LOGGING & PERFORATING SERVICES FOR THE OIL & GAS INDUSTRY

SHELWELL SERVICES, INC.

447 Lakeshore Drive, West
Hebron, Ohio 43025
Phone 614 928-2501

September 15, 1985

U. S. Nuclear Regulatory Commission
ATTN: George McCann
Region III
799 Roosevelt Road
Glen Ellyn, Illinois 60137

RE: Additional information
Required on renewal
application dated 6-21-84.
License No. 34-10445-01

Mr. McCann,

This information is submitted in regards to the 9 items of additional information that we discussed at our meeting at Region III on 7-31-85. The information was needed in order to complete the review of our license renewal application dated 6-21-84.

Paul D. Miller

Paul D. Miller
Radiation Safety Officer
Shelwell Services, Inc.

Item #1

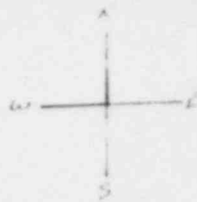
Shelwell Services, Inc.
645 East Main St.
Hebron, Ohio 43025

Shelwell Services Inc.
State Route 15 East
Fairfield, Illinois 62837

Shelwell Services, Inc.
One mile north on State route 45
on east side of highway.
Rock Creek, Ohio 44084

A-250 feet to nearest occuoied trailer.

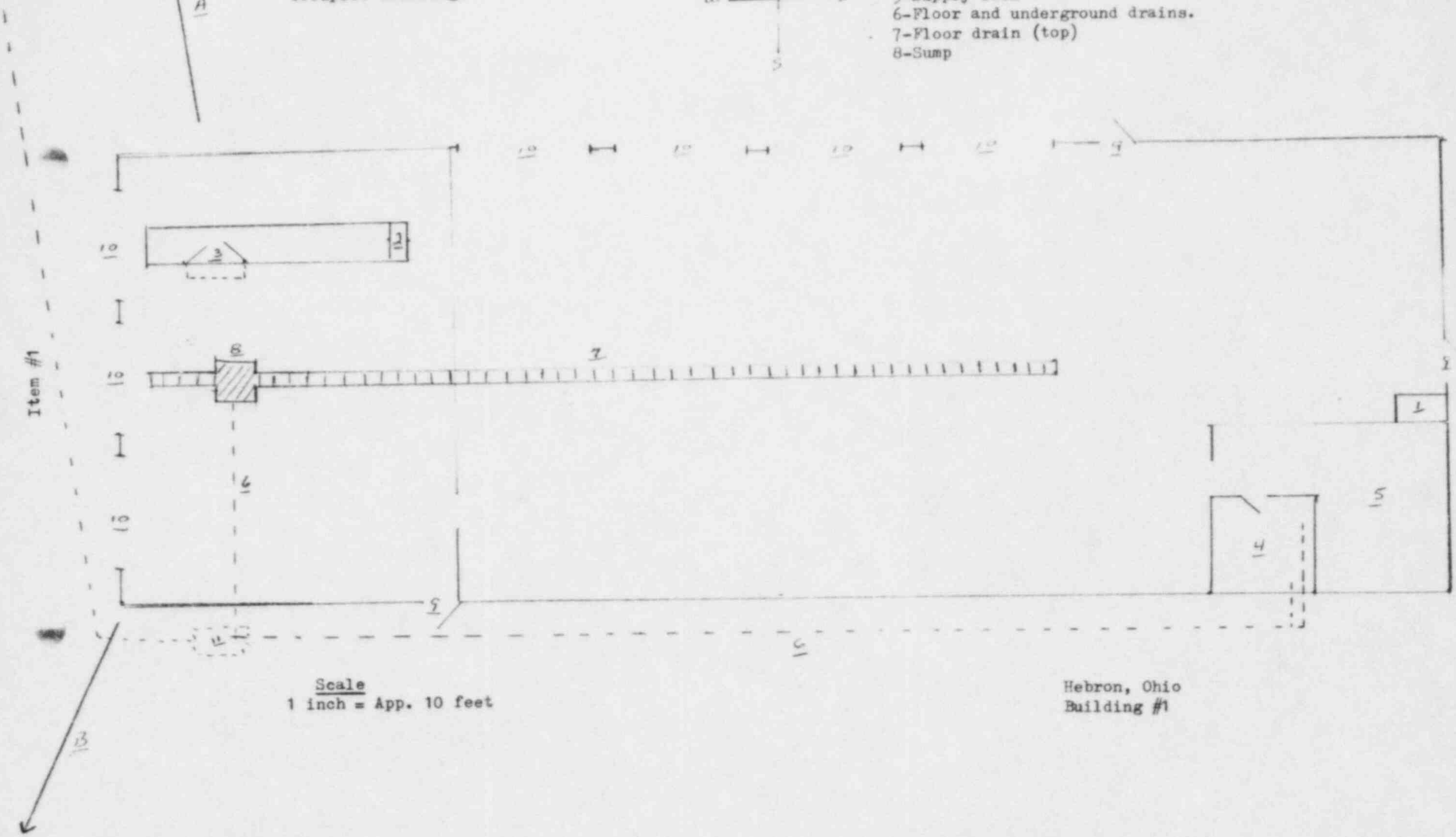
B-500 feet to nearest occupied dwelling.



1-Steel safe RA storage.
2-RA storage wells.
3-RA waste storage.

4-Rest room.
5-Supply room
6-Floor and underground drains.
7-Floor drain (top)
8-Sump

9-Outside walk-in doors.
10-Overhead truck stall doors.
11-Grease trap.

