

January 31, 2000

MEMORANDUM TO: John R. Madera, Chief, Materials Licensing Branch, DNMS

FROM: B. L. Jorgensen, Chief, Decommissioning Branch, DNMS  
/s/ B. L. Jorgensen

SUBJECT: DOW AGROSCIENCES, DECOMMISSIONING OF THE  
GREENFIELD FIELD RESEARCH STATION  
(LICENSE NO. 13-26398-01)

On January 31, 2000, your staff requested our review of a submittal from Dow

AgroSciences regarding the final status survey of the field research station located at

L Based on our review, we believe that the licensee has provided sufficient Ex. 2  
information and they have satisfactorily demonstrated that the levels of residual contamination  
of at station do not exceed 25 mrem per year, as specified in Ex 2  
Section 20.1402 of Subpart E; therefore, the request for deletion of this location from the  
license should be granted.

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 2  
FOIA-2002-0080

DOCUMENT NAME: G:\SEC\DOWCLOSE.WPD

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OFFICE	RIII		RIII (S)	C				
NAME	Lee/ml	TR	Jorgensen					
DATE	1-31-00		1-31-00					

OFFICIAL RECORD COPY

B/3

Inspector: Robert G. Gattone Jr.  
(Signature)

Date 10/1/97

Approved: J. R. Macle  
(Signature)

Date 10/1/97

*Field notes are to be used by the inspector to assist with the performance of the inspection. Note that all areas indicated in the field notes are not required to be addressed during each inspection. However, for those areas not covered during the inspection, a notation ("Not Reviewed") should be made in each section where applicable. Additionally, all areas covered during the inspection should be documented in sufficient detail to describe what activities and/or records the inspector observed. For example, the types of records that were reviewed and the time periods covered by those records should be noted. If the licensee demonstrates any practices at your request, describe those demonstrations. The observations and demonstrations you describe in this report, along with measurements and some records review, should substantiate your inspection findings.*

NOTE: For inspections of radioactive drug distributors, ensure that all applicable sections (regarding 10 CFR Part 32) of the radiopharmacy field notes are completed.

"NR" MEANS "NOT REVIEWED"

"VMS" MEANS "VIOLATION OF MINOR SAFETY SIGNIFICANCE"

1. INSPECTION, LICENSING, AND INCIDENT HISTORY

- A. Violations were identified during any of the last two inspections or two years, whichever is longer. (N/A = Initial insp.) ☐ N/A ☒ Y ☐ N
- B. Response letter(s) or 591(s) dated 7/10/95
- C. Violations from previous inspection(s):

REQUIREMENT CITED

STATUS

5/17-6/2/95 Inspection:

VIO/10 CFR 20.1501(b)/The licensee failed to calibrate a survey instrument used to analyze wipes of packages upon receipt. The instrument was calibrated annually. Closed.

11/18/92 Inspection:

Clear

- D. Any repeat violation(s) identified? ☐ Y ☒ N  
If "Yes," explain:
- E. License amendments issued since last

inspection, or program changes noted in the license:

<u>AMENDMENT #</u>	<u>DATE</u>	<u>SUBJECT</u>
07	1/18/96	Authorized receipt of sealed radioactive waste generated by contract licensees using DowElanco's radioactive material
08	5/13/96	[REDACTED] possession limits raised
09	6/12/96	LC25 was added to authorize licensee receipt of [REDACTED] from contract labs
10	3/11/97	New RSO, changed training of sealed source users to annually, changed monthly wipe testing of the [REDACTED] to include months of April through November and only when radioactive material is present in [REDACTED]
11	6/10/97	New RSO, changed RSC membership, added a new radioactive waste storage facility

F. During this inspection, was the licensee's implementation of all of the above amendments or program changes inspected/observed? ☐ N/A ☐ Y ☒ N

G. During this inspection, were any violations identified involving any of the above amendments or program changes? ☐ N/A ☐ Y ☒ N

H. List any incidents or events reported to NRC since the last inspection (Note: "None" indicates that regional event logs, event files, and the licensing file have no evidence of any incidents or events since the last inspection): ☒ None

INCIDENT OR EVENT

I. During this inspection, were the incidents/events reviewed with the licensee, and was the licensee's follow-up to the incidents/events examined? ☒ N/A ☐ Y ☐ N

- J. Describe the licensee's follow-up in response to the events/incidents listed in 1.H.:

Comments:

**2. ORGANIZATION AND SCOPE OF PROGRAM**

- A. Describe the licensee's organizational structure to indicate the "chain-of-command" from senior management to authorized users of licensed material. Show or describe where the RSO and Chairperson of the RSC are located in the licensee's organization and to whom they report:

**John Hagaman, President and CEO**  
**Perry Gehring, Vice President of Research and Development**  
**Jerry Toomer, Vice President of Human Resources**  
**Paul Brownson, M.D., RSC Chair**  
**Beth Swisher, Global Manager of Insect Research**  
**Greg Socha, RSO**  
**Chris Addleman, Radiation Safety Technical Assistant**  
**Heidi Dixon-White, Chemical Hygiene Officer**

- B. Identify licensee personnel contacted during the inspection (including those individuals contacted by telephone).

