



NON-URBAN LEVEE EVALUATIONS

Project Overview

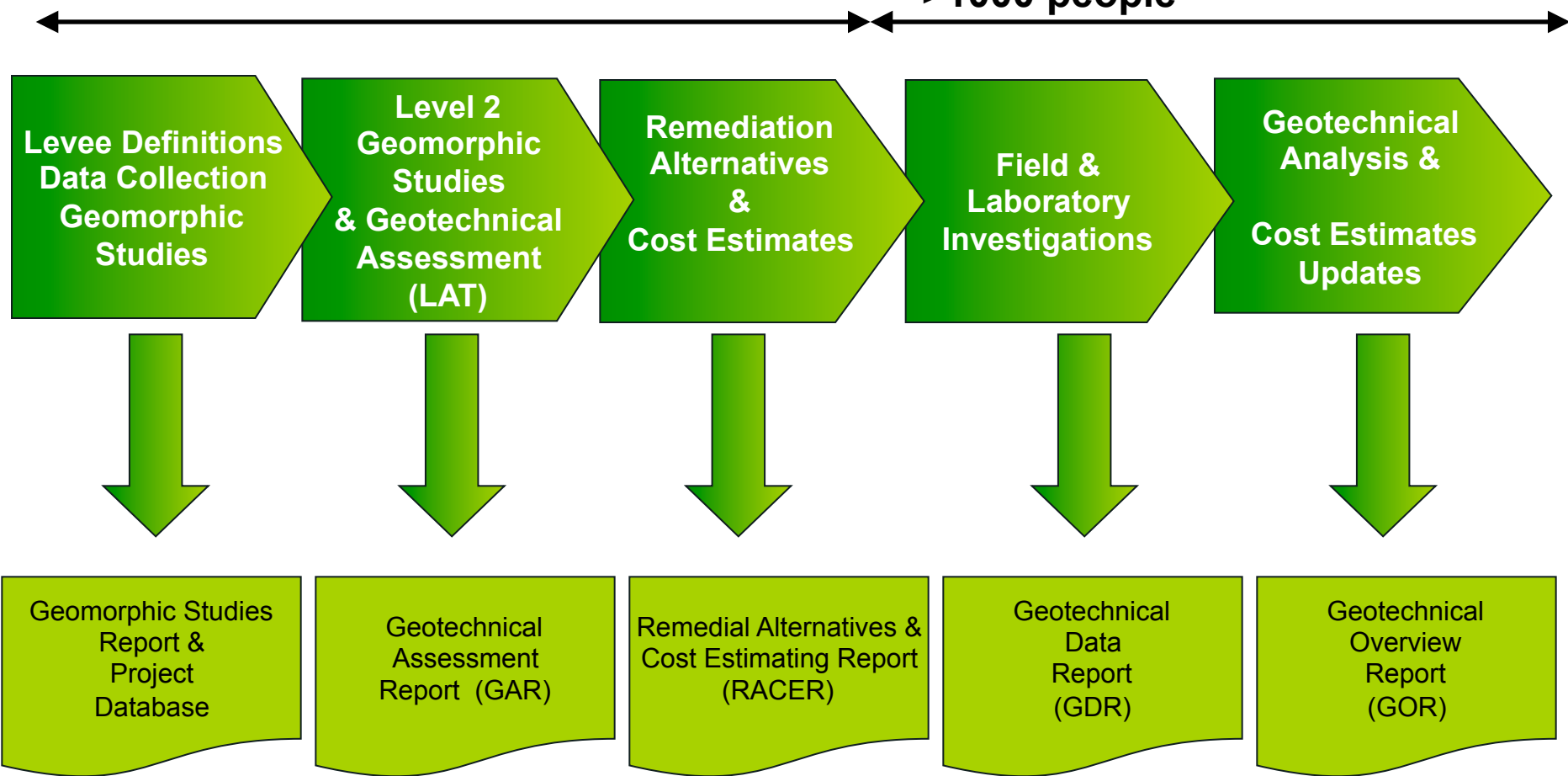
August 29, 2013



NULE PROJECT OVERVIEW

