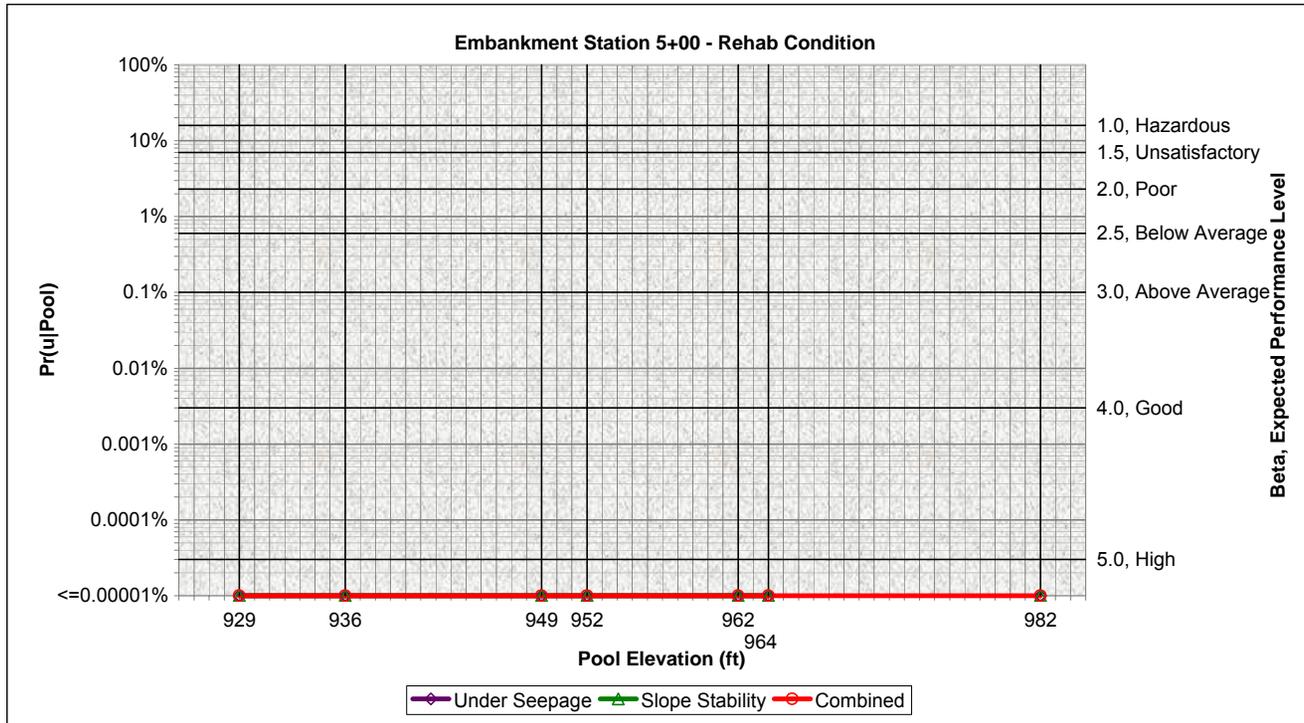**Bolivar Dam Probabilities of Unsatisfactory Performance - Rehabilitation Condition**

Embankment Station 5+00	Pool Elevation (ft)	Potential Failure Modes				Combined Pr(u|Pool)
		Under Seepage		Slope Stability		
		Pr(u|Pool)	Beta	Pr(u|Pool)	Beta	
	929	0.00000%	≥ 8.7	0 00000%	5.5	0.00000%
	936	0.00000%	≥ 8.7	0 00000%	5.5	0.00000%
	949	0.00000%	≥ 8.7	0 00000%	5.5	0.00000%
	952	0.00000%	≥ 8.7	0 00000%	5.5	0.00000%
	962	0.00000%	≥ 8.7	0 00000%	5.5	0.00000%
	964	0.00000%	8.7	0 00000%	5.5	0.00000%
	982	0.00000%	13.4	0 00000%	5.5	0.00000%

Embankment Station 5+00 - Rehab Condition

Y-axis (left): Pr(u|Pool) — 100%, 10%, 1%, 0.1%, 0.01%, 0.001%, 0.0001%, <=0.00001%

Y-axis (right): Beta, Expected Performance Level
- 1.0, Hazardous
- 1.5, Unsatisfactory
- 2.0, Poor
- 2.5, Below Average
- 3.0, Above Average
- 4.0, Good
- 5.0, High