**\*Perry Gehring, Vice President of Research and Development**  
**\*Paul Brownson, M.D., RSC Chair**  
**\*#Beth Swisher, Global Manager of Insect Research**  
**Ralph Lassiter, Field Station Manager**  
**Brian Haley, Site Manager of Safety and Security**  
**Jeanette Smith, Manager of Environmental Services**  
**\*#Greg Socha, RSO**  
**\*#Eric Hobson, Environmental Attorney**  
**Chris Addleman, Radiation Safety Technical Assistant**  
**Heidi Dixon-White, Chemical Hygiene Officer**  
**Ann Owens-Merlo, Principal Investigator (PI)**  
**Len McKendry, PI**  
**Dave Berard, PI**  
**Gerald Watson, PI**  
**Rachelle Leffert-Sorenson, Authorized User (AU)**  
**Andy Schaffner, AU**  
**Jerry Keaton, Research Technician**  
**Jim Donnelly, Environmental Services Technician**

(Use the following identification symbols:)

# Individuals present at entrance meeting

\* Individuals present at exit meeting

+ Individuals contacted by telephone

C. Authorized for multiple locations of use (x) Y ( ) N  
If yes, may use ATTACHMENT A as a guide  
for inspecting laboratories.

D. Authorized for multiple permanent field  
office locations (x) Y ( ) N  
(1) Inspection performed at multiple field offices (x) Y ( ) N  
(2) If "Yes," list office locations inspected:

E. Authorized for temporary job site locations ( ) Y (x) N  
(1) Inspection performed at temporary job site(s) ( ) Y ( ) N  
(2) If not, describe why not:

F. Briefly describe scope of activities, including  
types and quantities of use involving licensed  
material, frequency of use, staff size, etc.

The licensee used radioactive material to perform R&D on pesticides, fungicides, herbicides and growth regulators.                      was not used within the last two years, and no iodinations had ever been performed. A maximum of                      was used per experiment for DNA labeling studies. A maximum of                      was used per experiment for biological studies. A maximum of                      was used per experiment for DNA labeling. Pesticide labeling was performed with a maximum of                      per experiment. Field studies in                      were limited to application of                      labeled: (1) fungicide on apple trees; and (2) pesticide on plants and soil.                      labeled pesticides were applied to insects to trace uptake.

The licensee possessed about                      The largest source contained                      in a GC. Other sources included LSC reference sources                      static eliminators, and                      check sources.

The Radiation Safety Office (RSOF) staff consisted of the RSO, a Radiation Safety Technical Assistant, a Chemical Hygiene Officer, and a Radiation Safety Coop.

### 3. MANAGEMENT OVERSIGHT

A. Radiation Safety Committee (RSC) required [L/C]<sup>1</sup> (x) Y ( ) N

(1) RSC fulfills license requirements [L/C] (x) Y ( ) N

(2) Records maintained [L/C] (x) Y ( ) N

The inspector reviewed RSC meeting minutes dated 2/14/97, 6/6/97, 8/25/97, 11/18/96. The proper membership and quorum discussed the following topics:

- radiation safety training for ancillary staff;
- AU permit renewals;
- current possession of licensed material relative to license possession limits;
- dosimetry results;
- minor spill responses;
- licensing actions;
- security of licensed material; and
- results of an external radiation safety program audit conducted by Janet Grappin (i.e., Dow's RSO).

B. Radiation Safety Officer (RSO)

(1) Authorized on license [L/C] (x) Y ( ) N

(2) Fulfills duties as RSO (x) Y ( ) N

C. Audits, Reviews, or Inspections

(1) Audits are required [L/C] (x) Y ( ) N

(2) Audits or inspections are conducted (x) Y ( ) N

Audits conducted by RSOF

Frequency Quarterly for medium-level labs (only one), and semi-annually for low level labs (all others)

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Here and throughout the field notes, "L/C" means "license condition."

The RSOF audits included confirmatory ambient dose rate and removable contamination surveys.

- (3) Content and implementation of the radiation protection program reviewed annually by the licensee [20.1101(c)]<sup>2</sup> (x) Y ( ) N
- (4) Records maintained [20.2102] (x) Y ( ) N

As an audit action, the RSO purposely sent a P.O. for licensed material to the Purchasing Department without the required RSO's signature. The Purchasing department caught it and returned the P.O. to the RSO for signature.

- D. Use by authorized individuals [L/C] (x) Y ( ) N

The inspector reviewed records of individuals who were RSC approved to use licensed material.

- E. If supervision permitted by the license or by regs, authorized users supervise adequately [L/C] (x) Y ( ) N

#### 4. FACILITIES

- A. Facilities as described in license application [L/C] (x) Y ( ) N

The inspector toured the [ ] incident to transfer to Dow in Midland, MI for incineration. A sprinkler system was installed and fire Ex 2  
extinguishers were present.

The inspector toured the [ ] The facility was used to store Ex 2  
farm equipment (used exclusively for field studies) and sealed barrels of soil collected Ex 2  
from field studies using [ ]. The facility was properly secured and posted. Two fire  
extinguishers were present. No liquid radioactive waste was stored in the [ ]

The inspector toured [ ] field study station. Field studies Ex 2  
were in progress within a secured, posted, fenced-in area. The actively used area was  
fenced-in within an outer perimeter fence. When a field study was completed, core  
samples were collected and analyzed to verify that the soil contained < 66 dpm/gm of  
[C-14]. Coring was typically to a depth of 12-36 inches depending on the type of study.  
Soil was analyzed by heating the soil and absorbing the [C-14] into a liquid for eventual

Here and throughout the field notes, sections of 10 CFR are referenced only by their section numbers.



LSC analysis. The soil was weighed prior to sampling. Efficiency of the LSC analysis and the combustion collection process was evaluated prior to sample analysis. All soil samples were disposed as radioactive waste regardless of the analysis results.

The licensee implemented procedures to contain [ ] used in field studies. Rain water was contained within the study plot using wooden boxes. The staff were aware of the [ ] license limits of [ ] at any one time. Ex 2

The inspector toured [ ] The facility was used to store liquid radioactive waste in 50L plastic containers inside of 25 gallon plastic containers lined with wood chips. The facility had a dike and the door was locked shut. No flammables or explosives were stored in the facility. A sprinkler system was installed.

