

YMP-054-R0 YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT OFFICE
7/12/91 DOCUMENT APPROVAL SHEET

Title

CLASSIFICATION OF ITEMS IMPORTANT TO SAFETY
AND WASTE ISOLATION

NO. AP-6.17Q
 Q
 Non Q

APPROVAL

PROJECT MANAGER: E. L. Wilmot for C. P. Gertz 3/19/90
Signature Date

DIRECTOR OF QUALITY ASSURANCE: D. G. Horton 3/19/90
Signature Date

N/A : N/A N/A
(OTHER, AS REQUIRED) Signature Date

REVISION 0 EFFECTIVE DATE: 3/19/90

REVISIONS

INITIAL AND DATE

REVISION 1 REVISION 2 REVISION 3 REVISION 4

PROJECT MANAGER: [Signature] _____
4/23/92

DIRECTOR, QA: [Signature] _____
4/22/92

N/A N/A _____
(OTHER, AS REQUIRED)

EFFECTIVE DATE: 6/10/92

5/4/92

Complete Revision

Bob Barton - Preparing Transition Plan

Training

Cognizant QA - D. Spence



TRAINING REQUIRED YES N/A

NUMBER OF DAYS REQUIRED FOR TRAINING 34 working days

COMMENTS: Formal classroom training for baselined personnel

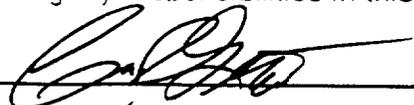
[Signature] 4-23-92
TRAINING OFFICER/TRAINING MANAGER DATE

AP-6.17a Rev 1 approval Doc 476

YMP-063-R0
10:15:91

**YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
PROCEDURE COMPLIANCE DOCUMENTATION FORM**

I have read, and understood and complied with Document AP-6.10 Rev 3 ICN# N/A
in accomplishing my responsibilities in this procedure.

Signature  Name (Printed) Carl Gertz
Title Project Manager Date 4/23/92

I have read, and understood and complied with Document AP-6.10 Rev 3 ICN# N/A
in accomplishing my responsibilities in this procedure.

Signature _____ Name (Printed) _____
Title _____ Date _____

I have read, and understood and complied with Document _____, Rev _____ ICN# _____
in accomplishing my responsibilities in this procedure.

Signature _____ Name (Printed) _____
Title _____ Date _____

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Title _____ Date _____

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Title _____ Date _____

I have read, and understood and complied with Document _____, Rev _____ ICN# _____
in accomplishing my responsibilities in this procedure.

Signature _____ Name (Printed) _____
Title _____ Date _____

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This procedure implements the Yucca Mountain Site Characterization Project Office (YMPO) interpretation of the determination of importance portion of NUREG-1318, Technical Position on Items and Activities in the High-Level Waste Geologic Repository Program Subject to Quality Assurance Requirements. It describes the method and responsibilities for (1) classification and recording of items important to public radiological safety and waste isolation, and (2) identification and recording of items not important to public radiological safety and waste isolation for which compliance with other regulatory requirements (such as parts of NUREG-1318; 10 CFR 60, Disposal of High-Level Radioactive Waste in Geologic Repositories; other CFRs; state and local statutes; and Department of Energy [DOE] Orders) may be required.

1.1.2 This procedure provides instructions for preparation, review, and approval of the Q-List and documentation of the information used to determine items to be placed on the Q-List.

1.1.3 The Management Control (MC) List developed as a result of this procedure will be further evolved in separate YMPO and Participant procedures.

1.2 SCOPE

The scope of this procedure includes all items that are or will have the potential to be located within the Controlled Area, activities associated with these items, and offsite activities which may impact the performance and assessment of performance of the natural barrier items.

2.0 APPLICABILITY

2.1 This procedure applies to the Yucca Mountain Site Characterization Project (YMP) function of determination of the importance and subsequent classification of items and activities and the preparation, review, approval, and revision of the YMP level versions of the Q-List, MC List and supporting documentation.

2.2 The determination of importance of an activity shall be made by the implementing Participant based on the importance of the item with which the activity is associated (with specific attention to the description of the characteristics of the item which have been instrumental in the determination of the item's importance) and in accordance with the requirements of the Participants approved Quality Assurance (QA) Program.

2.3 Documentation associated with an item or activity which describes specific requirements, or is used to attest to the characteristic(s) of an item or activity, is to be considered as collateral support to the item or activity.

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Accordingly, the documentation takes on the same importance as the item or activity and must be treated consistent with applicable QA program controls.

2.4 Implementation of Administrative Procedure (AP) AP-6.17Q, is a prerequisite to the selection of controls which each applicable participant shall perform pursuant to the requirements of the Quality Assurance Requirements Document (QARD) and their respective approved quality assurance program implementing documents.

3.0 DEFINITIONS

The following listed definitions apply to this procedure, in addition to those included in Appendix E of the QARD and the Project Glossary, YMP/89-15.

3.1 ASSESSMENT TEAM

The Assessment Team (AT) is a body of individuals formed within the YMP for the purpose of: (1) identifying items to be placed on the Q-List and describing the basis for each item placed on the Q-List including a sufficient characterization of the basis such that all organizations who must interact with the item will be able to select the controls from their qualified QA programs which they must employ to effect their activities associated with the item, and (2) conducting reviews of Participant implementation of the Determination of Importance process to ensure that adequate and consistent treatment is afforded Q-List items from a programmatic standpoint. The structure of the AT is composed of a single AT Manager and a sufficient number of additional team members to adequately represent the functional disciplines included in the YMP organization. All personnel shall be selected by the YMP Deputy Project Manager (DPM). Members of the AT may be selected from among all qualified YMP personnel and are not to be restricted to a single organization.

3.2 AT CONTROLLED LIST

The AT Controlled List is a list of controlled documents (basis information) to be used in the identification, determination and evaluation of items for the Q-List and for the MC List.

3.3 BASIS INFORMATION

Basis information is all information contained in documents on the AT Controlled List used to determine the classification of items. Basis information may include both YMP qualified information and Best Available Information (to be qualified prior to license application or construction), which provides pertinent input to the determination of items for the Q-List and MC List.

3.4 DESIGNEE

A designee is a qualified YMP staff member who has been designated signature authority by anyone required to sign the Q-List and MC List or related report documentation as a part of the approval process. Designation of signature authority must be made in writing by the designator and retained as part of the YMP QA records.

3.5 DETERMINATION OF IMPORTANCE

The process of evaluating the nature and extent to which an item is relied upon as an Item Important to Safety or as an Item Important to Waste Isolation.

