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DIVISION OF HIGH-LEVEL WASTE MANAGEMENT

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DATE: 8/15/89

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Correlation of SCP & WBS Dictionary

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YUCCA MOUNTAIN PROJECT LONG RANGE PLANNING
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Notes

1. ALL CAPS = OCRWM WBS element

2. Upper/lower = Project WBS element

3. WBS goes to SCP study level <u>except</u> WBS stops at investigation level for investigations with only one study

4. * designates recommended WBS elements to be added/changed as stated in the Project Office evaluation comments to OCRWM Proposed WBS Change-CP-6, dated 2/23/89.

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WBS Element	SCP Section	Participants
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1.2.1.2 SYSTEMS ENGINEERING		
1.2.1.2.1 System Requirements and Description		SNL
1.2.1.2.2 System Studies		SNL
1.2.1.2.3 Total System Life Cycle Cost		SNL
1.2.1.2.4 Systems Engineering Implementation		SNL, LANL, FSN, USGS, H&N, LLNL, T&MSS
1.2.1.2.5 Configuration Management and Change Control		T&MSS
1.2.1.3 TECHNICAL DATA BASE MANAGEMENT		
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1.2.1.3.2 Interactive Graphics Information System		SNL
1.2.1.3.3 Reference Information Base		SNL
1.2.1.3.4 Technical Data Base Management Computer Support		SNL
1.2.1.3.5 Technical Data Base Input		SNL, LANL, FSN, USGS, H&N, LLNL, T&MSS
1.2.1.4 PERFORMANCE ASSESSMENT		

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1.2.1.4.2 Waste Package Performance Assessment		LLNL
1.2.1.4.3 Repository Performance Assessment		
1.2.1.4.3.1 Postclosure Repository Design Analyses		SNL
1.2.1.4.3.2 Preclosure Radiological Safety Analyses		SNL
1.2.1.4.3.3 Waste Retrieval Requirements and Analyses		SNL
1.2.1.4.3.4 Seal Performance Requirements and Analyses		SNL
1.2.1.4.4 Site Performance Assessment		
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1.2.1.4.4.2 Favorable and Adverse Conditions		SNL, LLNL, LANL, USGS, T&MSS
1.2.1.4.4.3 Higher Level Findings		SNL, LLNL, LANL, USGS, T&MSS
1.2.1.4.5 Geochemical Modeling and Data Base Development		LLNL
1.2.1.4.6 Development and Validation of Flow and Transport Models		SNL
1.2.1.4.7 Supporting Calculations for Postclosure Performance Analyses		SNL, LLNL, LANL, USGS

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1.2.1.4.8 Performance Confirmation		SNL, LLNL, LANL, USGS
1.2.1.4.9 Development and Verification of Flow and Transport Codes		SNL
1.2.2 WASTE PACKAGE		
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1.2.2.2.1 Chemical and Mineralogical Properties of the Waste Package	8.3.4.2.4.1	LLNL
1.2.2.2.2 Hydrologic Properties of Waste Package Environment	8.3.4.2.4.2	LLNL
1.2.2.2.3 Mechanical Attributes of the Waste Package Environment	8.3.4.2.4.3	LLNL
1.2.2.2.4 Engineered Barrier System (EBS) Field Tests	8.3.4.2.4.4	LLNL, FSN, H&N, REECo
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1.2.2.3.1.1 Waste Form Testing - Spent Fuel		LLNL, T&MSS
1.2.2.3.1.2 Waste Form Testing - Glass		LLNL, T&MSS
1.2.2.3.2 METAL BARRIERS		LLNL
1.2.2.3.3 OTHER MATERIALS		LLNL