X-axis: Pool Elevation (ft) — 929, 936, 949, 952, 962, 964, 982

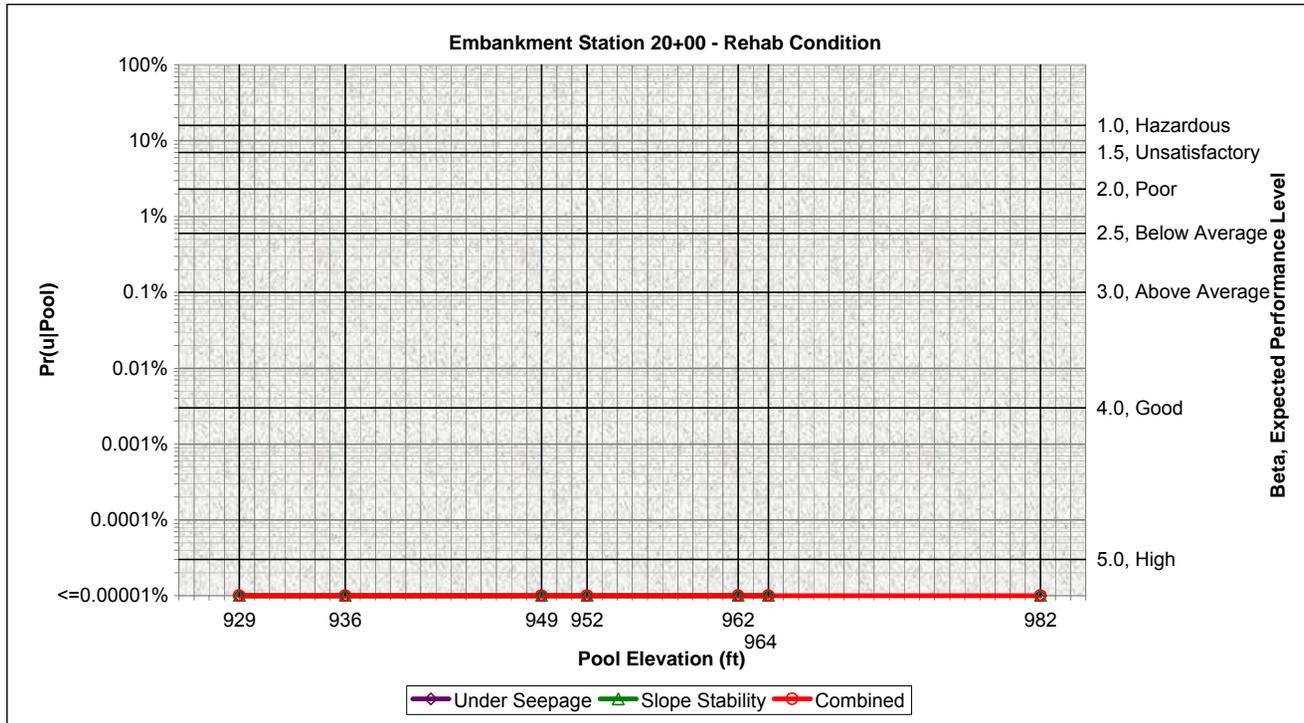Legend: Under Seepage — Slope Stability — Combined

Notes

1. Pr(u|Pool) = the probability of unsatisfactory performance due to potential failure modes (under seepage, through seepage, and slope stability) given a pool has occurred
2. Combined Pr(u|Pool) = the combined probability of unsatisfactory performance due to potential failure modes given a pool has occurred
3. The Beta values and Expected Performance Levels are plotted to correlate with Pr(u) values as specified in ETL 1110-2-547 (USACE, 1995)

Bolivar Dam Probabilities of Unsatisfactory Performance - Rehabilitation Condition

Embankment Station 20+00	Pool Elevation (ft)	Potential Failure Modes					Combined Pr(u|Pool)
		Under Seepage		Slope Stability			
		Pr(u|Pool)	Beta	Pr(u|Pool)	Beta		Pr(u|Pool)
	929	0.00000%	≥ 8.6	0 00000%	8.2		0.00000%
	936	0.00000%	≥ 8.6	0 00000%	8.2		0.00000%
	949	0.00000%	≥ 8.6	0 00000%	8.2		0.00000%
	952	0.00000%	≥ 8.6	0 00000%	8.2		0.00000%
	962	0.00000%	≥ 8.6	0 00000%	8.2		0.00000%
	964	0.00000%	≥ 8.6	0 00000%	8.2		0.00000%
	982	0.00000%	8 6	0 00000%	8.2		0.00000%

