copies to J. Madera
M. Weber

Advanced Medical Systems, Inc.

1020 London Road
Cleveland, OH 44110
(216) 692-3270

June 26, 1995

Mr. James Caldwell
Nuclear Materials Inspection, Section 2
United States Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60523-4351

Re: Application to Amend License No. 34-19089-01

Dear Mr. Caldwell:

On March 22, 1995, Advanced Medical Systems, Inc. (AMS) requested an amendment of License No. 34-19089-01 to permit evaporation of water stored in the warehouse of the London Road facility. The USNRC's first response occurred on June 8, 1995 when Mr. Wayne Slawinski forwarded to us a series of questions that pertained to this request. On that same date, we provided you with answers to those questions. However, as of the date of this letter, we have received no further response from the USNRC on this issue.

When we raised the issue again in a conference call between AMS and USNRC representatives, Mr. John Madera indicated that one of the concerns the USNRC has in regard to the evaporation process is the magnitude of potential off-site population doses. To relieve your concerns on this issue, and to expedite your approval of our amendment request, we are submitting the following information.

AMS intends to evaporate the treated water that currently exists in collapsible storage tanks in the AMS warehouse. The following are the current radionuclide contents of the collapsible storage tanks:

Tank Number	Mean ^{60}Co concentration (pCi/l)	Volume of water currently in Tank (gallons)	Total ^{60}Co Activity (μCi)
1	79.5	25,000	7 9
2	106.5	25,000	10.7
3	100	25,000	10.0
4	228.5	11,500	10.5
Total			39.1

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As we relayed to you previously, the evaporator is designed to prevent mist carry-over and particulate release during operation. However, if one assumes that none of these controls will exist, the entire source term currently in the four tanks would be released from the stack (e.g., none of the radioactivity remains in the residual sludge). Because of the low total activity in the water to be evaporated, AMS maintains that the off-site population doses would be negligible under these highly unlikely circumstances.

To demonstrate this point, the CAP-88 computer code (Clean Air Act Assessment Package-1988) was used to model the fate and transport of 40 microcuries of ^{60}Co. The CAP-88 model permits assessments of both collective population dose, and maximally exposed individual dose using a modified Gaussian plume equation to estimate the average dispersion of radionuclides released from up to six sources, which may be either elevated stacks or uniform area sources.[1]

The following assumptions were used as input to the CAP88 code for estimating off-site doses from the worst-case accident scenario at the London Road facility:

- Meteorological data from Cleveland, Ohio (Cleveland Airport) were deemed applicable to conditions at the AMS plant.
- The annual average rainfall amount is 89.9 cm per year.[2]
- The annual average temperature is 10° C.[3]
- The emission source height is equal to the height of the evaporator stack (two meters above the building).
- A momentum plume rise was assumed, with an exit velocity of 917 ft per minute.
- Agricultural usage fits an "Urban" scenario.
- The total activity released in one year is 40 microcuries of ^{60}Co.
- A 100% release fraction is assumed.
- The population distribution in the vicinity of the U. S. Department of Energy's Mount Laboratory is assumed to be representative of the population distribution in the vicinity of AMS. However, the distance to the nearest off-site receptor is 100 meters north of the AMS facility.[4]

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1 U. S. Environmental Protection Agency, "User's Guide for CAP88-PC, Version 1.0", by Barry S. Parks, Report No. 402-B-92-001, Office of Radiation Programs, March, 1992.

2 World Almanac, Holt, Reinhart & Winston, New York, 1989.

3 World Almanac, Holt, Reinhart & Winston, New York, 1989.

4 Cesar, D., Advanced Medical Systems, Inc., personal communication to C. D. Berger, Integrated Environmental Management, Inc., January 17, 1995.