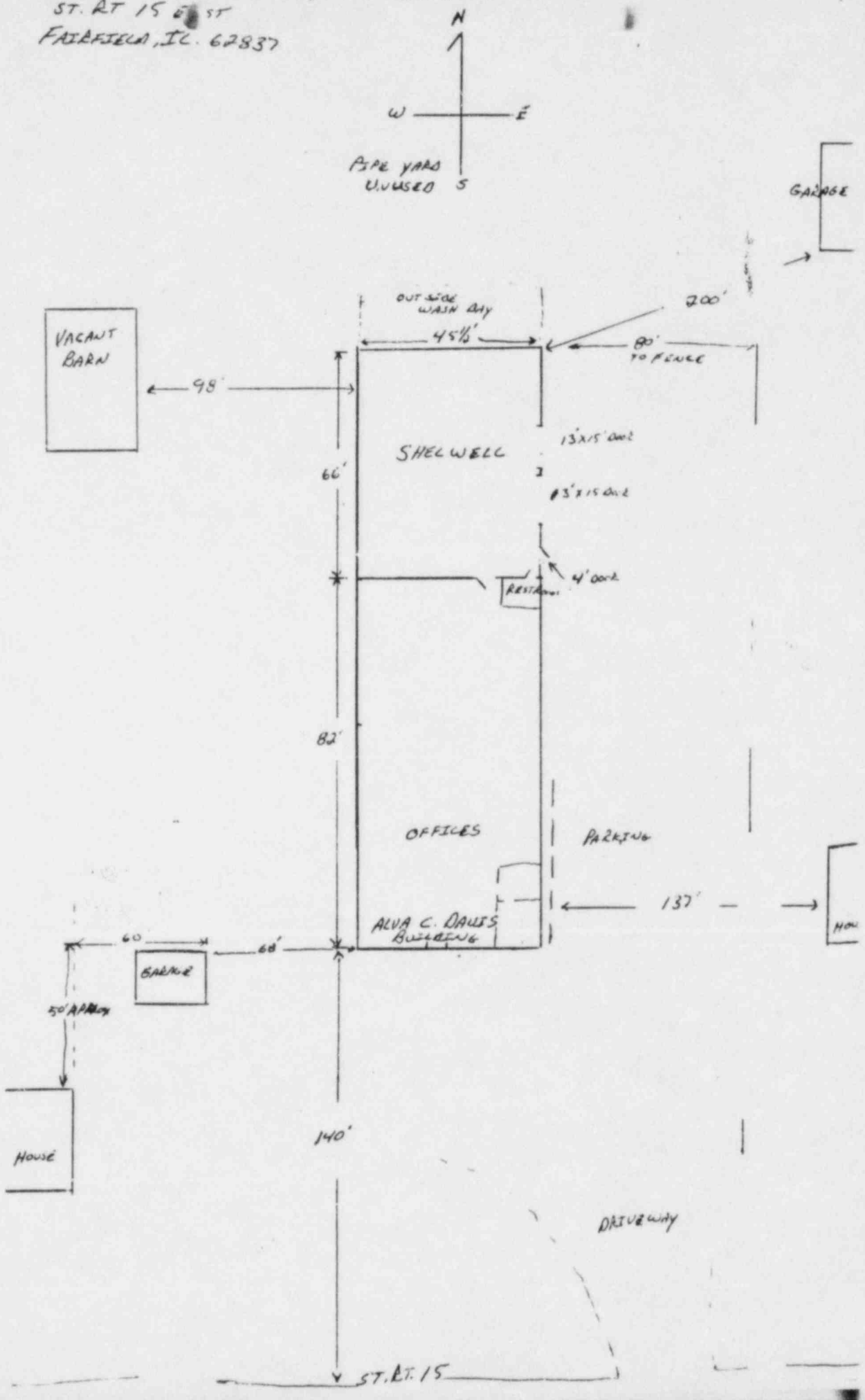


Scale
1 inch = App. 10 feet

Hebron, Ohio
Building #1

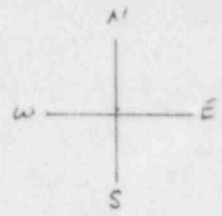
SHELWELL SERVICES, INC.
ST. RT 15 E ST
FAIRFIELD, IL. 62837