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1.2.2.3.4.2 Thermodynamic Data Determination		LLNL
*1.2.2.3.5 NONMETALLIC BARRIER CONCEPTS (*Addition Reccomended to HQ)		LLNL
1.2.2.4 DESIGN, FABRICATION, AND PROTOTYPE TESTING		
1.2.2.4.1 Waste Package Design		LLNL, T&MSS
1.2.2.4.2 Container Fabrication and Closure Development		LLNL, T&MSS
1.2.2.4.3 Container/Waste Package Interface Analysis		LLNL
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1.2.3.2.2.1.3 Three-dimensional Geologic Model	8.3.1.4.2.3	USGS
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1.2.3.2.3.3 Effects of Future Tectonic Activity on Erosion	8.3.1.6.3	USGS
1.2.3.2.3.4 Effects of Erosion on the Hydrologic, Geochemical, and Rock Characteristics	8.3.1.6.4	USGS
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1.2.3.2.5.1 Direct Releases from Volcanic Activity	8.3.1.8.1	
1.2.3.2.5.1.1 Probability of a Volcanic Eruption	8.3.1.8.1.1	LANL
1.2.3.2.5.1.2 Effects of a Volcanic Eruption Penetrating the Repository	8.3.1.8.1.2	LANL
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1.2.3.2.7.1.4 Laboratory Determination of the Mechanical Properties of Fractures	8.3.1.15.1.4	SNL

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1.2.3.2.8.4.4	Quaternary Faulting within Northeast-Trending Fault Zones	8.3.1.17.4.4	USGS
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1.2.3.3.2.2	Location of Adequate Water Supplies	8.3.1.16.2	T&MSS, USGS
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1.2.3.4.1.1 Ground-Water Chemistry Model	8.3.1.3.1	LANL
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1.2.3.4.1.6 Retardation of Gaseous Radionuclides	8.3.1.3.8	LANL
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1.2.3.5.3.16	Geologic Pavements	8.3.1.4.2.2	REECo, H&N, PA

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WBS Element	SCP Section	Participants
1.2.3.5.3.17 Geostatistical Drillholes	8.3.1.4.3.1	REECo, H&N
1.2.3.5.3.18 Calcite-Silica Drillholes and Trenches	8.3.1.5.2.1	REECo, H&N, PA
1.2.3.5.3.19 Volcanic Drillholes	8.3.1.8.5.1.1	REECo, H&N, PA
1.2.3.5.3.20 Surface Facilities Drillholes	8.3.1.14.2.1	REECo, H&N
1.2.3.5.3.21 Water Supply Drillholes and Tests	8.3.1.16.2.1	REECo, H&N
1.2.3.5.3.22 In Situ Stress Drillhole and Tests, and Quaternary Fault Trenches	8.3.1.17.4.8	REECo, H&N, PA
1.2.3.5.4 Prototype Air Coring		LANL, REECo, FSN, H&N
1.2.3.6 CLIMATOLOGY AND METEOROLOGY		
1.2.3.6.1 Environmental Meteorological Studies	8.3.1.12	
1.2.3.6.1.1 Regional Meteorological Conditions	8.3.1.12.1	
1.2.3.6.1.1.1 Characterization of Regional Meteorological Conditions	8.3.1.12.1.1	T&MSS
1.2.3.6.1.1.2 Plan for Synthesis of Meteorological Monitoring	8.3.1.12.1.2	T&MSS
1.2.3.6.1.2 Location of Population Centers Relative to Wind Patterns	8.3.1.12.3	T&MSS
1.2.3.6.1.3 Potential Extreme Weather Phenomena and Their Recurrence Intervals	8.3.1.12.4	T&MSS

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WBS Element	SCP Section	Participants
1.2.3.6.2 Climatology		
1.2.3.6.2.1 Change in Climatic Conditions	8.3.1.5	
1.2.3.6.2.1.1 Modern Regional Climate	8.3.1.5.1.1	USGS
1.2.3.6.2.1.2 Paleoclimate Study of Lake, Playa, and Marsh Deposits	8.3.1.5.1.2	USGS
1.2.3.6.2.1.3 Climatic Implications of Terrestrial Paleoecology	8.3.1.5.1.3	USGS
1.2.3.6.2.1.4 Paleoenvironmental History of Yucca Mountain	8.3.1.5.1.4	USGS
1.2.3.6.2.1.5 Paleoclimate-Paleoenvironmental Analysis	8.3.1.5.1.5	USGS
1.2.3.6.2.1.6 Future Regional Climate and Environments	8.3.1.5.1.6	USGS
1.2.3.6.2.2 Effects of Future Climate Conditions on Hydrologic Characteristics	8.3.1.5.2	
1.2.3.6.2.2.1 Quaternary Regional Hydrology	8.3.1.5.2.1	USGS
1.2.3.6.2.2.2 Future Regional Hydrology due to Climate Changes	8.3.1.5.2.2	USGS
1.2.3.7 RESOURCE POTENTIAL		
1.2.3.7.1 Natural Phenomena and Human Activities that Might Degrade Surface Markers and Monuments	8.3.1.9.1	USGS, SNL, H&N, LANL

