CABOT PERFORMANCE MATERIALS

SAFETY EVALUATION REPORT, LICENSE SMB-920

OCTOBER 17, 2002

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1. BACKGROUND

1.1 LICENSE HISTORY

Cabot Performance Materials (CPM), a subsidiary of Cabot Corporation, was first licensed to possess source material on January 21, 1963. That license, STC-681, authorized CPM, then known as Kawecki Chemical Company, storage only of eleven thousand tons of Malayan Tin Slag containing less than 0.1% thorium by weight at Boyertown, Pennsylvania (PA). An amendment, dated June 21, 1963, authorized the B-11 yard, Canton Railroad Piers, Baltimore, Maryland, as a second storage location.

License SMB-920 was first issued on March 17, 1967. In addition to the Boyertown and Baltimore sites, this license also authorized a site in the Reading, PA as a place of use. A site in Revere, PA was included as a place of use in a license amendment dated June 25, 1969.

Materials License SMB-920 was renewed on October 24, 1972. The Baltimore site was not included as part of that license, because Maryland became an agreement state in accordance with provisions of the Atomic Energy Act and Maryland issued a State License for that facility on November 24, 1972. Sites at Boyertown, Reading, and Revere were included in that license as authorized places of possession and use. SMB-920 was renewed subsequently on December 20, 1983, to KBI (Kaweki Berylco Industries) Division, Cabot Corporation, and after November 23, 1998, Cabot Corporation. By application dated March 16, 1994, CPM requested renewal of SMB-920. A recent application for renewal was submitted to the NRC on April 4, 2002.

In December 1993, the NRC and Cabot agreed to split SMB-920 into two licenses, because the Revere and Reading facilities were undergoing decommissioning, while Boyertown facility remained in operation. SMB-920 continued to remain as the license for Boyertown site within the Division of Fuel Cycle Safety and Safeguards, and License SMC-1562 was created as the license for the Revere and Reading sites within the Division of Waste Management.

1.2 LICENSE RENEWAL APPLICATION

On April 4, 2002, CPM requested the renewal of its Source Material License No. SMB-920 for a period of 10 years. The license has since been in timely renewal.

This Safety Evaluation Report (SER) describes the basis for the NRC staff's determination that Licenses SMB-920 can be renewed without adverse effects on public health and safety and the environment.

2. DISCUSSION

2.1 FACILITY DESCRIPTION

2.1.1 Facility

The CPM Boyertown facility is located on a 200-acre tract of land in southeastern Pennsylvania on the border of Berks and Montgomery counties, approximately 2.4 kilometers (1.6 miles) northeast of the borough of Boyertown in a sparsely populated area where agriculture is the primary land use. Most of the operations occur on about 44 acres. The northwestern and southwestern portions of the site are bordered by West Swamp Creek. Forested areas are located north of the operating areas and along West Swamp Creek on the southwest part of the site. Residences border the site boundary on the northeast, southwest, and southeast sides of the site.

The major facilities, related to source material processing and storage, include Building 073, where the ores and slags are digested; drum storage areas; the ore residue storage area (bulk storage bins); a wastewater treatment area; and warehouses which are used for raw material storage. Thee are also six lagoons on the site. Lagoons (basins) 1 and 2 are for collecting storm water, non-contact cooling water, and steam condensate prior to release to West Swamp Creek. Lagoons (reservoirs) 3 and 4 contain water pumped from West Swamp Creek for process use. Lagoons 5 and 6 contain treated industrial liquid effluent before discharge to West Swamp Creek.

2.1.2 Process Description

The facility processes tin slags, tantalite, and columbite ores to extract tantalum (Ta) and niobium (Nb) (also known as columbium). The ores and slags contain uranium and thorium source material with the combination of uranium at up to 4 wt. %. In addition to the extraction of Ta and Nb from ores, the main operations at the Boyertown facility include fabrication of products, treatment of industrial liquid waste (prior to release to the environment), and storage of by-product sludge containing valuable rare earth components. The by-product sludges are classified as source material because they contain uranium and thorium (in combination) in excess of 0.05 percent by weight. The by-product sludges also contain significant concentrations of Nb, Ta, and other rare earth elements. The ore residue is considered source material and is categorized as alternate feed material for a uranium recovery facility.

The residues could be handled according to any of the following four alternatives listed in renewal application:

1. Continue to store the residues on-site until operations cease, additional tantalum recovery operations are employed, storage capacity is exceeded, or possession limits in the license are approached.
2. Dispose of the residue at a licensed radioactive waste disposal site.
3. Transfer the residues to a licensed uranium/thorium operation for reprocessing.
4. Qualify some or all of the residues as unimportant quantities under the exceptions in 10 CFR 40.13.

There have been no major changes to the physical plant since the last license renewal. CPM expects to operate the facility in a manner similar to the recent past.

The plant ore feed rate is approximately 7,250 kilograms per day (16,000 pounds per day, 5 days per week) with ores/slags containing between 20 and 80 (averaging 45) wt. % Ta and Nb oxides (NbO).

2.1.2.1 Feed Material Handling

Feed materials received at the CPM facility in 2001 included ores and smelting process slags containing from 0.02 to 0.79 (0.19 average) wt. % uranium oxide (U_3O_8) and from 0.02 to 0.11 (0.06 average) wt. % thorium dioxide (ThO_2). Approximately 400,000 kilograms (900,000 pounds) of feed materials are stored on the site. Once material enters the system it is essentially retained within a closed system. Feed materials, in fifty-five-gallon drums, are transferred to a grinding and classifying circuit. The grinding and sizing equipment are within a closed system under negative pressure with the effluent air filtered before being released to the atmosphere.

2.1.2.2 Feed Material Digestion and Liquid/Solids Separation

In the current process, sized material from the grinding circuit is dissolved in hydrofluoric acid (HF) in heated digesters. Tantalum and NbO are converted to soluble fluotantalic acid (H_2TaF_7) and fluocolumbic acid (H_2NbF_7). Uranium and thorium impurities form insoluble fluoride compounds [UF_4 (uranium tetrafluoride) and ThF_4 (thorium tetrafluoride)] in this process step. Vapors escaping from the digesters are passed to a packed-bed scrubber to remove fluorides prior to release to the atmosphere. The acid slurry produced in the digesters is separated into a filtrate containing the dissolved Ta and Nb and a sludge stream containing uranium, thorium, and other insoluble feed impurities. The sludge stream is approximately 30% water by weight.

