

## **Design Analysis Cover Sheet**

*Complete only applicable items.*

1.

WBS:  
QA: QA

### 1.2.6

Page: 1 Of: 7

| 2. DESIGN ANALYSIS TITLE<br>Requirements Allocation Analysis For Test Alcoves Excavation and Layout CII: BABEAF000 |              |                               |                     |
|--|--------------|-------------------------------|---------------------|
| 3. DOCUMENT IDENTIFIER<br>BABEAF000-01717-0200-00001 REV 02  |              | 4. REV. NO.<br>02             | 5. TOTAL PAGES<br>7 |
| 6. TOTAL ATTACHMENTS/NO. OF PAGES IN EACH<br>NONE  |              | 7. SYSTEM ELEMENT<br>MGDS/ESF |                     |
|  | Print Name   | Signature                     | Date                |
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| 12. REMARKS<br><br>MOL.19960103.0243   |              |                               |                     |

## 2. DESIGN ANALYSIS TITLE

Requirements Allocation Analysis for Test Alcoves Excavation and Layout CII: BABEAF000

| 3. DOCUMENT IDENTIFIER<br>BABEAF000-01717-0200-00001 REV 02 |                |                  | 4. REVISION NUMBER<br>02  |
|---|----------------|------------------|---|
| 5. Revision No.   | 6. Pages Added | 7. Pages Deleted | 8. Description of Revision  |
| 00  | 7              | 0                | Initial Issue.  |
| 01  | 0              | 0                | Editorial changes throughout.                                     |
|   |                |                  | Section 10.2: Add "Muck, Material, and Personnel Handling         |
|   |                |                  | Systems."   |
|   |                |                  | Section 11: Addition and deletion of ESFDR Requirements.          |
|   |                |                  | Page 5: Add the following ESFDR Requirements:                     |
|   |                |                  | 3.2.1 J1, 3.2.1 R, 3.2.1 S, 3.2.1 Z1, 3.2.1 Z2, 3.2.1.4 B1,       |
|   |                |                  | 3.2.1.4 B3, 3.2.1.4 H, 3.2.1.6, 3.2.1.6 E, 3.2.1.6 F,             |
|   |                |                  | Page 5: Delete the following ESFDR Requirements:                  |
|   |                |                  | 3.2.1 H2cii, 3.2.1.4 B1bii, 3.2.1.9.2 A, 3.2.1.17 B, 3.2.1.19.3 D |
|   |                |                  | Page 6: Add the following ESFDR Requirements:                     |
|   |                |                  | 3.2.1.25.6 A, 3.2.1.28, 3.2.2.4 C7, 3.2.2.4 D15a                  |
|   |                |                  | Page 6: Delete the following ESFDR Requirements:                  |
|   |                |                  | 3.2.1.25.4, 3.2.2.4 I, 3.2.2.4 Q, 3.2.2.4 S2                      |
| 02  |                |                  | Section 1: state purpose of this revision.                        |
|   |                |                  | Section 8: update reference 8.1, 8.2                              |
|   |                |                  | Section 10.1: delete BABEAB000                                    |
|   |                |                  | Section 10.2: revise ESFDR interface reference                    |
|   |                |                  | Section 10.3: change BABED0000 to BABEAF000                       |
|   |                |                  | Section 11: delete 3.2.1 P, 3.2.1 AC, TBV-200,                    |
|   |                |                  | TBD-098, TBD-140, 3.2.2.4C8, TBD-096,                             |
|   |                |                  | 3.2.2.4 V5, and footnotes TBD-096, 098, 140.                      |
|   |                |                  | add: A to 3.2.1.28 and 3.2.1.28 C                                 |
|   |                |                  |   |
|   |                |                  |   |
|   |                |                  |   |
|   |                |                  |   |

## 1. PURPOSE

The purpose and objective of this analysis are to allocate all Exploratory Studies Facility Design Requirements (ESFDR) (Reference 8.1) applicable to Configuration Item (CI) Test Alcoves Excavation and Layout, Configuration Item Identifier (CII) BABEAF000, for Exploratory Studies Facility (ESF) Design Package 2C.

The purpose and objective of Revision 02 are to incorporate changes made in Exploratory Studies Facility Design Requirements Rev. 1, ICN-1.