Phase 1 – all NULE Levees

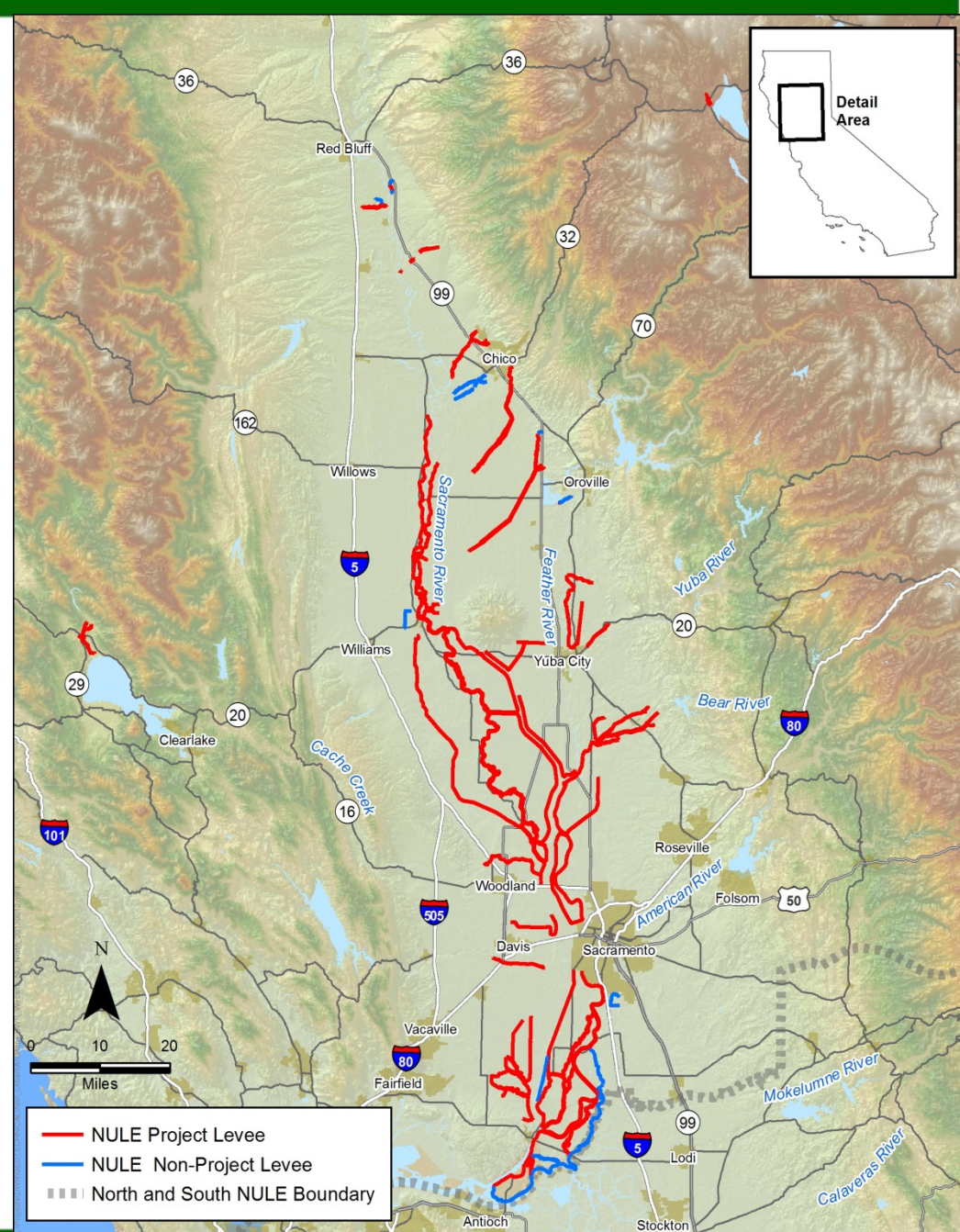
Phase 2 – levees that protect >1000 people