2.1.2.3 Metal Product Recovery

Tantalum and Nb compounds are recovered from the acid filtrate in a two-stage extraction process. In the first stage, Ta and Nb are extracted from the aqueous phase through contact with methyl isobutyl ketone (MIBK). The aqueous raffinate stream is processed for MIBK recovery. In the second stage, the Ta and Nb compounds are extracted from the organic phase into an aqueous stream that is treated with HF and H_2SO_4 to separate the Ta from the Nb compounds. Additional chemical processes may be employed to recover other rare materials.

Niobium is precipitated from the aqueous stream and ammonia (NH_3)-washed to produce diniobium pentoxide (Nb_2O_5), which is calcined in gas-fired kiln to produce NbO. Separation of Ta is primarily by a crystallization reduction/heat/treatment process. Potassium ions are used to

form crystals of potassium fluotantalum (K_2TaF_7), which are reduced by contact with metallic sodium, and heated in an electric furnace to produce Ta powder. The Ta may be packaged and sold or formed into foil, wire, or sheets.

2.1.2.4 Process Chemical Storage

Various acids, bases, and other potentially hazardous chemicals are used in industrial operations at the CPM facility. Chemicals stored in large quantities include hydrofluoric acid (HF), sulfuric acid (H_2SO_4), nitric acid (HNO_3), anhydrous ammonia (NH_3), methyl iso-butyl ketone (MIBK), chlorines (Cl_2), fuel oil, and propane. Fuel oil, MIBK, and acids are stored in tanks as liquids at ambient conditions while NH_3, Cl_2, and propane are stored as liquids under pressure at ambient temperature. Storage areas are diked, monitored, or provided with absorbent materials as appropriate. The site Preparedness, Prevention, and Contingency (PPC) Plan provides procedures to prevent spills and to respond to unplanned releases of hazardous materials.

2.1.3 Authorized Activities

CPM is authorized to possess natural uranium and thorium in any chemical or physical form in an amount that will not exceed 360 metric tons (400 tons). They are authorized to receive, possess and process this material at their facility at County Line Road, Boyertown, Pennsylvania. These limits and authorized activities will not change in the renewed license.

2.1.4 Organization and Administration

Section 10.2 of the license renewal application describes the positions, responsibilities, and authority of the applicant's staff who are directly responsible for radiation safety. An organization chart was provided in Figure 10-2 of the license application. Overall, the safety functions are independent of the functions of production. In Section 7.2 of the license application, CPM established educational and experience requirements for the Radiation Safety Officer (RSO). The RSO is the key position important to radiological safety at the site.

The Director of Operations reports to the General Manager of the Boyertown facility and is responsible for all operational activities at the Boyertown plant. His primary safety function is to

ensure that operations and activities adhere to approved radiation protection procedures. The RSO is the highest level radiation safety position at the Boyertown site. The RSO has the authority to stop production or other operations to protect the health and safety of workers, the public, or the environment. The commitment of authority to the RSO shows that the RSO has sufficient authority to assure plant safety. The RSO ensures that training is provided to the personnel and supervises the health surveillance program. Other CPM management positions that have responsibility for industrial safety at the Boyertown facility include the Safety and Health Manager, Manufacturing Manager, and Emergency Response Coordinator. CPM also uses a Health Physics Consultant, an outside expert who conducts an annual survey with the RSO to audit the proper handling of radiation safety and environmental monitoring programs.

CPM has an ALARA Committee in place to address radiation safety as well as occupational safety and health of workers and the public. The ALARA Committee helps to ensure that radioactive exposure is kept as low as reasonably achievable (ALARA). The committee meets at least once a year to look over the results of radiation monitoring and testing. The RSO calls for special meetings of the ALARA Committee whenever a new process or changed procedure in production is initiated that he determines should be reviewed for ALARA.

The NRC staff reviewed the CPM organizational structure, the minimum qualifications for the RSO, and responsibilities of the various personnel throughout the plant and determined that the staff has adequate education and experience to safely carry out operations involving licensed material; that the licensee plans, implements, and controls site activities in a manner that ensures the safety of the workers, the public, and the environment; and that the structure, qualifications, and responsibilities are acceptable.

2.1.5 Training

CPM is committed to ensuring that all radiation safety and emergency personnel, and all other personnel whose duties involve working with or around licensed materials, receive timely and appropriate training in potential hazards, corresponding safety and health rules, and procedures. CPM also commits to providing refresher training, as needed, with the RSO having the responsibility of ensuring all employees who may be near radiation sources are trained. The licensee commits to providing for initial safety indoctrination for all new employees, followed by

monthly training programs. The initial and ongoing safety training covers general OSHA requirements, plant safety rules, fire safety, and chemical safety.

All employees are also trained in the processes with which they work and are informed of the hazards associated with materials and chemicals used in the plant. Equipment and process operators receive training in safety and operational aspects such as hazardous chemicals and operations, work procedures, emergency shutdown procedures, emergency reporting and response procedures, evacuation procedures, incipient fire extinguishment, incidental spill response, personnel protective equipment (PPE), and respirator use. New developments or changes in safety procedures are followed by plant-wide training. On-the-job and classroom training is provided by various qualified individuals. Employee evaluations are conducted by one-the-job evaluations, and the licensee has intentions of implementing an evaluation program for safety training. Operator qualification is based upon satisfactory supervisory evaluations, with refresher training, which is conducted on an as-needed basis. CPM maintains files that document new employee indoctrination and training provided to contractors and visitors. This training includes a safety orientation to review appropriate material safety data sheets (MSDSs) and to heighten awareness of the hazards where they will be working.

The NRC staff has reasonable assurance that the licensee's training program will ensure that licensee personnel have the knowledge and skill necessary to operate and maintain the facility in a manner that will protect the health and safety of the workers and the public.

2.1.6 Operating Procedures

Section 10.4 of the license application describes the licensee's commitments regarding operating procedures. CPM performs periodic reviews of the written procedures to ensure that they are consistent with regulations and the radiation protection needs of the employees. Any employee or safety committee may request that an operating procedure be changed; however, the RSO is responsible for reviewing and approving changes to operating procedures related to radiation protection. The Quality Systems "Document Change Notice" form is required to be completed for procedural changes.

The NRC staff has reviewed, during site inspections, copies of the licensee's operating procedures for operation where chemical hazards could affect radiological safety in Building 073. They appear up-to-date, reflect current plant practices and conditions, and appear sufficiently detailed to be effective and useful. They are checked for content by technically competent personnel and approved by management, as demonstrated by the appropriate signatures.

