

MATERIALS LICENSE
SUPPLEMENTARY SHEET
OFFICIAL RECORD COPY

License Number

20-28706-01

Docket or Reference Number

030-32581

Amendment No. 04

Osteo Arthritis Sciences, Inc.
One Kendall Square, Building 200
Cambridge, Massachusetts 02139

In accordance with letter dated March 8, 1996, License Number 20-28706-01 is hereby terminated.



For the U.S. Nuclear Regulatory Commission

Original Signed By:

C. Thor Oberg

Date OCT 23 1996

By

Nuclear Materials Safety Branch
Region I
King of Prussia, Pennsylvania 19406

6/1

9611050096 961023
PDR ADOCK 03032581
C PDR

ML 10

OCT 23 1996

John D. Sakelaris
Former Radiation Safety Officer
Osteo Arthritis Sciences, Inc
1445 Quaker Street
Northbridge, MA 01534

Dear Mr. Sakelaris:

Please find enclosed Amendment No. 04 terminating License No. 20-28706-01 as requested by your letter dated March 8, 1996. The facilities at One Kendall Square, Building 200, Cambridge, Massachusetts, may be released for unrestricted use.

Your cooperation with us is appreciated.

Sincerely,

Original Signed By:
C. Thor Oberg

C. Thor Oberg
Division of Nuclear Materials Safety

License No. 20-28706-01
Docket No. 030-32581
Control No. 122995

Enclosure:
Amendment No. 04

DOCUMENT NAME: R:\WPS\MLTR\L2028706.01

To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

OFFICE	DNMS/RI	<input checked="" type="checkbox"/> N	DNMS/RI	<input checked="" type="checkbox"/> N			
NAME	COberg/cto		JKinneman				
DATE	10/11/96		10/12/96		10/ /96		10/ /96

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ML 10



THE ATHENAEUM GROUP

Athenaeum House
215 First Street
Cambridge, Massachusetts 02142-1268
617-492-2155
Fax 617-492-3729

20-28706-01

October 21, 1996

VIA FAX
610-337-5393

C. Thor Oberg
Health Physicist
United States Nuclear
Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406

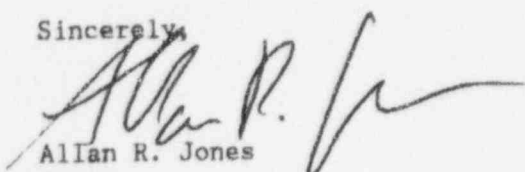
RE: OSTEOARTHRITIS SCIENCES - ONE KENDALL SQUARE, CAMBRIDGE, MA

Dear Mr. Oberg:

Confirming our conversation earlier today, I am writing to let you know that we did destroy the "radioactive materials" sign in the above-referenced laboratory as instructed by you.

Please contact me with any further questions. Thank you.

Sincerely,



Allan R. Jones
Partner

ARJ:emg

cc: Conrad C. Fagone

OFFICIAL RECORD COPY

ML 10

122995
OCT 21 1996

FAX REC'D

MS16
Q-1

USNRC Region 1
Division of Nuclear Materials Safety
475 Allendale Rd.
King of Prussia Pa. 19406-1415

License no. 20 28706 01
Control no. 122995
Docket no. 030 32581
17 Jul 1996

Dear Mr. Thor Oberg,

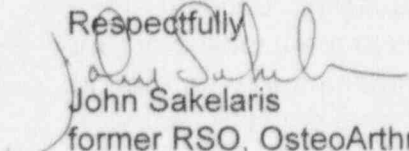
This is to confirm the several statements made in our recent telephone conversation regarding the release procedures used and the disposition of certain laboratory equipment at OsteoArthritis Sciences Inc.

The Radiation Safety group led by the RSO surveyed all equipment that could have been used with radionuclides which included all freezer and refrigeration equipment, all centrifugation equipment, all incubator equipment, all waterbath equipment, all photo developing equipment.

The Radiation Safety group led by the RSO surveyed all equipment that was specifically designed for use with the radionuclide program which included the scintillation counter and accessories, The biological safety cabinet, certain liquid transferring equipment, a DNA thermo cycler and photo film exposure cassettes. Each apparatus was surveyed according to the methods approved in the materials program for the assessment of surface removable contamination or non removable contamination. Meter readings by the calibrated type 3 survey meter using pancake style and NaI probes were all below the threshold limit of 0.05mr/hr and all wipe test results were below 100 dpm/100cm². I concluded from the survey data that all the laboratory apparatus was free of contamination and approved for release. The released apparatus was liquidated through several similar type research laboratories and equipment wholesalers. The primary recipient for the equipment was COMDISCO located in Canton Ma., Pangea Pharmaceuticals Inc. of Cambridge Ma., Leukocyte of Cambridge Ma. and Exelixis Pharmaceuticals of Cambridge Ma. I am not aware of any detailed records that specifically delineates which released item was purchased by which organization as the apparatus was sold in group lots to the highest bidders.

All calibrating sources and waste handling material were placed in radioactive waste containers and transferred to ADCO services for disposal in the Barnwell SC waste storage facility. It was my belief that the closure of the facility, and the survey and release of equipment was conducted in a prudent manner and with out risk to those who took possession of the assets.

Respectfully


John Sakelaris

former RSO, OsteoArthritis Sciences Inc.

/122995

OFFICIAL RECORD COPY

ML 10

JUL 31 1996

TELEPHONE CONVERSATION RECORD

LICENSE ***: Osteo Arthritis Sciences, Inc.

DOC-NAME: P:\TELOSTEO.CTO

* DEFICIENCY * : YES (X)
NO ()

LICENSE NO. 20-28706-01
DOCKET NO. 030-32581
MAIL CONTROL NO. 122995

** LER ** : YES ()
NO (X)

INCOMING (X) (Returning RI Call)
OUTGOING ()

TIME: 11:40 am
DATE: 7/11/96

CALLER: John D. Sakelaris

ORGANIZATION & INDIVIDUAL: No longer w/ Osteo Arth., Liensee S.D. & Closed

TELEPHONE NO.: Available @ 508-234-6933

SUBJECT: Amendment to terminate lic.

SUMMARY:

- A. Counting sheet ID as Protocol #10, Pages #1 - #4
1. Columns CPMB & CPMC; CPMA is for H-3, what rad. nucl. (C14, S-35, P-32, I-125) are included in the other 2 columns?
All others; basically data is to show that activity levels are well below Reg limits.
 2. From your response to Item 5 of Def. Ltr. I presume that all samples in the counting table are from floor wipes.
Yes, this is true as can be seen in the sketches of the labs.
- B. Counting Sheet ID as 6/Mar/96 wipe test survey data, page 1
1. These sample # are the same as those on page #4 of the Protoco; #10 sheets but the Locations are different.
The results are from the same counting instrument & the no. system is the same. Samples are the same as ID in the Location.
 2. This sheet shows 4 columns of data and is in dpm, why not as in Protocol #10 data sheets?
Again this is what we get from MIT where our wipes are counted, evaluated, and tabulated. Also, this shows wipe samples from surfaces other than the gridded floor area of other Protocol #10 data such as table tops, refrig, centrifuges, etc.
 3. What about equipment that was in the lab & used w/ lic. mtl's., what is the status of these. Were the wipe samples taken & counted & data retained?
Wipe samples were taken and w/ exception of a spot on the beta counter table, no contamination was found. This contam. was cleaned and I took it upon myself to sell all of the equipment, including the beta counter and 4 survey instruments, because they were not contaminated. Didn't keep the survey data and don't have a list of purchasers.

Please send a letter to me describing what you did as you discussed

OFFICIAL RECORD COPY

ML 10

(above). Include to the best of your knowledge any items, the survey results, and to whom they were sold. It's possible something could be contaminated & neither you or the purchaser are aware of it. If they find the contamination, they may come back at you. Did any of the instruments contain internal calibration or check sources?

No, not to my knowledge, we only had the beta counter and the survey instruments.

Please send us the information you have.

You will have it by next week.

ACTION REQUIRED: Await info requested

NAME, SIGNATURE and DATE: C. T. Oberg 07/11/96



ACTION TAKEN:

NAME, SIGNATURE and DATE: _____

MS-16
Q1

License No. 20-28706-01
Docket No. 030-32581
Control No. 122995

June 11, 1996

Mr. C. Thor Oberg
USNRC Region 1
Div. of Nuclear Materials Safety
475 Allendale Road
King of Prussia, Pa. 19406-1415

Dear Mr. Oberg:

This is in response to the deficiency letter dated May 12, 1996. The following information is provided to clarify the questions raised:

1. All surface areas were surveyed for removable and non removable contamination by properly functioning and calibrated survey equipment. The dose rate measured at all sample points were below 0.05 mr/hr as determined by a type 3 Ludlum survey meter. The count rate determined at all sample points were equal to or below background as measures by a Canberra model 2500TR Liquid Scintillation counter. All survey results indicated the facility met the release criteria for unrestricted use.

We inadvertently submitted liquid scintillation survey raw data resulting in CPM/100 cm² with background NOT subtracted via instrument protocol number 10 for wipe tests. The LSC instrument protocol 10 is programmed to flag any data that exceeds 100 dpm/100cm². No data exceeded this level. The background count rate and counting efficiencies determined by LSC for the licensed radionuclides are as follows.

	% efficiency	background (counts)
3H	40	18
14C	60	20
32P	70	14
125I	65	37

A re-examination of the data submitted should confirm that all wipe tests indicate the areas as being free of loose contamination.

The survey instrument used to perform the area survey was a Ludlum Model 3 with a GM pancake probe model 44-9 calibrated on 11/21/95. I am unfamiliar with the limit of instrument sensitivity however I have enclosed the calibration certificate and minimum detectable calculations as provided by the manufacturer for your review.

License No. 20-28706-01
Docket No. 030-32581
Control No. 122995

2. The executed NRC Form 314 is enclosed.
3. We were unclear in our original statements. All radionuclides at the facility were packaged as waste in appropriate containers and transferred to the Licensed waste hauler ADCO Services Inc. ADCO Services transported all the waste materials to the radioactive waste facility located at Barnwell, SC under a permit obtained by OsteoArthritis Sciences Inc. No waste is in storage at any other location.
4. The following approximate amounts of radionuclides were routinely used during the previous 6 months.

Room No.	Radionuclide	Amount Used Per Month
26	32P	10 Mci.
50	32P	10 Mci.
68	32P	2 Uci.
	3H	10 Uci

5. The tabulation of results did relate to specific wipe test points within the rooms indicated. You will note the room/ area maps contain shaded areas not found on the tabulation nor apparently correlating to the large scale facility floor plan. The room / area map was one of several guides we employed to re visit a contaminated spot if so detected. The shaded areas represented the location of equipment or laboratory furniture that existed at the time of the survey. The borders of the room/area map are at approximate scale and together represent the total area of the facility surveyed. The survey data relating to those equipment and furniture was not included with the submission but reflected levels at or below the release criteria. The rooms surveyed were the rooms indicated on the materials license and additional adjacent rooms to insure a comprehensive survey. The data does reflect a 100 cm² test point at one square meter intervals. A one square inch filter disk was used to conduct the wipe test survey in accordance with the established methods described in the program radiation safety manual.

