U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

PRESENTATION TO THE NUCLEAR WASTE TECHNICAL REVIEW BOARD

SUBJECT: TRADE STUDIES ON SOUTH PORTAL AND OPTIONAL SHAFT

PRESENTER: BRUCE T. STANLEY

PRESENTER'S TITLE AND ORGANIZATION: LEAD MINING ENGINEER
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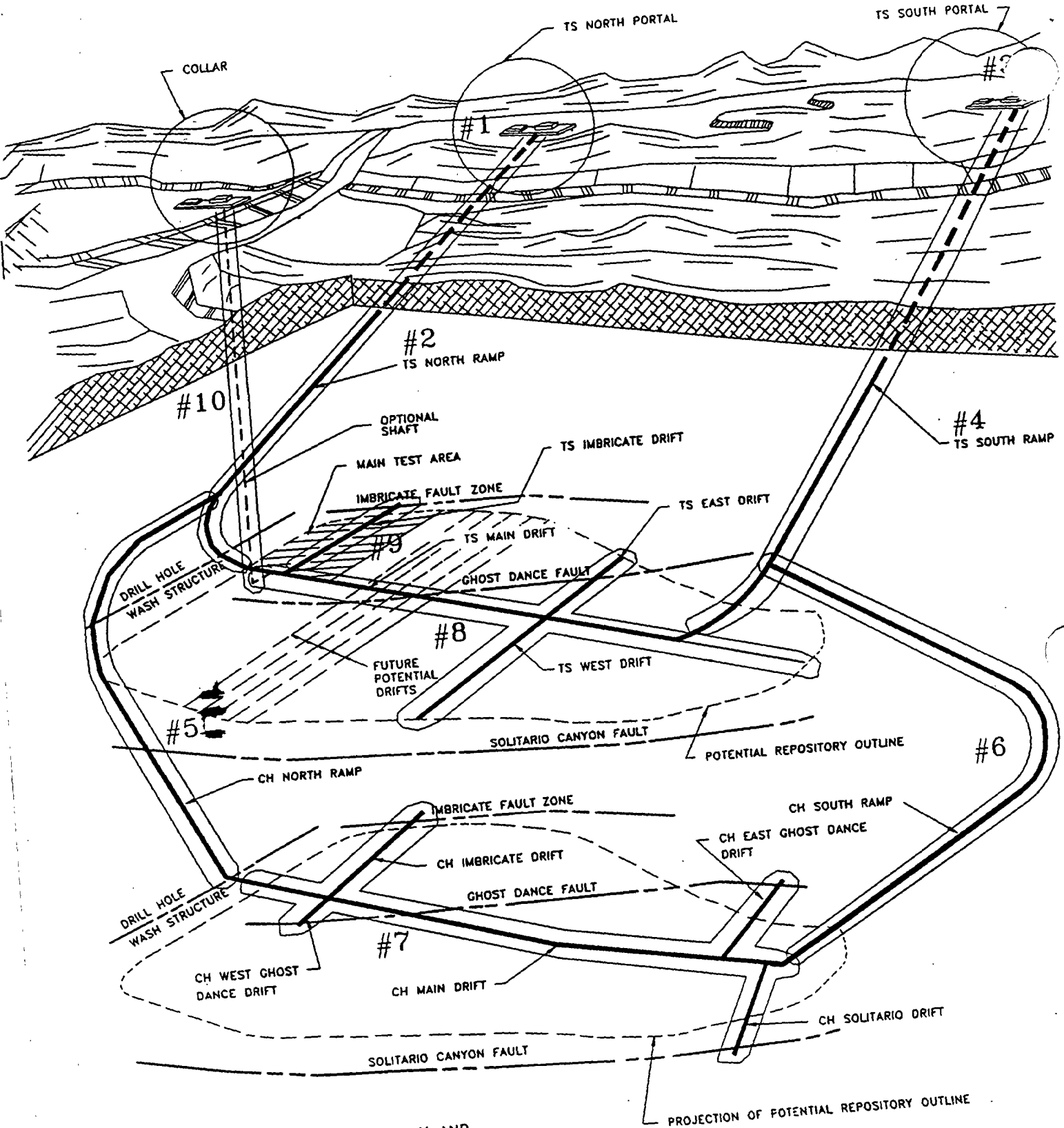
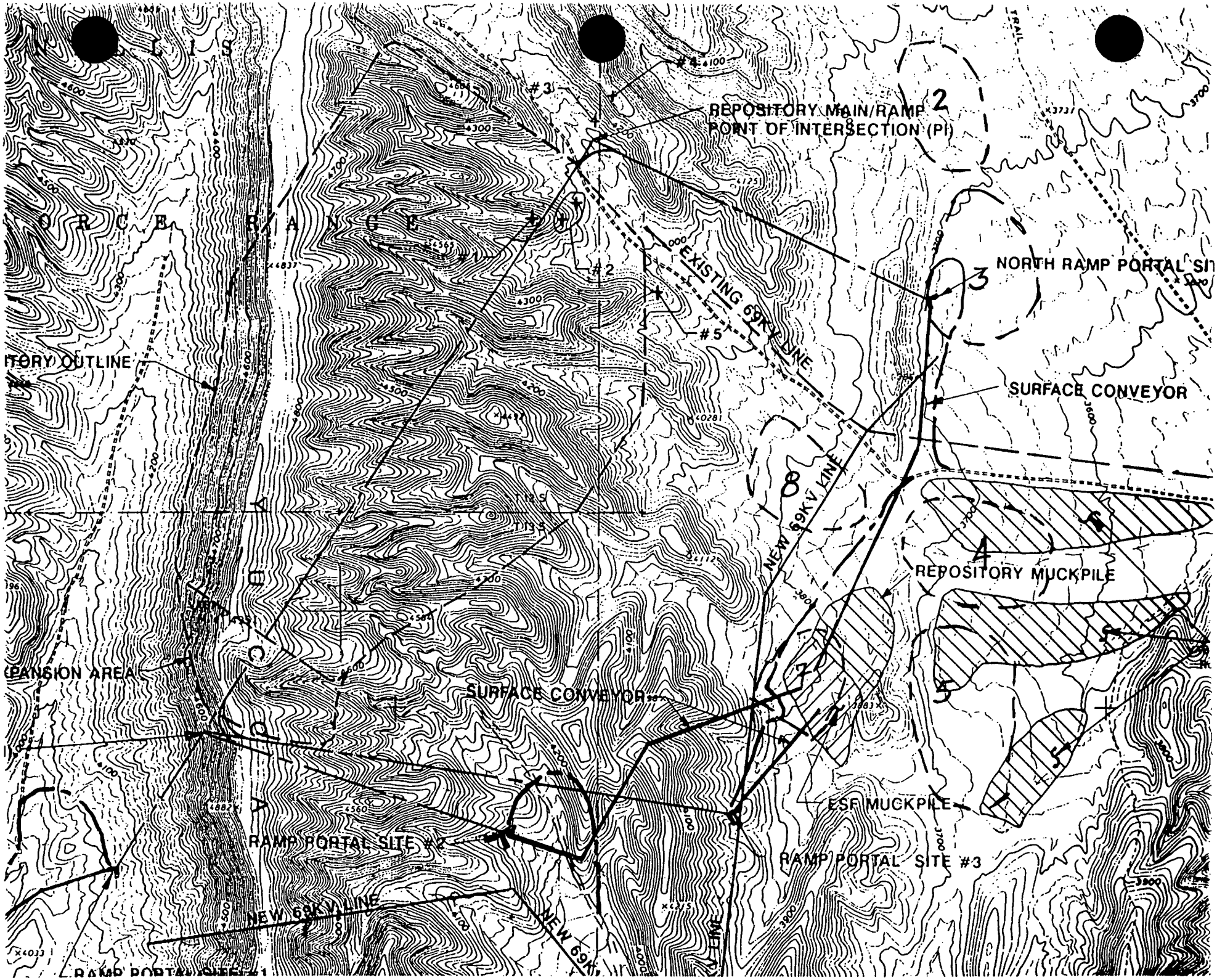
JULY 15, 1991