- An annual-average release with no follow-up remediation of the local land area is assumed.[5]

The results of this assessment shows that the maximum annual effective dose equivalent to a member of the general population is 0.0018 millirem. (Attachment 1 contains the summary report from this assessment.) However, the population distribution within 50 miles of Mound Laboratory may not reflect the population distribution in the vicinity of AMS. Therefore, the dose to the nearest off-site member of the general population was also calculated by this methodology. The result of this assessment is a maximum annual dose equivalent of 0.009 millirem. (Attachment 2 contains the summary report from this assessment.) As you can see, operation of the evaporation system, if one assumes an excessively conservative scenario, still results in trivial, if any, off-site population doses.

We hope that this analysis will assist you in completing your evaluation of our request to evaporate the treated water that currently exists in the warehouse of the AMS building. We are again asking that you give prompt consideration to this request since we are within 8,000 gallons of the maximum storage capacity of the building. Please call me at (216) 692-3270 if additional information is required or if I can help you expedite your approval.

Sincerely,

Robert Meschter

Robert Meschter, RSO

cc: D. Cesar
D. A. Miller, Esq., Stavole & Miller

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[5] It is conservative to assume that the entire annual average dose calculated by CAP88-PC is delivered over the duration of the release.

ATTACHMENT 1

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Population Assessment
Jun 26, 1995 11:18 am

Facility: Advanced Medical Systems
Address: 1020 London Road
City: Cleveland
State: OH Zip: 44110

Effective Dose Equivalent
(mrem/year)

1.77E-03

At This Location: 250 Meters North Northeast
Source Category:
Source Type: Stack
Emission Year: 1995

Comments: Release from Evaporator

Dataset Name: ams-evaporator
Dataset Date: Jun 26, 1995 11:17 am
Wind File: WNDFILES\CLE1140.WND
Population File: POPFILES\MOUNDFC.POP

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 250 Meters North Northeast
Lifetime Fatal Cancer Risk: 4.41E-08

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem/y)	Collective Population (person-rem/y)
GONADS	2.01E-03	5.39E-03
BREAST	1.82E-03	4.87E-03
R MAR	1.56E-03	4.18E-03
LUNGS	1.91E-03	4.89E-03
THYROID	1.92E-03	5.15E-03
ENDOST	1.64E-03	4.40E-03
RMNDR	1.58E-03	4.28E-03
EFFEC	1.77E-03	4.74E-03

FREQUENCY DISTRIBUTION OF LIFETIME FATAL CANCER RISKS

Risk Range	Number of People	Number of People In This Risk Range Or Higher	Deaths/Year In This Risk Range	Deaths/Year In This Risk Range Or Higher
1.0E+00 TO 1.0E-01	0	0	0.00E+00	0.00E+00
1.0E-01 TO 1.0E-02	0	0	0.00E+00	0.00E+00
1.0E-02 TO 1.0E-03	0	0	0.00E+00	0.00E+00
1.0E-03 TO 1.0E-04	0	0	0.00E+00	0.00E+00
1.0E-04 TO 1.0E-05	0	0	0.00E+00	0.00E+00
1.0E-05 TO 1.0E-06	0	0	0.00E+00	0.00E+00
LESS THAN 1.0E-06	2936957	2936957	1.66E-06	1.66E-06

RADIONUCLIDE EMISSIONS DURING THE YEAR 1995

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
CO-60	Y	1.00	4.0E-05	4.0E-05

SITE INFORMATION

Temperature:	10 degrees C
Precipitation:	90 cm/y
Mixing Height:	1000 m

SOURCE INFORMATION

Source Number: 1

Stack Height (m): 2.00
Diameter (m): 0.25

Plume Rise
Momentum (m/s): 5.00E+00
(Exit Velocity)

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.076	0.000	0.008
Fraction From Assessment Area:	0.924	1.000	0.992
Fraction Imported:	0.000	0.000	0.000

Beef Cattle Density: 2.03E-01
Milk Cattle Density: 4.56E-02
Land Fraction Cultivated
for Vegetable Crops: 1.70E-02