Embankment Station 20+00 - Rehab Condition

Y-axis (left): Pr(u|Pool): 100%, 10%, 1%, 0.1%, 0.01%, 0.001%, 0.0001%, <=0.00001%

Y-axis (right): Beta, Expected Performance Level: 1.0, Hazardous; 1.5, Unsatisfactory; 2.0, Poor; 2.5, Below Average; 3.0, Above Average; 4.0, Good; 5.0, High

X-axis: Pool Elevation (ft): 929, 936, 949, 952, 962, 964, 982

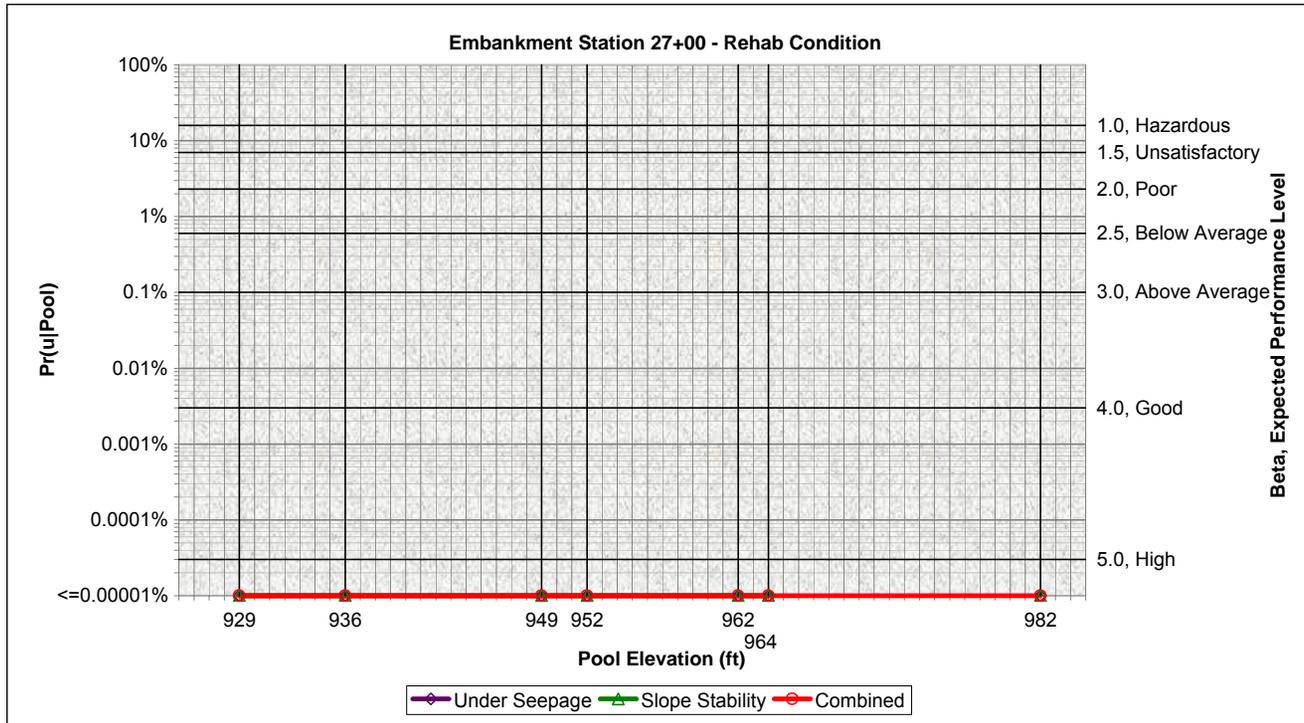Legend: Under Seepage, Slope Stability, Combined

Notes

1. Pr(u|Pool) = the probability of unsatisfactory performance due to potential failure modes (under seepage, through seepage, and slope stability) given a pool has occurred
2. Combined Pr(u|Pool) = the combined probability of unsatisfactory performance due to potential failure modes given a pool has occurred
3. The Beta values and Expected Performance Levels are plotted to correlate with Pr(u) values as specified in ETL 1110-2-547 (USACE, 1995)