PRELIMINARY ACCESS SITING REPORT

- EFFORT IS DIVIDED INTO
  - PRELIMINARY REPORT (COMPLETED)
  - FINAL REPORT (SCHEDULED COMPLETION FALL '91)
- COMBINATION OF THREE SEPARATE EFFORTS ADDRESSING
  - NORTH RAMP PORTAL SITING
  - SOUTH RAMP PORTAL SITING
  - OPTIONAL SHAFT SITING
- BASIS OF THE TRADE STUDIES FOCUSES ON THE FAVORABLE FEATURES OF THE HIGHEST RANKED OPTIONS IDENTIFIED IN THE ALTERNATIVES STUDY FINDINGS REPORT DATED FEBRUARY 12, 1991
- OPTION 30 WITH ENHANCEMENTS OF
  - OPTIONAL SHAFT
  - NORTH-EAST LOCATION OF MAIN TEST AREA INCORPORATES MOST OF THOSE FAVORABLE FEATURES



NOTE: THIS IS PICTORIAL ONLY AND NOT DRAWN TO SCALE



REPOSITORY MAIN/RAMP
POINT OF INTERSECTION (PI)
NORTH RAMP PORTAL SI
EXISTING 69KV LINE
SURFACE CONVEYOR
NEW 69KV LINE
REPOSITORY MUCKPILE
SURFACE CONVEYOR
ESF MUCKPILE
RAMP PORTAL SITE #2
RAMP PORTAL SITE #3
NEW 69KV LINE
NEW 69KV LINE
RAMP PORTAL SITE #1
ITORY OUTLINE
XPANSION AREA
#1
#2
#3
#4
#5

FUNDAMENTAL CONTROLS

- FUNCTIONAL REQUIREMENTS
  - PROVIDE FACILITIES FOR IN SITU SITE CHARACTERIZATION FOR THE MINED GEOLOGIC DISPOSAL SYSTEM (MGDS)
  - PROVIDE FOR THE INCORPORATION OF THE ESF INTO THE POTENTIAL REPOSITORY
- PERFORMANCE CRITERIA
  - TO THE EXTENT PRACTICAL, EXPLORATORY BOREHOLES AND SHAFTS (AND RAMPS) IN THE GEOLOGIC REPOSITORY OPERATIONS AREA SHALL BE LOCATED WHERE SHAFTS (AND RAMPS) ARE PLANNED FOR UNDERGROUND FACILITY CONSTRUCTION AND OPERATION OR WHERE LARGE UNEXCAVATED PILLARS ARE PLANNED (10 CFR 60.15(c)(3)).
  - SUBSURFACE EXPLORATORY DRILLING, EXCAVATION, AND IN SITU TESTING BEFORE AND DURING CONSTRUCTION SHALL BE PLANNED AND COORDINATED WITH GEOLOGIC REPOSITORY OPERATIONS AREA DESIGN AND CONSTRUCTION (10 CFR 60.15(c)(4))

APPROACH TO TRADE STUDIES FOR SOUTH RAMP ACCESS/OPTIONAL SHAFT

- INITIAL LIST OF SCREENING CRITERIA WAS DEVELOPED AND AGREED UPON BY ALL PARTICIPANTS
  - POSSIBLE SITES ARE SCREENED
- EACH PARTICIPANT PERFORMS THEIR OWN FIGURE OF MERIT (FOM)
  - DEVELOP DISCRIMINATORS/FACTORS RELATIVE TO AREA OF EXPERTISE (e.g., RSN-ENGINEERING, LANL-TESTING, etc.)
  - ASSIGN RELATIVE WEIGHTS
  - COMPUTE WEIGHTED VALUE

APPROACH TO TRADE STUDIES FOR SOUTH RAMP ACCESS/OPTIONAL SHAFT

(CONTINUED)

- COMBINED FIGURE OF MERIT IS PERFORMED
  - INDEPENDENT PANEL OF PARTICIPANT REPRESENTATIVES ASSIGN RELATIVE WEIGHTS TO:
    * ENGINEERING
    * PERFORMANCE ASSESSMENT
    * UNDERGROUND TESTING
    * SURFACE-BASED TESTING
  - COMPUTE OVERALL WEIGHTED VALUE USING PARTICIPANT FOM WEIGHTS
- "WINNERS" SELECTED ON BASIS OF HIGHEST SCORE

PARTICIPANT RESPONSIBILITY

- RSN - ENGINEERING (INCLUDES POTENTIAL REPOSITORY INTERFACE)
  - GEOLOGY: INPUT FROM USBR LITERATURE AND FIELD WORK
  - GEOPHYSICAL: INPUT FROM SAIC GEOPHYSICAL INFORMATION AND CROSS SECTIONS
  - TOPOGRAPHY: INPUT FROM EG&G AERIAL SURVEY
- LANL - UNDERGROUND TESTING
- SNL - PERFORMANCE ASSESSMENT
- USGS - SURFACE-BASED TESTING

SOUTH RAMP PORTAL SITING
ENGINEERING EVALUATION RESULTS

DISCRIMINATOR	WGTG FACTOR VALUE W	SITE 1-SOLITARIO *RATING V	SITE 1-SOLITARIO WTG VAL WV	SITE 2-GHOST DANCE *RATING V	SITE 2-GHOST DANCE WTG VAL WV	SITE 3-BOUNDARY RIDGE *RATING V	SITE 3-BOUNDARY RIDGE WTG VAL WV
1. PORTAL ACCESS ROAD CONSTR.	7	1.00	7.00	3.75	26.25	3.50	24.50
2. PORTAL PAD/ HIGHWALL CONSTR.	8	2.00	16.00	3.25	26.00	3.25	26.00
3. PORTAL CONSTR.	7	2.25	15.75	3.50	24.50	3.25	22.75
4. RAMP CONSTR.	10	2.50	25.00	3.75	37.50	3.00	30.00
5. RAMP LENGTH	9	4.50	40.50	3.50	31.50	1.75	15.75
6. RAMP GRADIENT	8	3.00	24.00	3.75	30.00	5.00	40.00
7. REPOS. INTEGR. IMPACTS	6	3.25	19.50	3.50	21.00	3.25	19.50
8. ESF/REPOSITORY LOGISTICS	8	2.00	16.00	3.25	26.00	4.00	32.00
WEIGHTED VALUE			163.75		222.75		210.50
WEIGHTED VALUE AS PERCENT OF TOTAL			27.43%		37.31%		35.26%

