



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

November 8, 1999

Mr. Robert Kossak, Manager  
Kiski Valley Water Pollution  
Control Authority  
1200 Pine Camp Road  
Leechburg, PA 15656

SUBJECT: REMEDIATION OF CONTAMINATED SLUDGE ASH LAGOON AT THE KISKI VALLEY WATER POLLUTION CONTROL AUTHORITY TREATMENT FACILITY

The purpose of this letter is to provide guidance for the development of a remediation plan for the contaminated sludge ash lagoon at the Kiski Valley Water Pollution Control Authority (KWPCA) treatment plant. Over the past several years, we have investigated possible remediation strategies with you, your staff and support contractors, and staff of the Pennsylvania Department of Environmental Protection (PADEP). To support this investigation, we conducted a preliminary assessment of alternatives, conducted a radiological survey of the ash lagoon, and provided interim guidance for conducting dose assessments. KWPCA recently supplemented the radiological characterization of the lagoon by conducting additional sampling and analysis. Using the combined data, we developed a 3D geospatial model of the ash lagoon to get a better understanding of the distribution of the uranium-235 contamination. We met with you on July 27, 1999, to demonstrate and discuss this model. At that meeting, we committed to provide you with guidance for developing a remediation plan for the lagoon. This guidance is enclosed and discussed below.

Although KWPCA is not a U.S. Nuclear Regulatory Commission (NRC) licensee, the regulatory framework under which we would review and approve a remediation plan is 10 CFR Part 20, specifically Subpart E and §20.2002. For onsite remediation alternatives, we would apply the requirements of 10 CFR 20 Subpart E. For off site disposal alternatives, the requirements of 10 CFR 20.2002 would apply (for disposal at locations other than a licensed low-level waste disposal facility) and any residual contamination at the KWPCA site would have to meet the requirements of Subpart E.

To support the implementation of 10 CFR 20 Subpart E, we recently completed development of the Draft "Standard Review Plan (SRP) for the Review of Decommissioning Plans and Other Information Submitted to Support the Release of Nuclear Facilities," a copy of which is enclosed (Enclosure 1). To provide tailored guidance for the development of a remediation plan for the ash lagoon, we have also developed, "Guidance for Development of a Remediation Plan" (Enclosure 2). To date, for each of the four remediation alternatives we have discussed, this enclosure identifies those portions of the SRP which should be included in the remediation plan. This guidance is not intended to indicate an NRC preferred alternative nor is it intended to restrict your consideration of other alternatives. Should you identify additional alternatives we

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will gladly revise the guidance to address those alternatives. To supplement this information, we have also enclosed a copy of Draft Regulatory Guide DG-4006, "Demonstrating Compliance with the Radiological Criteria for License Termination," (Enclosure 3), and NUREG-1549, "Decision Methods for Dose Assessment to Comply with Radiological Criteria for License Termination" (Enclosure 4). Both of these documents are referenced in the SRP. Guidance related to 10 CR 20.2002 is contained in NUREG-1101, "Onsite Disposal of Radioactive Waste," a copy of which has been provided by previous correspondence. Although this NUREG is titled "Onsite," the guidance is also applicable to off site disposals under §20.2002.

After you have had the opportunity to review the enclosed guidance, we suggest that we meet with you and PADEP staff to discuss this guidance in more detail. In addition, we recognize that there are unresolved issues associated with some of these alternatives and we would discuss these issues with you at the meeting and develop a plan for their resolution. Following this discussion and the resolution of outstanding issues, KVVWPCA will need to select a preferred alternative and develop and submit a remediation plan to NRC, consistent with the supplied guidance.

Should you have any questions concerning this guidance, please do not hesitate to call Robert Nelson, Chief, Special Projects Section, at (301) 415-7298.

Sincerely,



Larry W. Camper, Chief  
Decommissioning Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Enclosures:

1. Draft Standard Review Plan
2. Guidance for Development  
of Remediation Plan
3. Draft Reg Guide DG-4006
4. NUREG-1549

cc: KVVWPCA Dist. List

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[Original signed by:]  
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cc: The Honorable Rick Santorum  
KWPCA Dist. List

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# **GUIDANCE FOR DEVELOPMENT OF REMEDIATION PLAN**

## **DESCRIPTION OF ASH LAGOON**

- I. Location and Description of Ash Lagoon (SRP 3.1)
  - A. Size of contaminated area
  - B. Summary of all residences, facilities, and activities near the lagoon
  - C. Appropriate maps
  
- II. Radiological Status (SRP sections 4 and 14)
  - A. Contaminated soil (SRP 4.3 and 4.4)
    - 1. concentration data for all samples analyzed
    - 2. appropriate figures/(3D)maps detailing concentration distribution
    - 3. volume considerations
      - a. entire lagoon
      - b. contaminated ash
  - B. Surface water (SRP 4.5)
  - C. Groundwater (SRP 4.6)

