MOSSDALE TRACT AREA URBAN FLOOD RISK REDUCTION STUDY

September 16, 2021

Prepared for:

San Joaquin Area Flood Control Agency
California Department of Water Resources

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Appendix E – Economic and Life Loss Evaluation Technical Memorandum

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Appendix H – KSN ULDC 2040 Cost Estimate

Appendix I – PBI Alternative 3 2040 Cost Estimate

Acronyms

AB 838	Assembly Bill 838
ACE	Annual Chance Exceedance
APR	Adequate Progress Report
BCR	Benefit/Cost Ratio
BWFS	Basin-Wide Feasibility Study
CCTAG	Climate Change Technical Advisory Group
CEQA	California Environmental Quality Act
CPA	Conservation Planning Area
CVFED	Central Valley Floodplain Evaluation and Delineation
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CVHS	Central Valley Hydrology Study
DIF	Development Impact Fee
DPS	Distinct Population Segment
DSC	Delta Stewardship Council
DWR	Department of Water Resources
DWSE	Design Water Surface Elevation
EAD	Expected Annual Damages
EAH	Expected Annual Habitat
EALL	Expected Annual Life Loss
EAP	Emergency Action Plan
EIFD	Enhanced Infrastructure Financing District
EO	Executive Order
ES	Executive Summary
ESU	Evolutionary Significant Units
FDA	Flood Damage Analysis
FEMA	Federal Emergency Management Agency
FRM	Flood Risk Management
GIS	Geographic Information System
HEC	Hydrologic Engineering Center
HWY	Highway
IPE	Independent Panel of Experts

Acronyms

JEPA	Joint Exercise of Powers Agreement
JPA	Joint Powers Authority
LSJ/DS RFMP	Lower San Joaquin River and Delta South Regional Flood Management Plan
LSJRFS	Lower San Joaquin River Feasibility Study
LSRP	Levee Seepage Repair Project
LWA	Larson Wurzel & Associates
MID	Modesto Irrigation District
MTOL	Minimum Top of Levee
NAVD	North American Vertical Datum
NED	National Economic Development
NEPA	National Environmental Policy Act
NRDC	Natural Resources Defense Council
OAD	Overlay Assessment District
OES	Office of Emergency Services
O&M	Operations and Maintenance
OMR	Operation, Maintenance, and Repair
OMRRR	Operation, Maintenance, Repair, Replacement and Rehabilitation
PBI	Peterson Brustad, Inc
PCB	Paradise Cut Bypass
PPS	Person Per Structure
RAS	River Analysis System
RD	Reclamation District
RFMP	Regional Flood Management Plan
RM	River Mile
ROW	Right of Way
SB5	Senate Bill 5
SGMA	Sustainable Groundwater Management Act
SJAFCA	San Joaquin Area Flood Control Agency
SJMSCP	San Joaquin County Multi-Species Habitat Conservation and Open Space Plan
SJR	San Joaquin River
SLR	Sea Level Rise
SPFC	State Plan of Flood Control

Acronyms

SRA	Shaded Riverine Aquatic
SSIA	State Systemwide Investment Approach
TBD	To Be Determined
UFRR	Urban Flood Risk Reduction
ULDC	Urban Levee Design Criteria
ULOP	Urban Level of Protection
USACE	United States Army Corps of Engineers
WOP	Without Project
WP	With Project

Executive Summary

Introduction

The purpose of the Mossdale Tract Area Urban Flood Risk Reduction Study (UFRR Study) is to identify a plan acceptable to both local and State sponsors to achieve an urban level of protection (ULOP) in the Mossdale Tract Area. This UFRR Study report describes the planning process followed to develop and evaluate an array of alternatives and identify the Preferred Plan.

A separate and subsequent effort will examine the alternatives in compliance with the California Environmental Quality Act (CEQA). In addition, a separate effort to re-engage the United States Army Corps of Engineers (USACE) in an appropriate level of study to seek Federal authorization will be launched on a timetable separate from this UFRR study. It is assumed that the analyses and findings in this UFRR study will be utilized in the subsequent USACE study and as such, this UFRR Study has been scoped to provide a helpful and relevant product to support that subsequent USACE study.

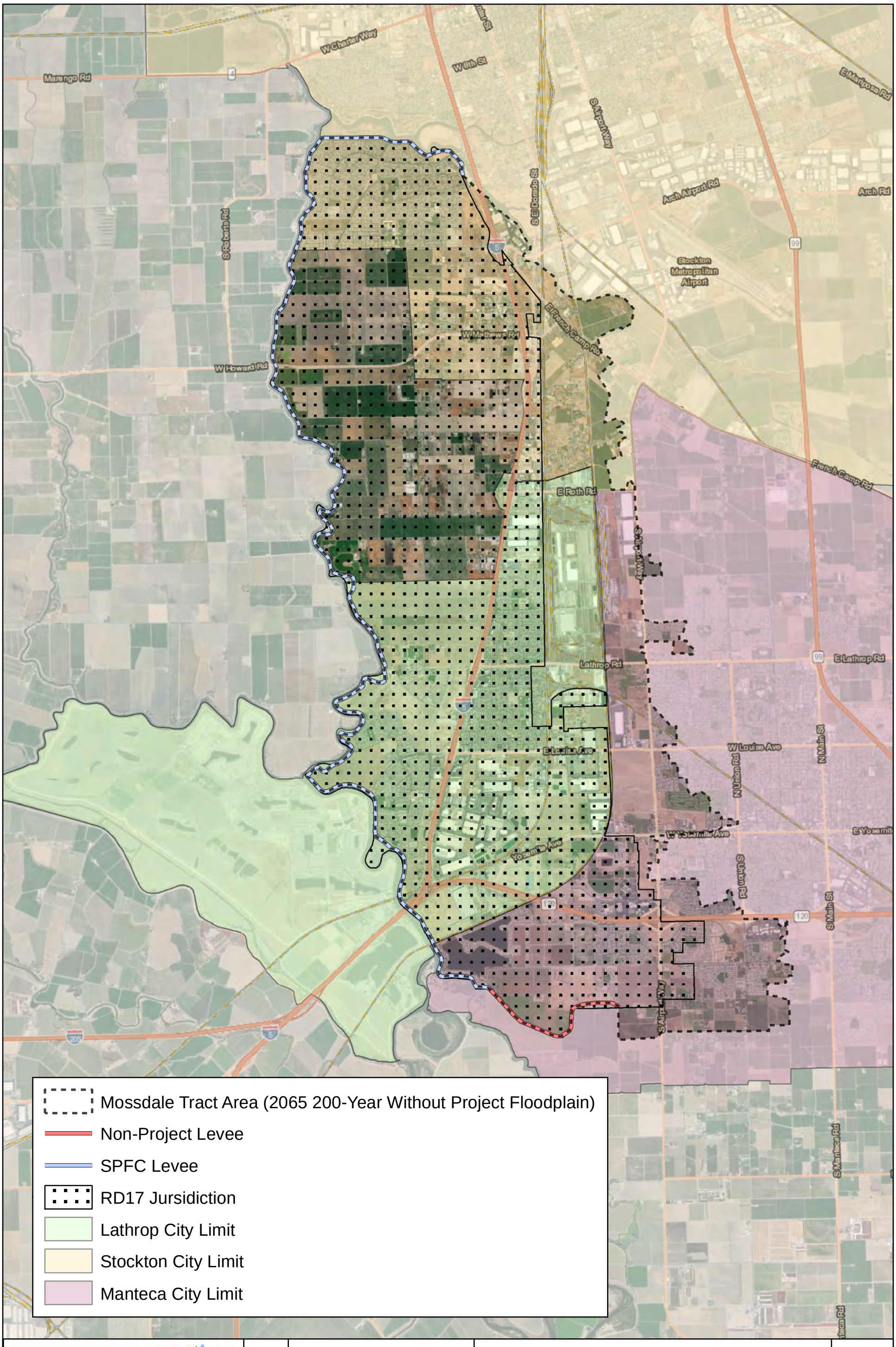
Several previous studies have been completed by federal, State, and local entities. The analyses presented herein capitalize on that prior work to the extent possible, and supplement or modify portions as required to meet the State and local objectives for this study.

Study Area

The Mossdale Tract area, as defined in this study, includes urban portions of Stockton, Lathrop, Manteca, and areas of unincorporated San Joaquin County which are protected by the Reclamation District 17 (RD 17) levee system. The eastern boundary of the Mossdale Tract area was defined in this study to be coincident with the composite 200-year without-project floodplain for 2065 climate conditions (Figure ES-1). This floodplain was selected to ensure adequate conservatism. The study area totals 22,400 acres, which is characterized as urban and urbanizing, with a largely rural subarea which is not planned for any development. The Cities of Stockton, Lathrop, and Manteca, and San Joaquin County control all land use decisions within the area.

RD 17 is a separate political entity with a jurisdictional area of 16,110 acres that is fully contained within the Mossdale Tract area. The RD 17 levee system, authorized by the Lower San Joaquin River and Tributaries Project in the Flood Control Act of 1944, is comprised of State-Federal Project levees (also referred to as State Plan of Flood Control, or SPFC levees) along the San Joaquin River and French Camp Slough, which form the west and north borders of RD 17, and a non-Project dryland levee which borders RD 17 on the south. The land generally slopes east to west, and there is no levee along the east side of the RD 17 jurisdiction. So, the interior drainage watershed extends to the east of RD 17.

The current population of the area is estimated to be 45,000. Critical facilities protected from flooding by RD 17 levees include the Veterans Affairs clinic, San Joaquin General Hospital, Kaiser Permanente Manteca Medical Center, San Joaquin County Jail, San Joaquin County Honor Farm, San Joaquin County Juvenile Hall, 32 schools, numerous facilities that house and/or provide services to vulnerable populations that would need special assistance during an evacuation due to flooding, four (4) fire stations, two (2) police stations, two (2) wastewater treatment plants, Interstate 5 (I-5), State Highway (HWY) 120, and two (2) major railroads. A new Veterans Affairs Hospital is also under construction in the area.



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MOSSDALE TRACT AREA

Mossdale Tract Area Overview

FIGURE ES-1

Study Sponsors and Participants

The local lead agency for this effort was initially the City of Lathrop, acting on behalf of both the cities of Lathrop and Manteca. The California Department of Water Resources (DWR) funded 50% of the cost of the study and participated as a study partner. In November 2017, the San Joaquin Area Flood Control Agency (SJAFCA), consisting of the City of Stockton, San Joaquin County, and the San Joaquin County Flood Control and Water Conservation District, modified its joint powers authority (JPA) structure to add the Cities of Lathrop and Manteca. The UFRR grant agreement and lead agency status were then transferred to SJAFCA in February 2020.

Problems, Opportunities, Goals, Objectives, and Constraints

Problems

- There is a significant risk to public health, safety and property associated with flooding, including an existing resident population of 45,000 people plus 1,700 temporarily housed people in jails and hospitals, 15,450 structures, and 45 critical facilities. The primary flood risk in the study area is from geotechnical failure of the existing levees. Levee overtopping or flanking is also a risk in the larger floods, especially in the future with climate change. Geotechnical failures caused by through-levee seepage or under-seepage are typically sudden and unpredictable, and can produce large volume, high velocity flood flows. These failures come during winter and spring with little warning, with minimal time for evacuation and emergency actions. Overtopping and flanking floods are much more predictable, so evacuation is much more effective for these failure mechanisms.
- The levees do not currently meet Urban Levee Design Criteria (ULDC) and therefore do not provide an ULOP for existing climate conditions.
- DWR analyses predict that climate change impacts on the San Joaquin River System will be extreme in the next 50 years, which will only further exacerbate existing problems.
- The ecosystem habitat within the study area has suffered from degradation.

Opportunities

- Reduce flood risk in the study area
- Improve habitat adjacent to project areas
- Integration with other federal, State, and local Initiatives for systemwide benefit
- State and/or federal financial participation

Goals

For this UFRR study, the State Central Valley Flood Protection Board's (CVFPB) 2017 Central Valley Flood Protection Plan (CVFPP) (California Department of Water Resources, 2017) program goals apply.

Primary Goal: Improve flood risk management

Supporting Goals:

- Improve operations and maintenance (O&M)
- Promote ecosystem functions
- Improve institutional support

- Promote multi-benefit projects

Objectives

Planning Objectives

The planning objectives are identical to the goals of the study which are primarily to improve flood risk management with supporting objectives of improving operations and maintenance (O&M), promoting ecosystem functions, improving institutional support, and promoting multi-benefit projects.

Study Objectives

Primary Study Objective: Develop a plan with net economic and life loss benefits that will provide a 200-year ULOP for the Mossdale Tract Area. The planning horizon for design of alternatives is year 2040 climate conditions, consistent with the flood risk management goal of the Cities of Lathrop, Manteca, and Stockton making 15-year findings that a ULOP exists in 2028. Future performance and climate resilience will be estimated for 2065 climate conditions.

Additional Study Objectives:

- Reduce and manage residual risk to public life safety, property, and critical infrastructure
- Reduce State's liability due to failure of SPFC levees
- Address State and Federal policies for wise use of the floodplain
- Identify alternatives to maximize State and Federal investment
- Incorporate environmental habitat components where possible
- Design a project that will be resilient to future predicted climate change
- Design a project that will not significantly increase O&M costs
- Develop project that all local agencies can agree upon to best maintain existing institutional support
- Select an alternative which allows some or all elements to be implemented quickly to both promptly reduce risk as well as satisfy Senate Bill 5 (SB5) requirements for the cities within the Mossdale Tract area

Constraints

There were two (2) clear constraints that were identified in this study:

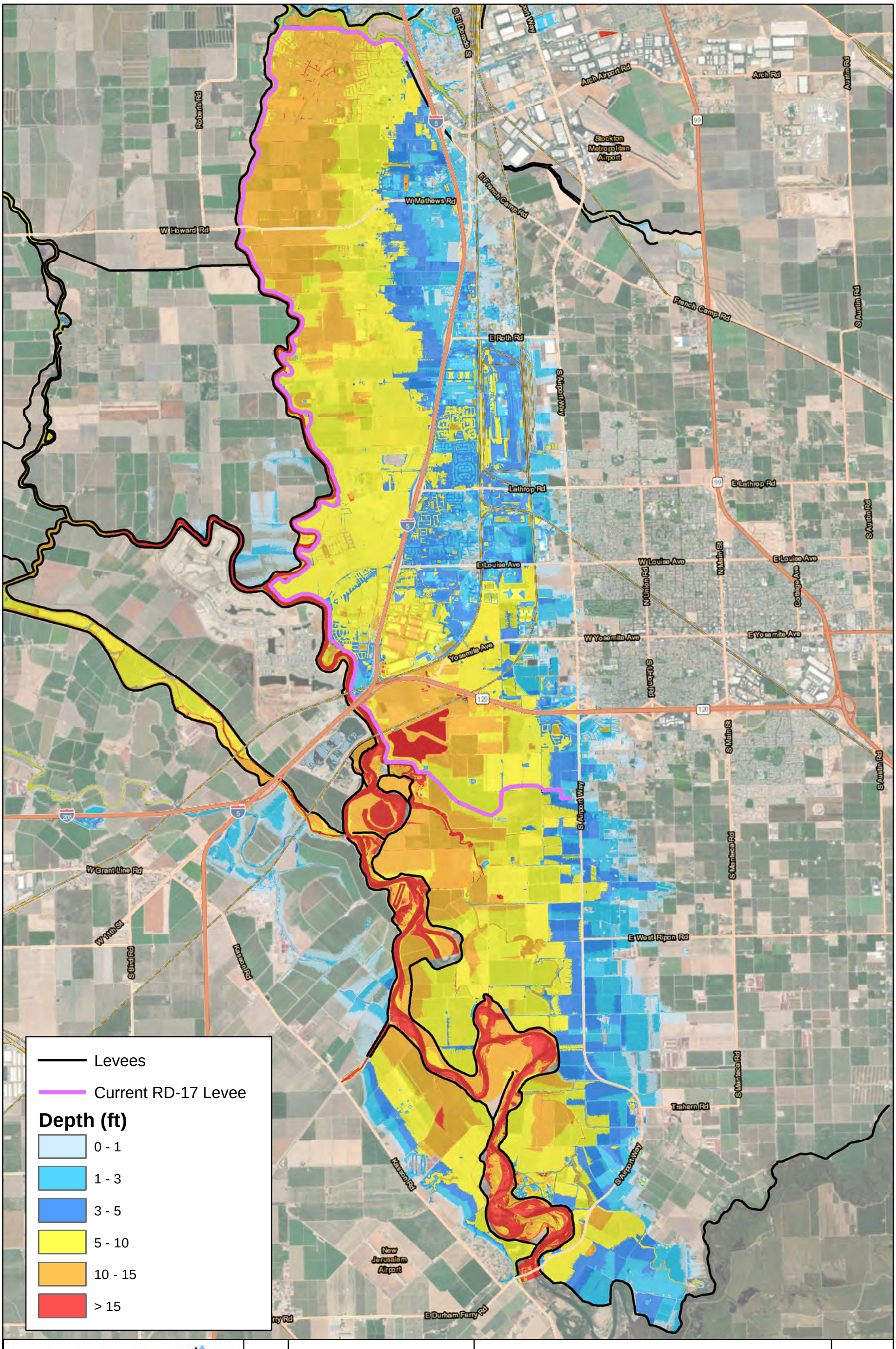
- State and federal policy requires wise use of the floodplain.
- Projects must comply with applicable federal, State, and local laws, regulations, and policies.

Without Project Conditions

For this study, there are two without-project conditions; the 2018 without-project condition (also known as existing conditions), and 2065 without-project conditions (assuming climate change predictions shown in the 2017 CVFPP). Due to ULOP requirement, it is assumed that in both without-project condition scenarios no urbanization or population growth occurs within the study area.

Figures ES-2 and ES-3 show the 200-year composite without project floodplain for existing conditions and 2065 climate change conditions, respectively. It should be noted that within the timeframe of this UFRR study, the RD 2062 levees on Stewart Tract were improved to 200-year standards. The hydraulic

modeling for this study predates the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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Exisiting Conditions 200-Year Composite Floodplain

FIGURE
ES-2

Levees

Current RD-17 Levee

Depth (ft)

- 0 - 1
- 1 - 3
- 3 - 5
- 5 - 10
- 10 - 15
- > 15

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Year 2065 Climate Conditions 200-Year Composite Floodplain

FIGURE ES-3

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.

Alternative Formulation

As noted previously, the scope of work for this UFRR Study was intended to capitalize on the prior work of several State, federal, and local studies, and to focus the UFRR study work effort on more detailed evaluation of alternatives previously identified. During the scoping process, an initial array of alternatives consisted of the alternative arrays from two (2) source studies:

- San Joaquin River Basin Lower San Joaquin River, CA FINAL Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report (LSJRFS) (United States Army Corps of Engineers, 2018),
- Draft San Joaquin River Basin-wide Feasibility Study (BWFS) (California Department of Water Resources, 2017)

Combining the alternatives from each of these sources resulted in more than 12 alternatives that were populated into an evaluation criteria matrix. This matrix was developed specifically to address the study goals, objectives, and constraints listed above. This initial array of alternatives was evaluated against the criteria using available metrics presented in the source documents including but not limited to the application of Wise Use of the Floodplain. A qualitative screening was performed based on the evaluation matrix, resulting in a number of alternatives being removed from the initial array, primarily because of poor economic performance. Then the remaining alternatives were further reduced by combining substantially similar alternatives as to simplify the analysis and comparison. Through this extensive process, a final array of seven (7) alternatives were identified, added directly to the scope of work, and analyzed as part of this study:

1. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR forecast, with local assurances for wise use of the floodplain. The key feature of local assurances is existing statutory development prohibitions in the State's Delta Plan.

2. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR forecast, with binding easements on about 5,100 acres for wise use of the floodplain, and inclusion of the Old River phased secondary/setback levee ecosystem restoration element.

3. Partial fix-in-place of levees fronting Lathrop and Manteca, plus a new secondary levee along the northern boundary of Lathrop. Levee improvements accommodate year 2040 climate change based on DWR forecast. Growth north of that line would be restricted by SB5 (no ULOP). Alternative 3 also includes the Old River phased secondary/setback levee ecosystem restoration element.

4a. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR forecast, with existing statutory development prohibitions in the State's Delta Plan and binding easements on about 1,430 acres for wise use of the floodplain, and inclusion of ecosystem restoration element(s). Initially the ecosystem restoration elements called for the Old River phased secondary/setback levee ecosystem restoration element, and additional Old River dry restoration. Further discussion with DWR later identified other suitable habitat restoration opportunities that can also serve as options for this element, as described in the *Preferred Plan* chapter of this report.

4b. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR

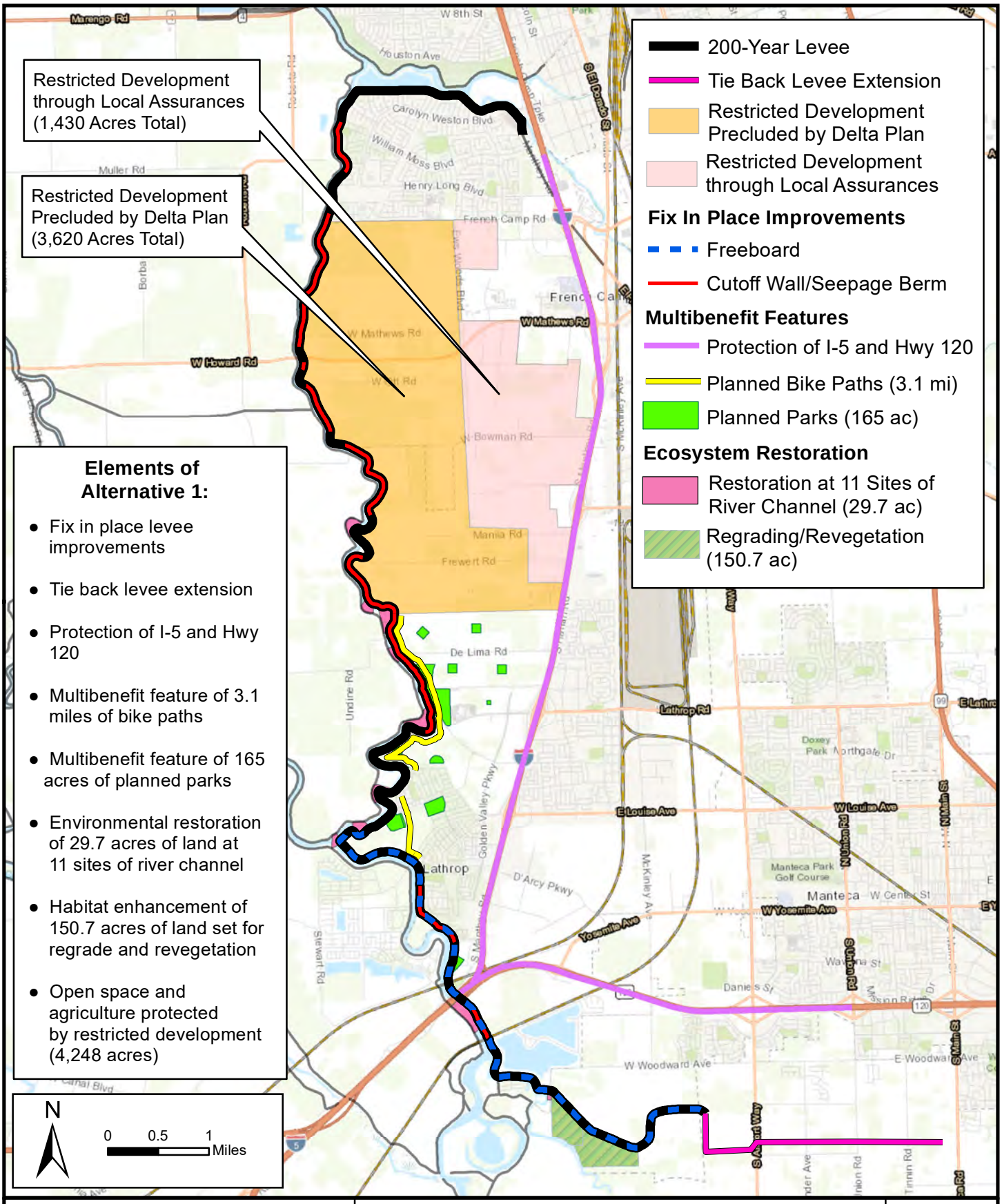
forecast, with local assurances for wise use of the floodplain, inclusion of the Old River phased secondary/setback levee ecosystem restoration element, and additional Old River dry restoration. The key feature of local assurances is existing statutory development prohibitions in the State's Delta Plan.

4c. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR forecast, with existing statutory development prohibitions in the State's Delta Plan and binding easements on about 1,430 acres for wise use of the floodplain, and inclusion of Old River dryland habitat ecosystem restoration.

4d. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR forecast, with local assurances for wise use of the floodplain, and inclusion of Old River dryland habitat ecosystem restoration. The key feature of local assurances is existing statutory development prohibitions in the State's Delta Plan.

Each of the alternatives include a number of features which act together to reduce flood risk. Key features of the final array of alternatives are described above. However, additional formulation was required to more fully define the structural and non-structural makeup of the alternatives. Alternatives include levee improvements, ecosystem restoration, multi-benefit features, wise use of floodplain features, and residual risk management features.

It is important to note that various ecosystem restoration features are located outside of the study area shown in Figure ES-1 but are considered features of the alternatives because of the close proximity and the benefit to the Mossdale Tract area. Alternative sizing is based on year 2040 climate change 200-year conditions, which is consistent with the goal of the local land use agencies being able to make 15-year extended findings by the year 2028 that an ULOP exists. The sizing criteria are also consistent with ULOP and ULDC, which require that findings be made based on a 20-year period. Key features of the final array of alternatives are shown in Figures ES-4, ES-5, ES-6, ES-7, ES-8, ES-9, and ES-10. A summary of the Old River element for each of the alternatives is shown in Figure ES-11.



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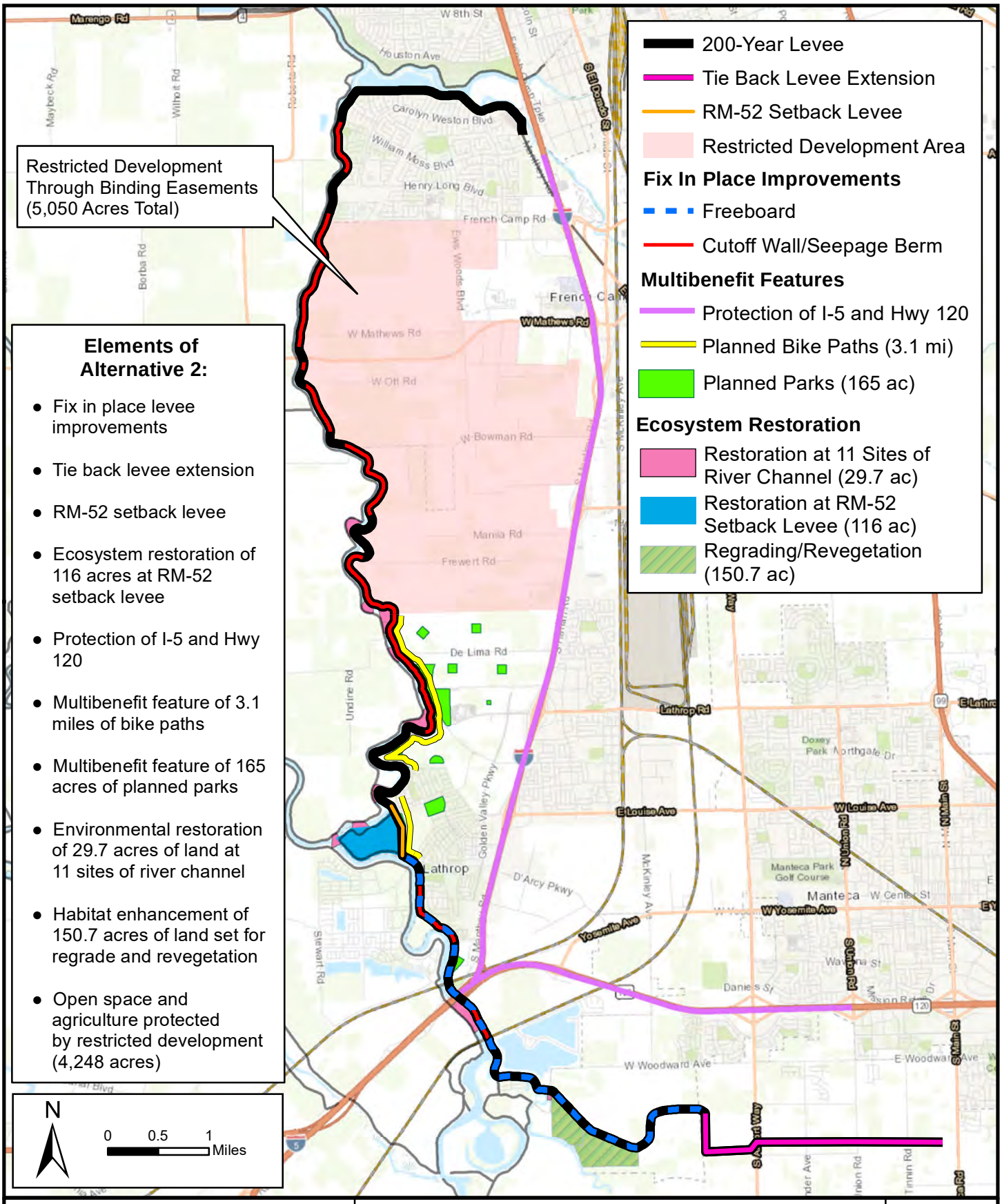
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MOSSDALE TRACT AREA

Key Features of Alternative 1

FIGURE

ES-4



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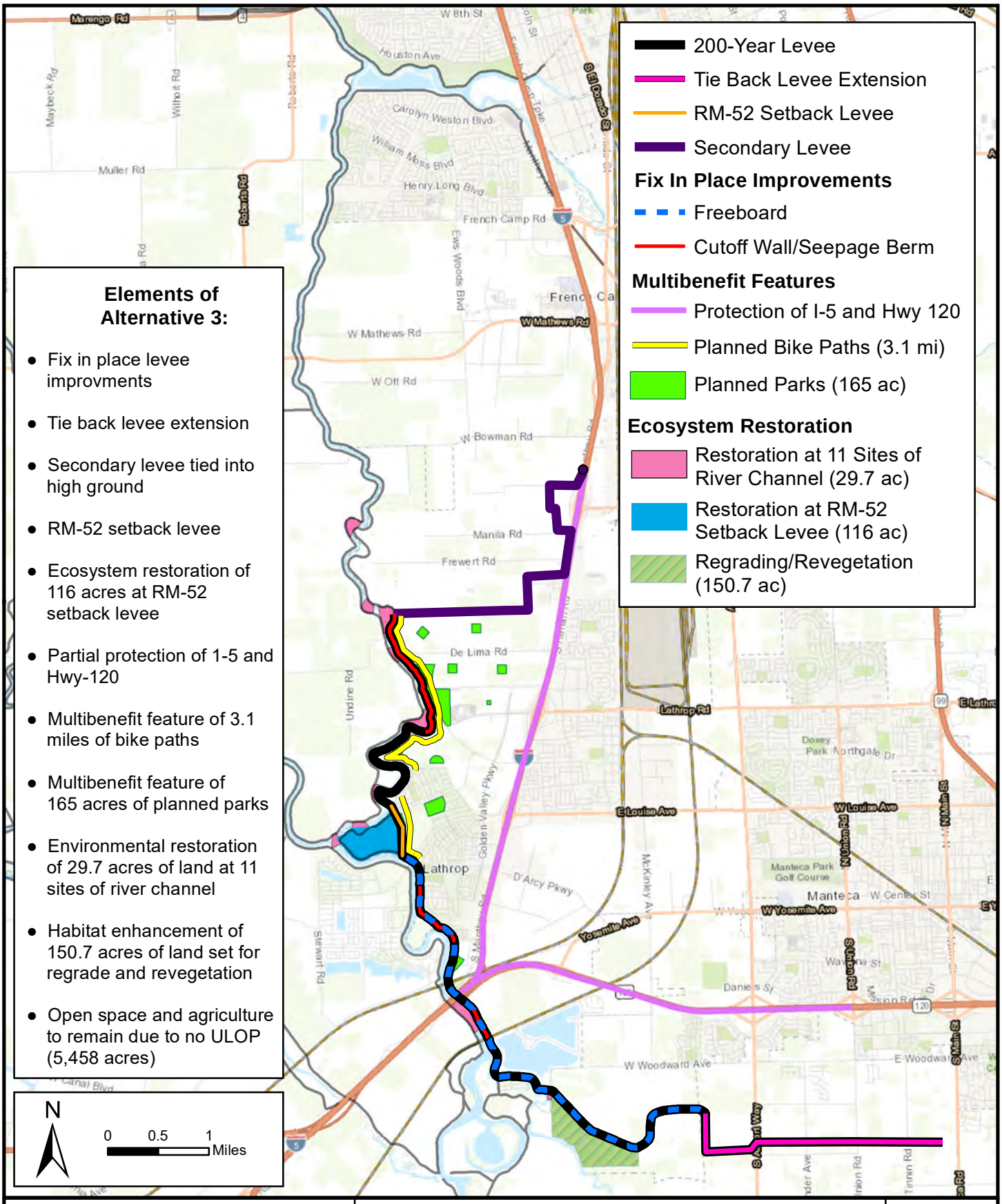
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MOSSDALE TRACT AREA