The inspector toured several labs in [ ] the only building where licensed material was routinely used. Ex 2

- B. Facilities are secured to prevent unauthorized access [L/C] (x) Y ( ) N
- C. Describe any self-contained dry-source-storage irradiators and/or survey instrument calibrators (model, radionuclide, activity, use, etc.) NR (x) N/A
- (1) Maintenance of safety-related components performed by authorized persons [L/C] ( ) Y ( ) N
- (2) Access to keys and/or material controlled [20.1801-1802, L/C] ( ) Y ( ) N
- (3) Access to high/very high radiation areas controlled [20.1601-1602, L/C] ( ) Y ( ) N
- (4) Adequate protection of shield integrity, fire protection [L/C] ( ) Y ( ) N

Basis for Findings:

## 5. EQUIPMENT AND INSTRUMENTATION

### A. Instruments and equipment:

- (1) Appropriate operable survey instrumentation possessed and readily accessible [L/C] (x) Y ( ) N
- (2) Calibrated as required [20.1501, L/C] (x) Y ( ) N

All GM survey instruments except the Ludlum MN 3, SN 96514 were used strictly as beta emitter detection devices. Therefore, constancy checks were performed regularly instead of having the instruments calibrated. Since the Ludlum MN 3, SN 96514 instrument was used to measure the ambient dose rate of packages upon receipt, it

was calibrated annually. The inspector reviewed the calibration records for SN 96514 dated 6/19/96 and 6/9/95. Both calibrations were performed by an authorized firm.

Serial No. 96514 was unavailable during the inspection because it had been sent for recalibration. The licensee used a loaner instrument (i.e., Ludlum MN 3, SN 058067) that was calibrated on 7/16/97 by an authorized firm.

Removable contamination surveys were analyzed with LSCs.

(3) Calibration records maintained [20.2103(a)] (x) Y ( ) N

B. Procedures established to identify and report  
safety component defects [21.21] NR ( ) Y ( ) N

The inspector reviewed records of the monthly removable contamination surveys performed in the pole barn on 8/14/97, 7/14/97 and 6/23/97.

Basis for Findings:

6. MATERIALS RECEIPT, USE, TRANSFER, AND CONTROL

A. Isotope, chemical form, quantity, and use, as  
authorized [L/C] (x) Y ( ) N

B. Licensed materials secured to prevent unauthorized  
removal or access [20.1801-1802] (x) Y ( ) N

The licensee's main

(1) Licensed material in storage in controlled  
or unrestricted areas is secured from  
unauthorized removal or access [20.1801] (x) Y ( ) N

(2) Licensed material in controlled or  
unrestricted areas and not in storage  
is controlled and under constant  
surveillance [20.1802] (x) Y ( ) N

(3) Access to restricted areas is limited  
[20.1003] (x) Y ( ) N

C. Describe how packages are received and by whom: ( ) N/A

Ex. 2  
fx2

Licensed material was ordered through the RSOF. All POs required RSO signature. Licensed material receipts and transfers were coordinated with the RSO so that the computerized inventory could be updated.

- D. Written package opening procedures established and followed [20.1906(e)] NR ☐ Y ☐ N
- E. All incoming packages with DOT labels wiped, unless exempted (gases and special form) [20.1906(b)(1)] NR ☐ Y ☐ N
- F. Incoming packages surveyed [20.1906(b)(2)] NR ☐ Y ☐ N
- G. Monitoring in (E) and (F) above, performed within time specified [20.1906(c)] NR ☐ Y ☐ N
- H. Transfer(s) between licensees performed [30.41] NR ☐ Y ☐ N
- I. All sources surveyed before shipment and transfer [20.1501(a), L/C] NR ☐ Y ☐ N
- J. Records of surveys and receipt/transfer maintained [20.2103(a), 30.51] NR ☐ Y ☐ N
- K. Transfers among licensee's authorized users or locations performed as required [L/C] ☐ N/A ☒ Y ☐ N

The RSO was notified of all transfers between authorized users.

- L. Arrangements made for packages containing quantities of radioactive material in excess of Type A quantity [20.1906(a)] NR ☐ N/A ☐ Y ☐ N
- M. Package receipt/distribution activities evaluated for compliance with 20.1301 [20.1302] NR ☐ N/A ☐ Y ☐ N

Basis for Findings:

## 7. TRAINING, RETRAINING, AND INSTRUCTIONS TO WORKERS

- A. Instructions to workers/students [10 CFR 19.12] ☒ Y ☐ N
- B. Training program required [L/C] ☒ Y ☐ N

(1) If so, briefly describe training program:

Sealed source users were required to receive annual retraining.

AUs (i.e., individuals authorized to use licensed material under the supervision of a PI) and PIs were required to achieve a 90% grade on an 85 question exam and complete a 90 day hands-on training course.

- (2) Training program implemented ☒ Y ☐ N
- (3) Periodic training program required ☒ Y ☐ N
- (4) Periodic training program implemented ☒ Y ☐ N

- (5) Records maintained NR ☐ Y ☐ N
- C. Individual's understanding of procedures and regulations is adequate ☒ Y ☐ N
- (1) Current operating procedures ☒ Y ☐ N
- (2) Emergency procedures ☒ Y ☐ N
- (3) Use of survey instrumentation ☒ Y ☐ N
- D. Revised Part 20  
Workers cognizant of requirements for:
- (1) Radiation safety program [20.1101] ☒ Y ☐ N
- (2) Annual dose limits [20.1301-1302] ☒ Y ☐ N
- (3) New NRC Forms 4 and 5 NR ☐ N/A ☐ Y ☐ N
- (4) 10% monitoring threshold [20.1502] ☒ Y ☐ N
- (5) Dose limits to embryo/fetus and declared pregnant worker [20.1208] NR ☐ Y ☐ N
- (6) Grave danger posting [20.1902] ☒ N/A ☐ Y ☐ N
- (7) Procedures for opening packages NR  
[20.1906] ☐ N/A ☐ Y ☐ N
- (8) Sewer disposal limits [20.2003] NR ☐ N/A ☐ Y ☐ N

Basis for Findings:

8. AREA RADIATION SURVEYS AND CONTAMINATION CONTROL

- A. Briefly describe area survey requirements [20.1501(a), L/C]:

Radioactive waste [REDACTED] was required to have monthly ambient dose rate and removable contamination surveys by the RSOF. EX 2  
2.2

The [REDACTED] site was required to have monthly removable contamination surveys from April through November if licensed material was used.