Bolivar Dam Probabilities of Unsatisfactory Performance - Rehabilitation Condition

| Embankment Station 27+00 | Pool Elevation (ft) | Potential Failure Modes | | | | Combined |
| | | Under Seepage | | Slope Stability | | |
		Pr(u|Pool)	Beta	Pr(u|Pool)	Beta	Pr(u|Pool)
	929	0.00000%	≥ 5.9	0 00000%	≥ 7 3	0.00000%
	936	0.00000%	≥ 5.9	0 00000%	≥ 7 3	0.00000%
	949	0.00000%	≥ 5.9	0 00000%	≥ 7 3	0.00000%
	952	0.00000%	≥ 5.9	0 00000%	7.3	0.00000%
	962	0.00000%	≥ 5.9	0 00000%	7.0	0.00000%
	964	0.00000%	≥ 5.9	0 00000%	7.0	0.00000%
	982	0.00000%	≥ 8.5	0 00000%	8.8	0.00000%

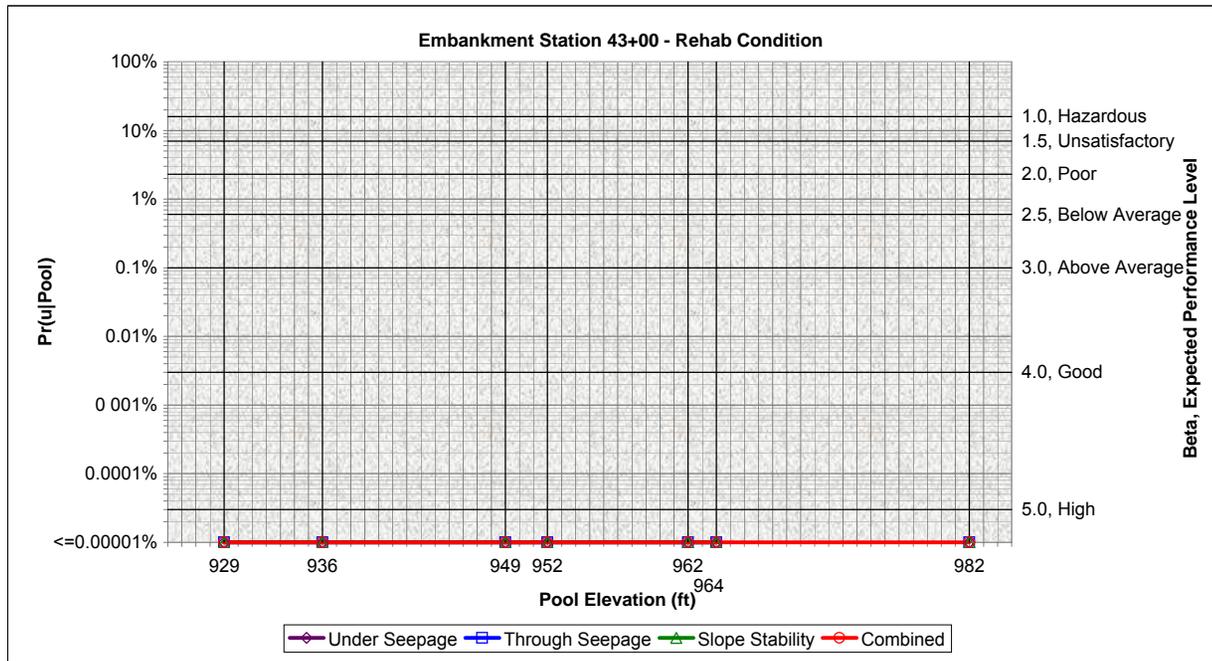Embankment Station 27+00 - Rehab Condition

Notes

1. Pr(u|Pool) = the probability of unsatisfactory performance due to potential failure modes (under seepage, through seepage, and slope stability) given a pool has occurred

2. Combined Pr(u|Pool) = the combined probability of unsatisfactory performance due to potential failure modes given a pool has occurred

3. The Beta values and Expected Performance Levels are plotted to correlate with Pr(u) values as specified in ETL 1110-2-547 (USACE, 1995)

Bolivar Dam Probabilities of Unsatisfactory Performance - Rehabilitation Condition

Embankment Station 43+00	Pool Elevation (ft)	Potential Failure Modes						Combined
		Under Seepage		Through Seepage		Slope Stability		
		Pr(u|Pool)	Beta	Pr(u|Pool)	Beta	Pr(u|Pool)	Beta	Pr(u|Pool)
	929	0 00000%	≥ 6 6	0 00000%	≥ 8.4	0.00000%	3.7	0.00000%
	936	0 00000%	≥ 6.1	0 00000%	≥ 8.4	0.00000%	3.7	0.00000%
	949	0 00000%	≥ 5.7	0 00000%	≥ 8.4	0.00000%	3.7	0.00000%
	952	0 00000%	≥ 5.7	0 00000%	8.4	0.00000%	3.7	0.00000%
	962	0 00000%	≥ 5.7	0 00001%	5 3	0.00000%	3.7	0.00001%
	964	0 00000%	5.7	0 00001%	5 2	0.00000%	3.7	0.00001%
	982	0 00000%	≥ 6 0	0 00000%	8 0	0.00000%	5 0	0.00000%