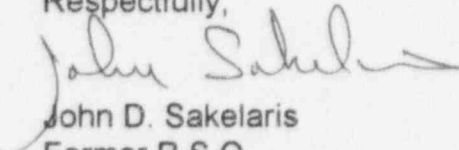
License No. 20-28706-01
Docket No. 030-32581
Control No. 122995

6. The question relating to our reference to the survey protocol has been addressed in section 1. To further describe the protocol, it was routinely used to analyze test results of a mixture of radionuclides. This protocol sets up detection regions with upper and lower boundaries listed a keV to allow the detection, identification and quantification of each of the licensed radionuclides. Region A has an upper limit of 12 keV and a lower limit of 0 keV. Thus all counts due to 3H would be contained in this region only, and listed as CPMA. protocol 10 does not automatically subtract background from each sample. Wipe test results in dpm/100 cm2 were determined by the following formula for each licensed radionuclide.

$$\frac{\text{CPM (sample)} - \text{CPM (background)}}{\text{instrument efficiency}}$$

We trust this addresses sufficiently the questions raised and will now allow for the termination of the materials license.

Respectfully,


John D. Sakelaris
Former R.S.O.
OsteoArthritis Sciences Inc.

Copy to:

T. Sharpe
J. Littlechild

Donald L. Haes, Jr., MS, CHP

Consulting Health Physicist

(617) 258-5640

CALIBRATION CERTIFICATECustomer: Osteo Arthritis SciencesAddress: One Kendall Square, B-200Cambridge, MA 02139Manufacturer: LUDLUMModel: 3S/N: 92667
(OAs #1)

Detector: GM end window: _____

Model: _____

S/N: _____

GM cylindrical: _____

Model: _____

S/N: _____

GM pancake: ✓Model: 44-9S/N: 088364

Ion Chamber: _____

Model: _____

S/N: _____

NaI (TI): _____

Model: _____

S/N: _____

Calibration Source: ²²⁶RaActivity: 20 μ CiCalibration Date: 4/15/86N.B.S. Traceable #: 119453-2Accuracy: + 1.0%

Calibration:

Battery check: OKCheck source reading: N/AScale: N/A

Scale	True Exposure Rate (calculated) mr/hr	Measured Exposure Rate	Scale Maximum
<u>X100</u>	<u>40</u>	<u>40</u>	<u>200 mr/hr</u>
<u>X100</u>	<u>20</u>	<u>20</u>	<u>200 "</u>
<u>X10</u>	<u>20</u>	<u>20</u>	<u>20 "</u>
<u>X10</u>	<u>10</u>	<u>10</u>	<u>20 "</u>
<u>X10</u>	<u>5</u>	<u>5.0</u>	<u>20 "</u>
<u>X1</u>	<u>2</u>	<u>1.9</u>	<u>2 "</u>
<u>X1</u>	<u>1</u>	<u>1.1</u>	<u>2 "</u>
<u>X0.1</u>	<u>0.15</u>	<u>0.14</u>	<u>0.2 "</u>

Comments: _____

This instrument has been calibrated under U.S.N.R.C. license # 20-13302-01.

Calibration frequency: 6 monthsCalibrated by: [Signature]Date: 11/21/95MIT Building 20C-207
77 Massachusetts Avenue
Cambridge MA 02139

(6-95)

10 CFR 30.36(c)(1)(iv)

10 CFR 40.42(c)(1)(iv)

10 CFR 70.38(c)(1)(iv)

CERTIFICATE OF DISPOSITION OF MATERIALS

INSTRUCTIONS: ALL ITEMS MUST BE COMPLETED -- PRINT OR TYPE
SEND THE COMPLETED CERTIFICATE TO THE NRC OFFICE SPECIFIED ON THE REVERSE

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 30 MINUTES. THIS SUBMITTAL IS USED BY NRC AS PART OF THE BASIS FOR ITS DETERMINATION THAT THE FACILITY HAS BEEN CLEARED OF RADIOACTIVE MATERIAL BEFORE THE FACILITY IS RELEASED FOR UNRESTRICTED USE. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0028), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503. AN AGENCY MAY NOT CONDUCT OR SPONSOR, AND A PERSON IS NOT REQUIRED TO RESPOND TO, A COLLECTION OF INFORMATION UNLESS IT DISPLAYS A CURRENTLY VALID OMB CONTROL NUMBER.

LICENSEE NAME AND ADDRESS

OSTEOARTHRITIS SCIENCES INC.
BLD 200, ONE KENDALL SQ.
CAMBRIDGE, MA. 02139

LICENSE NUMBER

20-28706-01

LICENSE EXPIRATION DATE

APRIL 30 1997

A. MATERIALS DATA (Check one and complete as necessary)

THE LICENSEE OR ANY INDIVIDUAL EXECUTING THIS CERTIFICATE ON BEHALF OF THE LICENSEE CERTIFIES THAT:
(Check and/or complete the appropriate item(s) below.)

- ☐ 1. NO MATERIALS HAVE EVER BEEN PROCURED OR POSSESSED BY THE LICENSEE UNDER THIS LICENSE.
OR
☒ 2. ALL ACTIVITIES AUTHORIZED BY THE LICENSE HAVE CEASED AND ALL MATERIALS PROCURED AND/OR POSSESSED BY THE LICENSE NUMBER CITED ABOVE HAVE BEEN DISPOSED OF IN THE FOLLOWING MANNER. (If additional space is needed, use the reverse side or provide attachments.) ATTACHED

Describe specific material transfer actions and, if there were radioactive wastes generated in terminating this license, the disposal actions including the disposition of low-level radioactive waste, mixed waste, Greater-than-Class-C waste, and sealed sources, if applicable.

For transfers, specify the date of the transfer, the name of the license recipient, and the recipient's NRC license number or Agreement State name and license number.

If materials were disposed of directly by the licensee rather than transferred to another licensee, licensed disposal site or waste contractor, describe the specific disposal procedures (e.g., decay in storage)

B. OTHER DATA

- ☒ 1. OUR LICENSE HAS NOT YET EXPIRED; PLEASE TERMINATE IT.
2. A RADIATION SURVEY WAS CONDUCTED BY THE LICENSEE TO CONFIRM THE ABSENCE OF LICENSED RADIOACTIVE MATERIALS AND TO DETERMINE WHETHER ANY CONTAMINATION REMAINS ON THE PREMISES COVERED BY THE LICENSE. (Check one)
- ☐ NO (Attach explanation)
- ☒ YES, THE RESULTS (Check one)
- ☐ ARE ATTACHED, or
- ☒ WERE FORWARDED TO NRC ON (Date) MARCH 8, 1996

3. THE PERSON TO BE CONTACTED REGARDING THE INFORMATION PROVIDED ON THIS FORM

NAME

JOHN SAKELARIS

TELEPHONE NUMBER
(Include Area Code)

508 234 6933

4. MAIL ALL FUTURE CORRESPONDENCE REGARDING THIS LICENSE TO

1495 QUAKER ST
NORTHBRIDGE MA. 01534

CERTIFYING OFFICIAL

I CERTIFY UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT

PRINTED NAME AND TITLE

JOHN SAKELARIS

SIGNATURE

John Sakelaris

DATE

JUN 12, 1996

WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECTS. 18 U.S.C. SECTION 1001 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 JURISDICTIONS.

122995

Donald L. Haes, Jr., MS, CHP
Consulting Health Physicist
(617) 258-5640

TeleFAX : (617)258-6831

FACSIMILE COVER PAGE

Total number of pages = 16, including this one.

To: John Sakelaris
Subject: OAS Close-out Survey
Date: May 30, 1996

COMMENTS: Following, you will find copies of the calibration certificates for the instruments you may have used for your survey, along with the manufacturer specifications of MDA, etc.

In addition, I have copies of the 205 wipe test results you asked me to count for you. My records indicate that you did not want assistance for the close-out, with the exception of providing the "raw data" for the wipe tests. The data is indeed in CPM, requiring a conversion to DPM by subtracting background and dividing by the efficiency for each radionuclide (ie, widow amount). The backgrounds and efficiencies are provided in the format I used for your monthly survey forms (also following). Please note that ALL samples were below the release criteria specified by NRC (NRC Guidelines also attached).

The samples were counted on a Canberra model 2500TR Liquid Scintillation Analyzer. The "Critical Level" (L_c : the net sample counting rate with probability α being exceeded when sample activity = 0) can be approximated as follows:

$$L_c = 2.32 \times \sigma_B = 2.32 \times [R_B/T_B]; \text{ for } \alpha = 0.05, \text{ and } T_B = T_{S+B}$$

Thus, $L_c = 12$ DPM for H-3; 4 DPM for C-14/S-35; 6 DPM for P-32, and 11 DPM for I-125.

I'm sorry if there was any confusion as to the definition of "raw data".

Best regards,



MIT Building 20C-207
77 Massachusetts Avenue
Cambridge, MA 02139

05 Mar 96 13:57

Protocol #:10

3H/14C/35S/32P

Page #1

User :

Time: 2.00

Data Mode: CPM

Nuclide: MANUAL

Background Subtract: None

	LL	UL	LCR	2SZ	BKG
Region A:	0.0 - 12.0		0	0.0	0.00
Region B:	12.0 - 110		0	0.0	0.00
Region C:	120 - 900		0	0.0	0.00

Quench Indicator: S15

S#	TIME	CPMA	CPMB	CPMC
1	2.00	12.50	11.00	11.50
2	2.00	19.50	15.50	4.00
3	2.00	12.00	14.50	7.00
4	2.00	14.00	7.00	4.00
5	2.00	13.00	10.50	5.50
6	2.00	11.00	11.00	8.50
7	2.00	8.00	8.50	6.00
8	2.00	13.50	10.50	2.50
9	2.00	17.00	12.50	4.00
10	2.00	12.00	12.00	5.50
11	2.00	13.00	11.50	5.50
12	2.00	10.00	12.50	9.50
13	2.00	12.50	7.50	5.50
14	2.00	8.50	9.50	5.50
15	2.00	10.50	12.50	5.50
16	2.00	14.50	8.50	9.00
17	2.00	9.00	14.00	5.50
18	2.00	12.00	13.00	4.50
19	2.00	13.00	11.00	2.00
20	2.00	11.00	6.50	7.50
21	2.00	13.00	10.50	8.00
22	2.00	6.00	13.00	3.00
23	2.00	12.00	13.50	8.00
24	2.00	13.50	17.00	5.50
25	2.00	17.50	6.00	4.00
26	2.00	15.00	10.00	4.50
27	2.00	11.50	11.00	6.00
28	2.00	8.50	8.50	7.50
29	2.00	10.50	10.50	4.50
30	2.00	9.00	10.00	7.00
31	2.00	11.00	10.00	4.00
32	2.00	11.50	11.00	4.50
33	2.00	11.50	10.50	5.00
34	2.00	11.00	13.50	7.00
35	2.00	11.00	13.00	2.50
36	2.00	9.00	15.00	6.50
37	2.00	15.50	7.00	10.00
38	2.00	7.50	11.00	4.00
39	2.00	13.00	9.50	7.50
40	2.00	10.50	7.00	5.50
41	2.00	11.00	12.50	3.50
42	2.00	12.50	12.50	8.00
43	2.00	15.00	14.00	6.50
44	2.00	12.50	12.50	8.00

