

STATE OF COLORADO

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Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department
of Public Health
and Environment

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Subject: **Notice of Violation**

This letter is a Notice of Violation of certain requirements of Title 25, Article 11, CRS 1989, Colorado Radioactive Materials License Number 369-01, and the State of Colorado *Rules and Regulations Pertaining to Radiation Control* (the Regulations). These violations were identified in an announced inspection conducted at your Canon City facility on March 18-22, 2002 by Thomas Pentecost, Ed Stroud, and Brian Vamvakias of this Division. The inspection consisted of selective examinations of procedures and records, independent radiation measurements, and observations and interviews made by the inspectors.

If proper actions are not taken by the licensee, on the basis of the violations (noncompliance items) cited in this letter, the Division will consider the institution of proceedings to revoke, suspend or modify the license as necessary, and imposition of civil penalties under 25-11-107 (5), CRS 1989.

Your written response must be submitted within thirty (30) days of receipt of this letter and must include: (1) corrective steps which have been taken to achieve compliance; (2) plans to achieve compliance with the requirements which cannot be remedied within thirty (30) days; and (3) other relevant information. Any compliance schedules or plans agreed to by the Division, as allowing reasonable opportunity to comply must specify implementation deadlines. If these deadlines are not met, this will provide the Division a basis, without further notice, to institute proceedings for suspension, revocation or modification of your license, as provided in RH 3.23 of the Regulations. Failure to take corrective actions or to respond to this letter as described above could also result in proceedings to impose the above referenced penalties.

The following Items of Noncompliance with the State of Colorado *Rules and Regulations Pertaining to Radiation Control* (The Regulations) and the conditions of your Radioactive Materials License were noted during this inspection:

Prepared by: _____ Reviewed by: _____ Reviewed by: _____ Mailed by: _____
Date: _____ Date: _____ Date: _____ Date Mailed: _____

1. RH 4.9 of the Regulations specifies requirements for assessing the Committed Effective Dose Equivalent (CEDE) to workers who are exposed to airborne radioactive materials. Dose assessments based on the contribution of fractional intakes of Class D, W, or Y compounds of specific radionuclides require detailed information regarding: (a) the specific airborne radionuclides in work areas; (b) the inhalation Class for each radionuclide in the mixture; (c) and the percent contributions to the total dose. RH 4.46.1.4 of the Regulations requires the licensee to maintain records of the specific information used to assess and calculate the CEDE.

Contrary to these requirements, at the time of the inspection, the following deficiencies were identified:

- A) The licensee did not have documentation to demonstrate the adequacy of the current intake and dose calculation methods and assumptions. Specifically, the licensee could not provide analytical data to support the assumed radionuclide concentrations and inhalation Classes (D, W, or Y) for airborne radioactive materials used in calculating doses. The licensee could not provide analytical data to support the omission of radionuclides present in the air which were not included in worker dose assessment, such as ^{220}Rn and its decay progeny.
- B) The spreadsheets in use by the licensee are different from those submitted as part of the renewal application and as approved by the Department in correspondence dated February 28, 2002. In addition, the licensee had not established written procedures to support the changes in the dose assessment spreadsheets.
- C) Examination of the data entered into the licensee's spreadsheets for the 2001 dose determinations has revealed numerous inconsistencies and errors. These include:
 - i) conflicts between a workers activity log and dose calculations sheets regarding the use of respiratory protection equipment;
 - ii) inconsistencies in the percentages of the measured activity on air samples which are allocated to specific radionuclides during dose calculations; and
 - iii) a failure to account for the measured levels of radioactive materials in air when assessing the workers dose.

The licensee must take immediate action to address the deficiencies in the methods, procedures, and documents used to determine and track occupational doses. Until revised procedures and supporting documentation can be reviewed and approved by the Department, the licensee must take all necessary and appropriate actions to control doses and limit intakes of radioactive materials to ensure compliance with the requirements specified in Part 4 of the Regulations. These actions may include, if necessary, removing personnel from work environments where substantial intakes of radioactive materials are possible.