North NULE Area Levees

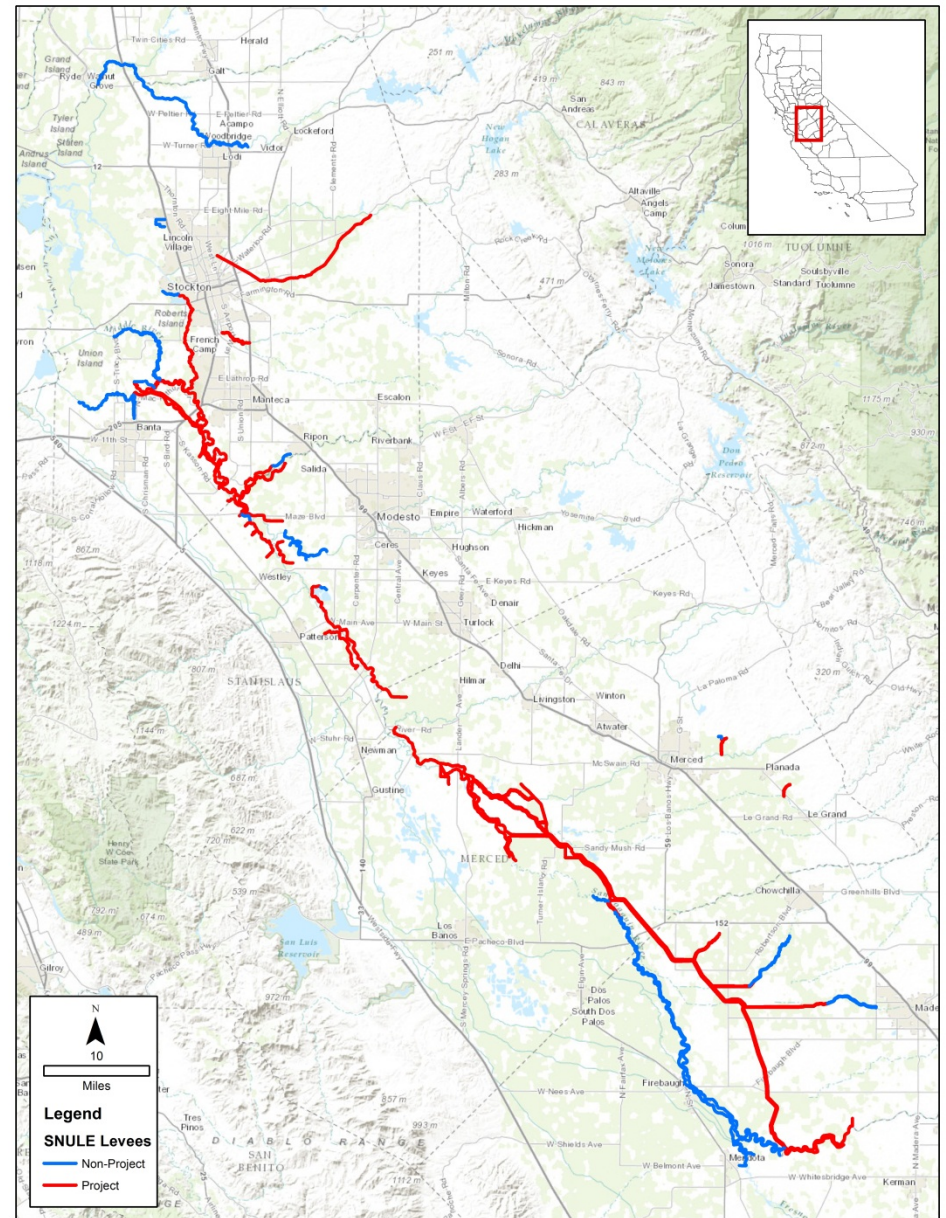
- 839 miles of Project levees (170 segments)
- 105 miles of appurtenant non-Project levee (34 segments)