122995

05 Mar 96 15:38

Protocol #:10

3H/14C/35S/32P

Page #2

User :

SN	TIME	CPMA	CPMB	CPMC
45	2.00	8.50	15.00	4.50
46	2.00	12.00	12.50	5.50
47	2.00	8.00	10.50	7.00
48	2.00	10.50	15.50	5.00
49	2.00	12.50	11.00	5.00
50	2.00	12.00	9.50	9.00
51	2.00	10.50	11.00	4.50
52	2.00	11.00	12.50	7.00
53	2.00	9.50	12.50	5.00
54	2.00	10.50	10.50	4.00
55	2.00	8.50	9.00	8.00
56	2.00	15.00	14.00	4.50
57	2.00	12.50	11.00	7.50
58	2.00	8.50	11.00	6.50
59	2.00	11.50	11.00	4.00
60	2.00	9.00	9.50	5.00
61	2.00	9.50	11.50	10.50
62	2.00	12.00	15.00	4.00
63	2.00	9.00	11.00	8.50
64	2.00	11.00	12.00	6.00
65	2.00	7.50	11.00	5.00
66	2.00	12.50	12.00	6.00
67	2.00	13.00	11.00	3.50
68	2.00	13.00	8.50	5.50
69	2.00	12.50	12.50	5.50
70	2.00	8.50	11.00	4.50
71	2.00	14.50	12.00	6.50
72	2.00	10.50	14.50	4.00
73	2.00	8.50	12.00	8.50
74	2.00	10.00	9.50	4.50
75	2.00	14.50	9.50	6.50
76	2.00	13.50	10.50	4.50
77	2.00	9.50	13.00	8.00
78	2.00	12.50	11.50	5.00
79	2.00	13.50	9.00	3.00
80	2.00	11.00	10.50	6.00
81	2.00	7.50	12.50	5.00
82	2.00	12.00	10.50	8.00
83	2.00	8.00	12.00	8.00
84	2.00	9.00	10.50	8.50
85	2.00	14.50	12.00	4.50
86	2.00	11.50	11.00	4.50
87	2.00	12.50	14.00	7.00
88	2.00	8.50	12.50	6.00
89	2.00	12.50	15.00	7.00
90	2.00	10.00	15.50	5.50
91	2.00	10.00	8.50	9.00
92	2.00	9.50	9.00	3.50
93	2.00	12.00	14.00	3.50
94	2.00	8.50	11.50	8.00
95	2.00	7.50	8.50	8.00
96	2.00	9.50	11.50	5.00
97	2.00	14.50	11.00	8.50
98	2.00	10.50	10.00	6.50
99	2.00	10.00	13.50	7.50
100	2.00	11.50	10.00	6.50

05 Mar 96 17:47

Protocol #:10

3H/14C/35S/32P

Page #3

User :

S#	TIME	CPMA	CPMB	CPMC
101	2.00	10.00	11.00	7.00
102	2.00	7.00	11.00	6.50
103	2.00	9.50	8.00	6.00
104	2.00	10.50	13.00	5.50
105	2.00	8.50	15.50	5.50
106	2.00	7.50	8.50	7.50
107	2.00	8.50	8.00	4.50
108	2.00	8.50	12.00	4.50
109	2.00	10.50	10.00	7.00
110	2.00	11.50	14.00	7.50
111	2.00	8.00	8.50	7.00
112	2.00	9.00	10.00	9.50
113	2.00	9.50	11.50	7.00
114	2.00	10.50	11.00	5.50
115	2.00	8.00	10.50	6.00
116	2.00	10.50	10.50	6.50
117	2.00	9.50	13.00	4.00
118	2.00	9.50	16.50	4.50
119	2.00	12.00	15.50	7.50
120	2.00	12.50	8.50	7.50
121	2.00	8.50	10.50	4.00
122	2.00	9.00	9.00	7.00
123	2.00	13.00	12.50	8.50
124	2.00	13.00	8.50	7.50
125	2.00	12.00	10.50	7.50
126	2.00	14.50	8.50	7.00
127	2.00	8.50	12.00	8.50
128	2.00	14.00	12.50	8.50
129	2.00	9.50	10.50	7.00
130	2.00	7.50	10.50	7.00
131	2.00	6.50	12.50	5.50
132	2.00	9.50	13.00	7.00
133	2.00	9.00	9.50	5.00
134	2.00	10.50	9.50	7.50
135	2.00	8.50	8.00	7.50
136	2.00	5.50	7.50	4.00
137	2.00	11.50	13.50	6.50
138	2.00	10.50	9.00	5.50
139	2.00	8.50	12.50	5.00
140	2.00	13.00	11.50	4.50
141	2.00	10.00	10.50	9.00
142	2.00	9.50	10.50	5.00
143	2.00	14.50	12.00	8.00
144	2.00	9.50	8.00	9.00
145	2.00	10.50	6.50	6.00
146	2.00	9.00	12.50	5.00
147	2.00	9.00	13.00	5.00
148	2.00	8.50	7.00	8.00
149	2.00	9.00	12.00	7.50
150	2.00	10.00	12.50	4.00
151	2.00	13.00	12.50	5.00
152	2.00	8.00	8.00	5.50
153	2.00	9.00	15.00	2.00
154	2.00	7.00	11.00	8.00
155	2.00	10.50	12.50	5.00
156	2.00	14.00	14.50	4.00

05 Mar 96 19:56

Protocol #:10

3H/14C/35S/32P

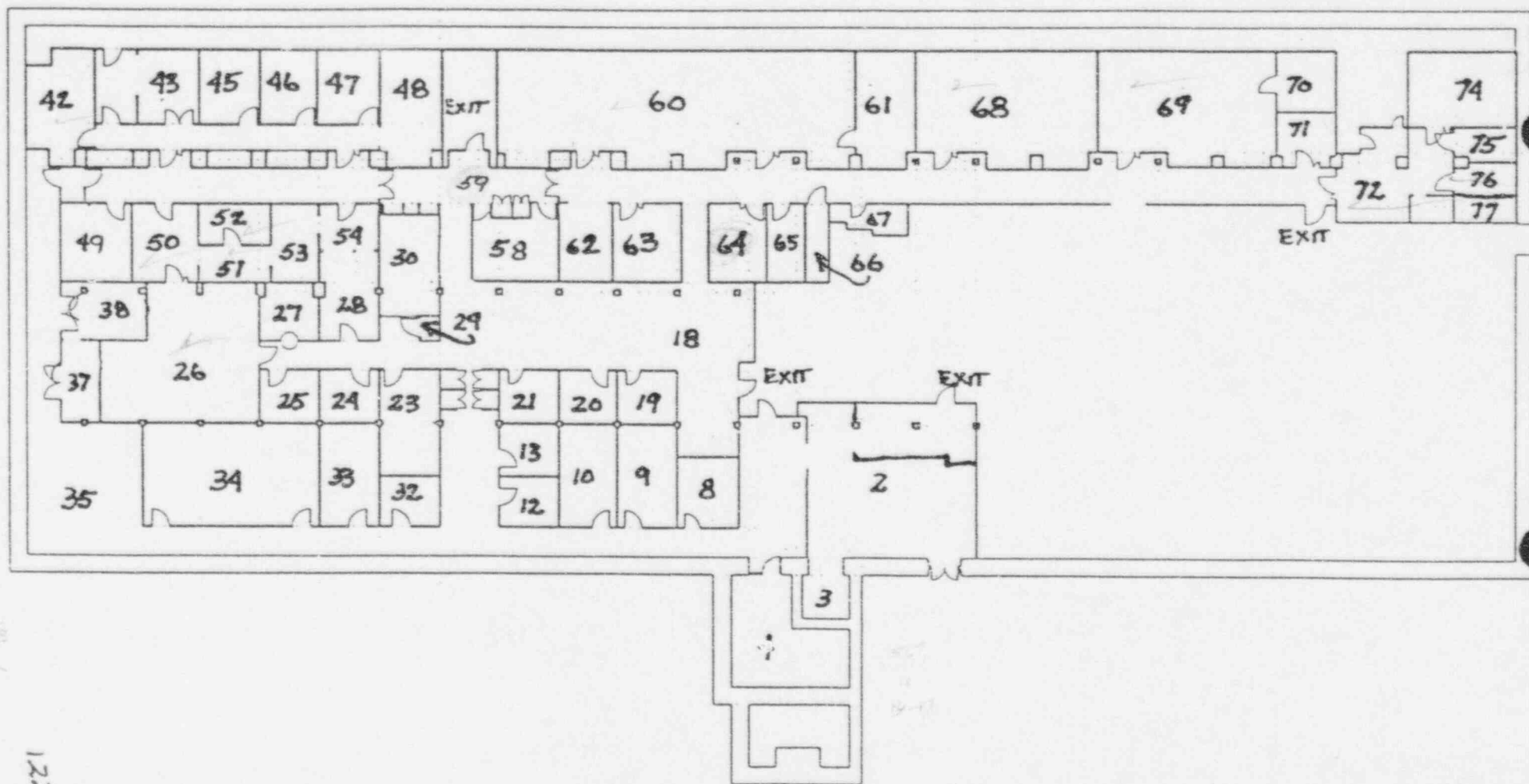
Page #4

User :

S#	TIME	CPMA	CPMB	CPMC
157	2.00	10.00	12.00	7.00
158	2.00	10.00	9.50	6.50
159	2.00	5.50	15.00	7.50
160	2.00	16.00	11.00	4.00
161	2.00	11.50	12.00	6.50
162	2.00	13.50	10.50	7.50
163	2.00	12.50	10.50	3.00
164	2.00	12.00	12.00	5.50
165	2.00	7.50	6.50	6.00
166	2.00	8.50	12.50	4.50
167	2.00	12.50	10.00	6.50
168	2.00	3.00	11.50	2.00
169	2.00	11.00	11.00	7.50
170	2.00	7.50	10.00	10.00
171	2.00	12.50	10.00	9.00
172	2.00	11.00	15.50	8.50
173	2.00	10.50	13.50	4.00
174	2.00	10.00	13.50	10.00
175	2.00	10.00	15.50	7.00
176	2.00	13.00	10.50	6.50
177	2.00	6.50	15.50	4.50
178	2.00	10.50	9.50	5.50
179	2.00	10.50	13.00	5.00
180	2.00	9.00	11.50	5.00
181	2.00	12.50	10.00	11.50
182	2.00	6.50	12.00	10.00
183	2.00	10.50	10.50	7.50
184	2.00	7.50	9.00	5.00
185	2.00	16.00	14.50	7.50
186	2.00	10.00	15.50	6.50
187	2.00	7.50	7.00	10.50
188	2.00	10.50	9.50	8.00
189	2.00	8.00	11.50	5.50
190	2.00	10.50	11.50	5.50
191	2.00	8.00	13.00	5.50
192	2.00	7.00	16.00	10.00
193	2.00	9.00	13.50	7.00
194	2.00	10.50	14.00	7.00
195	2.00	9.50	14.00	5.50
196	2.00	10.50	13.50	5.50
197	2.00	9.00	17.50	6.50
198	2.00	6.50	12.00	7.00
199	2.00	13.50	10.50	7.00
200	2.00	8.50	8.50	6.00
201	2.00	15.00	9.00	5.00
202	2.00	10.50	12.00	4.00
203	2.00	9.50	11.00	6.50
204	2.00	14.50	8.00	5.00
205	2.00	9.00	9.00	3.00

OSTEOARTHRITIS SCIENCES, INC.