TING VALUE V = AVERAGE RATING

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SOUTH RAMP PORTAL SITING
PERFORMANCE ASSESSMENT EVALUATION RESULTS

DISCRIMINATOR	WEIGHT W	SITE 1-SOLITARIO *RATING V	SITE 1-SOLITARIO WTG VAL WV	SITE 2-GHOST DANCE *RATING V	SITE 2-GHOST DANCE WTG VAL WV	SITE 3-BOUNDARY RIDGE *RATING V	SITE 3-BOUNDARY RIDGE WTG VAL WV
1. LIQUID REACHING REPOS. HORIZON	0.7	4	2.8	3	2.1	3	2.1
2. GAS ESCAPING FROM REPOSITORY HORIZON	0.3	1	0.3	2	0.6	3	0.9
WEIGHTED VALUE			3.1		2.7		3.0
WEIGHTED VALUE AS PERCENT OF TOTAL			35.23%		30.68%		34.09%

* RATING VALUE V = AVERAGE RATING

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SOUTH RAMP PORTAL SITING
UNDERGROUND TESTING EVALUATION RESULTS

DISCRIMINATOR	WEIGHT W	SITE 1-SOLITARIO *RATING V	SITE 1-SOLITARIO WTG VAL WV	SITE 2-GHOST DANCE *RATING V	SITE 2-GHOST DANCE WTG VAL WV	SITE 3-BOUNDARY RIDGE *RATING V	SITE 3-BOUNDARY RIDGE WTG VAL WV
1. REPRESENTA-TIVENESS	0.5	1	0.5	3	1.5	5	2.5
2. COMPLEMENTARY INFORMATION	0.4	2	0.8	3	1.2	4	1.6
3. INTERFERENCE	0.1	3	0.3	3	0.3	4	0.4
WEIGHTED VALUE			1.6		3.0		4.5
WEIGHTED VALUE AS PERCENT OF TOTAL			17.58%		32.97%		49.45%

ΠNG VALUE V = AVERAGE RATING

SOUTH RAMP PORTAL SITING

SURFACE-BASED TESTING EVALUATION RESULTS

DISCRIMINATOR	WEIGHT W	SITE 1-SOLITARIO *RATING V	SITE 1-SOLITARIO WTG VAL WV	SITE 2-GHOST DANCE *RATING V	SITE 2-GHOST DANCE WTG VAL WV	SITE 3-BOUNDARY RIDGE *RATING V	SITE 3-BOUNDARY RIDGE WTG VAL WV
1. INTERFERENCE	0.55	2.00	1.10	3.00	1.65	3.33	1.83
2. COMPLEMENTARY INFORMATION	0.40	2.33	0.93	3.00	1.20	3.67	1.47
3. MUCK PILE LOCATION	0.05	3.00	0.15	3.00	0.15	3.00	0.15
WEIGHTED VALUE			2.18		3.00		3.45
WEIGHTED VALUE AS PERCENT OF TOTAL			25.28%		34.76%		39.96%

* RATING VALUE V = AVERAGE RATING

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SOUTH RAMP PORTAL SITING
COMBINED EVALUATION RESULTS

EVALUATION CONSIDERATION	WEIGHT W	SITE 1-SOLITARIO RATING V	SITE 1-SOLITARIO WTG VAL WV	SITE 2-GHOST DANCE RATING V	SITE 2-GHOST DANCE WTG VAL WV	SITE 3-BOUNDARY RIDGE RATING V	SITE 3-BOUNDARY RIDGE WTG VAL WV
ENGINEERING	0.25	0.274	0.06850	0.373	0.09325	0.353	0.08825
PERF. ASSESSMENT	0.35	0.352	0.12320	0.307	0.10745	0.341	0.11935
UNDERGRND TSTING	0.35	0.176	0.06160	0.330	0.11550	0.494	0.17290
SURF.-BASED TSTING	0.05	0.253	0.01265	0.348	0.01740	0.400	0.02000
TOTAL WEIGHTED VALUE			0.26595		0.33360		0.40050