A Document Change Notice (DCN) is used to revise an existing procedure and can be initiated by anyone in the division. The DCN must be approved by the department supervisor/manager and forwarded to the Quality System Manager of his designee, along with copies of the marked up pages (where appropriate) and any substantiating backup information.

The licensee has in place adequate programs for the development and maintenance of clearly written operating procedures that provide reasonable assurance the operations are carried out safely, consistently and efficiently.

2.1.7 Internal Audits and Inspections

CPM conducts various inspections and audits as described in Section 10.3 of the license application. Among these, the RSO and the Health Physics Consultant conduct an annual review, consisting of a plant tour and review of records, to audit the radiation safety and monitoring program. The consultant prepares a written report to the RSO, who is responsible for follow-up action and maintaining records of the surveys.

The NRC staff has determined that the licensee's audit and inspection program is adequate to provide reasonable assurance that the health, safety, and environmental programs are effective and are being conducted in accordance with regulatory requirements.

2.1.8 Investigations and Reporting

The RSO is responsible for investigating, recording, reporting, and tracking and actions of reportable incidents. The licensee has an incident investigation program in place to investigate all incidents. Written procedures are in place to ensure thorough investigations of incidents and

near-misses. These procedures address training, reporting, communication of the investigation results, and commitments for follow-up corrective actions.

The NRC staff has determined that the licensee has an adequate program to investigate abnormal events through the preparation of procedures outlining the function, responsibility and scope of authority of the responsible management personnel and of the team members involved in the investigation of abnormal events.

2.1.9 Records

The RSO is responsible for maintaining CPM radiological health and safety records as described in Section 10.2.2 of the license application. Records of personnel radiation monitoring, radioisotope inventory, radiation surveys, instrument calibrations, training records, inspection records, licenses and registrations, and air, water, and smear analysis results are maintained.

The staff concludes that the licensee's system of maintaining records will be effective in validating and storing information about the health and safety aspects of the facility and its operations.

2.2 RADIATION PROTECTION

2.2.1 Administrative Requirements

The RSO reports to the Director of SHE and holds the highest level radiation safety position at the facility. The RSO supervises the radiological health surveillance program and provides training to employees. He has the authority to stop operations to protect the health and safety of workers, the public or the environment. Suspended operations may only be restarted by the General Manager. The RSO position must be filled by an individual who meets the minimum qualifications specified in Section 7 of the application.

2.2.1.1 Procedures

CPM maintains written procedures and a Radiation Safety Officer's Operations Manual that describe the routine practices of the program. These documents are available at the site for

review during inspections by NRC staff. The procedures have been revised to reflect the current 10 CFR Part 20 regulations and provide descriptions of the technical bases for existing programs. Past NRC inspections have noted no deficiencies in these written procedures. Therefore, the staff concludes that the procedures are adequate to document the routine practices at the site.

2.2.1.2 ALARA Commitments

The licensee has made a commitment to have an ALARA Committee (Committee), which meets at least once a quarter to review the radiation protection program, look over the results of radiation monitoring and testing information and make recommendations aimed at achieving ALARA levels in radiation protection. The Committee members are recommended by the RSO, selected by the Director of SHE, and include representation of various operation levels and members of management. The licensee has committed to posting and providing to the General Manager the ALARA Committee findings and recommendations.

The staff reviewed the administrative practices of the radiation protection program, which includes the responsibilities and authority of the RSO and the ALARA commitments. The staff finds the practices are consistent with good industry practice, and therefore, are acceptable.

2.2.2 Monitoring of Radiation Exposure

2.2.2.1 External Exposure

The external exposure of personnel is monitored and evaluated on the basis of data from personnel dosimeters which must be used as required by 10 CFR 20.1502. At CPM, personnel Luxel® dosimeters are used and are processed to evaluate the radiation dose by a National Voluntary Laboratory Accreditation Program (NAVLAP) accredited dosimetry processor.

The staff has reviewed the licensee's external exposure monitoring program and finds that it meets the requirements of Subpart F of 10 CFR Part 20, and therefore, is acceptable.

2.2.2.2 Monitoring Concentration of Radioactivity in Air and Controlling Internal Exposure

The Air Sampling Program is described in Section 10.8 and Attachment F to the supplemental information provided with the renewal application. CPM expects to reach the goal of maintaining radiation exposures below 10 percent of the regulatory limits through engineering controls and respiratory protection. The air sampling program consists of taking grab samples (low and high volume) as well as using lapel personnel samplers on a weekly basis. The grab samples will be used to determine what protective equipment and measures are appropriate for the operations. The lapel personnel samplers will be used to estimate worker's internal exposure. In addition, the radon levels in processing Building 073 are monitored. If an individual is suspected of having received more than 40 derived air concentration (DAC)-hours in one week (this is equivalent to 2 percent of the Annual Limit on Intakes), CPM will investigate the worker's internal exposure.

The licensee's air sampling program is based on an internal technical document that incorporates the guidance that is contained in Regulatory Guide 8.25 "Air Sampling in the Work Place." The technical document includes evaluations of the need for air sampling, methodology for measuring airborne radioactive material concentrations in the workplace, air sampling procedures to determine if respiratory protective equipment is used, and the need for bioassay analyses. That technical document also provides written justification for the DAC fraction calculations that are appropriate for the site.

The licensee commits to a bioassay program for the purpose of verifying that the air sampling and respiratory protection programs are effective. The bioassay program is based on an internal technical document that evaluates the chemical, physical, and radiological characteristics of materials at the site and the air sample data collected over the past four years. The licensee is committed to performing whole body counts and urine sampling or fecal sampling and analysis for those individuals whose air sample data exceed regulatory investigation levels. CPM will investigate any result that shows an internal deposition of radioactive material. Also if any unusual or emergency conditions arise, and individuals are suspected of having an intake of radioactive material, appropriate bioassay measurements will be performed as soon as practical to assess the internal disposition. CPM indicates that to date, there have been no whole body counts indicating internal deposition.

The staff has reviewed CPM's bioassay program and determined it meets the requirements of 10 CFR Part 20 and is acceptable.

2.2.2.3 Uses of Respiratory Protection Equipment

CPM has maintained a respiratory protection program for limiting workers' intake of radioactive material where airborne radionuclide concentrations may exceed administrative limits. The written respiratory protection program complies with OSHA requirements and requires medical certification and determination of individual fit factors for workers who may wear respirators. CPM is committed to maintaining their respiratory protection program equipment in accordance with 10 CFR Part 20 Subpart H, which describes the specific requirements for an acceptable respiratory protection program.

