initial radiation survey will be used to confirm the calculations shown in section VI of this item.

### III. Control measures.

If maintenance is required inside a vessel a warning sign will be placed at all entrances to the vessel prohibiting access without first contacting the radiation safety officer. The radiation safety officer when notified will lock the source head in the store position before allowing access of maintenance personnel in the vessel.

### IV. Leak testing.

Kay Ray will perform the leak testing of the source holder. The leak test kit used by Kay Ray is either the general radio isotope products WT-4 kit, or Kay Ray, Inc. model A kit, which have been approved by the NRC for use in the source wiping of Kay Ray source holders.

We wish to have our license worded to allow a three year source wipe interval on the device listed above. An extension has recently been granted to Kay Ray allowing a three year interval for source wiping, and we wish to have our license reflect this extended test period.

### V. Procedure to be followed in the event of damage to source housing.

The enclosed procedure will be followed in event of damage to the source housing.

Emergency Procedure to be followed after damage to Kay Ray source holders:

1. This procedure applies to all instances where damage is incurred by the source holder due to such action as fire, etc.
2. Immediately rope off the area around the source holder to a minimum of 10 feet in diameter.



3. Inform plant radiation safety officer or person responsible for the use of the source as to the situation.
4. Inform by phone or telegram the proper regional NRC office of the accident.
5. Notify Kay Ray at area code 312/259-5600 if their assistance is desired.
6. Limit access to source head until a radiation survey and source wipe can be performed by qualified personnel or a representative of Kay Ray.

VI. Worst case personnel radiation exposure calculation.

Procedure for calculation of worst case radiation exposure to operating personnel.

The attached calculation indicates a worst case operator exposure of 0.750 mr/per year. This exposure is based on the nearest operator location to the source housing and is less than 500 mr/per year which is well below the limits set in 10CFR20 for personnel monitoring equipment. The calculated radiation exposure rate one will receive at the detector is approximately .5 mr/per hour or less. These low level drop off according to the square law and result in negligible operator exposure a few feet from the detector. These radiation exposures will be verified at the time of start up. This will include the effects of radiation scattering along the vessel walls if applicable. These provisions will be taken to verify that no one will receive a worst case exposure of 500 mr/per year at the detector side of the vessel.

$$X = 0.03 \times 200 \times 0.5 \text{ hrs/day} \times 0.25 =$$

$$X = 6 \times .125 = .750 \text{ mr/yr.}$$

$$.03 \times 200 \times 25 \times 0.25$$

$$6 \times 6.25$$

$$36 \text{ mr/year}$$

## GAMMA SOURCE HEADS

Model No.	7056	7050B	7051B	7062	7063	7063P
(ft.)	7057 K (mr/hr)	7060B K (mr/hr)	7061B K (mr/hr)	7062P K (mr/hr)	7063 K (mr/hr)	7063P K (mr/hr)
0	0.63	12.5	3.0	500	50	15.0
1	0.05	0.59	0.17	11.22	2.3	0.82
2	0.02	0.18	0.06	3.31	0.74	0.26
3	0.009	0.09	0.03	1.56	0.34	0.12
4	0.006	0.05	0.02	0.90	0.20	0.07
5	0.004	0.03	0.01	0.59	0.14	0.05
6	0.003	0.02	0.008	0.41	0.09	0.03
7	0.002	0.02	0.006	0.31	0.08	0.03
8	0.002	0.01	0.005	0.24	0.06	0.02
9	0.001	0.01	0.004	0.19	0.06	0.02
10	0.001	0.009	0.003	0.15	0.03	0.01
11	0.0008	0.008	0.002	0.13	0.03	0.01
12	0.0007	0.006	0.002	0.11	0.02	0.009
13	0.0006	0.005	0.002	0.09	0.02	0.008
14	0.0005	0.005	0.002	0.08	0.02	0.007
15	0.0005	0.004	0.001	0.07	0.01	0.006
16	0.0004	0.004	0.001	0.06	0.01	0.005
17	0.0004	0.003	0.001	0.05	0.01	0.004
18	0.0003	0.003	0.001	0.05	0.01	0.004
19	0.0003	0.003	0.0009	0.04	0.01	0.004
20	0.0003	0.002	0.0008	0.04	0.008	0.003

Model No.	7064	7064P	7065	7067	7068
(ft.)	7064 K (mr/hr)	7064P K (mr/hr)	7065 K (mr/hr)	7067P K (mr/hr)	7069 K (mr/hr)
0	15	3.25	120	5	7.5
1	1.02	0.22	5.62	0.48	0.38
2	0.36	0.08	1.77	0.17	0.12
3	0.18	0.04	0.85	0.08	0.06
4	0.12	0.03	0.50	0.05	0.03
5	0.06	0.01	0.33	0.03	0.02
6	0.05	0.01	0.23	0.02	0.01
7	0.04	0.007	0.17	0.02	0.01
8	0.03	0.006	0.13	0.01	0.009
9	0.02	0.005	0.11	0.01	0.007
10	0.02	0.004	0.09	0.009	0.006
11	0.01	0.003	0.07	0.007	0.005
12	0.01	0.003	0.06	0.006	0.004
13	0.01	0.003	0.05	0.006	0.003
14	0.01	0.002	0.04	0.005	0.003
15	0.006	0.002	0.04	0.004	0.003
16	0.006	0.002	0.03	0.004	0.002
17	0.006	0.001	0.03	0.003	0.002
18	0.006	0.001	0.03	0.003	0.002
19	0.005	0.001	0.02	0.002	0.002
20	0.005	0.001	0.02	0.002	0.001

EL. 971'-6"  
First Floor

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