Item #1

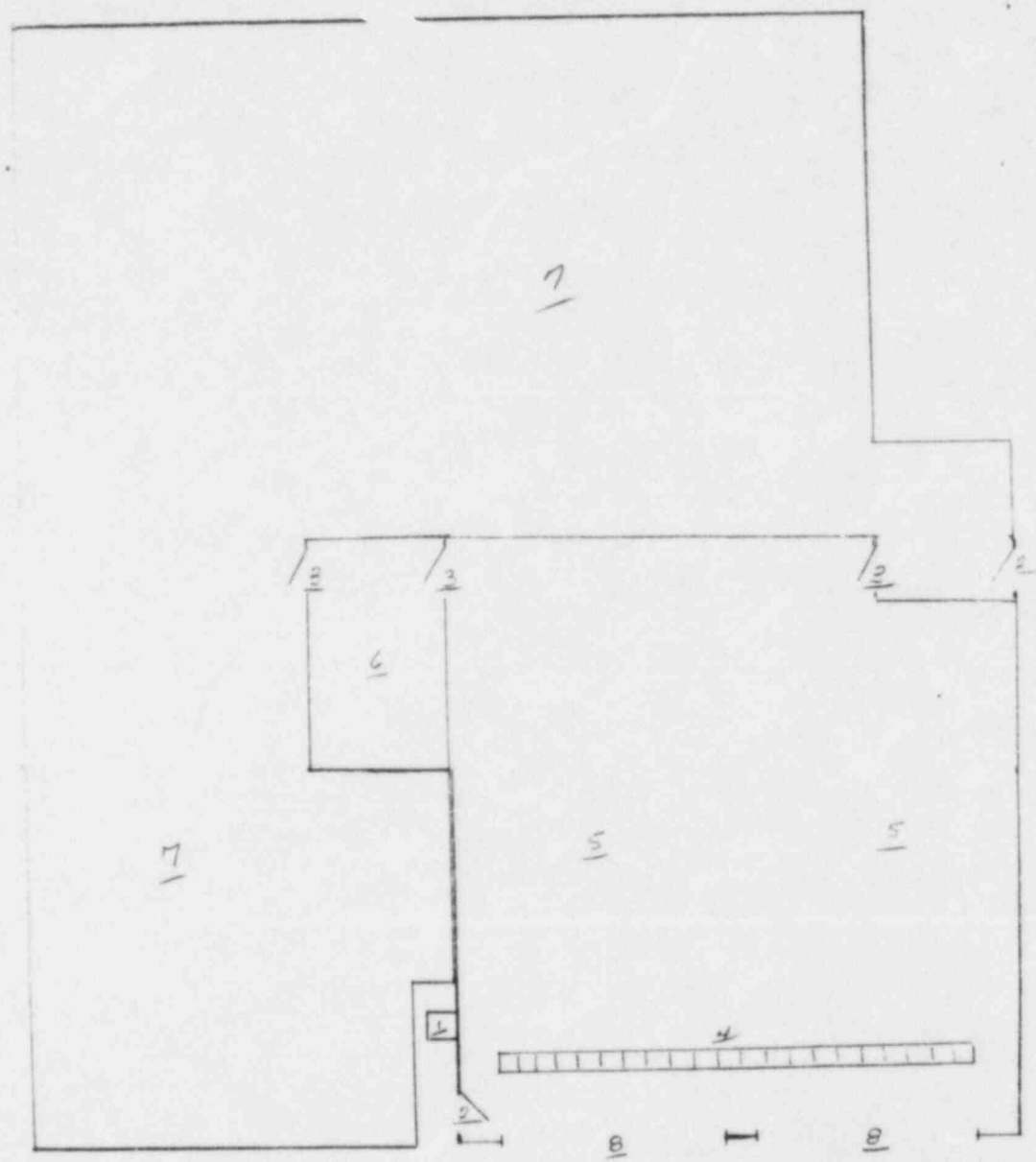


Item #1

Shelwell Services, Inc.
State Route 45 North
Rock Creek, Ohio 44084

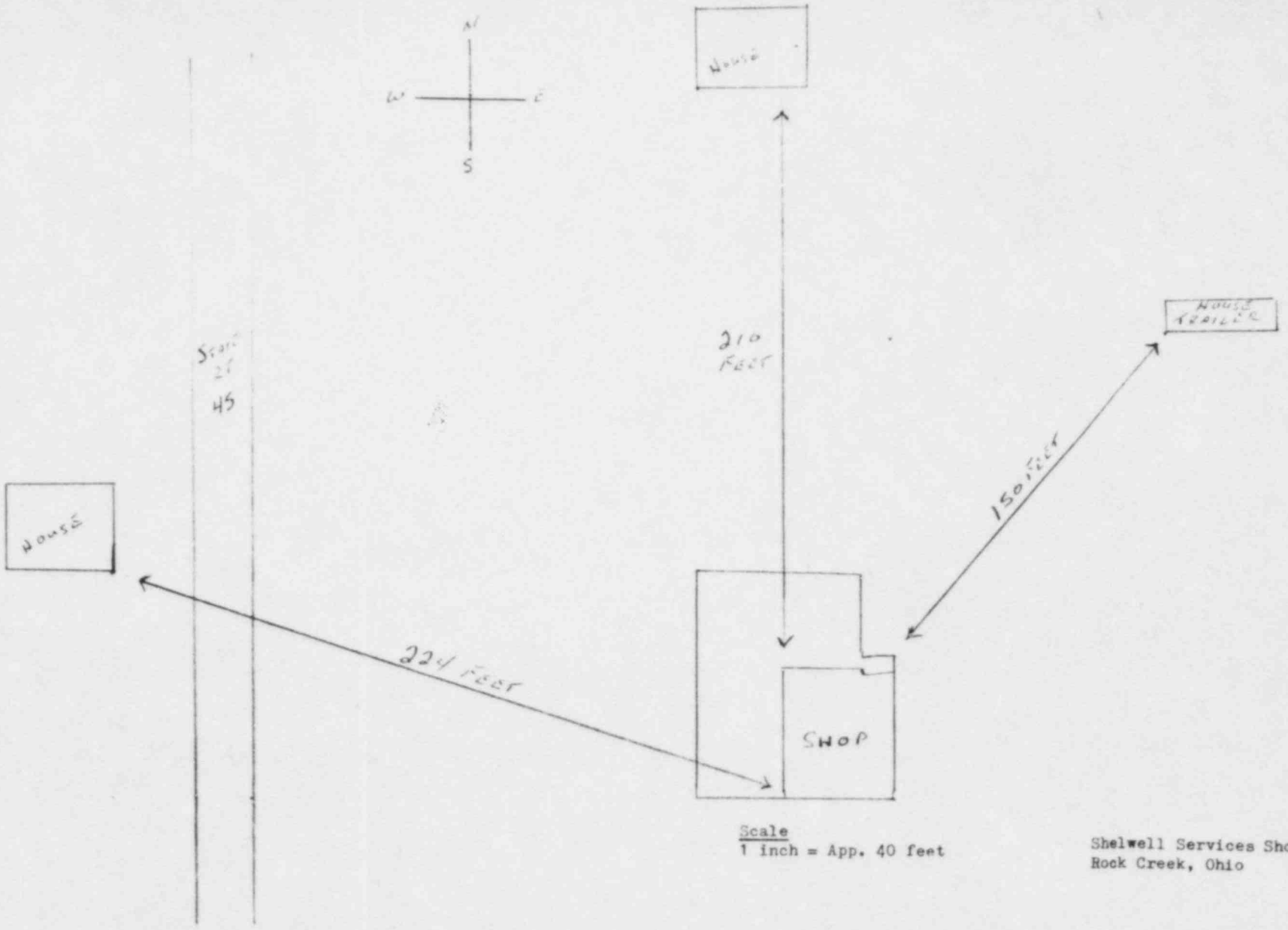


Scale
1 inch = App. 10 feet



1-Radioactive Tracer Material Storage Well
2-Outside Walk-in Doors
3-Interior Walk-in Doors
4-Floor Drain
5-Truck Bays
6-Office
7-Storage Area (Used By Owner)
8-Overhead Truck Stall Doors

Item #1



Scale
1 inch = App. 40 feet

Shelwell Services Shop
Rock Creek, Ohio

Item #2

We would like to have the opportunity to develop our own in hou training program covering "Radiation Safety Training" for our employe Paul Miller, the Radiation Safety Officer, will be responsible for and give the training to each of our employees. Mr, Miller has been with the company for 18 years and has served as the Radiation Safety Officer for the past 7 years.

Submitted as a part of this item is a list of the training Mr. r has received along with outlines covering the training programs to b ven logging supervisors and their assistants.

Along with the 18 years of O. J. T. Mr. Miller has satisfactori completed a five day course on "Radiological Safety Orientation and Fundamentals of Health Physics" given at Bethel Park, Penn. by App! Health Physics under DR. Robert G. Gallaghar.

In addition, Mr. Miller has had training in the following area r Mr. James Lewis, health physist for Wright Patterson Air Force Base on, Ohio.

A. Radiation Protection Problems.
B. Radiation Detection Equipment.
C. Radiation Exposure Records.
D. Source and area monitoring and identification.
E. Radiation mathematics and calculations.
F. Regulations governing access control into restricted areas

Our training program for assistant logging supervisors is an 8 course that covers the items listed in the Guide for the preparatio applications for the use of radioactive materials in well-logging op ions under Item 10.3.1 Training Requirements that states, each individu st have read or received instructions in our operating and procedures and demonstrated an understanding therwof. He also must demonstra etence to use, under the personel supervision of the logging supervisor, rces of radiation, related handling tools, and radiation survey instrume nich will be used on the job. In addition to the formal training each in dual must have a minimum of 520 hours (13 weeks) of OJT before being consi ered for the position of logging supervisor. This training must be under the direct supervision of a person listed on our materials license as a logging supervisor.

Item #2

Our training program for logging supervisors will be a 32 hour course that will cover the subjects listed in item #7 of the license application plus instructions in the commitments in our application and conditi of the NRC issued license.

Item #21

Applied HEALTH PHYSICS inc.

2986 Industrial Blvd. • Box 197 • Bethel Park, Pa. 15102 • Phone 412 • 563-2242

October 24, 1983

Mr. Paul Miller
SHELWELL SERVICES
447 Lakeshore Drive, West
Hebron, OH 43025

Dear Mr. Miller,

We congratulate you for having successfully completed the 40-hour Basic Radiological Safety Course on Ionizing & Nonionizing Radiation for Radiation Safety Officers (RSO) which was given in Bethel Park, PA, September 19-23, 1983. In the opinion of our staff, you have proved yourself capable of assuming the responsibility to serve as RSO for your organization and we are happy to present you with the enclosed certificate.

When you assume responsibilities as an RSO, please remember to make certain you also have a clear, concise, written policy statement from yo management that provides you with the necessary degree of authority to implement your management's safety policies and written operating proce Mere compliance with current regulatory requirements will not necessari protect you and your organization from experiencing unnecessary losses of time, money and reputations for alleged infractions of accepted radiolo safety practices and procedures. Periodic audits of your organization' radiation safety program, record system and procedures manual by indepe certified professionals (e.g. persons currently certified by the Americ Board of Health Physics) are as essential to assuring effective manage of your safety program as the annual audit of your company's financia programs by an independent certified public accountant (CPA).

Again, let me express the congratulations and appreciation of our staf the fine record you set in our training program and remind you that we welcome telephone calls and letters from you at any time. If there is way in which we can be of assistance, please remember, we are only a ph call away and it will be a pleasure to have the chance to continue a ver enjoyable and mutually beneficial relationship.

Sincerely yours,

APPLIED HEALTH PHYSICS, Inc.