BUILDING 200, ONE KENDALL SQUARE, CAMBRIDGE, MA



122995

06-Mar-96

Wipe Test Survey Results Building _____ Date ____/____/____

page 1

* % Efficiency Background (Counts)

3H	40	18
14C	60	20
32P	70	14
125I	65	37

Template Name = OASH

Probable Error (1=SD, 2=90%, 3=95%, 4=99%) = 3

DPM Screening Level = 200

SMP NO.	3H COUNTS	3H NETDPM+-ERROR	14C COUNTS	14C NETDPM+-ERROR	32P COUNTS	32P NETDPM+-ERROR	125I COUNTS	125I NETDPM+-ERROR	FLAG	LOCATION
168	11	-9 +- 13	22	2 +- 11	18	3 +- 8	25	-9 +- 12		042-FLOOR
169	9	-11 +- 13	26	5 +- 11	9	-4 +- 7	36	-1 +- 13		040-FLOOR CORRIDOR
170	24	8 +- 16	22	2 +- 11	12	-1 +- 7	33	-3 +- 13		052-FLOOR
171	42	30 +- 19	31	9 +- 12	19	4 +- 8	54	13 +- 14		059-FLOOR CORRIDOR
172	21	4 +- 15	16	-3 +- 10	15	1 +- 8	36	-1 +- 13		060-FLOOR DOOR #1
173	25	9 +- 16	31	9 +- 12	10	-3 +- 7	40	2 +- 13		060-FAR LEFT BAY
174	9	-11 +- 13	25	4 +- 11	20	4 +- 8	33	-3 +- 13		060-FLOOR LEFT BAY
175	22	5 +- 15	30	8 +- 12	10	-3 +- 7	37	0 +- 13		060-FLOOR MIDDLE BAY
176	18	0 +- 15	15	-4 +- 10	19	4 +- 8	31	-5 +- 12		060-FLOOR RIGHT BAY
177	14	-5 +- 14	27	6 +- 11	11	-2 +- 7	37	0 +- 13		060-FLOOR FAR RIGHT BAY
178	27	11 +- 16	43	19 +- 13	20	4 +- 8	68	24 +- 15		060-FLOOR DOOR #2
179	10	-10 +- 13	26	5 +- 11	11	-2 +- 7	41	3 +- 13		060-ENTRY DOOR HANDLES
180	14	-5 +- 14	22	2 +- 11	21	5 +- 8	32	-4 +- 13		060-FRIDGE HANDLES
181	14	-5 +- 14	28	7 +- 11	19	4 +- 8	20	-13 +- 11		061-FLOOR
182	12	-8 +- 13	23	3 +- 11	12	-1 +- 7	24	-10 +- 12		062-COLDROOM BENCH TOPS
183	11	-9 +- 13	29	8 +- 11	16	1 +- 8	33	-3 +- 13		062-COLD ROOM SINK
184	7	-11 +- 13	23	3 +- 11	12	-1 +- 7	28	-7 +- 12		062-COLDROOM DOOR HANDLE
185	9	-11 +- 13	30	8 +- 12	7	-5 +- 6	40	2 +- 13		062-COLDROOM FLOOR ENTWY
186	21	4 +- 15	24	3 +- 11	12	-1 +- 7	36	-1 +- 13		063-TOP ULTRA CENTRIFUGE
187	7	-14 +- 12	19	-1 +- 10	11	-2 +- 7	30	-5 +- 12		063-LYPHILLZER
188	12	-8 +- 13	17	-3 +- 10	10	-3 +- 7	28	-7 +- 12		063-FLOOR ENTRYWAY
189	18	6 +- 15	33	11 +- 12	15	1 +- 8	32	-4 +- 13		064-37C SHAKER
190	18	0 +- 15	18	-2 +- 10	12	-1 +- 7	49	9 +- 14		064-FLOOR
191	41	29 +- 19	31	9 +- 12	8	-4 +- 7	76	30 +- 16		064-B0C FREEZER HANDLES
192	15	-4 +- 14	16	-3 +- 10	15	1 +- 8	29	-6 +- 12		069-FLOOR RIGHT BAY
193	15	-4 +- 14	26	5 +- 11	13	-1 +- 7	35	-2 +- 13		069-FLOOR-MIDDLE-BAY
194	16	-3 +- 14	26	5 +- 11	12	-1 +- 7	32	-4 +- 13		069-FLOOR-LEFT-BAY
195	22	5 +- 15	24	3 +- 11	10	-3 +- 7	39	2 +- 13		069-FLOOR-BY-DOORWAY
196	23	6 +- 16	27	6 +- 11	12	-1 +- 7	37	0 +- 13		069-DOOR HANDLES
197	12	-8 +- 13	22	2 +- 11	15	1 +- 8	28	-7 +- 12		070-FLOOR COLD ROOM
198	14	-5 +- 14	22	2 +- 11	15	1 +- 8	40	2 +- 13		071-FLOOR
199	28	13 +- 17	21	1 +- 10	11	-2 +- 7	43	5 +- 13		071-BENCH
200	15	-4 +- 14	26	5 +- 11	22	6 +- 8	38	1 +- 13		071-HOOD
201	19	1 +- 15	27	6 +- 11	7	-5 +- 6	35	-2 +- 13		074-FLOOR
202	21	4 +- 15	20	0 +- 10	15	-1 +- 7	28	-7 +- 12		074-BENCH LEFT
203	14	-5 +- 14	18	-2 +- 10	12	-1 +- 7	50	10 +- 14		075-DOOR HANDLE
204	10	-10 +- 13	28	7 +- 11	10	-3 +- 7	33	-3 +- 13		075-FLOOR-ENTRYWAY
205	19	1 +- 15	28	4 +- 11	11	-2 +- 7	28	-7 +- 12		075-FLOOR-MIDDLE

DESIGNER AND MANUFACTURER
OF
*Scientific and Industrial
Instruments*



LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 915-235-5484
501 OAK STREET FAX NO. (915) 235-4872
SWEETWATER, TEXAS 79558, U. S. A.

MINIMUM DETECTABLE CALCULATIONS

Based on $L_d = 2.71 + 4.65 \sqrt{B}$ where: signal level such that at or above is likely to be detected at 95% confidence level.

B = Background

I-125	Mod. 44-3	Mod. 44-98	Mod. 44-21	Mod. 44-9	Mod. 44-7	Mod. 44-6	Mod. 44-1
	BkGnd=250 cpm Eff=19% 4 Pi $L_d = 76$ M/D = 400 Dpm uCi = 0.18 nCi	BkGnd=435 cpm Eff=23% 4 Pi $L_d = 100$ M/D = 434 Dpm uCi = 0.196 nCi	300 cpm Eff=19% 4 Pi $L_d = 83$ M/D = 436 Dpm uCi = 0.2 nCi	46 cpm Eff=0.1% 4 Pi $L_d = 34$ M/D = 34000 Dpm uCi = 0.0153 nCi	32 cpm Eff=0.07% 4 Pi $L_d = 29$ M/D = 43283 Dpm uCi = 0.019 nCi	20 cpm Eff=0.04% 4 Pi $L_d = 23$ M/D = 57500 Dpm uCi = 0.0259 nCi	70 cpm Eff=0.046% 4 Pi $L_d = 42$ M/D = 91304 Dpm uCi = 0.04 nCi
C-14	Mod. 44-1	Mod. 44-9	Mod. 44-98	Mod. 44-7	Mod. 44-21	Mod. 44-3	Mod. 44-6
	BkGnd=70 cpm Eff=10% 4 Pi $L_d = 42$ M/D = 420 Dpm uCi = 0.19 nCi	BC = 46 cpm Eff=5% 4 Pi $L_d = 34$ M/D = 680 Dpm uCi = 0.310 nCi	BC = 435 cpm Eff=10% 4 Pi $L_d = 100$ M/D = 1000 Dpm uCi = 0.45 nCi	BC = 32 cpm Eff=2.5% 4 Pi $L_d = 29$ M/D = 1160 Dpm uCi = 0.5 nCi	BC = 300 cpm Eff=6.5% $L_d = 83$ M/D = 1277 Dpm uCi = 0.58 nCi	BC = 250 cpm Eff=2.18% $L_d = 76$ M/D = 35780 Dpm uCi = 1.58 nCi	NO Response
P-32	Mod. 44-1	Mod. 44-9	Mod. 44-7	Mod. 44-21	Mod. 44-98	Mod. 44-3	Mod. 44-6
	BkGnd=70 cpm Eff=46.5% 4 Pi $L_d = 42$ M/D = 90 Dpm uCi = 0.04 nCi	BC = 46 cpm Eff=32.5% $L_d = 34$ M/D = 105 Dpm uCi = 0.047 nCi	BC = 32 cpm Eff=17% 4 Pi $L_d = 29$ M/D = 172 Dpm uCi = 0.07 nCi	BC = 300 cpm Eff=39.4% 4 Pi $L_d = 83$ M/D = 211 Dpm uCi = 0.095 nCi	BC = 435 cpm Eff=44% 4 Pi $L_d = 100$ M/D = 227 Dpm uCi = 0.102 nCi	BC = 250 cpm Eff=28% 4 Pi $L_d = 76$ M/D = 271 Dpm uCi = 0.12 nCi	BC = 20 cpm Eff=3.5% 4 Pi $L_d = 23$ M/D = 657 Dpm uCi = 0.296 nCi
Tc-99 ^M	Mod. 44-7	Mod. 44-9	Mod. 44-98				
	Eff=5% 5690 Dpm	Eff=6% 575 Dpm	Eff=6.5% 1538 Dpm				