## **REMEDIALATION ALTERNATIVES**

### Scenario I - Cap on-site

- I. Summary of Alternative
  - A. Title of alternative
  - B. General summary of actions to be performed
  - C. Regulatory objective: restricted vs. non-restricted release (SRP section 16; DG-4006)
  
- II. Location and Description of KVVWPCA Site (SRP 3.1)
  - A. Geographic location
  - B. Size of the KVVWPCA property
  - C. Size of the area in which the contaminated material will be stored
  - D. Appropriate maps
  
- III. Population Distribution at KVVWPCA Site (SRP 3.2)
  - A. Summary of the current population distribution in and around the site
  - B. Summary of the projected population distribution
  - C. A list of minority populations/census block group data

IV. Current/Future Land Use at KVVWPCA Site (SRP 3.3)

- A. Current land use (local and site-specific)
- B. Projected land use

V. Metrology and Climatology at KVVWPCA Site (SRP 3.4)

- A. Regional climatic data
- B. Severe weather phenomena
  - 1. types of events
  - 2. seasonal and annual frequency
- C. Weather-related radionuclide transmission parameters
- D. Description of local (on-site) meteorology
- E. National Ambient Air Quality Standards Category of the area

VI. Geology and Seismology at KVVWPCA Site (SRP 3.5)

- A. Regional geologic framework
- B. Local rock units
  - 1. names
  - 2. descriptions
  - 3. relationships
- C. Surface/near-surface geology
- D. Structural geology
- E. Seismology
  - 1. historical earthquakes
  - 2. present and future hazard
- F. Detailed description of lagoon
  - 1. Clay liner
    - a. thickness
    - b. continuity through lagoon/site
    - c. composition
    - d. permeable/penetrable
    - e. other
  - 2. Surrounding berm
    - a. present dimensions
    - b. composition
    - c. permeable/penetrable
    - d. other
- G. Detailed maps/figures

VII. Surface Water Hydrology at KVVWPCA Site (SRP 3.6)

- A. Exact location of nearby surface water
- B. Detailed description of site drainage
- C. Inventory of existing and planned surface water users whose intakes could be adversely affected by migration of radionuclides from the site
- D. Floodplain
- E. Description of regional/site man-made changes to the surface water system
- F. Maps denoting all relevant surface water features

VIII. Groundwater Hydrology at KVVWPCA Site (SRP 3.7)

- A. Description of the saturated zone
- B. Description of the unsaturated zone
- C. Physical parameters
- D. Description of groundwater flow directions and velocities
- E. Description of numerical techniques/models used to characterize the hydrology
- F. Monitor wells
  - 1. existing
  - 2. planned

IX. Natural Resources at KVVWPCA Site (SRP 3.8)

X. Ecology/Endangered Species at KVVWPCA Site (SRP 3.9)

XI. Design Information

- A. Physical description of proposed structure
- B. Appropriate figures/schematics of design
- C. Details concerning materials to be used
- D. Failure analysis for 1000 years
- E. Radiation protection methods to be employed during remediation (SRP section 10)
- F. Demonstration of compliance (SRP sections 11 and 14; DG-4006)

XII. Design Implementation

- A. Project organization (SRP section 9)
  - 1. contractor information (SRP 9.5)
- B. Schedules (SRP 8.5)

XIII. Environmental Impact

- A. Mobility of contamination (SRP section 11)
  - 1. groundwater
  - 2. surface water
  - 3. other
- B. Identify receptors (SRP section 5)
  - 1. remediation workers (SRP section 10)
  - 2. KVVWPCA employees
  - 3. members of public
  - 4. inadvertent intruder scenario
  - 5. other
- C. Identification of all pathways (SRP section 5)
  - 1. Justify those omitted
- D. Dose assessment (DG-4006; NUREG 1549; SRP section 5)
  - 1. critical group
  - 2. identification and justification of code and parameters utilized
  - 3. calculated doses
  - 4. ALARA (DG-4006 section 3; SRP section 7)
- E. Projected ecological impact

XIV. Economic Considerations (SRP section 15)

- A. Cost estimate (SRP 15.1)
- B. Economic feasibility (SRP 15.2)

XV. Societal Impact (SRP 6.1)

- A. Description of impacts to minority or low-income population within a 4 mile radius of the site
- B. Summary of the impacts on community resources such as land use and property values
- C. Any other health/safety/economic affects on neighboring communities

XVI. Consideration of Potential Accident Scenarios

- A. Flood
  - 1. effects on structure
  - 2. release of contaminants
  - 3. anticipated dose
- B. Other natural disasters/accidents
- C. Intruder scenarios

