

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 078-154-A - Part 1 of 2

Subject: Radioactive Material in Uncontrolled Location,
Norton, Massachusetts

Investigation at: Norton and Attleboro, Massachusetts

Investigation conducted: November 14, 28-30; December 1, 7, 8, 21, 1978;
January 9-12, 1979

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Investigation Summary:
Investigation on November 14, 28-30; December 1, 7, 8, 21, 1978; January 9-12, 1979 (Report No. 078-154 - Part 2)

Area Investigated: Investigation of an allegation by Mr. John Sullivan, 33 Chartley Brook Lane, Attleboro, Massachusetts, that Texas Instruments, of Attleboro (TI) possibly had discarded radioactive material at a private landfill area in Norton, Massachusetts where he had detected radioactivity at various locations.

Results: It was determined that M&C Nuclear, Inc., Attleboro, Massachusetts, which merged with TI in 1959, had used the aforementioned landfill area to discard trash and other material, including burned zirconium ashes, associated with nuclear fuel operations conducted at the TI facility from about 1957 to 1966. Based on NRC's review of TI's nuclear operations at that location and the analyses of the radioactive material found at the Norton landfill area, it is possible that TI was the major source of that material. Other possible sources of the radioactive material could not be determined because of the limited amount of radioactive physical evidence found at the Norton site.

POOR ORIGINAL

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TABLE OF CONTENTS

I. BACKGROUND

- A. Reason for Investigation
- B. Identification of Organizations Contacted

II. SUMMARY OF FINDINGS

- A. Allegations and Investigation Findings
- B. Conclusions

III. DETAILS

- A. Introduction
- B. Scope of Investigation
- C. Individuals Directly Interviewed and/or Contacted During
the NRC Investigation
- D. Specifications of Allegations
- E. Allegations and Investigation Findings
- F. Conclusions

I. BACKGROUND

A. Reason for Investigation

On September 22, 1978, Mr. John Sullivan, 33 Chartley Brook Lane, Attleboro, Massachusetts, telephonically contacted the Nuclear Regulatory Commission, Region I office (NRC:I) and reported that he had visited a private landfill area in Norton, Massachusetts, which contained discarded industrial equipment. He said that several of the items which he observed at the site indicated that they had been discarded by Texas Instruments, Inc. (TI), of Attleboro, Massachusetts and that he believed that the discarded TI items might possibly be radioactive.

On October 16, 1978, Mr. Sullivan telephonically contacted NRC:I and reported that he visited the aforementioned landfill area on October 6, 1978 and, using a beta-gamma survey meter, found several items which emitted varying amounts of radiation. On October 18, 1978, NRC:I received a letter from Mr. Sullivan in which he requested an investigation of the landfill area and furnished additional information regarding his observation of radiation readings on specific items discarded there. On November 14, 1974, Mr. Sullivan was interviewed by NRC:I inspectors at his school address in Florida. During the interview, he said that he saw the names "Texas Instruments", "Metals and Control" and "Engelhard" on some of the items which he observed during his visits to the aforementioned landfill area. He also said that he does not suspect any other company, besides TI, of dumping radioactive material at the above landfill area. He also identified fifteen other locations, some in Norton and some in Attleboro, Massachusetts, where he suspected radioactive material had been discarded.

B. Identification of Organizations Contacted

1. Patsy Cavaliere and Son, 279 Elm Street, Attleboro, Massachusetts

This is a general contractor concern whose operations include railroad construction.

2. DeAngelis Railroad Construction, 9 Irving Street, Worcester, Massachusetts

This is a general contractor concern whose operations include railroad construction.

POOR ORIGINAL

3. Dorrance Construction Company, Norton, Massachusetts

This is a general contractor concern whose operations include excavation and road construction.

4. Engelhard Industries Division, Engelhard Minerals & Chemicals Corporation, Route 152, Plainville, Massachusetts

This company's operations include the processing of chemicals and precious metals.

5. Texas Instruments Incorporated, Attleboro, Massachusetts

This company's operations include the processing of precious metals.

6. Westcott Construction Corporation, 135 East Washington Street, North Attleboro, Massachusetts

This is a general contractor concern whose operations include building construction.

II. SUMMARY OF FINDINGS

A. Allegations and Investigation Findings

The allegations reported by Mr. John Sullivan regarding the suspected presence of radioactive material at various locations in the Norton-Attleboro area were investigated. These allegations and the investigation findings are detailed in NRC:I Investigation Report No. 078-154, dated March 1, 1979. Included in that report are the results of numerous radiological surveys of the suspected locations reported by Mr. Sullivan and the results of the analyses of the radioactive material found at two of these locations during the course of the investigation.

Concurrent with the aforementioned investigation efforts, NRC:I inspectors investigated the allegation made by Mr. Sullivan regarding the possible source of the radioactive material which he reportedly detected at the private landfill area, located at 68 Union Road, Norton, Massachusetts, during his visits there. This NRC:I investigation included an on-site visual examination of the items discarded at that location. Interviews with individuals residing in that general area and individuals presently or formerly employed by TI, including contractor personnel, and a representative of Engelhard Industries Division, Engelhard Minerals & Chemicals Corporation, Plainville, Massachusetts, were also conducted during this investigation.

NRC:I inspectors observed at the Norton landfill site some of the items which Mr. Sullivan described as bearing the names "Texas Instruments" and "Metals and Control". One item was observed to have the partially obliterated words "Engelhard Industries, Inc. Irvington...Newark, New Jersey" printed thereon.

Information was developed through interviews with TI personnel and other individuals regarding the radioactive waste disposal, trash removal, and construction activities which were conducted at the TI facility in Attleboro during the period of time in question.

POOR ORIGINAL

It was verified that TI had dumped various items at the private landfill area in Norton where Mr. Sullivan had detected radioactivity. However, the investigation failed to substantiate that TI had discarded the radioactive material which was found at the above site.

B. Conclusions

The allegation that TI was suspected of discarding industrial equipment at the Norton landfill area (Shpack property) has been verified through interviews with TI personnel and other individuals. It was also determined that M&C Nuclear, Inc., Attleboro, Massachusetts, which merged with TI in 1959, had used the aforementioned landfill area to discard trash and other material, including burned zirconium ashes, associated with nuclear fuel operations conducted at the TI facility from about 1957 to 1966. Based on NRC's review of TI's nuclear operations at that location and the analyses of the radioactive material found at the Norton landfill area, it is possible that TI was the major source of that material. Other possible sources of the radioactive material could not be determined because of the limited amount of radioactive physical evidence found at the Norton site.

POOR ORIGINAL

III. DETAILS

A. Introduction

On September 22, 1978, Mr. H. W. Crocker, Chief, Fuel Facility Projects Section of the NRC Region I Office (NRC:I) received a telephone call from Mr. John Sullivan, 33 Chartley Brook Lane, Attleboro, Massachusetts. Mr. Sullivan reported that he had visited a private landfill area on Union Road near the border of Norton and Attleboro, Massachusetts which contained discarded industrial equipment. Mr. Sullivan stated that he had observed several items at the site that indicated they had been discarded by Texas Instruments, Inc. (TI) of Attleboro, Massachusetts. Mr. Sullivan further stated that no materials had been disposed of at this location within the last several years. However, since TI does have an NRC license to use radioactive materials, Mr. Sullivan believed it was possible that the discarded TI items might be radioactive. Mr. Crocker informed Mr. Sullivan that the TI plant is involved in large metallurgical operations and that only a small part of TI's work involves radioactive materials. Mr. Crocker told Mr. Sullivan that NRC:I was not aware of any radioactive material being discarded at this site and that NRC:I would look at this landfill area in conjunction with the next inspection at TI. Mr. Sullivan was satisfied with this course of action, and indicated he was returning to college in Florida the next week, but that NRC:I could contact him through his Massachusetts address.