SOUTH RAMP PORTAL SITING

COMBINED EVALUATION RESULTS
SENSITIVITY ANALYSIS - CASE 1

EVALUATION CONSIDERATION	WEIGHT W	SITE 1-SOLITARIO RATING *V	SITE 1-SOLITARIO WTG VAL WV	SITE 2-GHOST DANCE RATING *V	SITE 2-GHOST DANCE WTG VAL WV	SITE 3-BOUNDARY RIDGE RATING *V	SITE 3-BOUNDARY RIDGE WTG VAL WV
ENGINEERING	0.3	0.274	0.08220	0.373	0.11190	0.353	0.10590
PERF. ASSESSMENT	0.3	0.352	0.10560	0.307	0.09210	0.341	0.10230
UNDERGRND TSTING	0.3	0.176	0.05280	0.330	0.09900	0.494	0.14820
SURF.-BASED TSTING	0.1	0.253	0.02530	0.348	0.03480	0.400	0.04000
TOTAL WEIGHTED VALUE			0.26590		0.33780		0.39640

* V = WEIGHTED VALUES AS A PERCENT OF TOTAL, FROM TABLES 1-4

SOUTH RAMP PORTAL SITING
COMBINED EVALUATION RESULTS
SENSITIVITY ANALYSIS - CASE 2

EVALUATION CONSIDERATION	WEIGHT W	SITE 1-SOLITARIO RATING *V	SITE 1-SOLITARIO WTG VAL WV	SITE 2-GHOST DANCE RATING *V	SITE 2-GHOST DANCE WTG VAL WV	SITE 3-BOUNDARY RIDGE RATING *V	SITE 3-BOUNDARY RIDGE WTG VAL WV
ENGINEERING	0.20	0.274	0.05480	0.373	0.07460	0.353	0.07060
PERF. ASSESSMENT	0.35	0.352	0.12320	0.307	0.10745	0.341	0.11935
UNDERGRND TSTING	0.35	0.176	0.06160	0.330	0.11550	0.494	0.17290
SURF.-BASED TSTING	0.10	0.252	0.02530	0.348	0.03480	0.400	0.04000
TOTAL WEIGHTED VALUE			0.26490		0.33235		0.40285

* V = WEIGHTED VALUES AS A PERCENT OF TOTAL, FROM TABLES 1-4

SOUTH RAMP PORTAL SITING

COMBINED EVALUATION RESULTS
SENSITIVITY ANALYSIS - CASE 3

EVALUATION CONSIDERATION	WEIGHT W	SITE 1-SOLITARIO RATING *V	SITE 1-SOLITARIO WTG VAL WV	SITE 2-GHOST DANCE RATING *V	SITE 2-GHOST DANCE WTG VAL WV	SITE 3-BOUNDARY RIDGE RATING *V	SITE 3-BOUNDARY RIDGE WTG VAL WV
ENGINEERING	0.23	0.274	0.06302	0.373	0.08579	0.353	0.08119
PERF. ASSESSMENT	0.40	0.352	0.14080	0.307	0.12280	0.341	0.13640
UNDERGRND TSTING	0.27	0.176	0.04752	0.330	0.08910	0.494	0.13338
SURF.-BASED TSTING	0.10	0.253	0.02530	0.348	0.03480	0.400	0.04000
TOTAL WEIGHTED VALUE			0.27664		0.33249		0.39097

* V = WEIGHTED VALUES AS A PERCENT OF TOTAL, FROM TABLES 1-4

SOUTH RAMP PORTAL SITING

COMBINED EVALUATION RESULTS
SENSITIVITY ANALYSIS - CASE 4

EVALUATION CONSIDERATION	WEIGHT W	SITE 1-SOLITARIO RATING *V	SITE 1-SOLITARIO WTG VAL WV	SITE 2-GHOST DANCE RATING *V	SITE 2-GHOST DANCE WTG VAL WV	SITE 3-BOUNDARY RIDGE RATING *V	SITE 3-BOUNDARY RIDGE WTG VAL WV
ENGINEERING	0.20	0.274	0.05480	0.373	0.07460	0.353	0.07060
PERF. ASSESSMENT	0.35	0.352	0.12320	0.307	0.10745	0.341	0.11935
UNDERGRND TSTING	0.40	0.176	0.07040	0.330	0.13200	0.494	0.19760
SURF.-BASED TSTING	0.05	0.253	0.01265	0.348	0.01740	0.400	0.02000
TOTAL WEIGHTED VALUE			0.26105		0.33145		0.40755