Robert G. Gallagher, CHP, PE
President

Enclosure

RGG/ljh

Nice work, Paul! -
OBS

Item #21

CERTIFICATE OF RADIOLOGICAL TRAINING

This is to certify that PAUL MILLER

completed the course of training entitled

CONTROL OF IONIZING and NONIONIZING RADIATION
for
RADIATION SAFETY OFFICERS (RSO)

presented at SHERATON SOUTH HILLS, BETHEL PARK, PA

Certified RSO on September 23, 1983 2 2/3 Continuing Education Units (CEU)

Certificate No. 8309-015 This Certificate Expires 10-23-85

Applied HEALTH PHYSICS inc.
Bethel Park, Pennsylvania

Robert G. Gallagher, CHP, CSP
DIRECTOR OF TRAINING

Item #2

ACKNOWLEDGMENTS

This syllabus contains copies of many documents tha were originally prepared by various members of the staff of t Bureau of Radiological Health, Food and Drug Administration, U. S. Department of Health and Human Services. The Bureau of Radiological Health (BRH) develops and provides national progra designed to control unnecessary human exposure to potentially hazardous ionizing and nonionizing radiations and to ensure the safe and efficacious use of radiation. BRH also provides technical assistance to a variety of national and international organizations including the World Health Organization. We are grateful for the cooperation and assistance we have received from Mr. John C. Villforth, Director of BRH and from many members of his staff in the preparation and presentation of our radiological safety training courses.

We also wish to acknowledge the contributions that Dr. Joseph Kielman has made to this syllabus on the subject of nonionizing radiation.

Our health and safety training efforts began in 1962 and have continued to improve and expand in response to request from our clients in the United States, Canada and Mexico. The assistance we have received from numerous officials of federal and state agencies; members of professional and technical organizations, friends, colleagues, and the staff of AHP has made each syllabus and course better. We will continue to revise and improve all aspects of our training efforts. We firmly believe that training in health and safety is an essential investment of time and resources to ensure that the benefits from using radiation will exceed the risks. We hope you will join us in these efforts by giving us any suggestions that will improve the quality and value of our training programs.

Robert G. Gallaghar, PE, CHP
President

Item #2

RSO COURSE OUTLINE AND SCHEDULE

MONDAY

	Lecture #	Topics
9:00-10:00 a.m.		Introductions, description of course, and distribution of training materials
10:00-11:00 a.m.	1	Natural Radioactivity & Environmental Sources of Radiation
11:00-12:00 p.m.	2	Applications of Radiation and Radioactivity
12:00-1:00 p.m.		LUNCH
1:00-2:00 p.m.	3	History of Adverse Effects of Radiation
2:00-2:45 p.m.	4	Philosophy of Radiation Control
2:45-3:00 p.m.		COFFEE, TEA, OR COKE BREAK
3:00-4:00 p.m.	5	Safety Standards & Regulatory Control of Ionizing Radiation
4:00-4:30 p.m.	6	Units, Terms and Definitions
4:30-5:00 p.m.		Review and Discussion Schedule private review of your radiation safety program***

TUESDAY

9:00-10:30 a.m.	7	Atomic and Nuclear Stuctures and Radioactivity
10:30-10:45 a.m.		COFFEE OR TEA BREAK
10:45-12:00 p.m.	8	Radioactivity & Ionizing Radiation
12:00-1:00 p.m.		LUNCH
1:00-2:30 p.m.	9	Interaction of Radiation with Matter
2:30-2:45 p.m.		COFFEE, TEA, OR COKE BREAK
2:45-4:30 p.m.	10	Instrumentation for the Detection and Measurement of Ionizing Radiation

Item #2

RSO COURSE OUTLINE AND SCHEDULE

WEDNESDAY

	Lecture #	Topics
8:30-9:00 a.m.		QUIZ #1
9:00-10:30 a.m.	11	Radiation Shielding & Use of Inverse Square Law
10:30-10:45 a.m.		COFFEE OR TEA BREAK
10:45-12:00 p.m.	12	Biological Effects of External Radiation
12:00-1:00 p.m.		LUNCH
1:00-2:00 p.m.	13	Biological Effects of Internal Radiation
2:00-2:30 p.m.		COFFEE, TEA OR COKE BREAK
2:30-5:00 p.m.	14	Health Physics Lab Exercises and Demonstrations

THURSDAY

8:30-9:00 a.m.		QUIZ #2
9:00-10:00 a.m.	15	Personnel Monitoring
10:00-10:15 a.m.		COFFEE OR TEA BREAK
10:15-11:15 a.m.	16	Audit, Evaluation & Control of Radiation Risks
11:15-12:00 p.m.	17	Documentation & Effective Management of a Radiation Safety Program
12:00-1:00 p.m.		LUNCH
1:00-2:00 p.m.	18	Management of Emergencies, Incidents and Crises
2:00-2:15 p.m.		COFFEE, TEA OR COKE BREAK
2:15-3:30 p.m.	19	Packaging & Transportation of Radioactive Materials
3:30-4:00 p.m.	20	Disposal of Radioactive Mat'ls.
4:00-5:00 p.m.	21	Laser Safety

Item #2

RSO COURSE OUTLINE AND SCHEDULE

FRIDAY

	Lecture #	Topics
9:00-10:30 a.m.	22	Radiofrequency & Microwave Radiation Measurement and Control
10:30-10:45 a.m.		COFFEE OR TEA BREAK
10:45-12:00 p.m.	23	Ultraviolet, Ultrasound, and Infrared Measurement & Control
12:00-1:00 p.m.		LUNCH
1:00-2:00 p.m.		Summary & Distribution of final exams

*AHP's Office Telephones: Pittsburgh, PA (412) 563-2242; Albany, NY (518) 4[illegible]74; Washington, DC (301) 469-9135 (Pittsburgh & Albany are 24-hour day service).

Item #2

Training Course For Assistant Logging Supervisors

V. Reference Material

1. Shelwell Services, inc. Operating and Procedures Manual.
2. Manual of Radiation Safety. Support Consultants & Assoc[illegible], Inc.
3. Fundamentals of Health Physics. Applied Health Physics.
4. Radiation Safety Training Manual for Well Loggers. Gulf [illegible]ar, Inc.
5. Nuclear Regulatory Commission materials license No. 34-1[illegible]1
6. Radiological Health Handbook. U. S. Dept. of Health. Edu[illegible]ion, and Welfare.

Item #2

Assistant Logging Supervisor Examination

Name_____

1. When questions pertaining to our operating and emergency proced
   arise, who must be contacted? _____
2. List three methods used to help keep exposure rates below allowable limits.
   1._____
   2._____
   3._____
3. List the surveys that must taken at the temporary job site.
   1._____
   2._____
   3._____
   4._____
4. How do we maintain security over the radioactive sources?

5. How do we determine the amount of radiation each person has ab
   _____
6. What should you do if you lose your film badge?
   _____
7. Why is it necessary to survey each truck before leaving the shop
   _____
8. What information should be given to the RSO regarding a highway accident?

9. List four of the records maintained by the RSO.
   1._____
   2._____
   3._____
   4._____
10. At what intervals should the maintenance inspection be made?
    _____
11. How soon should the survey on a radioactive shipment be made?

12. Who is responsible for taking the surveyss pertaining to trace es?
    _____

13. List the three most important considerations for protection from radiation.

1._____

2._____

3._____

14. Define "stay time"

15. What does the term half-value-layer mean?

16. Using the "Inverse Square Law" determine the intensity at a point 3 feet from a given source when the intensity at 1 foot is 18 Mr/h.

