December 10, 1996

Mr. Ron A. Juday, Supervisor
Petrotomics Company
P.O. Box 8509
Shirley Basin, Wyoming 82615

SUBJECT: AMENDMENT 54 - HOUSEKEEPING ITEMS (LICENSE CONDITION 11)

Dear Mr. Juday:

The U.S. Nuclear Regulatory Commission staff, based on its review of your request by letter dated October 7, 1996, hereby amends Conditions 11 of Source Material License SUA-551 for the Shirley Basin, Wyoming Uranium Mill. The amendment changes the reference in Condition 11 from "License Condition 11 Summary" dated February 10, 1994, to that dated October 1996, to reflect current reclamation status of the site. All other conditions of this license shall remain the same.

The enclosed Technical Evaluation Report contains the staff's assessment of the licensing action. The license is being reissued to incorporate the requested change, and is enclosed. If you have any questions, please contact the NRC Project Manager, Mohammad Haque at (301) 415-6640.

Sincerely,

[ORIGINAL SIGNED BY:]

Joseph J. Holonich, Chief
Uranium Recovery Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-6659
TAC No. L51480 (closed)

Enclosures: As stated

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TECHNICAL EVALUATION REPORT

DATE: December 2, 1996

DOCKET NO. 40-6659 LICENSE NO. SUA-551

LICENSEE: Petrotomics Company

FACILITY: Shirley Basin, Wyoming

PROJECT MANAGER: Mohammad Haque

TECHNICAL REVIEWER: Mohammad Haque

SUMMARY AND CONCLUSIONS:

Petrotomics Company (Petrotomics), by its letter dated October 7, 1996, requested to amend Condition 11 of the Source Material License SUA-551 to reflect current reclamation status of the Shirley Basin uranium mill site. Based on its review, the NRC staff has found Petrotomics' request acceptable, and recommends the following changes to the "License Condition 11 Summary."

DESCRIPTION OF LICENSEE'S AMENDMENT REQUEST:

Petrotomics has proposed to update its February 10, 1994, submittal entitled "License Condition 11 Summary" (Summary). The revised Summary, dated October 7, 1996, is included as Attachment 1 to this report. The purpose of updating the Summary is to make the Condition 11 of License SUA-551 commensurate with current site activities. The proposed changes to the Summary are as follows:

Section 4.2 (WASTE MANAGEMENT SYSTEM/Liquids and solids)

Second paragraph. Add a sentence to note that construction was resumed in 1996.

Third paragraph. Add Maintenance Coordinator as an alternative to the Radiation Coordinator to conduct quarterly inspection of the impoundment retention system.

Item 5 (Emergency Containment Facility). Delete; renumber items 6, 7, and 8 to 5, 6, and 7; and add an item 8 to require to continue inspections during construction to detect unusual or unexpected conditions.

Last paragraph. Modify to require training whenever a change in inspectors occurs.

Section 5.1-1 (MANAGEMENT RESPONSIBILITIES)

Item 1. Modify the last sentence to reflect the current position of the person the Site Supervisor reports to.

Item 2. Modify the title of the Radiation Coordinator to Radiation Coordinator/Environmental Coordinator.

Figure 5.1-1 (Organizational Chart). Modify to reflect current status.

Section 5.5-1 (OCCUPATIONAL EXPOSURE - EXTERNAL)

First paragraph, second sentence. Replace by "Currently site workers receive substantially less than 10 percent of the occupational dose limit."

First paragraph, third sentence. Replace "All employees" with "selected personnel" to make it compatible with 5.5-1, item 1.

Item 1. Replace "Employees" with "personnel."

Item 4. Insert "Dose" between "less" and "than" in the last sentence. In addition, cite reference to 10 CFR 20.1201.

Section 5.5-6 (DECONTAMINATION PROCEDURES)

Item 1. Rewrite the paragraph to reflect the current status of the site. Decontamination procedures will be established by the Radiation/Environmental Coordinator using SOP's.

Item 2. Replace the word "pull" in the first sentence with "perform."

TECHNICAL EVALUATION:

The changes proposed above by Petrotomics are of housekeeping nature. The changes have resulted from Petrotomics' review of License Condition 11 in light of its reclamation status and comments made during the annual NRC inspections. Based on its evaluation of the proposed changes, the staff considers the licensee's request acceptable.