In addressing the deficiencies in the licensee's dose assessment program, the licensee must determine the specific radionuclides present in air and their associated inhalation Classes. Separate determinations are required for the various locations throughout the mill facility where the airborne radionuclides or Class of materials differ significantly. The licensee must document the technical basis for selecting the percentages and Classes for each radionuclide used in the excel spreadsheets for intake determination. The licensee must also document the technical basis for eliminating any radionuclides, present in the air, from the dose determination. Specifically, for any radionuclide in air which is not used in the dose determination, the licensee must show that the concentration of that radionuclide nuclide is less than 10% of its Derived Air Concentration (DAC) and that the sum of all disregarded radionuclides in the air is not more than 30% as outlined in RH 4.9. The licensee must re-evaluate the radionuclides present in air and the dose assessment calculations for each alternate feed stock processed by the licensee. The licensee must also, adhere to those specific procedures, methods, and assumptions which have been established in writing by the licensee and approved by the Department.

This violation is a repeat Item of Noncompliance, previously cited in the Department's October 13, 2000 Notice of Violation.

This is a Severity Level III violation and each violation of this type would have an associated civil penalty of \$1250.00.

2. RH 4.5 of the Regulations requires the licensee to develop, document, and implement an ALARA program to ensure that doses to workers are As Low As Reasonably Achievable. This ALARA program must be sufficient to assure compliance with the provisions of Part 4. In addition, License condition 18.4.1 requires the licensee's ALARA program to conform to the NRC Regulatory Guide 8.10, 8.31, and 8.37. Section 2.3.2 of the Regulatory Guide 8.31 specifically requires the Radiation Safety Officer (RSO) to provide the resident manager with monthly reviews of the most recent personnel exposure data, bioassay data, and time-weighted calculations.

Contrary to these requirements, the following significant ALARA Program deficiencies were identified:

- A. There was no documentation available at the time of the inspection to indicate that the licensee's management had taken actions to correct the significant programmatic deficiencies identified in the independent ALARA audit conducted in April 3-5, 2001 by Dr. Noel Savignac (hired by Cotter Corp.). The audit specifically identified deficiencies regarding: the determination of weekly intakes of soluble uranium; the need for beta-gamma surveys in the release of items from the restricted area; and respirator maintenance. The licensee failed to take appropriate and timely action to correct known deficiencies which have significant potential health impacts to the workers and the public.
- B. The monthly reports from the RSO to management for February 2001 identified elevated levels of Class Y uranium in the ADU and calciner areas. Breathing zone sample results indicated levels as high 26 times the DAC. Monthly reports for March, April, May, and June 2001 indicated that the airborne levels remained high in these areas, up to 44 times the DAC in June. The reports do not identify corrective actions to reduce airborne contamination levels.

- C. The monthly report from the RSO to management failed to mention or provide information pertaining to an incident where an individual's bioassay result exceeded 33 µg/L in April 2001.
- D. Personnel working within contaminated areas of the mill are allowed to enter eating areas in the facility without being required to perform contamination surveys or wash their hands. In addition, persons are permitted to chew tobacco in contaminated areas of the mill. This practice was directly observed during the inspection.
- E. The inspectors observed an operational pop machine located in a potentially contaminated area of the mill, between buildings and outside of any designated eating areas.
- F. Persons working in the administration area and the gatehouse are in an un-necessarily close proximity to the zirconium ore pile, which does not meet the intent of ALARA. These individuals are being exposed to airborne radioactive materials, including ²²²Rn and ²²⁰Rn releases from this ore pile which are estimated to be 96 Ci/y and 826 Ci/y respectively. These release rates were provided in the Screening Level Human Health Risk Assessment Uranium/Zirconium Project, prepared November 29, 2000 by Shepherd Miller, Inc.

The licensee must implement an ALARA program sufficient to assure compliance with the provisions of Part 4. The licensee must also take appropriate and timely action to correct program deficiencies identified in the independent ALARA audit conducted in April 3-5, 2001 by Dr. Noel Savignac.

This violation is a repeat Item of Noncompliance, previously cited in the Department's October 13, 2000 Notice of Violation.

This is a Severity Level V violation and each violation of this type would have an associated civil penalty of \$300.00.

3. RH 4.6.5 of the Regulations requires that the licensee limit the soluble uranium intake by an individual to 10 milligrams in a week in consideration of chemical toxicity. License Condition 18.1.2 requires the licensee to comply with the provisions of Part 4 of the Regulations. The licensee's operating procedure 2-8 requires the collection of bioassay samples at least on a monthly basis.