* V = WEIGHTED VALUES AS A PERCENT OF TOTAL, FROM TABLES 1-4

OPTIONAL SHAFT SITING
ENGINEERING EVALUATION RESULTS

DISCRIMINATOR	WEIGHT FACTOR VALUE W	SITE 1 - ABOVE COYOTE WASH *RATING V	WTG VAL WV	SITE 2 ES-2 VICINITY *RATING V	WTG VAL WV	SITE 3 DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 4 - ABOVE DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 5 - EAST EDGE ESF BLOCK *RATING V	WGT VAL WV
1. COLLAR ACCESS RD CONSTRUCTION	8	2.50	20.00	4.00	32.00	3.00	24.00	1.75	14.00	2.75	22.00
2. SHAFT SITE PAD CONSTRUCTION	8	2.75	22.00	3.75	30.00	2.75	22.00	2.50	20.00	2.75	22.00
3. COLLAR CONSTR.	6	3.50	21.00	3.50	21.00	3.50	21.00	3.25	19.50	3.00	18.00
4. SHAFT GEOLOGY	10	2.75	27.50	3.50	35.00	3.00	30.00	2.50	25.00	2.75	27.50
5. REPOS. INTEGR. IMPACTS	9	2.25	20.25	2.50	22.50	3.00	27.00	2.75	24.75	3.25	29.25
6. ESF/REPOS. LOGISTICS	7	2.50	17.50	3.50	24.50	3.25	22.75	3.00	21.00	3.00	21.00
7. SHAFT DEPTH	5	2.25	11.25	3.00	15.00	3.50	17.50	2.75	13.75	3.00	15.00
WEIGHTED VALUE			139.50		180.00		164.25		138.00		154.75
WEIGHTED VALUE AS PERCENT OF TOTAL			17.97%		23.18%		21.15%		17.77%		19.93%

* RATING VALUE V = AVERAGE RATING

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OPTIONAL SHAFT SITING
PERFORMANCE ASSESSMENT EVALUATION RESULTS

DISCRIMINATOR	WEIGHT FACTOR VALUE W	SITE 1 - ABOVE COYOTE WASH *RATING V	WTG VAL WV	SITE 2 ES-2 VICINITY *RATING V	WTG VAL WV	SITE 3 DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 4 - ABOVE DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 5 - EAST EDGE ESF BLOCK *RATING V	WGT VAL WV
1. LIQUID REACHING REPOS. HORIZON	0.7	2	1.4	2	1.4	4	2.8	5	3.5	3	2.1
2. GAS ESCAPING FROM REPOSITORY HORIZ.	0.3	2	0.6	2	0.6	3	0.9	4	1.2	2	0.6
WEIGHTED VALUE			2.0		2.0		3.7		4.7		2.7
WEIGHTED VALUE AS PERCENT OF TOTAL			13.25%		13.25%		24.50%		31.13%		17.88%

NG VALUE V = AVERAGE RATING

OPTIONAL SHAFT SITING
UNDERGROUND TESTING EVALUATION RESULTS

DISCRIMINATOR	WEIGHT FACTOR VALUE W	SITE 1 - ABOVE COYOTE WASH *RATING V	WTG VAL WV	SITE 2 ES-2 VICINITY *RATING V	WTG VAL WV	SITE 3 DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 4 - ABOVE DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 5 - EAST EDGE ESF BLOCK *RATING V	WGT VAL WV
1. REPRESENTATIVENESS	0.70	3	2.10	3	2.10	1	0.70	1	0.70	2	1.40
2. INTERFERENCE	0.15	4	0.60	3	0.45	5	0.75	5	0.75	5	0.75
3. ISOLATION	0.15	3	0.45	3	0.45	4	0.60	4	0.60	4	0.60
WEIGHTED VALUE			3.15		3.00		2.05		2.05		2.75
WEIGHTED VALUE AS PERCENT OF TOTAL			24.23%		23.08%		15.77%		15.77%		21.15%

* RATING VALUE V = AVERAGE RATING

OPTIONAL SHAFT SITING
SURFACE-BASED TESTING EVALUATION RESULTS

DISCRIMINATOR	WEIGHT FACTOR VALUE W	SITE 1 - ABOVE COYOTE WASH *RATING V	WTG VAL WV	SITE 2 ES-2 VICINITY *RATING V	WTG VAL WV	SITE 3 DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 4 - ABOVE DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 5 - EAST EDGE ESF BLOCK *RATING V	WGT VAL WV
1. INTERFERENCE	0.50	2.67	1.34	3.00	1.50	3.00	1.50	3.00	1.50	3.33	1.67
2. COMPLIMENTARY INFORMATION	0.50	2.67	1.34	3.00	1.50	2.00	1.00	2.00	1.00	3.00	1.50
WEIGHTED VALUE			2.67		3.00		2.50		2.50		3.17
WEIGHTED VALUE AS PERCENT OF TOTAL			19.30%		21.68%		18.07%		18.07%		22.88%