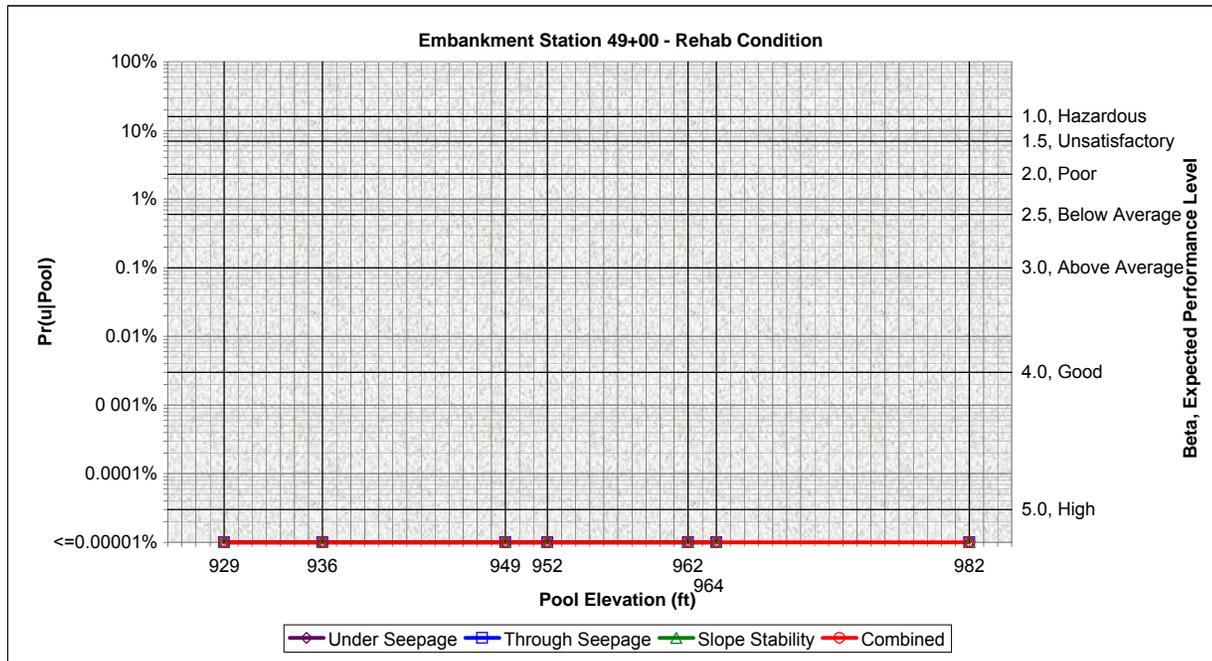Embankment Station 43+00 - Rehab Condition

Notes
1. Pr(u|Pool) = the probability of unsatisfactory performance due to potential failure modes (under seepage, through seepage, and slope stability) given a pool has occurred
2. Combined Pr(u|Pool) = the combined probability of unsatisfactory performance due to potential failure modes given a pool has occurred
3. The Beta values and Expected Performance Levels are plotted to correlate with Pr(u) values as specified in ETL 1110-2-547 (USACE, 1995)

Bolivar Dam Probabilities of Unsatisfactory Performance - Rehabilitation Condition

Embankment Station 49+00	Pool Elevation (ft)	Potential Failure Modes						Combined
		Under Seepage		Through Seepage		Slope Stability		
		Pr(u|Pool)	Beta	Pr(u|Pool)	Beta	Pr(u|Pool)	Beta	Pr(u|Pool)
	929	0 00000%	≥ 6 8	0 00000%	≥ 5.4	0.00000%	3.7	0.00000%
	936	0 00000%	7.0	0 00000%	10.1	0.00000%	3.7	0.00000%
	949	0 00000%	6.2	0 00000%	9 5	0.00000%	3.7	0.00000%
	952	0 00000%	≥ 6 2	0 00000%	8.1	0.00000%	3.7	0.00000%
	962	0 00000%	≥ 6.1	0 00000%	6.4	0.00000%	3.7	0.00000%
	964	0 00000%	≥ 6 0	0 00000%	6.1	0.00000%	3.7	0.00000%
	982	0 00000%	≥ 6 9	0 00000%	6 6	0.00000%	5 5	0.00000%