## 2. QUALITY ASSURANCE

The quality assurance classification and controls for the Test Alcoves Excavation and Layout intersecting the North Ramp excavated opening are presented in the Determination of Importance Evaluation for ESF Package 2C (DIE) (Reference 8.2). Section 11.3 of the DIE provides the basis for establishing QA controls for drill/blast excavation, water usage and reporting, organic material usage and reporting, control of conventional quality equipment involving fluids of concern, and notification of Test Coordination Officer if perched water is encountered. These temporary items or activities are not assigned specific classification numbers. Ground support activities are covered under separate CII.

## 3. METHOD

Identify applicable requirements by detailed review of the ESFDR (Reference 8.1).

## 4. CODES AND STANDARDS

Not applicable.

## 5. DESIGN INPUTS

No design inputs other than the criteria identified in Section 6 are applicable to this analysis.

## 6. CRITERIA

ESFDR (Reference 8.1)

## 7. ASSUMPTIONS

Not applicable.

## 8. REFERENCES

- 8.1 Yucca Mountain Site Characterization Project. *Exploratory Studies Facility Design Requirements*, YMP/CM-0019 Rev. 1, ICN-1, January 19, 1995.
- 8.2 Determination of Importance Evaluation for ESF Package 2C, Document Identifier BAB000000-01717-2200-00005, Rev. 03.

## 9. COMPUTER PROGRAMS

Not applicable.

## 10. DESIGN ANALYSIS

### 10.1 DEFINITION OF CI

This CI is defined as the excavation and layout of underground openings that extend beyond the perimeter of the North Ramp excavated opening which are required for conducting underground site characterization tests. The test alcove constructed under Package 1A, located in the ESF Starter Tunnel, is not included in this system. Test alcoves included in this system are those intersecting the North Ramp.

This CI does not include ground support for the test alcoves, which is included in its own CI.

### 10.2 BOUNDARIES AND INTERFACES

The repository/ESF interface requirements are found in ESFDR Section 3.1 and repository/ESF interface drawings are found in ESFDR Appendix A.2.

The Test Alcoves share physical interfaces with the following systems: Linings and Ground Support, Furnishings, North Ramp Excavation and Layout, Operations Support Area Alcoves, Subsurface Power, Subsurface Communications, Subsurface Lighting, Subsurface Ventilation, Subsurface Water and Wastewater, Subsurface Compressed Air, Fire Protection, Subsurface Monitoring and Warning Systems, Integrated Data and Control System (IDCS), Muck, Material and Personnel Handling Systems.

The Test Alcoves system shares functional interfaces with the following organizations: Test Coordinator's Office and Potential Repository Design Group. Surface based testing is an interface to all construction activities in the ESF.

### 10.3 ESFDR REQUIREMENTS

The requirements contained in the ESFDR (Reference 8.1) applicable to CII: BABEAF000 shall be listed in Section 11, Conclusions.

## 11. CONCLUSIONS

The following ESFDR criteria (Reference 8.1) are applicable to CII: BABEAF000:

|             |                 |
|-------------|-----------------|
| 3.2.1 C     | 3.2.1.4         |
| 3.2.1 D     | 3.2.1.4 A       |
| 3.2.1 H     | 3.2.1.4 B1      |
| 3.2.1 H1a   | 3.2.1.4 B1a     |
| 3.2.1 H2e   | 3.2.1.4 B1b     |
| 3.2.1 H2e i | 3.2.1.4 B1b i   |
| 3.2.1 I1    | 3.2.1.4 B1b iii |
| 3.2.1 I2    | 3.2.1.4 B1b iv  |
| 3.2.1 I3    | 3.2.1.4 B1b v   |
| 3.2.1 I4    | 3.2.1.4 B1b vi  |
| 3.2.1 J1    | 3.2.1.4 B2      |
| 3.2.1 J3    | 3.2.1.4 B3      |
| 3.2.1 J4    | 3.2.1.4 B4      |
| 3.2.1 J5    | 3.1.2.4 B5      |
| 3.2.1 J8    | 3.2.1.4 C       |
| 3.2.1 J9    | 3.2.1.4 C5      |
| 3.2.1 K     | 3.2.1.4 H       |
| 3.2.1 M     | 3.2.1.6         |
| 3.2.1 M1    | 3.2.1.6 E       |
| 3.2.1 M2    | 3.2.1.6 F       |
| 3.2.1 M3    | 3.2.1.8.1       |
| 3.2.1 M4    | 3.2.1.8.1 A     |
| 3.2.1 M5    | 3.2.1.9.3 Cl    |
| 3.2.1 M5a   | 3.2.1.9.4 B5    |
| 3.2.1 M5b   | 3.2.1.9.4 C1    |
|             | 3.2.1.9.6       |
| 3.2.1 Q     | 3.2.1.15 D      |
| 3.2.1 R     | 3.2.1.19.1 B    |
| 3.2.1 S     | 3.2.1.19.2 A    |
| 3.2.1 T     | 3.2.1.19.2 E1   |
| 3.2.1 W     | 3.2.1.19.2 E2   |
| 3.2.1 W1    | 3.2.1.19.2 E3   |
| 3.2.1 X     | 3.2.1.19.3      |
| 3.2.1 Z     | 3.2.1.19.3 B    |
| 3.2.1 Z1    | 3.2.1.19.4 C    |
| 3.2.1 Z2    | 3.2.1.19.5 A    |
| 3.2.1 AA1   | 3.2.1.20 B      |
| 3.2.1 AA2   | 3.2.1.21 A4     |
| 3.2.1 AA4   | 3.2.1.25.6 A    |
| 3.2.1 AA5   | 3.2.1.25.6 B    |
| 3.2.1 AA6   | 3.2.1.28 A      |
| 3.2.1 AB    | 3.2.1.28 C      |
|             | 3.2.2 C         |