* ING VALUE V = AVERAGE RATING

OPTIONAL SHAFT SITING
COMBINED EVALUATION RESULTS

DISCRIMINATOR	WEIGHT FACTOR VALUE W	SITE 1 - ABOVE COYOTE WASH *RATING V	SITE 1 - ABOVE COYOTE WASH WTG VAL WV	SITE 2 ES-2 VICINITY *RATING V	SITE 2 ES-2 VICINITY WTG VAL WV	SITE 3 DRILL HOLE WASH *RATING V	SITE 3 DRILL HOLE WASH WGT VAL WV	SITE 4 - ABOVE DRILL HOLE WASH *RATING V	SITE 4 - ABOVE DRILL HOLE WASH WGT VAL WV	SITE 5 - EAST EDGE ESF BLOCK *RATING V	SITE 5 - EAST EDGE ESF BLOCK WGT VAL WV
ENGINEERING	0.30	0.180	0.05400	0.232	0.06960	0.211	0.06330	0.178	0.05340	0.199	0.05970
PERF. ASSESSMENT	0.25	0.132	0.03300	0.132	0.03300	0.245	0.06125	0.311	0.07775	0.179	0.04475
UNDERGROUND TESTING	0.40	0.242	0.09680	0.231	0.09240	0.158	0.06320	0.158	0.06320	0.211	0.08440
SURFACE-BASED TSTING	0.05	0.193	0.00965	0.217	0.01085	0.181	0.00905	0.181	0.00905	0.229	0.01145
TOTAL WEIGHTED VALUE			0.19345		0.20585		0.19680		0.20340		0.20030

OPTIONAL SHAFT SITING
SENSITIVITY ANALYSIS - CASE 1

DISCRIMINATOR	WEIGHT FACTOR VALUE W	SITE 1 - ABOVE COYOTE WASH *RATING V	SITE 1 - ABOVE COYOTE WASH WTG VAL WV	SITE 2 ES-2 VICINITY *RATING V	SITE 2 ES-2 VICINITY WTG VAL WV	SITE 3 DRILL HOLE WASH *RATING V	SITE 3 DRILL HOLE WASH WGT VAL WV	SITE 4 - ABOVE DRILL HOLE WASH *RATING V	SITE 4 - ABOVE DRILL HOLE WASH WGT VAL WV	SITE 5 - EAST EDGE ESF BLOCK *RATING V	SITE 5 - EAST EDGE ESF BLOCK WGT VAL WV
ENGINEERING	0.30	0.180	0.05400	0.232	0.06960	0.211	0.06330	0.178	0.05340	0.199	0.05970
PERF. ASSESSMENT	0.30	0.132	0.03960	0.132	0.03960	0.245	0.07350	0.311	0.09330	0.179	0.05370
UNDERGROUND TESTING	0.30	0.242	0.07260	0.231	0.06930	0.158	0.04740	0.158	0.04740	0.211	0.06330
SURFACE-BASED TSTING	0.10	0.193	0.01930	0.217	0.02170	0.181	0.01810	0.181	0.01810	0.229	0.02290
TOTAL WEIGHTED VALUE			0.18550		0.20020		0.20230		0.21220		0.19960

= WEIGHTED VALUES AS A PERCENT OF TOTAL, FROM TA[illegible]S 10-13

OPTIONAL SHAFT SITING
SENSITIVITY ANALYSIS - CASE 2

DISCRIMINATOR	WEIGHT FACTOR VALUE W	SITE 1 - ABOVE COYOTE WASH *RATING V	WTG VAL WV	SITE 2 ES-2 VICINITY *RATING V	WTG VAL WV	SITE 3 DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 4 - ABOVE DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 5 - EAST EDGE ESF BLOCK *RATING V	WGT VAL WV
ENGINEERING	0.30	0.180	0.05400	0.232	0.06960	0.211	0.06330	0.178	0.05340	0.199	0.05970
PERF. ASSESSMENT	0.30	0.132	0.03960	0.132	0.03960	0.245	0.07350	0.311	0.09330	0.179	0.05370
UNDERGROUND TESTING	0.35	0.242	0.08470	0.231	0.08085	0.158	0.05530	0.158	0.05530	0.211	0.07385
SURFACE-BASED TSTING	0.05	0.193	0.00965	0.217	0.01085	0.181	0.00905	0.181	0.00905	0.229	0.01145
TOTAL WEIGHTED VALUE			0.18795		0.20090		0.20115		0.21105		0.19870