On October 16, 1978, Mr. Sullivan called Mr. Crocker from Florida and reported that he had gone to the aforementioned landfill area on October 6, 1978, and using a Civil Defense, beta-gamma, survey meter found the following:

1. A black bowl with yellow residue which read 3 mR/hr.
2. A tube attached to a brick-lined oven which read 2 mR/hr.
3. Several other items were 2-3 times the background radiation level.
4. A soldering hood which, although suspect, read at the background radiation level.

POOR ORIGINAL

On October 18, 1978, NRC:I received a letter from Mr. Sullivan. This letter requested an NRC investigation of the landfill site. Included was a sketch of the site and the route Mr. Sullivan used in his survey of October 7 and 8 during which he observed radiation readings on or near the discarded equipment of up to 3 mR/hr.

On November 14, 1978, during an interview with Mr. Sullivan, at his school address in Florida, NRC:I inspectors were informed by Mr. Sullivan that there were about a dozen other places within an area approximately one square mile, some located in Norton and some in Attleboro, which he suspected of having radioactive material. The reasons given were their remoteness and evidence of industrial waste which Mr. Sullivan had seen at those locations. Mr. Sullivan described these locations as being "older" than the Norton site and he said that the industrial waste consisted of solid, liquid and metal material. Mr. Sullivan stated that he had written a letter to Mr. Crocker of NRC:I and had included maps of these additional locations. Mr. Sullivan had not yet mailed the letter. At the conclusion of the interview, Mr. Sullivan furnished the hand-drawn maps of the additional locations to the NRC inspectors but retained the letter, which he stated he would mail to Mr. Crocker. The final number of sites indicated as "suspect" at this time by Mr. Sullivan was fifteen (15).

B. Scope of Investigation

This investigation was initiated on November 14, 1978 and included an on-site visual examination of items discarded at the Norton landfill site in an effort to determine the source of any identifiable items that could be related to NRC-licensed activities. Interviews were conducted with Mr. John Sullivan and other persons residing in the general vicinity of the Norton landfill site concerning their knowledge of any refuse disposal activities at that site. Interviews were conducted with present and former TI personnel and contractor personnel with regard to radioactive waste disposal operations, construction activities, off-site hauling of trash or other material from the TI site and the disposal of any TI material at the Norton landfill site.

A representative of Engelhard Industries Division of Engelhard Minerals & Chemicals Corporation, Route 152, Plainville, Massachusetts was interviewed regarding the decontamination and radioactive waste disposal operations associated with the former operations of D.E. Makepiece Division of Engelhard Industries at the above location in Plainville.

POOR ORIGINAL

C. Individuals Directly Interviewed and/or Contacted During the NRC Investigation

Patsy Cavalieri and Son, 279 Elm Street, Attleboro, Massachusetts

Mr. Anthony Cavalieri, President

DeAngelis Railroad Construction, 9 Irving Street, Worcester, Massachusetts

Mr. Andy DeAngelis, President

Mr. Joey DeAngelis, Estimator

Dorrance Construction Company, Norton, Massachusetts

Mr. Melvin Dorrance, President

Engelhard Industries Division, Engelhard Minerals & Chemicals Corporation, Route 152, Plainville, Massachusetts

Mr. George H. Scott, Jr., General Manager

Texas Instruments Incorporated, P.O. Box 5474, Dallas, Texas

Mr. George L. Williams, Assistant Vice President

Mr. Robert D. Murrill, Assistant Counsel

Texas Instruments Incorporated, Attleboro, Massachusetts

Mr. William I. George, Assistant Vice President

Mr. Fred Sherman, Project Manager

Mr. John A. Haug, Patent Counsel

Mr. Calvin Hopper, Manager, Nuclear Safety

Mr. Robert Gonzales, Security Administrator

Mr. Francis F. Gousie, Precious Metals Department

Mr. Kenneth McLeod, Grounds Foreman

Mr. Alfred Amancio, Grounds Keeper

Mr. Raymond Brogan, Maintenance Division

Mr. William Bird, Former Vault Custodian

Mr. Anthony F. Ferreira, Facility Engineer

Mr. Cleo Forcier, Group Safety Engineer

Westcott Construction Corporation, 135 East Washington Street,
North Attleboro, Massachusetts

Mr. Charles H. Whitmore, Jr., Project Manager & Safety Director

Other Individuals

Mr. John Sullivan, temporarily residing at 588 West Pine Road,
Melbourne Village, Florida

Mr. William R. Rollinson, Director of Attleboro Office of Civil
Defense

Mr. David Opatka, Director of Conservation, Town of Norton,
Massachusetts

Mr. Fred Huff, 481 Pike Avenue, Attleboro, Massachusetts

Mr. Jesse Earls, 463 Pike Avenue, Attleboro, Massachusetts

Mr. Harold Wetherall, 8 Union Road, Chartley, Massachusetts

Mr. Gerard Gelinis, 43 Oakdale Avenue, Attleboro, Massachusetts

Individual A (identity withheld by request)

Individual B (identity withheld by request)

Individual C (identity withheld by request)

D. Specifications of Allegations

The information which Mr. John Sullivan reported to NRC:I on September 22, 1978, included the allegations that TI had discarded some items at a private landfill area in Norton, Massachusetts and that he believed it was possible that the discarded TI items might be radioactive. This landfill area is located at 68 Union Road, Norton, Massachusetts and is owned by Mr. and Mrs. Isadore Shpack.

The information which Mr. Sullivan reported to NRC:I on October 16, 1978 included the allegation that during his visit to the aforementioned landfill area on October 6, 1978, certain items which he saw there were found to be radioactive, as determined by the radiation detection equipment which he was using on that occasion. During the interview with Mr. Sullivan on November 14, 1978, he said that he saw the names "Texas Instruments," "Metals and Control" and "Engelhard" on some of the items which he observed during his visits to the aforementioned landfill site. He said that he also saw what he described as "rods" at the Norton site and that it was these items which made him suspect that TI was dumping "things"

at the site. He also said that he does not suspect any other company, besides TI, of dumping radioactive material at the aforementioned landfill area. During the interview with Mr. Sullivan on November 14, 1978, he also identified fifteen other locations, some in Norton and some in Attleboro, which he suspected of having radioactive material discarded there.

E. Allegations and Investigation Findings

I. Allegation No. 1

(a) Allegation

It was alleged that radioactive material had been disposed of at a private landfill area (Shpack property) in Norton, Massachusetts and at fifteen other locations, some located in Norton and some in Attleboro, Massachusetts.

(b) Findings

As previously noted in Paragraph II.A, this allegation was investigated and the investigation findings are detailed in NRC:I Investigation Report No. 078-154, dated March 1, 1979.

Z. Allegation No. 2

(a) Allegation

It was alleged that TI had discarded industrial equipment at a private landfill area in Norton, Massachusetts (Shpack property) and that the discarded TI items might possibly be radioactive.

(b) NRC Findings

The investigation findings regarding the radiological surveys conducted at the aforementioned landfill area are detailed in NRC:I Investigation Report No. 078-154, dated March 1, 1979.

Interview of John Sullivan, temporarily residing at 588 West Pine Road, Melbourne Village, Florida, on November 14, 1978. Mr. Sullivan furnished the following information to NRC Inspectors J. Roth and R. E. Shepherd: Mr. Sullivan said that he has lived in Attleboro, Massachusetts, for about 8 years and his parents' home is in close proximity to the private dump site in Norton which is owned by Mr. and Mrs. I. Shpack. He said that he is majoring in geology studies at college and has for a long time been concerned about the environmental aspects of the water at the wetlands and the general environmental protection of the area in his neighborhood in Attleboro.

He said that during the Winter of 1977, he read in a local newspaper, the Narraganset Times, about an accident involving "a truck from Texas Instruments (TI) which was carrying fuel rods." He said that this was the first time that he associated his environmental interests with TI and that upon reading the newsclip about the accident, he knew that they were making nuclear fuel at the TI facility in Attleboro.

He said that he visited the Norton dump site on a number of occasions and did some research on TI's operations by reviewing documents at the Public Document Room (PDR) in Washington, D. C., where he stopped enroute to college in Florida.