XVII. Other Considerations (i.e. KVVPCA land use issues including provisions for restricted release if necessary, SRP 16, DG-4006)

XVIII. Status (if any) of Alternative

Scenario II - Disposal in a Sanitary Landfill

I. Summary of Alternative

- A. Title of alternative
- B. General summary of actions to be performed
- C. Regulatory objective: restricted vs. non-restricted release (SRP section 16; DG-4006)

II. Location and Description of Disposal Site (SRP 3.1)

- A. Geographic location
- B. Size of the property
- C. Size of the area in which the contaminated material will be disposed
- D. Summary of all residences, facilities, and activities near the site
- E. Appropriate maps

III. Population Distribution at Disposal Site (SRP 3.2)

- A. Summary of the current population distribution in the vicinity of the disposal site
- B. Summary of the projected population distribution
- C. A list of minority populations/census block group data

IV. Current/Future Land Use at Disposal Site (SRP 3.3)

- A. Current land use (locally and on-site)
- B. Projected land use

V. Metrology and Climatology at Disposal Site (SRP 3.4)

- A. Regional climatic data

- B. Severe weather phenomena
  - 1. types of events
  - 2. seasonal and annual frequency
- C. Weather-related radionuclide transmission parameters
- D. Description of local (on-site) meteorology
- E. National Ambient Air Quality Standards Category of the area

VI. Geology and Seismology at Disposal Site (SRP 3.5)

- A. Regional geologic framework
- B. Local rock units
  - 1. names
  - 2. descriptions
  - 3. relationships
- C. Surface/near-surface geology
- D. Structural geology
- E. Seismology
  - 1. historical earthquakes
  - 2. present and future hazard
- F. Landfill "structure"
  - 1. detailed description of liner
  - 2. topography
  - 3. other
- G. Detailed maps/figures

VII. Surface Water Hydrology at Disposal Site (SRP 3.6)

- A. Exact location of nearby surface water
- B. Detailed description of site drainage
- C. Inventory of existing and planned surface water users whose intakes could be adversely affected by migration of radionuclides from the site
- D. Floodplain
- E. Description of regional/site man-made changes to the surface water system
- F. Maps denoting all relevant surface water features

VIII. Groundwater Hydrology at Disposal Site (SRP 3.7)

- A. Description of the saturated zone
- B. Description of the unsaturated zone
- C. Physical parameters
- D. Description of groundwater flow directions and velocities
- E. Description of numerical techniques/models used to characterize the hydrology
- F. Monitor wells
  - 1. existing
  - 2. planned

IX. Natural Resources at Disposal Site (SRP 3.8)

X. Ecology/Endangered Species at Disposal Site (SRP 3.9)

- XI. Current (Pre-disposal) Radiological Status of Disposal Facility (SRP sections 4 and 14)
  - A. Contaminated structures, systems, and equipment (SRP 4.1 and 4.2)
  - B. Surface soil contamination (SRP 4.3)
  - C. Subsurface soil contamination (SRP4.4)
  - D. Surface Water (SRP 4.5)
  - E. Groundwater (SRP 4.6)

- XII. Characterization of On-Site Actions Planned (SRP Section 8)
  - A. Detailed description of planned activities
    - 1. volume/concentrations of materials to be exhumed
    - 2. methods of exhumation
    - 3. project organization (SRP section 9)
      - a. contractor information (SRP 9.5)
    - 4. schedules (SRP 8.5)
  - B. Appropriate figures/schematics descriptive of scenario
  - C. Radiation protection methods to be employed during remediation (SRP section 10)
  - D. Demonstration of compliance (SRP sections 11 and 14; DG-4006 section 2)

- XIII. Characterization of Off-Site Actions Planned
  - A. Detailed description of transport plan (NUREG 1660)
    - 1. contractor information (SRP 9.5)
    - 2. radiation protection methods (SRP section 10)
  - B. Detailed description of disposal actions
    - 1. contractor information (SRP 9.5)
    - 2. details of how material will be distributed at landfill
      - a. maps/figures
    - 3. radiation protection methods to be employed during disposal (SRP section 10)
    - 4. demonstration of compliance at landfill facility (SRP section 11 and 14; DG-4006 section 2)
  - C. Landfill information
    - 1. name, address, and point of contact at landfill under consideration

- XIV. Environmental Impact (landfill site)
  - A. See details from Scenario I, section XIII

- XV. Societal Impact (landfill site)
  - A. Description of impacts to minority or low-income population within a 4 mile radius of the facility
  - B. Summary of the impacts on community resources such as land use and property values
  - C. Any other health/safety/economic affects on neighboring communities

- XVI. Economic Considerations (SRP section 15)
  - A. Cost estimate (SRP 15.1)
  - B. Economic feasibility (SRP 15.2)