3.6 DIRECT INCLUSION

The process of selecting items for the Q-List without conduct of performance analysis.

3.7 EVENT TREE ANALYSIS

An event tree analysis defines a set of accident sequences that encompass the effects of credible events or accidents.

3.8 EXEMPTION

Items not selected for the Q-List based upon an evaluation which concludes the item(s) is not important to safety or waste isolation and which evaluation shall be part of the QA records.

3.9 EXTERNAL EVENT

External events are those caused by natural phenomena or by human activities initiated external to the potential Controlled Area.

3.10 INTERNAL EVENTS

Internal events are those caused by failures or operator activities within the potential Controlled Area.

3.11 ITEM

Item is an all-inclusive term used in place of the following: appurtenance, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, unit, and prototype hardware. Items may be engineered or natural (natural barriers). Documents and records used as the basis for identifying candidates for the Q-List are not items.

3.12 MANAGEMENT CONTROL LIST

The MC List is a tabulation of items that were evaluated for possible inclusion on the Q-List and determined not to be important to public radiological safety, or important to waste isolation.

The MC List and supporting documentation includes items which have been determined through an analysis/evaluation process to be non-Q items. Placement on the MC List does not exempt an item from the application of controls which meet the intent of direction which the Project Manager, may promulgate.

3.13 NATURAL BARRIER

A geologic entity whose physical, mechanical, chemical and hydrologic characteristics individually and collectively act to inhibit, minimize or preclude radionuclide transport.

3.14 OFFSITE DOSE

An offsite dose is a radiation dose to an individual at or beyond the controlled area boundary.

3.15 Q-LIST

The Q-List is a tabulation of items which shall be subject to the quality assurance controls of the QARD. It includes both engineered and natural items which are relied upon to prevent or mitigate a 0.5 rem dose or greater at or beyond the controlled area boundary during the preclosure phase, and which are relied upon to meet the postclosure performance objectives of 10 CFR 60, Subpart E.

3.16 SCENARIO

A scenario is an account or sequence of a projected course of action or event.

4.0 RESPONSIBILITIES

The following individuals or organizations are responsible for the activities identified in Section 5.0 of this procedure:

1. YMP Deputy Project Manager (DPM)
2. Assessment Team Manager (ATM)
3. Assessment Team (AT)
4. Document Control Center (DCC)

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5.0 PROCEDURE

NOTE: A flowchart of the following processes described in this procedure is attached as Figure 1.

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
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ASSESSMENT TEAM APPOINTMENT

DPM	1.	Appoint, or cause to be appointed, in writing, an individual (the AT Manager) to provide overall management and coordination of work performed by the Assessment Team.
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NOTE: The AT Manager appointment letter shall contain any specific directions deemed appropriate by the DPM for consideration during the required analysis/evaluation of items provided they do not conflict with the requirements of this procedure, other applicable upper tier documents, or the QARD.

	2.	Appoint, in writing, the additional individuals who shall serve as members of the Assessment Team. These additional members shall be qualified through experience, appropriate training and demonstrated capability to effectively represent the technical and regulatory responsibilities of the YMP Divisions.
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GENERAL ASSESSMENT TEAM OPERATION

ATM	3.	Develop, or cause to be developed, the procedures necessary to prescribe the method of operation of the Assessment Team.
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AT CONTROLLED LIST

	4.	Prepare, or cause to be prepared and maintain, a list (AT Controlled List) of YMP analysis/evaluation supporting documents for use by the AT. These documents shall form the "basis information" for determining the importance of items.
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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
ATM	5.	Ensure that all documents (including revisions to the Work Breakdown Structure [WBS] Dictionary) which form the AT Controlled List meet the following criteria: a. They have been prepared, reviewed, approved and distributed in accordance with approved quality procedures. b. Technical review and acceptance has been effected by the responsible YMPO Division(s).
	NOTE:	Approved upgrades to the YMP WBS Dictionary shall be included in the AT Controlled List in accordance with this procedure. The WBS shall also be included for use as a general checklist to assure that the items breakdown is comprehensive and commensurate with the level of current design maturity.
	6.	Inform DPM of potential impacts from proposed changes to basis information.
	7.	Approve AT controlled list and initiate control and distribution in accordance with AP-1.5Q, Issuance and Maintenance of Controlled Documents, and AP-1.18Q, Records Management: Las Vegas Record Source Implementation.

CLASSIFICATION OF ITEMS

8. Establish the detailed criteria which shall be used to determine selection of items considered for placement on the Q-List and obtain DPM approval. (See Attachments 4 and 5 for criteria guidance.) Manage development of the Q-List and the MC List including changes.

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AT	9.	Based on an assessment of the basis information, select a breakdown of items that is commensurate with the maturity level of the basis information. Further breakdown of these items shall be monitored by the AT to assure the inclusion of all YMP related items described in the basis information.
	10.	Using the basis information and the established criteria, implement the process of classifying each item as one of the following: a. Items Important to Public Radiological Safety (Step 15). b. Items Important to Waste Isolation (Step 18). c. Items analyzed and/or evaluated and not selected as Items Important to Safety (IITS) or Items Important to Waste Isolation (IITWI) (Step 21).
	11.	Select which of the three available methods (Exemption [Step 12], Direct Inclusion [Step 13], or Analysis [Steps 14-18]) is to be used to determine whether an item is placed on the Q-List or MC List.
	NOTE:	Prepare minutes summarizing the salient points of all ATM meetings wherein Q-List determinations are made. Distribute copies of the minutes to all Technical Project Officers (TPOs), YMP Division Directors, and AT Members as a minimum.
	EXEMPTION OF AN ITEM	
	12.	Identify items exempt from the Q-List whose function is proven to be unrelated to public radiological health and safety and/or waste isolation (1) by simple logic (e.g., office trailers, temporary

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
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office facilities) or (2) because the items are for feasibility determination or are prototype items which will not be used in the permanent repository. Document rationale for same.

PLACEMENT OF AN ITEM ON THE Q-LIST BY DIRECT INCLUSION

13. Place items that have not been exempted, analyzed or evaluated for their importance on the Q-List by Direct Inclusion. Prepare an analysis/evaluation package cover sheet (Attachment 2) and include documentation (reasons) for placement of items on the Q-List by Direct Inclusion.