Key Features of Alternative 2

FIGURE

ES-5



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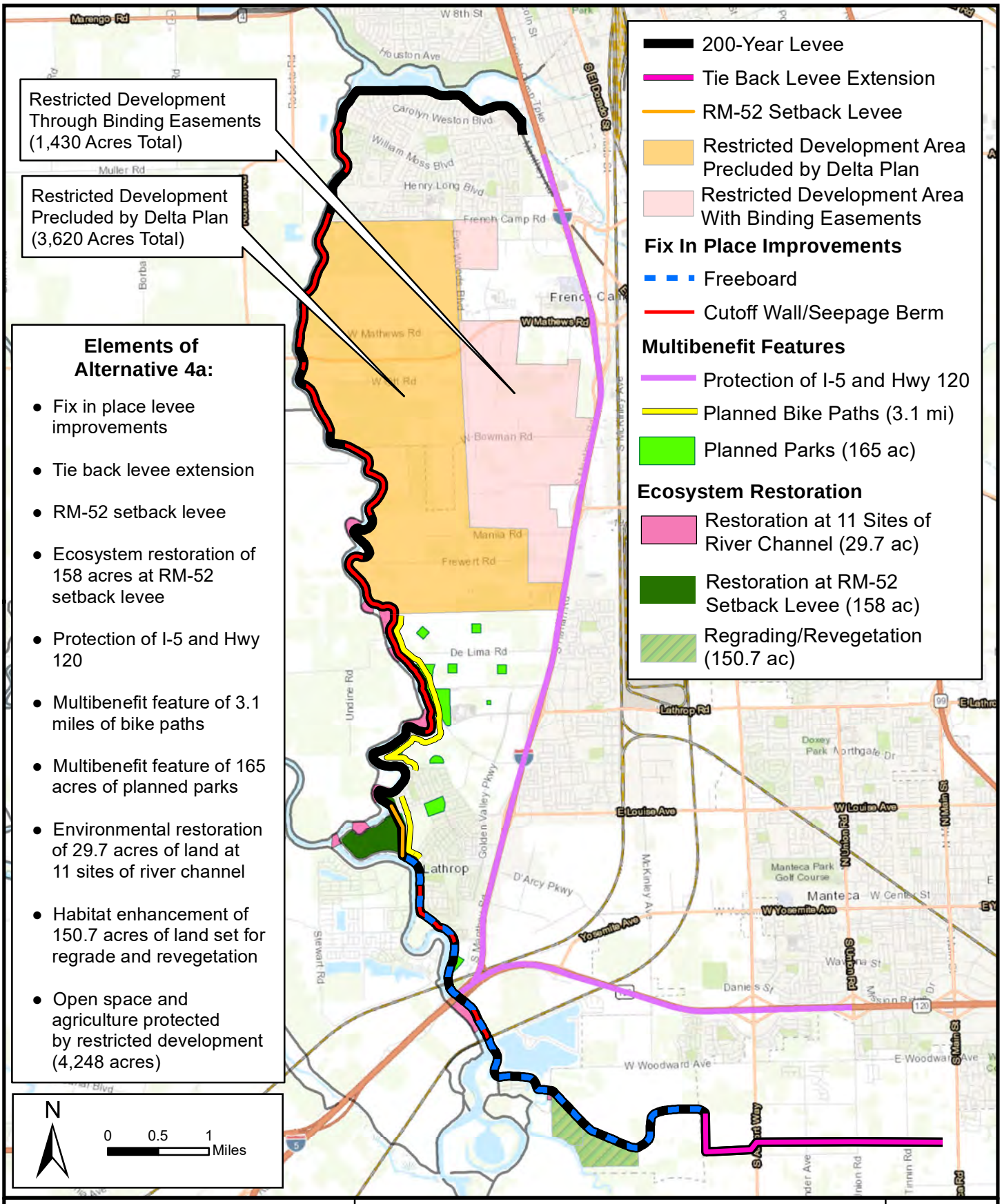
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Key Features of Alternative 3

FIGURE

ES-6



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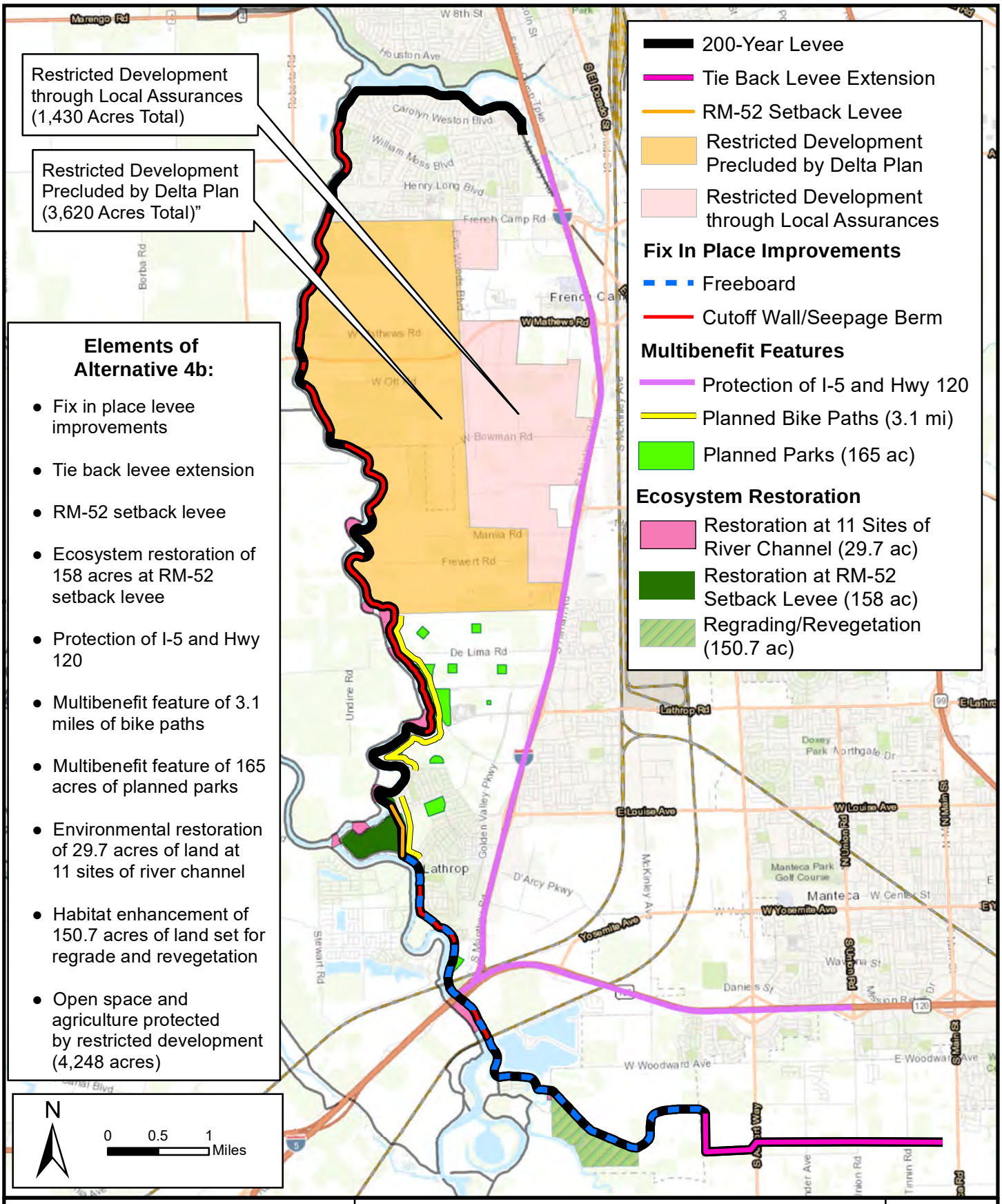
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MOSSDALE TRACT AREA

Key Features of Alternative 4a

FIGURE

ES-7



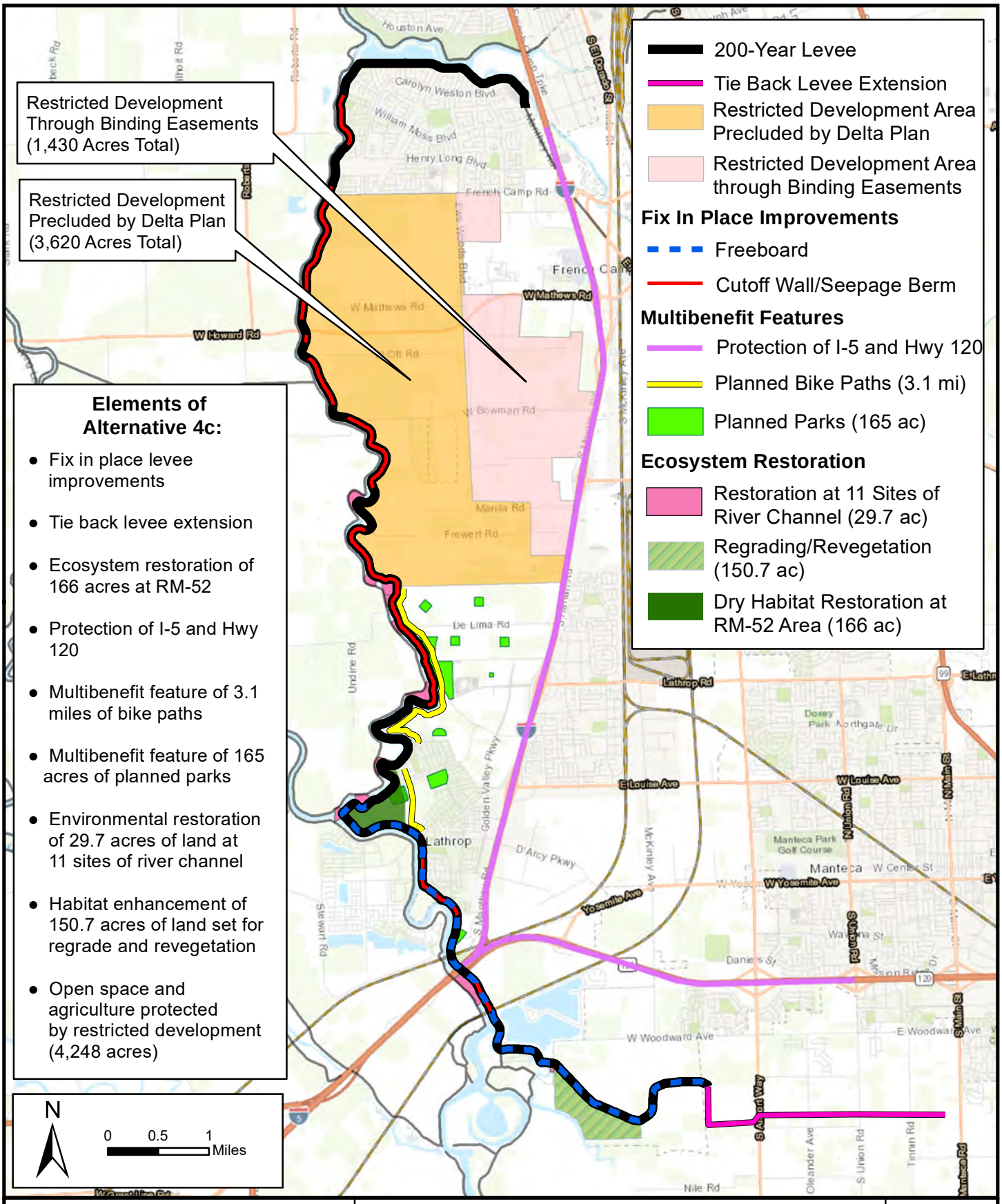
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Key Features of Alternative 4b

FIGURE

ES-8

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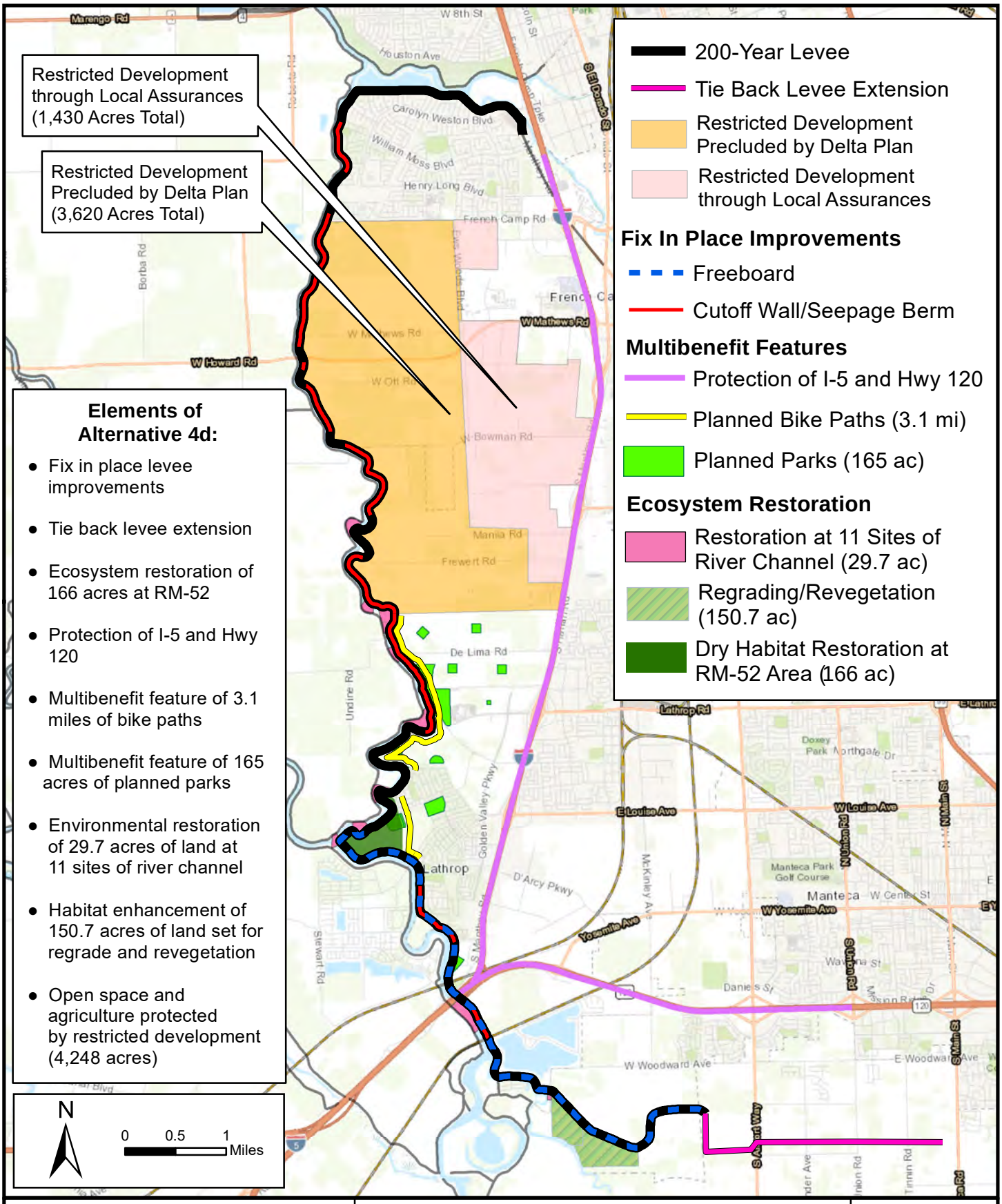
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Key Features of Alternative 4c

FIGURE

ES-9



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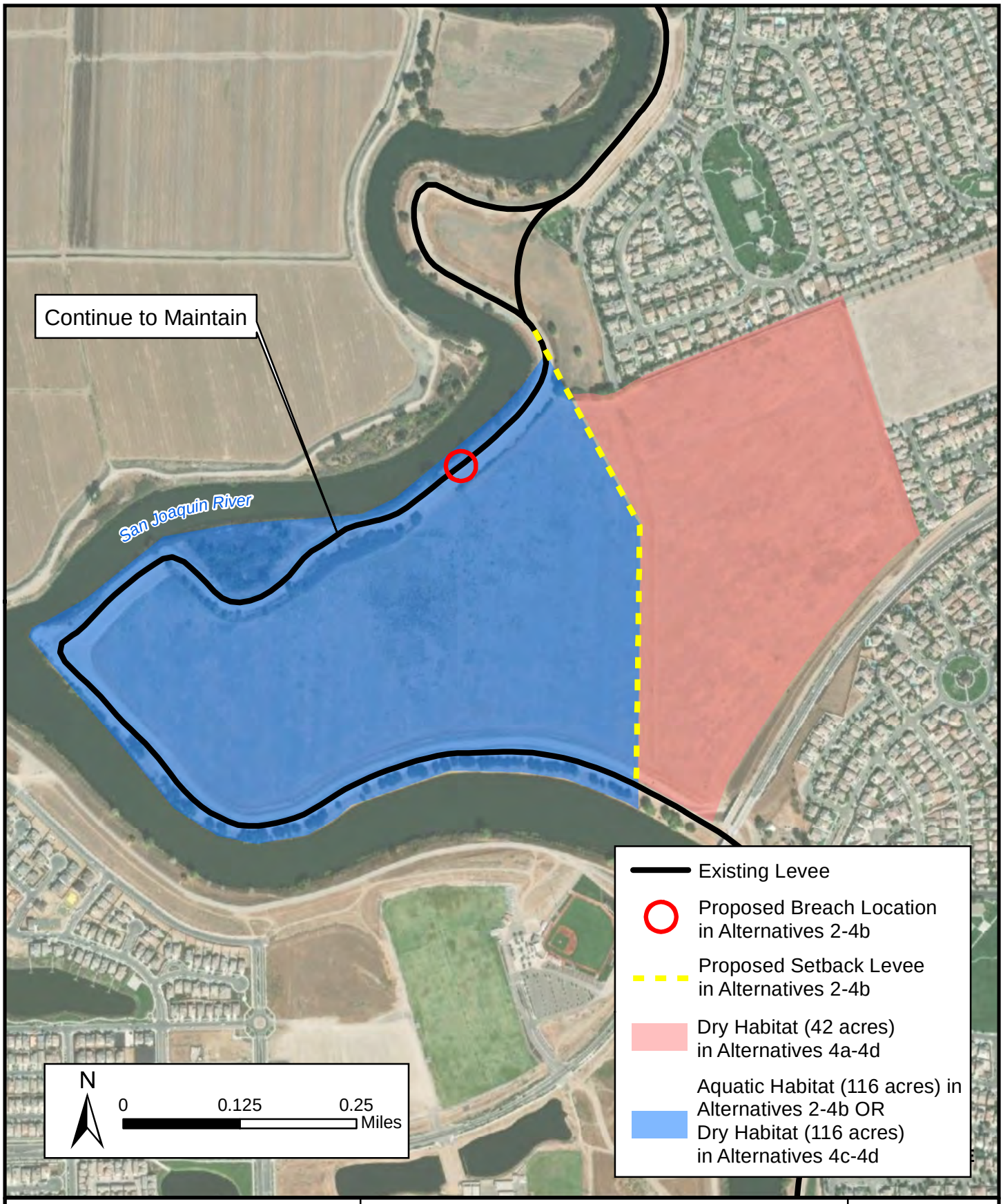
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MOSSDALE TRACT AREA

Key Features of Alternative 4d

FIGURE

ES-10



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MOSSDALE TRACT AREA

Summary of RM-52 Setback Levee and Restoration Feature under Each Alternative

FIGURE

ES-11

Alternative Evaluation

Quantitative analysis was performed to estimate economic benefits and reduction in loss of life for both current climate conditions and year 2065 climate conditions in order to test resiliency to climate change and to measure whether risk would be amplified as a result of any of the alternatives. Compliance with State and federal wise use of floodplains policies was also evaluated for each alternative. A quantitative comparison of each alternative is provided in Table ES-1; a final scoring of alternatives against the specified criteria is presented in Table ES-2.

Table ES-1. Quantitative comparison of alternatives

	Alternatives						
	1	**2**	**3**	**4a**	**4b**	**4c**	**4d**
Improve Flood Risk Management – Economic							
2018 Annual Flood Damage Benefit (Thousands of 2018 Dollars)	$ 46,994	$ 46,996	$ 40,736	$ 46,996	$ 46,996	$ 46,996	$ 46,996
2065 Annual Flood Damage Benefit (Thousands of 2018 Dollars)	$ 137,560	$ 137,927	$ 123,935	$ 137,927	$ 137,927	$ 137,927	$ 137,927
Improve Flood Risk Management – Life Safety							
2018 Annualized Life Loss Benefit	0.66	0.66	0.59	0.66	0.66	0.66	0.66
2065 Annualized Life Loss Benefit	5.52	5.53	4.55	5.53	5.53	5.53	5.53
Population Left in Deep 200-Year Floodplain	0	0	16,900	0	0	0	0
Number of East/West Roads Protected	6	6	3	6	6	6	6
Number of Students Protected	9,000	9,000	4,700	9,000	9,000	9,000	9,000
Number of Prisoners Protected	1,500	1,500	0	1,500	1,500	1,500	1,500
Number of Hospital Beds Protected	200	200	0	200	200	200	200
Ecosystem							
Riparian Habitat (Acres)	150.7	222	222	222	222	150.7	150.7
Marsh/Wetlands Habitat (Acres)	0	45	45	45	45	0	0
Shaded Riverine Habitat (Acres)	29.7	29.7	29.7	29.7	29.7	29.7	29.7
Dry Habitat (Acres)	0	0	0	42	42	166.9	166.9

Table ES-1. Quantitative comparison of alternatives (cont.)

Multi-Benefit							
Parks (acres)	165	165	165	165	165	165	165
Bike Paths (miles)	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Open Space/Agriculture Protected (Acres)	4,248	4,248	5,458	4,248	4,248	4,248	4,248
State Highways Protected (miles)	12	12	9	12	12	12	12
Costs							
Total Capital Cost (Thousands of 2018 Dollars)	$ 219,045	$ 376,887	$ 203,229	$ 288,920	$ 241,657	$ 282,057	$ 234,794
Annualized Capital Cost (Thousands of 2018 Dollars)	$ 8,114	$ 13,960	$ 7,528	$ 10,702	$ 8,951	$ 10,448	$ 8,697
Annual OMRRR Cost (Thousands of 2018 Dollars)	$ 519	$ 545	$727	$ 545	$ 545	$ 519	$ 519
2018 Annualized Mitigation Cost (Thousands of 2018 Dollars)	$ 57	$ 57	$ 57	$ 57	$ 57	$ 57	$ 57
2065 Annualized Mitigation Cost (Thousands of 2018 Dollars)	$ 481	$ 481	$ 481	$ 481	$ 481	$ 481	$ 481
2018 Annualized Project Cost (Thousands of 2018 Dollars)	$ 8,690	$ 14,562	$ 8,312	$ 11,304	$ 9,553	$ 11,024	$ 9,273
2065 Annualized Project Cost (Thousands of 2018 Dollars)	$ 9,114	$ 14,986	$ 8,736	$ 11,728	$ 9,977	$ 11,448	$ 9,697
2018 BCR	5.41	3.23	4.90	4.16	4.92	4.26	5.07
2065 BCR	15.09	9.20	14.19	11.76	13.82	12.05	14.22

Table ES-2. Alternative Evaluation Matrix

CVFPP/UFRR Study Goals	UFRR Study Objectives	Evaluation Metrics	Total Points Possible	Alternative						
				1	2	3	4a	4b	4c	4d
Improve Flood Risk Management	Economically achieve 200-year ULOP	Quantified annualized net benefits or benefit/cost ratio	20	20	12	18	15	19	16	19
		Quantified reduction in annualized fatalities	20	20	20	18	20	20	20	20
	Reduce residual risk to property, life safety, and critical infrastructure	Improved evacuation	5	5	5	3	5	5	5	5
		Improved protection of limited mobility populations	10	10	10	3	10	10	10	10
	Resilience to future climate change	Ability of the alternative to be modified in the future to adapt to climate change	10	10	10	10	10	10	10	10
	Address State and Federal policies for wise use of the floodplain	Conformance with State CVFPP and Delta Plan growth policies, and Federal EO11988	15	12	15	9	14	12	14	12
Promote Ecosystem Functions	Incorporate environmental habitat components where possible	Ecosystem habitat created	5	3	4	4	5	5	5	5
Promote Multi-Benefit Projects		Multi-benefit features created	5	4	5	4	5	5	5	5
Improved O&M		Reduction or amplification in O&M effort	5	5	4	2	4	4	5	5
Improve Institutional Support		Improvement in management of the flood protection system	5	5	5	5	5	5	5	5
		Total Points	**100**	**94**	**90**	**76**	**93**	**95**	**95**	**96**

Based on the evaluation presented in Table ES-2, Alternative 4d scores the highest, followed relatively closely by the other variations of Alternative 4 (Alternatives 4a through 4c) and Alternative 1. Alternative 2 fell 6 points behind the leading alternative because of the cost associated with the binding easements. Alternative 3 is a distant third and can therefore be eliminated from further consideration.

Transfer of Risk Analysis

The conveyance and storage of water during inundation of an area may provide some incidental flood protection to adjacent areas, both upstream and downstream. Water that would be temporarily conveyed through and stored on the Mossdale Tract during flooding would be displaced by a flood risk reduction project. On a gross scale, a project to provide 200-year flood protection to the Mossdale Tract would eliminate storage of approximately 186,500 acre-feet of water on the tract. Providing improved flood protection for the Mossdale Tract may therefore transfer hydraulic impacts to other areas.

A Transfer of Risk Analysis was completed as part of the UFRR study to evaluate these potential hydraulic impacts. Full details on the analysis are provided in Section 4.12 and in Appendix F.

The floodplain was analyzed to quantify the hydraulic impacts of the flood risk reduction project, most notably the dryland levee extension component of the project, which is featured in all the UFRR alternatives. The study team modeled pre- and post-project conditions with the Hydrologic Engineering Center Flood Damage Analysis (HEC-FDA) software to calculate expected annual damage (EAD) and expected annual life loss (EALL) for nine (9) index locations outside of the Mossdale Tract protection region (Figure ES-12).

The difference between the with- and without-project EAD and EALL then represents the transfer of risk induced by the proposed flood risk reduction project. Transfer of risk was analyzed for the three (3) different hydrologic scenarios: the 2018 analysis year represents current hydrologic conditions, the 2040 analysis year represents climate change hydrology projected to an intermediate planning horizon, and the 2065 analysis year represents climate change hydrology projected to a long-term planning horizon.

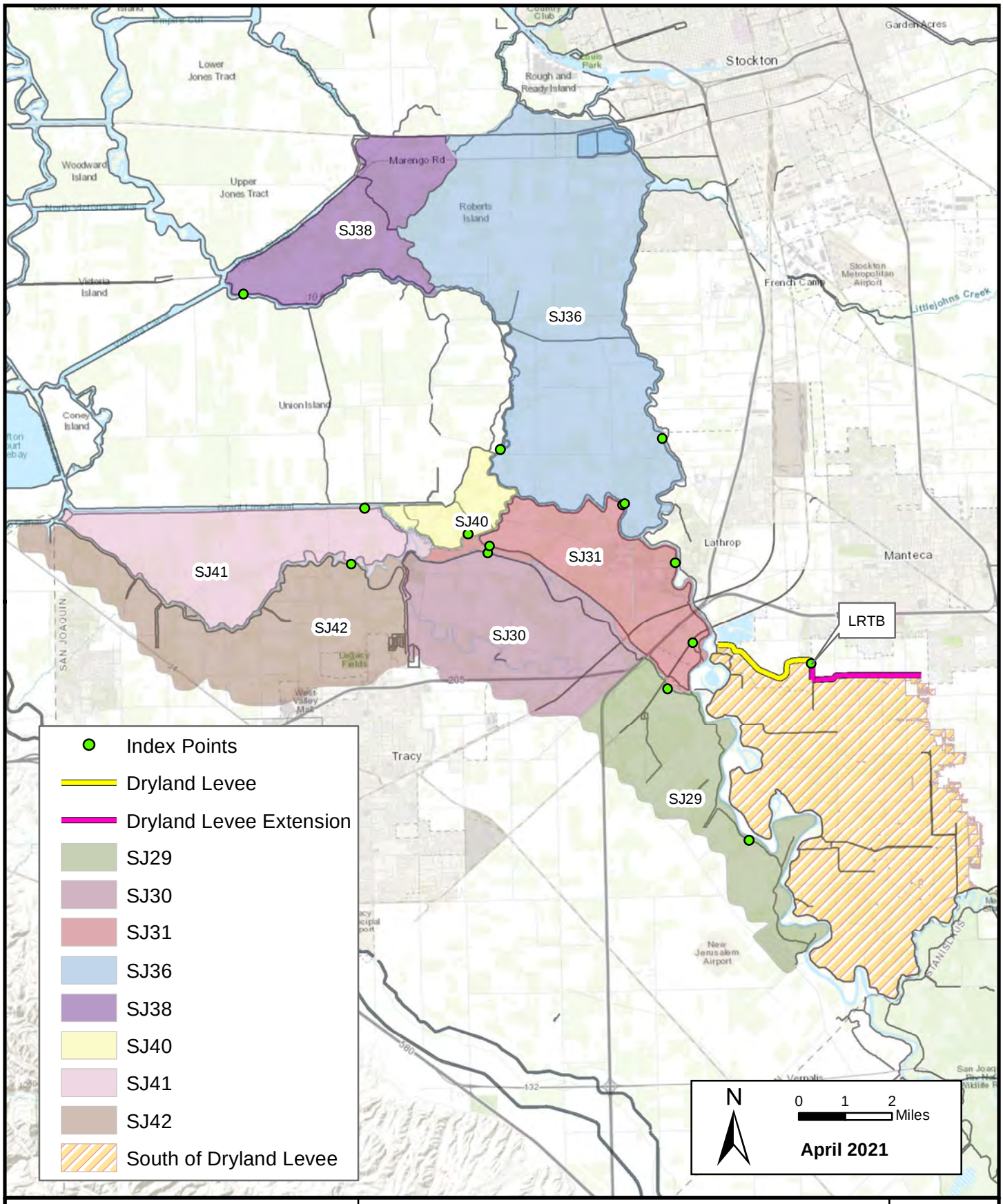
Tables ES-3 and ES-4 summarize results of the analysis.

Table ES-3 – Expected Annual Damages – WOP vs. WP ($1000's/year) over 50-year life of project

Year	South of Dryland Levee			West of SJR			Total Difference
	Without Project	With Project	Difference	Without Project	With Project	Difference	
2018	$1,936	$1,963	$27	$9,257	$9,288	$30	$57
2040	$4,371	$4,542	$171	$27,271	$27,398	$144	$315
2065	$7,975	$8,275	$300	$37,832	$38,011	$181	$481

Table ES-4 – Expected Annual Life Loss – WOP vs. WP (lives/year) over 50-year life of project

Year	South of Dryland Levee			West of SJR			Total Difference
	Without Project	With Project	Difference	Without Project	With Project	Difference	
2018	0.19	0.21	0.02	0.34	0.35	0.01	0.03
2040	0.68	0.77	0.09	0.81	0.85	0.04	0.13
2065	0.92	1.02	0.10	1.26	1.31	0.05	0.15



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Transfer of Risk Study Area

FIGURE

ES-12

Considering the large population of the Mossdale Tract area compared to the surrounding rural areas, the marginal transfer of hydraulic impacts is considered unavoidable, and mitigation should be explored consistent with CEQA and principles enforced by the CVFPB. Other regional projects such as an expansion of Paradise Cut could mitigate some of the impacts. In other areas, obtaining flowage easements may be considered. Or, financial assistance with non-structural mitigation measures such as structure elevations, relocations, evacuation planning, and levee relief cuts could be considered.

Hypothetical Mitigation for Induced Damages

Under existing (2018) hydrologic conditions, the project increases the EAD in the region by $57,000 per year, which equates to a 0.5% increase in annual damages. Assuming a benefit-cost ratio of 1.0, a 50-year economic period, and the 2018 federal discount rate of 2.750%, this impact translates to a hypothetical mitigation cost of $1.5M which could be used for a variety of mitigation measures.

Under future 2040 hydrologic conditions, the project increases the EAD in the region by $315,000 per year. Under future 2065 hydrologic conditions, the project increases the EAD in the region by $481,000 per year. Using the assumptions above, these impacts translate to hypothetical mitigation costs of $8.5M and $13M in 2040 and 2065, respectively.

Hypothetical Mitigation for Induced Life Loss

Under existing (2018) hydrologic conditions, the project increases the EALL in the region by 0.03 lives per year. Under future 2040 hydrologic conditions, the project increases the EALL in the region by 0.13 lives per year. Under future 2065 hydrologic conditions, the project increases the EALL in the region by 0.15 lives per year. Although minimal, this increase can be reduced with targeted mitigation activities. For example, structure elevations can be focused in areas where life risk is the highest. In addition, increased public education and improvements to notification systems can be implemented to improve awareness and warning times.

Transfer of Risk Conclusion

The CEQA/National Environmental Policy Act (NEPA) process will allow for a natural transition and opportunity to advance the UFRR study's hydraulic impact analyses and further define proper mitigation measures through a process that involves other responsible agencies and the public. Impacts to the surrounding environment and population are at the core of what the CEQA/NEPA process is intended for. The UFRR study report includes a solid hydraulic impact analysis that can form the basis for future conversations on appropriate mitigation measures. **Advancing the hydraulic impact and mitigation discussion through the CEQA/NEPA process will allow the community and regional stakeholders to provide input and will prove to be a much more transparent and constructive exercise.**

Preferred Plan

The forgoing analysis was circulated to the study partners and key stakeholders for review, then a workshop on August 18, 2020 was held to discuss the alternatives. In consideration of stakeholder input from the workshop, SJAFCA worked with local agencies to identify five alternative restoration areas to be considered in lieu of the Old River setback levee as identified in several of the alternatives. The State's Division of Multi-Benefit Initiatives deemed the five restoration areas as viable alternatives to the Old River setback. For a description of the alternative restoration areas, see the sub-section below.

While Alternative 4a did not score the highest, it scored near the top and was the most agreed upon alternative between the local agencies and the State. **Agreement between the State and the local agencies as well as the inclusion of alternative restoration areas pushed Alternative 4a over the edge to be selected as the Preferred Plan.**[1] **Both the Old River restoration area and the alternative restoration areas are being included as options in the Preferred Plan to be further studied as part of an environmental impact report under CEQA.**

Plan Features

The Preferred Plan features levee improvements, multi-benefit features (particularly ecosystem improvements), limitations on development for wise use of the floodplain, and residual risk management actions. Figure ES-7 shows key features associated with the Preferred Plan. In addition to the key features on the figure, residual risk management actions of the Preferred Plan include:

- Future residential construction to be mostly 2-story
- Relief cut plan for French Camp Slough left levee
- Requirement for all future critical facilities to be outside or elevated above the 500-year floodplain
- Development of a mitigation plan for existing critical facilities in the Mossdale Tract area
- Enhancement of a flood warning and evacuation plan; greater forecast/warning time, designation of dry evacuation routes, shelter in place plans for multi-story residences
- Declared interest in watershed and regional projects which improve flood risk reduction

The annualized cost of the Preferred Plan is provided in Table ES-5. Capital costs were annualized using a discount rate of 2.75% and a term of 50 years, per USACE Economic Guidance Memorandum 18-01 for FY18.

Costs for annual operation, maintenance, and repair of the levee features were estimated based on CVFPP annual unit costs of $50,000/mile for Lower San Joaquin urban levees. RD 17 currently spends approximately $29,300/mile, leaving an unmet need of $20,700/mile in order to maintain *existing* levees to an urban standard. *New* levees would require the full $50,000/mile. The obligation of non-Federal sponsors also includes replacement and rehabilitation (rounding out the final 2 R's in the abbreviation OMRR&R for operation, maintenance, repair, replacement, and rehabilitation). However, rehabilitation

[1] The following statement was provided by RD 17: "RD 17 which operates and maintains the levee where the RM-52 setback is located, is opposed to Alternative 4a due to the inclusion of the setback levee. The RM-52 setback is at the critical flow split between the San Joaquin and Old Rivers. Such setback will increase the flood risk to downstream areas including portions of RD 17 which contain critical facilities of the County, City of Stockton and Veteran Affairs as well as other highly developed portions of the City of Stockton including the Regional Wastewater Treatment facility and the Port of Stockton. The habitat benefits arguably provided by such setback can be provided at upstream locations without increasing the flood risk to downstream areas."

and replacement are typically handled as un-scheduled and un-budgeted future capital projects which are cost-shared and financed. It is assumed that all multi-benefit and ecosystem restoration features would be operated and maintained by others using third party funds.