- XVII. Consideration of Potential Accident Scenarios
  - A. Transport to landfill

- B. On-site
- C. Off-site

XVIII. Other Considerations

XIX. Status (if any) of Alternative

Scenario III - Disposal at a Licensed LLW Disposal Facility

I. Summary of Alternative

- A. Title of alternative
- B. General summary of actions to be performed
- C. Regulatory objective: restricted vs. non-restricted release (SRP section 16; DG-4006)

II. Characterization of On-Site Actions Planned (SRP Section 8)

- A. Detailed description of planned activities
  - 1. volume/concentrations of materials to be exhumed
  - 2. methods of exhumation
  - 3. project organization (SRP section 9)
    - a. contractor information (SRP 9.5)
  - 4. schedules (SRP 8.5)
- B. Appropriate figures/schematics descriptive of scenario
- C. Radiation protection methods to be employed during remediation (SRP section 10)
- D. Demonstration of compliance (SRP sections 11 and 14; DG-4006 section 2)

III. Characterization of Off-Site Actions Planned

- A. Detailed description of transport plan (NUREG 1660)
  - 1. contractor information (SRP 9.5)
  - 2. radiation protection methods (SRP section 10)
- B. Disposal Facility information
  - 1. name, address, and point of contact

IV. Economic Considerations (SRP section 15)

- A. Cost estimate (SRP 15.1)
- B. Economic feasibility (SRP 15.2)

V. Consideration of Potential Accident Scenarios

- A. Transport to landfill
- B. On-site
- C. Off-site

VI. Other Considerations

VII. Status (if any) of alternative

## Scenario IV - Partial Separation

### I. Summary of Alternative

- A. Title of alternative
- B. General description of actions to be performed
  - 1. treatment of "non-contaminated" ash
    - a. define "non-contaminated" ash
  - 2. treatment of "contaminated" ash (capped onsite, disposed at sanitary landfill, or disposed of at licensed LLW disposal facility)
    - a. define "contaminated" ash
- C. Regulatory objective: restricted vs. non-restricted release (SRP section 16; DG-4006)

### II. Detailed Characterization of Disposal Site

- A. See details from Scenario I, sections II-X (on-site); Scenario II, sections II-XI (sanitary landfill); or Scenario III, section IIIB

### III. Characterization of On-Site Actions Planned (SRP Section 8)

- A. Detailed description of planned activities
  - 1. volume/concentrations of materials to be exhumed
  - 2. methods of exhumation
  - 3. project organization (SRP section 9)
    - a. contractor information (SRP 9.5)
  - 4. schedules (SRP 8.5)
- B. Appropriate figures/schematics descriptive of scenario
- C. Radiation protection methods to be employed during remediation (SRP 10.0)
- D. Demonstration of compliance (SRP sections 11 and 14; DG-4006)

### IV. Treatment of "Non-Contaminated" Ash

- A. Describe specific treatment of "non-contaminated" ash
- B. Project organization (SRP section 9)
  - 1. contractor information (SRP 9.5)

### V. Treatment of "Contaminated" Ash

- A. Cap on-site (see details in Scenario I, sections XI-XIII, XV, XVI)
- B. Sanitary landfill (see details in Scenario II, sections XIII-XV, XVII)
- C. Licensed LLW disposal facility (see details Scenario III, sections III,V)

### VI. Economic Considerations (SRP section 15)

- A. Cost estimate of Scenario IV (SRP 15.1)
- B. Economic feasibility (SRP 15.2)

### VII. Consideration of Accident Scenarios

- A. Floodplain
- B. Transport
- C. Other(s)

### X. Other Considerations

X. Status (if any) of Alternative

Scenarios\* V-

\*Any other scenarios must be addressed in similar manner to that outlined for scenarios I-IV. Additional scenarios must be described in detail with environmental, economic, and societal advantages and disadvantages of each appropriately discussed.

**SELECTION OF PREFERRED ALTERNATIVE**

I. Summary

- A. Scenario I
  - 1. advantages
  - 2. disadvantages
- B. Scenario II
  - 1. advantages
  - 2. disadvantages
- C. Scenario III
  - 1. advantages
  - 2. disadvantages
- D. Scenario IV
  - 1. advantages
  - 2. disadvantages
- E- \_ Scenarios V-\_
  - 1. advantages
  - 2. disadvantages

II. Selected Scenario

- A. Justification as superior alternative
  - 1. Environmentally
    - a. lowest doses to the public at completion
    - b. returns the site to as close to pre-contaminated condition as possible
- B. Logistically feasible
  - 1. Financially
  - 2. Contractors
    - a. specialists available?
  - 3. Outside facilities
    - a. landfill agreeable?
  - 4. Other