_____

17. What items of clothing should be worn when handling radioactive material?

_____

18. What is stated in our commitment to the NRC regarding radioactive source holders?

19. List the five different types of radioactive material covered by the materials license.

1._____ 4._____

2._____ 5._____

3._____

20. List the maximum amounts of each tracer material covered by the license.

21. What types of survey meters will be used when making surveys?

1._____ 2._____

22. What is the reason for a "thin window" on a survey meter?

23. When calibrating a survey meter, where should the calibrating checks be made?

24. What does the term "block out" mean?

25. What type of meter should be used when measuring a radiation field of:

1. High intensity_____ 2. Low intensity_____

RADIATION TRAINING FOR WELL LOGGING SUPERVISORS

Time

I. FUNDAMENTALS OF RADIATION SAFETY — 6 Hr

- A. Characteristics of Radiation.
- B. Units of Radiation Dose and Quantity of Radioactivity.
- C. Hazards of Exposure to Radiation.
- D. Levels of Radiation from Licensed Material.
- E. Methods of Controllong Radiation Dose.
  1. Time.
  2. Distance.
  3. Shielding.

II. RADIATION DETECTION INSTRUMENTS TO BE USED — 2 Hr

- A. Use of Radiation Survey Instruments.
  1. Operation.
  2. Calibration.
  3. Limitations.
- B. Survey Technics.
  1. Truck Surveys.
  2. Site Surveys.
  3. Shop Surveys.
  4. Type of Instrument to be used.
- C. Use of Personnel Monitoring Equipment.
  1. Film Badge.
  2. Pocket Dosimeters.

III. EQUIPMENT TO BE USED — 4 Hr

- A. Handling Equipment and Remote Handling Tools.
  1. Clothing.
  2. Remote Handling Tools.
  3. Use.
- B. Licensed Material.
  1. Radioactive Sources.
  2. Radioactive Tracer Material.
- C. Storage, Control, and Disposal of Equipment and Licensed Material.
  1. Storage.
  2. Control.
  3. Disposal.
- D. Operation and Control of Equipment and Licensed Material.
- E. Maintenance of Equipment.

IV. THE REQUIREMENTS OF PERTINENT FEDERAL AND STATE REGULATIONS — 4 Hr

V. OPERATING AND EMERGENCY PROCEDURES 4 Hr

A. Description of the Radiation Protection Program.

B. Guidelines for the Control of Radiation Exposure.

C. Emergency Procedures and Guidelines.

D. Release of Facilities and/or Equipment for Unrestricted

E. Transfer and/or Disposal of Radioactive Materials.

F. Safety Operating Procedures.

VI. THE LICENSEE'S RECORDKEEPING PROCEDURES

VII. CASE HISTORIES AND POTENTIAL CONSEQUENCES OF ACCIDENTS IN WELL-LOGGING OPERATIONS

VIII. TRANSPORTING RADIOACTIVE MATERIALS

A. Identification.

B. Packaging.

C. Loading Requirements for RAM Shipments.

D. Other Sections to Note:

1. Shippers Responsibility.
2. Definitions.
3. Contamination Control.
4. General Transportation Requirements.
5. Immediate Notice of Certain Hazardous Materials Incidents.
6. Accidents; Radioactive Materials.

IX. REVUE AND EXAMINATION

IX. Reference Material.

1. Shelwell Services, Inc. Operating and Procedures Manual.
2. Manual of Radiation Safety. Support Consultants & Associates, Inc.
3. Fundamentals of Health Physics. Applied Health Physics.
4. Radiation Safety Training Manual for Well Loggers. Gulf Nuclear, Inc.
5. Nuclear Regulatory Commission material license No. 34-10448-01.
6. Radiological Health Handbook. U. S. Dept. of Health, Education, and Welfare.
7. Preliminary Case Study Report on the Breaching of the Encapsulation of Sealed Well Logging Sources. Office for Analysis and Evaluation of Operational Data. Prepared by Samuel L. Pettijohn.

Item #2

Following is an outline Bureau of Radiological Health video tape covering item I, Fundamentals of Radiation Safety, parts A., B., and C.

		Time
1.	A is for atom.	[illegible] Minutes
2.	Biological effects of ionizing radiation. Basic concepts and history.	[illegible] Minutes
3.	Biological effects of ionizing radiation. Determinants of radiation injury and the acute radiation syndrome.	[illegible] Minutes
4.	Biological effects of ionizing radiation. Long term effects. Part I.	[illegible] Minutes
5.	Biological effects of ionizing radiation. Long term effects. Part II.	30 Minutes
6.	Inter action of radiation with matter.	36 Minutes
7.	Decontamination of the nuclear medicine laboratory.	22 Minutes
8.	The roentgen.	[illegible] Minutes

Item #2

WELL LOGGING SUPERVISOR EXAMINATION

Name_____

1. What does the term "ALARA" mean?

2. What are permissable exposure limits for occupational workers per quarter_____, per year_____?

3. What are the most important considerations for protection from rad n?
   1._____ 2._____ 3._____

4. How many hours per day could you work in a 3 Mr/h area and still stay under your permissable limits in a 13 week period? _____

5. What is the definition of the term "STAY TIME"?

6. What is the meaning of a half-value layer?

7. How much lead is considered to be a half-value layer when shielding a Cs-137 source? _____

8. What type of survey meter should be used in a low intensity radiation field? _____

9. What does the term "BLOCK OUT" mean?

10. What type survey meter should be used when this condition exists?
    _____

11. List the surveys required to be taken at temporary job sites.
    1._____ 2._____ 3._____
    4._____ 5._____

12. How do we determine the amount of radiation we have been exposed to
    _____

13. What three items of clothing are required when handling radioactive material?
    1._____ 2._____ 3._____

14. What are the two main purposes for using remote handling tools when handling radioactive material?
    1._____ 2._____

15. List the five isotopes permitted under our NRC materials license.
    1._____ 2._____ 3._____
    4._____ 5._____

16. Define the following.
    1. Radiation area
    2. High Radiation area

17. What type of sign must be placed on all radioactive material storage areas?

_____

18. How many hours can be spent in a 2.5 Mr/h area and still be under permissable limits during the following?

1. Per quarter_____ 2. Per year_____

19. What is the permissable non-occupational exposure limit per year?

_____

20. What should be done if your film badge is lost or damaged?

21. Why is it important that a survey be taken on each truck before loading for a temporary job site?

22. Who should be notified if violations of NRC, DOT or license conditions are suspected?

1._____ 2._____

23. What is the radiation intensity limit at one foot from all storage areas?

_____

24. How often should storage areas be monitored?

_____

25. When should portable survey meters be calibrated?

26. During calibrations, at what point should the calibrating area be identified?

27. What information must be posted on each survey meter?

28. What should be done with clothing if it becomes contaminated during a tracer study?

29. What radiation intensity requirements must be met before releasing a temporary job site for unrestricted use?

30. When should sealed radioactive sources be leak tested?

31. How soon should a shipment of radioactive material be monitored?

32. When a source is lodged downhole and there is evidence of source damage, who is to be notified?

33. If an accident occurs during transportation, what are the Well Logging Supervisor's responsibilities?

34. What are two primary concerns whenever there is an accidental release of radioactive material?

1._____ 2._____

35. When at a temporary job site, what is the minimum distance a person who is not directly involved in the operation be required to remain at?

_____

36. When should the radioactive source be removed from the shielded container?

37. With the control of radiation exposure in mind, what primary concern will be accomplished by following our safety operating procedures?