CLASSIFICATION OF ITEMS IMPORTANT TO SAFETY

14. Using the basis information, perform, cause to be performed and/or document the analysis of items in accordance with the process described in Attachment 4 and identify IITS in accordance with Attachment 8. Information from the version of the YMP WBS dictionary in the AT Controlled List shall not be used as the only support for this analysis but will form a part of the basis of the analysis findings.
15. Upon completion of analysis and its documentation, prepare an IITS analysis/evaluation package which shall consist of a cover sheet (Attachment 2) approved by the AT Manager and all AT Members and other appropriate supporting information. Dissenting opinions of AT Members shall be documented and forwarded to the DPM for disposition.

CLASSIFICATION OF ITEMS IMPORTANT TO WASTE ISOLATION

16. Review Site Characterization Program Baseline (SCPB) Sections, including but not limited to, 8.3.2, 8.3.3, 8.3.4, and 8.3.5 to identify the natural and engineered barriers expected to assist

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in the isolation of emplaced waste from the accessible environment (Attachment 9). (For the initial Q-List, these barriers were placed by Direct Inclusion on the Q-List in accordance with a previous revision of this procedure.)

17. Perform, cause to be performed, and/or document such evaluation(s), as may be necessary, to a) identify limiting characteristics of natural barriers which will directly limit the conduct of site activities, and b) identify the characteristics of the engineered barriers necessary to assure radionuclide migration to the biosphere is within specified limits. Information from the version of the YMP WBS dictionary in the AT Controlled List shall not be used as the only support for this evaluation but may form a part of the basis of the analysis/evaluation findings.
18. Upon completion of evaluation and its documentation, prepare an IITWI analysis/evaluation package which shall consist of a cover sheet (Attachment 2) approved by the AT Manager and all AT Members and other appropriate supporting information. Dissenting opinions of AT Members shall be documented and forwarded to the DPM for disposition.

Q-LIST COMPILATION

19. Combine the IITS and IITWI in the following manner to form the Q-List:
 - a. Section 1 shall contain all those natural barriers designated as IITWI.
 - b. Section 2 shall contain all those engineered items designated as IITS and/or IITWI.

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AT	NOTE:	The Q-List shall contain references to supporting basis information and a brief description of the characteristics (including boundaries) which cause the items to be on the Q-List (may be by reference) for each item on the Q-List and a statement indicating if the item was placed on the list by Direct Inclusion.
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20. Update the Q-List in accordance with all evaluations that are performed by the implementation of this procedure. Attachment 6 contains the minimum format for the individual sections of the Q-List.

MANAGEMENT CONTROL LIST COMPILATION

21. Combine the items analyzed or evaluated and not selected for placement on the Q-List, including exempted items, from each analysis/evaluation package in the following manner to form the MC List:
 - a. Section 1 shall contain all items analyzed and not selected as IITS or IITWI.

NOTE: The MC List shall contain a reference to supporting basis information for each of the items or activities.

22. Update the MC List in consonance with all revisions to the current Q-List that are approved by the implementation of this procedure. Attachment 7 shows the minimum format for the MC List.

APPROVAL OF Q-LIST AND MC LIST

- | | | |
|-----|-----|---|
| ATM | 23. | Transmit the Q-List and MC List to the YMP DPM for approval as controlled documentation. This approval shall assure that an adequate independent review has been conducted. |
|-----|-----|---|

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CHANGES TO THE Q-LIST AND MC LIST

- | | | |
|-----|-----|---|
| ATM | 24. | Process changes, including additions, deletions, and revisions, to the Q-List and MC List in the manner described above. A change shall require initiation of the evaluation processes, designation of any new basis information or changed source documents, and control and issuance of a revised Q-List, or MC List. Use unaffected results of previous analysis or evaluation when a review of those results provides verification that the previous results are not impacted by the new basis information or changed source documents. |
| DCC | 25. | Notify the AT Manager when changes to basis information on the AT Controlled List occur. |
| ATM | 26. | Upon notification of changes by Document Control, determine the need for modifications to the Q-List and MC List and apply this procedure as necessary. |
| | 27. | Revise the Q-List and MC List as the YMP basis information changes and the design matures to ensure that they continue to provide meaningful information for the implementation of the requirements of 10 CFR 60, Subpart G. Changes shall be accomplished in a controlled manner through the implementation of this procedure so their impact is adequately assessed and communicated to all Participants. |

6.0 REFERENCES

NOTE: Refer to the latest revision of the documents listed below unless otherwise stated.

6.1 REQUIREMENTS DOCUMENTS

ANSI/ANS-2.12-1978, Natural and External Manmade Hazards at Power Reactor Sites, Guidelines for Combining

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DOE/RW-0214, Office of Civilian Radioactive Waste Management Quality Assurance Requirements Document

NUREG-1318, Technical Position on Items and Activities in the High-Level Waste Geologic Repository Program Subject to Quality Assurance Requirements

NUREG/CR-0150, Estimate of Internal Dose Equivalent to 22 Target Organs for Radionuclides Occurring in Routine Releases from Nuclear Fuel Cycle Facilities, Volume 3, 10/1/81

NUREG/CR-0172, Semiscale Program Description, 5/1/78

NUREG/CR-1918, Dose Rate Conversion Factors for External Exposure to Photons and Electrons, 8/1/81

NUREG/CR-2300, PRA Procedures Guide, "A Guide to the Performance of PRA for Nuclear Power Plants Final Report," 1/1/83

Regulatory Guide 1.3, Assumptions Used for the Evaluation of the Potential Radiological Consequences of a Loss of Coolant Accident for Boiling Water Reactors

Regulatory Guide 1.109, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, October 1977

10 CFR Part 60, "Disposal of High-Level Radioactive Wastes in Geologic Repositories"

6.2 INTERFACE DOCUMENTS

AP-1.5Q, Issuance and Maintenance of Controlled Documents

AP-1.18Q, Records Management: Las Vegas Record Source Implementation

YMP/CC-0001, Work Breakdown Structure Index and Dictionary

YMP/CC-002, Reference Information Base

YMP/CM-0011, Site Characterization Program Baseline

YMP/89-15, Project Glossary

7.0 FIGURES AND ATTACHMENTS

Figure 1, AP-6.17Q Flowchart

Attachment 1, Documentation Requirements

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- Attachment 2, Typical Analysis/Evaluation Package Cover Sheet
- Attachment 3, Analysis/Evaluation Package Cover Sheet Instructions
- Attachment 4, Process for Determining the Importance of Items Relative to Safety
- Attachment 5, Process for Determinating the Importance of Items Relative to Waste Isolation
- Attachment 6, Minimum Format for Q-List
- Attachment 7, Minimum Format for MC List
- Attachment 8, General Process for Identifying Recommended IITS
- Attachment 9, General Process for Identifying Recommended IITWI

8.0 RECORDS

The following documents produced during the implementation of this procedure to determine the importance of items and the preparation, review, and approval of the Q-List and the MC List are quality assurance records:

1. AT Controlled List of basis information.
2. Q-List including a brief description of characteristic(s) which cause the item to be classified as a "Q" item.
3. MC List.
4. Analysis/Evaluation Package(s).
5. Assessment Team Manager Appointment Letter.
6. Assessment Team Appointment Letter(s).