Contrary to these requirements, the licensee has failed to implement a bioassay program sufficient to demonstrate compliance with the 10 mg weekly soluble uranium intake limit for workers. The majority of workers are providing urine samples at 2-week frequencies and there are numerous instances where individuals exceeded the minimum monthly bioassay sampling frequency. The inadequacy of the bioassay program to demonstrate compliance with the 10 mg/week intake limit was also identified in the independent ALARA audit in 2001 by Dr. Noel Savignac.

The licensee must establish and implement a bioassay program sufficient to demonstrate compliance with the requirements of Part 4, including the 10 mg/week intake limit for soluble uranium. In establishing an acceptable written bioassay program and procedures, the licensee must address program deficiencies identified by the Department as part of the current license renewal and those deficiencies identified in the 2001 independent ALARA audit by Dr. Noel Savignac.

This violation is a repeat Item of Noncompliance, previously cited in the Department's October 13, 2000 Notice of Violation.

This is a Severity Level III violation and each violation of this type would have an associated civil penalty of \$1250.00.

4. License Condition 27.3 requires the licensee to implement a bioassay program in accordance with the U.S. NRC Regulatory Guide 8.22. Whenever an individual's bioassay results indicate 15 µg/L of uranium in the urine, the licensee is required to take specific actions as listed in Table 1 of Regulatory Guide 8.22.

Contrary to these requirements, no documentation was available at the time of the inspection to demonstrate that the licensee had investigated or taken corrective action when an individual's bioassay result exceeded 33 µg/L on April 30, 2001.

The licensee must ensure that timely and appropriate actions are taken whenever an individual's bioassay result is greater than 15 µg/L. These actions include: a thorough investigation as to the cause of the intake, timely re-testing of the individual's urine, a detailed and technically sound estimation of the actual intake of soluble uranium by that individual, actions to prevent/limit further intakes, and documentation of the investigation, findings, and corrective actions.

This violation is a repeat Item of Noncompliance, previously cited in the Department's October 13, 2000 Notice of Violation.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

5. RH 4.13 of the Regulations requires that the licensee limit the doses to an embryo/fetus to not more than 500 mrem during the entire pregnancy. The dose equivalent to an embryo/fetus is the sum of: the deep dose equivalent to the declared pregnant woman; and the dose equivalent to the embryo/fetus resulting from radionuclides in the embryo/fetus and radionuclides in the declared pregnant woman. If the dose equivalent to the embryo/fetus is found to have exceeded 5 mSv (0.5 rems), or is within 0.5 mSv (0.05 rems) of this dose, by the time the woman declares the pregnancy to the licensee, the licensee shall be deemed to be in compliance with RH 4.13.1 if the additional dose equivalent to the embryo/fetus does not exceed 0.5 mSv (0.05 rem) during the remainder of the pregnancy.

Contrary to these requirements, the licensee failed to determine and document the dose to the embryo/fetus when an employee provided a written declaration of pregnancy in 2001. The licensee assumed that the CEDE to the embryo/fetus from radioactive materials present in the woman's body to be negligible. No technical data was available at the time of the inspection to support this claim. This worker has had a number of positive bioassay results while working at the mill.

The licensee must determine and document the dose to the embryo/fetus upon receipt of a written declaration of pregnancy by a worker. The licensee must also ensure that the dose to the embryo/fetus remains within regulatory limits. If the licensee cannot demonstrate compliance with dose limits for the embryo/fetus when a declared pregnant worker has positive bioassay results for uranium intakes, then it may necessary to remove such a worker from the restricted area upon receipt of a declaration of pregnancy.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

6. RH 4.5.2 of the Regulations requires the licensee to use procedures and engineering controls based upon sound radiation protection principles to achieve doses to members of the public that are as low as is reasonably achievable (ALARA).