38. Which region of the Nuclear Regulatory Commission does the State of Ohio fall under?

_____

39. What is the proper shipping name for the radioactive sources that we transport?

_____

40. What is the DOT identification number?

_____

41. What class label is required for the following sources?

1. AmBe-241_____ 2. Cs-137 (2 Ci)_____ 3.
3. Cs-137 (125 mCi)_____

42. List five entries that must be included on the shipping papers.

1._____ 2._____
3._____ 4._____
5._____

43. Define "Transport Index".

44. What two conditions determine which of the following labels are adequate when transporting radioactive materials?

1.	RA-Yellow I	a.	TI_____	b.	Surface_____
2.	RA-Yellow II	a.	TI_____	b.	Surface_____
3.	RA-Yellow III	a.	TI_____	b.	Surface_____

45. What three items of information must be listed on the radioactive shipping label?

1._____ 2._____ 3._____

46. What is the total amount of activity authorized for shipment for each radionuclide listed?

1. AmBe-241_____ 2. Cs-137_____ 3. I-131_____
4. Ir-192 _____ 5. Sc-46 _____

47. What are the maximum radiation intensities permissable when transporting radioactive material under normal conditions?

    1. Surface_____ 2. TI_____

48. What are the maximum radiation levels permissable in any normally occupied position in the vehicle?

    _____

49. Define "Non-fixed radioactive contamination".

50. Define "A-1" and "A-2".

Item #3

The Radiation Safety Officer, Or his assistant, will conduct at a minimum, one unannounced, onsite inspection per year per logging supervisor that is working out of our Hebron, Ohio facility. Logging supervisors at our field stations at Fairfield, Illinois and Rock Creek, Ohio due to driving and the possibility of the supervisor being on a temporary job site, will be inspected, at a minimum, one time every 18 months.

These unannounced inspections will include but not be limited to:

1. Well site surveys required.
2. Establishing radiation areas.
3. Use of remote handling tools.
4. Records to be maintained at the job site.
5. Overall safety awareness.

Items to be audited at intervals not to exceed 6 months will include:

1. Survey instrument calibrations.
2. Leak tests.
3. Source inventory.
4. Utilization records.
5. Inspection and maintenance records.
6. Training records and test results.
7. Personnel monitoring records.
8. Shop survey records
9. Source and tracer invoices.

We also have a company policy on violations which states as follows:

A. For the first non-willful or non-malicious offense of a substantial nature, the employee will forfeit $250.00 in either pay or bonuses to which he would otherwise be entitled. This amount constitutes about three days pay. In addition, the employee will receive a written reprimand in his record which will outline the nature of his offense, the policy of enforcement and the sanctions which will occur if additional future offenses are committed. Additionally, the person will be scheduled for a one-half day separate and special training session carried out by the Radiation Safety Officer.

B. If that person commits a second non-willful or non-malicious offense, the employee will be suspended from employment for one week without any regular pay or bonuses which would have been earned during that weeks employment. Additionally, the written

reprimand would be delivered, and one-half day of special training would be required, after the week of suspended employment.

C. Any employee who has three substantial non-willful or non-malicious violations in any 36 consecutive months will be subject to dismissal unless the company becomes convinced that mitigating circumstances exist which justify the employee not being dismissed or relieved of all duties involving the handling of radioactive materials. If such circumstances exist, then the employee will lose another week's employment.

D. Any employee committing a willful or malicious violation of company policy or rules will be terminated.

Item#4

The well logging supervisor will perform or personally supervise all radiation surveys required of him by our materials license. He will also assure that the assistant logging supervisor is given the proper on job training.

He will be responsible for the safe handling of all radioactive material while transporting to and from and at the temporary job site and he insure that all surveys required are performed and entered on the ui ation log. In the event of an accident during transportation the well l supervisor, if necessary, will isolate and control access to the a area and instruct the assistant supervisor as to the proper notifi to be made.