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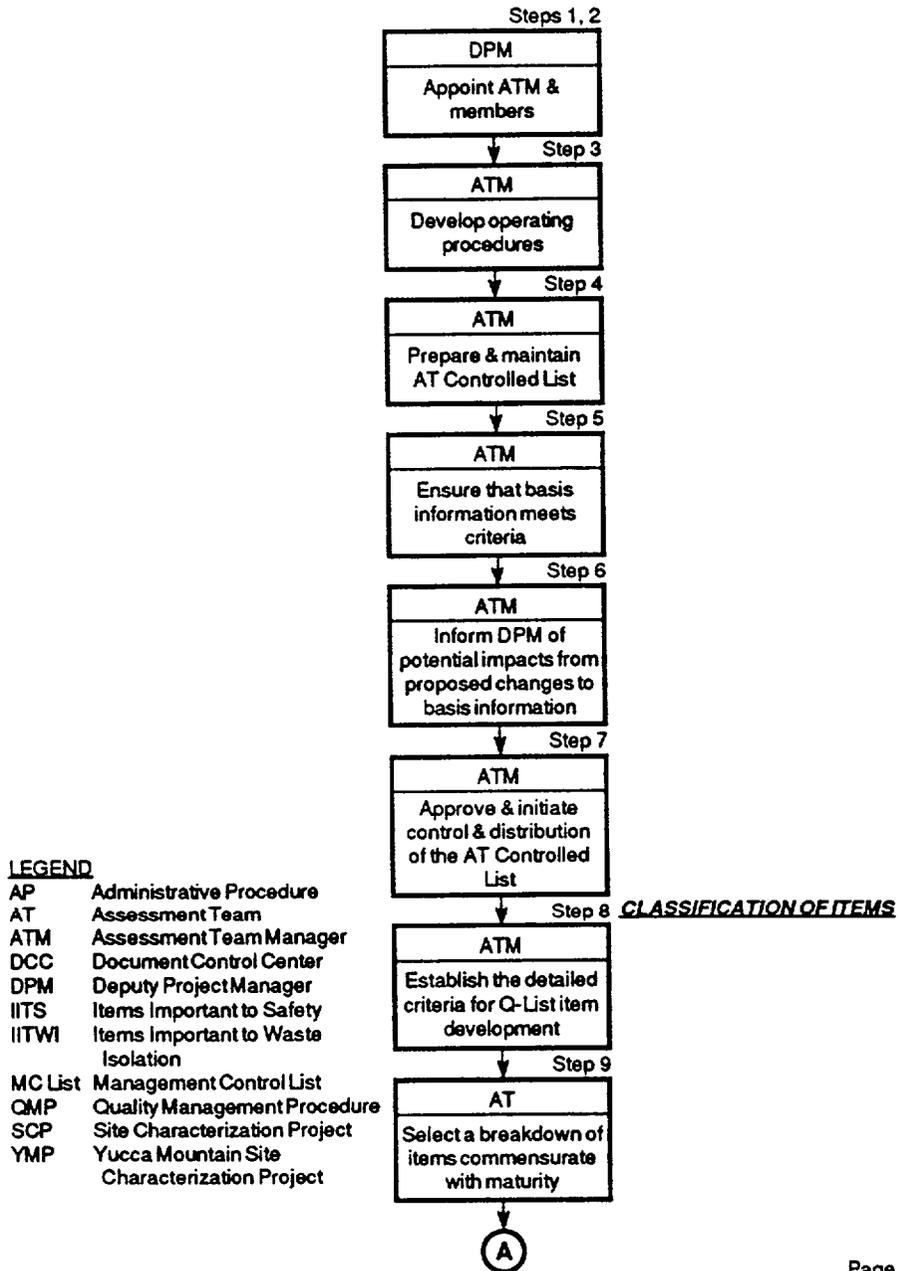


