



**PROPOSED SAFETY ANALYSIS APPROACH FOR THE SOLAR  
EVAPORATION POND (SEP) CAP**

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PROPOSED SAFETY ANALYSIS APPROACH  
FOR THE SOLAR EVAPORATION POND (SEP) RCRA CAP

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## 1.0 INTRODUCTION

EG&G Environmental Restoration Management (ERM) is proposing to construct a soil cap over the SEPs following removal of the existing pond contents and other associated remediation activities. ERM has requested EG&G Safety Analysis Engineering to determine the appropriate safety analysis documentation for the proposed RCRA cap, in accordance with DOE Orders.

The soil cap will be installed as a measure to control residual hazardous material contamination upon completion of remediation activities. The acceptable level of remediation will be established in the Decision Document developed for the project in accordance with DOE Order 5400.4, *Comprehensive Environmental Response, Compensation, and Liability Act Requirements*.

Included in the Decision Document will be an environmental assessment (EA) for the installation of the soil cap. The EA is required by the National Environmental Policy Act (NEPA). In accordance with NEPA requirements, the EA must assess the activity for the impact on the health and safety of the public and the environment.

Since the proposed soil cap is a passive barrier designed to confine low levels of residual contamination in the remediated SEPs, Safety Analysis Engineering (SAE) proposes that the activity descriptions, assessments, and risk analyses developed in support of the Decision Document, and specifically the EA, be the basis for compliance with the DOE Order requirements for safety analysis. This approach will eliminate the need and expense for a separate safety analysis document which is not expected to provide any additional benefit.

## 2.0 PROPOSED SAFETY ANALYSIS APPROACH COMPARISON TO REQUIREMENTS

Department of Energy (DOE) Orders 5480.23, *Nuclear Safety Analysis Reports*, and 5481.1B, *Safety Analysis and Review System*, are the primary Orders governing safety analysis requirements for nuclear and non-nuclear facilities, respectively.

Facilities are designated as "Nuclear Facilities" if the radiological inventory exceeds the threshold values in DOE Standard DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance With DOE Order 5480.23, Nuclear Safety Analysis Reports*. Based on analyses performed for removal of the solar pond sludge (EG&G,93; EG&G,94), the ponds will contain less than the Category 3 threshold limits. Therefore the facility is designated as non-nuclear and the requirements of DOE Order 5481.1B apply in lieu of 5480.23.

It is proposed that a single Decision Document be utilized to fulfill the safety analysis requirements of DOE Order 5481.1B as well as those of RCRA, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA),

and NEPA. The inclusion of safety analysis in environmental documentation has precedence in the Building 707 EA for thermal stabilization, and the EA for the Drill Cutting Drum Storage Facility. Table I summarizes the safety analysis requirements from DOE Order 5481.1B, and how these requirements will be met by the proposed analysis and documentation for the RCRA cap.

The Decision Document will be submitted to DOE for review. The project will only be implemented if a Finding of No Significant Impact (FONSI) is issued by DOE.

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TABLE 1  
 Comparison of Proposed Safety Analysis Approach  
 to DOE Order 5481.1B Requirements

DOE ORDER 5481.1B SECTION	REQUIREMENT	PROPOSED COMPLIANCE APPROACH
7. Policy		
7.c	(1) Potential hazards are systematically identified.	<p><u>Comply.</u> The hazards associated with the solar pond sludge have been identified and characterized, and the nature and extent of contamination in the soil is being evaluated through the RCRA Facility Investigation/Remedial Investigation (RFI/RI) process. Upon removal of the sludge and the performance of other remediation activities, residual contamination may remain based on remediation criteria. These remediation criteria will establish the upper bound for hazardous material and will be identified in the documentation.</p>
	(2) Potential consequences are analyzed.	<p><u>Comply.</u> The consequences will be established through risk assessments performed in accordance with approved EPA methods and criteria and with EPA and CDH concurrence.</p>

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DOE ORDER 5481.1B SECTION	REQUIREMENT	PROPOSED COMPLIANCE APPROACH
	(3) Reasonable measures to eliminate, control, or mitigate the hazards have been taken, including where applicable, compliance with commitments made in environmental assessments and impact statements.	<u>Comply.</u> The function of the RCRA cap is to provide control and mitigation of the remaining hazardous material following remediation. The safety analysis will be integral to the EA and thus will comply with any commitments therein. The safety analysis and EA are also integrated into the conceptual and preliminary design which ensures the design also meets commitments.
	(4) There is documented management authorization of the DOE operation based upon an objective assessment of the safety analysis.	<u>Comply.</u> The Decision Document and EA must be approved by DOE and a FONSI issued prior to installation of the RCRA cap.
Chapter I General Requirements		
3.a (Safety Analysis)	(1) Safety analysis shall be initiated during the earliest phases of the life cycle of the DOE operation to facilitate early hazard identification and their elimination of control.	<u>Comply.</u> EPA type risk analyses will be performed based on the remediation criteria with the risk goal of $1 \times 10^{-6}$ cancers per year. The Decision Document will contain or reference the risk analysis, as well as the conceptual and preliminary design, and will be the basis for DOE authorization to construct the RCRA cap.