Table ES-5. Summary of Preferred Plan Capital Costs (2018 dollars)

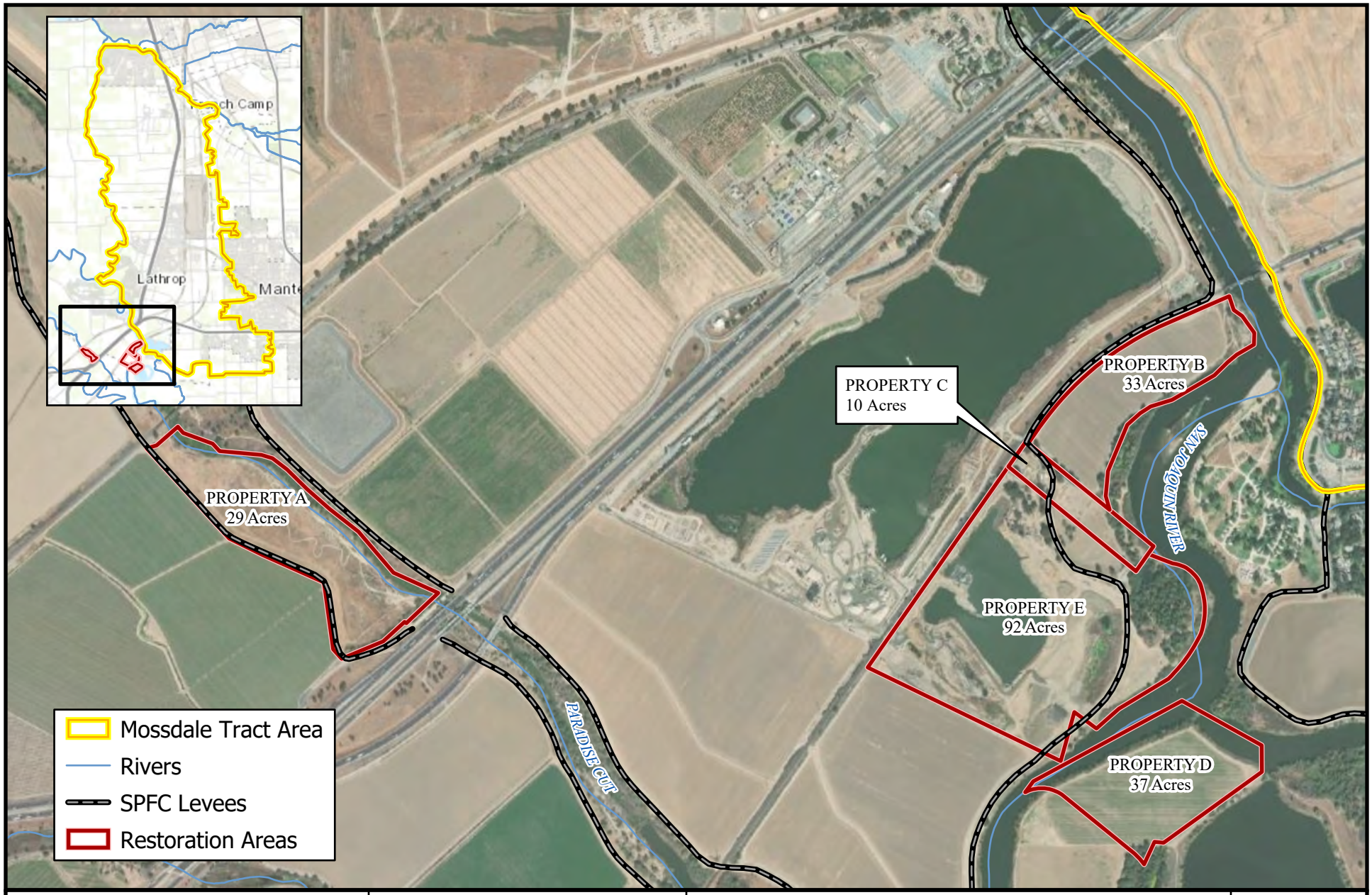
Description	Cost
ULDC improvements for 2018 climate conditions	
North of Station 447+38 (Alt 3 secondary levee connection point)	$63,122,000
South of Station 447+38	$73,763,000
Subtotal	$136,885,000
Additional improvements to meet ULDC for 2040 climate conditions	
North of Station 447+38	$1,481,000
South of Station 447+38	$55,106,000
Subtotal	$56,587,000
Ecosystem Restoration and Multi-benefit Features	
SJR channel margin restoration	$20,600,000
Restoration of lands south of the RD 17 dryland levee	$4,973,000
Old River secondary levee and restoration*	$22,612,000
Subtotal	$48,185,000
Wise use of floodplain features	$47,263,000
Total Capital Cost	$288,920,000
Annualized capital cost (50yr, 2.75% discount rate)	$10,702,000
2018 Annualized mitigation cost	$57,000
2065 Annualized mitigation cost	$481,000
Annualized marginal increase in OMR cost	$545,000
2018 Annualized project cost	$11,304,000
2065 Annualized project cost	$11,728,000

* Capital costs include the RM-52 setback feature as a placeholder for ecosystem restoration features. Alternative restoration areas will be considered beyond the RM-52 setback option.

Alternative Restoration Opportunities

Five restoration areas were identified by local agencies as alternatives to the Old River setback feature in Alternative 4a, the preferred alternative. All the properties are located south of the Union Pacific Railroad and north of the confluence with the Stanislaus River. The concept would be to convert the properties from agricultural land to a combination of dryland and aquatic habitat in lieu of the Old River setback feature.

The restoration areas support the Division of Multi-Benefit Initiatives' goals to promote ecosystem processes, habitat, and species by adding natural floodplain, establishing aquatic habitat, and restoring habitat for target species such as the endangered riparian brush rabbit. The locations of the alternative restoration areas are shown in Figure ES-13. Preliminary conversations with property owners have helped to identify these locations as viable options.



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May 2021

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Alternative Restoration Opportunities

FIGURE

ES-13

Plan Performance

For 2018 climate and development conditions, the Preferred Plan would produce annual flood damage reduction economic benefits of $46,996,000 per year, net benefits of $35,692,000 per year, and a benefit cost ratio (BCR) of 4.16.

For 2065 climate and development conditions, economic performance improves substantially, with annual benefits of $137,927,000 per year, net benefits of $126,623,000 per year, and a BCR of 11.76.

Life safety performance exhibits a similar pattern. For 2018 climate and development conditions, the Preferred Plan would reduce annualized fatalities by 0.66 per year. For 2065 climate and development conditions, the Preferred Plan would reduce annualized fatalities by 5.53 per year.

The Preferred Plan also greatly improves flood protection for critical facilities; it will provide 200-year level of protection for 2040 climate change conditions for all structures and persons within the Mossdale Tract area, including critical jail and hospital facilities housing 1,700 persons with limited mobility.

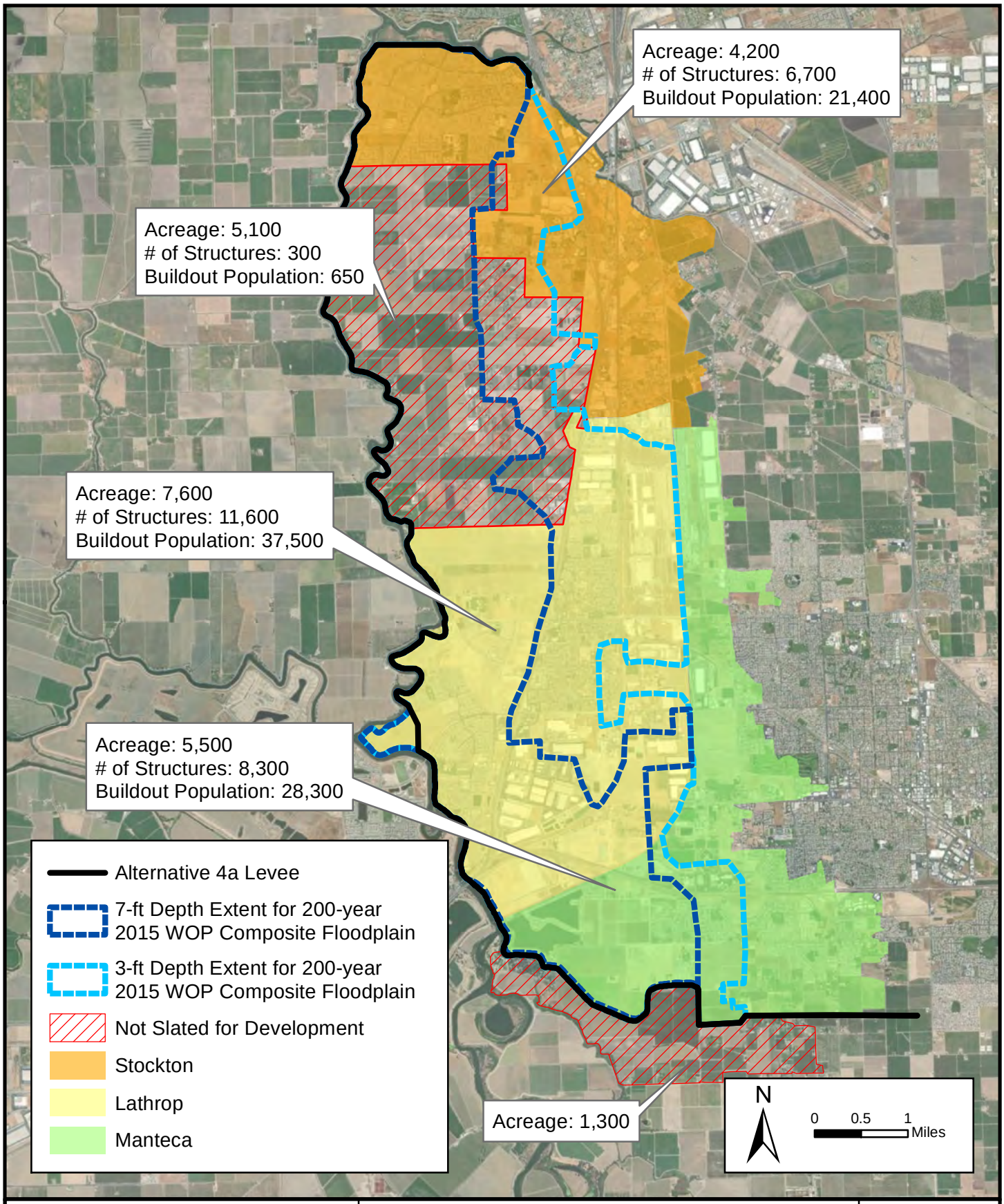
Wise Use of Floodplains

Wise use of the floodplain is achieved through removal of development potential on 5,050-acres of land by the State's Delta Plan and binding easements (Figure ES-14). These development restrictions limit growth in the study area to a buildout population of 87,800, compared to the 2018 population of 45,000. This population results in a significant reduction in risk to life and property from the previous USACE estimates which did not incorporate these development restrictions, while allowing for growth that will help fund a flood risk reduction project.

The CVFPP reaffirms that the State does not promote flood management improvements that induce population growth in *rural* areas and that *urban* flood risk reduction investments will be structured to assure that the aggregate economic and life safety risk are held constant or reduced over time. Figures ES-15 and ES-16 show the estimates for property (annual $ damages) and life risk for both without project (existing levees and 45,000 people) and the UFRR alternatives (improved levees and buildout population) with increasing climate change hydrology. The figures show that the property and life risk with the Preferred Plan is lower than the risk without the project.

Transfer of Risk

The Preferred Plan would result in a relatively minor transfer of hydraulic risk with the enlargement and extension of the southern dryland levee that would redirect major floods around the Mossdale Tract area instead of passing through it. Estimates of increased annual economic and life safety risk to affected areas outside of the Mossdale Tract area total $57,000 per year in economic damages, and 0.03 lives lost per year. The economic damages would justify a capital expenditure of $1.5M to mitigate this increased risk, assuming a BCR of 1.0, a 50-year economic period, and the 2018 federal discount rate of 2.750%.



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MOSSDALE TRACT AREA

Alternative 4a
Future-With-Project Structures and Population (both 2040 and 2065 Planning Horizons)

FIGURE

ES-14

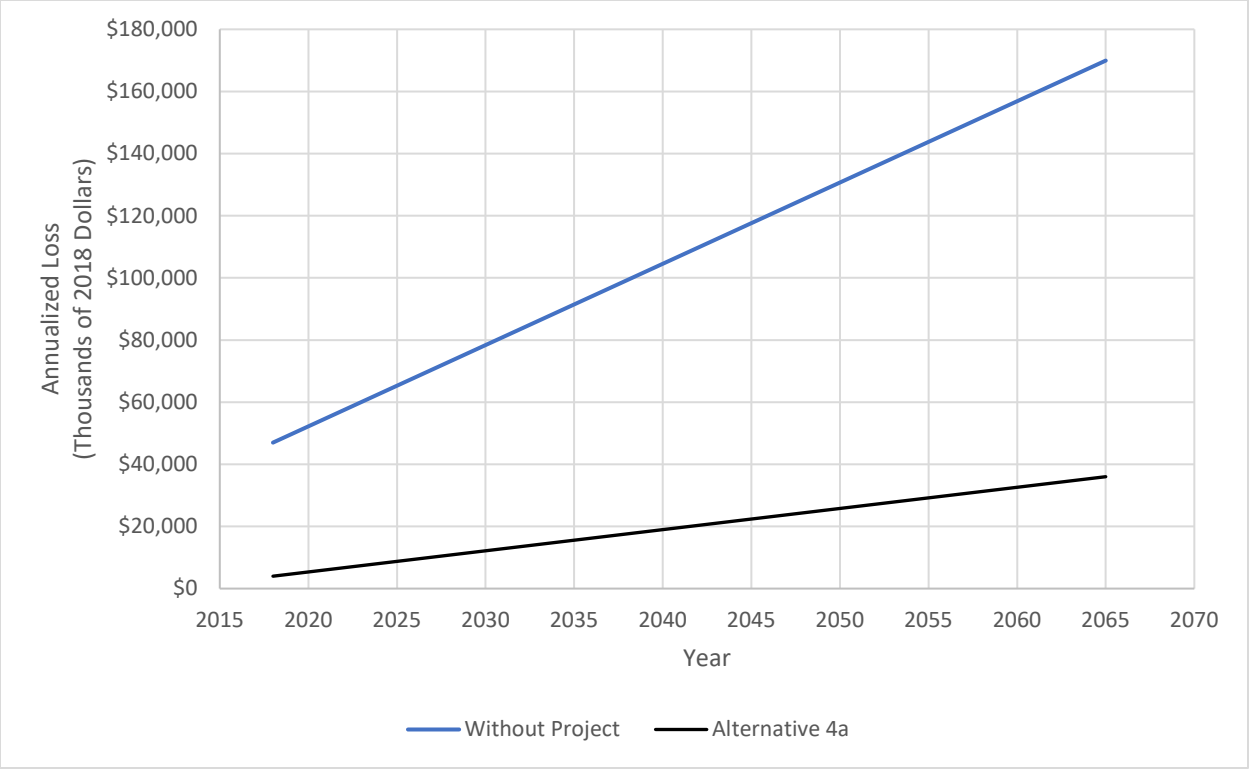


Figure ES-15 Annualized Damage of the Preferred Plan (2018 dollars)

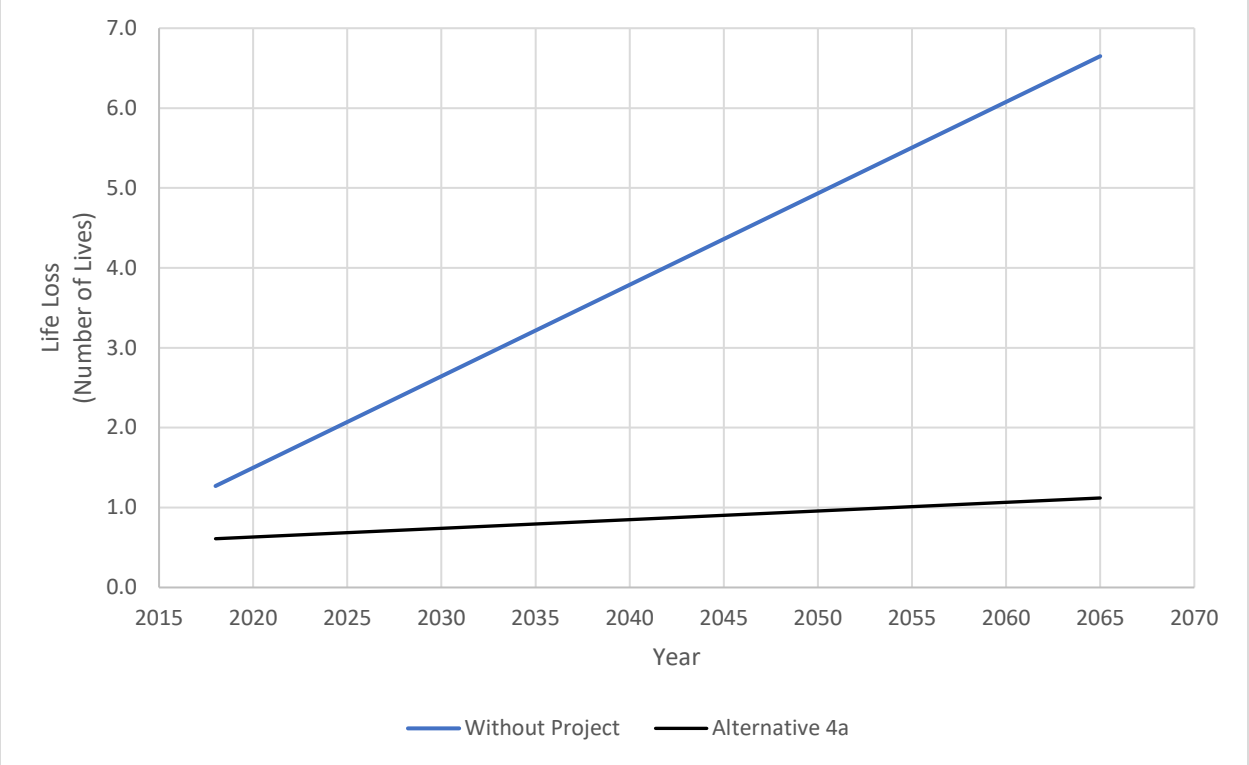


Figure ES-16 Annualized Mortality of the Preferred Plan

Plan Implementation

Plan Phasing

Because the levees work as a system, the levee improvements must be completed in their entirety in order to achieve their function, and the State's ULOP deadline is fast approaching. So, there is no functional opportunity to phase the Preferred Plan levee improvements. As a practical matter, the levee work will be performed in a series of separate construction bid packages. But these will be executed in a continuous and fast-tracked manner.

One item of levee improvement that does lend itself to phasing is addressed in SJAFCA's climate change adaptation policy (adopted in February 2019). This policy calls for near-term levee improvement projects to include additional stage in the design water surface elevation (DWSE) for an appropriate allowance for climate change, but that design to the full 2065 CVFPP climate change hydrology can be phased. The policy calls to acquire sufficient land to accommodate a levee which will address DWR's estimated year 2065 climate change hydrology, but that the structure does not immediately need to be built to this event.

For the Preferred Plan, the DWSE has been set as the 2040 climate conditions computed water surface profile. The DWSE was capped to be no more than 3-feet greater than the existing (2018) conditions 200-year water surface profile per SJAFCA's climate change policy. The minimum top of levee (MTOL) was then designed to be the DWSE plus either 3-feet or wind-wave height, whichever is greater. As climate science progresses and climate change hydrology predictions are adjusted, the RD 17 levees will be augmented, if necessary, using the additional right of way (ROW) that will have already been acquired.

The other features of the Preferred Plan beyond the structural flood risk reduction improvements will be phased based on funding opportunities and willing landowner negotiations.

Implementation Schedule

California SB5 (2007) originally set a deadline of 2025 for urban and urbanizing areas to achieve a ULOP in order to avert building restrictions. Further, a ULOP "finding" made in 2025 should have a degree of longevity so that the ULOP is not lost in the near-term due to uncertainties such as changing hydrology due to climate change. In 2020, Assembly Bill 838 (AB 838) was passed which extended Mossdale's ULOP deadline to 2028 to complete construction (AB 838, 2020). Project close-out is expected to be completed by 2029.

Implementation of the Preferred Plan will require a number of important preconstruction activities, including completion of a federal study to determine Federal interest (i.e. Phase 2 of the USACE LSJRFS), CEQA and NEPA compliance, federal, State, and local funding activities, engineering field investigations and design, ROW acquisition, and project financing. As noted earlier, levee construction will likely proceed as a number of smaller bid packages, and implementation of multi-benefit features, growth restriction features, and residual risk management features, will proceed based on funding opportunities and land acquisition from willing sellers.

Table ES-6 provides a schedule for planning and budgeting purposes.

Table ES-6. Preferred Plan Schedule

Activity	Start Date	Completion Date
Environmental Documentation	7/1/2021	2/28/2023
Right of Way Acquisition[1]	1/1/2023	1/31/2029
Engineering Design[2]	1/1/2022	12/31/2027
Construction	5/1/2024	12/31/2028
Permitting & Compliance[3]	1/1/2022	3/31/2029

[1] Completion is reflective of possession of the necessary rights to complete the improvements, not necessarily compensation.
[2] It is expected that the project bid packages would be phased and the first package of engineering plans and specifications would be completed in time to commence construction in 2024.
[3] Reflects required permitting and ongoing mitigation and monitoring requirements.

Governance Plan

During the course of this UFRR study, SJAFCA and San Joaquin County facilitated an important examination of flood management governance in San Joaquin County, with particular emphasis on establishing a robust agency to implement projects, primarily in the Metropolitan Stockton and Mossdale Tract areas. The outcome of that effort was a reformulation of SJAFCA.

On November 16, 2017, the Joint Exercise of Powers Agreement (JEPA) was expanded to include the Cities of Lathrop and Manteca. SJAFCA now has a nine- member Board of Directors with two (2) members from the San Joaquin County Flood Control and Water Conservation District and from the Board of Supervisors of the County; two (2) members from Stockton City Council; two (2) members from Lathrop City Council; two (2) members from Manteca City Council; and one (1) member of the public who resides or works within the boundaries of the Agency, appointed by a simple majority of the other Board members.

SJAFCA is empowered to act within the collective boundaries of its members: unincorporated San Joaquin County, and the cities of Stockton, Lathrop, and Manteca (not including the portion of the City of Lathrop west of the San Joaquin River). SJAFCA has "the power and authorization to acquire, construct, operate and maintain Works for the purpose of controlling and conserving waters for the protection of life and property that would or could be damaged by being inundated by still or flowing water."

Conceptual Financial Plan

A conceptual financial plan was prepared and discusses potential methods to fund the Preferred Plan given standard assumptions regarding federal, State, and local cost sharing. As presented in Section 5.0, the total project cost of the Preferred Plan is estimated at $290,459,000.

Table ES-7. Estimated Costs for the Preferred Plan

Project Element	Cost ($)
Levee Improvements	$ 193,472,000
Ecosystem Restoration and Multi-Benefit Features	$ 48,185,000
Wise Use of Floodplain Features	$ 47,263,000
Hypothetical Mitigation Costs	$ 1,539,000
TOTAL	**$ 290,459,000**

The cost of the Preferred Plan is assumed to be shared by the federal, State, and local partners which are the primary beneficiaries of the project. The Preferred Plan includes improvements to federally authorized levees that are part of the SPFC system and provides benefits to an area with 45,000 residents as well as numerous federal, State, and local critical facilities as described throughout this UFRR report.

SJAFCA and CVFPB continue to pursue USACE participation in a Phase 2 of the LSJRFS to explore flood risk management improvements to the Mossdale Tract area. For the purposes of this conceptual finance plan, it is assumed that the Phase 2 LSJRFS will follow completion of this UFRR study and that a federal interest is established. Under this scenario, the typical cost-share for the Preferred Plan is assumed to include a federal cost share of 65% and a non-federal cost share is 35%. Of the non-federal cost-share, it is assumed that the State and local cost share split is 70% and 30%, respectively.

The table below summarizes assumed cost share between federal, State, and local partners for the Preferred Plan.

Table ES-8. Estimated Cost Share for the Preferred Plan

Funding Source	Cost Share (%)	Cost ($)
Federal	65%	$188,798,000
Non-Federal	35%	
State (70% of Non-Federal)		$71,162,000
Local (30% of Non-Federal)		$30,499,000
TOTAL	100%	**$290,459,000**

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1 Introduction

1.1 Need for Study

On March 9, 2015, the City of Lathrop authored a Concept Proposal for a State Urban Flood Risk Reduction (UFRR) grant to design fix-in-place improvements to the Reclamation District 17 (RD 17) levees to achieve an Urban Level of Protection (ULOP), which is equivalent to a 200-year level of protection. The proposed project was titled "Phase 4 ULDC Improvements," and requested $20,527,500 in State grant funds to match $20,527,500 in local funds for the design phase services. On May 15, 2015, the State Department of Water Resources (DWR) responded with conditional approval for a smaller $5M grant for a study and preliminary design of a flood risk reduction project in the RD 17 area. The State's letter stated that "The study should analyze and recommend project alternatives that maximize public (multiple) benefits, while considering the wise use of deep floodplains, reducing risk, and promoting economic sustainability." The scope of work for the UFRR study specifies that the UFRR study utilize information from previous studies as much as possible in order to avoid duplication of effort. This report presents the UFRR study requested by the State.

A separate effort to re-engage the United States Army Corps of Engineers (USACE) in an appropriate level of study to seek federal authorization will be launched on a timetable separate from this UFRR study. It is assumed that the analyses and findings in this UFRR study will be utilized in the subsequent USACE study.

Several previous studies have been completed by federal, State, and local entities, including:

- 200-year Freeboard Analysis and Floodplain Mapping within RD 17 (Peterson Brustad Inc., 2014)
- Urban Levee Design Criteria (ULDC) Evaluation of the RD 17 Levee (Peterson Brustad, Inc., 2016)
- 200-year Urban Level of Protection Adequate Progress Study (Larsen Wurzel & Associates, Inc., 2016)
- USACE Lower San Joaquin River Feasibility (LSJRFS) (United States Army Corps of Engineers, 2018)
- DWR draft Basin-Wide Feasibility Study (BWFS) San Joaquin Basin (March 2017) (California Department of Water Resources, 2017)

The analyses presented herein capitalize on that prior work to the extent possible, and supplement or modify portions as required to meet the State and local objectives for this study. The State's *Guidance for Development of a State-led Feasibility Study* (California Department of Water Resources, 2014) was used to inform the process.

1.2 Study Area

The Mossdale Tract area, as defined in this study, includes urban portions of Stockton, Lathrop, Manteca, and rural areas of unincorporated San Joaquin County which are protected by the RD 17 levee system. The eastern boundary of the Mossdale Tract area was defined in this study to be coincident with the composite 200-year without-project floodplain for 2065 climate conditions (Figure 1-1). This floodplain was used to inform the area of benefit for the study. The study area totals 22,400 acres, which is characterized as urban and urbanizing, with a largely rural subarea which is not planned for any development. The Cities of Stockton, Lathrop, and Manteca, and San Joaquin County control all land use decisions within the area.

RD 17 is a separate political entity with a jurisdictional area of 16,110 acres that is fully contained within the Mossdale Tract area. The RD 17 levee system is comprised of State-Federal Project levees (also referred to as State Plan of Flood Control, or SPFC levees along the San Joaquin River and French Camp Slough, which form the west and north borders of RD 17, and a non-Project dryland levee which borders RD 17 on the south. The land generally slopes east to west, and there is no levee along the east side of the RD 17 jurisdiction. So, the interior drainage watershed extends to the east of RD 17.

All of the RD 17 levees were accredited by Federal Emergency Management Agency (FEMA) in September 2011 as providing 100-year flood protection. The levees do not yet provide 200-year flood protection, however. As described later in Section 2.3, the without-project 200-year floodplains extend beyond the eastern jurisdictional boundary of RD 17. Therefore, for the purposes of this study, the term "Mossdale Tract area" is used to describe the full area that would be flooded from a 200-year flood event under 2065 climate conditions, an area encompassing approximately 22,400 acres.

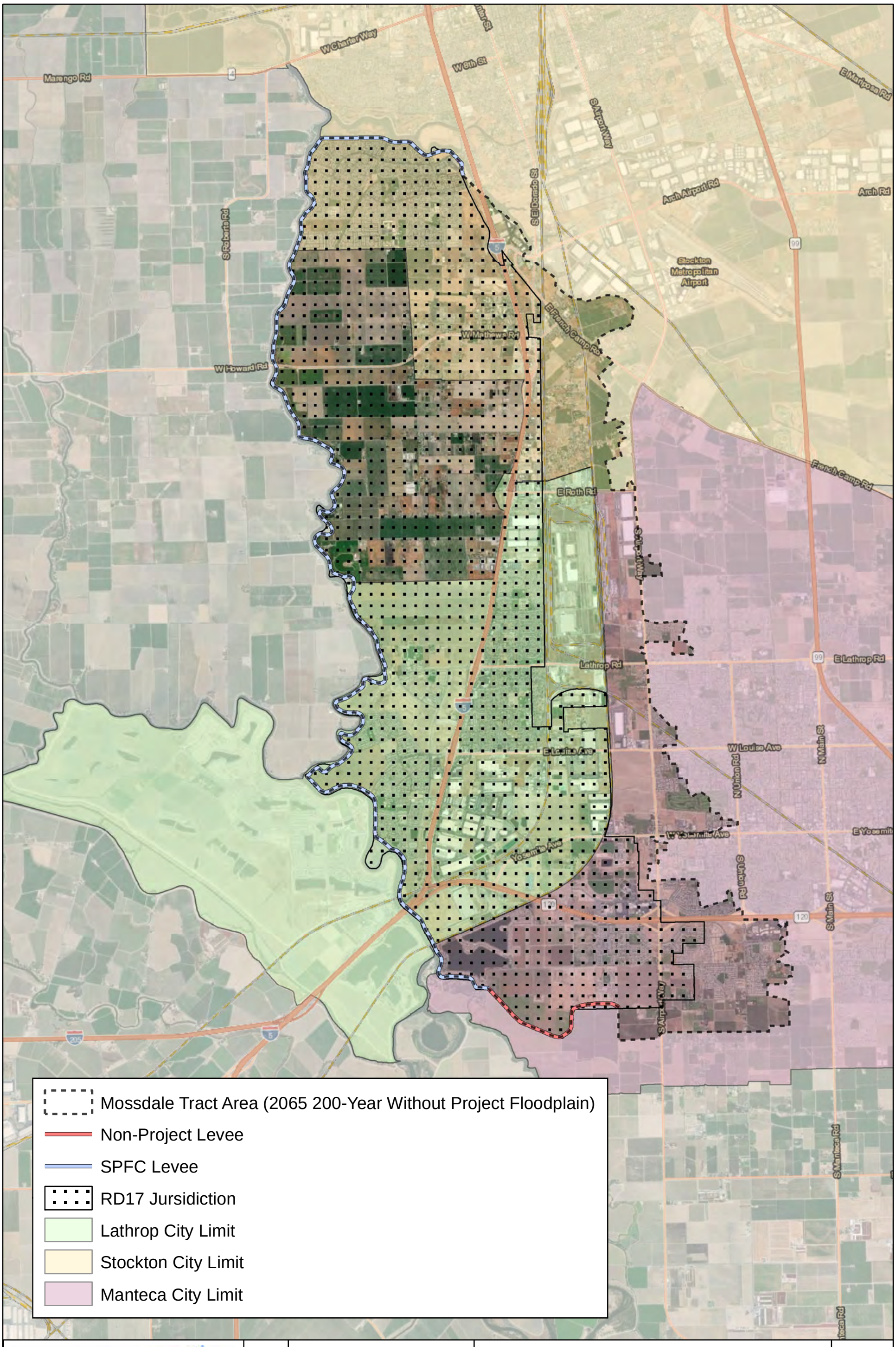
The current population of the area is estimated to be 45,000. Critical facilities protected from flooding by RD 17 levees include the Veterans Affairs clinic, San Joaquin General Hospital, Kaiser Permanente Manteca Medical Center, San Joaquin County Jail, San Joaquin County Honor Farm, San Joaquin County Juvenile Hall, 32 schools, numerous facilities that house and/or provide services to vulnerable populations that would need special assistance during an evacuation due to flooding, four (4) fire stations, two (2) police stations, two (2) wastewater treatment plants, Interstate 5 (I-5), State Highway (HWY) 120, and two (2) major railroads. A new Veterans Affairs Hospital is also under construction in the area.

As noted above, the RD 17 levees are currently accredited to 100-year FEMA standards per 44cFR 65.10, predicated on flood fighting for seepage. RD 17 is currently constructing the third phase of a three-phase Levee Seepage Repair Project (LSRP), intended to improve seepage performance to meet FEMA standards without flood fighting. The majority of the Mossdale Tract area is classified by FEMA as a Shaded X-Zone.

The RD 17 levees do not currently meet the State's 200-year ULDC and would need to be improved to provide an ULOP. An engineering study was completed in 2016 which assessed what improvements would be needed for the levee system to comply with the ULDC for 2018 climate conditions. This study is discussed further in Section 1.4.

The primary flood risk in the study area is from geotechnical failure of the existing levees. Levee overtopping or flanking is also a risk in the larger floods, especially in the future with climate change scenario. Geotechnical failures caused by through-levee seepage or under-seepage are typically sudden and unpredictable, and can produce large volume, high velocity flood flows. These failures come with little warning, with minimal time for evacuation and emergency actions. Overtopping and flanking floods are much more predictable, so evacuation is much more effective for these failure mechanisms.

Study area flood events generally occur during the winter months when colder air and water temperatures significantly increase the risk of death by exposure. The risk probability of unexpected levee failure (coupled with the consequence of basin-wide flooding) presents a continued threat to public safety, property, and critical infrastructure in the Mossdale Tract area.



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MOSSDALE TRACT AREA

Mossdale Tract Area Overview

FIGURE 1-1

1.3 Study Sponsors and Participants

The local lead agency for this effort was initially the City of Lathrop, acting on behalf of both the cities of Lathrop and Manteca. DWR funded 50% of the cost of the study and participated as a study partner. In November 2017, the San Joaquin Area Flood Control Agency (SJAFCA), consisting of the City of Stockton, San Joaquin County, and the San Joaquin County Flood Control and Water Conservation District, modified its joint powers authority (JPA) structure to add the Cities of Lathrop and Manteca. The UFRR grant agreement and lead agency status were then transferred to SJAFCA in February 2020.

1.4 Previous Studies

Information from previous studies was utilized in this UFRR study to capitalize on the prior investments and minimize re-work.

1.4.1 Lower San Joaquin River Feasibility Study

In January 2018, the USACE released the San Joaquin River Basin Lower San Joaquin River, CA FINAL Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report (LSJRFS) (United States Army Corps of Engineers, 2018), which included a great deal of background information, without-project analyses, and front-end planning activities such as stakeholder engagement, objectives and opportunities workshops, and alternative formulation and evaluation. The LSJRFS studied problems and flood damage reduction measures and alternatives for the Mossdale Tract area in the early stages of the planning process. A key finding of the LSJRFS was the necessity of a tieback levee extension to protect the RD 17 basin. The LSJRFS states:

Without the tie-back extension, levee improvements would have been necessary further upstream on the San Joaquin River and along the Stanislaus River to achieve the same flood risk reduction for the already urbanized portions of RD 17 and would have added about 16,000 acres of land that would be available for future development.