Contrary to these requirements, licensee permits UPS drivers to have unescorted access to the restricted areas of the mill. Within the mill a "radiation area" exists outside the calcium fluoride (alternate feed materials) storage building. Exposure rates as high as 12 mR/hr were measured outside the building during the inspection. In addition, "airborne radioactivity areas" have been present in the mill where concentrations of radioactivity have exceeded 40 times the DAC for the airborne radioactive materials. A one hour exposure to airborne concentration at 40 times the DAC level would produce a CEDE of 100 mrem. On two occasions, during the inspection, the UPS drivers were observed driving unescorted in the mill area and the trucks were observed to exit the site without any survey of the vehicle or the driver. The gate operator did not examine the vehicle to determine if any unauthorized materials were leaving the facility.

The licensee must prohibit the access of delivery drivers to the restricted areas of the mill. Packages can be delivered to the gate without unnecessarily exposing the driver (a member of the public) to radiation. The licensee must also ensure adequate security of radioactive materials in accordance with the intent of License Condition 19.6 and RH 4.25.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

7. RH 4.24.1.4 through 4.24.1.5 requires each licensee that uses respiratory protection equipment for limiting intakes of radioactive materials to have a written policy statement on respirator usage that covers: 1) the use of process or other engineering controls, instead of respirators; (2) the routine, nonroutine, and emergency use of respirators; and (3) the length of periods of respirator use and relief from respirator use.

Contrary to this requirement, written policy statements covering nonroutine and emergency use of respirators, as well as the length of periods of respirator use and relief from respirator use, were not available at the time of this inspection to demonstrate compliance with this requirement.

Written policy statements must be developed to cover the deficiencies mentioned above and forwarded to the Department with your reply. Guidance for these policy statements can be found in the *Manual of Respiratory Protection Against Airborne Radioactive Material*, NUREG/CR-0041.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

8. RH 4.24.1.3.4 requires each licensee that uses respiratory protection equipment for limiting intakes to radioactive materials to implement and maintain a respiratory protection program that includes, in part, written procedures regarding selection, fitting, issuance, maintenance, and testing of respirators, including testing for operability immediately prior to use; supervision and training of personnel; monitoring, including air sampling and bioassay; and record keeping.

Contrary to this requirement, written procedures regarding the issuance, maintenance and testing of respirators, the supervision and training of personnel and written procedures for record keeping were unavailable at the time of this inspection to demonstrate compliance with this requirement.

Written procedures must be developed as described above and forwarded to the Department with your reply. Guidance for these procedures can be found in the *Manual of Respiratory Protection Against Airborne Radioactive Material*, NUREG/CR-0041.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

9. License Condition 19.3.2 of the Radioactive Materials License requires the licensee to retain records of respirator maintenance, fitting and training.

Contrary to this requirement, records of respirator maintenance were unavailable at the time of the inspection to demonstrate compliance with this requirement.

Records of respirator maintenance must be kept as described above and available for review by members this Department. Guidance for these procedures can be found in the *Manual of Respiratory Protection Against Airborne Radioactive Material*, NUREG/CR-0041.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

10. License Condition 25.2 of the Radioactive Materials License requires, in part, that equipment, packages or materials released from controlled areas for sale, repair, reuse, resale or disposal be done so only after documented radioactive decontamination meeting the requirements of the Division, (1) as detailed in Annex C to the license, (2) as required pursuant to 6 CCR 1007-1, Part 3.22 and 17, and (3) in accordance with LC 11.1, Procedure 2-15. Footnote "a" to Table 1 of Annex C states that where surface contamination by both alpha and beta/gamma-emitting nuclides exists, the limits established for alpha and beta/gamma-emitting nuclides should apply independently.

Contrary to this requirement, records and observations made during this inspection indicate that equipment, packages and materials that may have alpha and beta/gamma contamination are released from controlled areas for sale, repair, reuse, resale and disposal without documented surveys for beta/gamma contamination as described above.

Contamination surveys must be completed as required above. Surveys for beta/gamma-emitting nuclides must be completed and documented in the same manner as the surveys for alpha emitting nuclides.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

11. RH 17.5 requires each licensee who transports licensed radioactive material, or who delivers licensed material to a carrier for transport, to comply with the applicable requirements of Part 17 and the regulations promulgated by the U.S. Department of Transportation (USDOT).