RECOMMENDED LICENSE CHANGE:

The staff recommends that Condition 11 of the Source Material License SUA-551 be revised to change the date of the "License Condition 11 Summary" submittal letter from February 10, 1994, to October 7, 1996.

ENVIRONMENTAL IMPACT EVALUATION:

An environmental assessment for this action is not required, since this action is categorically excluded under 10 CFR 51.22 (c)(11), and an environmental report from the licensee is not required by 10 CFR 51.60 (b)(2).

LICENSE CONDITION NO. 11
SUMMARY

Revised: October 1996

Attachment 1

3.4 DELETED by Amendment No. 21

3.5 DELETED by Amendment No. 21

3.6 DELETED by Amendment No. 21

4.0 Waste Management System

4.1 DELETED by Amendment No. 21

4.2 Liquids and Solids

The solid and liquid wastes from the milling process were placed in the tailings impoundment area. A brief description of the waste management program is presented below:

The tailings from the milling operation were deposited in an impoundment area west of the mill site. The tailings ponds were dry in 1987. The tailings were shaped and covered with a two foot thick cover layer of compacted clay in 1990, except for a six acre depressed area, in accordance with the reclamation plan. Two small evaporation ponds (total area approximately 37 acres) were constructed on the clay cover layer to receive corrective action pumpback water for evaporation. Construction in accordance with the reclamation plan was resumed in 1996.

In addition to frequent inspections of the corrective action systems by the Maintenance Coordinator, a quarterly inspection of the impoundment retention system is conducted and documented by the Radiation Coordinator or Maintenance Coordinator. This inspection entails, but is not limited to the following:

1. Embankment settlement. The top of the embankment and downstream toe areas are examined for any evidence of unusual localized or overall settlement or depressions.

2. Embankment slope conditions. Embankment slopes are examined for irregularities in alignment and variance from originally constructed slopes, unusual changes from original crest alignment and elevation, evidence of movement at or beyond the toe, erosions, and surface cracks that indicate movement.

3. Seepage. The downstream face of embankment slopes and toes, and the downstream valley areas are examined for evidence of existing or past seepage, springs, and wet or boggy areas.

4. Slope protection. The slope protection is examined for erosion-formed gullies and wave-formed notches and benches. The adequacy of slope protection against waves and surface runoff that may occur at the site is evaluated. The condition of vegetative cover is evaluated.

5. Inspection of diversion channels for channel bank erosion, bed aggradation or degradation and siltation, obstruction to flow, undesirable vegetation, or any unusual or inadequate operational behavior.

6. Groundwater. Groundwater is examined in accordance with License Condition 41, Environmental and Effluent monitoring program.

7. Post-construction changes. Data is collected on any changes that have occurred since the project construction which might influence the safety of the project.

8. Inspections will continue during reclamation contrurction to detect unusual or unexpected conditions.

Special inspections would be performed after the occurrence of significant earthquakes, tornadoes, floods, intense local rainfall or other unusual events. If unusual conditions, or signs of distress are noted in an inspection, additional technical evaluation of the retention system or problem area will be performed.

The employee performing inspections of the impoundment retention system will have training by an experienced dam stability inspector. Training will be required whenever a change in inspectors occurs.

5.0 OPERATIONS

Operations are limited to reclamation, corrective action and related activities. All operations will be conducted in conformance with applicable laws and regulations of the various governmental agencies involved. In order to assure compliance and further implement Petrotomics Company's policy of providing a safe working environment with implementation of the philosophy of maintaining radiation exposures as low as is reasonably achievable, the following programs have been initiated and maintained.

5.1 PROJECT ORGANIZATION

An organizational chart of individuals responsible for the development, review, approval, implementation and adherence to operating procedures and radiation safety programs is presented in Figure 5.1-1.

5.1-1 MANAGEMENT RESPONSIBILITIES

1. SITE SUPERVISOR: The Site Supervisor is responsible for the reclamation of the mine and mill, and all related facilities and activities associated with the Petrotomics Site. The Site Supervisor develops and maintains a plan of action to safely ensure the best possible reclamation at the lowest possible cost. The Site Supervisor reports to the Manager and Project Manager, Retained Liabilities Department, Denver Division, Texaco Exploration and Production Inc., Denver, Colorado.