2.2.2.4 Monitoring of Surface Contamination

CPM has committed to surveying the plant area on a routine basis. Smear samples are collected and analyzed for radioactivity at least monthly. CPM has established the limit of alpha contamination at 200 dpm/100 cm^2, which meets the value recommended in Regulatory Guide 8.30, "Health Physics Surveys in Uranium Mills."

The staff has reviewed the contamination control program and finds it is consistent with good industrial practice and with regulatory guidance and is, therefore, acceptable.

2.2.3 Conclusion

On completion of the Radiation Protection review of the licensee's renewal application, the staff has concluded that CPM has the necessary technical staff to administer an adequate radiological safety program that meets the requirements of 10 CFR Part 20.

2.3 ENVIRONMENTAL SAFETY

NRC reviewed CPM's commitments to environmental safety. These include commitments to control and monitor effluents from the plant, and to monitor the environment for the presence of contaminants.

2.3.1 Environmental Safety Regulations

The regulations in 10 CFR 20 Subpart D, "Radiation Dose Limits for Individual Members of the Public," require that licensees conduct operations so that the total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year, and that the dose in any unrestricted area from external sources does not exceed 0.002 rem (0.02 mSv) in any one hour.

In addition, CPM is subject to the Clean Air Act requirements of 40 CFR 61 Subpart I, National Emissions Standards for Radionuclide Emissions from Facilities Licensed by the Nuclear Regulatory Commission. These standards require that emissions of radionuclides, except radon, to the ambient air not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem.

The CPM Environmental Safety Program was evaluated in accordance with these two regulations.

NRC staff reviewed CPM's safety staff qualifications, corporate organization and authority, effluent control and monitoring commitments, environmental monitoring commitments, internal audit and inspection commitments, and event reporting commitments with respect to environmental safety. The commitments and NRC's conclusions are discussed in the following sections.

2.3.2 Organization

CPM has identified those staff positions that are responsible for safe operation of the Boyertown facility, and has established minimum qualifications for the individuals who fill the positions described in this SER.

The RSO has the authority to stop production or other operations to protect the health and safety of workers, the public, or the environment. CPM has also committed to contracting with a Consultant Health Physicist to conduct an annual survey with the RSO to audit the radiation safety and environmental monitoring programs. In addition, the ALARA Committee reviews

radiation monitoring and testing data, including those related to effluents and contamination of property.

NRC staff has reviewed the licensee's assignment of operating and monitoring responsibility with respect to environmental protection. Staff has determined that the RSO is given adequate authority to assure safe operation, and that the environmental program is monitored and audited sufficiently to provide reasonable assurance that it will be implemented in accordance with licensee procedures, and is therefore acceptable.

2.3.3 Effluent Control and Monitoring

CPM generates particulate effluents released to the atmosphere, liquid effluents to West Swamp Creek, and solid wastes that are sent off site for disposal or stored on the site. CPM provides controls of these effluents to reduce the amount of radioactive material released to the environment, and monitors them to assure the effectiveness of the controls. Each of these effluents is discussed below.

2.3.3.1 Air Effluents

Particulates containing source material, radon gas, and other potentially hazardous chemicals are generated by feed transfer, feed grinding and digestion, and by sludge treatment and storage. Potentially hazardous constituents that may be released to the atmosphere include uranium, thorium, their decay products, and HF. Airborne effluents are primarily generated in the ore crushing and grinding operations, and during ore digestion. These effluents are controlled and monitored, and CPM has established action levels and actions to be taken if the levels are exceeded. The controls, monitoring, action levels, and actions have been reviewed by NRC staff and are discussed in the following sections.

Atmospheric releases from the ore digestion process are controlled with a wet scrubber. Acids captured in the scrubber are condensed and recycled into the ore digestion process. Particulate releases from the ore grinding area are captured in a dust collector and baghouse. Particulate materials from the dust collector and baghouse are recycled into the process. Operating

procedures are in place for the ventilation and scrubber system, a baghouse, and dust collector. Operators are required to follow these procedures.

The performance of the scrubber system is monitored through the condenser chiller coolant high-temperature indicator and measurement of the scrubber liquid fluorine content each shift. Scrubbers are inspected and have preventive maintenance performed three times per year. Dust collectors are checked by operations and are serviced by maintenance. The performance of the dust collector and baghouse are monitored through measurements of the maximum pressure drops across the filters.

The scrubber operating procedure specifies a maximum fluorine content in the scrubber liquids, and specifies the procedure to be followed to keep the fluorine content below the limit. If the pressure-drops across the baghouse or dust collector are greater than the maxima specified in the operating procedures, the device is inspected and repaired.

As described in the environmental assessment prepared for this renewal the concentrations and projected dose impacts from air effluents comply with the limits in 10 CFR Part 20, Appendix B, Table 2, Col. 1, and 40 CFR Part 61, Subpart I, respectively.

NRC staff has reviewed CPM's commitments to control atmospheric effluents and has determined that the controls are appropriate for their intended uses, that the specified operating limits are appropriate and are monitored, and that appropriate actions will be taken if the operating limits are exceeded. These commitments provide reasonable assurance that gaseous and particulate effluents will be controlled and are therefore acceptable.

2.3.3.2 Liquid Effluents

Filtrates produced in the feed/sludge digestion and filtration process steps contain low levels of uranium and thorium. These aqueous filtrates are processed through the MIBK extraction and recovery systems and ultimately transferred to the waste treatment system along with non-radioactive effluent streams. CPM controls and monitors liquid releases to the environment, and has committed to perform corrective actions if the concentration of radioactive material in the

liquid effluent exceeds specified action levels. The controls, monitoring, action levels, and actions have been reviewed by NRC staff and are discussed in the following sections.

Acid waste liquids from the ore digestion are collected in one of six Segregation Tanks, from which they are pumped to the CPM Wastewater Treatment Plant and neutralized with lime in agitated treatment tanks. The pH of the treated wastewater is approximately 10.5-11.0. The neutralized mixture is pumped to Building 062 where the solids are separated from the liquids in a plate-and-frame filter press. The liquids are pumped to Lagoon 5. Prior to discharge, the water is pumped from Lagoon 5 to Lagoon 6, neutralized to meet the National Pollutant Discharge Elimination System (NPDES) discharge requirements, and discharged to Swamp Creek.