South NULE Area Levees

- 375 miles of Project levees (81 segments)
- 185 miles of appurtenant non-Project levees (33 segments)

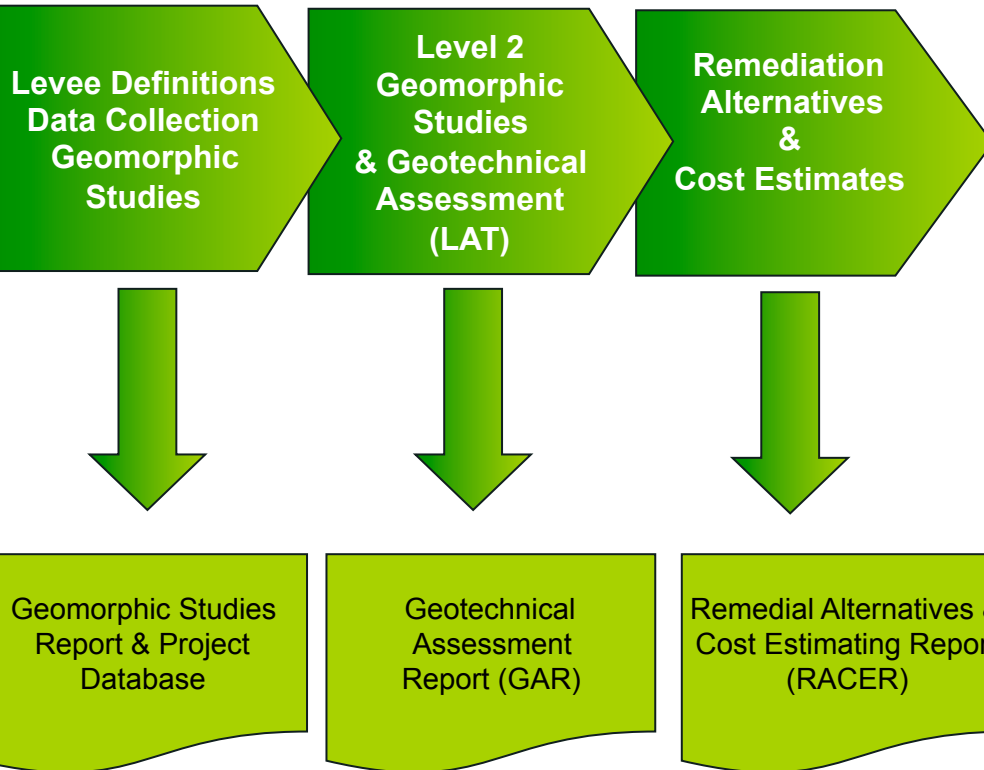




NULE PHASE I ACTIVITIES

(CONDUCTED 2008-2011)

Phase 1



Completed activities:

- Data collection
- Geomorphic mapping
- Geotechnical assessment
- Conceptual remedial alternatives and cost estimates



PHASE I – GEOTECHNICAL ASSESSMENT

Hazard Categories assigned as follows:

With water at the assessment water surface elevation,

Hazard Level A – Low likelihood of failure or flood-fighting to prevent failure

Hazard Level B – Moderate likelihood of failure or flood-fighting to prevent failure

Hazard Level C – High likelihood of failure or flood-fighting to prevent failure

Category LD – Lacking sufficient data



PHASE I – REMEDIAL ALTERNATIVES & COST ESTIMATES

- Cost estimates developed for levee segments with overall categorization of B, C, or LD
- Used a parametric cost estimating template (PCET) tool and a limited set of remedial alternatives; multiple alternatives where practical
- Results presented in Remedial Alternatives and Cost Estimates Reports
- Presents conceptual cost estimates for the deficiencies identified in the Geotechnical Assessment Report



