U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Report No. 030-33078/96-001 Program Code 03620

Docket No. 030-33078

License No. 37-30020-01 Priority 5 Category E

Licensee: Biofor, Inc.
Post Office Box 629
Waverly, Pennsylvania 18471

Facility Name: Biofor, Inc.

Inspection At: RD 1, Route 632, Olyphant, Pennsylvania
Olyphant, Pennsylvania

Inspection Conducted: August 28, 1996

Inspectors: _____ 10/21/96
C. Thor Oberg, Health Physicist date

Approved By: _____ 10/23/96
John D. Kinneman, Chief date
Nuclear Materials Safety Branch 2
Division of Nuclear Materials Safety

Inspection Summary: Announced special safety inspection and confirmatory survey on August 28, 1996, (Inspection Report No. 030-33078/96-001).

Areas Inspected: Inspection included radiation surveys in the lower level of facility located at RD 1, Route 632, Olyphant, PA. Two laboratory areas (including two offices each), a Cell Biology Lab and a Pharmacology Lab; vault area for storage of chemicals plus chemical and radioactive waste; combined change room and library areas; conference room; maintenance and copier rooms; and access hallway were surveyed for fixed and removable radioactive contamination. These independent measurements were conducted to confirm the licensee's decommissioning closeout survey results documented in letters dated June 17 and 26, 1996, and attachments, and a FAX dated August 15, 1996, submitted by the licensee's contracted firm.

Results: No safety issues or violations were identified. No significant fixed or removable radioactive contamination was identified. No radioactive materials were detected or observed to remain in the licensee's facility, with the exception of an exempt cesium-137 source in a liquid scintillation counter.

DETAILS

1. Persons Contacted

   * Todd Mobley, Technical Services Supervisor, Applied Health Physics, Inc.

   * Present at Exit Interview

2. Background Information

   Biofor, Inc., (Biofor) was initially licensed by the NRC on March 18, 1993. The licensee was authorized by License No. 37-30020-01 to receive, possess, and transfer specific quantities of tritium (H-3) and carbon-14 (C-14) for research and development in a lower level facility at RD 1, Route 632, Olyphant, PA.

   On March 19, 1996, the licensee's Radiation Safety Officer (RSO), notified the NRC Region I office that Biofor had terminated her services and that about 200 microcuries (μCi) of H-3 and C-14 remained on site. On the same day, Region I personnel contacted the Vice President and General Manager (VP) of Biofor by telephone to clarify the situation. The VP stated that all licensed activities were to be discontinued.

   On May 22, 1996, Mr. Todd Mobley of Applied Health Physics, Inc., (AHP) informed Region I that AHP had been retained under contract to Biofor's Parent Company, Scherer Health Care of Atlanta, GA, to handle the decommissioning and license termination activities for Biofor. The contact individual at Scherer Health Care is Mr. Gary Ruffcorn, Director of Finance and Accounting (770-333-0066). Later that day, Mr. Ruffcorn called Region I to confirm that Scherer Health Care had contracted AHP for the decommissioning of the facilities and termination of the Biofor license.

   Mr. Mobley of AHP informed Region I on June 24, 1996, that they had completed clean-up and remediation efforts at the Biofor facility and that a written report would be forwarded to Region I. All radioactive materials and waste had been packaged and shipped for disposal at a licensed burial site. The report, dated June 17, 1996, was received by Region I on July 3, 1996, with a letter dated June 26, 1996, from AHP. This letter also included an executed NRC Form 314. A corrected copy of the Biofor survey data spreadsheet was received by FAX on August 15, 1996.

   Appendix C of the AHP report is a tabulation of the instruments available in the Biofor facilities. Among these is a Beckman LS6000SC Counter that contains a 30 μCi cesium-137 (Cs-137) source for calibration purposes. The source will remain in the counter at the facility until a determination of the disposition of the instrument is made by the parent company, Scherer Health Care. The source is exempt from NRC regulations.