* V = WEIGHTED VALUES AS A PERCENT OF TOTAL, FROM TABLES 10-13

OPTIONAL SHAFT SITING
SENSITIVITY ANALYSIS - CASE 3

DISCRIMINATOR	WEIGHT FACTOR VALUE W	SITE 1 - ABOVE COYOTE WASH *RATING V	WTG VAL WV	SITE 2 ES-2 VICINITY *RATING V	WTG VAL WV	SITE 3 DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 4 - ABOVE DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 5 - EAST EDGE ESF BLOCK *RATING V	WGT VAL WV
ENGINEERING	0.20	0.180	0.03600	0.232	0.04640	0.211	0.04220	0.178	0.03560	0.199	0.03980
PERF. ASSESSMENT	0.15	0.132	0.01980	0.132	0.01980	0.245	0.03675	0.311	0.04665	0.179	0.02685
UNDERGROUND TESTING	0.60	0.242	0.14520	0.231	0.13860	0.158	0.09480	0.158	0.09480	0.211	0.12660
SURFACE-BASED TSTING	0.05	0.193	0.00965	0.217	0.01085	0.181	0.00905	0.181	0.00905	0.229	0.01145
TOTAL WEIGHTED VALUE			0.21065		0.21565		0.18280		0.18610		0.20470

* = WEIGHTED VALUES AS A PERCENT OF TOTAL, FROM TABLES 10-13

OPTIONAL SHAFT SITING
SENSITIVITY ANALYSIS - CASE 4

DISCRIMINATOR	WEIGHT FACTOR VALUE W	SITE 1 - ABOVE COYOTE WASH *RATING V	WTG VAL WV	SITE 2 ES-2 VICINITY *RATING V	WTG VAL WV	SITE 3 DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 4 - ABOVE DRILL HOLE WASH *RATING V	WGT VAL WV	SITE 5 - EAST EDGE ESF BLOCK *RATING V	WGT VAL WV
ENGINEERING	0.35	0.180	0.06300	0.232	0.08120	0.211	0.07385	0.178	0.06230	0.199	0.06965
PERF. ASSESSMENT	0.20	0.132	0.02640	0.132	0.02640	0.245	0.04900	0.311	0.06220	0.179	0.03580
UNDERGROUND TESTING	0.40	0.242	0.09680	0.231	0.09240	0.158	0.06320	0.158	0.06320	0.211	0.08440
SURFACE-BASED TSTING	0.05	0.193	0.00965	0.217	0.01085	0.181	0.00905	0.181	0.00905	0.229	0.01145
TOTAL WEIGHTED VALUE			0.19585		0.21085		0.19510		0.19675		0.20130

* V = WEIGHTED VALUES AS A PERCENT OF TOTAL, FROM TABLES 10-13

NORTH RAMP ACCESS

- THIS STUDY IS BEING REWRITTEN TO ADDRESS CONCERNS EXPRESSED DURING RECENT MANAGEMENT AND TECHNICAL REVIEWS
- SITING EVALUATION INCLUDES:
  - PREVIOUS SANDIA NATIONAL LABORATORY REPORTS
    - SAND84-2015 - LOCATION RECOMMENDATION FOR SURFACE FACILITIES
    - SAND84-2641 - SCP/CDR
    - SAND84-0260 - REPOSITORY DESIGN REQUIREMENTS
    - SAND85-0815 - PRELIMINARY VALIDATION OF GEOLOGY
  - LANL TPP91-5 PRELIMINARY TEST PLANNING PACKAGE
  - SAIC GEOTECHNICAL CONSIDERATIONS
  - USBR ENGINEERING GEOLOGY RECONNAISSANCE
  - PARSONS BRINKERHOFF INTERFACE CONCURRENCE
  - SNL PERFORMANCE ASSESSMENT CONCURRENCE
- CONCURRENCE ON NORTH PORTAL LOCATION RECEIVED FROM EACH PARTICIPANT

CONCLUSIONS

- SOUTH RAMP PORTAL SITE SELECTION
  - BOUNDARY RIDGE SITE PRODUCING A LONG RAMP (9200 FT) AT A LOW GRADIENT (1.6%)
  - A CLEAR "WINNER" NOT AFFECTED BY ALTERNATE WEIGHTING FACTORS
- OPTIONAL SHAFT SITE SELECTION
  - ES 2 VICINITY ALLOWING FLEXIBILITY TO ADJUST TO UNDERGROUND DRIFT LAYOUT
  - A MARGINAL "WINNER" DEFINITELY AFFECTED BY ALTERNATE WEIGHTING FACTORS
- NORTH RAMP PORTAL SITE SELECTION
  - REPORT IS TO BE REVISITED AND BASED ON EXPANDED CONSIDERATIONS FOR GEOMETRY AND GRADIENT
  - MAY CAUSE ALTERATION OF THE CONCEPTUAL DESIGN REPORT
  - MAY FOCUS ATTENTION ON CONSIDERING CHANGING FUNCTIONS OF THE NORTH AND SOUTH RAMPS