Mr. Sullivan showed the inspectors a photograph which he said he had taken at the Norton dump site on October 7, 1978. In the photograph there appeared to be a lot of debris or junked items including a number of black cylindrical plastic canisters, measuring about 1 inch in diameter and 2 inches in length, which he said had the name "Texas Instruments" printed on them. He said that he also saw what he described as "rods" at the Norton site and that it was these items which made him suspect that TI was dumping "things" at the site. He said that during his visits to the Norton site on other occasions he found a piece of sheet metal, measuring about 3 inches square, which was mounted on a piece of wood and which had the words "Metals and Control" written on the metal. He said that while he was at the Norton site he also saw some metallic plates, measuring about 2 feet by 3 feet and approximately 1/16 inch thick which he thought might be HFIR (High Flux Isotope Reactor) plates and which he was able to cut with a pair of tin snips. He said that based on his review of records at the PDR, concerning TI operations, he believed that TI was producing HFIR plates.

Mr. Sullivan said that he also saw at the Norton dump site some discarded wooden boxes, measuring about 12 feet long and 3 inches by 4 inches on the sides, which had the name Texas Instruments stenciled on the boxes. He said that when he was at the Norton dump site he spoke with Mrs. Shpack, the owner of the property, and she told him that Texas Instruments and other companies dumped their trash removals on that site.

Mr. Sullivan said that he had also visited the Norton dump site in July 1978 and had made approximately 6 visits there. He said that he also saw the name Engelhard on some of the items dumped there.

Mr. Sullivan said that he does not suspect any other company, besides TI, of dumping radioactive material at the Norton site. He said that there is no one, other than himself, who has expressed suspicion about radioactive material being dumped at the Norton site and that no one, other than himself, has expressed any opinion that such material came from TI. He said that he never saw, nor knows anyone who saw, the radioactive material being dumped there.

Visual examination of the Norton dump site on November 29, 1978.
NRC Inspector R. E. Shepherd made a visual examination of the Norton dump site and observed the following items scattered among the trash which had been dumped there:

1. A metal plate, approximately 3 inches square, which was attached to a banded wooden crate which measured about 4 feet square. The metal plate included the words "Metals Co., Attleboro, Massachusetts, NICOSEAL CO."
2. A 3-sided metal item, in the form of a duct, 2 sides of which measured about 4 feet square with a 3rd side measuring about 4 feet by 1 foot, which had the words "Metals & Controls" written thereon.
3. A wooden board, measuring about 6 feet long, 3 1/2 feet wide and 1 inch thick, which bore the words "Texas Instruments, Inc., Metals and Controls Division, 34 Forest Street, Attleboro, Massachusetts."
4. A large number of plastic items, measuring about 2 inches by 1 3/4 inches and 1/4 inch thick, with the words "KLIXON, Metals and Controls Inc., Corporate Division of Texas Instruments, Attleboro, Massachusetts, Made in U. S. A." printed thereon.

5. A large number of plastic containers, measuring about 1 1/2 inches long and 1 inch in diameter, with the words "Texas Instruments, Attleboro, Massachusetts, 1015C SER.1, MV, 6STI-1-1" printed thereon.
6. The top from a 55 gallon drum, with the partially obliterated words "Engelhard Industries, Inc. Irvington...Newark, New Jersey" printed thereon.

Interview of Mr. Fred Huff, 481 Pike Avenue, Attleboro, Massachusetts, on November 29, 1978. Mr. Huff furnished the following information to NRC Inspector R. E. Shepherd: Mr. Huff said that it is a wild guess on his part that the radioactive material which was found at the Norton dump site (Shpack property) came from somewhere locally, and that he did not know who dumped the material there.

During the interview with Mr. Huff, he flagged down a passing car driven by his neighbor, Mr. Jesse Earls, 463 Pike Avenue, Attleboro, Massachusetts, whom he invited to participate in the interview.

Interview of Mr. Jesse Earls, 463 Pike Avenue, Attleboro, Massachusetts, on November 29, 1978. During the interview with Mr. Fred Huff, Mr. Earls furnished the following information: He said that he has resided at the above address for about 5 years. He said that Texas Instruments (TI) trash trucks pass by his house almost every day and that he saw them go to the Attleboro Landfill Corporation dump site at least a couple of times when he also had gone there. He said that he did not know who dumped the radioactive material at the Norton dump site.

Interview of Individual A, who requested that his name be kept confidential. Individual A furnished the following information to NRC Inspector R. E. Shepherd on November 30, 1978. He said that Fred Fontaine and George, whose last name he could not recall but whom he described as retired from Metals and Controls, dumped trash every day at the Shpack dump site in Norton since September 1946. He said that 2 other Metals and Controls employees, Al Amancio and Joe Carr, also dumped there and drove in a 1958 Chevrolet black stake truck which was used strictly for the Nuclear Division of Metals and Controls. He said that Mr. Carr did not drive the truck but served as a "co-pilot" for Mr. Amancio and that they came with the truck to the Norton dump most of the time, whereas Mr. Fontaine and George (last name not recalled) would substitute for them at other times.

He said that in 1958 some trash was dumped at the Attleboro Landfill Corporation (ALC) dump site and that the trash included a sign which read "Metals and Controls, Nuclear Division, Contaminated Beyond This Point." He said that the incident regarding the sign was brought to the attention of Metals and Controls with a request that such trash be taken elsewhere in the future.

He said that he does not know who dumped the radioactive material at the Norton dump site (Shpack property) and said that only "Attleboro people" dumped at that site.

He said that Gaudet and Boyer Company has been hauling Texas Instruments (TI's) rubbish for about 2 years and that TI hauled their own rubbish prior to that.

He said that the bank (slope) on the north side of the ALC contains about 3 feet of loam which came from the TI site and was initially taken to a gravel pit on Harvey Street, Norton, Massachusetts, and later taken to the ALC location mentioned above. He said that this gravel pit is owned by Dorrance Construction Company which does excavation work for TI.

Interview of Mr. Harold Wetherall, 8 Union Road, Chartley, Massachusetts, on November 30, 1978. Mr. Wetherall furnished the following information to NRC Inspector R. E. Shepherd: With regard to the radioactive material which was dumped at the private dump (Shpack property) in Norton, Mr. Wetherall said that he thinks that the material may have come from Texas Instruments (TI) or from Thompson Chemical Company which was formerly located in Seekonk or Attleboro, Massachusetts. He said that Thompson Chemical had a fire around 1962 or 1963 and moved out, possibly to Freetown, Massachusetts, and may now be operating under another name.

Mr. Wetherall said that he owns the property where the electric power lines pass through the Shpack property in Norton and that he has owned this property for about 25 years. He said that he sold an easement to Massachusetts Electric Company whereby they are permitted to run their power lines through the property. The City of Attleboro had previously operated the dumping area now known as the Attleboro Landfill Corporation (ALC). He said that it was "local stuff" that was dumped at the Shpack dump site. He said that he knows that TI dumped material at the Shpack dump and that this knowledge is probably based on his conversation with Mr. Shpack. Mr. Wetherall said that he does not know if Thompson Chemical dumped anything at the Shpack dump.

Mr. Wetherall said that he believes that in the 1950's he saw TI trucks dumping at the Shpack dump site. He said that he does not recall the type of trucks which he saw. He said that he also saw TI trucks dump at the ALC site when it was being operated by the City of Attleboro.

Interview of Mr. Fred Sherman, Project Manager, Texas Instruments (TI), Attleboro, Massachusetts, on December 1, 1978. Mr. Sherman furnished the following information to NRC Inspector R. E. Shepherd: He said that TI was known as Metals and Controls from about 1914 to 1968 at which time they became known as Metals and Controls Division of TI. Around 1965 they dropped the words Metals and Controls from their name. He said that Patsy Cavalieri and Son, 279 Elm Street, Attleboro, Massachusetts, constructed a railroad spur at TI around 1965. Mr. Sherman said that he checked with TI's accountability section and thinks that the records (regarding the railroad spur) were destroyed. The railroad spur was put in after Metals and Controls had completed a nuclear fuel fabrication job. He said that Cavalieri Company would know more about the details of the railroad spur construction and whether or not any digging was necessary in connection with that job. He said that the TI employee who supervised the railroad spur job for TI is Al Bright who is no longer employed there. Mr. Bright was employed in the Plant

Engineering Facilities section. Mr. Sherman said that he did not know if it (the railroad spur construction) was a totally contracted job. He said that Al Bright now works for C. E. Maguire Inc., 31 Canal Street, Providence, R. I. Later, on this date, Mr. Sherman showed R. Shepherd an engineer's drawing, dated February 28, 1966, for the railroad spur job.