Regardless of the initial study findings, policy concerns regarding Executive Order (EO) 11988 (wise use of floodplains), which are discussed below, could not be resolved within the scope, schedule, and budget of the study, so the final array of alternatives excluded features affecting the Mossdale Tract area. Instead, the report called for a future Phase 2 LSJRFS to further study the Mossdale Tract area. For that reason, the January 2018 report included the word “Interim” in the title. The Phase 2 LSJRFS is expected to follow completion of this UFRR study in order to determine the Federal interest, if any, in a flood risk reduction project for the Mossdale Tract area.

1.4.2 State Funded Studies

Three State funded planning activities included extensive stakeholder engagement and alternative formulation: the completed Lower San Joaquin and Delta South Regional Flood Management Plan (RFMP) (Peterson Brustad Inc., 2014), the 2017 Central Valley Flood Protection Plan (CVFPP) (California Department of Water Resources, 2017), and the draft San Joaquin River BWFS (California Department of Water Resources, 2017). The BWFS provided the first detailed estimates of climate change with a 50-year planning horizon (2065). This included projection of flood stages in the Delta, as well as n-year flood hydrograph changes due to changed watershed conditions. These findings were later refined as part of the 2017 CVFPP update.

1.4.3 Senate Bill 5- Urban Level of Protection

The Cities of Lathrop and Manteca have taken steps towards achieving an ULOP in compliance with California’s SB5 legislation passed in 2007. The following activities have been completed:

1.4.3.a 200-year floodplain mapping; define area of impact

200-year floodplain maps were needed to define the area likely to be inundated in the event of levee failure during a 200-year event for 2018 climate conditions. This work was completed using local funds and resulted in the identification of parcels inundated during a 200-year flood event, and the flood depth at each parcel concurrently establishing their benefit from the flood control improvements necessary to protect against a 200-year flood event (Peterson Brustad Inc., 2014).

1.4.3.b 200-year water surface profile

A "levees-holding" water surface profile was completed using local funds to identify whether levee raising would be required and to determine whether existing RD 17 flood control improvements meet the ULDC requirements (Peterson Brustad Inc., 2014). Hydrology and hydraulics were based upon DWR Central Valley Floodplain Evaluation and Delineation (CVFED) hydraulic models and DWR Central Valley Hydrology Study (CVHS) hydrology.

1.4.3.c Reconnaissance levee rehabilitation cost estimate

A preliminary desktop assessment of existing levees was conducted using local funds to estimate the extent of ULDC deficiencies (KSN Inc., 2014). Existing information previously developed by RD 17 and DWR formed the basis of this preliminary assessment. This assessment was used to develop a programmatic cost estimate for the needed additional levee rehabilitation in order to inform financial and governance planning.

1.4.3.d ULDC analysis

Detailed analyses and documentation were completed in March of 2016 for the RD 17 levees using local funds to determine where ULDC is met for 2018 climate conditions and where deficiencies exist (Peterson Brustad, Inc., 2016). The analysis was vetted in a series of workshops with an Independent Panel of Experts (IPE), USACE, State Central Valley Flood Protection Board's (CVFPB), and DWR. Additional geotechnical explorations were performed as part of this work. Rehabilitation measures were identified to cure the deficiencies, costs estimated, and concurrence secured from the IPE. This analysis was documented in an Engineer's Report and an IPE report. An overview of the ULDC analysis findings can be found in Section 3.4.

1.4.3.e Adequate progress reports

Annual reports documenting adequate progress toward achieving an ULOP were prepared in 2016-18 in accordance with SB5 requirements (Larsen Wurzel & Associates, Inc., 2016) (Larsen Wurzel & Associates, Inc., 2017) (Larsen Wurzel & Associates, Inc., 2018). A key element of these reports is the local financing plan and schedule for achieving an ULOP.

A governance plan was prepared to identify a lead agency for financing and project delivery. The Cities of Lathrop and Manteca initially served as local flood management agencies in the reports, but in 2018 SJAFCA was established as the local flood management agency. However, SB5 compliance responsibility is defined by statute as residing with the land use authorities.

Items 1.4.3.a through 1.4.3.d were completed in 2014-2016 and were funded up-front by the Cities of Lathrop and Manteca. Items 1.4.3.a, 1.4.3.b, and 1.4.3.d were included as part of the scope of work for this UFRR study, and the costs were credited against the local share of the UFRR grant. The item 1.4.3.e adequate progress reports (APR) will be prepared annually until an ULOP is achieved.

2 Need and Objectives for Action

2.1 Problems and Opportunities

The previous studies analyzing this region summarized in Section 1.4 identified problems and opportunities for the project area, summarized in the following sections.

2.1.1 Problems

2.1.1.a Problem 1: There is a significant risk to public health, safety and property associated with flooding

The Mossdale Tract area is protected by levees on the right bank of the San Joaquin River, the left bank of French Camp Slough and a dryland levee to the south maintained by RD 17. This current levee system protects large portions of the cities of Lathrop, Stockton, and Manteca. Prior to 1996, the population in the Mossdale Tract areas was approximately 29,000. Currently approximately 45,000 people are protected by these levees, plus numerous critical facilities protected from flooding by RD 17 levees include the Veterans Affairs clinic, San Joaquin General Hospital, Kaiser Permanente Manteca Medical Center, San Joaquin County Jail, San Joaquin County Honor Farm, San Joaquin County Juvenile Hall, 32 schools, numerous facilities that house and/or provide services to vulnerable populations that would need special assistance during an evacuation due to flooding, four (4) fire stations, two (2) police stations, two (2) wastewater treatment plants, I-5, State HWY 120, and two (2) major railroads. A new Veterans Affairs Hospital is also under construction in the area.

While none of the levees protecting the Mossdale Tract Area have breached in the past, a number of past breaches upstream caused flooding to reach the dryland levee. In the 1997 event, the Stockton residential area known as Weston Ranch, located at the north end of the Mossdale Tract area, was issued a voluntary evacuation advisory in anticipation of a RD 17 levee breach, which did not materialize.

The primary flood risk in the study area is from geotechnical failure of the existing levees. Levee overtopping or flanking is also a risk in the larger floods, especially in the future with climate change. Geotechnical failures caused by through-levee seepage or under-seepage are typically sudden and unpredictable, and can produce large volume, high velocity flood flows. These failures come with little warning, with minimal time for evacuation and emergency actions. Overtopping and flanking floods are much more predictable, so evacuation is much more effective for these failure mechanisms.

A breach of one of the RD 17 levees or flanking of the southern dryland levee would primarily flood the Mossdale Tract area, with flood flows traveling northward, ponding against the French Camp Slough left levee, placing the adjacent Weston Ranch area of the City of Stockton in the deepest part of the floodplain. Flood waters would pond to the point of overtopping and in larger floods, flanking of the French Camp Slough left levee, where they would be conveyed down French Camp Slough and the San Joaquin River to the Delta. In major floods, the re-entry of floodwaters can cause flanking of the French Camp Slough right levee, resulting in flooding of Central Stockton.

Study area flood events generally occur during the winter months when colder air and water temperatures significantly increase the risk of death by exposure. The risk probability of unexpected levee failure (coupled with the consequence of basin-wide flooding) presents a continued threat to public safety, property, and critical infrastructure in the Mossdale Tract area.

2.1.1.b Problem 2: The levees do not meet ULDC and therefore do not provide an ULOP for current climate conditions.

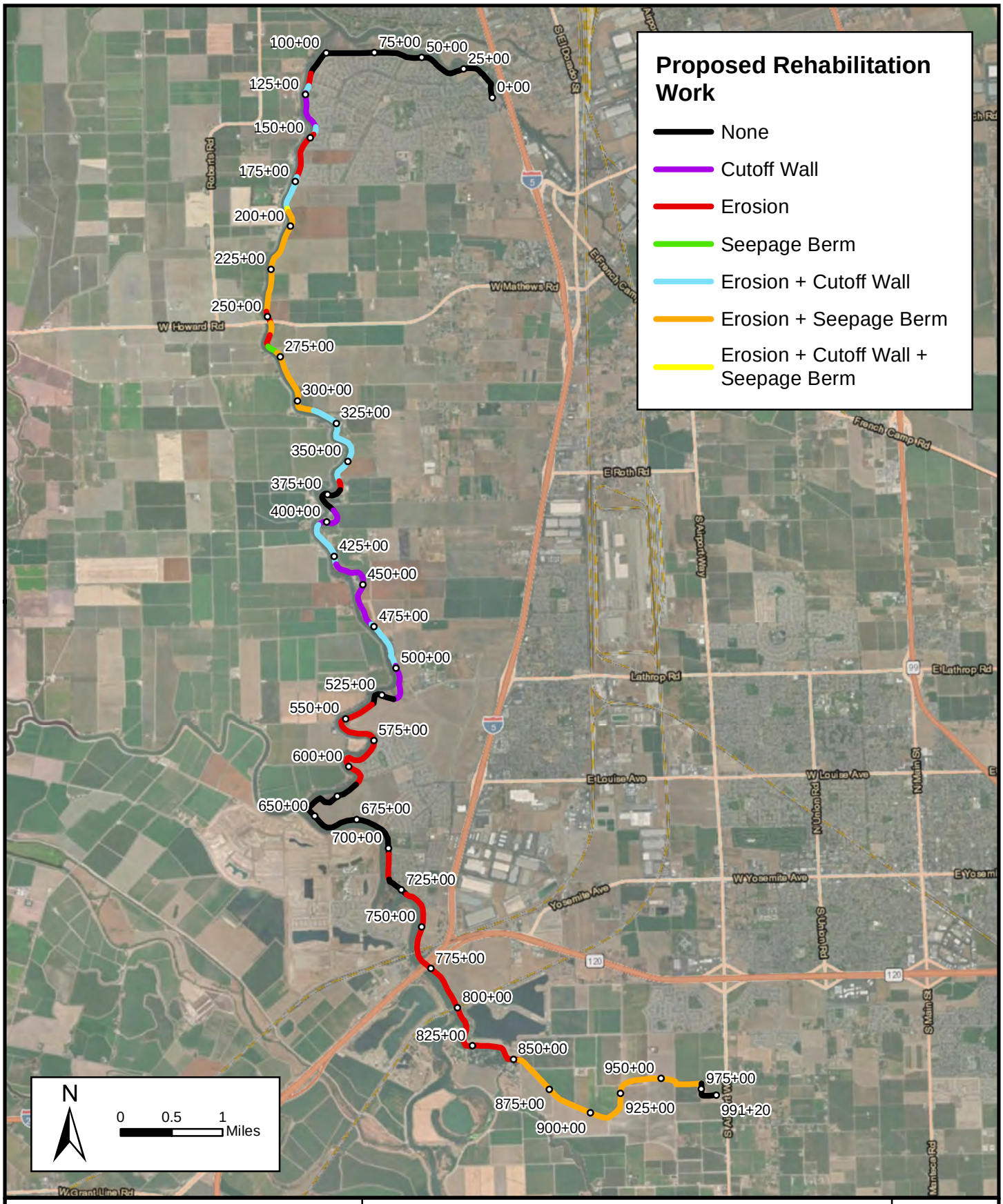
The Mossdale Tract area currently contains a population of approximately 45,000 people, which qualifies significant portions within the cities of Stockton, Lathrop, and Manteca as urban areas under SB5 and the State's ULOP Guidelines. An ULOP is needed to protect the existing population and critical facilities and is also a requirement for approvals of certain land use decisions in the area, as defined by SB5.

As part of the completed 2016 RD 17 ULDC documentation, an engineering analyses was performed based on 2018 climate conditions, and ULDC deficiencies within the RD 17 levee system were identified along with improvements needed for ULDC compliance (Table 2-1 and Figure 2-1).

Table 2-1. ULDC Status of RD 17 Levees for 2018 Climate Conditions

ULDC Section		Improvements Required
7.1	Design Water Surface Elevation	
7.2	Minimum Top of Levee	
7.3	Soil Sampling, Testing and Logging	
7.4	Slope Stability for Intermittently Loaded Levees	X
7.5	Under-seepage for Intermittently Loaded Levees	X
7.6	Frequently Loaded Levees	
7.7	Seismic Vulnerability	
7.8	Levee Geometry	X
7.9	Interfaces and Transitions	
7.10	Erosion	X
7.11	Right-of-Way	X
7.12	Encroachments	X
7.13	Penetrations	X
7.14	Floodwalls, Retaining Walls, and Closure Structures	
7.15	Animal Burrows	
7.16	Levee Vegetation	
7.17	Wind Setup and Wave Runup	
7.18	Security	X
7.19	Sea Level Rise	
7.20	Emergency Actions	X
8.0	O&M, Inspection, Monitoring, and Remediation of Poor Performance	

A more detailed description of ULDC improvements needed is presented in Section 3.4. Erosion, seepage, and levee stability are the primary ULDC deficiencies in the RD 17 system for 2018 climate conditions, along with site-specific ULDC deficiencies such as encroachments, pipe penetrations, and levee geometry.



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MOSSDALE TRACT AREA

ULDC Deficiencies for 2018 Climate Conditions

FIGURE

2-1

2.1.1.c Problem 3: Climate change impacts on the San Joaquin River System are predicted to be extreme in the next 50 years.

Substantial climate change impacts on river flood flows and Delta flood stages have been estimated by DWR in the BWFS. The San Joaquin River watershed includes a substantial high-elevation zone above 6,000 feet, which is characterized by snowmelt and rain on snow flooding. As the climate warms, these high elevation watersheds will change in several ways:

1. The snow line will rise over time. This means that a precipitation event will engage more square miles of watershed with rainfall, and less with snow, so the effective contributing drainage area for a rainfall event will increase.
2. Warm storms will drop rain over more of the watershed, so that rain on snow at higher elevations will combine with rain on ground in the lower elevations for higher intensity runoff events with greater runoff volume.
3. Climate warming will cause more drought and temperature stress on forests, making them more susceptible to fire. And burned areas are characterized by greater runoff and sediment production. Sediment runoff will collect in on-stream storage facilities, reducing their effectiveness at flood routing, and shortening their useful life.

DWR estimates that the 200-year peak flood flow at Vernalis will triple in magnitude by the year 2065 due to hydrologic climate change (California Department of Water Resources, 2017), which if correct, makes the lower San Joaquin River one of the most profoundly impacted rivers in the nation. Sea level rise (SLR) combined with storm surge in the Delta is a separate, but additive climate change impact that DWR predicts will affect the Mossdale Tract area. So, climate change must be taken into account in planning for sustained protection over time.

California SB5 (2007) originally set a deadline of 2025 for urban and urbanizing areas to achieve a ULOP in order to avert building restrictions. Further, a ULOP “finding” made in 2025 should have a degree of longevity so that the ULOP is not lost in the near-term due to uncertainties such as changing hydrology due to climate change. In 2020, Assembly Bill 838 (AB 838) was passed which extended Mossdale’s ULOP deadline to 2028 to complete construction. Project close-out is expected to be completed by 2029 (AB 838, 2020).

For this study, it is assumed that ULDC compliance will be achieved by 2028, and that a Type 1 ULOP finding will be made at that time. In order to provide for a measure of ULOP resilience against climate change, improvement plans must consider resiliency to climate change.

2.1.1.d Problem 4: The ecosystem habitat within the study area has suffered from degradation.

The CVFPP Conservation Strategy identified that the habitat in the study area once consisted of marsh, tidal-marsh, seasonal wet-lands, and riparian areas but has since largely been degraded due to flood control infrastructure and operations or converted for agricultural production and urban development. The SPFC levees that protect the now urban and agriculture areas align closely along the river channel and have disconnected the river from the floodplain. The proximity of the levees to the river channel prevents geomorphic process such as channel migration and vegetation growth resulting in degraded, channelized and simplified riverine habitat.

2.1.2 Opportunities

2.1.2.a Opportunity 1: Reduce Flood Risk in the Study Area

There is an opportunity to reduce flood risk to three urbanized areas from flood damages along the San Joaquin River and French Camp Slough. Additionally, alternatives could reduce flood risk to the north of French Camp Slough, outside the study area.

2.1.2.b Opportunity 2: Improve habitat adjacent to project areas

There is an opportunity to couple habitat improvements with improvements to flood protection infrastructure. The 2017 CVFPP and Conservation Strategy include priority improvements that are associated with the Mossdale Tract area.

2.1.2.c Opportunity 3: Integration with other Federal, State, and Local initiatives

There is an opportunity to integrate this project into other watershed-level projects proposed or considered in past studies.

2.1.2.d Opportunity 4: Obtain State and/or Federal financial participation

There is an opportunity to obtain State and/or Federal funds to help cost-share the project and alleviate local costs.

2.2 Goals, Objectives, and Constraints

2.2.1 Goals

Goals are overall policy-level aims. For this UFRR study, the CVFPP program goals apply:

Primary Goal:

Improve flood risk management. Reduce the chance of flooding, and damages once flooding occurs, and improve public safety, preparedness, and emergency response through the following:

- Identifying, recommending, and implementing structural and nonstructural projects and actions that benefit lands currently receiving protection from facilities of the SPFC.
- Formulating standards, criteria, and guidelines to facilitate implementation of structural and nonstructural actions for protecting urban areas and other lands of the Sacramento and San Joaquin River basins and the Delta.

Supporting Goals:

- **Improve operations and maintenance (O&M)**. Reduce systemwide maintenance and repair requirements by modifying the flood management systems in ways that are compatible with natural processes, and adjust, coordinate, and streamline regulatory and institutional standards, funding, and practices for O&M, including significant repairs.
- **Promote ecosystem functions.** Integrate the recovery and restoration of key physical processes, self-sustaining ecological functions, native habitats, and species into flood management system improvements.
- **Improve institutional support.** Develop stable institutional structures, coordination protocols, and financial frameworks that enable effective and adaptive integrated flood management (designs, O&M, permitting, preparedness, response, recovery, and land use and development planning).

- **Promote multi-benefit projects.** Describe flood management projects and actions that also contribute to broader integrated water management objectives identified through other programs.

2.2.2 Objectives

Study Objectives

Study objectives describe what the study is seeking to achieve.

Primary Study Objective: Develop a plan that will economically provide a 200-year ULOP for the Mossdale Tract Area. The planning horizon for design of alternatives is year 2040 climate conditions, consistent with the flood risk management goal of the Cities of Lathrop, Manteca, and Stockton making 15-year findings that a ULOP exists in 2028. Future performance and climate resilience will also be estimated for 2065 climate conditions for planning purposes.

Achieving the primary study objective will protect the lives and property of people in the study area including urbanized areas of Lathrop, Manteca, and Stockton, plus the critical infrastructure throughout the area.

Additional Study Objectives:

- Reduce and manage residual risk to public life safety, property, and critical infrastructure
- Reduce State's liability due to failure of SPFC levees
- Address State and Federal policies for wise use of the floodplain
- Identify alternatives to maximize State and Federal investment
- Incorporate environmental habitat components where possible
- Design a project that will be resilient to future predicted climate change
- Design a project that will not significantly increase O&M costs
- Develop a project that all local agencies can agree upon to best maintain existing institutional support
- Select an alternative which allows some or all elements to be implemented quickly to both promptly reduce risk as well as satisfy SB5 requirements for the cities within the Mossdale Tract

Planning Objectives

A planning objective is a statement of what an alternative plan should try to achieve. The planning objectives of this study align with CVFPP and will be used as the basis of the scoring criteria. As mentioned in the Goals section, the planning objectives are:

- Primary Goal: Improve Flood Risk Management
    - Supporting Goal: Improve O&M
    - Supporting Goal: Promote ecosystem functions,
    - Supporting Goal: Improve institutional support,
    - Supporting Goal: Promote multi-benefit projects.

2.2.3 Constraints

Constraints are key considerations that must be applied in the formulation of alternatives, and/or in evaluation of the alternatives.

2.2.3.a Constraint 1: Projects must comply with applicable Federal, State, and Local laws, regulations, and policies.

Constraints include USACE permission under 33 USC 408 (Section 408), Delta Plan development restrictions, ULOP restrictions, and FEMA National Flood Insurance Program restrictions, as well as the full array of State and Federal environmental laws. Some of the most important policies that constrain the alternative formulation are the State and Federal Wise Use of Floodplains policies.

2.2.3.a.1 State Wise Use of Floodplains Policy

The 2017 CVFPP highlights State Wise Use of Floodplain policy:

> *"Consistent with Executive Order B-39-77, the SSIA Portfolio was designed to reduce the chance of flooding while discouraging population growth in rural floodplains, with the intention of reducing aggregate flood risk. The state does not promote flood management improvements that would induce population growth in rural areas. Deep floodplains subject to rapid-rise flooding are the most critical concerns due to the high risk of life loss and property damage in such areas. Urban flood risk reduction investments under the SSIA will be structured to assure that the aggregate economic and life safety risks are held constant or reduced over time, and will be limited to areas protected by facilities of the SPFC. Agricultural conservation measures proposed by the SSIA are also designed to limit conversion of agricultural land to urban uses, and to preserved the robust agricultural economy of the Central Valley."*

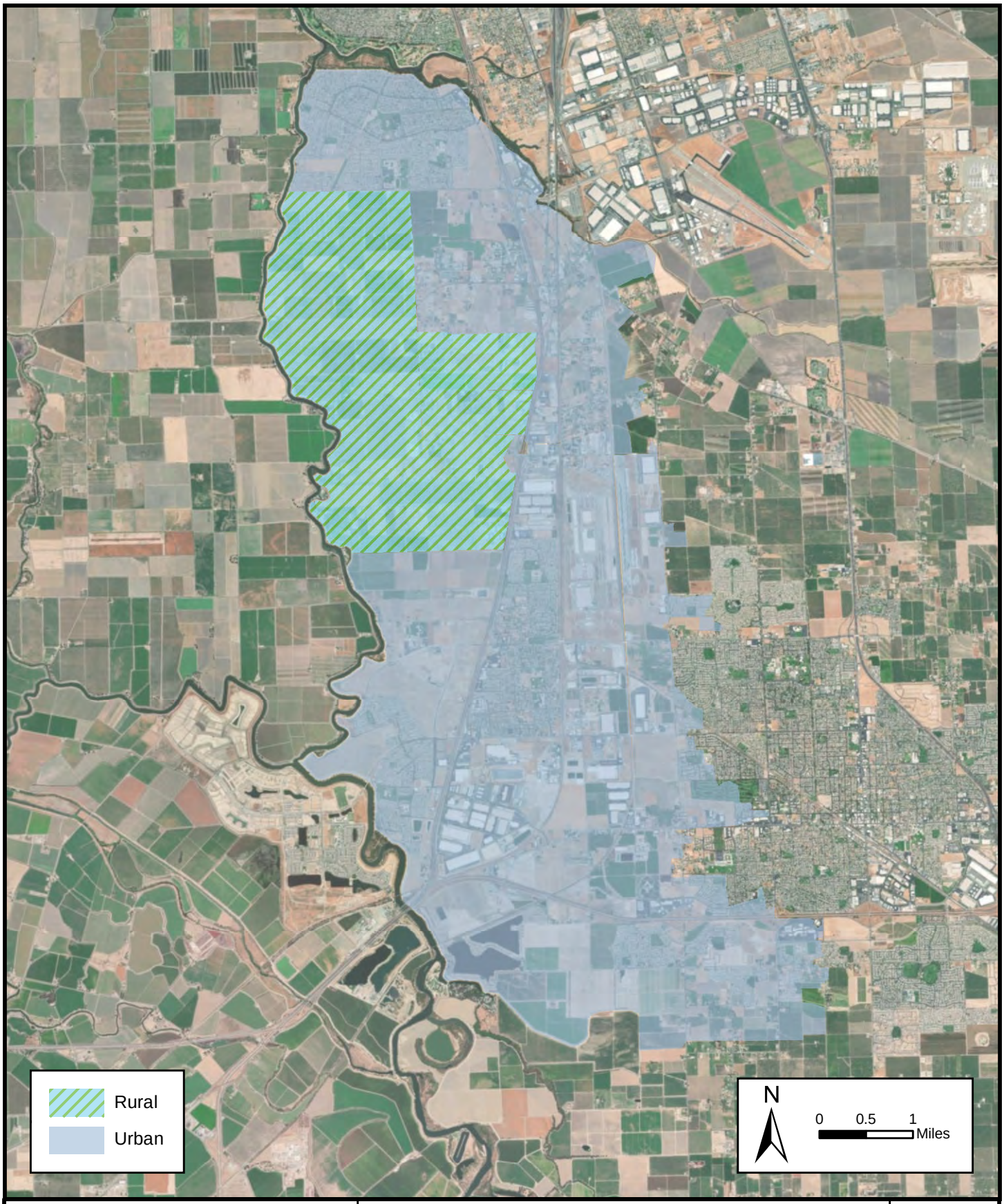
As noted in Section 1.2, the Mossdale Tract area is a partially urbanized basin. While most of the study area is agricultural or open space, the urban areas have a large population within them. The areas within city limits of the three cities each have a current population exceeding 10,000 and therefore these areas are considered to be urban areas under SB5 and the State's ULOP Guidelines, and not "rural floodplains", even though there are lands within the spheres of influence of the cities which are currently ag or open space, and entitled for development. The area within the county's jurisdiction, that has a population of less than 10,000 is still considered rural. Additionally, the rural area within the county's jurisdiction also corresponds to the deepest parts of the floodplain.

Much of the rural portion of the basin is still in agricultural production, so the final sentence in the State policy, which calls for limiting conversion of the agricultural lands to urban developments, is applicable.

The CVFPP excerpt above highlights the State's policy governing State investments:

1. Discourage population growth in rural floodplains
2. Deep floodplains with rapid rise flooding are the greatest concern
3. State investments will be limited to areas protected by SPFC facilities
4. Aggregate loss of life risk and property damage risk are held constant or reduced over time
5. Limit conversion of agricultural land to urban uses, and preserve the robust agricultural economy

Figure 2-2 delineates the urban and rural areas.



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Rural and Urban Areas

FIGURE

2-2

2.2.3.a.2 Federal Wise Use of Floodplains Policy

The following is excerpted from Section 3.6 of the LSJRFS:

> *ER 1165-2-26 provides the general guidance and policy for USACE's implementation of EO 11988 for all civil works projects. Paragraph 7 of the regulations states: "…It is the policy of the Corps of Engineers to formulate projects which, to the extent possible, avoid or minimize adverse impacts associated with use of the base floodplain and avoid inducing development in the base floodplain unless there is no practicable alternative. The decision on whether a practicable alternative exists will be based on weighing the advantages and disadvantages of floodplain sites and non-floodplain sites. Factors to be taken into consideration include, but are not limited to…the functional need for locating the development in the floodplain…The test of practicability will apply to both the proposed Corps action and to any induced development likely to be caused by the action."*
>
> [Figure 2-3] *outlines the analysis process as described in 43 FR 6030, U.S. Water Resources Council, Floodplain Management Guidelines for Implementing EO 11988, dated February 10, 1978.*

For the Federal government, wise use of the floodplain is governed by USACE guidance for compliance with EO 11988.

The LSJRFS initially considered RD 17 in the analysis, but the final recommended plan removed RD 17 because the time involved in resolving the policy concerns regarding EO 11988 compliance was not acceptable to the USACE or the local sponsor. The USACE determined that the construction of any project would promote development in the deepest part of the floodplain thereby increasing life loss risk in the area. It is important to note that the LSJRFS assumed that Stockton would expand into the deepest part of the floodplain South of Weston Ranch in an area that is prohibited from development by the Delta Plan. In the LSJRFS finding it emphasized the following:

"…the proposed urbanization within RD 17 occurs in the deepest areas of inundation. While some of the planned development could be relocated from the deepest areas of inundation, it may not be practicable to fully relocate all future development outside the floodplain."

The practicality of moving future development is an issue particularly for Lathrop and Manteca which have limited other options for growth. On the other hand, a portion of the assumed growth of Stockton is prohibited by the Delta Plan. Additionally, the Envision Stockton 2040 General Plan Update, adopted on December 4, 2018, changed 2,900 acres from urban village land use designation in the Mossdale Tract boundary to Open Space/Agricultural land use. This action thereby removed a combination of mixed land uses including residential, commercial, office, and schools on land in the deep part of the floodplain in the City of Stockton's Sphere of Influence and year 2040 General Plan planning horizon area.

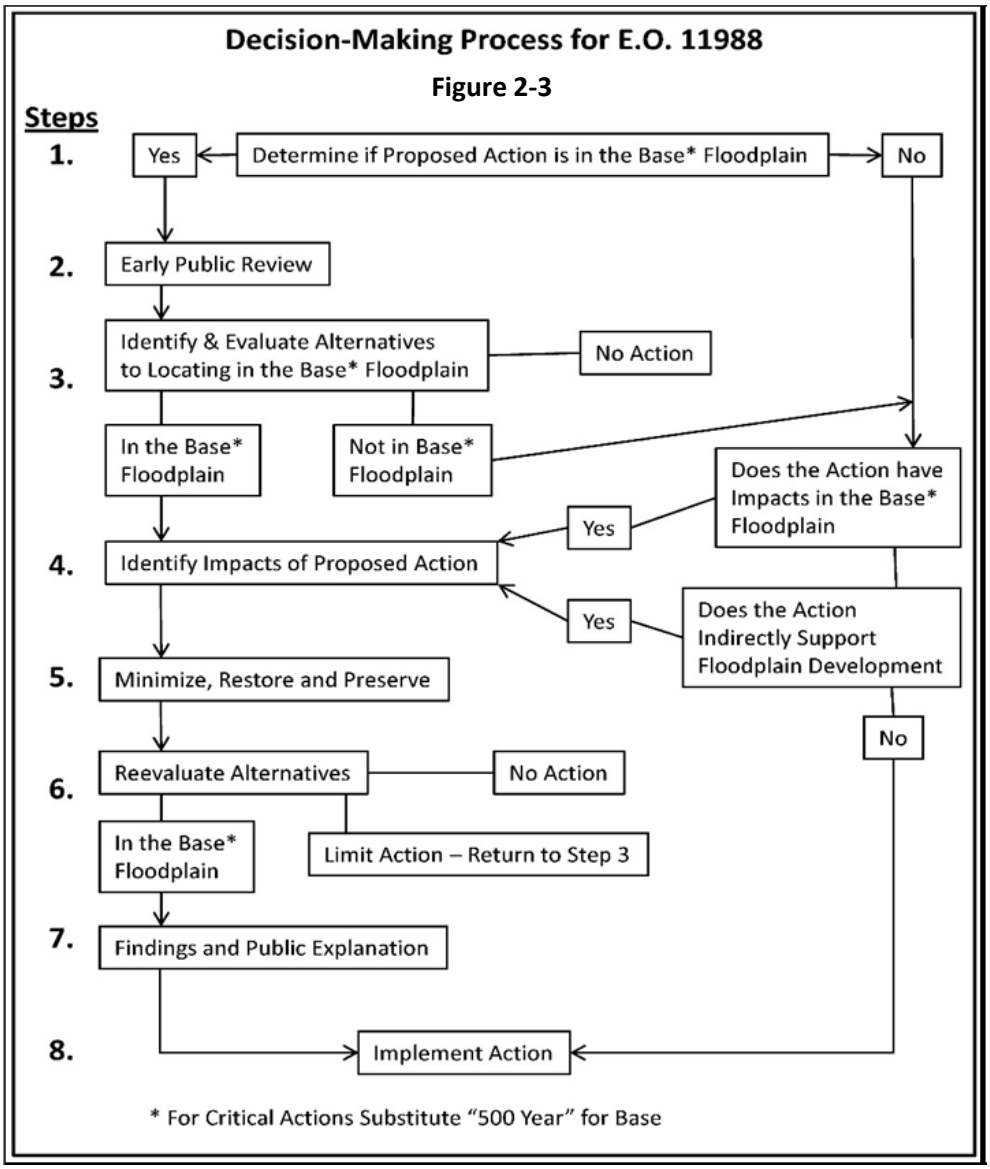


Figure 2-3 E.O. 11988 Decision-Making Process

2.2.3.b Constraint 2: Substantial development has been entitled and is partially constructed.

Within the Cities of Lathrop, Manteca, and Stockton, approximately 3,200 acres of land has had infrastructure (utilities, roads, etc.) constructed in anticipation of additional development, and large portions of the Oakwood Shores project (between SR 120 and the RD 17 dryland levee) have already been developed in San Joaquin County pursuant to approved specific plans, development agreements, and other development entitlements. Of the 3,200 acres, 1,660 acres of land had approved specific plans with infrastructure constructed prior to the passage of SB5 in 2007. The specific plans for Central Lathrop, Mossdale Village, and Crossroads Industrial Park were adopted on 11/9/2004, 9/22/2004, and 7/1/1989, respectively. Planning alternatives that do not consider existing, entitled, and planned development will likely be unacceptable at the local level and will greatly increase costs likely becoming economically unjustified. A $200 million public infrastructure Community Facilities District was approved in Lathrop, guaranteed by public bonds, of which about $70 million is currently assessed on about 1,000 acres of fully entitled property to be developed in the future.

2.3 Without Project Conditions

Future-without-project conditions is the most likely condition expected at some future date in the absence of implementation of the proposed project. These conditions define the benchmark against which the alternative plans are evaluated. For this study, there are two without-project conditions; the 2018 without-project condition (also known as existing conditions), and 2065 without-project conditions. The study evaluates the various alternatives under both of these conditions. Although much of the land has not yet been developed tens of millions of dollars are currently being spent to construct utilities and roadways in anticipation of future development.