- B. Performed as required [20.1501(a), L/C] ☒ Y ☐ N
- (1) Contamination found ☒ Y ☐ N
- (2) Corrective action taken and documented ☒ Y ☐ N
- C. Records maintained [20.2103, L/C] ☒ Y ☐ N
- D. Handling and use of radioactive materials [L/C]
- (1) Protective clothing worn ☒ Y ☐ N

- |     |  |             |
|-----|--|-------------|
| (2) | Personnel routinely monitor or frisk themselves after procedures or before leaving | (x) Y ( ) N |
| (3) | No eating/drinking/smoking in use/storage areas                                    | (x) Y ( ) N |
| (4) | No food, drink, or personal effects stored in use/storage areas                    | (x) Y ( ) N |
| (5) | Proper dosimetry worn  | (x) Y ( ) N |
| (6) | Radioactive waste disposed in proper containers                                    | (x) Y ( ) N |
| (7) | No pipetting by mouth  | (x) Y ( ) N |
| (8) | Use of shielding/distance while using/storing material                             | (x) Y ( ) N |

Basis for Findings:

E. Protection of members of the public

- |     |  |             |
|-----|--|-------------|
| (1) | Licensee made adequate surveys to demonstrate either: (1) that the TEDE to the individual likely to receive the highest dose does not exceed 100 mrem in a year; or (2) that if an individual were continuously present in an unrestricted area, the external dose would not exceed 2 mrem in any hour and 50 mrem in a year [20.1301(a)(1), 1302(b)]; and (3) the air emissions to the atmosphere are within the constraint level [20.1101] | (x) Y ( ) N |
| (2) | Unrestricted area radiation levels do not exceed 2 mrem in any one hour [20.1301(a)(2)]  | (x) Y ( ) N |
| (3) | Records maintained [20.2103, 20.2107]  | (x) Y ( ) N |

F. Leak tests and Inventories [L/C]

- |     |   |                     |
|-----|---|---------------------|
| (1) | Performed as required                         | ( ) N/A (x) Y ( ) N |
| (2) | Adequate analysis methodology and sensitivity | ( ) N/A (x) Y ( ) N |
| (3) | Records maintained [L/C]                      | (x) Y ( ) N         |

The inspector reviewed leak test records of all sealed sources dated 5/30/97, 11/28/96 and 5/28/96.

Basis for Findings:

9. RADIATION PROTECTION

- |    |   |             |
|----|---|-------------|
| A. | Licensee performed exposure evaluation [20.1501]  | (x) Y ( ) N |
| B. | Licensee incorporated ALARA considerations in the |             |

radiation protection program [20.1101(b)]

(x) Y ( ) N

C. External Dosimetry

( ) N/A

Handlers of [redacted] were assigned WB and extremity badges. Environmental Services staff who handled radioactive waste containers were assigned WB badges.

(1) Licensee monitors workers [20.1502(a), L/C] (x) Y ( ) N

(2) External exposures account for contributions from airborne activity [20.1203] (x) N/A ( ) Y ( ) N

(3) Processor\_Landauer\_\_\_\_\_Frequency\_Monthly\_\_\_\_\_

(4) Processor is NVLAP-approved [20.1501(c)] (x) Y ( ) N

(5) Dosimeters exchanged at required frequency [L/C](x) Y ( ) N

D. Internal Dosimetry

(x) N/A

No bioassays were performed since the last inspection. The RSO stated that bioassays would be conducted if an individual was likely to receive > 10% of the dose limits in 10 CFR 20.

(1) Licensee monitors workers [20.1502(b), L/C] ( ) Y ( ) N

(2) Briefly describe licensee's program for monitoring and controlling internal exposures [20.1701-1702, L/C]:

(3) Air sampling performed ( ) Y ( ) N

(4) Monitoring/controlling program implemented ( ) Y ( ) N

(5) Respiratory protection equipment [20.1703, L/C] ( ) Y ( ) N

E. Reports

( ) N/A

(1) Reviewed by \_\_\_\_\_ Frequency \_\_\_\_\_

(2) Inspector reviewed personnel monitoring records for period \_\_\_\_\_ to \_\_\_\_\_

1997 (to 7/31/97) 1996 1995

WB max (mrem)	m	m	m
Extremity max (mrem)	60	70	70

(3) Prior dose determined for individuals likely

- to receive doses [20.2104] NR ☐ Y ☐ N
- (4) Maximum exposures TEDE \_\_\_\_\_ Other \_\_\_\_\_
- (5) Maximum CDEs \_\_\_\_\_ Organs \_\_\_\_\_
- (6) Maximum CEDE \_\_\_\_\_
- (7) Licensee sums internal and external [20.1202] ☐ Y ☒ N
- (8) TEDEs and TODEs within limits [20.1201] ☒ Y ☐ N
- (9) NRC Forms or equivalent [20.2104(d), 2106(c)] NR
- (a) NRC Form 4 ☐ Y ☐ N Complete: ☐ Y ☐ N
- (b) NRC Form 5 ☐ Y ☐ N Complete: ☐ Y ☐ N
- (10) Worker declared her pregnancy in writing during inspection period (review records) NR ☐ N/A ☐ Y ☐ N
- If "yes," licensee in compliance with dose to embryo/fetus [20.1208] ☐ Y ☐ N  
and records maintained [20.2106(e)] ☐ Y ☐ N
- F. Who performed PSEs at this facility (number of people involved and doses received)? [20.1206, 20.2104-2105, 20.2204] ☒ N/A
- G. Records of exposures, surveys, monitoring, and evaluations maintained [20.2102-2103, 20.2106, L/C] ☒ Y ☐ N
- H. Licensee advises each worker annually of worker's dose [19.13(b)] NR ☐ Y ☐ N