2. RADIATION COORDINATOR: The Radiation/Environmental Coordinator is responsible for establishing and conducting monitoring and control procedures in accordance with State and Federal Government regulations. He ensures that necessary tests are performed to obtain data for radiological monitoring and maintains all records in connection with these tests. He works with State and Federal officials in matters pertaining to radiation control and assures compliance with provisions of the United States Nuclear Regulatory Commission license. The Radiation/Environmental Coordinator reports directly to the Site Supervisor.

5.1-2 REQUIRED APPROVALS

Non-routine maintenance, cleanup and equipment modification and any remedial or corrective actions are initiated by any level of management with the appropriate action channeled through the Site Supervisor. Activities involving possible radiation exposure are monitored by the Radiation Department to assure the established limits are not exceeded. In addition to the required approvals discussed above, if it has been determined that any process or operation proves an immediate radiation hazard to employees, the Radiation Coordinator has the authority to stop the operation until the hazard has been mitigated.

In the case of non-routine maintenance where employee exposure limits are approached, the Radiation Coordinator will remove affected employees from the designated work areas.

5.1-3 DELETED by Amendment No. 21.

ORGANIZATIONAL CHART

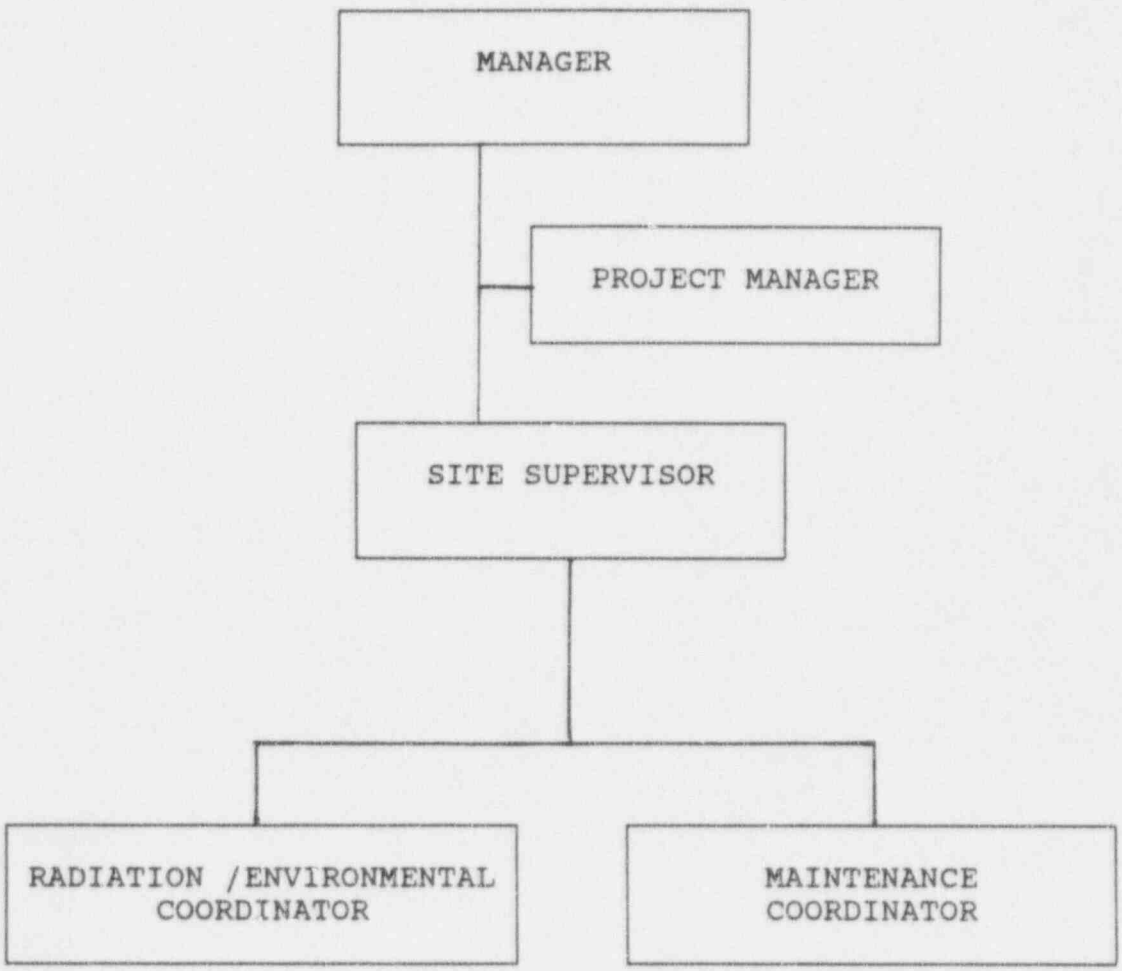

Figure 5.1-1

5.1-4 CORPORATE REVIEW AND ASSISTANCE

Corporate management and professional review, guidance and assistance from corporate management headquarters, Texaco Inc., is provided as needed. When necessary, outside consultants are brought in to review, evaluate and recommend remedial actions.