No additional treatment is provided for liquid effluents from the lagoons. Lagoon effluents are discharged when stream flow conditions are conducive to providing adequate dilution, which is determined by dissolved solids loading. CPM holds an authorization to discharge under the NPDES in the form of a water quality management permit issued by the Commonwealth of Pennsylvania, Department of Natural Resources, and Bureau of Water Quality Management. This NPDES permit authorizes CPM to discharge from Lagoons 5 and 6 through Outfall 001 to West Swamp Creek.

CPM monitors and controls the effluents to detect unusual conditions. The NPDES permit requires effluent monitoring for pH flow in millions of gallons per day, suspended solids, net soluble phosphate, ammonia-nitrogen, fluoride, and total dissolved solids. The permit contains limits on pH (between 6.0 and 9.0); suspended solids (20 mg/l daily average and 40 mg/l daily maximum); and phosphate (0.5 mg/l daily average and 1.0 mg/l daily maximum). The other parameters are monitored but have no limits at Outfall 001. The permit also allows discharges of cooling and boiler water from Outfall 002, and water treatment filter backwash from Outfall 003.

Under the previous license, Cabot fulfilled NRC requirements relating to water effluent release by collecting samples at Outfall 001 as required by condition 14c of License No. SMB-920, and analyzing for gross alpha and gross beta-gamma concentrations at least quarterly to determine compliance with the license condition. Prior to 1994, the minimum detectable concentrations for samples analyzed by the laboratory using a gross alpha technique were higher than the revised 10 CFR Part 20 Appendix B limits because the water contained a high level of dissolved solids that

provided a large self-shielding factor. The contract laboratory then performed alpha spectroscopy, and demonstrated that the activity concentrations were less than the minimum detectable concentrations, and that the sensitivity for detection was below the limit in NRC regulations. The laboratory was instructed to continue to perform alpha spectroscopy for water samples. Condition 18 of the license prior to 1994 required that the licensee analyze the specified effluent and environmental samples for gross alpha and gross beta-gamma concentrations. CPM asserted that the condition should require that they sample for "radioactivity." NRC staff agreed that specifying that the licensee should sample for "radioactivity" is more appropriate, because this allows the flexibility to use more appropriate analytical methods for the monitoring. Therefore, the staff recommended and CPM has indicated the following as license Condition 14:

> The licensee shall collect the following samples at the Boyertown site and analyze for radioactivity at least quarterly:
>
> a. Composite samples from a continuously collected sample of the effluent at Outfall 001 when effluent is discharged.
>
> b. Upstream and downstream water samples (relative to Outfall 001) of West Swamp Creek.
>
> c. Groundwater samples from Monitoring Wells 1a, 2, 3, and 4 identified in Figure 4.1 of NUREG-1027.
>
> If the concentration of any radionuclide exceeds 1 percent of the value given in 10 CFR 20, Appendix B, Table II, an investigation shall be made to determine the possible cause and appropriate action shall be taken. If the concentration of a radionuclide exceeds 10 percent of the value in Table II, the licensee shall report the incident to the Administrator, Region I, U.S. Nuclear Regulatory Commission, within 30 days after the analysis is received by the licensee.
>
> d. Sediment samples from upstream and downstream locations in West Swamp Creek and immediately downstream of Outfall 001. If gross alpha concentrations exceed 100 pCi/g, an investigation shall be made to determine the cause.

The licensee shall maintain a record of all monitoring results obtained in accordance with this license condition.

CPM's internal corrective action level for natural thorium is $3x10^{-9}$ μCi/ml, the level for natural thorium is $3x10^{-8}$ μCi/ml, and the level for natural uranium is $3x10^{-7}$ μCi/ml. Corrective actions include additional sampling, initiating clean up, investigating the cause, instituting repairs, and rechecking.

NRC staff has reviewed CPM's commitments to controlling and monitoring liquid effluents and has determined that they provide reasonable assurance that radioactive materials will not be released to the environment effluents at concentrations greater than the limits in 10 CFR Part 20, Appendix B, Table 2, Column 2. They are, therefore, in compliance with 10 CFR 20.1302 and are acceptable.

2.3.3.3 Solid Wastes

Solid wastes generated at the CPM facility include low-level radioactive waste, filtrated sludge, and miscellaneous non-radioactive trash. A combination of reprocessing, off-site disposal, and recycling is used to manage these wastes.

Low-level radioactive residues are generated at about a rate of 2,000 kilograms per day (4300 pounds per day), and consist of digester solids with approximately 1 wt. % uranium and thorium. This material is stored on the site in bulk storage bins.

Filtrate sludge containing near-background levels of uranium and thorium is generated in the liquid waste treatment system at a rate of 47,000 kilograms per day (104,000 pounds per day). From 1999 through September 2002, the uranium and thorium content averaged 4.2 and 1.0 parts per million, respectively. The material was disposed at local landfills where it was used for daily cover material. Non-radioactive wastes also are sent to the Pottstown landfill for disposal. CPM monitors these wastes for moisture, uranium, and thorium. Wastes are sent to the landfill only if the average concentration of natural uranium and thorium is less that 10 pCi/g by analysis.

NRC staff has determined that the sampling and analysis plan for solid wastes is adequate to provide reasonable assurance that no radioactive wastes are sent to an unlicensed facility, thereby demonstrating compliance with 10 CFR 20.2001, and that the plan is therefore acceptable.

2.3.4 Environmental Monitoring

CPM has committed to a program of environmental monitoring that includes monitoring of surface water and sediment in West Swamp Creek, ambient air, and ground water.

2.3.4.1 Surface Water and Sediment

Two locations in West Swamp Creek are sampled for surface water and sediment. One location is 3.6 meters downstream of Outfall 001, and the second location is about 76 meters upstream from Outfall 001. The samples are collected quarterly and analyzed for gross alpha and beta emitters. CPM has established action levels of 1% and 10% of the Part 20, Appendix B, Table 2, Col. 2 effluent limits in the creek water samples. These action levels are sufficient to assure that radioactivity is detected below the maximum contaminant level for gross alpha particle radioactivity in community water systems, codified in 40 CFR 141.15. There is no drinking water maximum contaminant level for natural and gross β emitters; however, drinking water monitoring regulations require that individual radioactive constituents be identified if the gross beta particle activity exceeds 50 pCi/l.