Basis for Findings:

10. RADIOACTIVE WASTE MANAGEMENT ☐ N/A
- A. Disposal ☐ N/A

- (1) Decay-in-storage ( ) N/A
- (a) Procedures approved [20.2001(a)(2), L/C] (x) Y ( ) N
- (b) In accordance with [L/C] (x) Y ( ) N
- (c) Labels removed or defaced [20.1904(b)] (x) Y ( ) N

DIS was limited to licensed material with < 90 day half-lives. [REDACTED] liquid waste was analyzed with an LSC to confirm it was indistinguishable from background prior to disposal after DIS. Solid [REDACTED] waste was analyzed with a pancake probe to confirm it was indistinguishable from background prior to disposal after DIS. Ex 2

- (2) Special procedures performed as required [L/C] (x) N/A ( ) Y ( ) N
- (3) Liquid scintillation (LS) media and animal carcasses [20.2005] NR ( ) N/A ( ) Y ( ) N
- (4) Improper/unauthorized disposals [20.2001] ( ) Y (x) N
- (5) Records maintained [20.2103(a), 20.2108, L/C] (x) Y ( ) N

[REDACTED] waste was received from other licensees about twice per year only if: (1) the [REDACTED] originated from DowElanco; (2) it was packed within 25 gallon sealed drums; and (3) a DowElanco AU was present prior to shipment to oversee package preparation and instruct the staff regarding proper packaging, labeling and loading. Ex. 2

#### B. Effluents

( ) N/A

- (1) Release into sanitary sewer [20.2003] NR ( ) N/A ( ) Y ( ) N
- (a) Material is readily soluble or readily dispersible [20.2003(a)(1)] ( ) Y ( ) N
- (b) Monthly average release concentrations do not exceed Appendix B values [20.2003] ( ) Y ( ) N
- (c) No more than 5 Ci of H-3, 1 Ci of C-14, and 1 Ci of all other radionuclides combined released in a year [20.2003] ( ) Y ( ) N
- (d) Procedures to ensure representative sampling and analysis properly implemented [20.1501(a)(2), L/C] ( ) Y ( ) N
- (2) Release to septic tanks [20.2003] NR ( ) N/A ( ) Y ( ) N
- (a) Within unrestricted limits [App B, Table 2] ( ) Y ( ) N
- (3) Waste incinerated ( ) N/A ( ) Y (x) N



- (a) License authorizes [20.2004(a)(3)] ☐ Y ☐ N
- (b) Licensee directly monitors exhaust ☐ Y ☐ N
- (c) Airborne releases evaluated and controlled [20.1501, 20.1701] ☐ Y ☐ N
- (4) Control of effluents and ashes [20.1201, 20.1301, 20.1501, 20.2001, L/C] ☐ N/A  
 {See also IP 87102, RG 8.37}
- (a) Air effluent less than 10 mrem constraint limit [20.1101] ☒ Y ☐ N
- (b) If no licensee reported appropriate information to NRC ☐ Y ☐ N
1. Corrective actions implemented and on schedule ☐ Y ☐ N

The licensee used the EPA's Comply program to demonstrate compliance with the NESHAPS rule on 3/27/96. The calculated dose to the public was 0.9 mrem for 1995. The licensee's program hadn't changed since 1995.

(c) Description of effluent monitoring program (x) N/A

- (i) Monitoring-system hardware equipment adequate ( ) Y ( ) N
- (ii) Equipment calibrated as appropriate ( ) Y ( ) N (x) N/A
- (iii) Air samples/sampling technique (x) N/A  
(charcoal, HEPA, etc.) analyzed with appropriate equipment ( ) Y ( ) N

#### Basis for Findings:

C. Waste Management ( ) N/A

(1) Waste compacted [L/C] NR ( ) Y ( ) N

(2) Storage area(s) ( ) N/A

(a) Protection from elements and fire [L/C] (x.) Y ( ) N

(b) Control of waste maintained [20.1801] (x) Y ( ) N

(c) Containers properly labeled and area properly posted [20.1902, 20.1904] (x) Y ( ) N

(d) Package integrity maintained [L/C] (x) Y ( ) N

- (3) Packaging, Control and Tracking  
[Part 20, App. F.III.] [20.2006(d)]:  
Note: The licensee's waste is likely to be Class A.NR
- (a) Not packaged for disposal in cardboard or fiberboard boxes [61.56(a)] ☐ Y ☐ N
  - (b) Liquid wastes solidified, (i.e., less than 1% freestanding liquid) and void spaces minimized [61.56(a), (b)] ☐ Y ☐ N
  - (c) Does not generate harmful vapors [61.56] ☐ Y ☐ N
  - (d) Structurally stable (will maintain its physical dimensions and form under expected disposal conditions) [61.56(b)] ☐ Y ☐ N
  - (e) Packages properly labeled [App. F.III.A.2] ☐ Y ☐ N
  - (f) Licensee conducts a QC program to ensure compliance with [61.55-56] and includes management evaluation of audits [App. F.III.A.3] ☐ Y ☐ N
  - (g) Shipments not acknowledged within 20 days after transfer are investigated and reported [App. F.III.A.8] ☐ N/A ☐ Y ☐ N
- (4) Transfers to land disposal facilities ☒ N/A