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WBS Element	SCP Section	Participants
1.2.3.7.2 Present and Future Value of Resources	8.3.1.9.2	
1.2.3.7.2.1 Natural Resource Assessment	8.3.1.9.2.1	USGS, LANL
1.2.3.7.2.2 Water Resource Assessment	8.3.1.9.2.2	T&MSS
1.2.3.7.3 Potential Effects of Exploiting Natural Resources	8.3.1.9.3	
1.2.3.7.3.1 Future Inadvertent Human Intrusion Studies	8.3.1.9.3.1	T&MSS
1.2.3.7.3.2 Potential Effects of Exploration or Extraction of Natural Resources	8.3.1.9.3.2	T&MSS, USGS, LANL
1.2.3.8 DEFERRED SITE CLOSE OUT		TBD
1.2.4 REPOSITORY		
1.2.4.1 MANAGEMENT AND INTEGRATION		SNL, T&MSS
1.2.4.2 DEVELOPMENT AND TESTING		
1.2.4.2.1 ROCK MECHANICS	8.3.1.15	
1.2.4.2.1.1 In Situ Thermal/Mechanical Tests	8.3.1.15.1	
1.2.4.2.1.1.1 Excavation Investigations	8.3.1.15.1.5	SNL, FSN, H&N, REECo
1.2.4.2.1.1.2 In Situ Thermomechanical Properties	8.3.1.15.1.6	SNL, FSN, H&N, REECo

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WBS Element	SCP Section	Participants
1.2.4.2.1.1.3 In Situ Mechanical Properties	8.3.1.15.1.7	SNL, FSN, H&N, REECo
1.2.4.2.1.1.4 In Situ Design Verification	8.3.1.15.1.8	SNL, FSN, H&N, REECo
1.2.4.2.1.2 Rock Mass Analyses		SNL, FSN, H&N
1.2.4.2.1.3 Rock Mechanics Field Testing		SNL, FSN, H&N, REECo
1.2.4.2.2 EQUIPMENT AND INSTRUMENTATION DEVELOPMENT		SNL, FSN
1.2.4.2.3 Design Analysis and Certification		SNL
1.2.4.2.3.1 Certification of Design Methods		SNL
1.2.4.2.3.2 Design Analysis		SNL
1.2.4.3 FACILITIES		
1.2.4.3.1 SITE PREPARATION		SNL
1.2.4.3.2 SURFACE FACILITIES		SNL
1.2.4.3.3 SHAFTS/RAMPS		SNL
1.2.4.3.4 SUBSURFACE EXCAVATIONS		SNL
1.2.4.3.5 UNDERGROUND SERVICE SYSTEMS		SNL
1.2.4.4 OPERATIONS/MAINTENANCE		SNL
1.2.4.5 DECOMMISSIONING		SNL

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1.2.4.6 SEALING	8.3.3.2.2.1	
1.2.4.6.1 Sealing Design and Design Requirements		SNL, FSN
1.2.4.6.2 Sealing Testing		SNL, REECo
*1.2.4.7 DESIGN BASIS (*Addition Recommended to HQ)		
1.2.4.7.1 Design Requirements		SNL
1.2.4.7.2 Design Basis Analysis		SNL
1.2.5 REGULATORY AND INSTITUTIONAL		
1.2.5.1 MANAGEMENT AND INTEGRATION		T&MSS, USGS, SNL, LANL
1.2.5.2 LICENSING		
1.2.5.2.1 NRC Interaction Support		T&MSS, LANL, USGS, LLNL, SNL, H&N, FSN
1.2.5.2.2 Site Characterization Program		T&MSS, LANL, USGS, LLNL, SNL
1.2.5.2.3 Regulatory Review		T&MSS, LANL, USGS, SNL, LLNL, FSN H&N,
1.2.5.2.4 Technical Support Documentation		T&MSS, LANL, LLNL, USGS, SNL
1.2.5.2.5 Study Plan Coordination		T&MSS, LANL, USGS, LLNL, SNL
1.2.5.2.6 Semi-Annual Progress Reports		T&MSS, LLNL, USGS, SNL, LANL
1.2.5.2.7 Site Recommendation Report		T&MSS, LANL, LLNL, SNL, USGS