3. Instrumentation used by Region for the Confirmatory Survey

   The following are the radiation survey and measurement instruments used for the NRC Region I confirmatory survey conducted on August 28, 1996, at the vacated Biofor facilities, Olyphant, Pennsylvania:

TABLE I

PORTABLE INSTRUMENTS USED ON-SITE
LUDLUM MEASUREMENTS, INC.
SURVEY RATE-METERS AND DETECTORS

MODEL NO.	NRC NO.	CALIB. DATE	PROBE	TYPICAL BKGD. ACTIVITY
No.19, MICRO R METER	33512	03/14/96	N/A	10 - 21 μrem/hr
No.3, Geiger counter	7765	03/14/96	end window GM	(not used)
IBID	120895	08/23/96	#44-9 pancake	.02-.04 mrem/hr

TABLE II

REMOVABLE ACTIVITY (WIPE) MEASUREMENTS
CONDUCTED AT THE REGION I LABORATORY

INSTRUMENT TYPE	ACTIVITY MEASURED	TYPICAL BACKGROUND ACTIVITY
Liquid Scintillation Counter	H-3	~6.0 cpm
	C-14	~14.4 cpm
Proportional counter	gross beta	~1.1 cpm

4. Surveys Conducted and Results

A. **Radiation Levels, Gamma Dose Rates:** The Micro R Meter was used to determine the dose rate throughout the facility with the instrument held at waist level and within two to three feet from walls, benches, and equipment. The results of this survey were influenced by natural radiation from construction materials and/or the natural environment external to and beneath the building. The general radiation levels in the licensee's facilities ranged from 18 to 24 micro rem per hour (μrem/hr). Dose rates measured in the stairwell area going up to the street level were 10 to 15 μrem/hr while dose rates in the conference room, raised two steps above the hallway and laboratory areas, varied between 20 and 21 μrem/hr.

The licensee was authorized for, and used only, H-3 and C-14 in millicurie amounts. Because neither of these radionuclides are gamma emitters, the dose rates measured with the Micro R Meter were not the result of the Biofor licensed operations.

No significant gamma radiation above natural background levels were detected.

B. **Fixed Activity Contamination Levels:** The Ludlum 3 rate meter and the Ludlum No. 44-9, pancake type, Geiger-Muller (GM) detector combination was used to determine fixed radioactive contamination. Floors, walls, laboratory benches, sinks and drain boards, miscellaneous laboratory equipment and furniture, and other extraneous [illegible]s were surveyed with this instrument.

The instrumentation was calibrated at the Region I facilities, on August 23, 1996, using NRC calibration source set No. 63 containing technetium-99 (Tc-99), cesium 137 (Cs-137), and thorium-230 (Th-230) traceable standard sources. The rate meter scale readings were in millirem per hour (mrem/hr) and the detector probe area was measured to be ~20 square centimeters (cm^2). The calibration conversion factor was calculated in disintegrations per minute, per mrem/hr, per 20 cm^2 (dpm / mrem/hr / 20 cm^2). The conversion factor was determined to be:

1.4 E4 dpm-hr/mrem-20cm^2

Measurements made with this unit ranged from 0.02 to 0.05 mrem/hr. The net activity indicated by these readings (0.05 mrem/hr - 0.04 mrem/hr background) of 0.01 mrem/hr, corrected to the activity level for 100cm^2 of surface area, was calculated to be 700 dpm/100cm^2. Because the measurements obtained may reflect a contribution from natural radiation levels, a more realistic evaluation could be made by averaging both the background and the measurement readings. Thus, the net measurement would be 0.005 mrem/hr and the average surface area activity calculates to be 350 dpm/100cm^2. A statistical variation for this value can be calculated as 350 (±1,050) dpm/100cm^2.

Based on the limits established in Table 1 of the NRC Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material (NRC Guidelines), no fixed beta-gamma surface contamination levels exceeded the average limit of 5,000 dpm/100cm^2.