**In accordance with its license, the licensee transferred long-lived radioactive waste to Dow in Midland, MI for incineration.**

- (a) Transferred to person specifically licensed to receive waste [30.41, 20.2001(b)] ☐ Y ☐ N
- (b) Each shipment accompanied by a manifest prepared as specified in Section I of Appendix F [20.2006(b), App. F.III.A.4] ☐ Y ☐ N
- (c) Manifests certified as specified in Section II of Appendix F [20.2006(c)] ☐ Y ☐ N

D. Records of surveys and material accountability are

maintained [20.2103, 2108]

☒ Y ☐ N

Basis for Findings:

11. RECORDKEEPING FOR DECOMMISSIONING NR

The licensee established a 66 dpm/100 square centimeter trigger level for decommissioning of field study sites. However, all field study sites that have been or will be used are within secured, posted, and fenced-in areas. The licensee would not release a field study site to unrestricted use without a license amendment approval.

- A. Records of information important to the safe and effective decommissioning of the facility maintained in an independent and identifiable location until license termination. ☐ Y ☐ N
- B. Records include all required information [30.35(g)] ☐ Y ☐ N
- (1) List of restricted areas [30.35(g)(3)] indicates that laboratories or other rooms have been released since the last inspection ☐ Y ☐ N
- (2) Confirmatory measurements show that each room is within release limits, and licensee records adequately document the basis for releasing each room ☐ Y ☐ N
- C. Copies of the licensee's decommissioning cost estimates and funding methods on file ☐ Y ☐ N
- D. If the licensee uses a parent company guarantee or a self-guarantee as funding method, does the file contain a copy of the financial test performed for the licensee's most recently completed fiscal year? ☐ N/A ☐ Y ☐ N
- E. If "Yes" to D., do the financial test ratios meet the criteria in 10 CFR Part 30, Appendix A, Section II for parent company guarantees and Appendix C, Section II for self guarantees? ☐ Y ☐ N
- F. Date that licensee's financial assurance instrument was submitted to NRC, if applicable: \_\_\_\_\_ ☐ N/A
- G. Date that licensee's decommissioning plan was submitted to NRC, if applicable: \_\_\_\_\_ ☐ N/A
- H. Have radiological conditions at the licensee's facility changed since the financial assurance

mechanism and/or decommissioning plan was submitted due to:

- (1) Incidents or events? ☐ N/A ☐ Y ☐ N
- (2) Unplanned process upsets or changes? ☐ N/A ☐ Y ☐ N
- (3) Unauthorized material, form, or possession limit changes? ☐ N/A ☐ Y ☐ N
- (4) Any other changes? ☐ N/A ☐ Y ☐ N

If "Yes" to any of the above (1)-(4),  
notify regional management.

Basis for Findings (include comments and measurements on any areas the licensee released for unrestricted use):

## 12. COMPLIANCE WITH DECOMMISSIONING TIMELINESS RULE

- A. License to conduct a *principle activity* has expired or been revoked ☐ Y ☒ N
- B. Licensee has made a decision to permanently cease *principal activities*, at the entire site, or any separate buildings, or any outdoor areas, including inactive burial grounds ☐ Y ☒ N
- C. A 24-month duration has passed in which no *principal activities*, have been conducted under the license at the site, or at any separate buildings, or any outdoor areas, including inactive burial grounds ☐ Y ☒ N

The licensee planned to cease field study work at the [REDACTED] location within the next two years. Additionally, the licensee planned to begin field studies at a new location. The inspector discussed the provisions of 10 CFR 30.36 with the RSO. The RSO was aware of the need for prior license amendment approval before beginning field studies at a new location. Ex. 2

- D. If "Yes" to either A or B or C:
  - (1) Identify Site/Bldg/Area: \_\_\_\_\_
  - (2) Date of occurrence of A, B, or C: \_\_\_\_\_

NOTE: If "No" to A and B and C, decommissioning timeliness rule does not apply. If "Yes" to either A or B or C, then complete Attachment B, "Decommissioning

Timeliness Field Notes," for this licensee.

Basis for Findings:

13. TRANSPORTATION (10 CFR 71.5(a) and 49 CFR 170-189) NR ( ) N/A

A. Licensee Transports: [complete sections (1) - (4), as applicable]

(1) Limited Quantities, and/or Instruments and Manufactured Articles: (Radioactive Material, excepted package, [additional info], 7, UN 2910) ( ) N/A

(a) Package meets general design requirements [173.410] ( ) Y ( ) N

(b) Radiation level  $\leq 0.005$  mSv/hr (0.5 mrem/hr) (Exclusive use instruments and articles, 2 mrem/hr) ( ) Y ( ) N

(c) Contamination less than 173.443 limits, QC examination/test performed prior to each shipment [173.475(l)] ( ) Y ( ) N

(d) Limited Quantity Package marked "Radioactive" [173.421(a)(4)] ( ) Y ( ) N

(e) 173.422 certification statement attached/enclosed ("This package conforms to the conditions and limitations specified in...") ( ) Y ( ) N

(2) Type A Quantities (Radioactive Material, nos, 7, UN 2982) ( ) N/A

(a) Packaging:

(i) Packaging is proper for contents (i.e., DOT 7A), is unimpaired, and is prepared correctly [173.475(a)-(f)] ( ) Y ( ) N

(ii) All packages meet general design requirements [173.410] ( ) Y ( ) N

(iii) DOT 7A Package meets additional Type A design requirements [173.412, 178.350] ( ) Y ( ) N

(b) Recordkeeping:

(i) Special Form source records

- [173.476(a)] ☐ Y ☐ N
- (ii) DOT 7A performance/design documentation [173.415(a)] ☐ Y ☐ N
- (c) Hazards communications requirements (consult the "NRC field reference charts" that correspond to elements (I) through (v), below):
- (I) Shipping Papers [172.200-205] ☐ Y ☐ N

Proper {Shipping name (e.g., Radioactive Material, Special Form, N.O.S.), Hazard Class (e.g., Radioactive Material), UN Number (e.g., UN 2974), Quantity, Package Type (i.e., only if it's an NRC or DOE approved package (e.g., Type B)), Nuclide, RQ (RQ if > 10 mCi Am-241, 1 Ci Cs-137, 10 Ci Co-60, 10 Ci Ir-192), Radioactive Material, Physical and chemical form, Activity, Category of label, TI, Shipper's Name, Certification and Signature, Emergency Response Phone Number, "Limited Quantity" (if applicable), "Cargo Aircraft Only" (if applicable)} [172.200-204]

- (ii) Marking Packages [172.300-338]

Properly marked (Shipping Name (e.g., Radioactive Material, Special Form, N.O.S.), UN Number (e.g., UN 2974), Package Type, RQ (e.g., RQ if > 10 mCi Am-241, 1 Ci Cs-137, 10 Ci Co-60, 10 Ci Ir-192) "This End Up" (liquids), Name and Address of consignee) [172.301, 306, 310, 312, 324] ☐ Y ☐ N

- (iii) Labeling Packages [172.400-450] ☐ Y ☐ N
- (iv) Placarding Vehicles [172.500-560] ☐ Y ☐ N
- (v) Emergency Response information and guidance [172.600-604] ☐ Y ☐ N

- (d) Radiation level/Contamination limits [173.441, 173.443]

- (I) Package levels within limits ☐ Y ☐ N
- (ii) QC examination/test performed prior to each shipment [173.475(I)] ☐ Y ☐ N

- (3) Type B Quantities (Radioactive Material, nos. 7, UN 2982) ☐ N/A

- (a) Packaging is proper for contents (i.e., Type B), is unimpaired, and is prepared correctly [173.475(a)-(f)] ☐ Y ☐ N
  - (b) Inspector must complete Section 2 of NRC Inspection Procedure (IP) 86740
  - (c) Sections 2.c. and 2.d., shown in the previous section for Type A Quantities, also apply. Complete those sections.
- (4) LSA Material and SCO (Radioactive Material, LSA, nos, 7, UN 2912) or (Radioactive Material, SCO, nos, 7, UN 2913) ☐ N/A
- (a) If licensee makes significant LSA/SCO shipments, inspector should complete Inspection Requirement 03.02 of Temporary Instruction (TI) 2515/133 (issued 3/15/96)
  - (b) Otherwise, if licensee has a minor LSA/SCO program:
    - (i) Licensee properly characterizing material as LSA/SCO [173.403] ☐ Y ☐ N
    - (ii) All packages meet general design requirements [173.410] ☐ Y ☐ N
    - (iii) Proper LSA/SCO packaging selected and used [173.475, 173.427] ☐ Y ☐ N
    - (iv) Placarding exclusive use vehicles, marking package "Radioactive-LSA" or "Radioactive-SCO," as appropriate [173.427(a)(6)] ☐ Y ☐ N
    - (v) Shipping Papers [172.200-205] (see "NRC field reference chart" for content and exceptions) ☐ Y ☐ N

**B. DOT HAZMAT Employee Training Program [49 CFR 172.700-704]:**

- (1) Each HAZMAT employee receives training and is tested [172.702] ☐ Y ☐ N
- (2) Recurrent training at least every 2 years [172.704(c)(4)] ☐ Y ☐ N
- (3) HAZMAT employee training includes general awareness, function-specific, and safety training [172.704] ☐ Y ☐ N
- (4) HAZMAT employer recordkeeping includes employee name, completion date, description/copy/location of training



materials, name and address of training  
provider, and certification [172.704(d)]

☐ Y ☐ N

C. Carrier Modal Specific Requirements, Highway  
Transportation [49 CFR Part 177]:

☐ N/A

- (1) Driver Training, or CDL w/ HAZMAT endorsement  
[177.800, 177.816] ☐ Y ☐ N
- (2) Incident Reporting to DOT [177.807, see also  
171.15 and 171.16] ☐ Y ☐ N
- (3) Shipping Paper Accessibility (on seat or in  
driver's side door pocket, readily visible) ☐ Y ☐ N
- (4) Placarded Vehicles Routing and Driver Training  
requirements [177.825 and 49 CFR 397 Subpart D  
(i.e., the motor carrier regs)] ☐ Y ☐ N
- (5) Sum of total package TIs on non-exclusive use  
vehicle < 50 [177.842(a)] ☐ Y ☐ N
- (6) Packages blocked/braced for transport  
[177.842(c)] ☐ Y ☐ N

D. Miscellaneous Requirements

- (1) No labeled packages carried in passenger  
compartments [173.448(c)] ☐ Y ☐ N
- (2) Overpack requirements observed, if packages are  
offered in overpack. Overpack marked w/ proper  
shipping name and number, package and overpack  
labeled as needed, marked "inner package  
complies ...." [173.24] ☐ Y ☐ N
- (3) Expanded and changed A1/A2 values from the  
4/1/96 rule changes have been implemented  
[173.435] (verify only once per licensee) ☐ Y ☐ N
- (4) Written instructions included with exclusive  
use shipments [173.403] ☐ Y ☐ N

Basis for Findings:

13. POSTING AND LABELING NR

- A. NRC Form 3 "Notice to Workers" is posted [19.11] ☐ Y ☐ N
- B. Parts 19, 20, 21, Section 206 of Energy  
Reorganization Act, procedures adopted pursuant to  
Part 21, and license documents are posted or a notice  
indicating where documents can be examined is posted  
[19.11, 21.6] ☐ Y ☐ N

- C. Other posting and labeling per 20.1902 and 20.1904, respectively, and the licensee is not exempted by 20.1903 or 20.1905 ( ) Y ( ) N

Basis for Findings:

14. **GENERIC COMMUNICATION OF INFORMATION**

- A. Bulletins, information notices, NMSS Newsletters, etc., received by the licensee (x ) Y ( ) N
- B. Licensee took appropriate action in response to bulletins, generic letters, etc. (x ) Y ( ) N

Basis for Findings:

15. **NOTIFICATION AND REPORTS**

- A. Licensee in compliance with 19.13, 30.50 (reports to individuals, public and occupational, monitored to show compliance with Part 20) ( ) N/A (x ) Y ( ) N

Monitored individuals received an annual letter from the RSO regarding exposure results.