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WBS Element	SCP Section	Participants
1.2.5.2.8 License Application		T&MSS, LANL, LLNL, SNL, USGS
1.2.5.3 ENVIRONMENTAL COMPLIANCE		
1.2.5.3.1 Environment Assessment		T&MSS
1.2.5.3.2 Environmental Impact Statement (EIS)		T&MSS, LANL, USGS, LLNL, SNL
1.2.5.3.3 Environmental Regulatory Compliance		T&MSS
1.2.5.3.4 Environmental Monitoring and Mitigation Plan		T&MSS
1.2.5.3.5 Reclamation Plan		T&MSS
1.2.5.4 ENVIRONMENT		
1.2.5.4.1 Aesthetics		T&MSS
1.2.5.4.2 Air Quality/Meteorology	8.3.1.12.2	T&MSS
1.2.5.4.3 Archeological Resources		T&MSS, DRI
1.2.5.4.4 Noise		T&MSS
1.2.5.4.5 Radiological Studies		T&MSS, EPA, EG&G
1.2.5.4.6 Soils		T&MSS
1.2.5.4.7 Terrestrial Ecosystems		EG&G
1.2.5.4.8 Water Resources		T&MSS, USGS
1.2.5.4.9 Land Use/Resource Lands		T&MSS

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WBS Element	SCP Section	Participants
1.2.5.4.10 Native American Interactions		T&MSS
1.2.5.4.11 Environmental Field Work Coordination		T&MSS
1.2.5.5 TRANSPORTATION		
1.2.5.5.1 Transportation Studies		
1.2.5.5.1.1 Yucca Mountain Access Route Evaluation		T&MSS
1.2.5.5.1.2 Transportation Impact Studies		T&MSS
1.2.5.5.1.3 Engineering and Institutional Support		T&MSS, SNL
1.2.5.5.2 Impacts of Offsite Installation Evaluation	8.3.1.13	T&MSS, SNL
1.2.5.6 SOCIOECONOMICS		
1.2.5.6.1 Socioeconomic Studies		T&MSS
1.2.5.6.2 Radiological Monitoring Program Support	8.3.1.10	T&MSS, EG&G
1.2.5.7 COMMUNICATION AND LIAISON		T&MSS
1.2.6 EXPLORATORY SHAFT (ES) FACILITY		
1.2.6.1 MANAGEMENT AND INTEGRATION		T&MSS, LANL, REECo, FSN, H&N, SNL, ACOE, MS&HA, BOM, PA
1.2.6.1.1 Exploratory Shaft Management, Planning, and Technical Assessment		FSN, REECo, H&N, SNL, LANL, T&MSS, MS&HA, BOM, ACOE

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1.2.6.1.2 Quality Assurance		FSN, REECo, H&N, T&MSS
1.2.6.1.3 Safety Analysis		FSN, REECo, H&N
1.2.6.2 SITE PREPARATION		
1.2.6.2.1 Site and Roads	8.3.1	H&N, REECo
1.2.6.2.2 Surface Utilities and Communications Systems	8.3.1	H&N, REECo
1.2.6.3 SURFACE FACILITIES		
1.2.6.3.1 Buildings and Surface Facilities	8.3.1	H&N, REECo
1.2.6.3.2 ES-1 Shaft Collar	8.3.1	FSN, REECo
1.2.6.3.3 ES-2 Shaft Collar	8.3.1	FSN, REECo
1.2.6.4 FIRST SHAFT		
1.2.6.4.1 ES-1 Shaft and Liner	8.3.1	FSN, REECo, H&N
1.2.6.4.2 ES-1 Hoist and Headframe	8.3.1	FSN, REECo, H&N
1.2.6.5 SECOND SHAFT		
1.2.6.5.1 ES-2 Shaft and Liner	8.3.1	FSN, REECo, H&N
1.2.6.5.2 ES-2 Hoist and Headframe	8.3.1	FSN, REECo, H&N
1.2.6.6 SUBSURFACE EXCAVATIONS		
1.2.6.6.1 Main Test Levels		FSN, REECo, H&N