The average and maximum radiation levels measured with this instrument did not exceed the 0.2 mrem/hr average at 1 cm or 1.0 mrem/hr maximum at 1 cm measured through <7 milligrams (mg)/cm^2 of total absorber. No levels greater than 0.05 mrem/hr were observed for measurements made in contact with surfaces. The results of wipe samples taken from several of these surfaces for removable activity measurements (Section 4. C.) are indicative that the observed activity levels are not from loose contamination.

C. **Removable Activity Contamination Levels:** The inspector conducted surveys for removable radioactive contamination by the use of 42.5 cm diameter, filter paper wipe samples. Wipes were taken over an area of at least 100 cm^2 from furnishings and equipment surface in laboratories, the hallway, and other spaces where licensed materials were used or stored. A total of 32 wipes were obtained. Of these, 17 wipes were taken dry and 15 were taken wet and deposited directly into Liquid Scintillation

Counter (LSC) vials, containing 10 milliliters of water, and capped. The wet wipes were taken specifically for the determination of H-3 and to ensure retention of this usually volatile radionuclide.

The wipe samples were returned to Region I and were submitted for analyses on August 30, 1996. The analytical results were completed on September 17, 1996, and were reviewed and evaluated by the inspector.

The dry wipe samples were initially counted in a proportional counter to determine the gross beta activity. These wipes were subsequently deposited in LSC vials, with an appropriate amount of scintillation cocktail solution, and counted in the LSC.

The wet wipe samples, to which scintillation cocktail solution was also added, were counted directly for the determination of H-3 and C-14.

From the results of counting all of the wipe samples, the highest activity was determined from the wet wipes. The highest removable H-3 activity was measured as 11 (± 12) dpm/100cm² or 1.1 (± 1.2) % of the Guideline limit. The highest removable activity level for C-14 was 11 (± 3) dpm/100cm² or 1.1 (± 0.3) % of the limit specified by the NRC Guidelines. None of the wipe sample activity levels exceeded the limits outlined in Table 1 of the NRC Guidelines for removable contamination levels, 1,000 dpm/100cm² for beta-gamma emitters (except strontium-90). The H-3 activity was from a floor wipe in the Cell Biology Lab inside a refrigerator in the Instrument Room area. The refrigerator had been used for storage of radioactive materials. The high C-14 activity was from a wipe of the floor in the Cell Biology Lab where AHP personnel found and remediated a detectable level of contamination.

No safety issues or violations were identified.

5. Facility Observations

During the confirmatory survey of these facilities, the inspector noted that the licensee had left the place in an apparent hurry. The laboratory areas, although neat, appeared to be in use or ready for use. The general appearance of the laboratories was as though personnel had just left for lunch or for the day and never returned. All types of laboratory glassware, chemicals, equipment, and instruments remained in place ready for use.

Although no significant amount of contamination was found, AHP personnel had removed the HEPA filters, and some interior sections, from the fume hood located in the Cell Culture Room area of the Cell Biology Lab. The removed items were packaged and disposed of as radioactive waste by AHP. This was done as a precautionary measure in case undetectable contamination was incorporated in or on the items.

No safety issues or violations were identified.

6. Exit Interview

On August 28, 1996, the inspector completed the confirmatory survey of the Biofor, Inc., vacated facilities Inc., and held an exit interview with Mr. Todd Mobley of AHP. Mr. Mobley was informed that the inspector found no significant levels of radioactive contamination and no residual radioactive materials during the survey conducted with direct reading instruments. The wipe samples, taken to determine removable radioactive contamination, will be analyzed at the Region I office facilities and the results will be made available when the analyses are completed.

The disposition of the Cs-137 calibration source remaining in the Beckman liquid scintillation counted was questioned by the inspector. According to Mr. Mobley, the source will be removed and returned to Beckman. He will contact the manufacturer for specific information that may be required for shipping. He further stated that AHP is authorized by their license (No. 37-14600-01) to perform these services.