DOE ORDER 5481.1B SECTION	REQUIREMENT	PROPOSED COMPLIANCE APPROACH
	(2) Safety analysis shall be provided by the organization with immediate operating responsibility.	<u>Comply.</u> The Decision Document will be prepared by the organization responsible for implementing the remediation activity under the management of the RFO, ER office, which is responsible for the Solar Ponds project.
	(3) Safety analysis shall identify and demonstrate conformance with applicable guides, codes, and standards. Deviations from current DOE design criteria shall be evaluated and documented in the facility safety analysis report.	<u>Comply.</u> The Applicable or Relevant and Appropriate Requirements (ARARs) process is legally mandated by CERCLA and the IAG and specifically designed to identify standards to be used in designing the project and in establishing the commitments necessary to ensure compliance. These ARARs will be identified in the Decision Document as appropriate.
	(4) Wherever possible, cover classes of efforts or individual operations within a facility (or under an activity or project) so that individual efforts or operations which are to be conducted are bounded by the general analysis.	<u>Comply.</u> The entire Operable Unit 4 (OU4) closure area is being addressed such that individual hazards within OU4 are bounded by the general risk analysis.
	(5) Demonstrate that there is reasonable assurance that the DOE operation can be conducted in a manner that will limit risks to the health and safety of the public and employees, and adequately protect the environment.	<u>Comply.</u> This is the primary function of the proposed Decision Document.

DOE ORDER 5481.1B SECTION	REQUIREMENT	PROPOSED COMPLIANCE APPROACH
	(6) Describe the features of the actual design and conduct of the DOE operation that demonstrate conformance with design or performance assumptions made in the environmental assessments or impact statements previously issued by DOE, or satisfactorily account for deviations.	<u>Comply in part.</u> The Decision Document will include a description of the conceptual design (CD) as opposed to actual design. However, since the proposed "facility" is a soil cap, the CD in conjunction with the EA, is expected to provide an adequate description.
3.b (Review of the Safety Analysis)	(1) The review shall include a documented evaluation of the adequacy of the preventative or mitigative design features and the administrative controls provided to limit the risk.	<u>Comply.</u> The Decision Document will be reviewed by the DOE, EPA, CDH and the public. The document will be approved by the DOE, EPA and CDH. Documentation of reviews will be kept in the plant records system and, where appropriate, in the IAG Administrative Record.
	(2) The line organization review shall serve as a basis for authorization of the proposed DOE operation.	<u>Comply.</u> The "operation" to construct the RCRA cap will proceed only upon receipt of the necessary approvals on the Decision Document and issuance of a FONSI by DOE HQ. These approvals will serve as the authorization basis.
	(3) The line organization review may be conducted at the Headquarters level, or at the field level, as delegated.	<u>Comply.</u> Both the Field Office and Headquarters are included in the review of the Decision Document.

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DOE ORDER 5481.1B SECTION-	REQUIREMENT	PROPOSED COMPLIANCE APPROACH
	(4) The review provided by the line organization shall be conducted by individuals, the majority of whom are not directly involved in the management of the DOE operation being evaluated.	<u>Comply.</u> The line organization review of the Decision Document will include individuals not directly involved in the management of the operation and will be administered by DOE, RFO and DOE HQ. Reviews will also be performed by EPA, CDH and the public.
	(5) The review shall be sufficiently documented to allow independent evaluation of its adequacy.	<u>Comply.</u> The reviews will be sufficiently documented in accordance with appropriate administrative requirements. See 3.b(1) above.
3.c (Authorizations)	(1) The level of management authorization of a DOE operation shall be determined by the line organization. It should be commensurate with the type and magnitude of the hazards involved.	<u>Comply.</u> The Decision Document will be signed by DOE, RFO and concurred with by DOE Headquarters. DOE HQ will issue the FONSI. The EPA and CDH will also approve the document. Construction of the proposed RCRA cap will not proceed until DOE issuance of a FONSI.
	(2) Authorizations signify that a determination has been made by the line organization for DOE that the risk is acceptable.	<u>Comply.</u> The receipt of the necessary approvals from governing authorities and the issuance of the FONSI will provide the determination that the risks are acceptable.

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