R. Shepherd examined the engineering drawing of the railroad spur project, which included an elevation scale drawing. It would appear from an examination of the drawing that the job required a buildup of material to lay the railroad bed, rather than an excavation of material, from a point near the corner of Building 10 to the point where the railroad spur connected with the existing railroad track. The only excavation necessary for the railroad bed appeared to be from a point beginning at approximately one-third of the length of Building 10, on the southwest side of the building, and extending alongside the building (in a northwest direction) toward the end of the building. Mr. Sherman said that the paved road which was constructed on the south side of Building 10 and which intersects the railroad spur, was built by Narraganset Improvement, Providence, R. I., and that, based on an aerial photograph of the TI site which Mr. Sherman showed to R. Shepherd, the road construction was done about the same time as the railroad spur job.

Mr. Sherman suggested that Bill Bird and Frank Gousie, who are presently employed at TI, might possibly have information regarding trash removal operations at the TI site.

Interview of Mr. Francis F. Gousie, Precious Metals Department, Texas Instruments (TI), on December 1, 1978. Mr. Gousie furnished the following information to NRC Inspector R. E. Shepherd in the presence of Mr. Fred Sherman of TI: Mr. Gousie said that anything that came from M&C Nuclear Division and which was dumped at the Norton dump (Shpack property) was "clean." He explained "clean" to mean that it had been thoroughly screened by Health Physics personnel. He said that from about 1957 or 1958 until the phase out time (of Building 10) around 1965, they burned contaminated clothing and zirc chips outside in a furnace on the south side of Building 5. He said that they did not burn uranium and that any ash from the burning operation was shipped out to a U. S. Government burial site. He said that Cleo Forcier was the Health Physics technician in charge of screening the material taken from TI for dumping

purposes. Mr. Gousie said that he brought trash to the Shpack dump site in Norton about once a day, after the phase out of Building 10. He said that he did this until about 1968 and that there were 4 other men who were involved in the trash removal operation and whom he named as follows: Fred Fontaine, whom he described as retired and living in a trailer park in North Attleboro; Al Amancio, who still works at TI; Kenny McLeod, who, he said, was the foreman and who still works at TI; Frank Liberace, whom he described as retired.

Mr. Gousie said that all of the trash that was taken to the Shpack dump site was taken there after the phase out (of Building 10). He said that they had 2 dump trucks and that it was usually one man using the truck at any one time. He said that if he had any doubt about anything being loaded onto the truck for dumping he would have Cleo Forcier check it out, that is, anything that they picked up when cleaning out the "yard," which he described as a fenced-in area around Building 5.

Mr. Gousie said that there were times when he delivered dirt to the Shpack dump site but that it was not dirt taken from the yard. He said that there was no excavation done in the yard area. He said that he brought about 2 loads of dirt to the Shpack dump site.

Mr. Gousie was reinterviewed on January 9, 1979, by NRC Inspectors R. E. Shepherd and R. H. Smith in the presence of TI representatives F. Sherman and J. A. Haug, TI's Attleboro Patent Counsel. Mr. Gousie and the above individuals visited the fenced-in area around Building 5 and he pointed out the approximate locations where he said that he burned contaminated clothing, including work shoes, in an outside incinerator, and where he burned zirc (zirconium) chips at another location within the fenced-in area. This second area was estimated to be approximately 300 feet away from the incinerator location. He said that he also burned some wooden skids with the zirc chips. He said that the dirt which he took to the Norton dump site, as previously reported by him to R. E. Shepherd on December 1, 1978, consisted of the ashes from the burned zirc chips and from the wooden skids mentioned above.

Interview of Individual B, who requested that his name be kept confidential. Individual B furnished the following information to NRC Inspector R. E. Shepherd on December 7, 1978. He said that he worked at Texas Instruments (TI) as a private consultant and/or as a representative for a private company which did work for TI at various

times between 1975 and 1976. During this time he had occasion to visit TI approximately 20 to 25 times, about 30 minutes to 2 hours each time. On no occasion had he visited any area where radioactive material was handled nor was there any contaminated material in those areas which he visited.

Individual B said that while he was at TI he knows that they used local dumping grounds and has seen a TI truck at the Norton landfill area (Shpack property). He said that it was a pickup truck, possibly blue, with Texas Instrument's name and a map of Texas on the driver's door. He said that he saw the truck there a couple of times during 1975 and 1976. He said that he did not know who was driving the truck or how many people were in the truck. He said that he did not actually see the people in the truck dump anything at the landfill area nor did he see them pick up anything. He said that he was just driving by the dump on these occasions. While he was at TI during 1975 and 1976 he saw open TI trucks taking dirt and/or trash from the TI site about 3 or 4 times but he does not know where the trucks took the dirt or trash and he is not positive as to whether it was dirt and/or trash in the trucks, because of the lapse of time between then and now. He said that he never saw TI dump anything at the Norton site which he knows or believes to be radioactive or contaminated material and no one has ever told him that they saw this happen.

He said that when he picked up and read the NRC's press release about the radioactive material found at the Norton landfill area, for some reason the name TI immediately came to his mind, perhaps because he saw TI trucks there, as mentioned above, and because he did not think that TI's Health Physics (HP) program was "all that good." In this regard he said that he had no definitive reason to say that TI's HP program was not good except for his past conversations with TI people and because he knows that TI called in a consultant to discuss advising TI on the HP aspects of setting up a "hot shop" which indicated to him that they (TI) cannot be "all that good" in the HP area. With regard to the TI people with whom he had spoken, he said that he did not recall their names, job responsibilities or the areas where they worked at TI.

Interview of Mr. George L. Williams, Assistant Vice President, Texas Instruments (TI), Dallas, Texas, on December 7 and 8, 1978. Mr. Williams was interviewed at the TI facility in Attleboro, Massachusetts and furnished the following information to NRC Inspector R. E. Shepherd in the presence of TI representatives F. Sherman and R. D.

Murrill, TI's Assistant Counsel, Dallas, Texas. He said that Metals and Controls Corporation is the corporation which initially made fuel plates at the TI facility on a very small scale. As the activity grew in size, M&C Nuclear Incorporated became a wholly-owned subsidiary of Metals and Controls Corporation around 1957. Mr. Williams was President and General Manager of the fuel fabrication operation of M&C Nuclear, Incorporated from 1958 to about 1967. Metals and Controls Corporation had nothing to do with the nuclear fuel operation when M&C Nuclear, Incorporated came into existence. He said that Metals and Controls Corporation, together with M&C Nuclear, Incorporated merged with TI in 1959 and Building 10 was phased out of the nuclear fuel activity in 1966.

Interview of Mr. Kenneth McLeod, Grounds Foreman, Texas Instruments (TI), Attleboro, Massachusetts, on December 7, 1978. Mr. McLeod furnished the following information to NRC Inspector R. E. Shepherd, in the presence of TI representatives F. Sherman, G. L. Williams, and R. D. Murrill: Mr. McLeod said that he had no knowledge of any burning activity on the TI site and that he had no knowledge of any soil or dirt being removed from the TI site. He said that he would not be involved in anything like that. He said that he was the foreman of the truck drivers who took trash from the TI site and that he was referring here only to Buildings 1, 2, 3, and 4. He said that he had no responsibility for any of the waste or trash removal from Building 10. He said that the drivers who were working for him were Fred Fontaine, George (whose last name he could not recall), and Frank Liberace (now retired).