PHASE I – REMEDIAL ALTERNATIVES & COST ESTIMATES

- Cost estimates are for comparison of remediation alternatives and for CVFPP planning purposes
 - Cost estimates are not for construction
- Cost estimates in the RACER are intended to include all significant direct and indirect costs
- Order of magnitude estimates (Class 4)
- Simplified easement, land acquisition, and environmental mitigation cost assumptions
- Contingency
- Anomalous conditions/hazards are included in the contingency factor

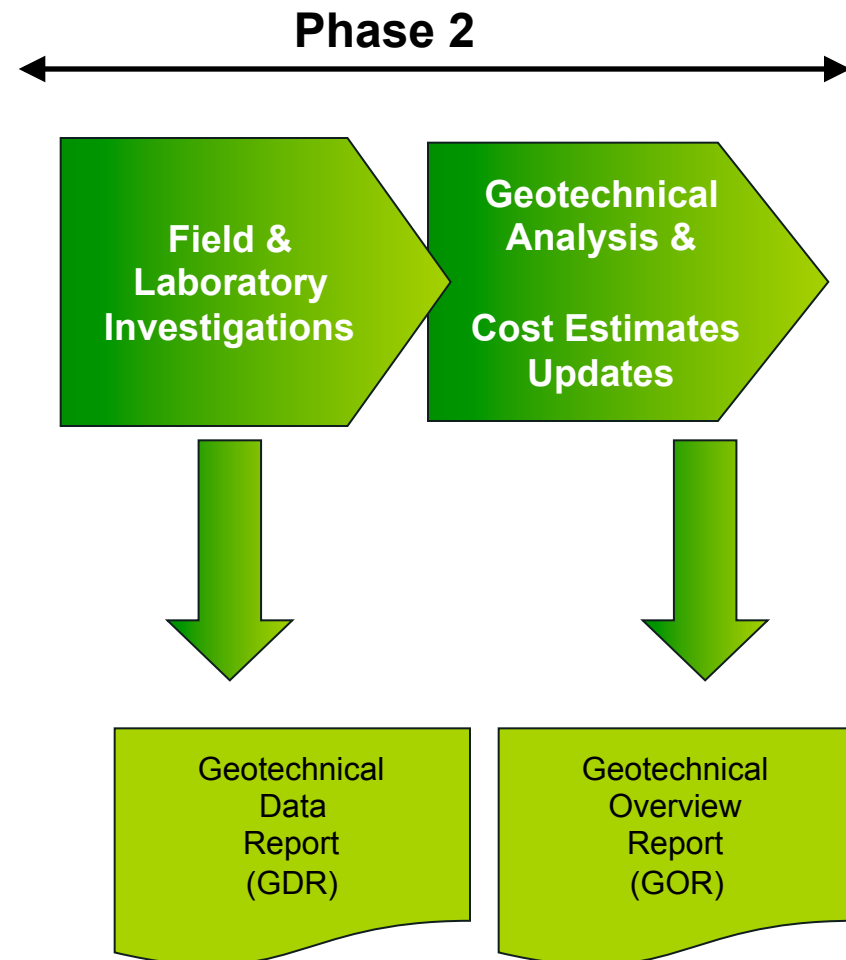


NULE PHASE 2 ACTIVITIES

(CONDUCTED 2009-PRESENT)

Status of activities:

- Field work and laboratory analyses are complete
- Preparation of final GDRs is nearly complete
- Analysis of existing and remediated conditions is complete
- Preparation of Geotechnical Overview Reports is underway





PHASE 2 – GOR STUDY AREAS

Sacramento River Basin

- Chico North and South
- Clarksburg
- Colusa Drain
- Colusa North
- Colusa South
- Gerber
- Knights Landing
- Sutter
- Wheatland
- Woodland South

San Joaquin River Basin

- Ash Slough
- Berenda Slough
- Black Rascal/Fairfield
- Diverting Canal/Mormon Slough
- Eastside Bypass/
Chowchilla Bypass
- Fresno River
- Gravelly Ford
- RD 2064
- RD 2075
- RD 2095
- SJRRP/CCID