2.3.1 2018 Without Project Conditions (Existing Conditions)

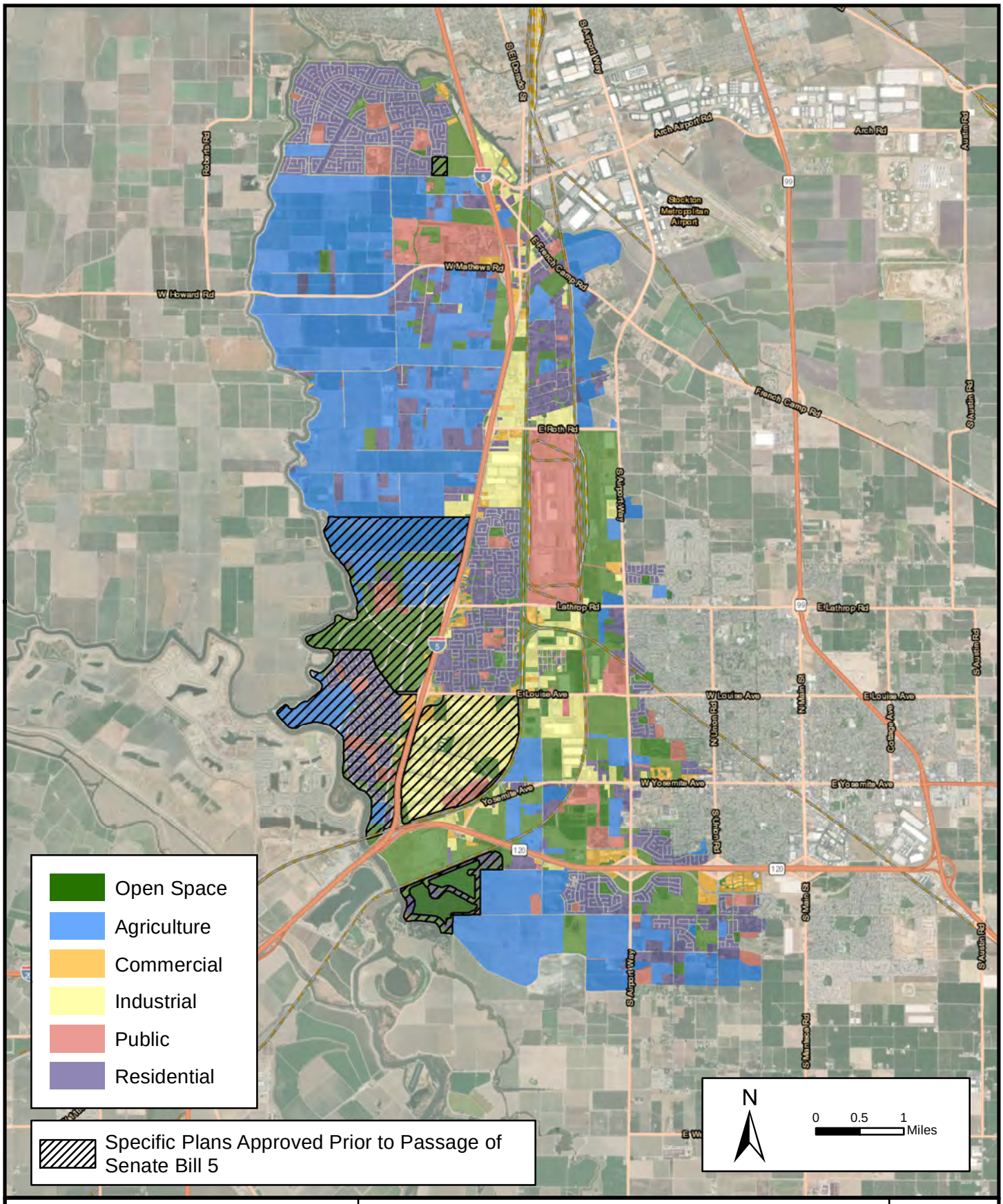
2.3.1.a Population, Existing Use of Land, & Critical Facilities

The Mossdale Tract Area is a 22,400-acre study area governed by the Cities of Stockton, Manteca, and Lathrop as well as unincorporated San Joaquin County. The eastern boundary of the Mossdale Tract area was established for this study to be coincident with the composite 200-year without-project floodplain for 2065 climate hydrology. Figure 2-4 and Table 2-2 shows existing use of the land within the study area that are within each entity's sphere of influence. Of the Mossdale Tract Area, currently 66% of the area is either open space or agriculture and 34% of the area has been urbanized through residential, commercial, industrial, and public construction. As discussed previously, 1,660 acres of land had approved specific plans with infrastructure constructed prior to the passage of SB5.

Table 2-2. 2018 Existing Use of Land

	Existing Use of Land (Acres)						
	Agriculture	Residential	Commercial	Industrial	Public	Open Space	**Total (Rounded)**
Stockton	650	1,410	70	170	520	1,680	**4,500**
Lathrop	1,200	990	200	1,290	940	2,980	**7,600**
Manteca	870	930	190	100	260	3,160	**5,500**
San Joaquin County	3,150	400	0	40	0	1,220	**4,800**
Total (Rounded)	**5,900**	**3,700**	**500**	**1,600**	**1,700**	**9,000**	**22,400**
Percentage	**26%**	**17%**	**2%**	**7%**	**8%**	**40%**	**100%**

While most of the study area is agricultural or open space, the urban areas have a large population within them. Currently, there are approximately 45,000 people who live within the study area, not including an additional temporarily housed population associated with the County jail complex and County hospital. Population was estimated from a residential structure count within each jurisdiction's sphere of influence within the study area, using a San Joaquin County geographic information system (GIS) database, multiplied by persons/structure values for various residential land uses (see Appendix E for more detail). Table 2-3 breaks down that population by jurisdiction. This population is at risk from flooding if a levee were to breach along the study area. This is especially true for the approximately 17,700 people who live within Stockton in an area known as Weston Ranch. Weston Ranch is a housing development that lies at the lowest point in the study area and is particularly prone to deep flooding if a perimeter levee were to break.



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MOSSDALE TRACT AREA

2018 Existing Land Use

FIGURE
2-4

Table 2-3. 2018 Population in the Mossdale Tract Area

Jurisdiction	Population
Stockton	17,700
Lathrop	16,700
Manteca	10,200
San Joaquin County	400*
Total	**45,000***

* Population totals do not include an additional population of 1,700 which are temporarily housed in critical facilities in San Joaquin County.

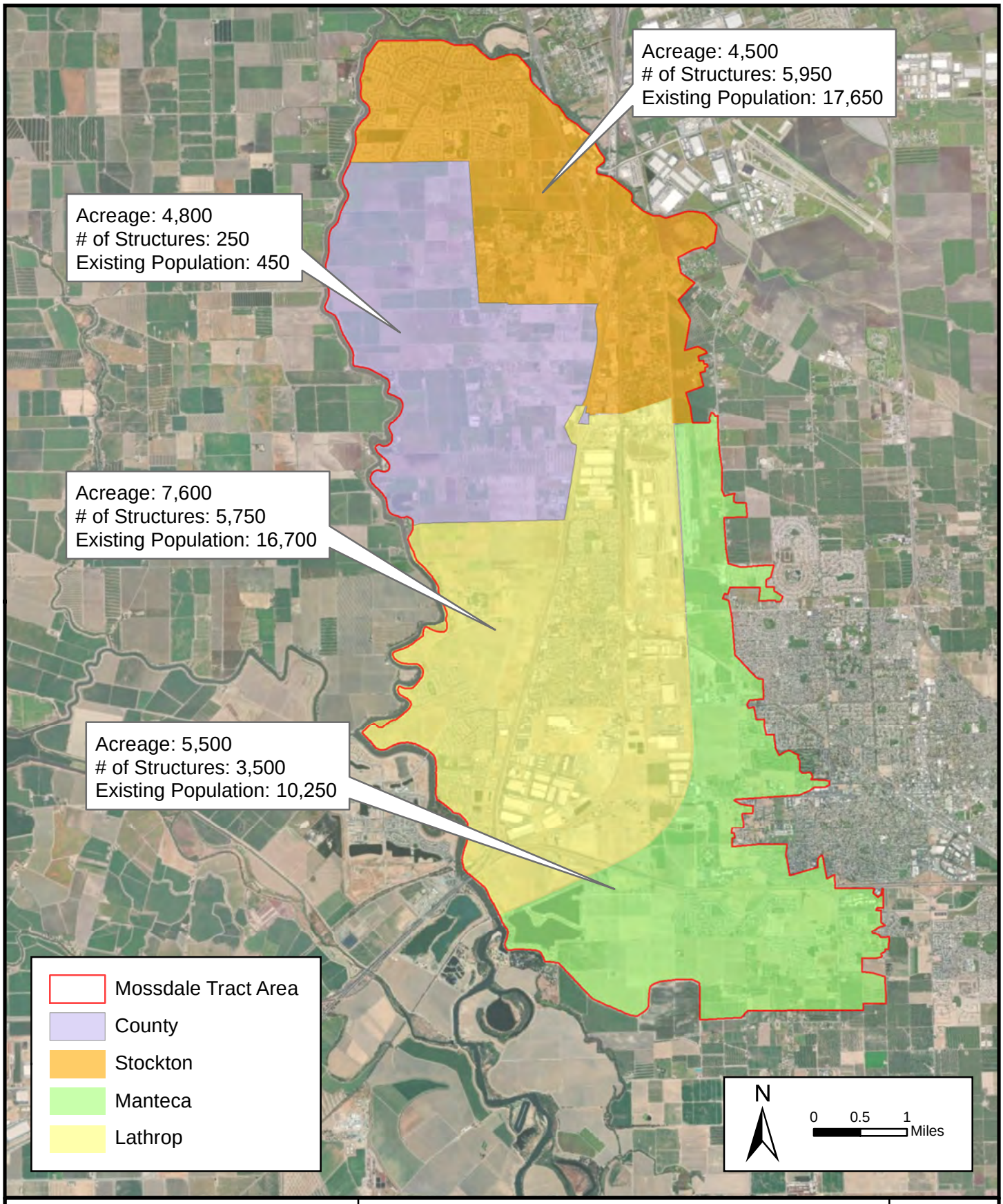
Figure 2-5 shows the study area, spheres of influence, structure counts, and estimated existing populations.

The definition of critical facilities can be found on the FEMA website:

> *For some activities and facilities, even a slight chance of flooding is too great a threat. Typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities. These facilities should be given special consideration when formulating regulatory alternatives and floodplain management plans. A critical facility should not be located in a floodplain if at all possible. If a critical facility must be located in a floodplain it should be provided a higher level of protection so that it can continue to function and provide services after the flood. Communities should develop emergency plans to continue to provide these services during the flood.*

Figure 2-6 shows a map of the locations of existing critical facilities within the study area. This figure shows there are 28 schools, two (2) hospitals, three (3) prisons/jails, four (4) fire stations, two (2) police/sheriff stations, and two (2) wastewater treatment plants at risk from flooding. Particularly worth noting is the San Joaquin County General Hospital, jail facilities and the San Joaquin County Sheriff's office located on the north end of the study area. The jails, which hold up to 1,500 people, and the 200-bed hospital, have potential for deep flooding and would be difficult to evacuate in the case of an emergency. If flooding were to occur in this region, it would likely lead to a loss of life.

I-5 is also a critical facility located within the study area and would likely be partially impassible in the event of a perimeter levee break. I-5 is a primary transportation corridor for the state for both emergency services and commerce.



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MOSSDALE TRACT AREA

2018 Spheres of Influence, Structures, and Population

FIGURE

2-5

AIRPORT

FIRE STATION

HOSPITAL

POLICE

PRISON

SCHOOL

WASTEWATER

Mossdale Tract Area

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N

0 0.5 1 Miles

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2018 Critical Facilities

FIGURE 2-6

2.3.1.b Existing Conditions Floodplains and Water Surface Profiles

A detailed hydraulic analysis for this study was completed to estimate the extent of existing floodplains. This hydraulic analysis, provided in Appendix A, utilized a Hydrologic Engineering Center River Analysis System (HEC-RAS) version 5.0 model which was adapted from an existing DWR HEC-RAS 4.1 model. The model includes 2D flow areas that can accurately map floodplains for various flood magnitudes, levee breaks, and improvement scenarios. The model utilized flood hydrology from the 2017 CVFPP. Flood scenarios were modeled for six (6) representative breach locations (taken from the LSJRFS) for 10-, 25-, 50-, 100-, 200-, 500-year return periods.

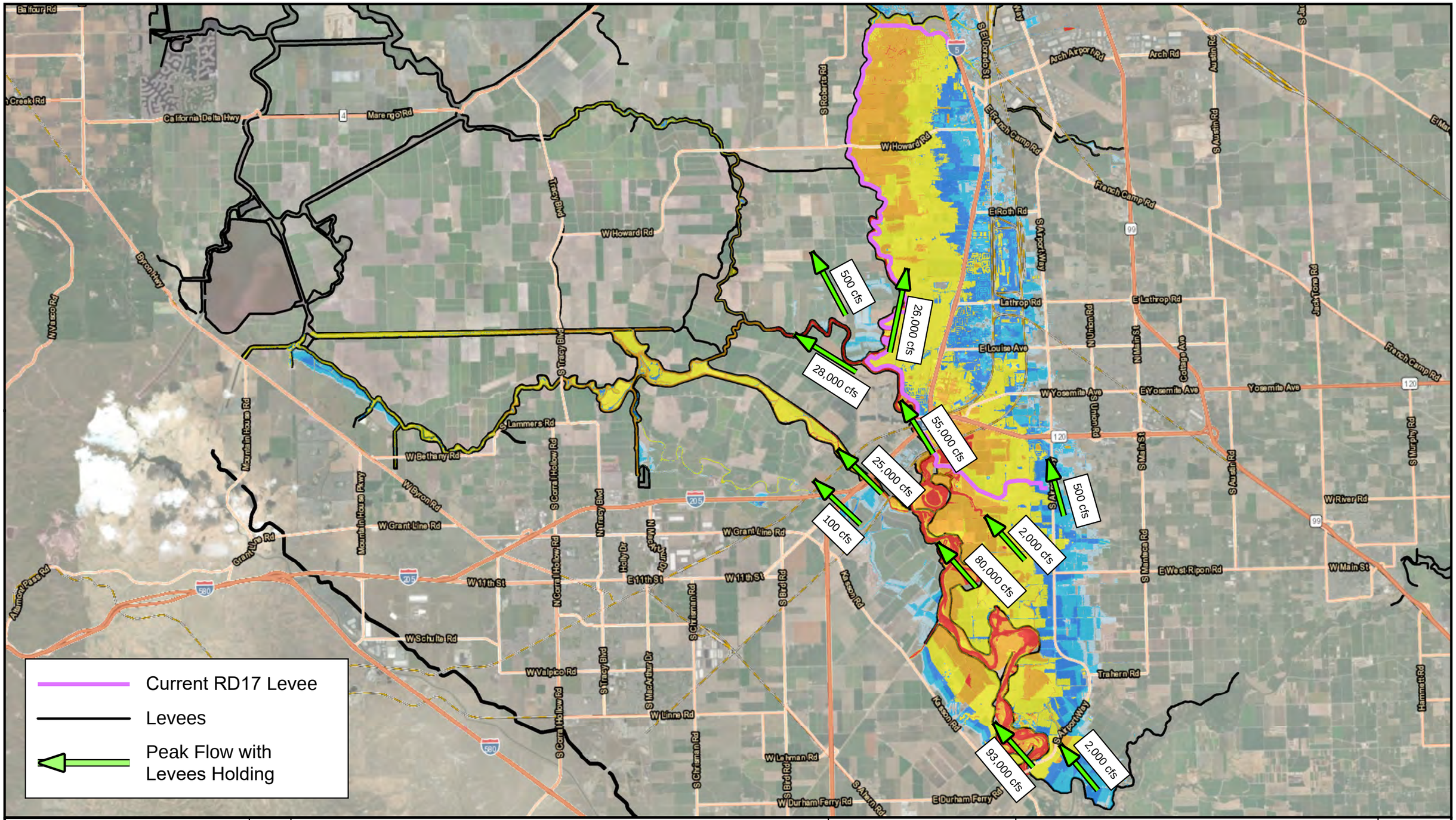
For most of the modeled flood events, flow overtops the Stanislaus and San Joaquin River levees upstream of the study area and inundates the area south of the dryland levee. In events greater than the 25-year flood, water will flank the RD 17 dryland levee and inundate portions of the study area. This assumes that levees upstream of the study area overtop but do not fail, consistent with ULDC analysis guidelines.

Figure 2-7 shows the composite 2018 climate conditions 200-year floodplain based on the six (6) different breach scenarios. Figure 2-8 shows a levees-holding water surface profile and levee profile (existing levee configuration; levees can overtop and flank, but do not fail). A more comprehensive set of floodplain maps and water surface profiles are provided in Appendix A.

2.3.1.c Existing Levees

The RD 17 levees were accredited to meet FEMA 100-year standards in 2011, predicated on flood fighting. In 2007, RD 17 embarked upon its LSRP with the intent of improving its levees to meet 2005 USACE seepage criteria, thereby strengthening performance in the 100-year flood and eliminating reliance on flood fighting to meet FEMA 100-year flood protection criteria. The design project was to be implemented in three phases. Phases I & II of the project were constructed before 2018, but Phase III was still pending. One feature of the Phase III project, the northern portion of the Old River RM-52 setback and restoration feature, is going into construction and is included in the existing (2018) without project conditions.

Construction of Phase III of the LSRP is expected to be completed by 2022 and will be considered to be completed for the future (2065) without-project conditions. Figure 2-9 shows the reaches of levee that were included in the LSRP.



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N

Depth (ft)

0 - 1	1 - 3	3 - 5	5 - 10	10 - 15	> 15

0 1 2 Miles

1 in = 2 miles

Mossdale Tract Area

Current Conditions 200-Year Composite Floodplain

FIGURE

2-7

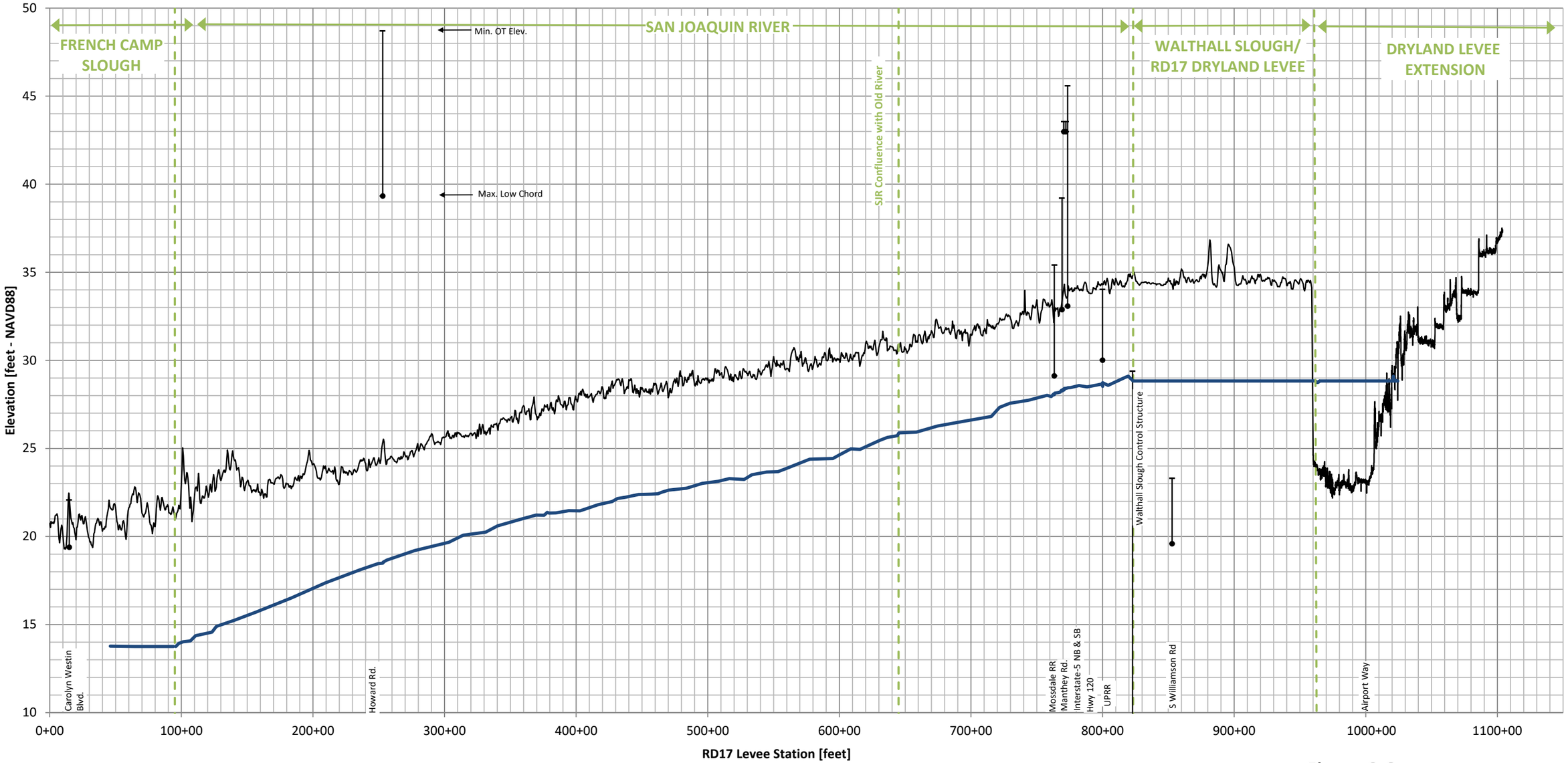


Figure 2-8

LEGEND

- RD17 Top of Levee
- Stream Junction
- Bridge (Max. Low Chord; Min. OT Elev.)
- PBI 200yr WSP

May 2018

MOSSDALE TRACT AREA
URBAN FLOOD RISK REDUCTION STUDY

Existing Conditions 200-year
Without Project Levees-Holding
Water Surface Profile

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100-Year Levee
Phase 1
Phase 2
Phase 3

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N

0 0.5 1 Miles

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RD17 Levee Seepage Repair Project

FIGURE
2-9

2.3.1.d Habitat Conditions

The study area is within the CVFPP-Conservation Strategy, Lower San Joaquin Conservation Planning Area (CPA). The Lower San Joaquin River CPA encompasses the San Joaquin River from its confluence with the Merced River into the Delta, as well as several major tributaries including the Merced, Stanislaus, Tuolumne. (Figure 2-10).

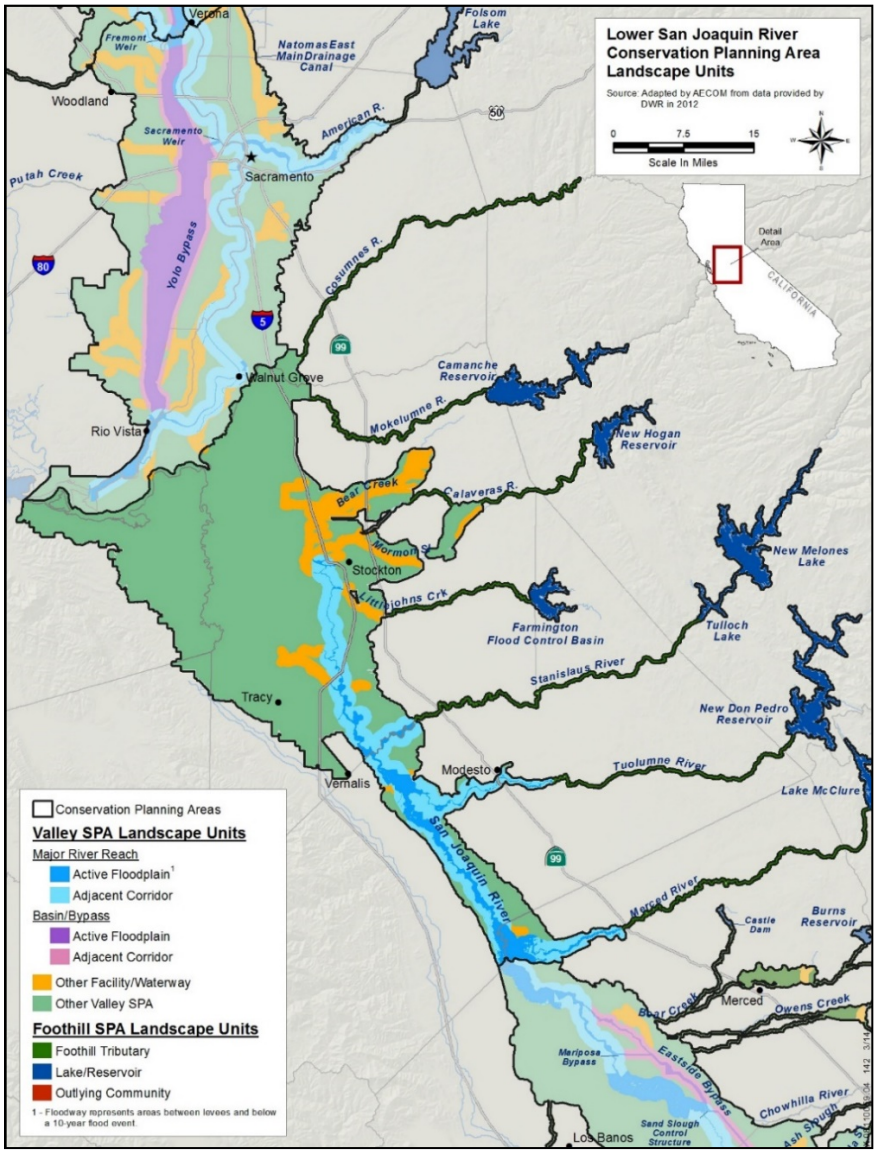


Figure 2-10. Lower San Joaquin River Conservation Planning Area

The Conservation Strategy outlined the existing habitat, the potential habitat, and habitat creation objective for the Lower San Joaquin River CPA. While the Conservation Strategy focuses on the entire Lower San Joaquin River CPA, much of the information does apply to the study area.

The Conservation Strategy identified that the habitat in the study area once consisted of marsh, tidal-marsh, seasonal wet-lands, and riparian areas but has since largely been degraded due to flood control infrastructure and operations or converted for agricultural production and urban development. The SPFC levees that protect the now urban and agriculture areas align closely along the river channel and

have disconnected the river from the floodplain. The proximity of the levees to the river channel prevents geomorphic process such as channel migration and vegetation growth resulting in degraded, channelized and simplified riverine habitat. Table 2-4 provides the existing habitat conditions for the entire Lower San Joaquin River CPA along with target metrics for new projects in this region.

Table 2-4. Existing Conditions along Major River Reaches in the Lower San Joaquin River Conservation Planning Area for Targeted Ecosystem Processes, Habitats, and Stressors

Goal Topic	Target: Metric	Existing Conditions (2012)[1]
Ecosystem processes	Floodplain inundation: inundated floodplain—major river reaches[2]	7,900 acres – 2% of historical area
	Floodplain inundation: inundated floodplain—bypasses/transient storage areas[2]	Not applicable
	Riverine geomorphic processes: natural bank[3]	229 miles – 81% of riverbank (maximum value[4])
	Riverine geomorphic processes: river meander potential	18,300 acres – 48% of meander corridor
Habitats	SRA cover: natural bank[3]	229 miles – 81% of bank total (maximum value[4])
	SRA cover: riparian-lined bank	146 (natural) + 17 (revetted) miles – 57% of riverbanks
	Riparian[5]	9,400 acres – 25% of active river floodplain
	Marsh (and other wetlands): nontidal marsh[5]	700 acres – 1% of active river floodplain
	Marsh (and other wetlands): tidal marsh[5]	<100 acres – 1% of active river floodplain
	Marsh (and other wetlands): seasonal wetlands[5]	1,000 acres – 2% of active river floodplain
Stressors	Revetment	55 miles – 19% of riverbank (minimum value[4])
	Levees: project	123 miles – 81% in meander corridor and 81% condition of higher concern
	Levees: non-project	77 miles – 64% in meander corridor
	Fish passage barriers[6]	Not available
	Invasive plants: area infested by prioritized invasive plant species[7]	805 acres in SRA (34 acres in Channel Maintenance Areas)

Sources: *Appendix E, "Invasive Plant Management Plan"; Appendix F, "Existing Conditions"; Appendix H, "Central Valley Chinook Salmon Rearing Habitat Required to Satisfy the Anadromous Fish Restoration Program Doubling Goal", Appendix K, "Synthesis of Fish Migration Improvement Opportunities in the Central Valley Flood System"; and DWR 2011.*

Key: SRA = shaded riverine aquatic.

Notes:

1 Values are for major river reaches, except where noted, and have been rounded to the nearest 50 acres and 1 mile, excluding invasive plant infestations, which are provided to the nearest acre.

2 Area inundated by 2-year, 14-day or longer flows, December–May.

3 This condition is provided under both riverine geomorphic processes and SRA cover.

4 Data are incomplete or unavailable.

5 Acreage represents amount within 1 mile of the San Joaquin River and lower reaches of the Merced, Tuolumne, and Stanislaus Rivers. Percentages of "active floodplain" are for the floodplain inundated by a 10-year (10-percent-chance) event.

6 DWR has not yet identified existing barriers and migration concerns for the Lower San Joaquin River CPA.

7 Acreages are underestimates because of data limitations described in Appendix E, "Invasive Plant Management Plan."

Additionally, the Lower San Joaquin River CPA provides an important corridor to many endangered terrestrial and aquatic species such as:

- Delta button-celery
- Slough thistle
- Valley elderberry longhorn beetle
- Steelhead (California Central Valley Distinct Population Segment (DPS))
- Chinook salmon, Central Valley fall-/late fall–run ESU
- Chinook salmon, Central Valley spring-run evolutionary significant units (ESU)
- Delta smelt
- Green sturgeon (southern DPS)
- Giant garter snake
- California black rail
- Least Bell's vireo
- Greater sandhill crane
- Swainson's hawk
- Riparian brush rabbit
- Riparian woodrat

The Conservation Strategy also outlines the potential habitat opportunity and objective amount for each of the metrics (Table 2-5). While the information provided is for the entire Lower San Joaquin River CPA, the Conservation Strategy did provide some information specific to the study area. Particularly, the regions adjacent to the San Joaquin River levees within much of the study area have a greater than 50% chance Floodplain Inundation Potential. Because the existing SPFC levees closely align to the river channel, setback levees would be required to obtain this benefit.

Table 2-5. Conservation Needs, Potential Opportunities, and Objectives in the Lower San Joaquin River Conservation Planning Area

Goal Objective: Metric	Additional Need[1]	Potential Opportunity[1]	Objective Amount[1]	Notes
Ecosystem processes				
Floodplain inundation: inundated floodplain—major river reaches Area inundated by 2-year, 14-day or longer flows, December–May (acres)	25,700	11,600	11,600	Opportunity includes all reconnected land, not just portion with frequent, sustained inundation
Floodplain inundation: inundated floodplain—bypasses/transient storage areas (acres)	Included in rivers above	200	200	May not be inundated in 50 percent of years or more frequently
Riverine geomorphic processes: natural bank[2] (miles)	13	12–14	13	—
Riverine geomorphic processes: river meander potential (acres)	4,300	10,200	4,300	To support natural bank and riparian habitat objectives
Habitats				
SRA cover: natural bank[2] (miles)	13	12–14	13	—
SRA cover: riparian-lined bank (miles)	0–120	6	6	Need has a high level of uncertainty
Riparian habitat (acres)	8,800	5,800	5,800	With grassland inclusions
Marsh/other wetland habitat (acres)	6,500	100	100	With inclusions of upland vegetation
Stressors				
Fish passage barriers: channel-wide structures	Potential barriers not evaluated	Potential barriers not evaluated	TBD	—
Invasive plants: prioritized species (infested acres)[3]	805	34	34	Opportunity is in Channel Maintenance Areas

Sources: *Appendix E, "Invasive Plant Management Plan"; Appendix F, "Existing Conditions"; Appendix H, "Central Valley Chinook Salmon Rearing Habitat Required to Satisfy the Anadromous Fish Restoration Program Doubling Goal", and Appendix L, "Measurable Objectives Development: Summary of Conservation Needs and Scale of Restoration Opportunities".*

Key: SRA = shaded riverine aquatic; TBD = to be determined.

Notes:

[1] Values have been rounded to the nearest 100 acres and 1 mile, excluding invasive plant acreages, which are provided to the nearest acre.

[2] This condition is provided under both riverine geomorphic processes and SRA cover.

[3] Acreages are underestimates because of data limitations described in Appendix E, "Invasive Plant Management Plan."

2.3.1.e Other Multi-Benefit Features

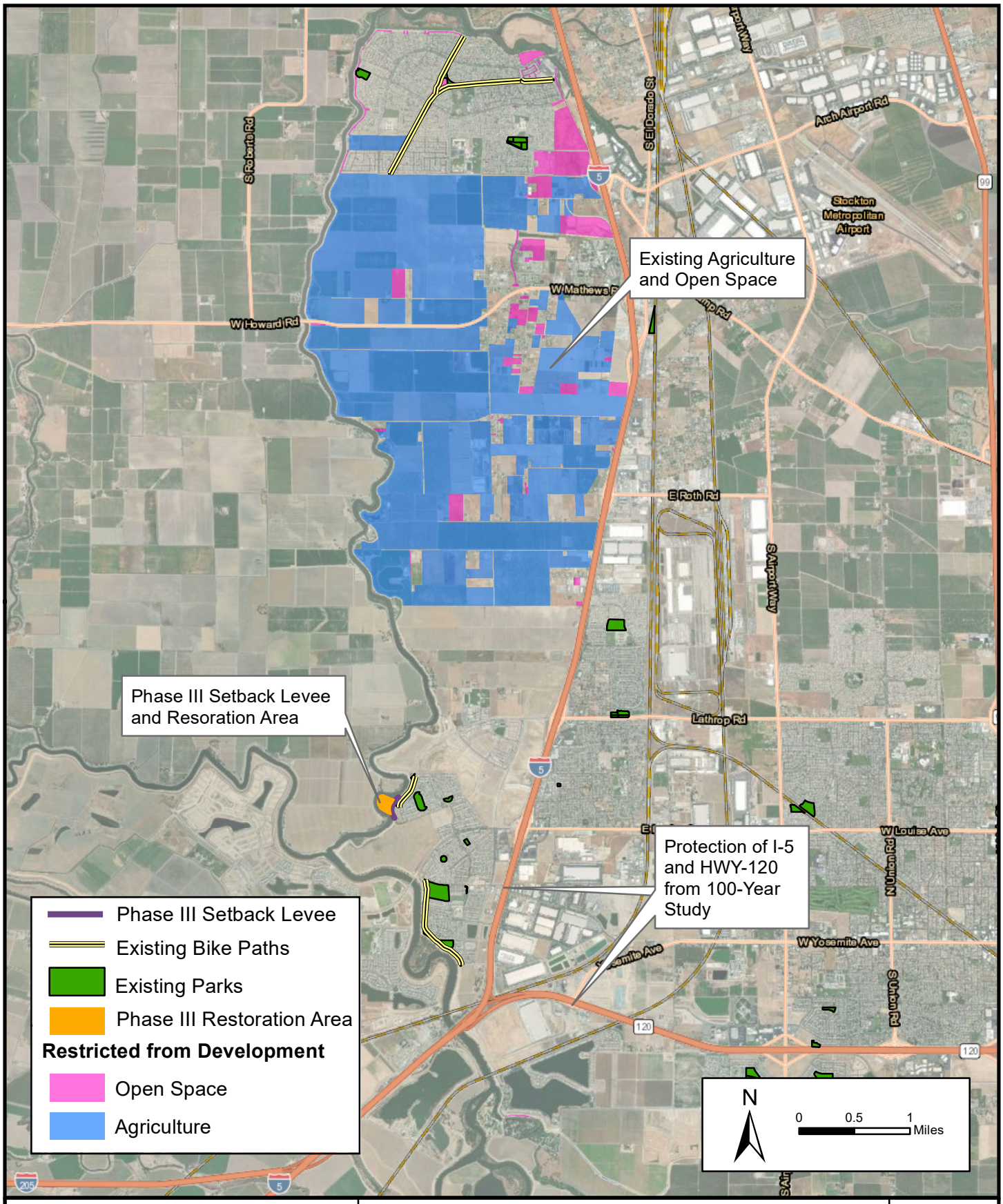
Other multi-benefit features, such as recreation, protection of agriculture, and open space, and protection of State facilities in the study area include:

- 175 acres regional parks
- 3.0 miles of bike paths
- 3,325 acres of open space and agriculture inside the Delta Plan area which is restricted from development
- I-5 and State HWY 120 has 100-year level of protection according to FEMA (but not according to the USACE)

Additionally, the LSRP Phases I, II, and III have or will increase the amount of multi-benefit features within the study. Since the LSRP will be considered completed for the purposes of the without project condition, the LSRP will provide the following additional multi-benefit features:

- Existing regional parks and bike paths will be improved where seepage berms are being built
- Increased protection of I-5 and State HWY 120 (but not a 200-year level of protection)
- Northern portion of the Old River RM-52 setback and restoration feature (approximately 7.5 acres of aquatic habitat)

Figure 2-11 shows the multi-benefit features considered to be a part of the without project condition.