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WBS Element	SCP Section	Participants
1.2.6.6.2 Exploratory Drifts		FSN, REECo, H&N
1.2.6.6.3 Secondary Levels		FSN, REECo, H&N
1.2.6.7 UNDERGROUND SERVICE SYSTEMS		
1.2.6.7.1 Utilities, Services, and Communications	8.3.1	FSN, REECo, H&N
1.2.6.7.2 ES-1 Shaft Internals and Conveyances	8.3.1	FSN, REECo, H&N
1.2.6.7.3 ES-2 Shaft Internals and Conveyances	8.3.1	FSN, REECo, H&N
1.2.6.8 OPERATIONS		
1.2.6.8.1 Site and Equipment Maintenance	8.3.1	REECo
1.2.6.8.2 ESF Operation	8.3.1	REECo
1.2.6.8.3 Operational, Environmental, Health, and Safety Training	8.3.1	REECo
1.2.6.8.4 Integrated Data Systems	8.3.1	LANL, H&N, FSN, REECo
1.2.6.9 DECOMMISSIONING		TBD
1.2.7 TEST FACILITIES		
1.2.7.1 MANAGEMENT AND INTEGRATION		T&MSS, FSN, H&N, REECo
1.2.7.2 TESTING		
1.2.7.2.1 CLIMAX		LLNL, FSN, H&N, REECO

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WBS Element	SCP Section	Participants
1.2.7.2.2 G-TUNNEL		FSN, H&N, REECO, SNL
1.2.7.3 NEW FACILITY ACQUISITION		
1.2.7.4 FIELD OPERATIONS		
1.2.7.4.1 Field Operations Center		SAIC
1.2.7.4.2 Maintenance Operations		REECo
1.2.7.4.3 Administrative and Support Services		REECo
1.2.8 LAND ACQUISITION		
1.2.8.1 MANAGEMENT AND INTEGRATION		T&MSS
*1.2.8.2 SITE CHARACTERIZATION (*Change Recommended to HQ)		T&MSS, BLM
1.2.8.3 REPOSITORY		
1.2.8.3.1 Repository Site		T&MSS, BLM
1.2.8.3.2 Transportation Routes		T&MSS, BLM
1.2.9 PROJECT MANAGEMENT		
1.2.9.1 MANAGEMENT AND INTEGRATION		
1.2.9.1.1 Management		T&MSS, LANL, FSN, USGS, H&N, LLNL, REECo, SNL, MACTEC

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WBS Element	SCP Section	Participants
1.2.9.1.2 Administrative Services		T&MSS, REECo, WSI, CSC, OSTI
1.2.9.1.3 Project Peer Review		T&MSS, LANL, FSN, USGS, H&N, LLNL, REECo,
1.2.9.1.4 Records Management		T&MSS, LANL, FSN, USGS, H&N, LLNL, REECo, SNL
1.2.9.2 PROJECT CONTROL		T&MSS, LANL, FSN, USGS, H&N LLNL, REECo, SNL, MACTEC
1.2.9.3 QUALITY ASSURANCE		
1.2.9.3.1 Quality Assurance Program Development		T&MSS, LANL, FSN, USGS, H&N, LLNL, REECo, SNL
1.2.9.3.2 Quality Assurance - Audits and Surveillances		T&MSS, LANL, FSN, USGS, H&N, REECo, SNL, LLNL
1.2.9.3.3 Quality Assurance - Quality Engineering		T&MSS, LANL, FSN, USGS, H&N, REECo, SNL, LLNL
1.2.9.3.4 Quality Assurance - Quality Overview		T&MSS, MACTEC, LANL, FSN, USGS, H&N, REECo, SNL, LLNL
1.2.9.3.5 Quality Assurance - Quality Control		T&MSS, FSN, H&N, REECo
1.2.9.9 NTS ALLOCATION		NTS
1.2.10 FINANCIAL/TECHNICAL ASSISTANCE		
*1.2.10.1 STATE AND LOCAL GOVERNMENTS (*Addition Recommended to HQ)		NV
*1.2.10.2 PAYMENTS-EQUAL-TO-TAXES (*Addition Recommended to HQ)		NV
*1.2.10.3 UNIVERSITY FUNDING (*Addition Recommended to HQ)		NV

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