NULE – FIELD WORK AND LABORATORY ANALYSES

- North NULE Field Work Summary
 - Approximately 150 miles of levees explored
 - 264 soil boring, 686 CPT, and 7 vane shear locations
 - Associated laboratory analyses
- South NULE Field Work Summary
 - Approximately 125 miles of levees explored
 - 210 soil boring and 699 CPT locations
 - Associated laboratory analyses



PHASE 2 – GEOTECHNICAL OVERVIEW REPORT (GOR)

- Geotechnical evaluation and modeling for levee segments where field work was conducted
- Applied to reaches
- Incorporates new information from stakeholders, where available
- Geotechnical analysis of existing and remediated conditions
 - Seepage Analyses
 - Stability Analyses

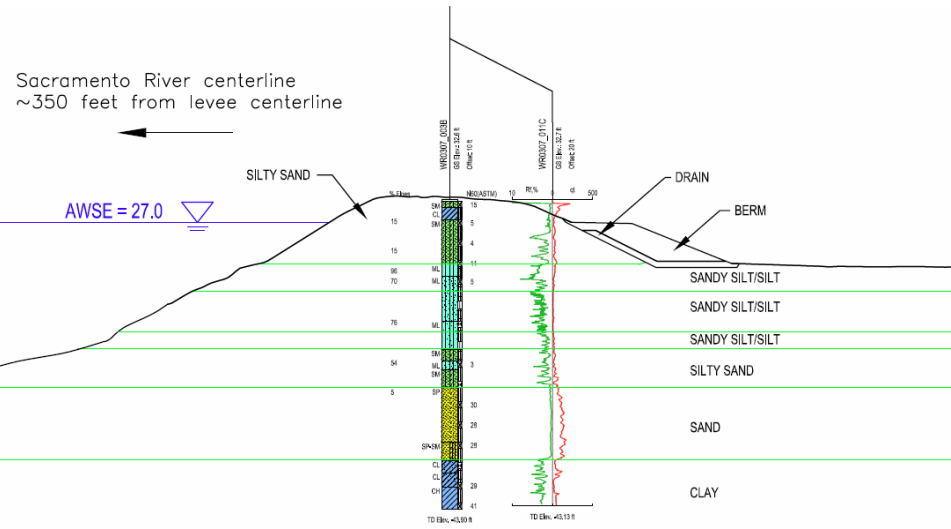


PHASE 2 – GEOTECHNICAL OVERVIEW REPORT (GOR)

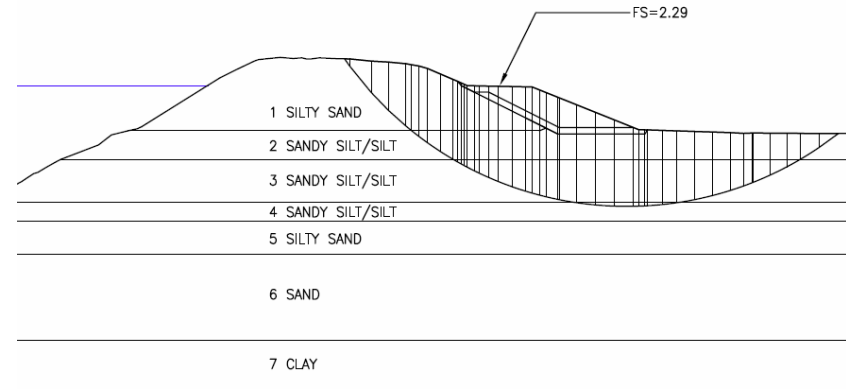
- Anomalous conditions/hazards – levee features that potentially impact the levee performance but affect less than about 500 feet of levee length – not analyzed
- Updated cost estimates for remedial alternatives