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MOSSDALE TRACT AREA

Existing Multibenefit Features

FIGURE 2-11

2.3.2 2065 Without Project Conditions

USACE ER 1105-2-100 (Planning) provides the following description of the without-project condition and its significance:

> *The without-project condition is the most likely condition expected to exist in the future in the absence of a proposed water resources project. Proper definition and forecast of the future without-project condition are critical to the success of the planning process. The future without-project condition constitutes the benchmark against which plans are evaluated. Forecasts of future without-project conditions shall consider all other actions, plans and programs that would be implemented in the future to address the problems and opportunities in the study area in the absence of a Corps project. Forecasts should extend from the base year (the year when the proposed project is expected to be operational) to the end of the period of analysis.*
>
> *The with-project condition is the most likely condition expected to exist in the future with the implementation of a particular water resources development project. Comparison of conditions with the project to conditions without the project will be performed to identify the beneficial and adverse effects of the proposed plans. These with and without-project comparisons provide the framework for the evaluation of alternative plans.*

As noted in the Objectives section of this report, the planning horizon for design of alternatives is year 2040 climate conditions, consistent with the flood risk management goal of the Cities of Lathrop, Manteca, and Stockton making 15-year findings that an ULOP exists in 2028. Future performance and climate resilience will be estimated for 2065 climate conditions for planning purposes.

2.3.2.a Population, Use of Land, & Critical Infrastructure

Absent a project being constructed, the study area does not meet ULOP standards. Without an ULOP being met, state law precludes the cities of Lathrop, Manteca, or Stockton from approving residential development within the presently undeveloped portions of the study area after the year 2028, or before if findings of adequate progress are not made. Additionally, the State's Delta Plan prohibits development in areas that were not already slated for development in the Delta. Adopted by the Delta Stewardship Council (DSC) on May 16, 2013, the Delta Plan prohibits development of agriculturally zoned property within the Delta Secondary Zone outside the city limits of Stockton, Manteca, and Lathrop unless the area was both within a City Sphere of Influence and zoned for development at the time of Delta Plan adoption. 3,620 acres of the study area are within the Delta Plan Exclusionary Zone.

Since both ULOP and the Delta Plan restrictions are controlled by State law and these State laws are not projected to change significantly, it was assumed that no development would be allowed to occur in the study area under the without-project conditions. Therefore, 2065 without-project population, use of land, and critical infrastructure are projected to be the same as for existing conditions.

2.3.2.b Year 2040 and 2065 Climate Conditions Floodplains and Water Surface Profiles

Year 2065 climate change hydrology was derived from the 2017 CVFPP. The 2017 CVFPP built on previous iterations of the CVFPP, the San Joaquin River draft BWFS, DWR's Climate Change Technical Advisory Group (CCTAG) (California Department of Water Resources, 2015), as well as other supporting documentation. As a general overview of the 2017 CVFPP analysis, three (3) major components contributed to the 2065 climate change hydrology: SLR, storm surge, and watershed climate (temperature and precipitation) changes. The 2065 climate change hydrology was coded into the HEC-RAS 5.0 model and floodplains from the same six (6) breach locations analyzed for existing conditions were produced for the 10-, 25-, 50-, 100-, 200-, 500-year return periods. Details and complete results of this modeling can be found in Appendix A.

For most of the modeled flood events, flows overtop the Stanislaus and San Joaquin River levees upstream of the study area and inundate the area south of the RD 17 dryland levee. In events greater than the 25-year flood (2065 climate conditions), water will flank the RD 17 dryland levee and inundate portions of the study area. This assumes that levees upstream of the study area overtop but do not fail, consistent with ULDC analysis guidelines.

As described earlier in Section 2, year 2040 is the basis of design for the project alternatives, so it is necessary to estimate hydraulic conditions for that planning horizon, even though economic analyses will not be performed for that year. To be conservative, a straight-line interpolation was performed on hydrologic inputs between 2018 and 2065 to estimate 2040 hydrology, then HEC-RAS 5.0 was used to produce the design levees-holding water surface profile.

Figure 2-12 shows the composite 2065 climate conditions 200-year floodplain based on the six (6) different breach scenarios. Figure 2-13 shows a levees-holding water surface profile and levee profile for both 2040 and 2065 climate conditions (existing levee configuration; levees can overtop and flank, but do not fail). A more comprehensive set of floodplain maps and water surface profiles are provided in Appendix A.

Comparing Figures 2-12 and 2-13 with their existing climate counterparts, Figures 2-7 and 2-8 reveal a substantial increase in flood risk to existing population, property, and critical infrastructure due to anticipated climate change, even in the absence of urban growth. Under without-project conditions, the Mossdale Tract area would quickly lose its 100-year protection status, and level of protection would continue to decay with time, increasing the risk of failure of SPFC levees with each passing year. This amplification of risk in the without-project condition is quantified in Section 4.

It should be noted that within the timeframe of this UFRR study, the RD 2062 levees on Stewart Tract were improved to 200-year standards. The hydraulic modeling for this study pre-dates the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.

2.3.2.c Without-Project Foreseeable Projects

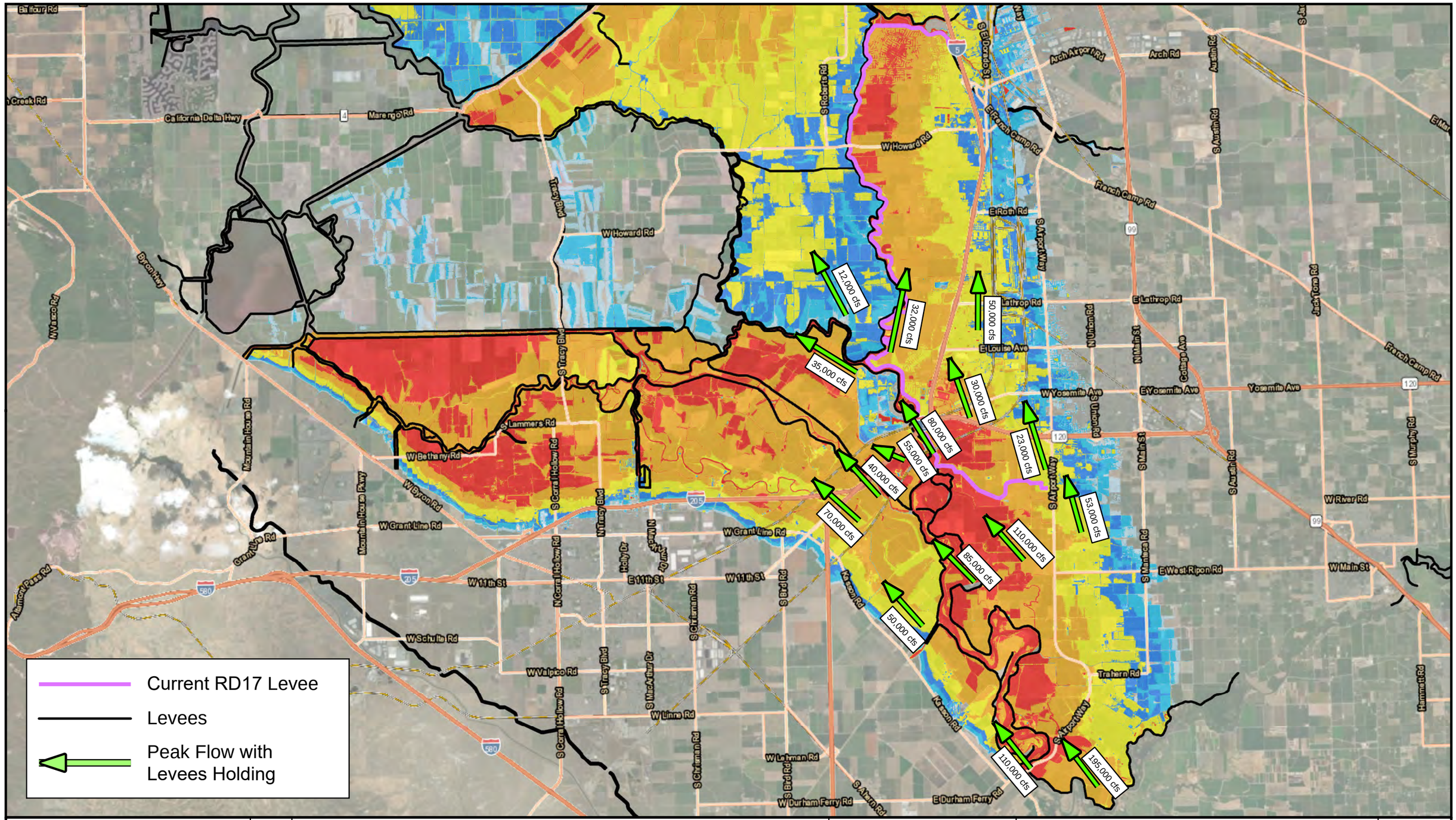
The only additional flood protection improvement that was included in the 2065 without-project condition was the RD 17 LSRP Phase III, because it is fully funded, in the final stages of design and permitting, and is considered imminent. Construction for Phase III is expected to be completed by 2022. This is the final phase of the project described in Section 2.3.1.c which is intended to improve current climate conditions 100-year flood protection performance.

2.3.2.d Habitat Features

There are no planned habitat projects within the study area, and no growth is projected in the without-project condition.

2.3.2.e Multi-Benefit

There are no planned multi-benefit projects within the study area, and no growth is projected in the without-project condition. Because of this, no changes between the 2018 without-project scenario are considered.



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N

Depth (ft)

0 - 1	1 - 3	3 - 5	5 - 10	10 - 15	> 15

0 1 2 Miles

1 in = 2 miles

Mossdale Tract Area

2065 Climate Change Without Project 200-Year Composite Floodplain

FIGURE 2-12

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.

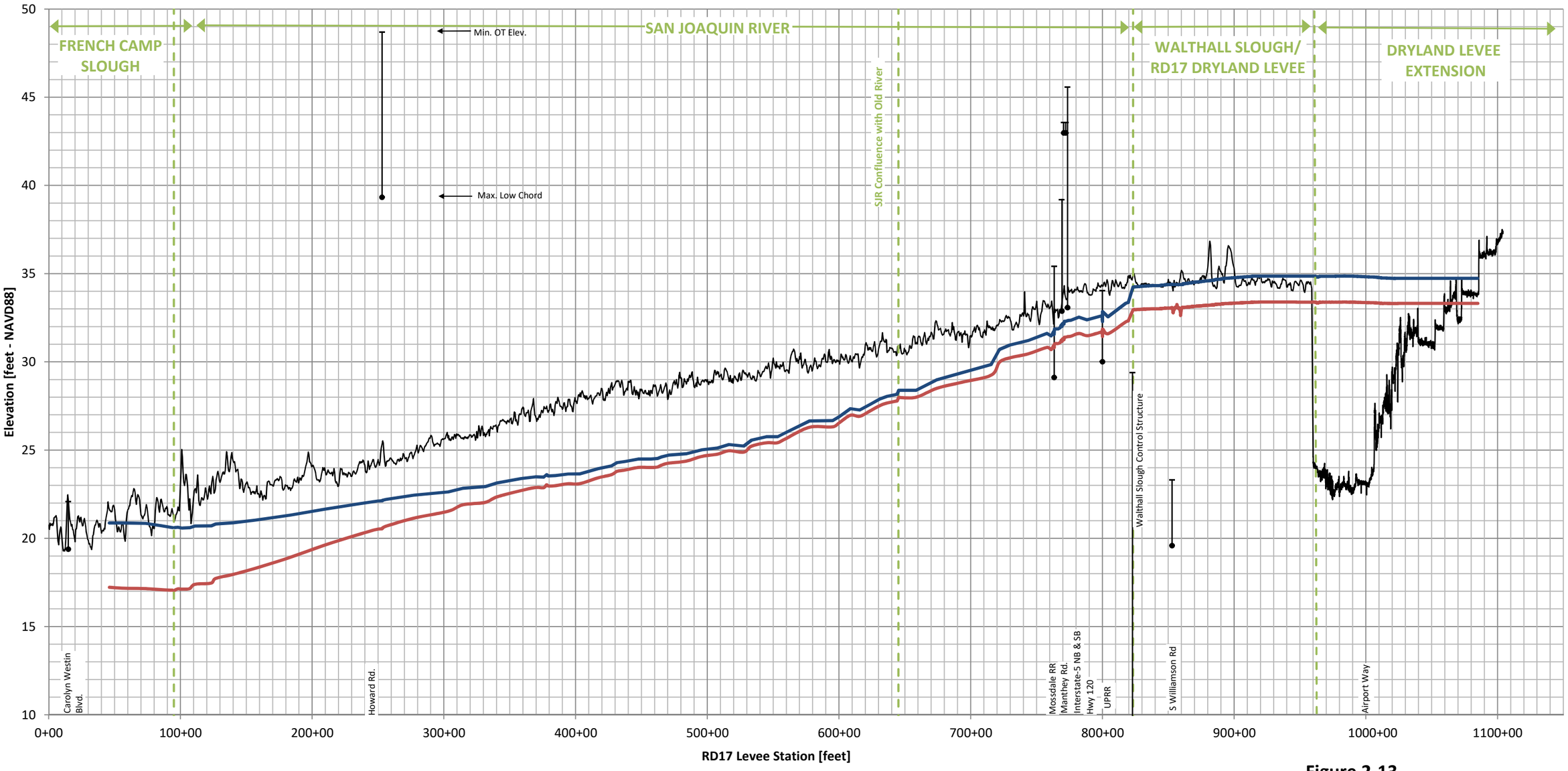


Figure 2-13

MOSSDALE TRACT AREA
URBAN FLOOD RISK REDUCTION STUDY

Year 2040 and 2065 Climate Conditions
200-year Without Project Levees-Holding
Water Surface Profiles

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LEGEND

- RD17 Top of Levee
- Stream Junction
- Bridge (Max. Low Chord; Min. OT Elev.)
- PBI 200yr 2040 WSP
- PBI 200yr 2065 WSP

June 2019

3 Plan Formulation

3.1 Formulation and Evaluation of Previous Studies' Alternatives

The scope of work for this UFRR Study called for an abbreviated alternative formulation process, with three alternatives defined in the study scope of work. When developing the scope of work for this study, the alternative formulation efforts from two major prior feasibility studies (highlighted in Section 1.4) were reviewed to formulate the initial three alternatives. These previous studies' alternatives constitute the initial array of alternatives that were previously analyzed at a high level in order to narrow the field to a final array for more detailed analyses.

3.1.1 USACE LSJRFS Alternatives

The USACE LSJRFS examined 8 alternatives that would benefit the Mossdale area (Figures 3-1, 3-2). The following is an excerpt from the LSJRFS:

> *The RD 17 area is defined by the levees along the right bank of the San Joaquin River, the left bank levees of French Camp Slough, and a dry-land levee at the upstream end of the reclamation district. A small secondary levee is included in RD17-A, RD17-C, RD17-D, and RD17-E for potential floodplain restoration. RD17-D includes a significant setback levee for potential floodplain restoration. RD17-F includes a ring levee for Weston Ranch to determine the viability of ring levee alternatives for the RD 17 area. The Flood Warning, Emergency Evacuation Plan and Flood Plain Management measures are included in all the alternatives discussed below.*
>
> *RD17-A, SJR (San Joaquin River) North: This alternative addresses the San Joaquin River and French Camp Slough flooding sources. This alternative includes the following measures: cutoff wall and improvements to the existing levee. The alternative covers 77,000 linear feet (14.6 miles) of levee.*
>
> *RD17-B, SJR Tieback: This alternative addresses the San Joaquin River as the flooding source. It includes the following measures: cutoff wall, seepage/stability berm, and improvement of the existing levee. The alternative covers a total 21,900 linear feet (4.148 miles) of levee.*
>
> *RD17-C, SJR North and Tieback: This alternative addresses the San Joaquin River and French Camp Slough flooding sources. It includes the following measures: cutoff wall, erosion protection, and improvement to the existing levee. The alternative covers 98,900 linear feet (18.7 miles) of levee.*
>
> *RD17-D, SJR Setback and Tieback: This alternative addresses the San Joaquin River as the flooding source. This alternative includes the following measures: cutoff wall, seepage/stability berm, erosion protection, improve existing levee and a setback levee to limit protection of already developed but non-urbanized flood plain within RD 17. The alternative covers a total 100,300 linear feet (19.0 miles) of levee.*
>
> *RD17-E, SJR North with Tieback and Extension: This alternative addresses the San Joaquin River and French Camp Slough flooding sources. It includes the following measures: cutoff wall, seepage/stability berm, erosion protection, improvement to the existing levee, small secondary levee and an extension of the tie-back levee to address flanking issues. The alternative covers 106,900 linear feet (20.2 miles) of levee.*
>
> *RD17-F, Weston Ranch Ring Levee: This alternative addresses the San Joaquin River and French Camp Slough flooding sources for Weston Ranch. It includes a new levee to form a ring levee*

around Weston Ranch, and an extension of the RD 404 levees to prevent flanking during lower frequency events. The alternative covers 33,370 linear feet (6.3 miles) of levee.

RD17-G, SJR Setback and Tieback Extension: This alternative addresses the San Joaquin River as the flooding source, and includes a setback levee to limit protection of already developed but not urbanized floodplain within RD 17. It extends the tieback levee at the southern-most end of the RD to minimize probability of flanking during extreme high-water events. The alternative covers 113,500 linear feet (21.5 miles) of levee.

Paradise Cut Bypass Alternative: This alternative includes levee setbacks, dredging, and construction of a short bypass at the upstream end of Paradise Cut. The levee along the right bank of Paradise Cut would be set back. Salmon Slough and Doughty Cut would be dredged to increase channel capacity. A channel would be cut through the island between Salmon Slough and Doughty Cut. Paradise dam would be widened from 180 feet to 400 feet. An additional weir would be constructed on the San Joaquin River upstream of Paradise Dam, and a channel would be constructed to Paradise Cut. New levee segments would have soil-bentonite cutoff walls installed during construction for management of through- and under-seepage.

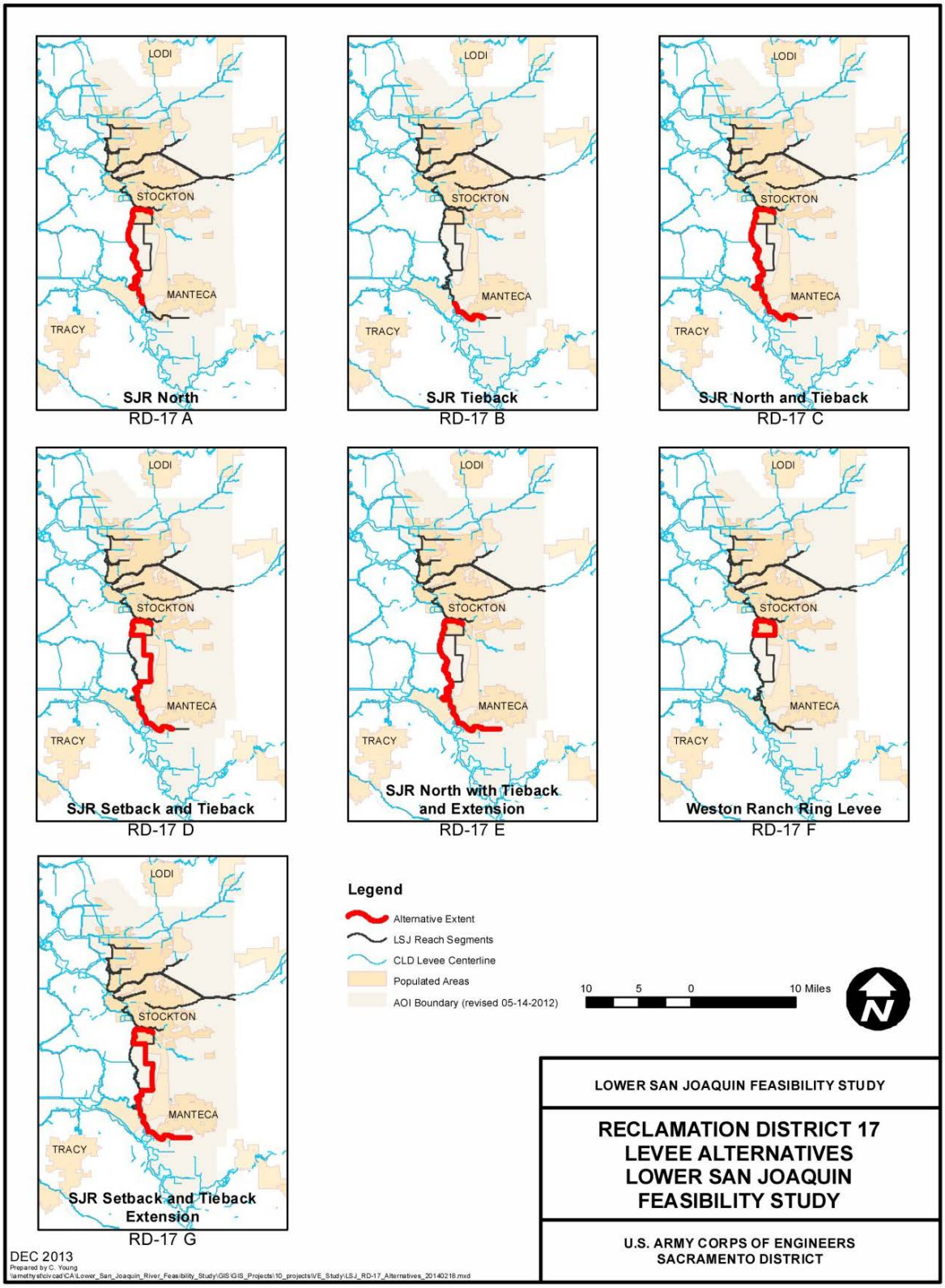


Figure 3-1. USACE LSJRFS Preliminary Array of Mossdale Tract Area Levee Alternatives

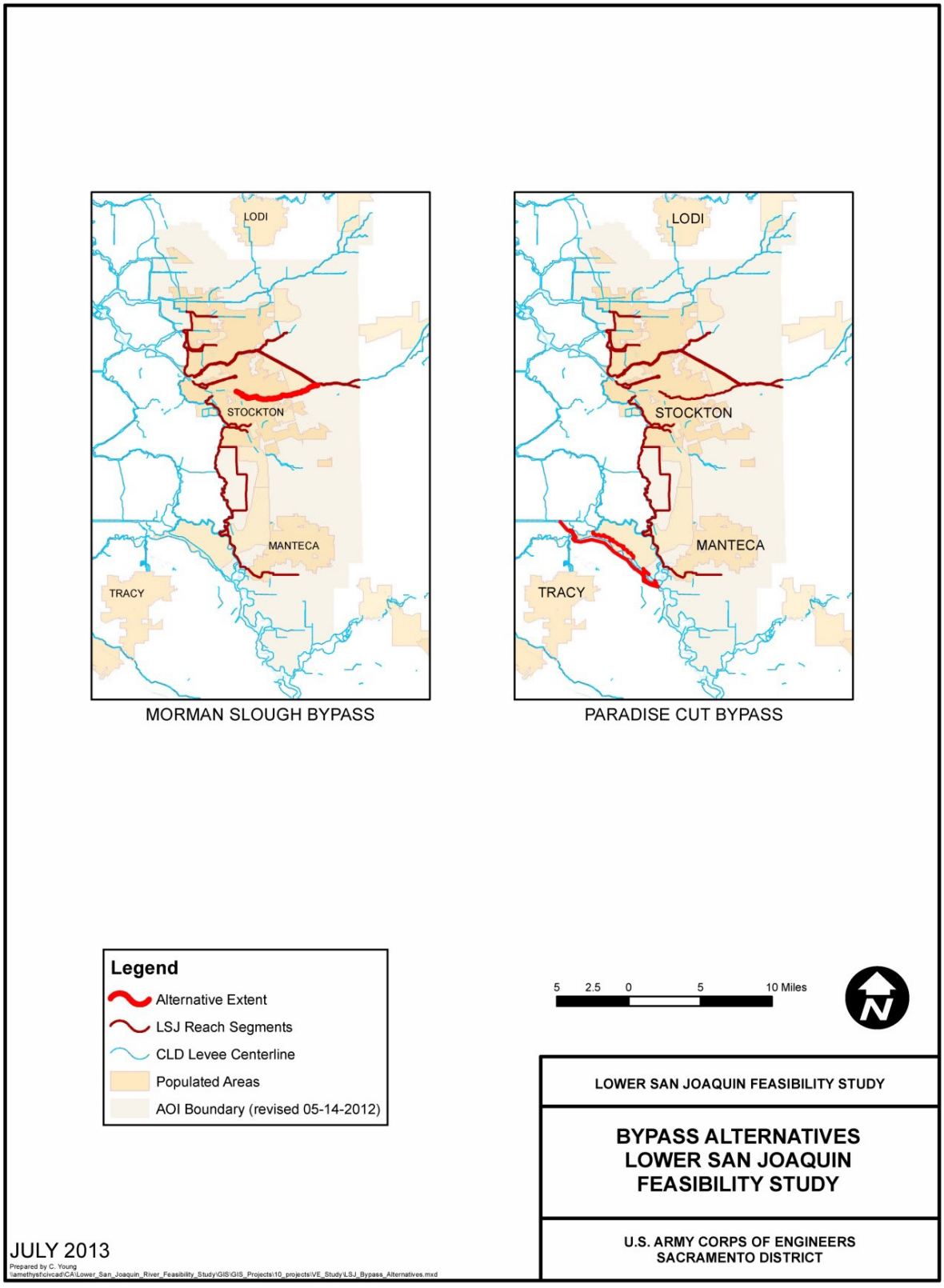


Figure 3-2. USACE LSJRFS Bypass Expansion Alternatives

3.1.2 DWR BWFS Alternatives

The DWR Draft San Joaquin River BWFS (California Department of Water Resources, 2017) formulated both systemwide and regional alternatives that would benefit the Mossdale Tract area. Regional alternatives were formulated to serve the following objectives:

- Reduce long-term loss of life and flood damages
- Achieve a 200-year level of protection for the population within the existing incorporated areas in RD 17
- Promote wise use of floodplains by limiting growth in deep floodplains to manage residual risk and achieve compliance with EO 11988
- Provide multiple benefits where opportunities exist

DWR's initial array of regional alternatives is excerpted from the BWFS (Figure 3-3):

Option A – Fix-in-Place: This single-purpose flood management option includes fix-in-place levee improvements to meet urban flood protection requirements for a 200-year flood event with projected climate change. This is consistent with the RD 17 improvements included in the Lower San Joaquin/Delta South RFMP.

Option B – Fix-in-Place with Easement: This single-purpose flood management option pairs Option A with agricultural conservation easements to reduce urbanization in deep floodplains of approximately 6 feet or higher.

Option C – Cross Levee Option: This single-purpose flood management option builds a new cross levee that meets urban flood protection requirements for a 200-year flood event with projected climate change. This levee alignment would protect existing urban populations. The existing San Joaquin River levee would remain unchanged to protect rural-agricultural areas within deep floodplains of approximately 6 feet or higher, but the existing levee would not provide an urban LOP.

Option D - North Setback with Easement Option: This multi-benefit option includes fix-in-place levee improvements and a setback levee on the northern portion of RD 17. The setback levee and breaching the existing levee could maximize inundated floodplain habitat. Agricultural easements behind the setback levee would reduce urbanization in areas of deep flooding. All levees would meet urban flood protection requirements for a 200-year flood event with projected climate change.

Option E – Large Setback Option: This multi-benefit option includes a large setback levee in the northern portion of RD 17 as shown on Figure 3-1. The setback levee would have the same alignment as Option C to protect existing urban populations. The existing levee would be breached, and portions of the setback area would be converted to habitat restoration in coordination with landowners. Existing structures in the setback area would be addressed through potential nonstructural actions.

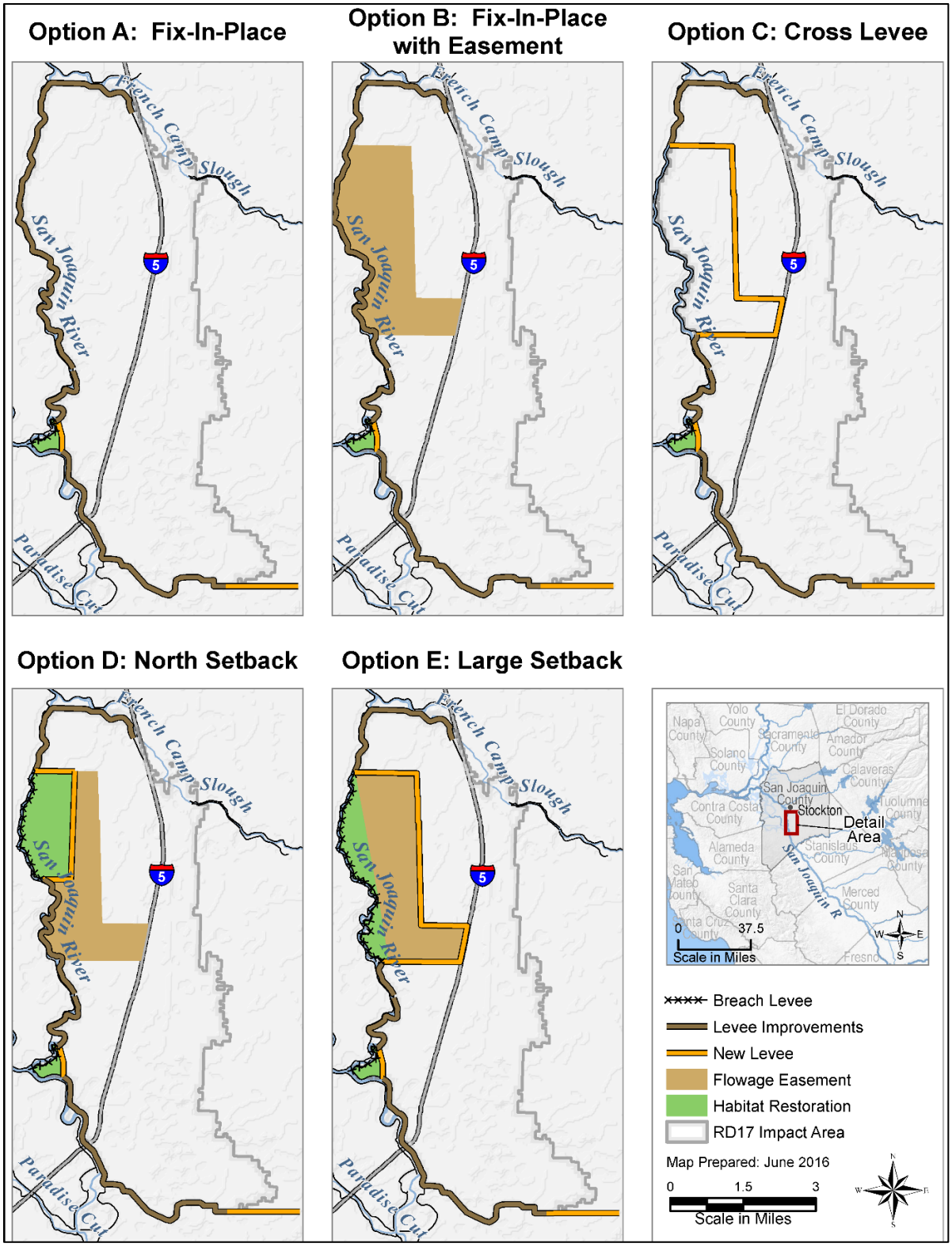


Figure 3-3. DWR BWFS Initial Array of Regional Alternatives for the Mossdale Tract Area

3.1.3 Preliminary Setback Levee Analysis

The Conservation Strategy identified the ecosystem benefit potential if setback levees were implemented. It also identifies a portion of the study area from the I-5/HWY 120 bridge to just upstream of Howard Road as an area with a high potential for setback levees based on high risk of failure. While the ecosystem benefit potential remains, the levee's potential for failure has changed substantially since the Conservation Strategy's analysis was conducted. Since the analysis, the LSRP Phases I and II have been completed and Phase III will be initiated in 2020. Once completed the LSRP will have greatly improved the condition of the levee within the study area and at the same time, limit setback levee opportunities.

The LSRP identified and evaluated 10 setback levee locations for consideration along the San Joaquin River from Walthall Slough to Howard Road. Figure 3-4 shows the setback locations and their corresponding numbering. An economic analysis was performed (MacKay & Somps, March 13, 2009) to determine the cost of constructing the setback versus the cost of fixing the levee in place. Of the 10 options, four of these were determined to be possibly economically viable, while the other six were considered economically unjustifiable. After some design had been accomplished, the remaining four setback levees were further analyzed to determine their hydraulic impact and to better determine their economic viability. Please note, ecosystem restoration benefits were not taken into account when determining economic feasibility as part of either of these analyses.