Mr. McLeod said that Frank Gousie came on the grounds as a garden laborer and had nothing to do with the removal of trash from the site. He also said that Mr. Gousie would not be involved in removing any dirt from the site. He said that TI always saved all the dirt that they could.

With regard to the railroad spur construction around 1965, he said that he saw the spur being built and recalled that they put in a railroad bed with stones or rocks and that they had to move some dirt aside. He said that he did not know how deep the railroad bed was or what they did with the dirt which was pushed aside when preparing the bed. He said that he did not see any of the dirt being moved from the railroad bed location. He said that he never saw anyone, who worked in the nuclear fuel activity, burning anything outside.

Mr. McLeod said that Mr. Gousie worked under his supervision. He said that from about 1957 until 1966, "they" (TI) had one dump truck. The trucks would go offsite with trash from Buildings 1, 3, and 4 and the trash would go to the Norton dump (Shpack property) from about 1957 until about 1972 when TI got a compactor and dumpsters. He said that he very seldom, about 3 or 4 times a year, drove any trash to the Norton dump. He said that Fred Fontaine took trash to the dump the most often, about twice a day, and that later on, George (last name not recalled) took the most trips to the dump. He said that Frank Gousie very seldom (about 3 or 4 times a year) took trash to the Norton dump. He said that Joe Carr came to work for him (Mr. McLeod) around the same time that Mr. Gousie did and that Mr. Carr did the same kind of work that Mr. Gousie did. He said that Mr. Carr did landscaping work such as pruning shrubs. He said that he did not think that Mr. Carr hauled any trash to the Norton dump. He said that Mr. Carr was employed in the nuclear division but that he did not know in what capacity. He said that Mr. Carr worked in the nuclear activity prior to coming to work for him. He said that he does not know how long he (Carr) worked for Metals and Controls and said that he did not know if Mr. Carr is still employed at TI.

Mr. McLeod said that was unaware that a sign bearing the words "M&C Nuclear Division, Contaminated Beyond This Point," reportedly had been dumped at the Attleboro Landfill Corporation dump site. He said that he had no knowledge of any onsite burial area of material at the TI site.

Interview of Mr. Alfred Amancio, Grounds Keeper, Texas Instruments, Attleboro, Massachusetts, on December 7, 1978. Mr. Amancio furnished the following information to NRC Inspector R. E. Shepherd in the presence of TI representatives F. Sherman, G. L. Williams, and R. D. Murrill: Mr. Amancio's present supervisor is Mr. Kenneth McLeod. His former supervisor was Mr. Ray Brogan who is still employed at Texas Instruments (TI). When Mr. Amancio worked for M&C Nuclear (under Mr. Brogan's supervision), Mr. McLeod worked for Metals and Controls (the non-nuclear operation). (Mr. Fred Sherman mentioned during this interview that the nuclear fuel operation in Building 10 began around 1956 or 1957 and lasted until about 1966.) Mr. Amancio said that he made 3 or 4 trips each day to the Norton dump (Shpack property) to dump trash consisting mostly of paper, cardboard, and probably some piping. He said that when he loaded the trash

truck he would have a helper with him all the time while loading the truck which he described as a black Chevrolet platform dump truck (stake truck), possibly weighing 2 tons. The truck had the words "M&C Nuclear" on the side of the door. He said that he went to work for Mr. McLeod around 1960 or 1961. He said that the only steady man that he (Amancio) had helping him load the truck was Joe Carr. Mr. Amancio said that he does not recall that Mr. Carr ever drove the truck. He said that he cannot recall hauling any dirt off the TI site. Regarding the railroad spur construction around 1965, he said that he does not know if any excavation was necessary in order to make the spur. He said that he did not know or could not recall seeing any dirt being removed from the TI site.

Mr. Amancio said that he recalled that he burned zirc (zirconium) chips in an area which was opposite Building 11 in the present visitor parking lot for Building 12. He said that he burned the zirc chips, and only zirc chips, once or twice a week from about 1956 or 1957 until about 1960. He said that Joe Carr helped him burn the zirc chips which, he said, came from Building 10. He said that he never burned any contaminated material and never saw anyone burn such material. He said that this was the only burning operation which he knows about. He said that everything else went to the Norton dump site.

Mr. Amancio said that Toby Knoll (phonetic) had charge of the M&C grounds until his retirement and that Mr. Knoll had nothing to do with the nuclear activity. He said that he does not know anything about any trash removal from TI prior to 1956 or 1957 when he was transferred to M&C Nuclear from the precious metals refinery. He said that he never saw anyone scan or survey the trash which he hauled to the Norton dump. He said that Fred Fontaine and another man picked up trash from M&C and that this trash had nothing to do with the nuclear operations in Building 10. He said that he never entered the contaminated area of Building 10 and never hauled or took anything away from Building 10 as trash. He said that Frank Gousie never worked for him and that if there was any burning operation anywhere on the site, except where he said that he (Amancio) burned zirc chips, then he is not aware of it. He said that Joe Carr did not drive any trucks off site. He said that Mr. Liberace worked for Mr. McLeod and that Mr. Liberace drove the rubbish packer down to the Attleboro Landfill Corporation dump site but did not go with trash to the city dump. He said that Mr. Liberace came

to work at TI about 12 years ago, long after the phase out of Building 10 and that Mr. Liberace picked up trash from all over the site, including Building 10 after the close out (phase out) of that building.

Mr. Amancio was shown a diagram of the TI site by R. Shepherd and he indicated on the diagram the approximate area where he burned zirc chips, as mentioned above.

Interview of Mr. Raymond Brogan, Maintenance Division, Texas Instruments, (TI), Attleboro, Massachusetts, on December 8, 1978. Mr. Brogan furnished the following information to NRC Inspector R. E. Shepherd in the presence of TI representative Robert D. Murrill: Mr. Brogan said that in July 1957, he changed jobs from Metals and Controls to M&C Nuclear and that he worked in that role in Building 10 from July 1957 through 1964. He said that 95 per cent of his duties were in the maintenance area and that he had no manufacturing responsibilities in the fuel fabrication area. The other 5 per cent of his duties consisted of a manufacturing responsibility with regard to handling finished fuel plates up through the final assembly process. He said that, by reason of his job responsibilities in the maintenance operation, he had occasion to be in a contaminated area on a daily basis. He said that all of the protective clothing, such as shoe covers, were put into 55-gallon barrels and sent to a laundry in Connecticut and transported there, and returned to TI, by a TI truck or by common carrier. He said that some shoe covers were disposable and that those which were not disposable were washed, and that the water that was used for washing them was saved. The barrels of water which were accumulated from the washing operation were shipped to Oak Ridge, Tennessee. He said that a salvage area was set up in Building 5, around late 1958 or 1959, to evaporate the water and collect the sludge.

Mr. Brogan said that he had no knowledge of any radioactive material or contaminated clothing going from TI to the Norton dump (Shpack property).

With regard to any burning operation on the TI site, he said that the only thing that they burned was zirc chips in a gravel pit and that they had joint exercises or training sessions with the Attleboro Fire Department and the Fireman's Insurance Association, both of whom participated in fire-extinguishing drills during the zirc-burning operation.

Mr. Brogan was shown a diagram of the TI site by R. E. Shepherd and Mr. Brogan indicated on the drawing the approximate area where the zirc burning operation occurred. This area is situated at a point on the diagram approximately midway between Buildings 11 and 12. Mr. Brogan said that they ceased burning zirc in that area, but that he could not recall when they did so, and that they moved the zirc burning operation to an area on the southeast side of Building 5. Mr. Brogan also indicated the approximate location of this area on the diagram shown to him by R. Shepherd.