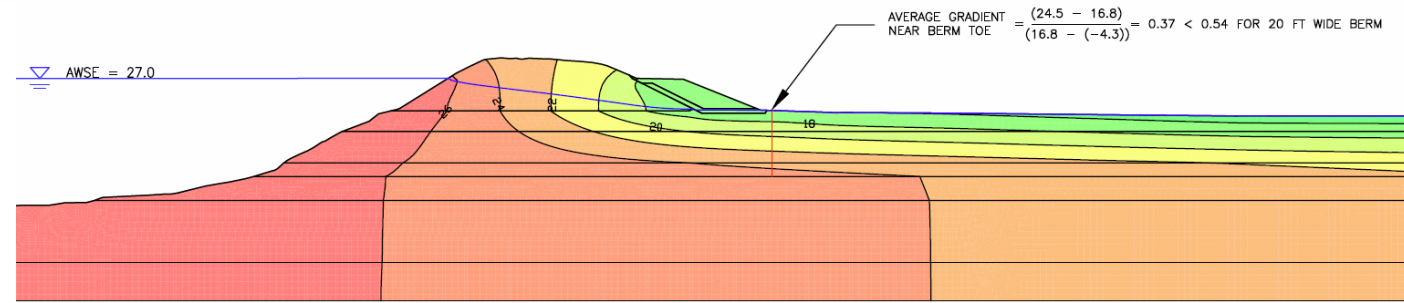
GEOTECHNICAL ANALYSES WITH LEVEE IMPROVEMENT ALTERNATIVES – REACH D



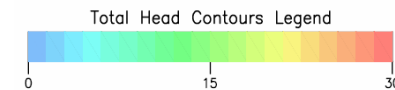
Geologic Cross Section



Stability Results



Seepage Results





DRAFT CONCEPTUAL COST ESTIMATES FOR REMEDIAL ALTERNATIVES

Reach	Reach Length, ft	Freeboard/Geometry	Erosion	Seepage	Slope Stability	Fill Ditch	Totals
A	1,736	--	\$1,450,000 ⁽¹⁾	\$1,262,000	--	--	\$2,712,000
B	6,963	--	\$6,867,000 ⁽¹⁾	\$7,581,000	--	--	\$14,448,000
C	7,493	--	\$5,542,000 ⁽¹⁾	\$18,211,000	--	--	\$23,753,000
D	11,750	--	\$9,222,000 ⁽¹⁾	\$14,292,000	--	--	\$23,514,000
E	5,000	--	\$3,924,000 ⁽¹⁾	\$14,455,000	--	--	\$18,379,000
F	8,000	--	\$6,279,000 ⁽¹⁾	\$9,846,000	--	--	\$16,125,000
G	10,000	--	\$9,203,000 ⁽¹⁾	\$22,844,000	--	--	\$32,047,000
H	8,044	\$222,000 ⁽¹⁾	\$4,451,000 ⁽¹⁾	\$15,630,000	--	--	\$20,303,000
J	7,530	\$4,742,000	--	\$15,873,000	--	\$258,000	\$20,873,000
K	6,550	\$4,031,000	--	\$18,145,000	--	\$224,000	\$22,400,000
L	9,100	\$3,877,000 ⁽¹⁾	--	\$18,464,000	--	\$312,000	\$22,653,000
N	2,400	--	--	--	--	\$160,000	\$160,000
Totals:	82,166	\$12,872,000	\$46,938,000	\$156,603,000	--	\$954,000	\$217,367,000
NOTE:							
(1)	Length of remedial alternative is less than the Reach Length.						

No Reach I in Clarksburg Study area



PHASE 2 – GEOTECHNICAL OVERVIEW

- Results will be presented in a two volume Geotechnical Overview Report
 - Volume 1 – Existing Conditions
 - Volume 2 – Remediated Conditions
- GOR results supersede GAR results
- Scheduled for completion in 2014



NULE SUMMARY OF DELIVERABLES

- Phase 1
 - Levee Evaluation Program database and geodatabase
 - Geomorphology Technical Memoranda and Maps
 - Geotechnical Assessment Reports (GAR)
 - Remedial Alternatives and Cost Estimates Report (RACER)
- Phase 2
 - Geotechnical Data Reports (GDR)
 - Geotechnical Overview Reports (GOR) – in process



Questions