Contrary to this requirement, the following deficiencies were identified:

- A. 49 CFR 172.203 (c)(2), requires the letters "RQ" to be entered on shipping papers, either before or after the basic description required by 172.202, for each hazardous substance offered for shipment. Contrary to this requirement, shipping papers prepared and issued by the licensee during 2001 and 2002 for shipments of uranium oxide did not contain the required "RQ" designation.
- B. 49 CFR 172.202 requires that the proper shipping name, as defined in 172.101, be used on the shipping papers that accompany each shipment of radioactive materials. Contrary to these requirements, shipping papers prepared and issued by the licensee during 2001 and 2002 for uranium oxide shipments, did not contain the proper shipping name as listed in 49 CFR 172.101.

The proper shipping name and the letters "RQ" must be included on the shipping papers for radioactive materials offered for shipment as described in 49 CFR 172. The availability of a complete and correct shipping paper description for a hazardous material shipment is vital not only to the carrier and the consignee, but also to emergency response personnel in the event of an incident.

This is a Severity Level III violation and each violation of this type would have an associated civil penalty of \$1250.00.

12. Cotter Procedure 2-3 entitled *Gamma and Beta Radiation Surveys*, referenced in License Condition 11.1, states in part 2.3, "Beta measurements will be taken using a Beta-Gamma detector specifically designed for the differentiation of Beta-Gamma measurements. Beta readings will be taken at a distance of less than twelve (12) inches from the area being surveyed. Beta calibration of instruments will be conducted as per U.S. NRC Reg. Guide 8.30, Appendix C, *Beta Calibration of Survey Instruments*." Appendix C of NRC Reg. Guide 8.30 states, "A correction factor must be applied to determine the beta dose rate."

Contrary to these requirements, records of the beta-gamma surveys conducted in 2001 indicate that the beta dose rates measured and recorded during the surveys were uncorrected. A beta correction factor was not included with the survey.

Beta correction factors must be determined and used as described in Cotter Procedure 2-3 and NRC Reg. Guide 8.30. Failure to accurately determine and use these correction factors may result in an underestimate of the true radiation exposure. This can result in excessive or unnecessary radiation exposure to workers.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

13. Section 2.5 of Procedure 2-15, "Release of Equipment to Unrestricted Areas" (dated 10/24/94) states specifically what documentation will be noted on the release form. The procedure states "The surveyor must identify the item being surveyed (be specific), the date of the survey, the maximum readings obtained, initials of the person performing the survey, instrument(s) used to perform the survey and the serial numbers of the instrument used indicate whether a mantle or source check or both were performed and any mantle or source check or both were performed and any additional information that is pertinent in the remarks column, ..." Section 2.7 of this procedure states "The EC/RSO shall review and sign each completed Alpha Survey Release Form..."

Contrary to this, records for alpha survey of vehicles leaving the property are not complete. None of the departure forms or acceptance forms reviewed were signed off by either the RSO or Mill Manager, indicating there was no review of these forms by management. A departure form dated 11/19/01 for a railcar ATSF 302710 did not have complete information for the beta survey meter. A receiving form dated 12/26/01 did not have information on the vehicle or product and did not have survey results recorded. A departure form dated 12/26/01 for truck ID 154-967 did not have complete information for the alpha survey meter.

The Licensee must properly train individuals who perform this procedure to properly complete each form as per the procedure. Also, there must be either an RSO or Mill Manager review and sign-off of each form as per procedure.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

14. Section 2.1 in Procedure 2-9 "In Vivo Bioassay" states that In Vivo bioassay will be performed annually for "workers routinely involved in ore crushing and handling, in the calcining and handling of uranium concentrates, in maintenance of related equipment, or within three months, for a worker exposed to 520 derived air concentration hours of Natural Uranium in a calendar quarter, or as soon as possible for a worker with urinalysis results as specified in NRC Reg. Guide 8.22, Table 1."

Contrary to this, the licensee performs In Vivo lung scans for workers present during the month of December. Workers who were routinely involved in operations with potential for inhalation of radioactive material earlier in the year do not receive in vivo lung scans if they are not employed in December.

The licensee must perform annual In Vivo bioassays (lung scans) for all employees that meet the requirements as in procedure 2-9.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

15. License condition 26.3.2 states that the licensee's QA/QC program shall use NRC RG 4.15. NRC Reg. Guide 4.15, Section C.2. Specifications of Qualifications of Personnel states that "An indoctrination and orientation program appropriate to the size and complexity of the organization and to the activities performed, should provide that (a) personnel performing quality-related activities are trained and qualified in the principles and techniques of the activities performed, (b) personnel are made aware of the nature and goals of the quality assurance program, and (c) proficiency of personnel who perform activities affecting quality is maintained by retraining, re-examining, and re-certifying or by periodic performance reviews, as appropriate.