Under the NPDES permit, CPM also monitors the water quality in West Swamp Creek to meet three in-stream limitations: ammonia-nitrogen (as N), 1.5 mg/l; fluoride, 2.0 mg/l; total dissolved solids, 750 mg/l. Sediment samples are collected and analyzed for gross alpha concentrations. An action level is set at 100 pCi/g for gross alpha in sediment samples based on measurement sensitivity. Should gross alpha contamination be detected in excess of this action level, the release limits for uranium and thorium (10 pCi/g) would be exceeded and remediation of these sediments may be necessary at decommissioning. To date there have been no measurements that indicated a need for remediation of sediments.

2.3.4.2 Air

CPM monitors air at three locations surrounding the plant. One sampler is located west of the plant. Since this sampler is located in a predominantly upwind direction from the plant, it provides a background measurement of radionuclides in the environment. Two additional air samplers are located southeast and east-southeast of Building 073 in the predominantly downwind directions. These two monitors will provide measurement of the concentrations of radiological effluents near the site boundary.

CPM has established two action levels for the environmental air sampling data. Level 1 action will be taken if the radioactivity measured at the environmental air samplers exceeds 30% of the effective effluent limit from Part 20, Appendix B, Table 2, Col. 1, with consideration given for the subtraction of background levels.

The Level 1 action is investigation of the potential causes and, if appropriate, modifications to the processes or equipment to reduce the levels. Level 2 actions, halting the work processes until appropriate actions have been taken to reduce the levels, will be taken if the radioactivity measured at the environmental monitoring station exceeds 80% of the effective effluent limit from Part 20, Appendix B, Table 2, Col. 1, with consideration given for the subtraction of background levels.

2.3.4.3 Ground Water

Ground water quality is monitored for radioactivity through sampling and analysis of ground water monitoring wells in several areas on the site. In addition, the drains under Lagoons 5 and 6 collect ground water, which is tested to determine if there is a failure in the liners of the storage lagoons. Additional site wells are not monitored for radioactive materials.

The ground water monitoring locations are described and justified in a document developed by CPM's hydrology consultant and provided as an attachment to the Environmental Assessment. Ground water samples are collected quarterly and analyzed for pH, chloride, ammonia nitrogen, total dissolved solids, and radioactivity.

NRC staff has reviewed the CPM's commitments to environmental monitoring and has determined that they will provide reasonable assurance that any significant radioactive contamination of the environment will be detected in a timely manner, and those impacts to the environment from CPM's operations can be assessed. For example, NRC staff has reviewed the ground water and underdrain monitoring program and has determined that it provides reasonable assurance that a significant leak or other discharge of radioactive materials to ground water would be detected in time to perform corrective actions to prevent significant contamination of ground water. Therefore, the commitments to environmental monitoring are acceptable.

2.3.5 Environmental Audits and Inspections

The environmental safety program is audited in accordance with CPM's Quality Department Procedure. This procedure assigns responsibility for the audits, describes the audit process, and contains a schedule to assure that audits are performed at least annually.

NRC staff has reviewed the auditing program and has determined that it is adequate to provide reasonable assurance that the environmental program will be implemented in accordance with the license commitments and is therefore acceptable.

2.3.6 Event Notification and Reporting

During the current license period there have been no events requiring reports to the NRC regarding exceedences of regulatory limits.

CPM has committed to report to NRC Region I if the concentration of any radionuclide in liquid effluents exceeds 10 percent of the limit in 10 CFR Part 20, Appendix B, Table 2, Column 2. This report must be sent to Region I within 30 days after the analysis results are received by the licensee.

2.3.7 Conclusion

NRC staff reviewed CPM's safety staff qualifications, corporate organization and authority, effluent control and monitoring commitments, environmental monitoring commitments, internal audit and inspection commitments, and event reporting commitments with respect to

environmental safety. As a result of this review NRC staff have determined that CPM's commitments are adequate to provide reasonable assurance that the Boyertown facility can be operated in accordance with the environmental protection requirements of 10 CFR Parts 20 and 40, and are therefore acceptable.

2.4 CHEMICAL/PROCESS SAFETY

As stipulated in the memorandum of Understanding (MOU) between the United States Nuclear Regulatory Commission (NRC) and the Occupational Safety and Health Administration (OSHA), dated October 21, 1988, the NRC maintains jurisdiction over various categories of hazards at its licensed facilities. In addition to radiological hazards, the NRC is responsible for the following:

A. *Chemical hazards posed directly by radioactive materials*. These may include toxic, fire, or explosion hazards derived form licensed nuclear materials, or chemical or physical hazards from nuclear mater processing operations (e.g., acid dissolution of uranium during which HF is formed), which can have serious toxic effects both on-site and off-site.

B. *Plant conditions that may directly or indirectly affect radiation hazards*. These may include chemical or physical hazards derived from hazardous material, whether intimately involved with nuclear material operations or not, that can impact the ability of plant operators to perform their duties, or hazards derived from gaseous or liquid flammable material such as hydrogen which, if released and ignited, can breach radioactive material confinement systems and lead to significant radiation exposure.

The licensee's processing operations in Building 073 present potential hazards that fall under either category A or B, above. Thus, as part of the Cabot license renewal review process, it is the NRC's responsibility to ensure that the licensee is taking adequate measures to identify and prevent or minimize the consequences that these potential hazards may pose (i.e., the licensee should display elements of a chemical safety program).

NRC's draft Branch Technical Position (BTP) on Management Controls/Quality Assurance, Requirements for Operation, and Chemical Safety for Fuel Cycle Facilities, *Federal Register*, Volume 54, No. 53, dated march 21, 1989, was utilized as a guideline for performing the review of the licensee's intended chemical safety practices. In addition to giving specific guidance, the draft BTP indicates that OSHA regulations in 29 CFR 1910.101.120 should be followed, as applicable, by NRC facilities. Accordingly, the NRC staff also examined CPM's chemical safety practices with respect to elements of the OSHA "PSM rule," 29 CFR 1910.119. "Process Safety Management of Highly Hazardous Chemicals." The rule contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, or explosive chemicals which may result in toxic, fire, or explosion hazards.

It should be noted that the licensee's overall chemical safety practices were examined by the NRC staff, as the licensee did not segregate its chemical safety program to separately address only those chemical hazards that could possibly affect radiological safety, which is the NRC's primary concern. The NRC staff did, however, focus attention on operations and chemical safety practices in Building 073, where there is by far the greatest risk (probability and consequence) of chemical hazards adversely affecting radiological safety.