POPULATION DATA

Direction	Distance (m) 250	750	1500	2500	3500	4500	7500
N	0	0	799	0	0	0	0
NNW	0	1557	0	0	0	0	3868
NW	0	0	1546	0	0	0	0
WNW	0	0	0	0	0	0	0
W	0	0	0	2132	0	0	5966
WSW	0	0	0	0	0	0	1009
SW	0	0	0	0	0	0	3102
SSW	0	0	0	0	0	0	7666
S	0	0	0	767	0	0	6473
SSE	0	0	0	468	0	0	6677
SE	0	0	0	0	0	0	0
ESE	0	0	1730	0	1597	0	3250
E	0	0	0	0	0	0	9340
ENE	0	0	0	2852	0	2857	7365
NE	0	0	471	0	3898	2191	16453
NNE	593	0	1040	1086	0	0	4856

Direction	Distance (m) 15000	25000	35000	45000	55000	70000
N	45365	36184	15879	30312	27926	30986
NNW	4085	7707	4616	7065	12717	23106
NW	3777	3380	4549	5381	4223	16238
WNW	2740	4133	8780	4360	47053	22798
W	2719	3932	3742	3072	4139	28587
WSW	3343	2891	11443	21156	3330	12158
SW	18238	12638	83556	17650	14277	38926
SSW	35825	13221	24045	169397	363735	379153
S	7806	5822	45842	72806	78978	92117
SSE	5020	17157	5324	14092	7380	19412
SE	1349	1619	1783	8292	4565	15152
ESE	3621	4905	2451	13355	6458	9075
E	20431	11472	7316	6923	1212	22384
ENE	55176	24453	16373	6004	3497	16057
NE	103165	57218	36202	23998	89972	24474
NNE	103048	74061	21522	7028	3633	10815

ATTACHMENT 2

C A P 8 8 - P C

Version 1.00

Clean Air Act Assessment Package - 1988

S Y N O P S I S R E P O R T

Non-Radon Individual Assessment
Jun 26, 1995 11:24 am

Facility: Advanced Medical Systems
Address: 1020 London Road
City: Cleveland
State: OH Zip: 44110

Effective Dose Equivalent
(mrem/year)

8.64E-03

At This Location: 100 Meters North
Source Category:
Source Type: Stack
Emission Year: 1995

Comments: Release from Evaporator

Dataset Name: ams-evaporator
Dataset Date: Jun 26, 1995 11:23 am
Wind File: WNDFILES\CLE1140.WND

MAXIMALLY EXPOSED INDIVIDUAL

Location Of The Individual: 100 Meters North
Lifetime Fatal Cancer Risk: 2.16E-07

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Dose Equivalent (mrem/y)
GONADS	9.69E-03
BREAST	8.79E-03
R MAR	7.56E-03
LUNGS	9.25E-03
THYROID	9.31E-03
ENDOST	7.88E-03
RMNDR	7.87E-03
EFFEC	8.64E-03

RADIONUCLIDE EMISSIONS DURING THE YEAR 1995

Nuclide	Class	Size	Source #1 Ci/y	TOTAL Ci/y
CO-60	Y	1.00	4.0E-05	4.0E-05

SITE INFORMATION

Temperature:	10 degrees C
Precipitation:	90 cm/y
Mixing Height:	1000 m

SOURCE INFORMATION

Source Number:	1
Stack Height (m):	2.00
Diameter (m):	0.25
Plume Rise Momentum (m/s): (Exit Velocity)	5.00E+00

AGRICULTURAL DATA

	Vegetable	Milk	Meat
Fraction Home Produced:	0.076	0.000	0.008
Fraction From Assessment Area:	0.924	1.000	0.992
Fraction Imported:	0.000	0.000	0.000

Food Arrays were not generated for this run.
Default Values used.