Figure 1 - AP-6.17Q Flowchart

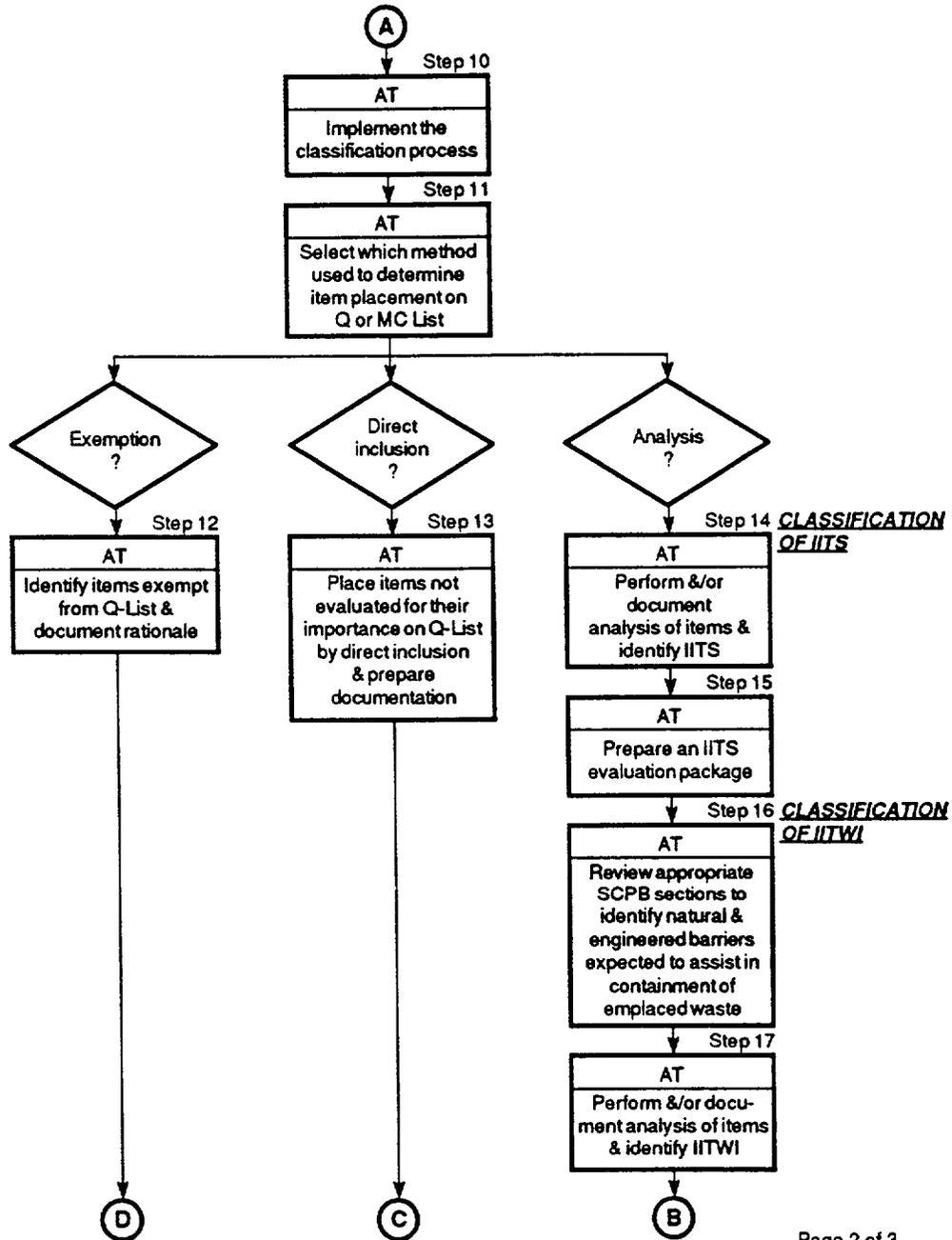


Figure 1 - AP-6.17Q Flowchart (continued)

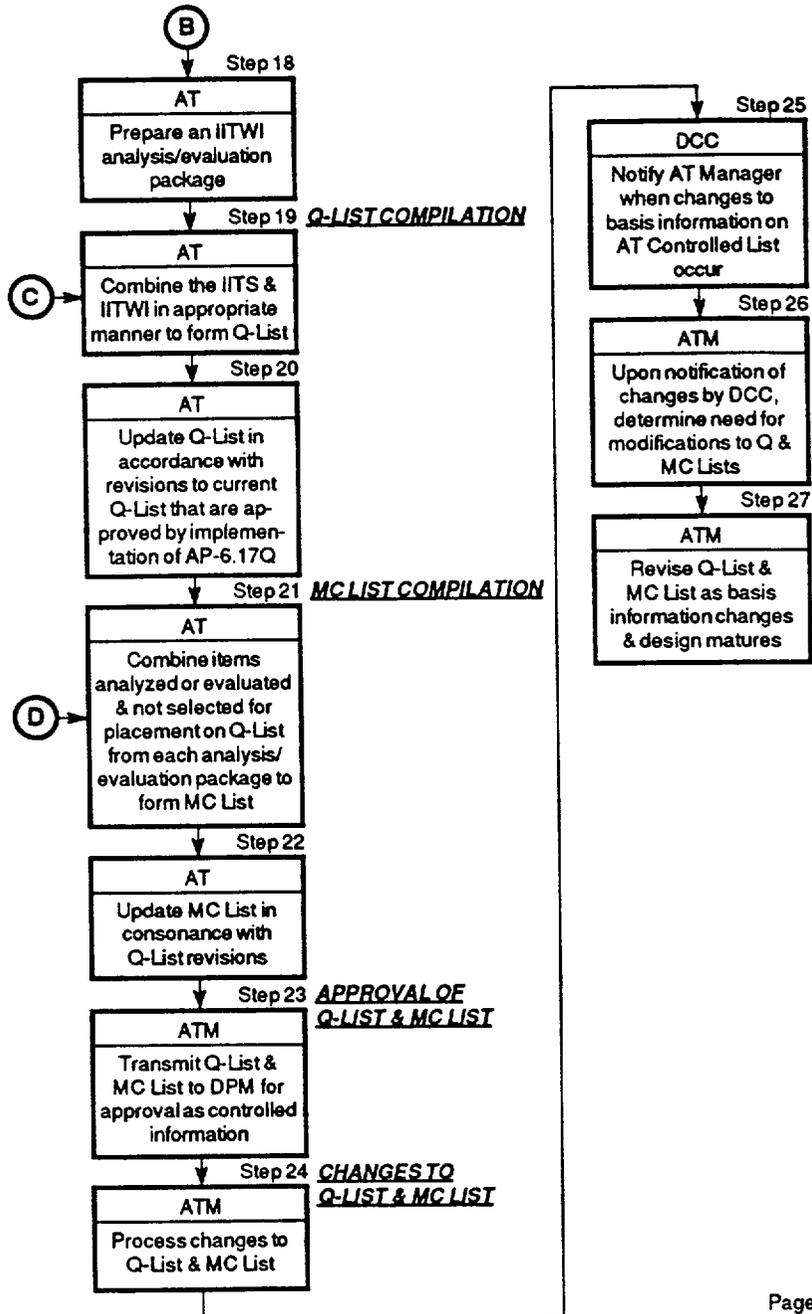


Figure 1 - AP-6.17Q Flowchart (continued)

DOCUMENTATION REQUIREMENTS

1. The ATM shall document, or cause to have documented, all analyses and evaluations that are performed to determine the importance of items.
2. The documentation shall be of sufficient detail to permit independent reviewers to comprehend and duplicate the original determinations without assistance from the original preparers.
3. Each item or group of items analyzed or evaluated for importance shall be supported by documentation marked with an identifier for the subject item or items. The documentation shall become a part of the analysis/evaluation package. The documentation shall, to the extent practicable, include but not be limited to the following:
 - a. The determination that an item is or is not important to safety or waste isolation.
 - b. The analysis or evaluation that is unique to this item or the reference to information that pertains to the purpose and importance of the item.
 - c. Reference to the basis information source for the item.
 - d. Signed and dated by the preparing parties.
4. Analyses, evaluations, and calculations shall, to the extent practicable, include the following completed items and sections in their documentation:
 - a. Name of the item for which the calculation is performed.
 - b. Objective of the analysis, evaluation, or calculation.
 - c. Special directions given and by whom.
 - d. Method of analysis, evaluation, or calculation used.
 - e. Listing of basis information sources and specific data used.
 - f. Qualitative statement regarding the degree of uncertainty or maturity of the basis information.
 - g. Assumptions and their bases.
 - h. References (title [including catalog number], revision number, author, and date).

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DOCUMENTATION REQUIREMENTS (continued)

- i. Special terms used.
- j. Constants used.
- k. Conclusions.
- l. An orderly description of analysis/evaluation logic.
- m. Approval by the preparing parties.