Mr. Brogan said that he did not know who did the burning (of zirc) at the first location mentioned above. With regard to the second location, he said that he did not know if Arthur Hanson, who left the company in 1960 or 1961 and who designed the water evaporator in Building 5, did any of the burning of zirc outside at the second location. He said that Jeff Gelinis, who is now retired, did some of the burning at this second location. Mr. Brogan said that as far as he knows, only zirc was burned outside. He said that when they installed the evaporator unit in Building 5, all of the water was evaporated there and that they shipped out the sludge to an approved burial place, the location of which he did not know. Mr. Brogan said that he had working under his supervision Al Amancio who was responsible for grounds-keeping and for hauling trash in the M&C truck, which later was designated as the TI truck, to the Norton Landfill (Shpack property). He said that in 1957 they set up a completely separate grounds maintenance operation and that Mr. Amancio was responsible for the grounds having to do with the nuclear operation. He said that Mr. McLeod was responsible for all other grounds. Mr. Amancio had this job from 1957 to about 1963 and reported to Mr. Brogan during this period. After 1963 Mr. Amancio reported to Mr. McLeod. Mr. Brogan said that he (Brogan) "lost" the responsibility in approximately 1963 and 1964 but got it back again around 1964. He said that Mr. McLeod was responsible for maintenance work related to the nuclear operation in 1963 until the phase out (of Building 10) in 1966. He said that Mr. Amancio picked up only trash from the clean area of Building 10. He said that he is not sure of what Mr. Amancio's pick-up area was when Mr. Amancio began to report to Mr. McLeod in 1962 or 1963.

Mr. Brogan said that they bought a compactor around 1963 or 1964 and that about 95 per cent of all rubbish that left the site left in the compactor truck. Those who drove the compactor truck were Al Amancio, Frank Liberace, and Fred Fontaine. He said that Joe

Carr drove the stake dump truck and that Mr. Carr reported to Mr. Amancio. He said that he does not know if Mr. Carr drove the compactor truck. He said that anything that came out of Building 10 and went into the compactor was clean in that it would come from a clean area. He said that if there was any question about an item being contaminated, Health Physics personnel would always be involved in checking it and that nothing would leave the site without Health Physics approval. He said that Cleo Forcier was a Health Physics Technician and reported to Peter Loyson, the Health Physics Officer, during a period sometime between 1967 and 1966. Mr. Loyson was succeeded by Peter Duff who was later succeeded by Norman Weiss who is still employed at TI.

Mr. Brogan said that he does not recall seeing any dirt or earth being removed from the TI site. With regard to the railroad spur that was built around 1965, he said that the whole railroad spur area was located in a generally swampy area and that he recalls that his colleague, Al Bright, who was the Facilities Engineer on the job, mentioned to him that they ran into some peat bogs or peat pockets. He said that Mr. Bright left TI in 1970 to take another job.

Mr. Brogan said that many times he saw Health Physics personnel checking for contamination (for example, taking smears) on outgoing trucks which were taking "stuff" from the contaminated area of Building 10. He said that he never saw them (Health Physics personnel) do the same thing with trucks going to the Norton dump site.

Mr. Brogan said that they had what they called a "stockade" which was a parking (storage) area for contaminated waste going to an approved burial site. The stockade included 55-gallon drums and contaminated debris in containers and it had a 6-foot high cedar fence around it. Mr. Brogan was shown a diagram of the TI site by R. Shepherd and he indicated on the diagram the approximate location of the stockade which appears to have been located opposite the south side of Building 10 in an area which is now a paved parking area.

Mr. Brogan was re-interviewed on January 9, 1979 by NRC Inspectors R. E. Shepherd and R. H. Smith in the presence of Mr. Fred Sherman and Mr. John A. Haug, TI's Attleboro Patent Counsel. Mr. Brogan furnished the following additional information: He said that it

was approximately sometime between 1959 and 1962 when the zinc-burning operation was moved from the previously noted area (in the general vicinity of Buildings 11 and 12) to the area on the southeast side of Building 5. He accompanied Messrs. Shepherd and Smith to the latter area and pointed out the approximate area where the zinc-burning operation took place. This area was observed to be approximately 300 feet away from the southeast side of Building 5.

With regard to the protective clothing which was sent to a laundry in Connecticut, as previously mentioned by Mr. Brogan, he said that it would have been someone working in the shipping and receiving department who was responsible for that operation. He said that Dwight Patton was responsible for shipping and receiving and that there are a number of people still working at TI who would have had those responsibilities at that time.

Interview of Mr. Gerard (Jeff) Gelinis, 43 Oakdale Avenue, Attleboro, Massachusetts, on January 9, 1979. Mr. Gelinis furnished the following information to NRC Inspectors R. E. Shepherd and R. H. Smith: He said that from about 1963 to 1967, he was employed at Texas Instruments (TI), which was then known as Metals and Controls, and his position was supervisor of the waste area or scrap reclamation area which was a fenced-in area near Building 5. He said that an incinerator was located outside Building 5, in a lean-to structure with a stack, adjoining Building 5. He said that they burned low level contaminated paper, containing natural uranium, in the incinerator. They also burned some cardboard, but did not burn any clothing or metal. The material which was burned came from work benches in Building 10. He said that the contaminated material which was burned was of too low an enrichment to be sent to Oak Ridge, Tennessee. Those who burned the contaminated material included himself, Joe Carr, Frank Gousie, and Ray LaChance. He said that George Beard was responsible for shipping "stuff" (contaminated waste) to Oak Ridge. He said that Ray LaChance lives in Plainville and that Joe Carr lived in Norton. He said that the ash from the incinerator was shipped to Oak Ridge. He said that the contractor who did the decontamination job at Building 10, after the phase out, was Bill Dunlap who is now deceased. The "decon" job at Building 10 involved steam cleaning and painting of the area. The water from the steam was brought to Mr. Gelinis to be evaporated in Building 5, after which the sludge was put into sealed drums and sent to Oak Ridge. The burning in the incinerator

took place about once per week and the ashes would be picked up by Messrs. Gausie, LaChance, and Carr and put into drums to be sent to Oak Ridge. He said that the distance from the incinerator to the area where zirconium was burned was about 300 feet. The incinerator was on a cement slab measuring about 20 feet square. He said that they had to wear protective clothing inside the fenced area where they burned the zirconium and the contaminated material (in the incinerator) at separate locations. They also had to put on protective clothing to burn the zirconium. The zirconium chips which were burned inside the fenced-in area were brought there by fork lift truck. He said that the protective clothing was worn in the zirconium-burning area only as a precaution and that they washed down the fork lift truck every so often. Mr. Gelinas said that to the best of his knowledge, Cleo (Forcier) never found any contamination in the area where the zirconium was burned. He said that no dirt was ever removed from the fenced-in area. Danny Lopes and George Gancey (phonetic), who are now deceased, used to haul trash from the TI site. Mr. Gelinas said that he had no knowledge of any dirt having been removed from the TI site. With regard to the railroad spur which was constructed in the general vicinity of the fenced-in area around Building 5, Mr. Gelinas said that they had to build up the area (i.e. use land fill) for the railroad bed in order to build the spur. He said that he has no knowledge of any excavation work performed in connection with the railroad spur construction. He said that there was never any burning done outside the fenced-in area, mentioned above, except for an area near Building 12 where burning of zirconium was done after this type of burning operation was transferred from the Building 5 area to the Building 12 area around 1965 or 1966. The area in question is situated near or in the parking lot in the vicinity of Building 12.

With regard to the material burned in the incinerator, as mentioned above, it was brought there in 55-gallon drums.

Interview of Mr. William Bird, an employee of Texas Instruments (TI), Attleboro, Massachusetts, on January 9, 1979. Mr. Bird furnished the following information to NRC Inspectors R. E. Shepherd and R. H. Smith in the presence of Mr. Fred Sherman and Mr. John A. Haug: Mr. Bird said that he was employed as a vault custodian in Building 10 from about 1957 until the phase out of that building in 1965. His job responsibilities included the packaging of contaminated material, usually solid chips, which would be put in a solution and

then into 1 and 2-gallon metal containers which would be marked to indicate radioactive material. The containers were then taken from the site by an AEC appointed carrier. He said that he had no knowledge of anything having been taken from the TI site to the Shpack dump site in Norton. He said that Jeff Gelinias was the foreman of the scrap area (with regard to the scrap taken from Building 10) and that Joe Carr and Frank Gousie worked for Mr. Gelinias. Mr. Bird said that the only burning of material that he knows about is the burning of zirc chips in an open area in back of Building 5, possibly a hollowed out area, and that those who burned the zirc chips included himself, and Messrs. Gelinias, Carr, and Gousie. He said that he did not see any incinerator or furnace in that area while he was there. He said that they burned zirc chips about once per month while Building 10 was involved in the nuclear fuel operation. He said that he is not sure, but thinks, that they shipped out the zirconium ashes in barrels and that these barrels did not have radioactive material stickers on them. He said that they used shovels to put the zirc ashes in the barrels. He said that this was the only burning area that he knows about. He said that he had no knowledge of any dirt having been removed from the TI site. Regarding the construction of the railroad spur at the TI site around 1965, he said that he does not recall that they had to do any digging but he recalled that the job had more to do with leveling off the area for the railroad bed.