5.1-5 A.L.A.R.A. PROGRAMS

Mechanisms through which Petrotomics Company continues to assure that employee exposures and effluent releases are maintained as low as reasonably achievable are listed below:

1. Petrotomics Company has a commitment to its personnel to keep the occupational exposures as low as reasonably achievable. Workers will be made familiar with this policy upon employment. They will be told what radiation exposure means, and why they are required to implement Radiation Safety Rules and Regulations at all times on their jobs. Employees will be made aware of the importance and responsibility of their own actions in lowering the radiation exposure for all people in their work environment.

2. In addition to new employee training, Petrotomics Company maintains a continuing education program of all employees. Discussed during meetings are methods through which the Company can improve radiation safety of the operation in addition to the industrial safety aspects.

3. Where anomalous conditions may appear, specific employees are counseled on an individual basis with emphasis placed on maintaining optimal production in a safe manner.

4. It is a continuing policy of Petrotomics Company to review on a cost effective basis additional engineering controls to maintain exposure and effluent releases as low as reasonably achievable.

5.2 QUALIFICATIONS

Qualifications of radiation protection personnel are enumerated below:

1. Radiation Coordinator

   A. Education: A bachelor's degree in the physical sciences or engineering from an accredited college or university.

B. General: One year of supervisory experience and one year of experience in a uranium mill or related industry.

C. Health Physics Experience: One year of work experience in applied health physics, radiation protection, industrial hygiene or similar work.

D. Specialized Training: A formalized intensive course in health physics. At least one week of the course should be specifically applicable to health physics for uranium milling and mining. Refresher training - DELETED by Amendment No. 35.

E. Specialized Knowledge: A thorough knowledge of the proper applications and use of all health physics equipment used at the site, the chemical and analytical sampling and monitoring, and methodologies used to calculate personnel exposure to uranium and its daughters.

2. DELETED by Amendment No. 35

5.3 TRAINING

The purpose of the in-house radiation safety program is:

1. To place in proper perspective for the employee the short and long-term radiation hazards associated with the job;

2. To instruct and train employees in practices instituted by management to keep occupational exposures as low as reasonably achievable;

3. To assure each employee has an understanding (both initially and over the duration of his employment) of the radiation safety procedures which should be followed;

4. To stress most safety radiation procedures are "common sense" procedures, just as are occupational safety procedures, that have been implemented to protect the employee, and;

5. To emphasize the employee's personal responsibility to protect himself and others by adhering to all safety procedures.

All new employees receive instructions in plant and personal safety, including radiation safety procedures taken to minimize radiation exposure.

Repeated violations of safety practices will result in disciplinary action, up to and including dismissal. A system of Safety Warning Letters are used to properly document safety violations.

5.3-1 EMPLOYEE RADIATION SAFETY TRAINING

Basic indoctrination in radiation protection is given to all employees assigned to work in the tailings area. The training is given prior to an employee's commencement of work activities. The new employee will sign a statement indicating he/she has read and is familiar with the safety procedures and understands such procedures prior to commencement of work. The signed statement will be included in the employee's exposure file.

Formal retraining, which addresses essentially the same material as is presented to new employees, is given to employees annually. The basic employee indoctrination training includes the following:

1. Introduction. Included is a brief review of the historic milling process and the hazards associated with the milling of uranium ore.

2. Description of Radiation. Included is an explanation and definition of radiation and explanation of the associated health protection problems, and an explanation of terms, i.e., half-life, rem, mrem, maximum permissible exposure.

3. Types of Radiation. A discussion of the types of radiation and their characteristics is presented. Emphasis is placed on alpha, beta and gamma radiation.

4. Biological Effects of Radiation. The effects of radiation on the body is discussed along with the exposure limits which have been established.

5. Radioactive Minerals in Mining. A look at U-238 and the products of its decay. Chemical characteristics, half-life and hazards are covered for these elements.