Contrary to these requirements, there is no documentation of retraining, re-examining, or re-certification for the licensee's staff who have been conducting chemical analysis of urine and air monitoring samples for many years. The staff performing these analytical procedures lack college level training in Chemistry or equivalent education.

The licensee must ensure that employees performing analysis on bioassay and environmental samples must have refresher training documented that shows they have sufficient and current knowledge of the proper techniques in sample analysis.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

16. License Condition 27.6.3 dictates that alpha contamination surveys shall be conducted at least weekly in each lunch room, change room or office as provided in Procedure 2-4 "Alpha Surveys".

Contrary to this, documentation of area surveys for alpha contamination were lacking total alpha surveys. The only weekly survey documents for 2001 that included total alpha readings were dated 6/11/01, 10/1/01, and 12/31/01.

The Licensee must include both a test for removable contamination and fixed contamination in the weekly survey in order to evaluate the radiological hazards present in the work environment.

This is a Severity Level IV violation and each violation of this type would have an associated civil penalty of \$625.00.

In addition to the above violations, the Department had identified an number of items which are of concern. While these Items of Concern are not violations, they are significant deficiencies in your radioactive materials program and warrant your attention. Please include with your response to this Notice of Violation your opinions regarding the following Items of Concern and your proposed actions to address the deficiencies.

Items of Concern:

- (A) Numerous recommendations were made in the independent ALARA audit conducted in April 3-5, 2001 by Dr. Noel Savignac. These recommendations identified specific deficiencies in the licensee's operating procedures. Cotter should address each issue identified in that audit.
- (B) RH 4.7 of the Regulations requires the licensee to demonstrate compliance with the dose limits by summing external and internal doses. At the Cotter mill facility, intakes of radioactive materials may occur primarily by inhalation, ingestion, or by a combination of both processes. RH 4.7.3 requires the license to account for occupational intakes of radionuclides by oral ingestion if the intake is greater than 10 percent of the applicable oral ALI and include it in demonstrating compliance with limits. Dose assessment spreadsheets show that there is no Class D Uranium exposure. If this is true, then the positive urine bioassay results for uranium indicate intake of uranium by workers through other pathways, i.e. ingestion. The licensee must ensure that worker dose assessment accounts for ingested materials.
- (C) A number of deficiencies have been identified in the licensee respiratory protection program. If these issues are not adequately resolved, it may be necessary for the licensee to re-assess the intakes or workers assuming that an individual inhales radioactive material at the airborne concentration in which the individual is present, as required by RH 4.9.2.

- (D) The licensee has not maintained an inventory system for documenting and tracking the receipt, storage, use/processing, transfer, burial, and disposal of radioactive materials. The licensee should develop and implement an inventory tracking system. The licensee should track and document all radioactive materials received at the facility. This includes alternate feed materials, contaminated equipment/materials received for disposal, and any other radioactive materials received for direct disposal into the waste repository. The licensee should document what materials have been processed through the mill for recovery of uranium or other minerals and the dates when the processing occurred. The licensee must clearly identify the number of drums of alternate feed materials which are in storage pending processing. The Licensee should also clearly identify all materials placed directly into the repository for disposal. This information is needed to assure compliance with the RH 1.6 of the Regulations and the license.
- (E) Workers who are required to wear respiratory protection devices at the site are tested to insure that the devices fit properly. An irritant smoke is used at the site for this test. The National Institute for Occupational Safety and Health (NIOSH), NRC Reg. Guide 8.15, and NRC NUREG/CR-0041 no longer recommend this method for fit-testing of respirators. Another method, such as the quantitative fit-testing methods recommended in the above references, should be used to test workers for adequate respirator fit.
- (F) The licensee should obtain Department approval for any and all alternate feed materials prior to receipt of those materials. The 3000+ drums of calcium fluoride currently in storage at the facility are pending processing. However, there appears to be no currently approved means for handling and processing those materials. In addition, it is not clear that those materials are appropriate for direct disposal into the waste the repository, if the materials are not processed.
- (G) Workers at the mill site reuse filter cartridges for respiratory protection devices. NRC NUREG/CR-0041, part 4.12.6, states that licensees who wish to reuse filter cartridges should perform a test on the cartridges to detect damage that might have occurred during prior use. If the licensee will reuse filter cartridges for respiratory protection devices they should perform a test on the used cartridges as per NUREG/CR-0041, part 4.12.6.
- (H) Parts 4 and 17 of the Colorado Regulations, and 49 CFR of the U.S. DOT Regulations contain requirements for the safe receipt of shipments containing radioactive materials. Currently, instructions for receipt surveys at the mill are contained in individual work plans. However, not all radioactive materials received at the mill are covered under a work plan. In addition, certain types of shipments, such as placarded, bulk LSA shipments, have special receipt survey requirements. A generic procedure should be written to give guidance to plant personnel for receipt surveys.