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YMP-068-R0

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT ANALYSIS/EVALUATION PACKAGE COVER SHEET

1) PACKAGE OR IDENTIFICATION NUMBER _____ 2) PAGE 1 OF _____
3) PACKAGE REVISION NUMBER _____

4) TITLE OR SUBJECT _____
5) RECOMMENDED IITS IITWI MANAGEMENT CONTROL LIST
 OTHER

The signatures below constitute procedural compliance. I have read, understood, and complied with Procedure _____, Rev. _____, ICN # _____, in accomplishing my responsibilities in this procedure.

6) RESPONSIBLE AT MEMBERS SIGNATURE AND DATE:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

The signature below constitutes procedural compliance. I have read, understood, and complied with Procedure _____, Rev. _____, ICN # _____, in accomplishing my responsibilities in this procedure.

7) AT MANAGER SIGNATURE AND DATE:

The signature below constitutes procedural compliance. I have read, understood, and complied with Procedure _____, Rev. _____, ICN # _____, in accomplishing my responsibilities in this procedure.

8) DEPUTY PROJECT MANAGER SIGNATURE AND DATE:

AP-6.17Q

**INSTRUCTIONS FOR PREPARATION OF
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
ANALYSIS/EVALUATION PACKAGE COVER SHEET
YMP-068**

1. Enter any tracking identification number assigned by the AT or AT Manager to assist in statusing and tracking the subject task of the attached analysis/evaluation package. If no identifier is assigned, enter NA. The AT Manager is responsible for the completion of items 1 through 5 and Item 7 of the cover sheet.
2. When the subject analysis/evaluation package is complete and attached to the cover sheet, enter the total number of pages (including the cover sheet) in the space provided.
3. Enter the appropriate package revision designator (letter or number).
4. Enter a short statement describing the title or general subject of the analysis/evaluation package.
5. Mark the appropriate bracketed space to indicate the objective of the analysis/evaluation package (i.e., IITS, IITWI, MC List, or other).
6. Each AT Member involved in the analysis or evaluation of an item shall sign and date the cover sheet at Item 6 to indicate approval of the contents of the package and the subject recommended item(s). Should additional signature spaces be required, additional lined sheets of paper may be used.
7. Following the signing of the package cover sheet by the AT members, the AT Manager shall sign and date the cover sheet to indicate approval of the contents of the package and the subject recommended items.
8. Upon completion of the Deputy Project Manager (DPM) review and approval, the DPM shall sign and date the package cover sheet to indicate approval of the analysis/evaluation package.
9. The AT shall transmit the entire analysis/evaluation package to Document Control.

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1. A documented design configuration consistent with AT Manager and DPM direction shall be selected by the AT for the application of this procedure. The design configuration shall be from the Project baseline and also shall be listed as basis information. Documentation that supports this design or system configuration shall be referenced in the analysis of items.
2. The AT shall divide the documented design configuration into distinct units or parts, called elements. Each element shall be uniquely identified and serve to facilitate the systematic analysis process described in this exhibit.
3. Site-specific initiating events shall be identified and screened for applicability to all elements. Initiating events shall be separated into internal and external initiating events. Recommended credible and significant internal and external initiating events requiring further assessment shall be identified on an element-by-element basis.
 - a. The assessment team shall determine the method(s) used for the identification of internal initiating events and define criteria for screening or grouping such events. The methods and the screening criteria shall be documented. The screening process should not reject a credible event that could lead to a significant radiological release, but it may reduce the number of events requiring detailed assessments. Where engineering judgment is a primary feature of the methods, the following records shall be maintained: instructions, evaluation criteria, method for selection of analysts, qualifications of the analysts, records of meetings, and correspondence. Other methods of identifying initiating events (see NUREG/CR-2300) may also be adapted for analysis of the repository.
 - b. A checklist of a wide spectrum of external events, such as that in ANSI/ANS-2.12-1978, shall be used in conjunction with site-specific screening criteria to establish the external initiating events. The checklist, the screening criteria, and the list of credible external initiating events requiring further assessment shall be documented.
4. Event trees shall be developed for each internal and external event in the screened list to depict, logically and systematically, the various accident scenarios. The intermediate events in the event trees shall represent responses of various items in the facility design that occur after the initiating event, and hence continue the accident progression into an accident scenario (NUREG/CR-2300). Operator actions or errors

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shall be considered in event tree development. The extent of development and application of event trees should be consistent with the available design detail and data.

Fault trees may be used to systematically examine the various ways that a system, an item, or a major component can fail and result in an initiating or intermediate event in an accident scenario. Critical parameters affecting item performance may also be determined.

5. Offsite dose consequences shall be calculated for each branch in the event tree. The dose consequences shall be calculated for a 50-yr dose commitment to a maximally exposed member of the offsite public at the nearest boundary of the controlled area.
 - a. Assessments shall be conducted to calculate source terms and the associated offsite doses. To establish radioactive source terms, the quantities of radioactive materials present, the chemical and physical forms of radioactive materials, the radionuclide content, and the accident conditions shall be considered. Estimates of release fractions of radionuclides for each specific accident scenario shall be made and documented based on their physical and chemical properties and the accident conditions at the time of the release.
 - b. The dose assessments shall be calculated as the total of the external exposure from the passing cloud and the internal exposure from inhalation of radionuclides in the cloud and from food pathways. Dose calculations shall be performed using:
 - (1) Immersion 50-yr dose conversion factors obtained from Regulatory Guide 1.109 and NUREG/CR-1918.
 - (2) Internal 50-yr dose equivalent conversion factors obtained from Regulatory Guide 1.109, NUREG/CR-0150, Volume 3, and NUREG/CR-0172.
 - (3) The radionuclide inventory (Ci/MTU) of the spent fuel, which shall be obtained from the current version of the RIB and/or applicable basis information.
 - (4) Dispersion factors (X/Q), which may be obtained from meteorological data in the current version of the RIB; alternatively, conservative X/Q from Regulatory Guide 1.3 may be used.