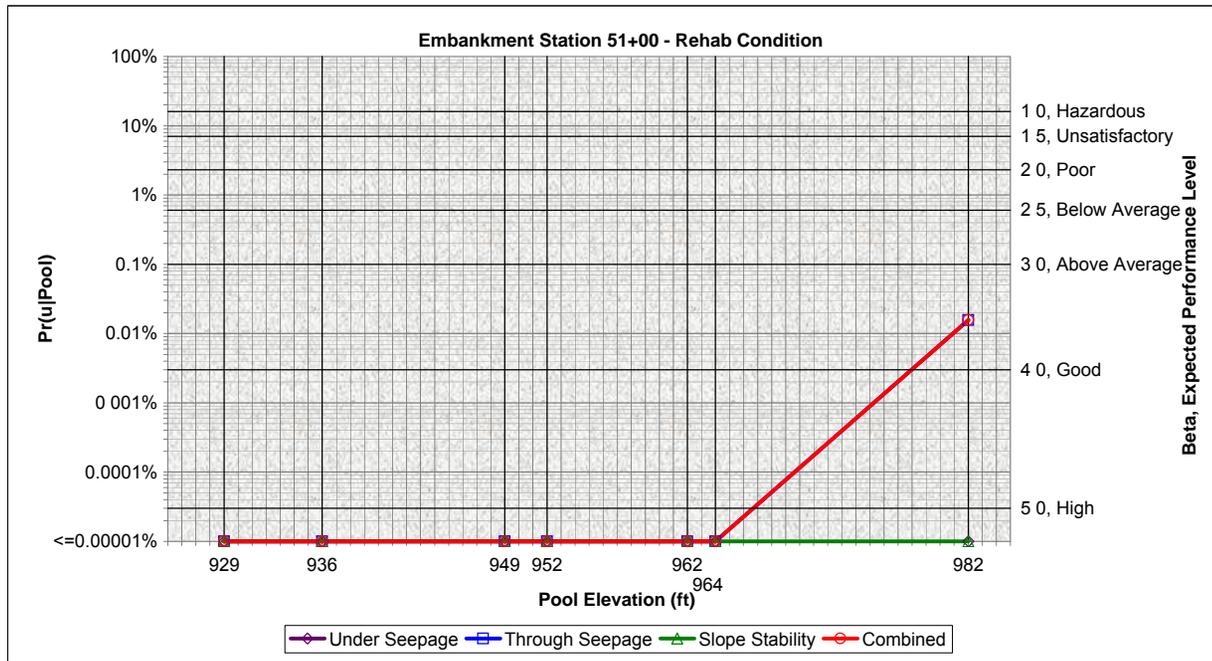Embankment Station 49+00 - Rehab Condition

Notes

1. Pr(u|Pool) = the probability of unsatisfactory performance due to potential failure modes (under seepage, through seepage, and slope stability) given a pool has occurred
2. Combined Pr(u|Pool) = the combined probability of unsatisfactory performance due to potential failure modes given a pool has occurred
3. The Beta values and Expected Performance Levels are plotted to correlate with Pr(u) values as specified in ETL 1110-2-547 (USACE, 1995)

Bolivar Dam Probabilities of Unsatisfactory Performance - Rehabilitation Condition

Embankment Station 51+00	Pool Elevation (ft)	Potential Failure Modes						Combined
		Under Seepage		Through Seepage		Slope Stability		
		Pr(u|Pool)	Beta	Pr(u|Pool)	Beta	Pr(u|Pool)	Beta	Pr(u|Pool)
	929	0 00000%	≥ 7.4	0 00000%	≥ 9.7	0.00000%	6 3	0.00000%
	936	0 00000%	7.4	0 00000%	≥ 5 6	0.00000%	6 3	0.00000%
	949	0 00000%	6.8	0 00000%	≥ 5 6	0.00000%	6 3	0.00000%
	952	0 00000%	≥ 6 8	0 00000%	≥ 5 6	0.00000%	6 3	0.00000%
	962	0 00000%	≥ 6 8	0 00000%	≥ 5 6	0.00000%	6 3	0.00000%
	964	0 00000%	≥ 6 8	0 00000%	5 6	0.00000%	6 3	0.00000%
	982	0 00000%	≥ 6 8	0 01571%	3 6	0.00000%	6 3	0.01571%