Interview of Mr. Anthony Cavaleri, President, Patsy Cavaleri and Son, 279 Elm Street, Attleboro, Massachusetts, on January 9, 1979.

Mr. Cavaleri furnished the following information to NRC Inspectors R. E. Shepherd and R. H. Smith: He said that his company did not construct the railroad spur at the Texas Instruments (TI) facility. He suggested that the Westcott Construction Company, which has done construction work at TI, might have information regarding the railroad spur project.

Interview of Mr. Andy DeAngelis, President, DeAngelis Railroad Construction, 9 Irving Street, Worcester, Massachusetts, on January 10, 1979. (Mr. DeAngelis was initially contacted by telephone by R. E. Shepherd on January 9 and arrangements were made to interview him at a job site in Holliston, Massachusetts, on January 10.) Mr. DeAngelis furnished the following information to NRC Inspectors R. E. Shepherd and R. H. Smith: He said that around 1976, he removed a section of railroad track at the Texas Instruments (TI) site and

that his company was a subcontractor for Westcott Construction Corporation which was the prime contractor on that job for TI. He said that the section of track was over 200 feet long and was about the length of Building 4 which is situated alongside the area from which the track was removed. He said that he did not have to remove any dirt or material in connection with that job. He said that he did not know the exact dates when this work was done. He said that the work done by his company involved only the removal of the railroad ties and track. He said that someone stole about 5 or 6 of the railroad ties and he then took the remaining ties (approximately 200) to his storage yard which is located at 1187 Millbury Street, Worcester, Massachusetts. He said that his company did not handle the construction of the railroad spur which was constructed at TI around 1965. He said that the only railroad track which he constructed for TI was a 300 foot section of track which his company, as the prime contractor for TI, constructed during the Summer of 1978. This was an extension to an existing railroad spur. He said that Narraganset Company was also doing work at TI when his company was laying the section of track, mentioned above, and that some other company was putting in a drain under the track. He said that when his company laid the 300 feet of railroad track, he removed about 3 truck loads of asphalt which he took to the Narraganset Company's private dump in Attleboro. He said that Bruce, whose last name he could not recall but who is a superintendent for the Narraganset Company, told him to take it there. Mr. DeAngelis said that when he was laying the section of track in 1978, they ran into a steel pipe, measuring about 12 inches in diameter and about 20 feet long, which had about one inch of dirt around the inside circumference. He said that the "TI people" told him to remove the pipe and he took it to his company's storage yard in Worcester.

Mr. DeAngelis said that he saw other contractors removing truck loads of dirt from the TI site but he does not recall who they were or where they took it. He said that his company has records and photographs of the 2 jobs, mentioned above, which were done at the TI site and which would be available to the inspectors at his place of business in Worcester. Messrs. Shepherd and Smith informed Mr. DeAngelis that they would visit the storage yard in Worcester where the railroad ties and steel pipe are presently stored and he said that he would arrange to have someone there to show these items to the inspectors upon their arrival at the storage yard later on this same date (January 10).

Interview of Mr. Joey DeAngelis, Estimator, DeAngelis Railroad Construction, 9 Irving Street, Worcester, Massachusetts, on January 10, 1979. Mr. J. DeAngelis furnished the following information to NRC Inspectors R. E. Shepherd and R. H. Smith: He said that the DeAngelis Company, working as a subcontractor for Westcott Construction Corporation, removed a section of railroad track outside Building 4 at the Texas Instruments (TI) facility in 1977. In doing this job, the DeAngelis Company removed the steel rails and wooden ties and brought the ties to the DeAngelis Company's storage yard in Worcester, Massachusetts, where they are presently stored.

During July and August 1978, the DeAngelis Company, working as a prime contractor for TI, laid a section of railroad track which became an extension to an existing railroad spur at the TI site. In doing this job, the DeAngelis Company did some excavation work to prepare the railroad bed and had to remove 4 buried steel plates and a section of steel pipe. The steel plates ranged in thickness from 1/4 inch to 2 inches and measured about 4 feet wide and 6 feet long. The steel pipe measured about 20 feet long and 12 inches in diameter. The steel plates and pipe were also removed from the TI site and taken to the DeAngelis Company's storage yard in Worcester, Massachusetts. The inspectors visited the storage yard on January 10, 1979 and observed the railroad ties, steel plates, and steel pipe mentioned above. The storage yard is enclosed by a chain-link fence with gates which are locked.

Mr. J. DeAngelis showed the inspectors photographs of the railroad job sites at TI which were taken by him when the DeAngelis Company worked on these two jobs in 1977 and 1978. He also had records regarding the various types of work involved in constructing the railroad spur in 1978 and these records showed that it was necessary to dig up a section of asphalt and dirt to prepare the railroad bed. The records showed that the dirt was removed on August 12, 1978 but do not indicate where it was removed to.

Interview of Mr. Charles H. Whitmore, Jr., Project Manager and Safety Director, Westcott Construction Corporation, 135 East Washington Street, North Attleboro, Massachusetts, on January 10, 1979. Mr. Whitmore was interviewed by NRC inspectors R. E. Shepherd and R. H. Smith regarding any knowledge that he might have about the railroad spur constructed at the Texas Instruments (TI) facility around 1965. He said that he would review his company's records but believed that

the Westcott Construction Corporation may have been the prime contractor for that job and that the A. A. Accaro Company, Franklin, Massachusetts, was the subcontractor. He said that he would have more definite information after reviewing his records and would have this information available on January 11.

Mr. Whitmore was reinterviewed on January 11 and he said that his company was not involved in the construction of the railroad spur as previously reported, although his company has done construction work at the TI facility. He said that he has no knowledge of any dirt or debris having been removed from Texas Instruments (TI) by his company, either as a prime contractor or through a subcontractor, with the exception of the excavation for the foundation for the addition to Building 4, which was done during June, July, and August 1976. He said that the excavated material was put into Dorrance Company trucks and that the Westcott Company had hired Dorrance to do that work. He said that this material was taken by Dorrance Company to the Attleboro Landfill Corporation dump and to another Dorrance-owned site in the Norton-Attleboro area.

Joint Interview of Individual C, who requested that his name be kept confidential and Mr. Anthony F. Ferreira, Facility Engineer, Texas Instruments (TI), on January 11, 1979. Individual C and Mr. Ferreira furnished the following information to NRC Inspectors R. E. Shepherd and R. H. Smith in the presence of TI representatives F. Sherman and J. A. Haug: Both Individual C and Mr. Ferreira said that the Cavalieri Company installed the railroad spur at the TI site in 1965. When informed that the inspectors spoke with Mr. Anthony Cavalieri (of Patsy Cavalieri & Son) and were told by him that his company did not build the railroad spur, they indicated that the railroad spur was built by Mr. Cavalieri's father and that the Cavalieri Company constructed the railroad track and that Dorrance Excavation Company did the grading work for the railroad bed.

Mr. Ferreira said that he saw the work being done on the railroad spur construction by both the Cavalieri and Dorrance Companies. He said that the Dorrance Company had to do some excavation work on the north end of the construction area where a section of the track

was subsequently removed by the DeAngelis Company. He said that the whole railroad spur job (excluding the work done later by the DeAngelis Company) was done in the middle of 1965. Individual C said that the Accaro Company, Franklin, Massachusetts, had nothing to do with the construction of the railroad spur. (The name of this company was mentioned by R. E. Shepherd as possibly being the subcontractor on the railroad spur construction, based on information furnished to R. E. Shepherd by Mr. Charles Whitmore, of Westcott Construction Corporation, on January 10, 1979).