* Without screen in sample holder
** With screen in sample holder

* 5.5% out of S/S body
M/D = 418 Dpm
uCi = 0.188 nCi

MAY 12 1996

License No. 20-28706-01
Docket No. 030-32581
Control No. 122995

Thomas R. Sharpe
President
OsteoArthritis Sciences, Inc.
One Kendall Square, Building 200
Cambridge, MA 02139

Dear Mr. Sharpe:

This is in reference to your letter dated March 8, 1996 requesting an amendment to terminate License No. 20-28706-01. In order to continue our review, we need the following additional information:

1. The information you submitted in support of the release of your facility for unrestricted use did not include adequate information regarding the residual radiation levels and the levels of residual removable contamination remaining in the facility. Criteria for release of facilities for unrestricted use are included in the enclosed guide. Please submit the following additional information:
 - a. Results of surveys made for radiation levels in milliroentgen per hour (mR/hr) and of wipe test surveys made for removable contamination in disintegrations per minute per 100 square centimeters (dpm/100 cm²), and
 - b. the manufacturer, model number, sensitivity, and the most recent calibration results of the survey instruments used to perform these measurements.
2. In accordance with 10 CFR 30.36(j)(1) (enclosed), submit a properly executed NRC Form 314 (enclosed).
3. Your letter dated March 8, 1996, states that all radioisotopes have been removed from your facility and transferred to waste storage facilities. Please identify the waste storage facilities and the NRC or Agreement State license under which the waste is stored. Specify the final disposition of the licensed materials.
4. Identify the authorized spaces (rooms/laboratories) in which radioisotopes were used and specify the approximate amounts of each radionuclide used in each of these spaces.
5. The tabulation identified as "Wipe Test Survey Results" on page 1 enclosed with your letter specifies locations which apparently refer to

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ML 10

Thomas R. Sharpe
OsteoArthritis Sciences, Inc

-2-

room numbers. Please advise us if this is not correct. If this is correct, the results for Room Nos. 26, 50, 51, 68, 72, or 76 are not included nor is the sketch for the Room/Area identified as No. 59. Further, the identifying sample numbers for these results are missing. Please explain or submit the missing information. Also, include the areas wiped by the removable activity samples (e.g., 100 cm²).

6. The tabulated results on Page #1 through Page #4, apparently identified as Protocol #:10, enclosed with your letter are all presented in counts per minute (cpm). These results should be in disintegrations per minute (dpm) per unit area if they are for wipe samples. If instead these are direct reading radiation survey results, the table should be so identified, results tabulated in mR/hr, and the specific survey information included. In addition, please identify "Protocol#:10" if it is pertinent to the survey and results.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I Office and refer to Mail Control No. 122995. If you have any technical questions regarding this deficiency letter, please call me at (610) 337-5202.

Please reply within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By:

C. Thor Oberg

C. Thor Oberg, Health Physicist
Division of Nuclear Materials Safety

License No. 20-28706-01
Docket No. 030-32581
Control No. 122995

Enclosures:

1. 10 CFR Part 30
2. NRC Form 314
3. "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," April 1993

DOCUMENT NAME: R:\WPS\DLTR\D2028706.01

To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/enci "E" = Copy w/ attach/enci "N" = No copy

OFFICE	DNMS/RI	N	DNMS/RI	N			
NAME	COberg/cto		JKireman				
DATE	05/06/96		05/ /96		05/ /96		05/ /96

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OsteoArthritis
SCIENCES, INC.

8 March 1996

S. Arrendondo, Acting Chief
Nuclear Materials Safety Branch,
USNRC, Region 1, 475 Allendale Road
King of Prussia, PA. 19406-1415

Dear Ms. Arrendondo,

This is in reference to our materials license 20-28706-01 as attached. We request our materials license be terminated. Our facility is closing and the corporation is being dissolved. All isotopes have now been removed from the facility and transferred to waste storage facilities via the licensed waste hauler ADCO Services Inc. An exhaustive survey and wipe test has been conducted of our laboratories and I can certify that all radioactive materials have been removed and that no contamination exists at the facility. Sample points at one square meter apart in all the spaces authorized to contain radioactive materials were wipe tested (see attached). All other spaces were surveyed with calibrated survey meters suspended less than 3 inches from the contact surfaces.

Respectfully

J. D. Sakelaris
Laboratory Manager, R.S.O.

T Sharpe
President, OsteoArthritis Sciences Inc.

% Efficiency Background (Counts)

3H	40	18
14C	60	20
32P	70	14
125I	65	37

Template Name = OASM

Probable Error (1=50, 2=90%, 3=95%, 4=99%) = 3

DPM Screening Level = 200

3H	3H	14C	14C	32P	32P	125I	125I	FLAG	LOCATION
COUNTS	NETDPM+-ERROR	COUNTS	NETDPM+-ERROR	COUNTS	NETDPM+-ERROR	COUNTS	NETDPM+-ERROR		
11	-9 +- 13	22	2 +- 11	18	3 +- 8	25	-9 +- 12		042-FLOOR
9	-11 +- 13	26	5 +- 11	9	-4 +- 7	36	-1 +- 13		040-FLOOR CORRIDOR
24	8 +- 16	22	2 +- 11	12	-1 +- 7	33	-3 +- 13		052-FLOOR
42	30 +- 19	31	9 +- 12	19	4 +- 8	54	13 +- 14		059-FLOOR CORRIDOR
21	4 +- 15	16	-3 +- 10	15	1 +- 8	36	-1 +- 13		060-FLOOR DOOR #1
25	9 +- 16	31	9 +- 12	10	-3 +- 7	40	2 +- 13		060-FAR LEFT BAY
9	-11 +- 13	25	4 +- 11	20	4 +- 8	33	-3 +- 13		060-FLOOR LEFT BAY
22	5 +- 15	30	8 +- 12	10	-3 +- 7	37	0 +- 13		060-FLOOR MIDDLE BAY
18	0 +- 15	15	-4 +- 10	19	4 +- 8	31	-5 +- 12		060-FLOOR RIGHT BAY
14	-5 +- 14	27	6 +- 11	11	-2 +- 7	37	0 +- 13		060-FLOOR FAR RIGHT BAY
27	11 +- 16	43	19 +- 13	20	4 +- 8	68	24 +- 15		060-FLOOR DOOR #2
10	-10 +- 13	26	5 +- 11	11	-2 +- 7	41	3 +- 13		060-ENTRY DOOR HANDLES
14	-5 +- 14	22	2 +- 11	21	5 +- 8	32	-4 +- 13		060-FRIDGE HANDLES
14	-5 +- 14	28	7 +- 11	19	4 +- 8	20	-13 +- 11		061-FLOOR
12	-8 +- 13	23	3 +- 11	12	-1 +- 7	24	-10 +- 12		062-COLDROOM BENCH TOPS
11	-9 +- 13	29	8 +- 11	16	1 +- 8	33	-3 +- 13		062-COLD ROOM SINK
9	-11 +- 13	23	3 +- 11	12	-1 +- 7	28	-7 +- 12		062-COLDROOM DOOR HANDLE
9	-11 +- 13	30	8 +- 12	7	-5 +- 6	40	2 +- 13		062-COLDROOM FLOOR, ENTWY
21	4 +- 15	24	3 +- 11	12	-1 +- 7	36	-1 +- 13		063-TOP ULTRA CENTRIFUGE
7	-14 +- 12	19	-1 +- 10	11	-2 +- 7	30	-5 +- 12		063-LYPHILLIER
12	-8 +- 13	17	-3 +- 10	10	-3 +- 7	28	-7 +- 12		063-FLOOR ENTRYWAY
18	0 +- 15	33	11 +- 12	15	1 +- 8	32	-4 +- 13		064-37C SHAKER
18	0 +- 15	18	-2 +- 10	12	-1 +- 7	49	9 +- 14		064-FLOOR
41	29 +- 19	31	9 +- 12	8	-4 +- 7	76	30 +- 16		064-80C FREEZER HANDLES
15	-4 +- 14	16	-3 +- 10	15	1 +- 8	29	-6 +- 12		069-FLOOR RIGHT BAY
15	-4 +- 14	26	5 +- 11	13	-1 +- 7	35	-2 +- 13		069-FLOOR-MIDDLE-BAY
16	-3 +- 14	26	5 +- 11	12	-1 +- 7	32	-4 +- 13		069-FLOOR-LEFT-BAY
22	5 +- 15	24	3 +- 11	10	-3 +- 7	39	2 +- 13		069-FLOOR-BY-DOORWAY
23	6 +- 16	27	6 +- 11	12	-1 +- 7	37	0 +- 13		069-DOOR-HANDLES
12	-8 +- 13	22	2 +- 11	15	1 +- 8	28	-7 +- 12		070-FLOOR COLD ROOM
14	-5 +- 14	22	2 +- 11	15	1 +- 8	40	2 +- 13		071-FLOOR
28	13 +- 17	21	1 +- 10	11	-2 +- 7	43	5 +- 13		071-BENCH
15	-4 +- 14	26	5 +- 11	22	6 +- 8	38	1 +- 13		071-HOOD
19	1 +- 15	27	6 +- 11	7	-5 +- 6	35	-2 +- 13		074-FLOOR
21	4 +- 15	20	0 +- 10	15	-1 +- 7	28	-7 +- 12		074-BENCH LEFT
14	-5 +- 14	18	-2 +- 10	17	-1 +- 7	50	10 +- 14		075-DOOR-HANDLE
10	-10 +- 13	28	7 +- 11	10	-3 +- 7	33	-3 +- 13		075-FLOOR-ENTRYWAY
19	1 +- 15	25	4 +- 11	11	-2 +- 7	28	-7 +- 12		075-FLOOR-MIDDLE

M. 3/2/96 BTH

05 Mar 96 13:57

Page #1

Protocol #:10

3H/14C/35S/32P

User :

Time: 2.00

Data Mode: CPM

Nuclide: MANUAL

Background Subtract: None

	LL	UL	LCR	25%	BKG
Region A:	0.0 - 12.0		0	0.0	0.00
Region B:	12.0 - 110		0	0.0	0.00
Region C:	120 - 900		0	0.0	0.00