Embankment Station 51+00 - Rehab Condition

Legend: Under Seepage, Through Seepage, Slope Stability, Combined

Beta, Expected Performance Level:
- 1 0, Hazardous
- 1 5, Unsatisfactory
- 2 0, Poor
- 2 5, Below Average
- 3 0, Above Average
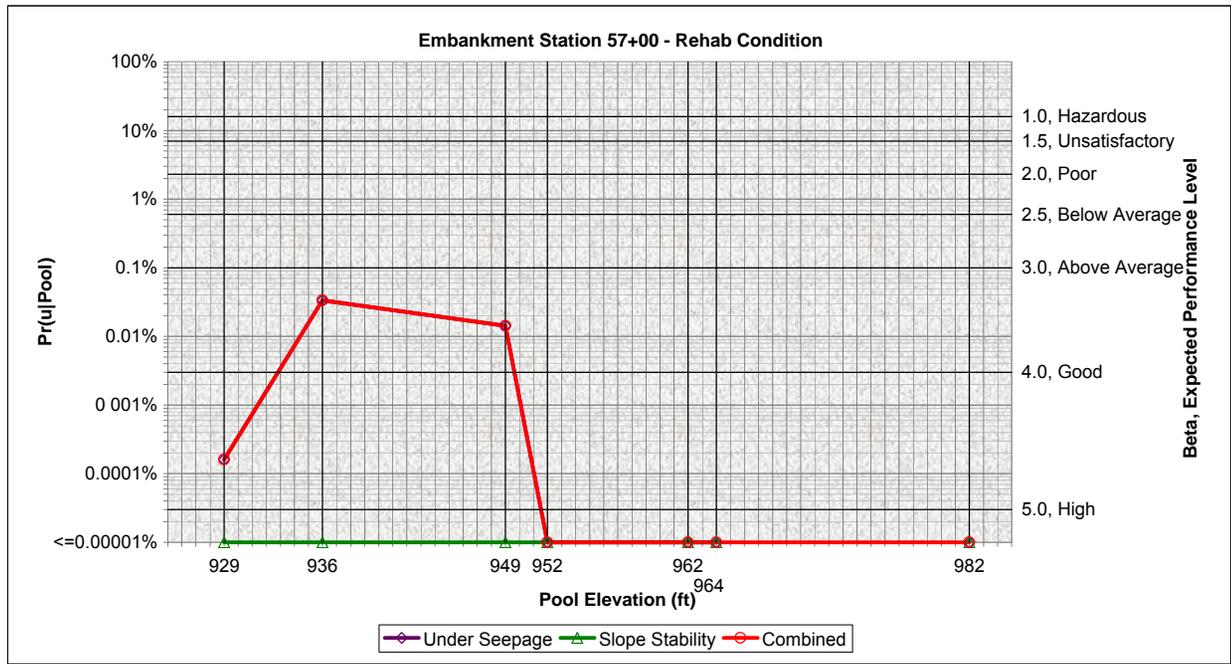- 4 0, Good
- 5 0, High

Notes
1. Pr(u|Pool) = the probability of unsatisfactory performance due to potential failure modes (under seepage, through seepage, and slope stability) given a pool has occurred
2. Combined Pr(u|Pool) = the combined probability of unsatisfactory performance due to potential failure modes given a pool has occurred
3. The Beta values and Expected Performance Levels are plotted to correlate with Pr(u) values as specified in ETL 1110-2-547 (USACE, 1995)

Bolivar Dam Probabilities of Unsatisfactory Performance - Rehabilitation Condition

| Embankment Station 57+00 | Pool Elevation (ft) | Potential Failure Modes | | | | Combined |
| | | Under Seepage | | Slope Stability | | |
		Pr(u|Pool)	Beta	Pr(u|Pool)	Beta	Pr(u|Pool)
	929	0 00016%	4.7	0 00000%	6.7	0.00016%
	936	0 03345%	3.4	0 00000%	6.7	0.03345%
	949	0 01426%	3.6	0 00000%	6.7	0.01426%
	952	0 00000%	5.9	0 00000%	6.7	0.00000%
	962	0 00000%	5.4	0 00000%	7.7	0.00000%
	964	0 00001%	5.2	0 00000%	7.7	0.00001%
	982	0 00000%	≥ 5 8	0 00000%	8.4	0.00000%