- (I) Shipping papers prepared by the licensee for the uranium oxide (yellow cake) shipments were prepared in a non-standard format. For instance, the Bill of Lading listed a description of the cargo as “55 Gallon Steel Drums Containing Uranium Oxide, Marked LSA.” However, a second shipping document, titled “Shipper-Transport Information,” listed the cargo as “Radioactive Material – Uranium Oxide Marked LSA-1.” Information contained in these two documents should be combined to produce a simplified Bill of Lading.
- (J) The licensee should provide the Department with clear documentation demonstrating that all materials received for direct disposal are suitable for disposal. These documents should be provided to the Department prior to receiving the materials.
- (K) Portable survey instruments used to perform alpha contamination surveys are checked routinely with an alpha check source to verify operability and detection efficiency. However, no such check is performed for the instruments used to perform beta contamination surveys. A procedure should be written to perform this beta efficiency check. The energy of the beta check source should be similar to energy of the beta radiation normally encountered at the site and the source should be NIST traceable. In addition, training should be given to employees to ensure that all personnel properly perform checks.
- (L) Interviews and observations of the personnel performing contamination surveys indicate that not all personnel perform the surveys in the same manner. Steps should be taken to verify that personnel, who perform contamination surveys, make appropriate corrections for the probe area, probe distance to the surface being surveyed and probe distance to the efficiency check source.
- (M) Records for employee alpha surveys showed that employees were released with several hundred dpm/100cm² on their persons. Also, several reports were not signed by the RSO as having been reviewed. A proper ALARA program must make every effort to reduce radioactive contamination to as low as practical. Allowing elevated contamination levels is not considered ALARA when employee survey records show that it is quite common for employees to achieve very low levels of surface contamination on hands, feet or clothing. The ALARA program must include a procedure that directs personnel to make every effort to reduce alpha contamination to as low as possible.
- (N) Dosimetry badges are stored in a guardhouse that is located close to the ore storage area that has elevated gamma radiation levels. Control badges are stored in the guard house 24 hours a day. User badges could be on a person for at least one shift in areas that may have gamma levels lower than the Guard House. When the Control badge reading is subtracted from a user badge, the user badge could potentially lose real exposure data. All dosimetry badges must be stored and maintained in a low background area. Cotter should evaluate other areas for badge storage.

- (O) Occupational dose calculations for TEDE and CEDE are not being completed on a quarterly basis. The lack of worker dose determination throughout the year prevents the licensee from identifying elevated worker doses and taking appropriate corrective actions in the event that a person is approaching a dose limit. The licensee should calculate the TEDE and CEDE for all employees at least quarterly. In addition, the licensee should promptly (within the next quarter) determine the TEDE for all personnel who have terminated employment at the Cotter mill.
- (P) The licensee has had numerous safety incidents over the past year. Many of these incidents involved acid spills. During the inspection on March 20, 2002, 150 gallons of yellow-cake slurry spilled during the unloading of this material from a tanker truck. Also, on March 20, 2002, four (4) un-attended railcars were found rolling down the track and were stopped by an employee who ran up to the rail cars and set the brakes. The licensee should take aggressive and prompt action to limit future safety problems and prevent re-occurrences of incidents.
- (Q) The Cotter Corporation Evaluation Report No. 298-2 "Evaluation of Natural Uranium in Air-Lower Limit of Detection" was not signed or dated by the QA Manager or the Mill Manager as is indicated on the last sheet of the form. Reports dealing with parameters that affect the dose calculations of workers should be reviewed by and signed by the RSO as well as appropriate management.
- (R) The Alpha Contamination Survey form RSD 42R does not document the background reading of the instrument used, the lower limit of detection for the instrument used or the action level in dpm/100 cm². Also, there is no procedure associated with this form. The Licensee should immediately generate a procedure for surveying personnel for alpha contamination and train the appropriate personnel on its use. The Alpha Contamination Survey form RSD 42R should be updated to include the above information.