Quench Indicator: SIS

S#	TIME	CPMA	CPMB	CPMC
1	2.00	12.50	11.00	11.50
2	2.00	19.50	15.50	4.00
3	2.00	12.00	14.50	7.00
4	2.00	14.00	7.00	4.00
5	2.00	13.00	10.50	5.50
6	2.00	11.00	11.00	8.50
7	2.00	8.00	8.50	6.00
8	2.00	13.50	10.50	2.50
9	2.00	17.00	12.50	4.00
10	2.00	12.00	12.00	5.50
11	2.00	13.00	11.50	5.50
12	2.00	10.00	12.50	9.50
13	2.00	12.50	7.50	5.50
14	2.00	8.50	9.50	5.50
15	2.00	10.50	12.50	5.50
16	2.00	14.50	8.50	9.00
17	2.00	9.00	14.00	5.50
18	2.00	12.00	13.00	4.50
19	2.00	13.00	11.00	2.00
20	2.00	11.00	6.50	7.50
21	2.00	13.00	10.50	8.00
22	2.00	6.00	13.00	3.00
23	2.00	12.00	13.50	8.00
24	2.00	13.50	17.00	5.50
25	2.00	17.50	6.00	4.00
26	2.00	15.00	10.00	4.50
27	2.00	11.50	11.00	6.00
28	2.00	8.50	8.50	7.50
29	2.00	10.50	10.50	4.50
30	2.00	9.00	10.00	7.00
31	2.00	11.00	10.00	4.00
32	2.00	11.50	11.00	4.50
33	2.00	11.50	10.50	5.00
34	2.00	11.00	13.50	7.00
35	2.00	11.00	13.00	2.50
36	2.00	9.00	15.00	6.50
37	2.00	15.50	7.00	10.00
38	2.00	7.50	11.00	4.00
39	2.00	13.00	9.50	7.50
40	2.00	10.50	7.00	5.50
41	2.00	11.00	12.50	3.50
42	2.00	12.50	12.50	8.00
43	2.00	15.00	14.00	6.50
44	2.00	12.50	12.50	8.00

12.5 - 18
= 3.4

S#	TIME	CPMA	CPMB	CPMC
45	2.00	8.50	15.00	4.50
46	2.00	12.00	12.50	5.50
47	2.00	8.00	10.50	7.00
48	2.00	10.50	15.50	5.00
49	2.00	12.50	11.00	5.00
50	2.00	12.00	9.50	9.00
51	2.00	10.50	11.00	4.50
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54	2.00	10.50	10.50	4.00
55	2.00	8.50	9.00	8.00
56	2.00	15.00	14.00	4.50
57	2.00	12.50	11.00	7.50
58	2.00	8.50	11.00	6.50
59	2.00	11.50	11.00	4.00
60	2.00	9.00	9.50	5.00
61	2.00	9.50	11.50	10.50
62	2.00	12.00	15.00	4.00
63	2.00	9.00	11.00	8.50
64	2.00	11.00	12.00	6.00
65	2.00	7.50	11.00	5.00
66	2.00	12.50	12.00	6.00
67	2.00	13.00	11.00	3.50
68	2.00	13.00	8.50	5.50
69	2.00	12.50	12.50	5.50
70	2.00	8.50	11.00	4.50
71	2.00	14.50	12.00	6.50
72	2.00	10.50	14.50	4.00
73	2.00	8.50	12.00	8.50
74	2.00	10.00	9.50	4.50
75	2.00	14.50	9.50	6.50
76	2.00	13.50	10.50	4.50
77	2.00	9.50	13.00	8.00
78	2.00	12.50	11.50	5.00
79	2.00	13.50	9.00	3.00
80	2.00	11.00	10.50	6.00
81	2.00	7.50	12.50	5.00
82	2.00	12.00	10.50	8.00
83	2.00	8.00	12.00	8.00
84	2.00	9.00	10.50	8.50
85	2.00	14.50	12.00	4.50
86	2.00	11.50	11.00	4.50
87	2.00	12.50	14.00	7.00
88	2.00	8.50	12.50	6.00
89	2.00	12.50	15.00	7.00
90	2.00	10.00	15.50	5.50
91	2.00	10.00	8.50	9.00
92	2.00	9.50	9.00	3.50
93	2.00	12.00	14.00	3.50
94	2.00	8.50	11.50	8.00
95	2.00	7.50	8.50	8.00
96	2.00	9.50	11.50	5.00
97	2.00	14.50	11.00	8.50
98	2.00	10.50	10.00	6.50
99	2.00	10.00	13.50	7.50
100	2.00	11.50	10.00	6.50

05 Mar 96 17:47

Page #3

Protocol #:10

3H/14C/35S/32P

User :

S#	TIME	CPMA	CPMB	CPMC
101	2.00	10.00	11.00	7.00
102	2.00	7.00	11.00	6.50
103	2.00	9.50	8.00	6.00
104	2.00	10.50	13.00	5.50
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107	2.00	8.50	8.00	4.50
108	2.00	8.50	12.00	4.50
109	2.00	10.50	10.00	7.00
110	2.00	11.50	14.00	7.50
111	2.00	8.00	8.50	7.00
112	2.00	9.00	10.00	9.50
113	2.00	9.50	11.50	7.00
114	2.00	10.50	11.00	5.50
115	2.00	8.00	10.50	6.00
116	2.00	10.50	10.50	6.50
117	2.00	9.50	13.00	4.00
118	2.00	9.50	16.50	4.50
119	2.00	12.00	15.50	7.50
120	2.00	12.50	8.50	7.50
121	2.00	8.50	10.50	4.00
122	2.00	9.00	9.00	7.00
123	2.00	13.00	12.50	8.50
124	2.00	13.00	8.50	7.50
125	2.00	12.00	10.50	7.50
126	2.00	14.50	8.50	7.00
127	2.00	8.50	12.00	8.50
128	2.00	14.00	12.50	8.50
129	2.00	9.50	10.50	7.00
130	2.00	7.50	10.50	7.00
131	2.00	6.50	12.50	5.50
132	2.00	9.50	13.00	7.00
133	2.00	9.00	9.50	5.00
134	2.00	10.50	9.50	7.50
135	2.00	8.50	8.00	7.50
136	2.00	5.50	7.50	4.00
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138	2.00	10.50	9.00	5.50
139	2.00	8.50	12.50	5.00
140	2.00	13.00	11.50	4.50
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143	2.00	14.50	12.00	8.00
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145	2.00	10.50	6.50	6.00
146	2.00	9.00	12.50	5.00
147	2.00	9.00	13.00	5.00
148	2.00	8.50	7.00	8.00
149	2.00	9.00	12.00	7.50
150	2.00	10.00	12.50	4.00
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152	2.00	8.00	8.00	5.50
153	2.00	9.00	15.00	2.00
154	2.00	7.00	11.00	8.00
155	2.00	10.50	12.50	5.00
156	2.00	14.00	14.50	4.00

S#	TIME	CPMA	CPMB	CPMC
157	2.00	10.00	12.00	7.00
158	2.00	10.00	9.50	6.50
159	2.00	5.50	15.00	7.50
160	2.00	16.00	11.00	4.00
161	2.00	11.50	12.00	6.50
162	2.00	13.50	10.50	7.50
163	2.00	12.50	10.50	3.00
164	2.00	12.00	12.00	5.50
165	2.00	7.50	6.50	6.00
166	2.00	8.50	12.50	4.50
167	2.00	12.50	10.00	6.50
168	2.00	3.00	11.50	2.00
169	2.00	11.00	11.00	7.50
170	2.00	7.50	10.00	10.00
171	2.00	12.50	10.00	9.00
172	2.00	11.00	15.50	8.50
173	2.00	10.50	13.50	4.00
174	2.00	10.00	13.50	10.00
175	2.00	10.00	15.50	7.00
176	2.00	13.00	10.50	6.50
177	2.00	6.50	15.50	4.50
178	2.00	10.50	9.50	5.50
179	2.00	10.50	13.00	5.00
180	2.00	9.00	11.50	5.00
181	2.00	12.50	10.00	11.50
182	2.00	6.50	12.00	10.00
183	2.00	10.50	10.50	7.50
184	2.00	7.50	9.00	5.00
185	2.00	16.00	14.50	7.50
186	2.00	10.00	15.50	6.50
187	2.00	7.50	7.00	10.50
188	2.00	10.50	9.50	8.00
189	2.00	8.00	11.50	5.50
190	2.00	10.50	11.50	5.50
191	2.00	8.00	13.00	5.50
192	2.00	7.00	16.00	10.00
193	2.00	9.00	13.50	7.00
194	2.00	10.50	14.00	7.00
195	2.00	9.50	14.00	5.50
196	2.00	10.50	13.50	5.50
197	2.00	9.00	17.50	6.50
198	2.00	6.50	12.00	7.00
199	2.00	13.50	10.50	7.00
200	2.00	8.50	8.50	6.00
201	2.00	15.00	9.00	5.00
202	2.00	10.50	12.00	4.00
203	2.00	9.50	11.00	6.50
204	2.00	14.50	8.00	5.00
205	2.00	9.00	9.00	3.00

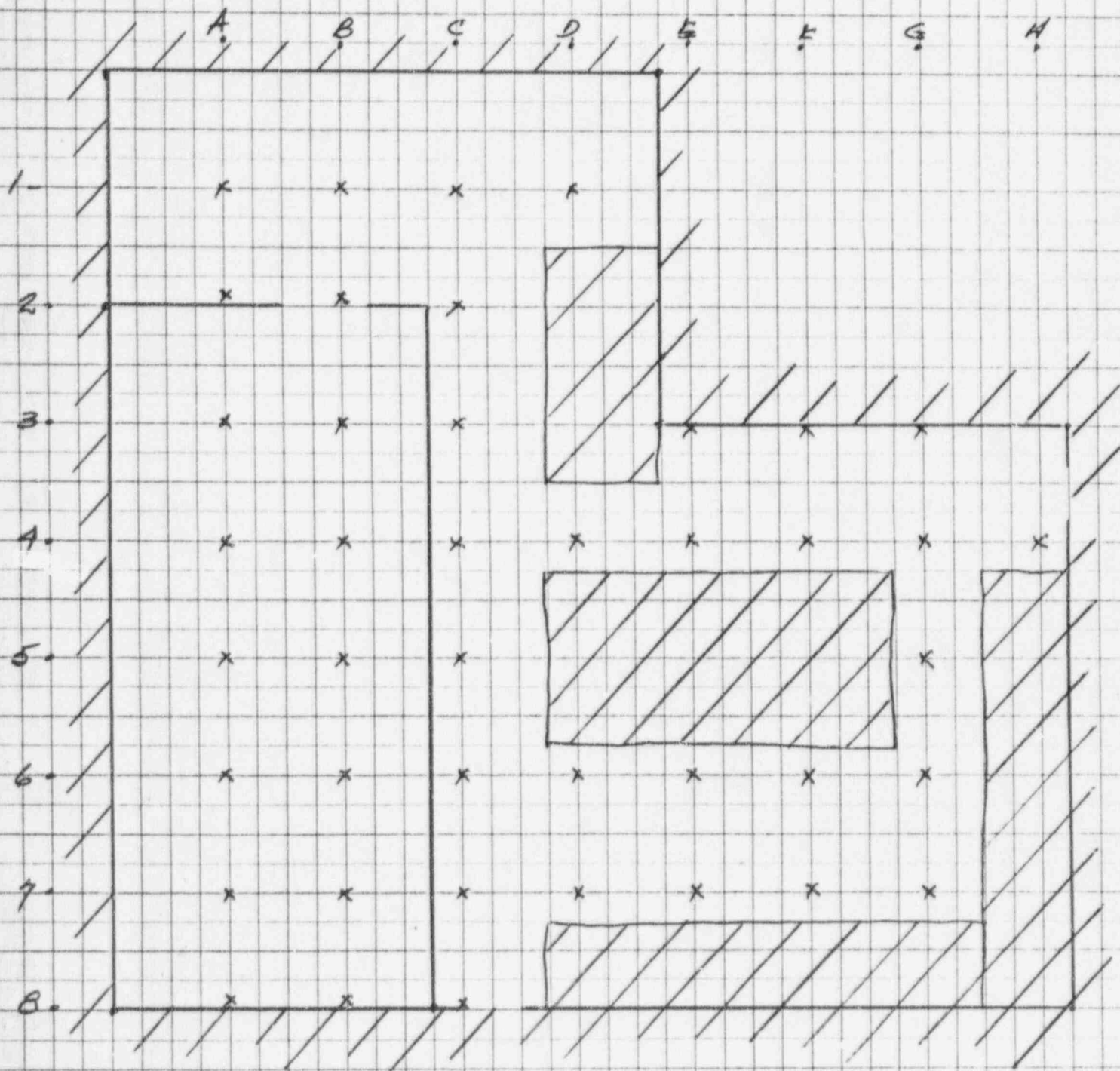
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2	26a2	12	26b4	22	26c6	32	26e7	42	26h4
3	26a3	13	26b5	23	26c7	33	26f3	43	50a1
4	26a4	14	26b6	24	26c8	34	26f4	44	50a2
5	26a5	15	26b7	25	26d1	35	26f6	45	50a3
6	26a6	16	26b8	26	26d4	36	26f7	46	50c1
7	26a7	17	26c1	27	26d6	37	26g3	47	50c2
8	26a8	18	26c2	28	26d7	38	26g4	48	50b1
9	26b1	19	26c3	29	26e3	39	26g5	49	50b2
10	26b2	20	26c4	30	26e4	40	26g6	50	51a1