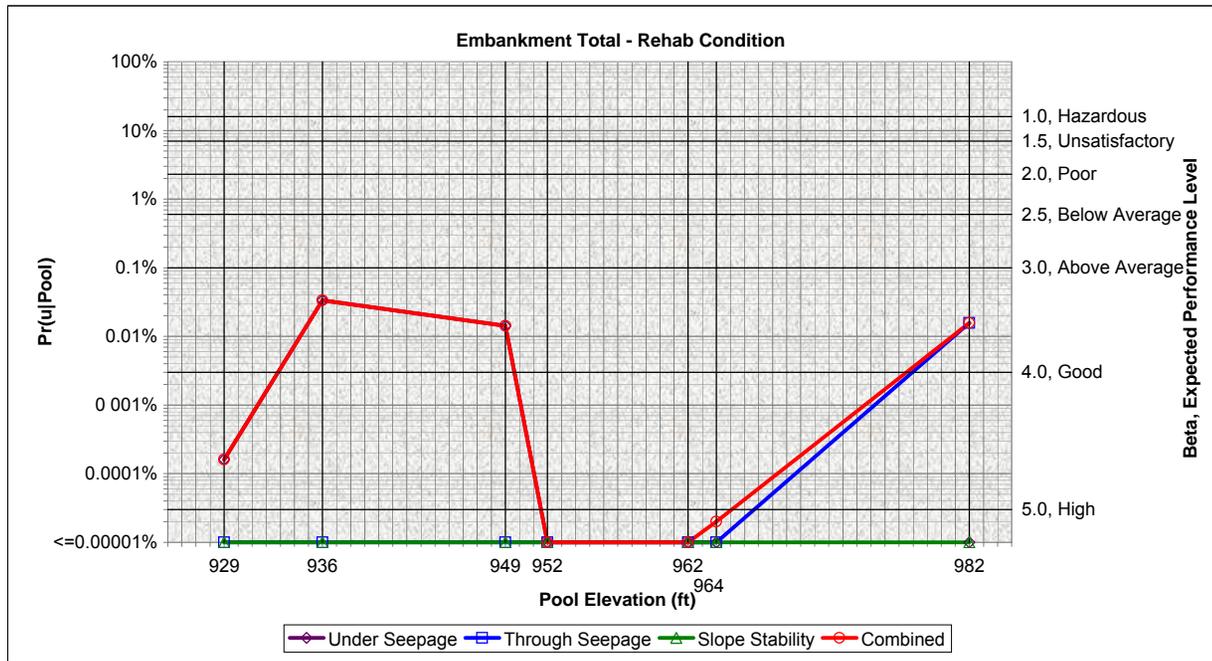Embankment Station 57+00 - Rehab Condition

Notes
1. Pr(u\|Pool) = the probability of unsatisfactory performance due to potential failure modes (under seepage, through seepage, and slope stability) given a pool has occurred
2. Combined Pr(u\|Pool) = the combined probability of unsatisfactory performance due to potential failure modes given a pool has occurred
3. The Beta values and Expected Performance Levels are plotted to correlate with Pr(u) values as specified in ETL 1110-2-547 (USACE, 1995)

Bolivar Dam Probabilities of Unsatisfactory Performance - Rehabilitation Condition

Embankment Total	Pool Elevation (ft)	Potential Failure Modes			Combined Pr(u|Pool)
		Under Seepage Pr(u|Pool)	Through Seepage Pr(u|Pool)	Slope Stability Pr(u|Pool)	
	929	0.00016%	0.00000%	0.00000%	0.00016%
	936	0.03345%	0.00000%	0.00000%	0.03345%
	949	0.01426%	0.00000%	0.00000%	0.01426%
	952	0.00000%	0.00000%	0.00000%	0.00000%
	962	0.00000%	0.00001%	0.00000%	0.00001%
	964	0.00001%	0.00001%	0.00000%	0.00002%
	982	0.00000%	0.01571%	0.00000%	0.01571%

Embankment Total - Rehab Condition

Notes

1. Pr(u|Pool) = the probability of unsatisfactory performance due to potential failure modes (under seepage, through seepage, and slope stability) given a pool has occurred
2. Combined Pr(u|Pool) = the combined probability of unsatisfactory performance due to potential failure modes given a pool has occurred
3. The Beta values and Expected Performance Levels are plotted to correlate with Pr(u) values as specified in ETL 1110-2-547 (USACE, 1995)