- B. Licensee in compliance with 20.2201, 30.50 (theft or loss) (x ) None ( ) Y ( ) N
- C. Licensee in compliance with 20.2202, 30.50 (incidents) (x ) None ( ) Y ( ) N
- D. Licensee in compliance with 20.2203, 30.50 (overexposures and high radiation levels) (x ) None ( ) Y ( ) N
- E. Licensee aware of NRC Ops Center phone number [(301)-816-5100] (x ) Y ( ) N
- F. Licensee in compliance with [20.2203] (constraint on air emissions) ( ) None (x ) Y ( ) N

Basis for Findings:

16. **SPECIAL LICENSE CONDITIONS OR ISSUES** (x )  
N/A

- A. Special license conditions or issues to be reviewed:

B. Evaluation:

17. OBSERVATIONS/DEMONSTRATIONS OF LICENSED ACTIVITIES

*Briefly describe the activities and procedures observed and/or demonstrated during the inspection. For example, if you observed licensee personnel working in radiation areas using licensed material or performing functions associated with radiation safety such as receiving or transporting licensed material; conducting or receiving training; disposing of radioactive waste; conducting surveys; or making measurements, then describe what you saw. If the licensee demonstrated any practices at your request, describe those demonstrations. The observations and demonstrations you describe here, and elsewhere in the "Basis for Findings" sections of this report, along with measurements and some records review, should substantiate your inspection findings.*

Describe what activities or procedures were observed and/or demonstrated by the licensee during the inspection:

The inspector interviewed several AUs and PIs and had them demonstrate how:

- licensed material was used;
- surveys were performed;
- radioactive waste was disposed;
- licensed material was received and controlled; and
- spills were handled.

The inspector observed the RSO perform an internal audit of Owens-Merlo's Lab 262.

*The following sections should be completed in a narrative format by the inspector to briefly describe the measurements performed by the inspector, inspection findings, and any post-inspection communications with regional staff.*

18. NRC INSPECTOR'S MEASUREMENTS

( ) N/A

A.	<u>Survey instrument</u>	<u>Serial No.</u>	<u>Date of calibration</u>
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Ludlum MN 3	84921	2/20/97
Alnor MN 9850	5145	2/18/97

B. Inspector performed CONFIRMATORY measurements (x) Y ( ) N

C	Inspector performed INDEPENDENT measurements	(x)	Y	( )	N
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D. Briefly describe the types of measurements performed (i.e., exposure rates, wipe tests, soil samples, air flow measurements, etc.), locations where measurements were taken, the results of these measurements (mR/hr, dpm, etc.), and whether inspector's results conflicted with the licensee's measurements. If independent measurements were not made, justify why they were not performed on this inspection:

The inspector performed ambient dose rate surveys of selected surfaces in the following areas and obtained the following maximum results (< 50 cpm bkg):

**Location** .

### Result

bkg  
bkg  
bkg  
bkg

Ex2      Ex. 2

The inspector performed a face velocity measurement of the hood in result was 150 fpm.

# The Ex 2

## 19. CONTINUATION OF REPORT ITEMS

(x) N/A

**20. VIOLATIONS, NON-CITED VIOLATIONS (NCVs), AND OTHER ISSUES**

(x)

N/A

**NOTE:** Briefly state (1) the requirement and (2) how and when the licensee violated the requirement. For non-cited violations (NCVs), indicate why the violation was not cited. Attach copies of all licensee documents needed to support the violation.

## 21. DEBRIEF WITH REGIONAL STAFF

A. Was inspection feedback provided to regional licensing staff?

(x) Y ( ) N

If "Yes," name of individual on the licensing staff: Patty Pelke

If "Yes," describe issues discussed:

**Prior to the inspection, the inspector discussed the status of a notification of change of ownership with Patty Pelke.**

**After the inspection, the inspector briefed Patty Pelke regarding the inspection findings.**

- B. Briefly describe post-inspection communications with other regional staff (inspector's supervisor, Agreement State officer, State liaison officer, etc.):

See above

**22. PERFORMANCE EVALUATION FACTORS (PEFs)**

- |    |   |   |
|----|---|---|
| A. | Lack of senior management involvement with the radiation safety program and/or Radiation Safety Officer (RSO) oversight | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N                              |
| B. | RSO too busy with other assignments   | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N                              |
| C. | Insufficient staffing   | <input type="checkbox"/> Y <input checked="" type="checkbox"/> N                              |
| D. | Radiation Safety Committee fails to meet or functions inadequately  | <input type="checkbox"/> N/A <input type="checkbox"/> Y <input checked="" type="checkbox"/> N |
| E. | Inadequate consulting services or inadequate audits conducted   | <input type="checkbox"/> N/A <input type="checkbox"/> Y <input checked="" type="checkbox"/> N |

Remarks (consider the above assessment and/or other pertinent PEFs with regard to the licensee's oversight of the radiation safety program):

Regional follow-up on above PEFs citations:

END