no.	location	no.	location	no.	location	no.	location	no.	location
51	51a2	61	42a2	71	60a3	81	60a13	91	60b4
52	51a3	62	42a3	72	60a4	82	60a14	92	60b5
53	51a4	63	42b1	73	60a5	83	60a15	93	60b7
54	52a1	64	42b2	74	60a6	84	60a16	94	60b8
55	52a2	65	42c1	75	60a7	85	60a17	95	60b10
56	52a3	66	42c2	76	60a8	86	60a18	96	60b11
57	52b1	67	42d1	77	60a9	87	60a19	97	60b13
58	52b2	68	42d2	78	60a10	88	60a20	98	60b14
59	52b3	69	60a1	79	60a11	89	60b1	99	60b16
60	42a1	70	60a2	80	60a12	90	60b2	100	60b17

no.	location	no.	location	no.	location	no.	location	no.	location
101	60b19	111	60c13	121	60d5	131	60d15	141	68a8
102	60b20	112	60c14	122	60d6	132	60d16	142	68b1
103	60c1	113	60c16	123	60d7	133	60d17	143	68b2
104	60c2	114	60c17	124	60d8	134	60d19	144	68b4
105	60c4	115	60c19	125	60d9	135	60d20	145	68b5
106	60c5	116	60c20	126	60d10	136	68a1	146	68b7
107	60c7	117	60d1	127	60d11	137	68a2	147	68b8
108	60c8	118	60d2	128	60d12	138	68a4	148	68c1
109	60c10	119	60d3	129	60d13	139	68a5	149	68c2
110	60c11	120	60d4	130	60d14	140	68a7	150	68c4

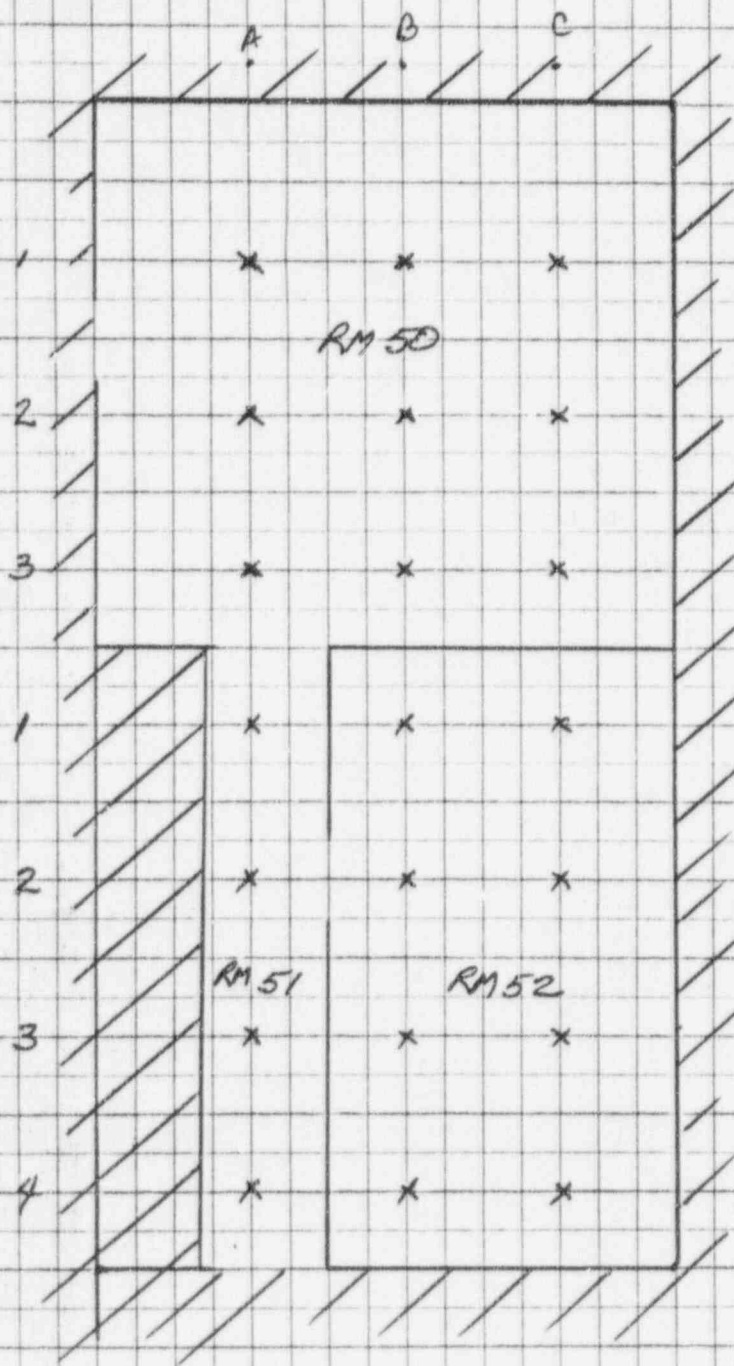
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151	68c5	161	68d8	171	69b7	181	69d5	191	72b3
152	68c7	162	69a1	172	69c1	182	69d6	192	72b4
153	68c8	163	69a2	173	69c2	183	69d7	193	72b5
154	68d1	164	69a4	174	69c4	184	69d8	194	72c1
155	68d2	165	69a5	175	69c5	185	72a1	195	72c2
156	68d3	166	69a7	176	69c7	186	72a2	196	72c4
157	68d4	167	69b1	177	69d1	187	72a3	197	72c5
158	68d5	168	69b2	178	69d2	188	72a5	198	72d5
159	68d6	169	69b4	179	69d3	189	72b1	199	72d4
160	68d7	170	69b5	180	69d4	190	72b2	200	72d2

no.	location	no.	location	no.	location	no.	location	no.	location
201	76a1	202	76a2	203	76a3	204	76b2	205	76b3