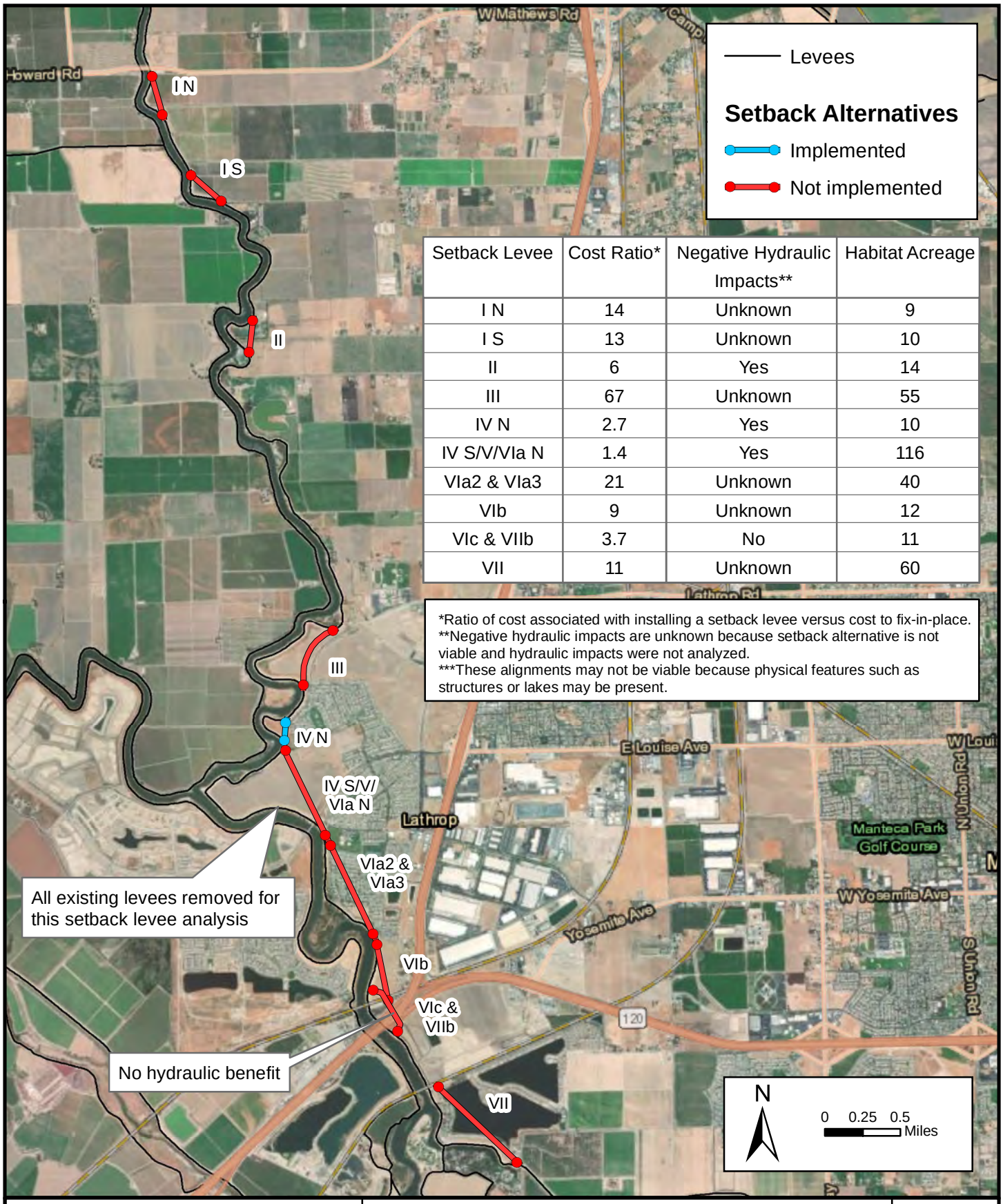
The setback levee "IV S/V/VIa N" was determined to have severe hydraulic impacts because the plan considered removing the existing levees on the right bank of the San Joaquin River both upstream and downstream of the Old River Confluence (ENGEO, February 26, 2009). The removal of the existing levees caused more water to move downstream on the San Joaquin River causing a negative hydraulic impact along this reach. Because of the negative hydraulic impacts, the setback levee in this form was not implemented. If reconfigured to avoid negative hydraulic impacts, this alternative could be viable.

Finally, another analysis was performed which determined that all three of the remaining setbacks were economically infeasible (MacKay & Somps, July 26, 2010). Additionally, the same study determined that one of the setback levees ("VIc & VIIb") had no hydraulic benefit and the other two setback levees ("IV N" & "II") had negative downstream hydraulic impact. From this analysis, two of the setback levees were discarded and one was implemented as part of Phase III.

The rest of the setback levee locations are considered fixed in-place for this project because Phases I and II are complete and Phase III is funded, most of the permitting process is complete, and construction is slated to being in 2020. Implementing additional setback levees in the reaches improved by Phases I-III would result in stranding prior State and Local investments.

Additionally, many of these setback levees will provide only minimal habitat at a large cost increase to the project. Ignoring the "IV S/V/VIa N" setback, which was replaced by the RM-52 setback in 2 of the alternatives, and any unreasonable setback levee locations (setback levees not crossing lakes or urban areas), the total amount of ecosystem created would be about 100 acres.

Due to all the aforementioned reasons, the alternatives laid out in the previous sections opted for more cost-efficient ecosystem such as the 150.7 acres on Walthall Slough and the RM-52 setback levee.



Setback Levee	Cost Ratio*	Negative Hydraulic Impacts**	Habitat Acreage
I N	14	Unknown	9
I S	13	Unknown	10
II	6	Yes	14
III	67	Unknown	55
IV N	2.7	Yes	10
IV S/V/VIa N	1.4	Yes	116
VIa2 & VIa3	21	Unknown	40
VIb	9	Unknown	12
VIc & VIIb	3.7	No	11
VII	11	Unknown	60

*Ratio of cost associated with installing a setback levee versus cost to fix-in-place.
**Negative hydraulic impacts are unknown because setback alternative is not viable and hydraulic impacts were not analyzed.
***These alignments may not be viable because physical features such as structures or lakes may be present.

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Levee Seepage Repair Project
Setback Levee Analysis

FIGURE
3-4

3.2 Evaluation Criteria

Evaluation criteria for this study very closely track the CVFPP evaluation criteria (Table 3-1). The primary goal of the project, Improve Risk Management, was assigned 80 of the 100 total possible points, and supporting goals of Promote Ecosystem Functions, Promote Multi-Benefit Projects, and Improve Institutional Support, together carry the remaining 20 possible points. The decision to heavily weight flood risk management was made for the purpose of reflecting study's primary objective of flood risk reduction while still giving weight to the other supporting goals. Additionally, the supporting goals are weighted equally because the CVFPP did not indicate a preferred supporting objective.

Since the evaluation of each criterion is qualitative for the evaluation formulation process, the value of each score (e.g. what constitutes a 10 vs a 5) is not applicable at this point. The specific point values for each of the criterion will be described in Section 4.11.

Table 3-1. Alternative Evaluation Criteria

CVFPP Goals	UFRR Study Objectives	Evaluation Metrics (based on qualitative rating unless noted)	Total Points Possible
Improve Flood Risk Management	Economically achieve 200-year ULOP	Quantified annualized net benefits or benefit/cost ratio	20
		Quantified reduction in annualized fatalities	20
	Reduce residual risk to property, life safety, and critical infrastructure	Improved evacuation	5
		Improved protection of limited mobility populations	10
	Resilience to future climate change	Ability of the alternative to be modified in the future to adapt to climate change	10
	Address State and Federal policies for wise use of the floodplain	Conformance with State CVFPP and Delta Plan growth policies, and Federal EO11988	15
Promote Ecosystem Functions	Incorporate environmental habitat components where possible	Ecosystem habitat created	5
Promote Multi-Benefit Projects		Multi-benefit features created	5
Improved O&M		Reduction or amplification in O&M effort	5
Improve Institutional Support		Improvement in management of the flood protection system	5
		Total Points	100

3.3 Application of Criteria to Initial Array of Alternatives

Preliminary screening of the initial alternative arrays was performed in the referenced studies using various subsets of the key evaluation criteria. The criteria used in the source documents were generally useful in screening alternatives based on the criteria presented in Section 3.2.

The USACE screened their preliminary array of alternatives based on economic performance, life safety, and protection of critical infrastructure. Table 3-2 provides USACE's results.

Table 3-2. USACE Screening Analysis of LSJRFS Preliminary Array of RD 17 Alternatives

Alternative	Annual Benefits ($1,000)	Net Benefits ($1,000)	Life Safety	Residual Critical Infrastructure Benefitting from Reduced Flood Risk
RD17-A SJR North	10,000	-300	Good	49
RD17-B SJR Tieback	0	-2,000	Poor	49
RD17-C SJR North and Tieback	10,000	-3,000	Good	49
RD17-D SJR Setback and Tieback	10,000	-10,000	Good	49
RD17-E SJR North with Tieback and Extension	27,000	12,000	Excellent to Very Good	51
RD17-F Weston Ranch Ring Levee	12,400	5,000	Poor	49
RD17-G SJR Setback and Tieback Extension	24,000	0	Good	49
Paradise Cut Bypass Expansion	12,000	-10,000	Poor	-

Based on USACE's screening analysis shown in Table 3-2, USACE made the following decisions:

Alternative RD17-E was carried forward into the focused array because it had the highest net benefits. RD17-F was not carried forward because of lack of effective evacuation routes. If the remaining urbanized areas in RD 17 were also protected by ring levees, the net benefits would become negative because the cost of the ring levees would exceed the benefits (based on professional judgment). Although RD17-G is economically justified, it was not carried forward since RD17-E outperforms it with greater net benefits.

Alternative PCB (Paradise Cut Bypass) was not carried forward due to the negative net benefits.

It is worth noting that the LSJRFS did not consider ecosystem restoration, multi-benefit features, O&M improvement, or institutional support. Regardless, Alternatives A, B, C, and D do not meet the primary objective of economically achieving 200-year level of protection and were thus screened out. Alternative G is economically neutral and will be carried forward for further analysis. Finally, Alternative F is a ring levee around Weston Ranch only which does not match the objectives of our study to provide 200-year level of protection for Lathrop and Manteca.

DWR screened the BWFS preliminary array of alternatives based on performance against the CVFPP goals. Table 3-3 provides DWR's results.

Table 3-3. DWR Screening Analysis of BWFS Preliminary Array of Options

CVFPP Goal	Primary Goal – Improve Flood Risk Management			Supporting Goal – Promote Ecosystem Functions		Supporting Goal – Promote Multi-Benefit Projects	
Screening Metric	Flood damage reduction from200-year event with projected climate change (assumes no future growth)	Life loss reduction from 200-year event with projected climate change (assumes no future growth)	Developable area (acres)	Inundated floodplain – total amount of land and EAH for 2-Year EAH (acres)	Riparian, marsh, and grassland habitat amount – total amount (acres)	Potential residential parcels within 0.5 mile of boundary	Costs
Option A Fix-in-Place	$2.7B	177 lives	10,953	0	0	-	$396M
Option B Fix-in Place with Easement	$2.7B	177 lives	7,179	0	0	-	$565M
Option C Cross Levee Option	$2.7B	177 lives	7,179	0	0	-	$437M
Option D North Setback with Easement	$2.7B	177 lives	7,179	1,275	1,333	-	$517M
Option E Large Setback Option	$2.7B	177 lives	7,179	605	782	Positive Contribution[1]	$572M

Notes:

- EAH = expected annual habitat
- Developable area was determined by subtracting existing urban areas and proposed agricultural conservation easements from the total area to be protected with an ULOP for each option. No additional easements were subtracted. With this approach, Option A has the most developable area and was determined by USACE to be noncompliant with Executive Order 11988 on the wise use of floodplains. Life loss calculations reflect existing population.

[1] Potential additional residences associated with the RD 17 Multi-Benefit Improvement Element qualitatively assessed as part of Configuration Option D.

The State carried all of the options forward except for Option A, stating the following:

> *Option A has the most developable area. Because USACE has determined Option A to be noncompliant with Executive Order 11988 on the wise use of floodplains, Option A was not studied further in the BWFS.*

The State then utilized Options B and E in their larger system alternatives, and, in the end, recommended Option C in their Recommended Plan for the BWFS and 2017 CVFPP.

The State's evaluation table does not include key information needed for evaluation of the State options per Table 3-1 criteria. But because the State options closely resemble the USACE RD 17 alternatives, USACE's evaluations in Table 3-2 can be utilized to inform screening decisions. DWR's Option B closely resembles USACE's RD17-E, but with additional easement costs, Options C and E resemble RD17-G, although Option E would carry additional easement costs.

Table 3-4 outlines the screening analysis of the initial array of alternatives of this feasible study.

Table 3-4. Screening Analysis of Initial Array of Alternatives

CVFPP Goals	UFRR Study Objectives	Evaluation Metrics (based on qualitative rating unless noted)	USACE LSJRFS Alternatives		DWR BWFS Options		
			RD17-E	RD17-G	Option B	Option C	Option E
Improve Flood Risk Management	Economically achieve 200-year ULOP	Quantified annualized net benefits or benefit/cost ratio	$12M ann. net benefits	$0 ann. net benefits	Same as RD17-E, but with additional easement costs, but net benefits would still be positive	Same as RD17-G	Same as RD17-G, but with additional easement costs, so net benefits would be negative
		Quantified reduction in annualized fatalities	Very good	Very good	Very good	Good	Very good
	Reduce residual risk to property, life safety, and critical infrastructure	Improved evacuation	Excellent to very good	Good	Excellent to very good	Good	Good
		Improved protection of limited mobility populations	51 facilities benefit	49 facilities benefit	51 facilities benefit	49 facilities benefit	49 facilities benefit
	Resilience to future climate change	Ability of the alternative to be modified in the future to adapt to climate change	Very good	Very good	Very good	Very good	Very good
	Address State and Federal policies for wise use of the floodplain	Conformance with State CVFPP and Delta Plan growth policies, and Federal EO11988	Local assurances plus Delta Plan exclusion; good	Leaves growth area unprotected; Very good	Easements restrict growth area; Very good	Leaves growth area unprotected; Very good	Easements restrict growth area; Very good
Promote Ecosystem Functions	Incorporate environmental habitat components where possible	Ecosystem habitat created	Minor	Minor	Good	Good	Excellent
Promote Multi-Benefit Projects		Multi-benefit features created	-	-	-	-	Positive Contribution
Improved O&M		Reduction or amplification in O&M effort	Very good	Add secondary levee, Poor	Add secondary levee at Old River, Good	Add secondary levee, Poor	Add secondary levee, Poor
Improve Institutional Support		Improvement in management of the flood protection system	Good	Good	Good	Good	Good

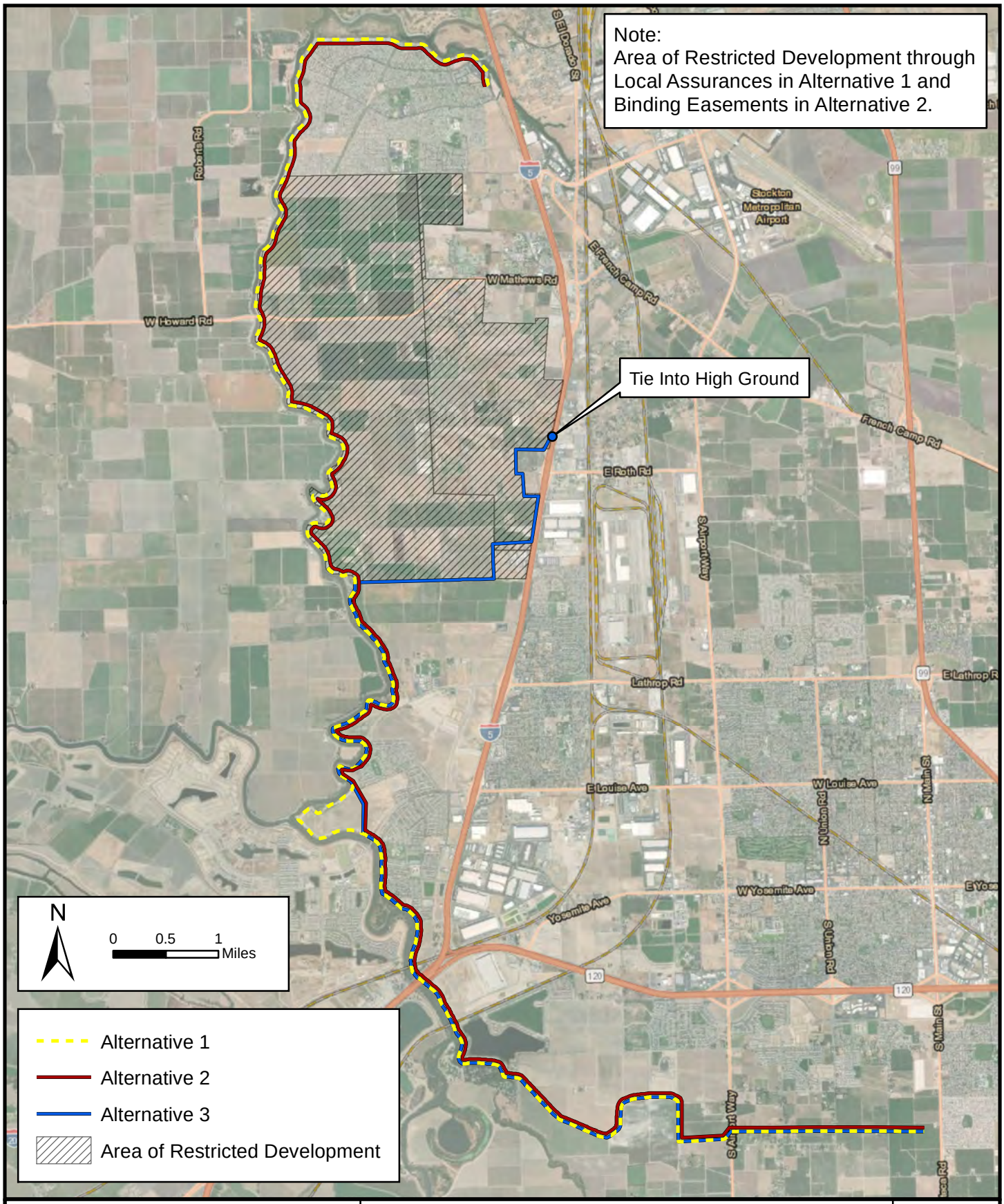
Although the qualitative screening-level evaluation in Table 3-4 showed varying levels of expected performance in the various categories, performance against the primary objective (Economically achieve a 200-year ULOP) was evaluated in a pass/fail manner, resulting in eliminating the following alternatives:

- USACE Alternative RD17-G, due to poor economic performance. USACE estimated net benefits of $0 and screened out that alternative in their study.
- DWR Option C, due to poor economic performance. Option C is nearly identical to RD17-G, and was screened out for the same reason as RD17-G.
- DWR Option E, due to poor economic performance. Option G is nearly identical to RD17-G, but with additional easement costs added, so it was screened out for the same reason as RD17-G.

From this initial screening the scope of work for this UFRR study called for analysis of three alternatives (Figure 3-5):

1. Full fix in place levee improvements accommodating year 2040 climate change based on DWR's forecast, with local assurances for wise use of the floodplain. The key feature of local assurances is existing statutory development prohibitions in the State's Delta Plan.
2. Full fix in place levee improvements accommodating year 2040 climate change based on DWR's forecast, with binding easements on about 5,100 acres for wise use of the floodplain, and inclusion of the Old River phased secondary/setback levee multi-benefit element.
3. Partial fix in place of levees fronting Lathrop and Manteca, plus a new secondary levee along the northern boundary of Lathrop. Levee improvements accommodate year 2040 climate change based on DWR forecast. Growth north of that line would be restricted by SB5 (no ULOP). Alternative 3 also includes the Old River phased secondary/setback levee multi-benefit element.

UFRR alternative 1 very closely resembles USACE's Alternative RD17-E and DWR's Option A which was not analyzed in the BWFS. UFRR Alternative 2 closely resembles DWR's Option B. UFRR Alternative 3 is unique. Table 3-5 provides an initial evaluation of the alternatives formulated for this study based on previous analyses.



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Key Flood Risk Management Features of Alternatives

FIGURE
3-5

Table 3-5. Initial Screening Analysis of UFRR Array of Alternatives

CVFPP Goals	UFRR Study Objectives	Evaluation Metrics (based on qualitative rating unless noted)	UFRR Study Scope Alternatives		
			1	2	3
Improve Flood Risk Management	Economically achieve 200-year ULOP	Quantified annualized net benefits or benefit/cost ratio	Same as RD17-E and DWR Option A which was not analyzed	Same as DWR Option B, but net benefits would still be positive	Unique Alternative
		Quantified reduction in annualized fatalities	Very good	Very good	Good
	Reduce residual risk to property, life safety, and critical infrastructure	Improved evacuation	Excellent to very good	Excellent to very good	Good
		Improved protection of limited mobility populations	51 facilities benefit	51 facilities benefit	49 facilities benefit
	Resilience to future climate change	Ability of the alternative to be modified in the future to adapt to climate change	Very good	Very good	Good, but relies on high ground tie-in to I5; could eventually be flanked
	Address State and Federal policies for wise use of the floodplain	Conformance with State CVFPP and Delta Plan growth policies, and Federal EO11988	Local assurances plus Delta Plan exclusion; good	Easements restrict growth area; Very good	Leaves growth area unprotected; Very good
Promote Ecosystem Functions	Incorporate environmental habitat components where possible	Ecosystem habitat created	Minor	Good	Good
Promote Multi-Benefit Projects		Multi-benefit features created	-	-	-
Improved O&M		Reduction or amplification in O&M effort	Very good	Add secondary levee at Old River, Good	Add secondary levees at Old River and north Lathrop; poor
Improve Institutional Support		Improvement in management of the flood protection system	Good	Good	Good

3.4 Final Array of Alternatives

The study team performed a wide variety of technical analyses on the three initial alternatives. These included evaluations of hydraulics, geotechnical, cost estimates, risk performance, multi-benefit features, and others. The formulation and evaluation of the three initial alternatives were always envisioned as a way to learn about project performance and as a step towards developing a fourth alternative. The scope of work for this UFRR study envisioned selecting features of the initial three alternatives to develop a hybrid alternative that could be evaluated and compared with the initial three alternatives.

DWR management and local stakeholders each provided input for the "Alternative 4". The differences were minor, but important, so Alternative 4 is being presented with four minor permutations, represented as Alternatives 4a through 4d. The final array of alternatives consists of Alternatives 1, 2, 3, 4a, 4b, 4c, and 4d, as described in the following section.

3.4.1 Key Alternative Themes

1. Full fix in place levee improvements accommodating year 2040 climate change based on DWR forecast, with local assurances for wise use of the floodplain. The key feature of local assurances is existing statutory development prohibitions in the State's Delta Plan.

2. Full fix in place levee improvements accommodating year 2040 climate change based on DWR forecast, with binding easements on about 5,100 acres for wise use of the floodplain, and inclusion of the Old River phased secondary/setback levee ecosystem restoration element.

3. Partial fix in place of levees fronting Lathrop and Manteca, plus a new secondary levee along the northern boundary of Lathrop. Levee improvements accommodate year 2040 climate change based on DWR forecast. Growth north of that line would be restricted by SB5 (no ULOP). Alternative 3 also includes the Old River phased secondary/setback levee ecosystem restoration element.

4a. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR forecast, with existing statutory development prohibitions in the State's Delta Plan and binding easements on about 1,430 acres for wise use of the floodplain, inclusion of the Old River phased secondary/setback levee ecosystem restoration element, and additional Old River dry restoration.

4b. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR forecast, with local assurances for wise use of the floodplain, inclusion of the Old River phased secondary/setback levee ecosystem restoration element, and additional Old River dry restoration. The key feature of local assurances is existing statutory development prohibitions in the State's Delta Plan.

4c. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR forecast, with existing statutory development prohibitions in the State's Delta Plan and binding easements on about 1,430 acres for wise use of the floodplain, and inclusion of Old River dryland habitat ecosystem restoration.

4d. Full fix-in-place levee improvements accommodating year 2040 climate change based on DWR

forecast, with local assurances for wise use of the floodplain, and inclusion of Old River dryland habitat ecosystem restoration. The key feature of local assurances is existing statutory development prohibitions in the State's Delta Plan.

Each of the alternatives include a number of features which act together to reduce flood risk. Key features of the final array of alternatives are described above. However, additional formulation was required to more fully define the structural and non-structural makeup of the alternatives. Alternative sizing is based on year 2040 climate conditions, consistent with the goal of the local land use agencies being able to make 15-year extended findings in 2028 that an ULOP exists. Alternatives will be tested for resiliency against further climate change to year 2065 conditions, using climate estimates from the 2017 CVFPP.

The following paragraphs describe the key features of each of the alternatives of the final array. Section 3.4.9 describes residual risk management features common to the four alternatives. A comprehensive cost estimate for each of the alternatives is presented in Section 4.

3.4.2 Alternative 1 – Fix-In-Place with local assurances for wise use of the floodplain

3.4.2.a Levee Improvements

Levee improvements necessary to meet ULDC requirements for 2018 climate conditions were identified in the 2016 RD 17 ULDC Engineer's Report (Peterson Brustad, Inc., 2016), summarized in Table 3-6, and the following paragraphs.

Table 3-6. Proposed Improvements to Meet ULDC Requirements (2018 Climate Conditions)

Project No.	Project Name	7.2 MTOL	7.4 Stability	7.5 Seepage	7.8 Geometry	7.10 Erosion	7.12 Encroachments	7.13 Penetrations
2.1	Dryland levee reconstruction and seepage berm			X	X			X
5.1	Cutoff wall		X	X				X
5.2	Seepage Berm		X	X				X
5.3	Cutoff wall		X	X				X
10.1	Erosion repairs					X		
12.1	Encroachment remediation						X	
13.1	Pipe penetration rehabilitation							X

Project No. 2.1 – Dryland Levee Reconstruction and Seepage Berm (Sta. 853+50 to Sta. 972+25). The improvements consist of widening the levee and constructing a drained seepage berm. They also include reconstructing pipe penetrations that cross the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.5 Under-seepage for Intermittently Loaded Levees, 7.8 Levee Geometry, and 7.13 Penetrations (numbers refer to sections in the ULDC).

Project No. 5.1 – Cutoff Wall (Sta. 119+50 to Sta. 192+00). The improvements consist of constructing a fix-in-place cutoff wall of varying depth. They also include reconstructing pipe penetrations that cross

the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.4 Slope Stability for Intermittently Loaded Levees, 7.5 Under-seepage for Intermittently Loaded Levees, and 7.13 Penetrations.

Project No. 5.2 – Seepage Berm (Sta. 190+50 to Sta. 297+75). The improvements consist of constructing a drained seepage berm of varying width. They also include reconstructing pipe penetrations that cross the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.4 Slope Stability for Intermittently Loaded Levees, 7.5 Under-seepage for Intermittently Loaded Levees, and 7.13 Penetrations.

Project No. 5.3 – Cutoff Wall (Sta. 311+00 to Sta. 518+50). The improvements consist of constructing a traditional cement/bentonite slurry cutoff wall of varying depth. They also include reconstructing pipe penetrations that cross the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.4 Slope Stability for Intermittently Loaded Levees, 7.5 Under-seepage for Intermittently Loaded Levees, and 7.13 Penetrations.

Project No. 10.1 – Erosion Repairs (Sta. 114+00 to Sta. 972+25). The improvements consist of supplementing riprap rock slope protections at varying application rates. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.10 Erosion.

Project No. 12.1 – Encroachment Remediation (various locations from Sta. 112+73 to Sta. 815+40). The improvements consist of removing high hazard encroachments. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.12 Encroachments.

Project No. 13.1 – Pipe Penetrations Rehabilitation (various locations from Sta. 571+35 to Sta. 801+00). The improvements consist of reconstructing pipe penetrations that cross the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.13 Penetrations.

Right-of-way acquisition is also needed for existing levee reaches that are currently deficient, and for the new section of dryland levee. Per the SJAFCA climate change policy, right-of-way will be acquired for the levee footprint that would protect against the 200-year 2065 CVFPP climate change scenario. The physical levee would not be initially built to this scenario, but acquiring the ROW will allow for flexibility to adjust the project facilities in the future as climate science progresses.

Additional incremental levee improvements for climate resiliency – The additional work to add climate resilience generally consists of raising of the RD 17 levee south of the Old River bifurcation and raising/extending of the dryland levee to prevent flanking at the south end of RD 17.

The amount of raising and extension was based on a design water surface elevation (DWSE) that takes into account climate change uncertainties. The DWSE is based on the 2040 climate change 200-year water surface profile. It was capped to be no more than the existing conditions 200-year water surface profile plus 3-feet based on guidance from SJAFCA's climate change policy.

The minimum top of levee (MTOL) was then set based on ULDC guidance as the DWSE plus the greater of either 3-feet or wind/wave calculations. For portions of the dryland levee, wind setup plus wave runup controls the minimum top of levee because during a major flood, the area south of the dryland levee extending to the Stanislaus River would be entirely flooded and would have very long fetch lengths. Calculated wind setup plus wave runup increases levee freeboard requirements to 5' in some segments of the dryland levee.

The conceptual alignment for the dryland levee extension was provided by the City of Manteca. Additional detail on the hydraulics and hydrology, wind setup and wave runup, and DWSE and MTOL are provided in Appendices A, B, and C, respectively.

A summary of additional levee improvements necessary to meet ULDC requirements for year 2040 climate conditions is provided in Table 3-7.

Table 3-7. Additional Levee Improvements to Meet ULDC Requirements for 2040 Climate Change Conditions

Project No.	From Station	To Station	Description
1	192+00	212+00	Widen Seepage Berm
2	312+30	339+00	Extend Cutoff Wall
3	703+00 781+00	741+30 799+50	Cutoff Wall
4	570+00	822+80	Levee Raise along San Joaquin River
5	822+80	959+00	Levee Raise along Walthall Slough / Dryland Levee
6	959+00	1104+00	Dryland Levee Extension (new levee)

Project 1 – Widen Seepage Berm along San Joaquin River (Station 192+00 to Station 212+00). Current climate ULDC design recommendations in Table 3-7 called for a seepage berm for this reach. The proposed preliminary design for Project 1 consists of widening the seepage berm an additional 30 feet.

Project 2 – Extend Cutoff Wall along San Joaquin River (Station 312+30 to Station 339+00). Current climate ULDC design recommendations called for a seepage berm for this reach. The proposed preliminary design for Project 2 consists of extending the cutoff wall an additional 10 feet deeper.

Project 3 – Cutoff Wall along San Joaquin River (Station 703+00 to Station 741+30 and Station 781+00 to Station 799+50). The proposed preliminary design for Project 3 consists of constructing a traditional cement/bentonite slurry cutoff wall. The work would take place within the existing levee prism; therefore, no new right-of-way acquisition is required.

Project 4 – Levee Raise along San Joaquin River (Station 570+00 to Station 822+80). The proposed preliminary design for Project 4 involves levee crown raising with some additional backslope work as needed. The majority of the levee reach includes existing or future seepage berms with related right-of-way; therefore, minimal new right-of-way acquisition is required. A floodwall is proposed in three locations in which it would be cost-prohibitive to raise the earthen embankment due to the presence of major encroachments.

Project 5 – Levee Raise along Walthall Slough / Dryland Levee (Station 822+80 to Station 959+00). The proposed preliminary design for Project 5 involves major levee raising with backslope work. The entire levee reach includes existing or future seepage berms with related right-of-way; therefore, no new right of-way acquisition is required.

Project 6 – Dryland Levee Extension (Station 959+00 to Station 1104+00). This reach includes extending a new levee eastward from the existing dryland Levee. The proposed preliminary design for Project 6 involves constructing a new levee prism with a 50-foot-wide seepage berm. Since this reach is a new levee, major right-of-way acquisition is required for the full width and length of improvements.

3.4.2.b Ecosystem Restoration and Multi-benefit Features

The Governor's California Water Action Plan places a priority on projects which achieve multiple benefits, such as those which reduce flood risk *and* enhance habitat, water supply, water quality, recreation, hydropower, etc. A workshop was held with local sponsors and stakeholders in early 2018 to discuss potential enhancements which could achieve multiple benefits. This subsection summarizes features to be included with Alternative 1. It is important to note that various ecosystem restoration

features are located outside of the study area but are considered features of the alternative because of the close proximity and the benefit to the Mossdale Tract area.

3.4.2.b.1 Lower San Joaquin River Channel Margin Restoration

This feature includes acquisition and restoration of 29.7 acres of land at 11 sites on the water side of the Lower San Joaquin River right levee between Stations 425+00 and 855+00 (Figure 3-6). Restoration would consist of removal of invasive plants such as Arundo, waterside bench grading, and new plantings to create shaded riverine aquatic (SRA) habitat.

This ecosystem restoration feature is conditioned upon landowner willingness to sell, willingness of a conservation agency or non-governmental organization to take over ownership and O&M of the restored lands, and availability of capital funds.

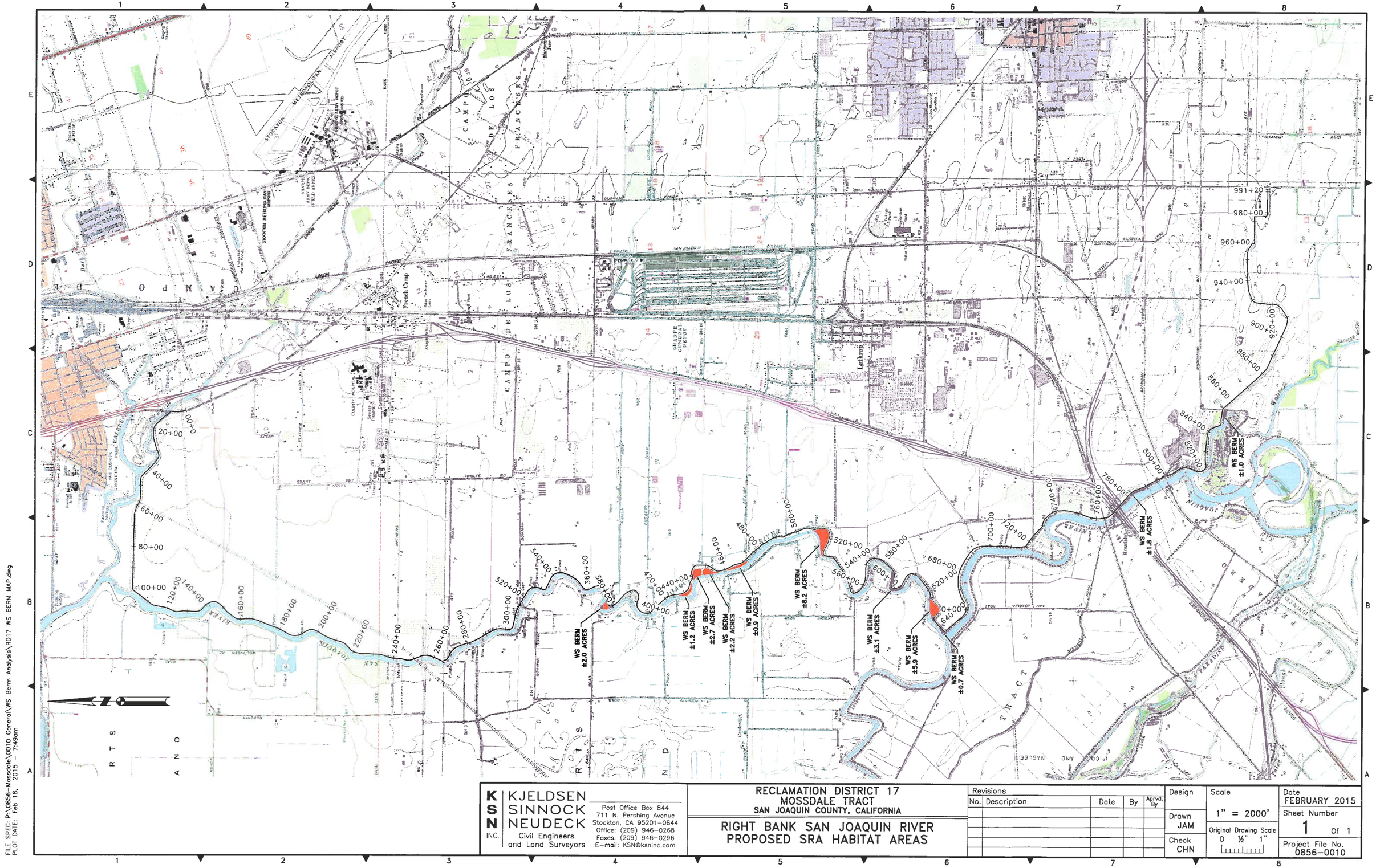
3.4.2.b.2 Restoration of Lands south of the RD 17 Dryland Levee

The City of Manteca currently owns approximately 150.7 acres of land south of the RD 17 dryland levee, just east of Williamson Road (Figure 3-7). This feature would include restoration grading and re-vegetation. For cost estimating purposes it was assumed that grading would be very minor, and that restoration planting would be in the form of riparian forest. The intent of the concept is to allow public unimproved pedestrian access to the restored land. However, these restoration and access assumptions would be refined in project implementation.