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6. The probability or frequency of occurrence of the accident scenarios in the event trees shall be classified. It is sufficient to denote each event as either credible or not credible. It is not required to determine a numerical probability for initiating (external, internal), or intermediate events in the event trees. Similarly, numerical values for fault trees are not required. However, the assignment of numerical values may provide a rational basis for the comparison of events and a determination of credibility. Should quantitative evaluation of event frequencies and probabilities be pursued, the assessment team shall identify data sources used for such analyses and use engineering judgment and conservative bounding assumptions for items or systems where reliable data cannot be obtained.
 - a. Assessments of the probability of occurrence of initiating and intermediate events shall be based on the following considerations:
 - (1) Use of existing or published data.
 - (2) Accepted predictive techniques.
 - (3) Analyses of the performance of the system.
 - (4) Engineering judgment and experience.
 - b. The probability assessments may utilize previously published data of equipment failures and documented judgments of engineers and technical specialists experienced in nuclear facility designs and their potential failure modes.
7. The event trees constitute a data base for establishing the list of items important to safety. If both of the following considerations are met, the accident scenario shall be classified as a Q-scenario. Scenarios not meeting both of these criteria shall be classified as NQ-scenarios (not Q-scenarios).
 - a. The dose criterion - an accident scenario must cause an offsite dose of 0.5 rem or greater.
 - b. The probability criterion - an accident scenario must either be termed "credible" by being composed of credible events, or it must be estimated to have a probability of occurrence greater than 1×10^{-6} /yearAn NQ-scenario shall be reclassified as a Q-scenario if:
 - a. a reasonable variation in assumptions or data could cause the two criteria to be met, or

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- b. practical considerations based on judgement indicate it should be a Q-scenario.
8. The Q-scenarios shall be assessed further to identify which of the items in the facility design are to be classified as IITS and which items are to be classified as not-IITS. The assessment shall determine the role that each specific item plays in the accident scenarios. These assessments and the rationale for classifying specific items as important to safety shall be documented. Considerations for classifying specific items as IITS include:
 - a. Their failure directly causes the release of radioactive materials that exceeds the 0.5 rem dose criterion.
 - b. Their failure causes the loss of essential consequence mitigating items that are relied on to lower the probability of exceeding the dose criterion to less than 10^{-6} /year, taking into account the initial failure probability.
 - c. Their failure may initiate an accident that results in an offsite dose of 0.5 rem or greater if mitigating features are not considered.
 9. In addition to the three considerations in 8 above, consensus judgement based on other considerations may be used to identify IITS. These considerations include historical licensing experience and previous designation of IITS as a result of analysis.
 10. A summary listing of all items important to safety shall be compiled and documented. The IITS shall be placed on the Q-List by the AT Manager. The critical parameters affecting the performance of the item will be described in the related analysis documentation.
 11. All items in the design that were not IITS shall be placed on the list of items analyzed and not selected as IITS (MC List). These items will be derived from the following sources:
 - a. Items not identified as important to safety from the Q-Scenarios evaluated in Step 9 (Attachment 8).
 - b. Items represented on the event trees that do not contain Q-Scenarios and were therefore eliminated with all other NQ-Scenarios in Step 9 (Attachment 8).

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- c. Items not represented on the event trees generated in Step 4 due principally to the screening process completed in Step 3 (Attachment 8).

The list shall include a summary tabulation of the element's location, its classification, and a basis for classification as not important to safety.

- 12. Supporting documentation used and developed during the process of determining recommended IITS shall be collected, formatted, arranged and transmitted by the AT Manager to document control in accordance with AP-1.5Q.

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1. The Assessment Team shall adopt a design or system configuration consistent with that used in the evaluation of items important to safety. Where necessary, this configuration may be expanded to include natural and engineered items that fall outside the scope of preclosure IITS. Documentation that supports this design or system configuration shall be referenced in the evaluation of items.
2. Items that are not part of the repository postclosure design configuration shall not be evaluated for importance to waste isolation. However, temporary items and materials that may alter the properties of natural barriers during the preclosure period shall be retained and evaluated.
3. Postclosure items shall be evaluated for importance to waste isolation according to this procedure. The Assessment Team shall prepare or cause to be prepared project performance assessment documentation appropriate to the evaluations being performed. This documentation will be listed in the reference material, must satisfy the requirements for inclusion on the controlled list, and shall be approved and issued as a controlled document.

The Assessment Team evaluation shall complete performance allocation or performance assessment of individual items evaluated.

4. The evaluation will address the total system performance requirements of 10 CFR 60.112 and component performance requirements of 10 CFR 60.113. To the extent possible, the evaluation will examine variation of design parameters and natural barrier properties to determine sensitivity of the performance of the item.
5. Where the ability of an item to meet the performance standards of 10 CFR 60.112 and .113 is affected by the design parameters and natural barrier properties related to that item, the item is important to waste isolation. The Assessment Team shall identify these items for inclusion on the Q-List.

The Assessment Team shall identify or provide reference to documentation that identifies the parameters and properties that may affect proper operation of the barriers. Where performance allocation is applied, identification of required parameters values shall be provided. This information shall be included in the analysis/evaluation package for all items to be placed on the Q-List.

Q-LIST SECTION 1.0 - ENGINEERED ITEMS IMPORTANT TO SAFETY AND/OR WASTE ISOLATION				REV. NO. _____	PAGE _____	OF _____
ITEM NAME	IITS	IITWI	DESCRIPTION OF ITEM	BASIS INFORMATION REFERENCES (TITLE, REV. NO., AUTHOR, DATE)		DATE LISTED

Q-LIST SECTION 2.0 - NATURAL BARRIER ITEMS IMPORTANT TO WASTE ISOLATION				REV. NO. _____	PAGE _____	OF _____
NAT BARRIER NAME		DESCRIPTION OF ITEM	BASIS INFORMATION REFERENCES (TITLE, REV. NO., AUTHOR, DATE)		DATE LISTED	

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MANAGEMENT CONTROL LIST SECTION 1 - ITEMS NOT SELECTED AS IMPORTANT TO SAFETY OR AS IMPORTANT TO WASTE ISOLATION			
ITEM NAME	DESCRIPTION OF ITEM	BASIS INFORMATION REFERENCES (TITLE, REV. NO., AUTHOR, DATE)	DATE LISTED