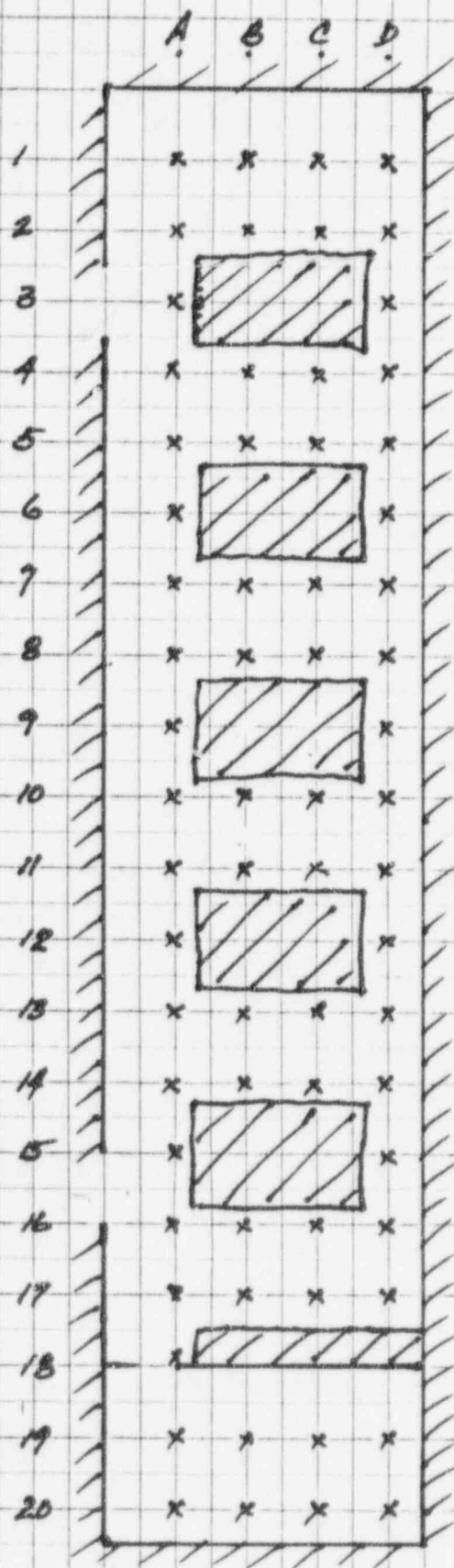


RM 26 SAMPLE POINTS

NOT TO SCALE

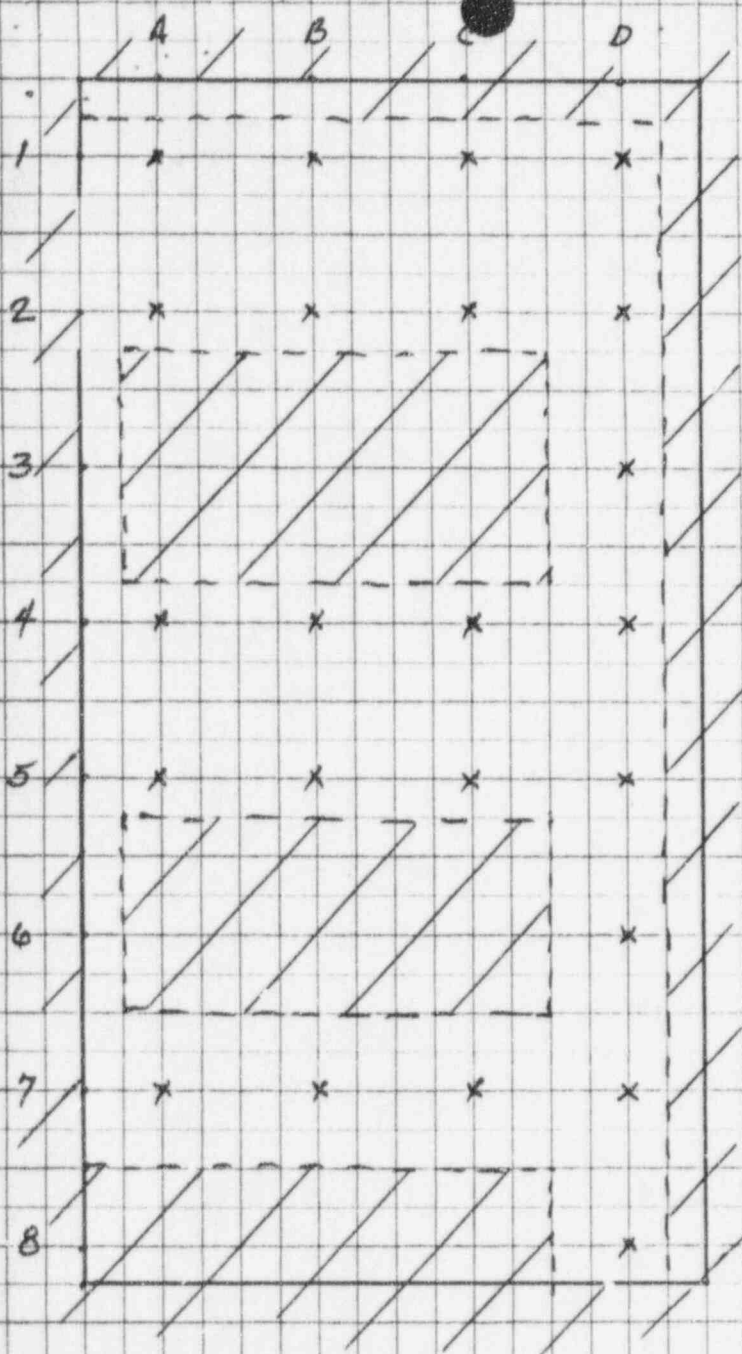


RM 50, 51, 52,
SAMPLE POINTS

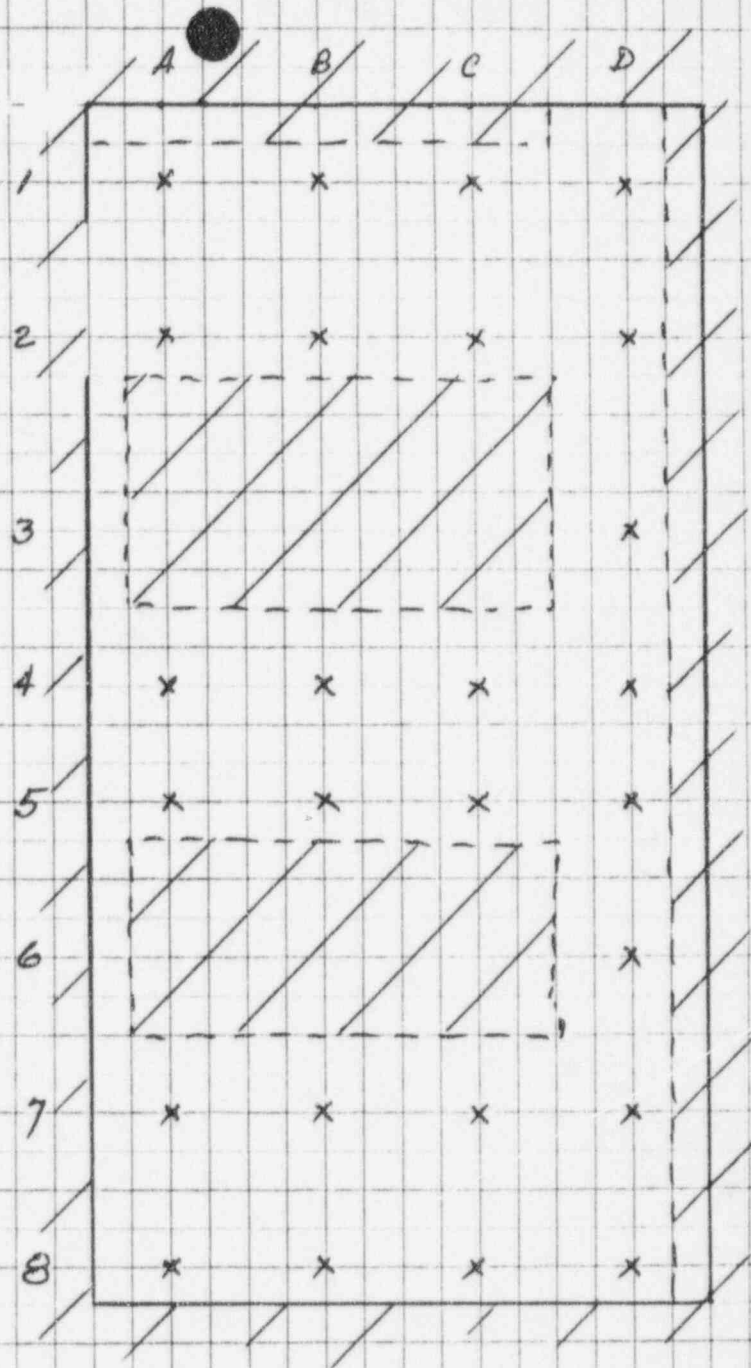


RM 60 SAMPLE POINTS

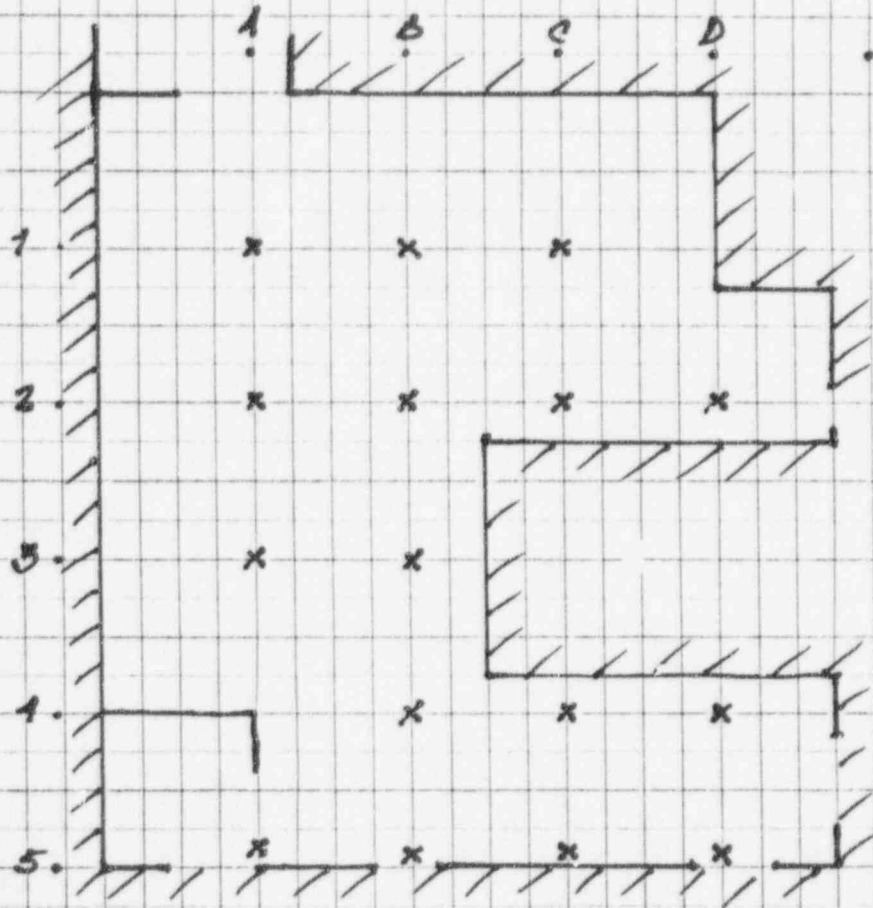
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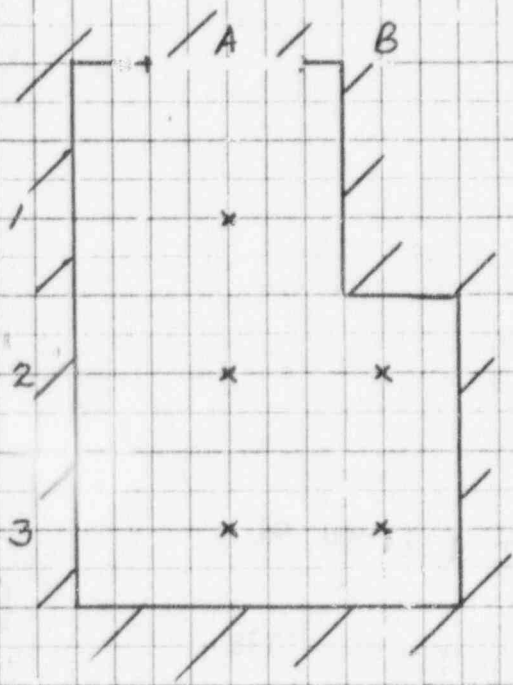
RM 69 SAMPLE POINTS



RM 68 SAMPLE POINTS



RM 72 SAMPLE POINTS



RM 76 SAMPLE POINTS

122995

NOT TO SCALE

: (FOR LFMS USE)
: INFORMATION FROM LTS
: -----
: PROGRAM CODE: 03620
: STATUS CODE: 0
: FEE CATEGORY: 3M
: EXP. DATE: 20020430
: FEE COMMENTS: -----
: DECOM FIN ASSUR REQD: N
:

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

LICENSE FEE TRANSMITTAL

A. REGION I

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: OSTED ARTHRITIS SCIENCES, INC.
RECEIVED DATE: 960312
DOCKET NO: 3032581
CONTROL NO.: 122995
LICENSE NO.: 20-28706-01
ACTION TYPE: TERMINATION

2. FEE ATTACHED
AMOUNT: -----
CHECK NO.: -----

3. COMMENTS

SIGNED M.A. Perkins
DATE 3/26/96

FEE EXEMPT

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE IS ENTERED ✓)

1. FEE CATEGORY AND AMOUNT: 3M Termination

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT -----
RENEWAL -----
LICENSE -----

3. OTHER -----

SIGNED D. Brown
DATE 4/2/96

RECEIVED BY LFDCB
4/3/96 = (96)
Apr 1
D. Brown
4/2/96