2.4.1 Process Safety Information (PSI)

The licensee provided the NRC staff with an inventory listing of materials consumed and produced in the process along with their locations. The licensee indicated that there are no incompatible materials stored or used in such a way that inadvertent mixing could occur. Material Safety Data Sheets (MSDSs) are available to all employees for all potentially hazardous materials and controlled copies are in 11 locations throughout the plant. For operations in Building 073, the licensee maintains simplified process flow diagrams, P&IDs, and information concerning process chemistry.

The licensee addressed the corrosive characteristics of the HF and other materials used in the process. Various corrosion resistance systems are in place for digesters, digester components, piping, condensers, scrubbers, and ductwork. It is the responsibility of the engineering and maintenance departments to ensure that good engineering practices are followed with respect to compatible materials of construction and corrosion resistance when new or replacement

equipment is installed. To provide assurance of this, and to assure that other safety issues are addressed, a process Hazard Review is conducted, prior to process start-up, to evaluate risks and any potential harm to employee and public health and safety.

The licensee has committed to developing a PSI document control system to ensure that PSI content is accurate and contains current information. The facility has and has committed to maintain sufficient process safety information to support their chemical safety efforts.

2.4.2 Hazards Identification and Assessment

A Hazards and Operability (Haz-Op) study was performed on the digestion and filtering operations in Building 073. The licensee's methods in conducting this assessment were appropriate given the complexity of the process and the level of hazards involved. MSDSs were utilized by the assessment team in order for them to become reacquainted with the chemical and physical properties of the chemicals used in the process, as well as the health and safety issues and precautions. Process chemistry, along with the different reactions and the conditions and parameters affecting them were also reviewed prior to performing the assessment. Process equipment was also reviewed, including P&IDs, materials of construction, design specifications, testing requirements and frequency, instrumentation, control logic and interlocks. All documentation seemed appropriate.

The skills and qualifications of those performing the assessment were sufficient. The assessment team included members from operations (engineers and operators), maintenance, R&D, environmental health and safety, radiation protection, and engineering. Several members of the team were trained HAZ-OP leaders.

Numerous recommendations resulted from the assessment. The licensee gave careful consideration to each recommendation, and proposed appropriate actions. In particular, the NRC staff had some concerns regarding the lack of digester, HF tank and slurry tank overflow and continuous level indicators, and the lack of HF monitors in Building 073. The licensee identified these issues in the HA and indicated that they would provide for these overflow and continuous level indicators and HF monitors. The indicators and monitors were all installed and were functioning at the time of this review.

The licensee indicated that they would perform hazards assessments for all new projects and process modifications. This includes the second stage of the proposed revised digestion process. The licensee has an adequate Hazard Identification and Assessment (HIA) Program and has the necessary organization and controls in place to implement and maintain the program.

2.4.3 Detection and Monitoring

Activities involving hydrogen and HF pose the most significant chemical hazards in Building 073. Hydrogen is sometimes generated during ore digestion due to the carry-over of metallic iron from the ball milling operation. To detect the presence of hydrogen, each digestion tank utilized in the digestion process is outfitted with a hydrogen monitor. If hydrogen is present in the digester off-gasses at a level above 2% but less than 3%, a warning light and audible alarm are activated. The operator would then reduce or stop the feed rate of ore into the digester. If the hydrogen concentration in the digester off-gases exceeds 3%, the ore feed and steam heat to the digester are automatically shut down.

Hydrogen monitors are checked at the start of each batch digestion. A certified calibration gas is piped to each hydrogen detector. If the instrument does not analyze the calibration gas within a specified range, the operator is instructed not to begin digestion, and an area supervisor is then contacted to direct investigation and/or repair. Drager tubes are used to measure the HF level in the air, and are used by operators and supervisors on an as needed basis. If HF is detected, by smell, the Drager tubes are used to quantify the level, and to determine the appropriate response. The licensee plans to install continuous area HF monitors for the digestion areas of Building 073 in order to better detect high levels of HF in the area.

Liquid waste storage tanks are equipped with level indicators and high level alarms. The level indicators are continuously monitored by the wastewater treatment plant operators, as these tanks supply the primary feedstock to the treatment plant. The high level alarms sound at both the Security Office and the Wastewater Treatment Plant. Various other tests are performed to ensure proper operation of the scrubber, condenser, filter presses, and cooling system for the condenser.

The licensee's detection and monitoring efforts are sufficient to help ensure that operations in Building 073 are conducted in a safe manner. In addition, the licensee's emergency response

program, as described, appears sufficient to handle any chemical emergencies that may occur at the site.

2.4.4 Maintenance and Inspection

The licensee has a maintenance and inspection program which is designed to minimize the potential for accidental release of hazardous materials, ensure the reliability of safety devices, maintain the operational integrity of critical pieces of equipment, and comply with all applicable laws and codes. Records and schedules are maintained by the departments responsible for performing the check. Some examples of maintenance activities include quarterly inspection of fume scrubbers, annual pressure relief valve tests, biannual pressure vessel certification, weekly safety shower and eyewash inspections, and annual inspection of bulk storage tanks that contain corrosive materials.

There are a number of preventive maintenance (PM) programs in place to maintain and ensure the ongoing mechanical integrity of the equipment in Building 073. For example, all parts and equipment are either replaced in kind by maintenance, or reviewed by maintenance management for suitability of purpose with manufacturers' recommendations and in process service requirements. The licensee's maintenance and inspection program seems adequate to support the safe operation of activities in Building 073.

2.5 FIRE SAFETY

The feed material enters Building 073, where it is dissolved in hydrofluoric acid (HF) in heated digester vessels. The acid slurry produced is then passed through a filter press. The filtrate containing Ta and Nb is separated for further processing. The solid residue, which is in the form of sludge, contains essentially all of the radioactive material in the original feed. The HF used in the process if spilled may react with organic material with evolution of heat and cause a fire. However, Building 073 is of noncombustible construction and the fire load in it is light, so that the building or its other contents will not significantly contribute to the growth of fire.

The facility has an underground fire main with an adequate number of hydrants installed in it. Hydrants exist in the vicinity of Buildings 010, 040, 111, and 073. Additionally, portable fire

extinguishers are provided in each building. All of the uranium- and thorium-bearing residues are deposited in concrete storage bins, which are located at some distance from the process buildings. The concrete storage bins contain very little combustible material and are supplied with portable fire extinguishers.

CPM has a Labor-Management Health and Safety Committee that inspects work areas on a monthly basis. Any deficiency noted by the committee is tracked and corrected.