DISTANCES USED FOR MAXIMUM INDIVIDUAL ASSESSMENT

100

Advanced Medical Systems, Inc.
121 North Eagle Street • Geneva, Ohio 44041
(216) 466-4671 FAX (216) 466-0186

June 26, 1995

Mr. James Caldwell
Deputy Director
Division of Radiation Safety and Safeguards
U. S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60523-4351

Dear Mr. Caldwell:

In response to your June 9, 1995, letter regarding concerns of certain recent and past U. S. Nuclear Regulatory Commission License activities at Advanced Medical Systems, Inc.'s facility, the following are our responses:

ITEM I:

During the week of March 27, 1995, water was released to AMS' parking lot adjacent to the back loading dock area from hoses connected to outdoor tanks storing contaminated water.

Answer: During the week of March 7, 1995, the USNRC had personnel on site the entire time. The USNRC should have been able to gather information from their own personnel to address this concern, especially since USNRC personnel were sent specifically to observe and report on the water treatment process. If the USNRC personnel could not address this concern, what did they accomplish by being on site? The following were the events of the week of March 27, 1995:

3/26	Mobile lab arrives.
3/27	The following USNRC personnel were on site: John House, Mike Weber, and Keith Andre. The mobile lab was set up directly adjacent to the back loading dock area. USNRC personnel activities were related primarily to this area.
3/27-28	The USNRC mobile lab was broken into.
3/28	USNRC personnel were on site.
3/29	USNRC personnel were on site.

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3/30 USNRC personnel were on site. Northeast Ohio Regional Sewer District personnel were observed trespassing on AMS' property. The NEORSD personnel had to climb over a fence to gain access to the property. A police report was filed.

3/31 USNRC personnel were on site. The Cleveland Fire Department was summoned to fill the front sewer with hydrant water to restore a USNRC acceptable differential.

Furthermore, this situation was addressed with Jack Grobe of the USNRC during the week of March 27, 1995. The USNRC again needs to review their files. The revisiting of past concerns is a waste of USNRC time and licensee time.

AMS denies during the week of March 27, 1995, water was released to the AMS parking lot adjacent to the back loading dock area from hoses connected to outdoor tanks storing contaminated water.

The fire suppression system work during the week of March 27, 1995, was to incorporate changes into our fire suppression system requested by the Cleveland Fire Department. This included installing trip valves and sensors to allow pinpointing of the sprinkler activation. USNRC personnel again observed this work being done. The fire suppression system uses city water which AMS assumes is not contaminated. A description of the loading dock sump system is as follows:

> Water from the loading dock drains to a sump inside the loading dock door. The sump water is then pumped to the parking lot.

Once again, USNRC personnel have examined this system and viewed its operation. Furthermore, on May 3, 1995, Mike Weber from the USNRC made an unannounced visit to our facility and took samples of sump water and <u>incoming</u> fire suppression water. The USNRC should review their own sample results.

Does the USNRC have any evidence, such as documents or facts to support this allegation?

<u>ITEM II:</u>

In addition to the water discharges referred to above, AMS' discharged water contaminated with cobalt-60 directly from outdoor storage tanks into the area of its rear shipping dock.

<u>Answer:</u> AMS denies this allegation. Does the USNRC have any information supporting this allegation, such as dates, documents, or facts?

ITEM III:

In 1991, AMS submitted its Radiological/Contingency Emergency Plan to the Cleveland Fire Department and subsequently received comments from the Fire Department. However, AMS did not incorporate these comments in its final Emergency Plan. Moreover, AMS did not submit these comments to the NRC as required.

Answer: I am not aware that AMS must incorporate comments from first responders and other reviewers of its Emergency Plan into the document. USNRC regulations state only that the licensee should obtain input of offsite organizations. I have reviewed the prior Director of Regulatory Affairs files from 1991 and do not find any evidence of correspondence from the Cleveland Fire Department regarding the Radiological/Contingency Emergency Plan.

Does the USNRC have any information, documents, or copies of correspondence to support this allegation? If so, please forward the documents to us. It does not make any sense for the USNRC to withhold suggested improvements to our Emergency Plan from us.

Sincerely,

DAVID CESAR
Treasurer

DC/cs

cc: Dwight Miller, Esq.