SINGIFICANT UNRESOLVED ITEMS:

1. At the time of the inspection, the licensee's occupational dose calculations and records were not completed for 2001. The adequacy of the dose determinations and compliance with occupational dose limits could not be verified.
2. Public dose and NESHAPS assessment for 2001 were not completed at the time of the inspection. The adequacy of the methods and modeling assumptions used in making public dose determinations and the licensee's compliance with public dose limits could not be verified.
3. The licensee has added new buildings, processes, and radioactive materials at the Canon City facility. The adequacy of the existing financial assurance warranty for to ensure site decommissioning could not be verified during the inspection.

As required by RH 10.2 of the Regulations, this notice must be posted so as to permit individuals engaged in licensed activities to observe it on the way to or from any particular licensed activity location to which the document applies. Any acknowledgment to this report by the licensee shall be posted within five (5) working days after dispatched by the licensee. Such documents shall remain posted for a minimum of five (5) working days or until actions correcting the violations have been completed, whichever is later.

The number and type of violations identified in this inspection indicate a serious and substantial breakdown in the management oversight of this facility. The Department is especially concerned that Cotter has failed to address radiation safety issues that have been identified by Cotter's internal reviews, and by audits of both and Cotter's contracted, independent auditor and by the Department. Further, Cotter often does not submit required documents on schedule. Some examples of the above include:

- Failure to complete worker dose assessments and public dose assessment on schedule
- Failure to submit as-builts within 90 days of completing construction as required by License Condition 17.3
- Failure to provide the Primary Evaporation Cell and De-watering Drain System As-Built Report requested in early 2000 and March 2001
- Failure to provide the Department with revised radiological health and safety procedures to address deficiencies identified during the review of the renewal application. Specifically, revised procedures RHS 1-4 and RHS 2-14 were to be provided to the Department by February 14, 2002. At least 14 other revised procedures are due to the Department as part of the license renewal review.
- Several repeat Items of Noncompliance
- Failure to demonstrate (no documentation available at the time of the inspection) that the licensee's management had taken actions to correct the significant programmatic deficiencies identified in the independent ALARA audit conducted in April 3-5, 2001 by Dr. Noel Savignac (hired by Cotter Corp.).

The Radiation Services Program's experience has been that when a licensee has a significant number of compliance issues, and/or fails to correct safety issues previously identified, the basis for the breakdown in safety is often the result of one of three reasons: lack of management oversight, technical incompetence of radiation safety staff, or insufficient staff to fulfill all safety requirements. Please submit, together with your response to the Items of Noncompliance:

1. A detailed listing of all radiation safety issues that must be addressed under your license. This should include routine tasks; responses to compliance issues; and licensing issues relating to routine operations, the renewal, and any additional tasks that will be required as part of Cotter's attempt to receive alternative feeds and materials for direct disposal.
2. For each task, indicate if it is addressed by Cotter employees or contractors. For those tasks assigned to staff, provide the expected number of hours to complete the tasks. For recurring tasks, such as training or preparation of materials acceptance reports, estimate the time required on an annual basis.

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3. Indicate the staff tasked to the above projects, and identify any shortfall. If Cotter does not have sufficient resources to meet the requirements of the license, identify the steps Cotter will take to supplement current resources, and the date when sufficient resources will be available.

An inspection will be conducted by representatives of this Division within six months from the date of this letter to verify that full compliance has been achieved. If you have any questions concerning this letter, please contact Tim Bonzer of this Division at (303) 692-3055.

/OS/

W. Jacobi, Program Manager
Laboratory and Radiation Services Division

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