REV. NO. _____ PAGE _____ OF _____

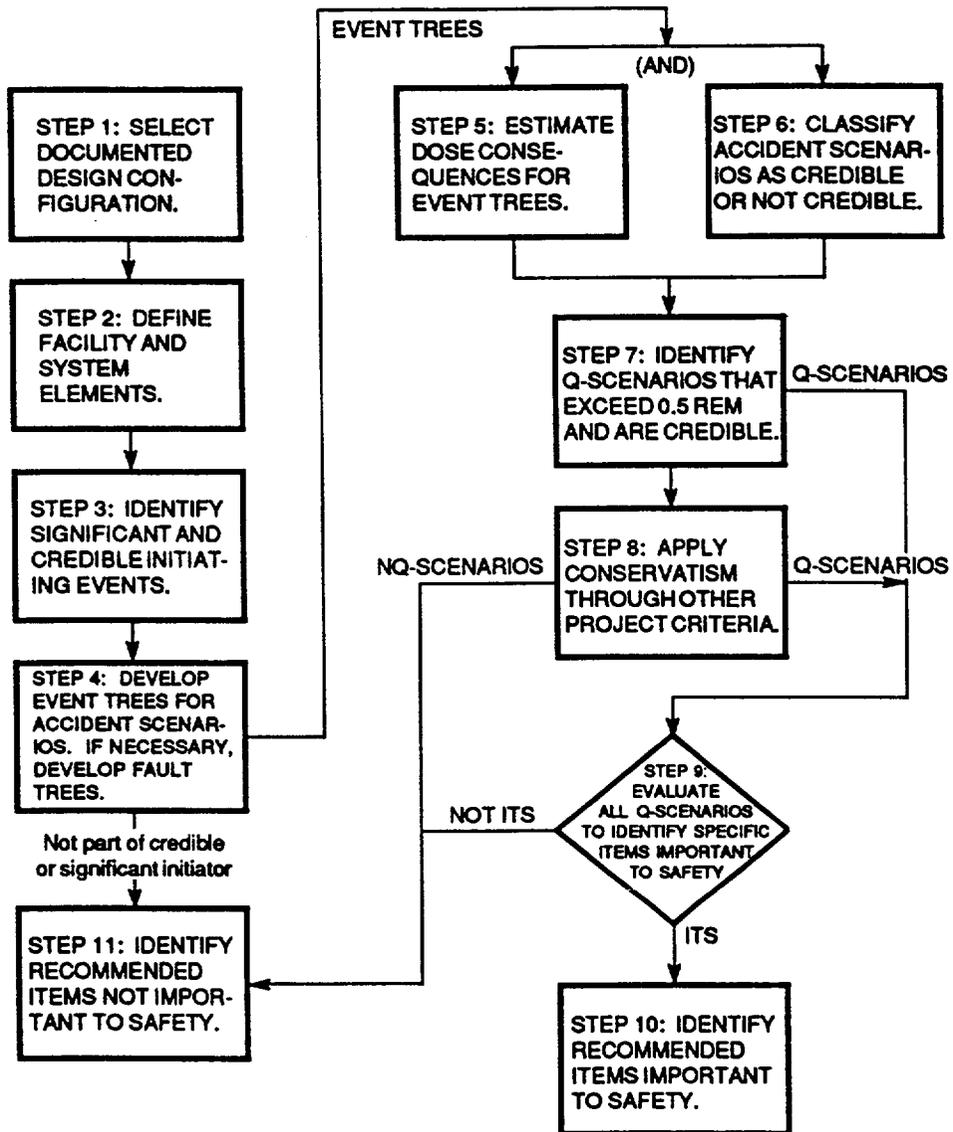
AP-6.17Q.04/03-4-92

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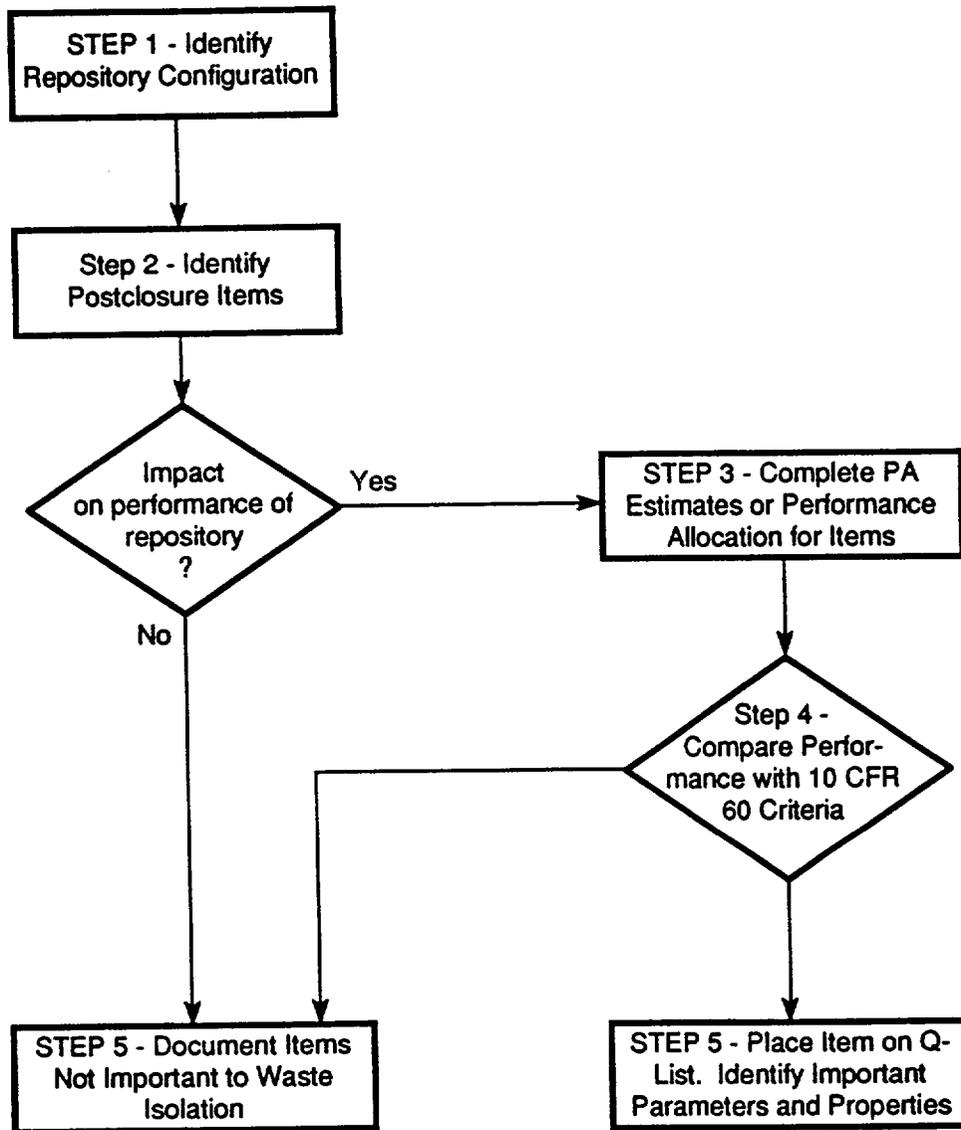
QAITS.013/11-19-91

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