Item #5

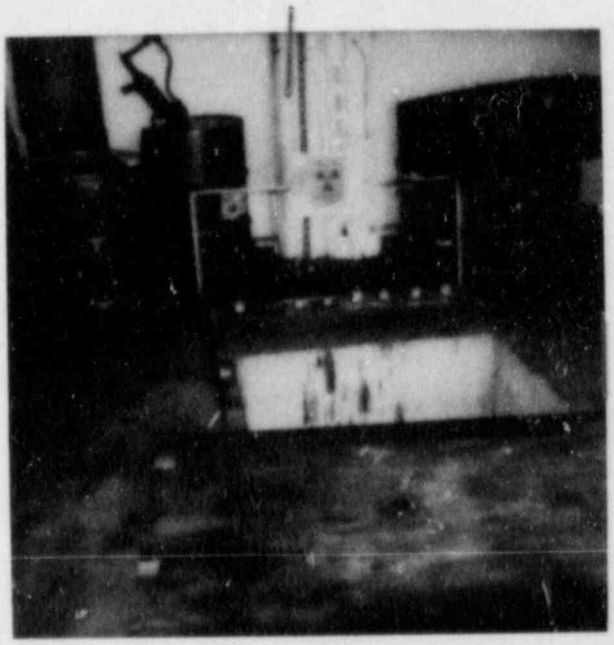
Hebron, Ohio

Rock Creek, Ohio

Fairfield, Illinois

Item #5

Steel Safe Storage Area
Hebron, Ohio



Storage Wells
Hebron, Ohio

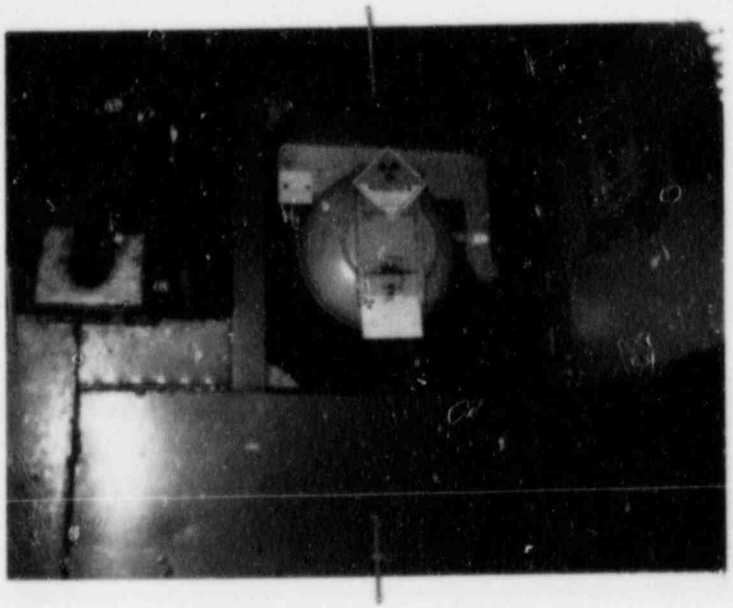
Item #5

Radioactive Waste Storage Area
Hebron, Ohio

Radioactive Tracer & Tracer Waste
Storage Well
Fairfield, Illinois

Same set that was appear for Wayne Cty

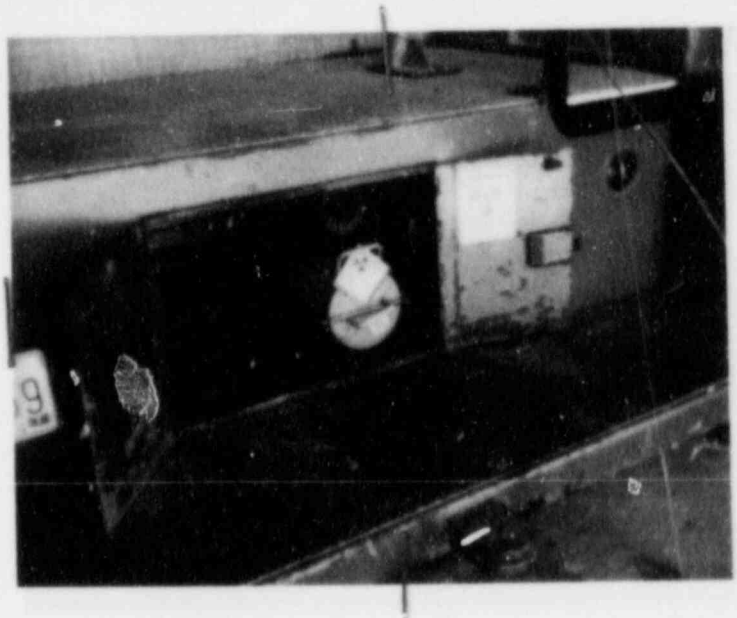
Item #5



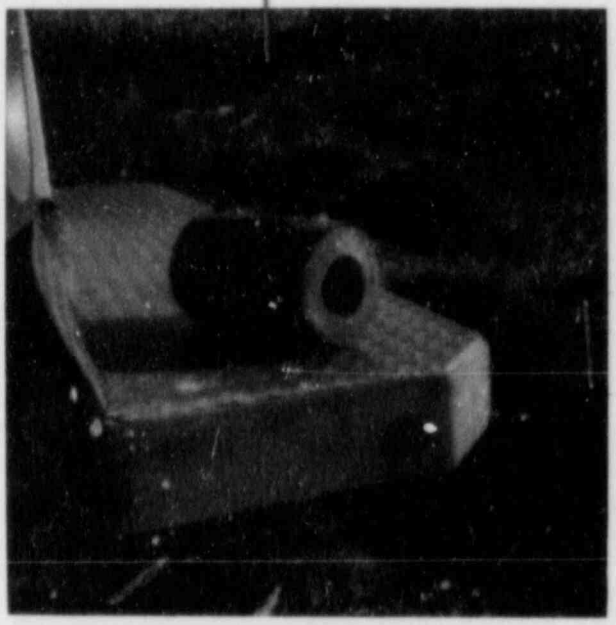
AmBe-241
Shipping Container

AmBe-241
Shipping Container

Item #5



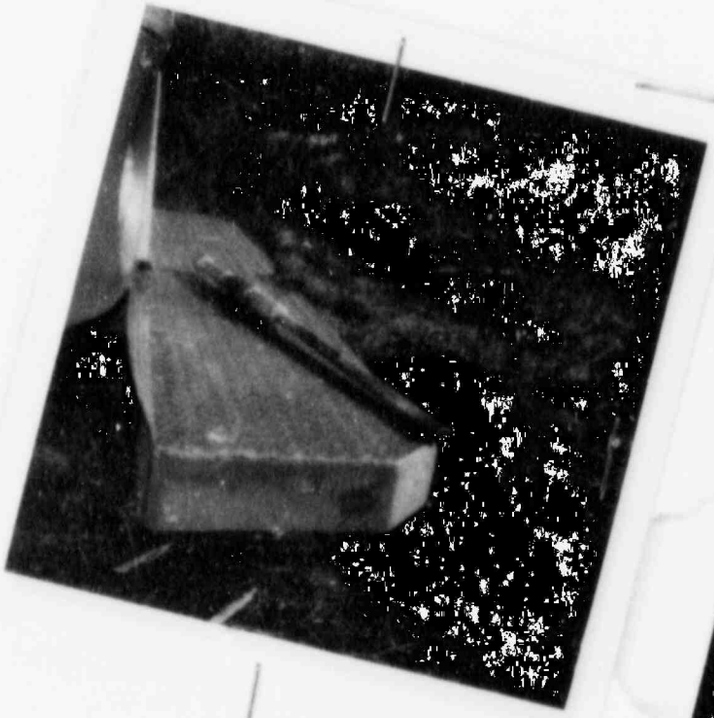
Cesium-137 (2 Curies)
Shipping Container



Cesium-137 (125 Millicuries)
Shipping Container

Item #5

AmBe-241 Handling Tool



Cesium-137 (2 Curies) Handling Tool

Tracer Material Handling Tool

Item #5

AmBe-241 Handling Tool

Cesium-137 (2 Curies) Handling Tool

Tracer Material Handling Tool

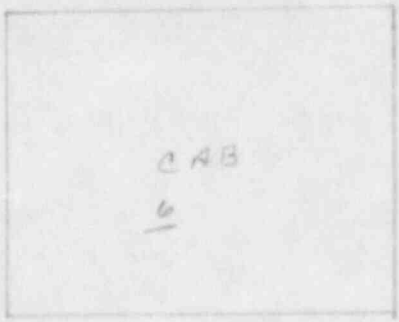
Item #6

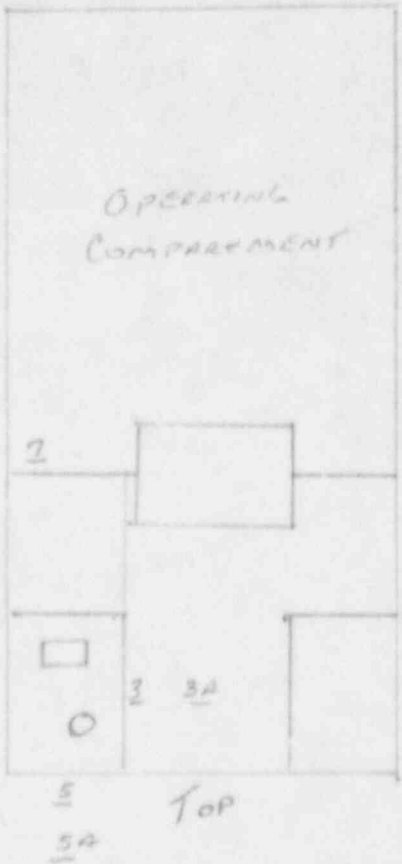
RADIATION PROFILE
TRUCK #323

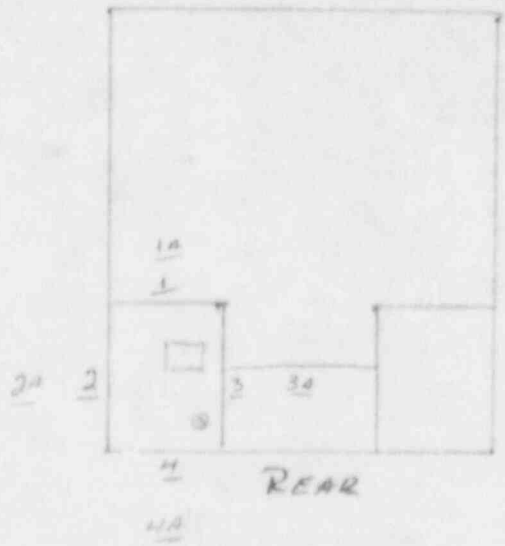
POSITION	MR/H
1	.6
1A	.25
2	.6
2A	.25
3	1.2
3A	.4
4	11.0
4A	.8
5	4.0
5A	.9
6	.02
7	.04