|              |                                   |
|--------------|-----------------------------------|
| 3.2.2 D      | 3.2.2.4 M                         |
| 3.2.2 D1     | 3.2.2.4 M1                        |
| 3.2.2 D2     | 3.2.2.4 N                         |
| 3.2.2 D3     | 3.2.2.4 N2                        |
| 3.2.2 G      | 3.2.2.4 O3                        |
| 3.2.2 G1     | 3.2.2.4 P                         |
| 3.2.2.4 A    | 3.2.2.4 P1 <sup>1</sup> (TBV-201) |
| 3.2.2.4 A3   | 3.2.2.4 P2                        |
| 3.2.2.4 B    | 3.2.2.4 R                         |
| 3.2.2.4 B2   | 3.2.2.4 S4                        |
| 3.2.2.4 C    | 3.2.2.4 S5                        |
| 3.2.2.4 C1   | 3.2.2.4 S6                        |
| 3.2.2.4 C3   | 3.2.2.4 S8                        |
| 3.2.2.4 C4   | 3.2.2.4 T                         |
| 3.2.2.4 C7   | 3.2.2.4 T5                        |
| 3.2.2.4 C10  | 3.2.2.4 U                         |
| 3.2.2.4 D    | 3.2.2.4 U1                        |
| 3.2.2.4 D2   | 3.2.2.4 U2                        |
| 3.2.2.4 D3   | 3.2.2.4 U2a                       |
| 3.2.2.4 D4   | 3.2.2.4 U2b (TBD-139) (TBV-207)   |
| 3.2.2.4 D5   | 3.2.2.4 U4a                       |
| 3.2.2.4 D6   | 3.2.2.4 U4b                       |
| 3.2.2.4 D7   | 3.2.2.4 U4c                       |
| 3.2.2.4 D10  | 3.2.2.4 U5                        |
| 3.2.2.4 D12  | 3.2.2.4 V                         |
| 3.2.2.4 D15a | 3.2.2.4 V1                        |
| 3.2.2.4 E    | 3.2.2.6 B                         |
| 3.2.2.4 F    | 3.2.9 A                           |
| 3.2.2.4 G    | 3.2.9 A1                          |
| 3.2.2.4 H    | 3.2.9.4 A                         |
| 3.2.2.4 H1   | 3.2.9.4 D1 <sup>2</sup> (TBD-097) |
| 3.2.2.4 H2   | 3.2.9.4 D3                        |
| 3.2.2.4 I5   | 3.2.9.4 D4                        |
| 3.2.2.4 L7   | 3.2.9.4 D5                        |
|              | 3.2.9.4 E                         |

<sup>1</sup>(TBV-201) TBV number not carried down to output documents. Work may proceed because any probe drilling employed in advance of excavation shall be performed under the direction of the Test Coordinator's Office and will not impact design. The TBV will be resolved, even though it will not appear on lower tier documents. The TBV remains open.

<sup>2</sup>(TBD-097) TBD number not carried down to output documents. Work may proceed using designs which contain suitable accommodation for such additional testing as may be required by the U.S. Nuclear Regulatory Commission, to the extent known at this time and which can be reasonably anticipated. The designs shall satisfy the intent of ESFDR (Reference 8.1) requirements in this respect. The TBD will be resolved, even though it will not appear on lower tier documents. The TBD remains open.

## **12. ATTACHMENTS**

Not applicable.