6. Health Hazards. Specific hazards of exposure to beta and gamma radiation and the ingestion or inhalation of radioactive dust is covered. Internal and external hazards are discussed, as well as protective measures.

7. Monitoring Programs. Addressed are the basic detection methods and instrumentation used for detection of radiation to determine employee exposure. Employees are instructed as to purposes and functions of equipment and the importance of monitoring programs.

8. Principles of ALARA. Management's position in support of the ALARA principles is stated and an explanation of the ALARA program is provided.

9. Employees Rights Under Federal Laws. Instruction is given in accordance with 10 CFR 19, "Instructions to Workers" commensurate with the potential radiological health protection problems in the restricted areas.

All female employees working in the tailings area will be instructed in the potential health protection problems associated with prenatal radiation exposures outlined in Regulatory Guide 8.13, "Instructions Concerning Prenatal Radiation Exposure". Signed acknowledgments of the instruction and understanding of such instructions from each female employee will be maintained in the employee's exposure file.

Also reviewed are allowable exposure limits in accordance with 10 CFR 20 and general operating procedures to maintain exposures ALARA. Also reviewed are required notification and posting requirements in accordance with 10 CFR 19 as well as the radiation exposure reports which workers may request pursuant to 10 CFR 19.13. 10 CFR 21, "Notification of Defects or Noncompliance" is also reviewed.

10. Radiation Safety Rules. Rules established to provide a safe working area are reviewed. Since protection from radiation safety hazards is commensurate with good industrial and good personal hygiene, emphasis is placed on the responsibility of the employee to maintain safe working conditions and abide by established safety rules. In accordance with general safety practices, repeated violations of the safety rules will result in disciplinary action, up to and including dismissal.

11. Methods of Controlling Contamination. Emphasis is placed on good personal hygiene through showering and change of clothing or monitoring prior to exiting property, and through washing prior to eating. Proper cleaning techniques are also stressed.

12. Protective Clothing. Included in the indoctrination are proper use and purpose of the appropriate protective equipment, including protective equipment, clothing, gloves, boots, coveralls, eyeglasses, hard hats and respirators.

5.3-2 DELETED by Amendment No. 21.

5.3-3 RADIATION SAFETY PERSONNEL

Personnel performing radiation protection duties receive additional training beyond the normal indoctrination training. Such training consists of special seminars and/or on-the-job training. Training from seminars will include, but is not limited to, basic radiation theory, biological effects of radiation on matter, radiation measurement (including survey techniques and methods, personnel monitoring methods, quantitative and qualitative measurements), control of radiation sources (including distance, time, geometry, shielding methods, contamination control, use of personal protective equipment, and first aid), implementation cf the ALARA philosophy, decontamination techniques (for both personnel and equipment), regulations that are applicable and audit techniques necessary to verify conformance with applicable requirements for radiation protection.

5.3-4 INDUSTRIAL SAFETY TRAINING

New employees are instructed in basic safety rules and work procedures. Safety awareness is continually emphasized at the facility. On a job-specific basis, employees are advised of the precautionary measures necessary for the safe handling and operation of tools, chemicals, solvents, and equipment used at the site.

First aid equipment and facilities are provided at the main office.

5.3-5 DELETED by Amendment No. 21

5.4 SECURITY

Access to the restricted area is controlled by a locked gate at the entrance when Company personnel are not on the property. The restricted area is surrounded by fence, either four strand barbed wire, or combination woven wire and barbed wire. The restricted area is posted in accordance with 10 CFR 20.203 (e). Also, the entrance to the property is posted with the sign, "CAUTION - ANY BUILDING OR CONTAINER WITHIN THIS AREA MAY CONTAIN RADIOACTIVE MATERIAL."

All visitors are required to register at the site office and are not permitted to tour the area without appropriate authorization. When necessary, visitors are escorted while within the secured areas.

Contractors having work assignments, such as equipment repair, will be given appropriate security, safety, and radiation protection orientation commensurate with their duties while in the restricted area.

5.5 RADIATION SAFETY

To comply with the requirements of 10 CFR 19 and 10 CFR 20, Petrotomics maintains an employee radiation monitoring and protection program described briefly in the following subsections.

5.5-1 OCCUPATIONAL EXPOSURE - EXTERNAL

External whole body exposure to ionizing radiation is maintained as low as reasonably achievable. Currently site workers receive substantially less than 10 percent of the occupational dose limit. However, selected personnel are badged as a precautionary measure.