The facility has an organized Emergency Response Team, whose members are certified HAZMAT technicians and receive a full day of interior fire fighting training each year. They can also request assistance from several fire departments from nearby communities. Offsite fire department members participate in some of the training sessions and are given familiarization tours of the facility. Furthermore, the facility provides hands-on portable fire extinguisher training to the general workforce on an annual basis.

In view of all of the observations above, the staff has determined that the facility is adequately protected against inadvertent dispersal of licensed radioactive material by accidental fires.

2.6 DECOMMISSIONING

NRC regulations at 40.36(c)(2) require that a licensee provide a decommissioning funding plan (DFP) in their application for renewal. This DFP should include a cost estimate for decommissioning and an acceptable financial assurance instrument to cover the costs described in the estimate. These two elements are required for license renewal.

In developing the cost estimate for the DFP, the applicant must make an assessment of the decommissioning activities anticipated at the site. Acceptable alternatives for decommissioning include decontaminating the site to allow release for unrestricted use. Typically, the staff will consider such an alternative in evaluating the licensee's cost estimate. Approval of the cost estimate does not equate to approval of the licensee's final decommissioning plan (DP). Operating conditions may affect the licensee's final DP. Therefore, the staff, unless specifically requested by the licensee, will typically evaluate only the objective and cost of the DP information provided in the renewal application.

Additionally, the licensee is required to maintain specific information for the purposes of decommissioning, to be used in developing and executing the final DP for the facility. The specific information required is described in 40.36(f). Unused portions of the facility, as described in 40.42, are required to be identified for decommissioning within 2 years of cessation of principal activities. A final DP is required for each unused portion of the facility within a year of identification, and remediation required within 2 years of approval of the final DP.

The Cabot supplemental information, dated _____ described the decommissioning cost estimate, the basis for the decommissioning cost estimate, and the financial assurance instrument used by the licensee to demonstrate compliance with the financial assurance requirements. The licensee has provided a detailed DFP. NRC staff has evaluated the Cabot cost estimate and the associated financial instrument. The licensee provided a letter of credit, dated _____, in the amount of $_____ to cover the described costs for decommissioning under the assumptions described in the submittals.

The Cabot DFP provides a detailed breakdown of the costs anticipated for decontaminating the facility and reducing the residual contamination to acceptable levels for unrestricted release of the site. The licensee indicates that the costs reflect activities that "will permit release of the facility for unrestricted use in accordance with NRC guidelines." The licensee specifies the guidelines to be those contained in the "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct Source and Special Nuclear Material," and the "Branch Technical Position on the On-Site Disposal of Thorium and Uranium Wastes from Past Operations." The staff finds that the decommissioning objective is acceptable as a basis for the cost estimate. This is because the objective is consistent with the regulatory requirements and uses the criteria described in the NRC staff's "Site Decommissioning Management Plan (SDMP), Action Plan," published in the Federal Register at 57 FR 13389, dated April 16, 1992, as the cleanup criteria.

Based on its review, the staff has determined that the value of the financial instrument provided by Cabot adequately reflects the anticipated cost of decommissioning the site, provided the materials currently in storage are either processed to recover additional metals values or disposed of using an alternative method to conventional disposal.

The cost estimate includes a cost item for transporting/processing/disposal of the entire volume of ore residue currently stored on site (approximately 400,000 cubic feet). This is acceptable because the residue represents feedstock material with a positive value based on its metal content. In addition, the waste volume requiring disposal after processing should be substantially less than the current volumes in storage. This will reduce the cost of offsite waste disposal.

If the residues were not considered an asset and had to be disposed of at existing commercial disposal facilities, the cost for disposal alone would range from $4 to 132 Million. Transportation costs to haul the residues to disposal facilities could add another $4 Million cost, assuming transport costs at about $10/ft^3. If processing is unsuccessful and residues must ultimately be disposed of offsite without further volume reduction, the cost for disposal could be considerably reduced by obtaining authorization to dispose of the waste in a disposal impoundment for 11e(2) byproduct material. Although the licensee has not, so far, secured any contracts for accepting the residues for disposal at such a facility, costs for disposal of the residues in uranium mill tailings impoundments could be on the order of several tens of hundreds to thousands of dollars plus a transportation cost for a total disposal cost of several million dollars.

The licensee is currently financially viable and has enjoyed this stability for an extended period. Although there is some slight, but unquantified, risk of licensee default over the time period required to process the material, it is environmentally beneficial and cost-effective to process these materials to recover the residual metal values. In addition, the letter of credit represents a reasonably large financial assurance for this type of licensee. If default occurred, the amount of credit would be expected to cover most, if not all, of the expense of decontamination, decommissioning, radiation surveys, and waste disposal. Therefore, the staff has reasonable assurance that the licensee has provided adequate financial assurance for decommissioning in support of the license renewal. However, the staff will assess the financial viability of the licensee on an annual basis, based on reviews of annual reports and audited financial statements, to ensure that the basis for this reasonable assurance remains intact and to ensure that the licensee continues to reduce potential decommissioning liabilities during processing (e.g., by reducing the volume of residues and waste stored on site). In the event that financial assurance for decommissioning the Boyertown site significantly degrades in the future, the staff will

consider taking additional actions that may be necessary to compel compliance and protect the public.

Release of equipment prior to decommissioning is independently addressed by the licensee in Condition 13 of the license as stated below:

> Release of equipment, facilities, or packages to the unrestricted area or to uncontrolled areas onsite shall be in accordance with the "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated April 1993.

The staff finds that the commitments provided by the applicant, and as conditioned, are adequate as they provide reasonable assurance that sufficient funding for decommissioning will be available in the event of licensee default.

3. ENVIRONMENTAL REVIEW

An Environmental Assessment (EA) update has been prepared for this license renewal. The EA concluded that renewal of the license will have no significant impact on the environment, and a Finding of No Significant Impact (FONSI) was published in the Federal Register on October 2, 1996 (61 FR 51470). The Federal Register notice included a summary of the EA and a notice of opportunity for a hearing in accordance with 10 CFR Part 2, Subpart L. No requests for a hearing or other comments from the public were received.

4. CONCLUSION

The NRC staff has reviewed the applicant's submittal and supplementary information regarding radiological, chemical, fire, and environmental safety; the staff has evaluated the applicant's decommissioning funding plan; the staff has evaluated the licensee's compliance history; and based on this review has determined that there is reasonable assurance that the facility can be operated in a safe manner and in accordance with the regulations set forth in 10 CFR Part 40. The staff, therefore, recommends that the license be renewed for a period of five years.

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