Mr. Ferreira said that the Dorrance Company brought in "fill" to grade the track near the junction where the spur connected to the main track. He also said that neither the Dorrance Company nor the Cavalieri Company took anything off the TI site in connection with the railroad spur construction.

Individual C said that when the DeAngelis Company installed a railroad spur last year (as an add-on to the existing spur), the DeAngelis Company removed from the TI site an area of asphalt, measuring about 20 feet wide, 100 feet long, and about 2 inches thick, but Individual C did not know where this material was taken after leaving the TI site. Individual C said that Mr. DeAngelis asked where he could dump the asphalt and was told that he (Mr. DeAngelis) could dump it in the Attleboro Landfill dump site. Individual C said that there was a steam pipe which Mr. DeAngelis had to remove when constructing the railroad spur in 1978. He said that this was originally a steam pipe going from Building 6 to Building 10. i.e. it was a steam intake pipe into Building 10 from Building 6.

With regard to the road constructed near the south side of Building 10, Mr. Ferreira said that the Narraganset Company and the Dorrance Company were the two prime contractors for the road construction work performed around the TI site.

Individual C said that Building 12 was built during 1967 and 1968 and that a small cement walk, measuring about 4 to 6 inches deep, about 10 feet wide, and about 300 feet long, and connecting parking lot "O" with Building 12, was built over an onsite dumping area which measured about 300 feet in diameter. Individual C said that he did not have any idea as to the depth of the dumping area or as

to what was dumped there. He also said that he did not know how long the dumping area was used and he did not see anyone dump anything in that area. Individual C also said that he never saw anything taken from TI property in connection with the construction of Building 12 and the cement walkway mentioned above.

Mr. Ferreira said that "they" burned some zirconium scraps in 55-gallon drums in the above-mentioned dumping area but that this was done simply for fire-extinguishing instruction purposes. He said that this is the only area where he (Ferreira) saw anyone burn anything on the TI site. R. E. Shepherd showed Mr. Ferreira a diagram of the TI facility and pointed to an area on the diagram which was an area where Mr. A. Amancio said that he had burned zirconium. Mr. Ferreira said that the place where he (Ferreira) saw zirconium being burned, solely for fire instruction purposes, was in the same general vicinity as that which was reported by Mr. Amancio as the area where he (Amancio) burned zirconium.

Interview of Mr. Cleo Forcier, Group Safety Engineer, Texas Instruments, Attleboro, Massachusetts, on January 11, 1979. Mr. Forcier furnished the following information to NRC Inspectors R. E. Shepherd and R. H. Smith: He said that he has been working at the Texas Instruments (TI) site in Attleboro for 22 years and was employed as a Health Physics (HP) inspector during the period that Building 10 was in operation with regard to nuclear fuel operations. He said that, to the best of his knowledge, material such as paper towels and rags, which came from Building 10, were taken to the incinerator, which was located in a carport-type structure adjoining Building 5, without having a radiation survey performed on such material. The people who used the incinerator wore protective clothing, including gloves, disposable shoe covers, and film badges. He said that Joe Carr and Jeff Gelinis did some of the burning in the incinerator and that the ashes were put into 55-gallon drums which were then brought back into Building 10. He said that he performed periodic radiation surveys of Building 5 and the general area where the burning in the incinerator was done.

With regard to an onsite dumping area located between Buildings 11 and 12, he said that this dump area contained stacks and duct work from Building 10, after the phase out of Building 10. All of the scrap from Building 10, after it (the scrap) was decontaminated was sold to "Miller", a scrap dealer in Attleboro, whom he could not

identify more specifically. Mr. Forcier said that he (Forcier) and his associates at Metals and Controls did the "decon" job of Building 10, using soap and water, and muriatic solution, if necessary. He said that everything was surveyed for contamination before it left the building. He said that no liquid waste was put into the onsite dumping area. He said that he never saw, nor had any occasion to survey, any truck containing trash going to any local dump. He said that zirconium was burned in only one area on the TI site and that this was in the fenced-in area near Building 5, at a "good distance" from Building 5. The only burning areas that he knows about are the incinerator burning area and the zirconium burning area mentioned above. He said that none of the company's truck drivers ever asked him to survey anything that they were going to transport somewhere. He said that he has no knowledge of any dirt, debris, or rocks having been taken from the TI site.

He said that he could not recall what was done with the residue from the steam-cleaning "decon" job of Building 10. He said that Charles Enthwistle (phonetic) participated in the "decon" job and that Enthwistle is still employed at TI. Mr. Forcier did the radiation surveys with regard to the "decon" job but he did not do the actual steam-cleaning and does not know who did the steam-cleaning job. He did not know if Dunlap, a name mentioned by R. Shepherd, did the steam-cleaning job.

Mr. Forcier said that he does not know if any contaminated material was put into the onsite dumping area mentioned above. Also, he said that he does not know why any material was put into the onsite dumping area nor does he know who was responsible for putting anything into this area. He said that he had no knowledge of a water evaporation operation in Building 5. He said that he has no knowledge of what was done with the zirconium ashes from the burning area, in the vicinity of Building 5, mentioned above. He said that he has no knowledge of any sign or sign post used at the site and which had words to the effect "Radioactive Material, No Trespassing Beyond This Point." He said that the onsite dumping area was a hole, about 15-20 feet deep which was covered with about 10 feet of dirt.

Interview of Mr. Melvin Dorrance, President, Dorrance Construction Company, Norton, Massachusetts, on January 12, 1979. Mr. Dorrance furnished the following information to NRC Inspectors R. E. Shepherd and R. H. Smith: With regard to the construction of the railroad

spur at Texas Instruments (TI) in Attleboro, Massachusetts, which was constructed around 1965, he said that his company removed approximately 200 loads of peat from the construction area and took it to Mr. Dorrance's privately owned dumping area on Harvey Street, Norton, Massachusetts. He said that his company did not dump anything at the Shpack dumping site in Norton which his company removed from either TI property or from Engelhard Industries property in Plainville, Massachusetts. He said that his company brought some old houses to the Shpack dumping site to be burned there but that these houses did not come from TI or Engelhard Industries property.

F. Conclusions

The conclusions related to Allegation No. 1 and the investigation findings associated therewith are discussed in NRC:I Investigation Report No. 076-154, dated March 1, 1979.

With regard to Allegation No. 2, it has been verified through visual examination of the Norton landfill area (Shpack property) that certain items discarded there bore the names "Texas Instruments" and "Metals and Controls". None of these items were found to contain radioactive material or radioactive contamination as determined by the radiological surveys which were conducted at the above site and detailed in NRC:I Investigation Report No. 078-154.

It has been determined through interviews with TI personnel and other individuals that this company, operating under the name Texas Instruments, Metals and Controls Corporation and/or M&C Nuclear Corporation, has employed various members of its maintenance force to haul trash from the TI facility in Attleboro to the Norton landfill area (Shpack property) on a frequent basis over a number of years. One TI employee who was involved in TI's trash disposal operations stated that he hauled two loads of dirt, consisting of ashes from burned zirconium chips and wooden skids, from the TI facility to the Norton landfill area. The information developed through the interviews with TI personnel and other individuals failed to substantiate that the TI items discarded at the Norton landfill area were radioactive.

It was also determined that M&C Nuclear, Inc., Attleboro, Massachusetts, which merged with TI in 1969, had used the aforementioned landfill area to discard trash and other material, including burned zirconium ashes, associated with nuclear fuel operations conducted at the TI facility from about 1957 to 1966. Based on NRC's review of TI's nuclear operations at that location and the analyses of the radioactive material found at the Norton landfill area, it is possible that TI was the major source of that material. Other possible sources of the radioactive material could not be determined because of the limited amount of radioactive physical evidence found at the Norton site.