Meter used - Monitor 4
Serial No. - 107
Calibrater - 5-14-85

Number only - Surface
Number & A - 1 Meter

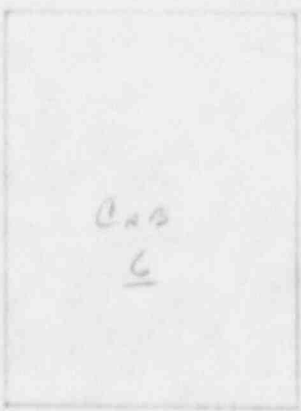


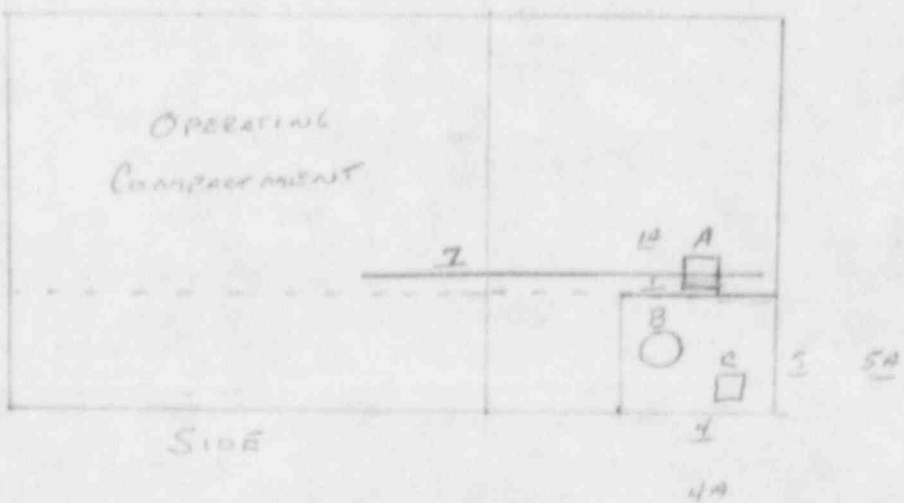




A - Cs-137 125 mCi.
B.- AmBe 3 Curies
C - Cs-137 2 Curies

Above is maximum amount transported





Item #7

J. Procedures for handling Radioactive Tracer Material during [illegible] evaluations:

a. Clothing:

1. Gloves.

2. Rubber boots.

3. Coveralls.

Prior to handling any tracer material, insure the use of the above clothing. In the event the clothing becomes contaminated with the radioactive material, remove the clothing and place in a plastic bag before leaving the work site. This practice reduces the potential spread of the radioactive material to the vehicle, shop and home.

b. Storage and Transport:

1. All radioactive material will be stored in the steel safe storage area.

2. Insure the use of remote handling tongs at all times when handling the radioactive material.

3. Prior to using the tracer material, perform the following:

a. Inspect the container for proper containment by insuring that the lids are sealed and the container is not broken.

b. Conduct a radiation survey to determine the radiation levels. This will provide information to determine the potential exposure to personnel during the handling procedures. Remember that every effort should be made to maintain exposures to less than 100 mrems. per week. If the radiation level is 100 Mr/h, one could expect to receive his 100 mrems. in one hour.

c. Always use DOT approved transport containers.

d. Minimize the time spent near the container while transporting or carrying the container directly to the storage location on the vehicle.

e. Insure that the container is secured and is properly identified as "Radioactive Material".

c. Use:

1. Never transport tracer material except directly to and from the location of use, ie, never store the material on vehicle unless there is an anticipated need. Return all unused tracer material to the storage area upon return to the shop.

2. Tracers should be introduced into the well at the [illegible] available point to the well. Every effort should [illegible] to insure minimum distance of flow through piping [illegible] the well. Always inject the tracer on the discharge [illegible] of any pumping system and flush the system following injection.

3. Monitor the well site, piping, clothing and areas of potential spills or loss of the tracer material.

4. In the event the tracer was spilled or leaked causing a contamination problem, the area of concern will be isolated and roped off. Notification of the Radiation Safety Officer and/or supervisor will be made to obtain clean up instructions and assistance. Never leave a job site unidentified if contamination has occured.

5. Insure that your clothing and shoes are not contaminated before leaving the job site. Contaminated clothing, including shoes, should be placed inside a container and returned to the shop for disposition.

6. Return all unused tracer material to the shop storage area.

7. Perform a radiation survey of the vehicle to insure against vehicle contamination.

NOTE: Job site or equipment will not be released for unrestricted use if radiation levels are 0.2 Mr/h or or greater above background. This reading will be taken 1 inch from surface.

The amount of tracer material used during each study is between 1 and 2 millicuries.

Any contaminated items will be contained in a sealed container and held for disposal and/or decontamination.

Short half-life tracer contaminated articles will be stored until radiation levels decay to background at which time all radioactive labels will be destroyed and the articles will be disposed of as ordinary trash.

Unused tracer material, after 10 half-lives of decay, will be mixed and disposed of with new tracer material.

Item #9

I. Procedures for calibration of portable survey meters:

a. The following information describes the radioactive source to be used during calibrations of portable survey meters:

1. Radionuclide: Cs-137
2. Manufacturer: Gamma Industries
3. Model No.: VD-HP
4. Activity: 2 millicuries
5. Output: 7.1 Mr/h @ 1 foot
6. Accuracy:

b. Portable survey meters will be calibrated at intervals not to exceed six (6) months and each time after servicing.

c. Portable survey meters will be calibrated using the following procedures:

1. Remote handling tools will be used at all times while handling the calibration source.
2. During calibrations, the area will be identified and marked where radiation intensities exceed 2 Mr/h.
3. Each individual involved in the calibration procedures will be required to wear a personnel monitoring dosimeter.
4. Calibrations will be conducted by or under the supervision of the Radiation Safety Officer or the Assistant Radiation Safety Officer.
5. Calculations will be made prior to calibrating meters to determine the activity of the source.
6. Each scale of the instrument will be calibrated at two points located at approximately 1/3 and 2/3 of full scale.
7. The exposure rate measured by each instrument will be within plus or minus 20% of the true exposure rate.
8. Calibration date will be posted on each meter.
9. Calibration date, serial number and initials of person performing calibrations will be entered in the calibration log book.
10. A copy of these measurements will be posted with each meter and also maintained by the Radiation Safety Officer.

d. Any meter that cannot be calibrated will be returned to the manufacturer for repairs then re-calibrated before returning the meter to service. The following points will be checked on each meter:

1. Check batteries and replace if necessary.
2. Check terminals and clean if necessary.

LOGGING & PERFORATING SERVICES FOR THE OIL & GAS INDUSTRY

SHELWELL SERVICES, INC.

Item #9

Route #1, Harbor Hills

Hebron, Ohio 4
Phone 614 928-

CERTIFICATE OF INSTRUMENT CALIBRATION

Instrument Model_____ Serial No_____

Calibration Data:

RANGE	EXPOSURE RATE (mR/h)	INST. READING (mR/h)	EXPOSURE RATE (mR/h)	INST. READING (mR/h)

Calibration Source: Cs-137 2 millicuries

Procedures have been approved by the U. S. Nuclear Regulatory Commission and are on file in License No. 34-10445-01

Calibrated by_____ Date_____