External exposure to ionizing radiation will be determined from known dose rates and exposure times using personnel monitoring devices.

1. Personnel Dosimetry: Selected personnel are issued personnel dosimeters which are worn on site and are changed out quarterly. The TLD badges are presently furnished and analyzed by Eberline of Santa Fe, New Mexico. In the future, any firm offering comparable design specifications for personnel dosimeters may be used.

2. Exposure Control Limits - Action Levels: In cases where personnel dosimeters reveal a gamma dose in excess of 25% of 1.25 rem in any calendar quarter, the following actions are implemented:

    a. The Radiation Coordinator conducts an investigation to determine where and how the exposure(s) occurred.

    b. A review of gamma survey results is conducted to verify that the work area has no unusual external radiation and, if necessary, additional surveys of the area are conducted to determine the potential cause of the elevated levels of external radiation. Results of readings from

other TLD badges for other employees working in the same area are reviewed to verify that there was no excessive exposure. In the case of contamination of TLD badge, the employee is counselled to prevent a recurrence of such contamination.

If a source of unusual external radiation is noted, appropriate corrective action will be taken to lower the level of radiation as far below limits as specified in 10 CFR 20 as is reasonably achievable and to ensure that no unnecessary exposure occurs in the future.

3. Exposure Records: All exposure records are kept in accordance with regulations set forth in 10 CFR 20.102. All exposure investigations are documented.

4. Exposure of Minors: Exposure of occasional visitors who are less than 18 years of age is automatically limited by the limited period of contact and by the controlled environment required in a restricted area. Any exposure, when evaluated over a calendar quarter, will result in far less dose than 10% of the levels specified in 10 CFR 20.1201.

5.5-2 DELETED by Amendment No. 21.

5.5-3 OCCUPATIONAL EXPOSURE - INTERNAL - DELETE

5.5-4 BIOASSAY - DELETE

5.5-5 DELETED by Amendment No. 21.

5.5-6 DECONTAMINATION PROCEDURES

Each employee is responsible for safety and quality in his work and for adherence to all safety and radiation protection rules as a condition of employment. Supervisors will ensure that all safety rules are adhered to.

1. Employees

The potential for radiological comtamination is minimal because the mill has been decommissioned and because earthen cover has been placed over the tailings pile. Requirements for self monitoring and decontamination by employees will be based on potential for contamination and will be established by the use of SOP's.

2. Contamination Surveys

At least once per quarter, the Radiation Coordinator will perform a spot check on employees with a survey instrument to verify that contaminated clothing is not removed from the property and proper self monitoring techniques are being used. An action level of 1,000 dpm alpha/100cm2 is used

Surveys of potentially contaminated equipment is conducted before the equipment is released to unrestricted areas. If contamination is detected, the equipment is decontaminated until additional efforts do not significantly reduce contamination levels. The surface contamination levels listed in U.S. NRC Regulatory Guide 1.86, "Termination of Operating Licenses for Nuclear Reactors" (June 1974), is used to establish release limits.

5.5-7 DELETED by Amendment No. 21.

5.5-7-1 SAMPLING METHODOLOGIES

All sampling methodologies for the environmental monitoring program are detailed in the Standard Operating Procedures.

General information regarding sampling methodologies include the following:

Sampling Locations;
Date and Time of Collection;
Sample Identification - i.e. air, vegetation, etc.;
Sample Type - i.e. grab, continuous;
Sample Preparation (if applicable);
Analysis Required;
Individual Collecting Sample.

5.6 EMERGENCY NOTIFICATION

In accordance with the conditions of 10 CFR 20.402, "Reports of Theft or Loss of Licensed Material"; 10 CFR 20.403, "Notifications of Incidents"; and 10 CFR 20.405, "Report of Overexposures and Excessive Levels and Concentrations", Petrotomics will take the appropriate actions immediately to notify the appropriate authorities. The management of Petrotomics will also be notified of any such instances.

Where indicated, an investigation shall be made of the instance and a written report shall be prepared. Reports submitted to the Nuclear Regulatory Commission shall be in accordance with Sections 20.402, 20.403, and 20.405 of 10 CFR 20.

In accordance with 10 CFR 21, notification of reportable incidents to NRC will be through the delegated Executive Officer. The Executive Officer is the Site Supervisor for Petrotomics.

5.7 DELETED by Amendment No. 21.

5.8 DELETED by Amendment No. 21.