This ecosystem restoration feature is conditioned upon willingness of a conservation agency or non-governmental organization to take over ownership and O&M of the restored lands, and availability of capital funds.

3.4.2.b.3 Other Multi-Benefit Components

Since the alternative would provide 200-year level of protection to the study area, the growth in the urban areas would create approximately 165 acres of new regional parks and 3.1 miles of new bike paths. Additionally, this alternative would protect the State facilities of I-5 and State HWY 120 from a 200-year flood event given 2040 climate conditions. Finally, the alternative would protect 4,248 acres of agriculture and open space (3,325 acres within the Delta Plan Area; 923 acres within the 1,430 acres of local assurances) from development under this alternative.



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RECLAMATION DISTRICT 17
MOSSDALE TRACT
SAN JOAQUIN COUNTY, CALIFORNIA

RIGHT BANK SAN JOAQUIN RIVER
PROPOSED SRA HABITAT AREAS

Revisions				
No.	Description	Date	By	Aprvd. By

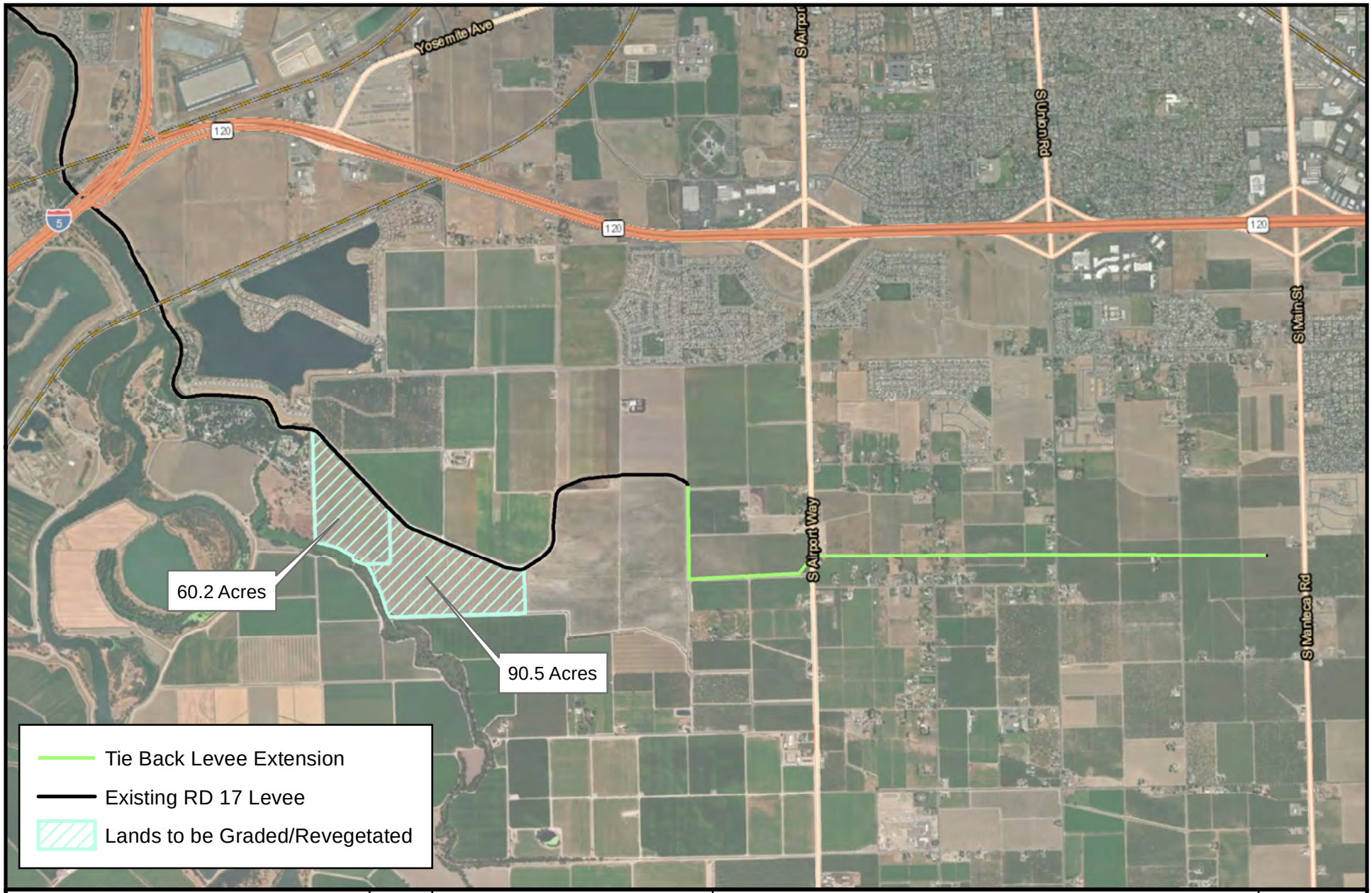
Design
Drawn JAM
Check CHN

Scale 1" = 2000'
Original Drawing Scale 0 ½" 1"

Date FEBRUARY 2015
Sheet Number 1 Of 1
Project File No. 0856-0010

FILE SPEC: P:\0856-Mossdale\0010 General\WS Berm Analysis\R017 WS BERM MAP.dwg
PLOT DATE: Feb 18, 2015 - 7:49am

Figure 3-6. Lower San Joaquin River Channel Margin Restoration



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N

0 0.25 0.5 Miles

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Restoration of Lands South of the Dryland Levee

FIGURE

3-7

3.4.2.c Wise Use of the Floodplain

3.4.2.c.1 Alternative 1 Planned Growth

The General Plans of the Cities of Lathrop, Manteca, and Stockton, and San Joaquin County identify planned land uses in the Mossdale Tract area at buildout. Larson Wurzel & Associates (LWA) further refined buildout estimates for the portion of the study area protected by Alternative 1 using a development absorption analysis (Larsen Wurzel & Associates, Inc., 2017) to estimate new development which would be additive to the existing land uses shown in Table 3-8. The LWA report provided locations of each of the new development with approximate number of structures to be added for each. In some cases, site layouts have been developed and these were incorporated into the distribution of structures within the development. If a site layout was not available, the number of structures were evenly distributed within the development area based on zoning. The LWA report is provided in Appendix D. Buildout is expected to occur in the 2030s, which is prior to the 2040 design horizon, and prior to the 2065 planning horizon. The combined future-with-project land use estimates for Alternative 1 are provided in Table 3-8 and Figure 3-8.

Table 3-8. Future-With-Project Use of Land for Alternative 1 (both 2040 and 2065 Planning Horizons)

	Alternative 1 Future Use of Land (Acres)						
	Agriculture	Residential	Commercial	Industrial	Public	Open Space	**Total (Rounded)**
Stockton	650	1,530	250	170	520	1,380	**4,500**
Lathrop	0	1,930	400	1,530	1,000	2,750	**7,600**
Manteca	450	3,770	210	110	280	690	**5,500**
San Joaquin County	3,150	400	0	40	0	1,220	**4,800**
Total (Rounded)	**4,300**	**7,600**	**900**	**1,800**	**1,800**	**6,000**	**22,400**
Percentage	**19%**	**34%**	**4%**	**8%**	**8%**	**27%**	**100%**

As noted in Section 2.3.1, currently 66% of the area is either open space or agriculture and 34% of the area has been urbanized through residential, commercial, industrial, and public construction. At buildout under Alternative 1, 4,500 acres agriculture and open space areas will be urbanized. The areas in agriculture and open space would decrease to 46%, and developed areas would increase to 54% of the Mossdale Tract area. All development would occur within the cities. It is worth noting that about 1,660 acres of the 4,500 acres that will convert from agriculture and open space use to urban use has had specific plans approved with infrastructure constructed prior to the passage of SB5 in 2007 (Pre-SB5 Areas). That 1,660 acres within the Pre-SB5 Areas is not, in reality, agriculture or open space, rather it is partially developed land.

Future-with-project population for Alternative 1 was estimated from a residential structure count based on existing structures plus additions from the LWA absorption analysis, multiplied by persons/structure values for various residential land uses (Table 3-9). The population growth under Alternative 1 is estimated to be 44,200, which is slightly less than a doubling of the existing population of 45,000.

Table 3-9. Future-With-Project Population for Alternative 1 (both 2040 and 2065 Planning Horizons)

Jurisdiction	Existing Population	Total Projected Growth		Buildout Population
		Post-SB5 Areas	Pre-SB5 Areas	
Stockton	17,700	3,400	500	21,600
Lathrop	16,700	4,800	17,400	38,900
Manteca	10,200	17,800	300	28,300
San Joaquin County	400*	0	0	400*
Total	**45,000***	**26,000**	**18,200**	**89,200***

* Population totals do not include an additional population of 1,700 which are temporarily housed in critical facilities in San Joaquin County.

Figure 3-8 shows the study area, spheres of influence, and estimated Alternative 1 future-with-project structure counts, and populations.

3.4.2.c.2 Alternative 1 Wise Use of the Floodplain Considerations and Measures

This section identifies measures associated with Alternative 1 which will mitigate risk in accordance with the 2017 CVFPP wise use of floodplain policy highlighted in Section 2.2.3.a and summarized as follows:

1. Discourage population growth in rural floodplains
2. Deep floodplains with rapid rise flooding are the greatest concern
3. State investments will be limited to areas protected by SPFC facilities
4. Aggregate loss of life risk and property damage risk are held constant or reduced over time
5. Limit conversion of agricultural land to urban uses, and preserve the robust agricultural economy

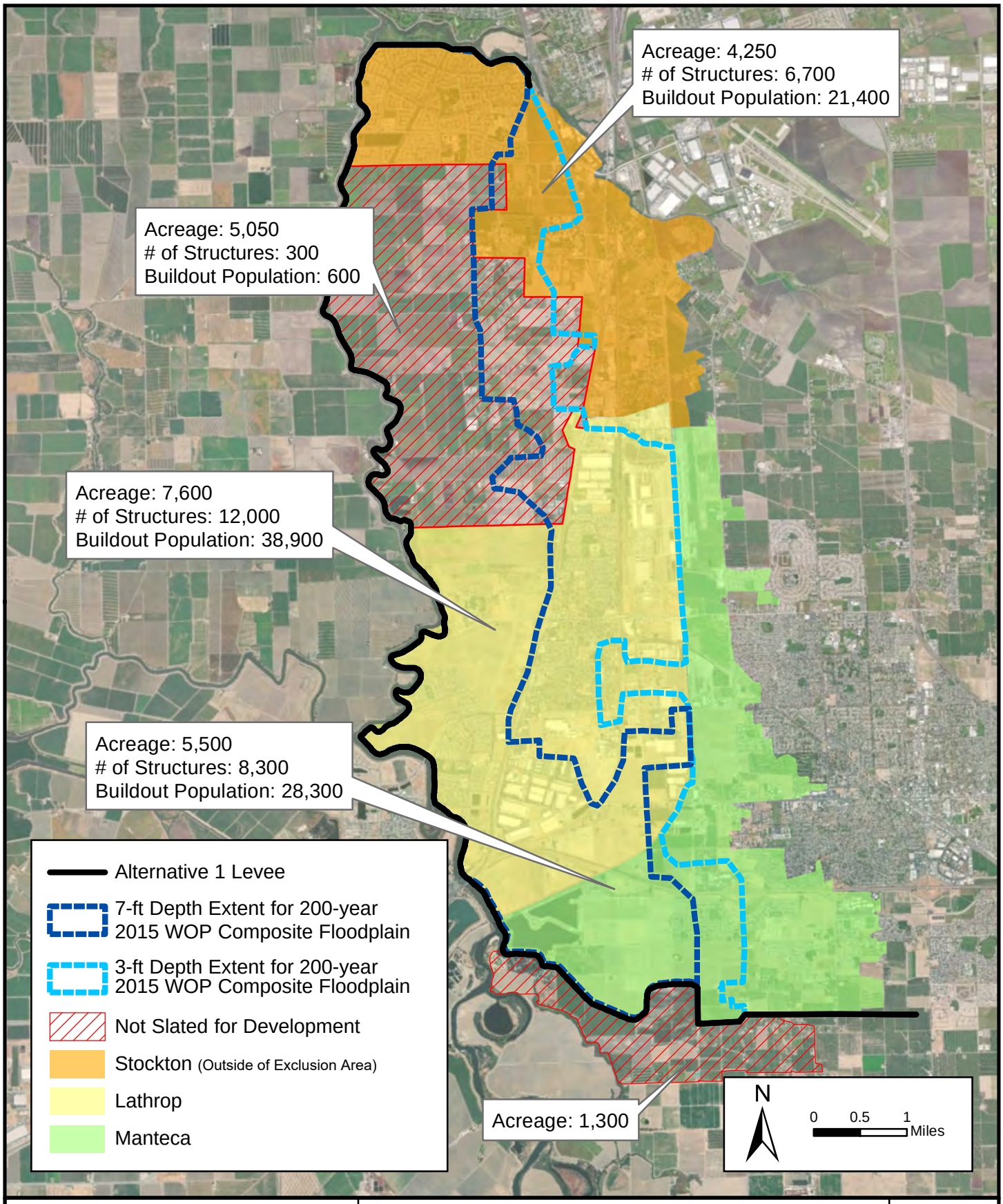
3.4.2.c.2.1 Measures for Mitigating Item 1 (Discourage population growth in rural floodplains)

As noted in Section 2.2.3.a, the Mossdale Tract area is only a partially urban floodplain because existing populations of the portions of the three cities within the area are all greater than 10,000. However, the portion of the study area that is within San Joaquin County's jurisdiction contains a substantial amount of agriculture and open space and is considered rural. Some of the highest risk critical facilities are also directly adjacent to this area, including the County Hospital and jail complex, housing a combined temporary population of 1,700 with limited mobility. Emergency evacuation of these people would be complicated and time consuming.

Tables 3-8 and 2-2 indicate no planned growth in the County's jurisdiction. Limits on development and population growth in a major portion of this area is assured by restrictions in the State's Delta Plan. The Delta Plan for the Sacramento-San Joaquin River Delta, authorized by passage of the Delta Reform Act in 2009, prohibits development of agriculturally zoned property within the Delta Secondary Zone and outside the city limits of Stockton, Manteca, and Lathrop, unless the area was both within a city sphere of influence and was zoned for development at the time of adoption of the Delta Plan by the DSC on May 16, 2013. The Delta Plan authority is State law codified in California Water Code Division 35 (Sections 85000 through 85350). While the policies are regulatory requirements, the Delta Plan relies on self-certification of projects by State and local public agencies. The city of Stockton submitted a certification of consistency for their General Plan. San Joaquin County did not submit a certification of consistency but made modifications to the General Plan in light of DP P1 requirements. The gross area currently restricted from additional development by the Delta Plan totals approximately 3,620 acres

within the deep floodplain. The Delta Plan exclusion zone provides assurances against development that will remain permanent for as long as the Delta Plan policy DP P1 remains in force.

After the adoption of the Delta Plan, the City of Lathrop reduced their sphere of influence giving 2,055 acres of land use control back to the County, a portion of which is outside of the Delta Plan area. Including the area given up by City of Lathrop, the County controls 1,090 acres of land that is outside of the Delta Plan area but west of I-5, within the deeper portions of the floodplain. The County has no plans for development in these areas. The City of Stockton, rather than changing their sphere of influence, rezoned 340 acres west of I-5 to remain agricultural. Therefore, a total of 1,430 acres of land has been voluntarily excluded from development within the deepest portions of the floodplain. The no-growth assurances for this alternative are less binding than obtaining flood easement for this growth reduction area. The total of the Delta Plan development exclusion area and the voluntary exclusion area between Lathrop and Stockton is 5,050 acres. The City of Manteca General Plan included growth south of the RD 17 dryland levee and dryland levee extension. None of this 1,300-acre area will have 200-year flood protection under Alternative 1 and will therefore be subject to development restrictions under SB5. Areas restricted from development under Alternative 1 are shown in Figure 3-9.



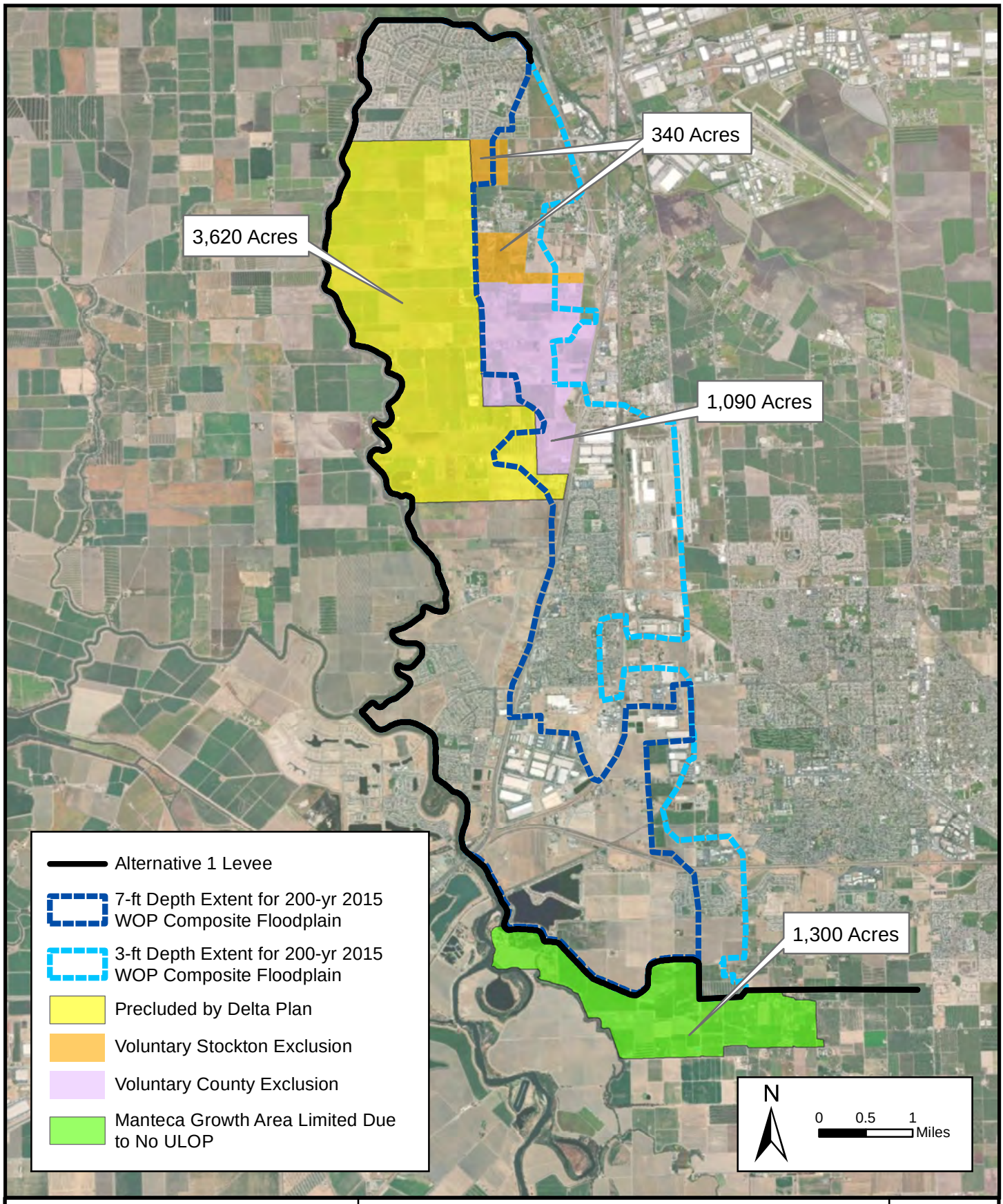
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Alternative 1
Future-With-Project Structures and Population (both 2040 and 2065 Planning Horizons)

FIGURE

3-8



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Areas Restricted from Development Under Alternative 1

FIGURE 3-9

3.4.2.c.2.2 Measures for Mitigating Item 2 (Deep floodplains with rapid-rise flooding)

Figure 3-10 shows areas with anticipated growth under Alternative 1, highlighting areas of deep flooding (over 3') in the 200-Year 2018 without project. The figure also shows areas with depths over 7', which is an important threshold for loss of life calculations. There are no areas with rapid rise flooding (over 1.5 feet/hour).

The Delta Plan exclusion zone prevents development in the bulk of the deep floodplain areas.

As noted above, life loss calculations are particularly sensitive to depths over 7'. Two-story construction helps to mitigate depth concerns, because it allows for vertical evacuation on short notice, which is far more feasible and repeatable than reliance on horizontal evacuation. Recent development patterns as evidenced by the River Islands area of the City of Lathrop, show market drivers favoring 2-story construction over 1-story construction 88% to 12%. For modeling purposes, it was assumed that all future residential growth in the Mossdale Tract area will similarly favor 2-story construction.

It is worth noting that with anticipated climate change, the area precluded from development becomes even deeper.

3.4.2.c.2.3 Measures for Mitigating Item 3 (Limit State investment to areas protected by SPFC facilities)

Section 1.2 identified the portion of RD 17 levees which are SPFC facilities. However, a composite of failures of the SPFC facilities exposes the entire Mossdale Tract area to flooding. Therefore, the State could be a cost sharing partner in all of the Alternative 1 levee improvements.

3.4.2.c.2.4 Measures for Mitigating Item 4 (No increase in Aggregate Life Loss or Property Damage Risk)

Section 4 presents an analysis of life loss and economic damages for Alternative 1, which demonstrates that the measures proposed will result in a reduction in aggregate risk for both life loss and property damage through the 2065 planning horizon.

3.4.2.c.2.5 Measures for Mitigating Item 5 (Limit Conversion of Ag to Urban)

Much of the agricultural lands within the Mossdale Tract area lie within the development exclusion zones identified on Figure 3-9. The lands slated for development are nearly all currently owned by developers and have been idled in anticipation of development. Several other initiatives demonstrate a commitment to agriculture within the Mossdale Tract area, which are discussed in the following paragraphs.

Land Use Agencies are Targeting Funds to Achieve Multiple Resource Benefits

San Joaquin County and its cities have adopted the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) to provide a strategy for balancing conservation of open space with development, while protecting the region's agricultural economy and providing for the long-term management of plant, fish, and wildlife species. Development projects in the Mossdale Tract area contribute fees to the SJMSCP for the preservation of habitat and open space via easements. These easements protect lands from development throughout San Joaquin County, and thus, provide opportunities for both habitat restoration and floodplain management in perpetuity. The SJMSCP has launched an aggressive effort to develop a system of preserves along Paradise Cut, Old River, and Middle River in the deep floodplains adjacent to the City of Lathrop. The SJMSCP could use funding anywhere within the County including the Mossdale Tract Area.

In Lathrop, the Central Lathrop Specific Plan will provide approximately $10 million in revenue toward habitat preservation, of which $2.6 million has already been paid and was instrumental in the acquisition of the preserves. Every acre of greenfield development triggers a habitat protection fee. By

design, these fees to date were spent outside the Mossdale Tract area in an effort to avoid conflicts with future development shown on local general plans. Furthermore, the SJMSCP has concluded that the most effective use of the SJMSCP funds is to focus on the Paradise Cut expansion area since it has a diverse collection of listed species, habitats, and interconnected preserves.

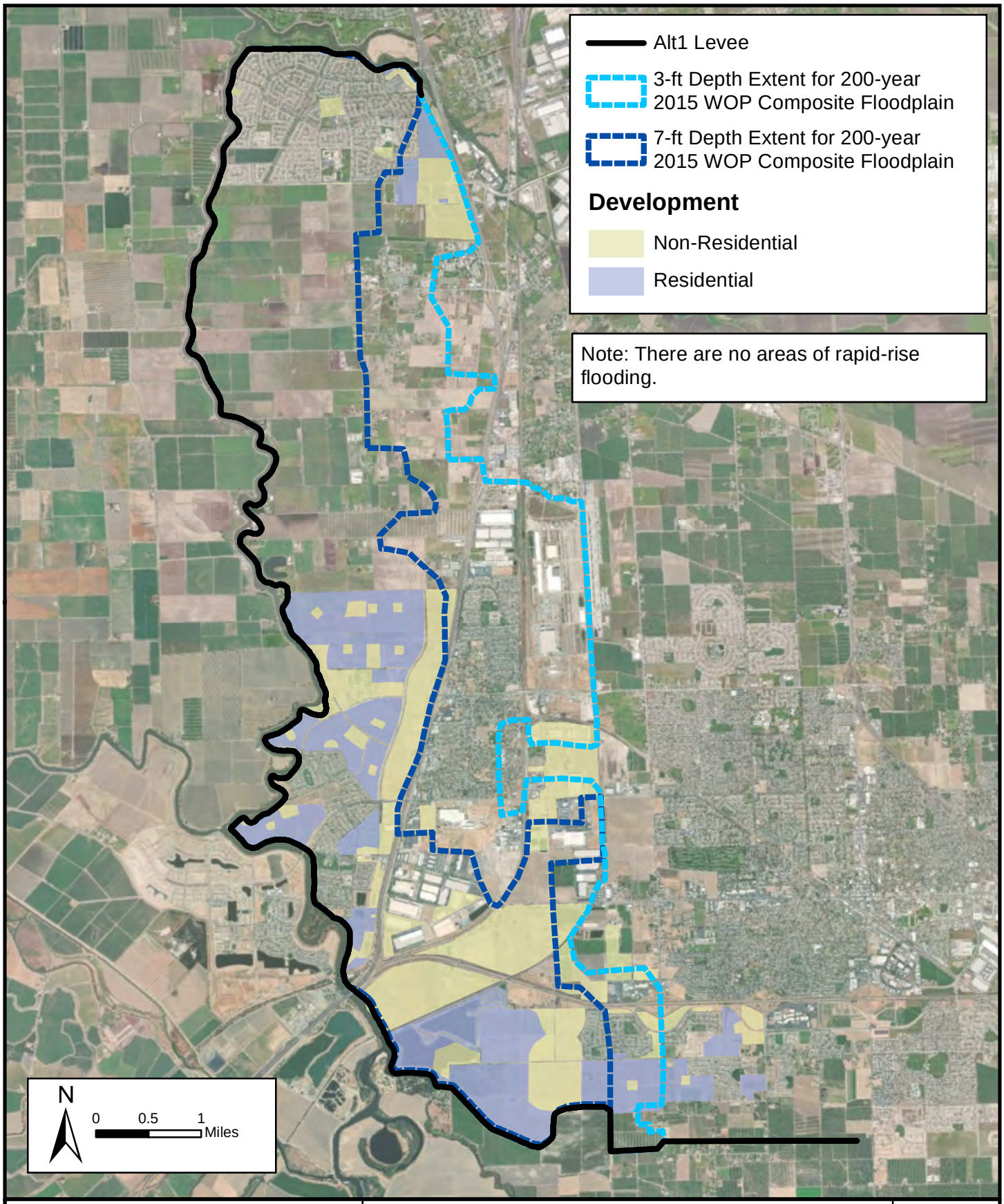
The Land Use Agencies are Exploring Ways to Target Funds to Protect Farmland Within the Mossdale Tract Area

San Joaquin County and the cities of Stockton, Lathrop and Manteca adopted Agricultural Mitigation Fee Programs that are directed toward acquiring permanent conservation or agricultural easements. Specifically:

- San Joaquin County requires 1:1 mitigation for agricultural land converted to a nonagricultural use. In lieu of acquiring land, the project proponents may pay a fee (currently $8,675 per acre).
- Lathrop is a partner with the Central Valley Farmland Trust under its Agricultural Mitigation Fee program. Lathrop has committed to reach out to the Farmland Trust to explore ways to encourage the use of over $4 million in revenue to acquire easements on prime farmland property in the deep flood plain north of Lathrop's Sphere of Influence.
- Stockton also collects an Agricultural Mitigation Fee to mitigate the loss of agricultural land in the City of Stockton which provides for the acquisition of agricultural conservation easements at a 1:1 ratio. Like Lathrop, Stockton partners with the Central Valley Farmland Trust to negotiate and acquire conservation easements throughout San Joaquin County, including land areas within the Mossdale Tract area.
- Manteca collects an Agricultural Mitigation Fee, as well, and its fee amounts to approximately $2,600 per acre. The City has collected approximately $2.2 million in fees devoted to the preservation of agricultural land.

3.4.2.d Alternative 1 Formulation Summary

Key features of Alternative 1 are shown on Figure 3-11.



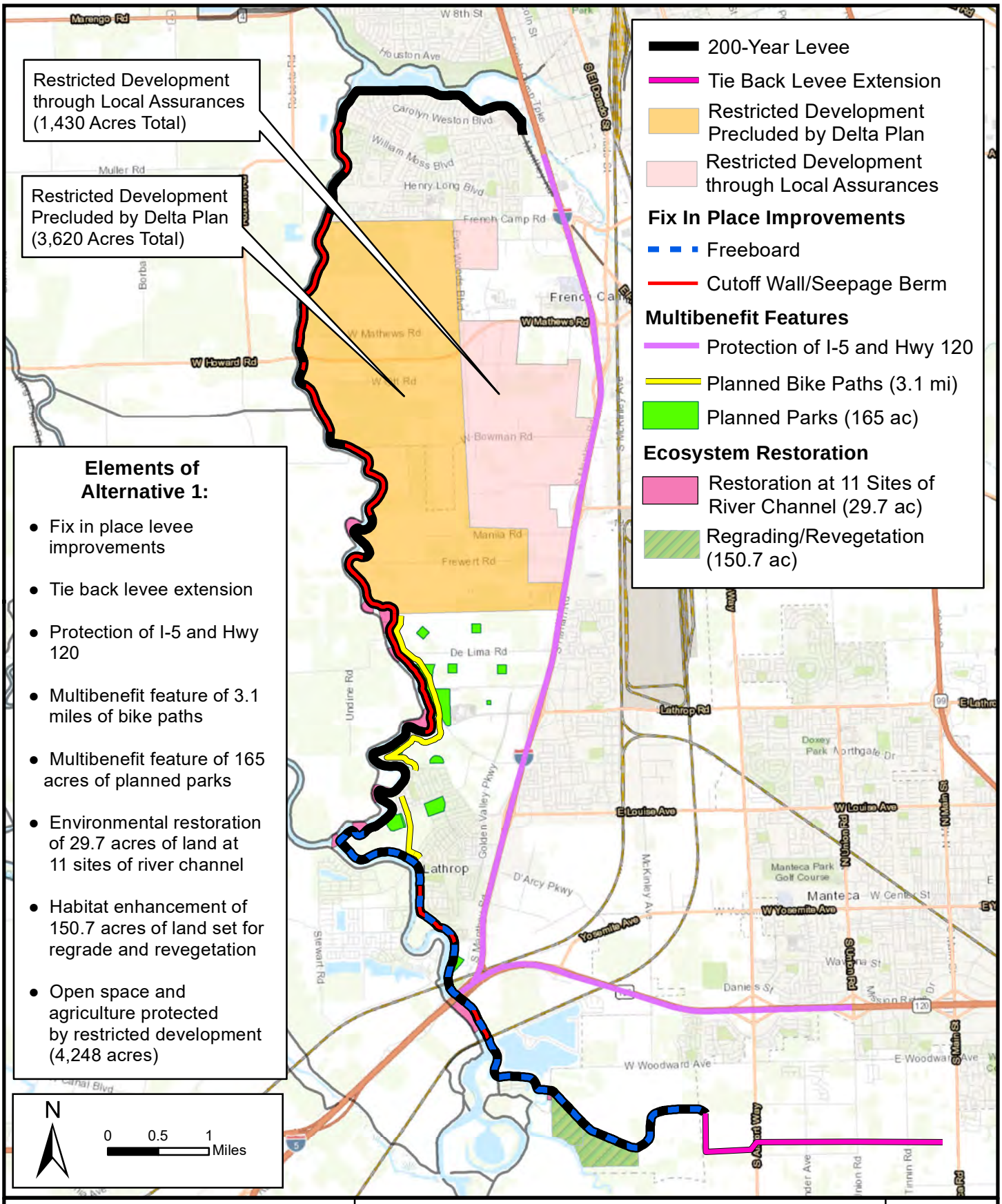
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Alternative 1 Growth Areas Versus Deep and Rapid-Rise Flood Risk Zones

FIGURE

3-10



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Key Features of Alternative 1

FIGURE
3-11

3.4.3 Alternative 2 – Fix-In-Place with Easement for Wise Use of Floodplain

3.4.3.a Levee Improvements

Levee improvements for Alternative 2 are nearly identical to Alternative 1 which were described in Section 3.4.2. The one difference is the addition of a secondary levee at Old River and partial degradation of the stranded reach of primary levee, as described in the following section.

3.4.3.b Ecosystem Restoration and Multi-benefit Features

Alternative 2 includes all the multi-benefit and ecosystem restoration features from Alternative 1, plus the following.

3.4.3.b.1 Old River Secondary Levee and Restoration

This feature was included in the 2017 CVFPP as "RM-52 Setback" (Figure 3-12) (AECOM, 2014). The concept would be to construct a new secondary levee meeting the ULDC across the historic floodplain at a sharp bend in the San Joaquin River at the Old River distributary. The existing primary levee would remain and would still be improved, and the northern portion of the setback was constructed as part of RD 17's LSRP Phase III and was included as part of the existing (2018) condition. All agricultural lands between the primary and secondary levee would be acquired and converted to riparian, marsh, and inundated floodplain habitat. The 2017 CVFPP proposed three (3) breach locations (Figure 3-12). However, under this alternative, one short (nominally 100-300') section of the primary levee downstream of the Old River distributary would be degraded to allow backwater flooding of the restored area during higher water events. This configuration would keep the Old River flow split unchanged in order to avoid issues of redirected hydraulic impacts. Operations, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) would be required for both the primary and secondary levees; the OMRR&R objective for the redundant part of the primary levee would be to maintain the hydraulics of the river, so levee failures are to be prevented.

This ecosystem restoration feature is conditioned upon landowner willingness to sell, willingness of a conservation agency or non-governmental organization to take over ownership and O&M of the restored lands, availability of capital funds, and availability of OMRR&R funds for the new secondary levee. The State's Division of Multi-Benefit Initiatives deemed the Old River element as viable option for meeting the Initiative's goals to promote ecosystem processes, habitat, and species.

3.4.3.b.2 Other Multi-Benefit Components

Alternative 2 would provide the same multi-benefit features as Alternative 1 outlined in Section 3.4.2.b.3. Within the 5,050 acres of binding easement, 4,248 acres of agriculture and open space would be protected from develop under this alternative.

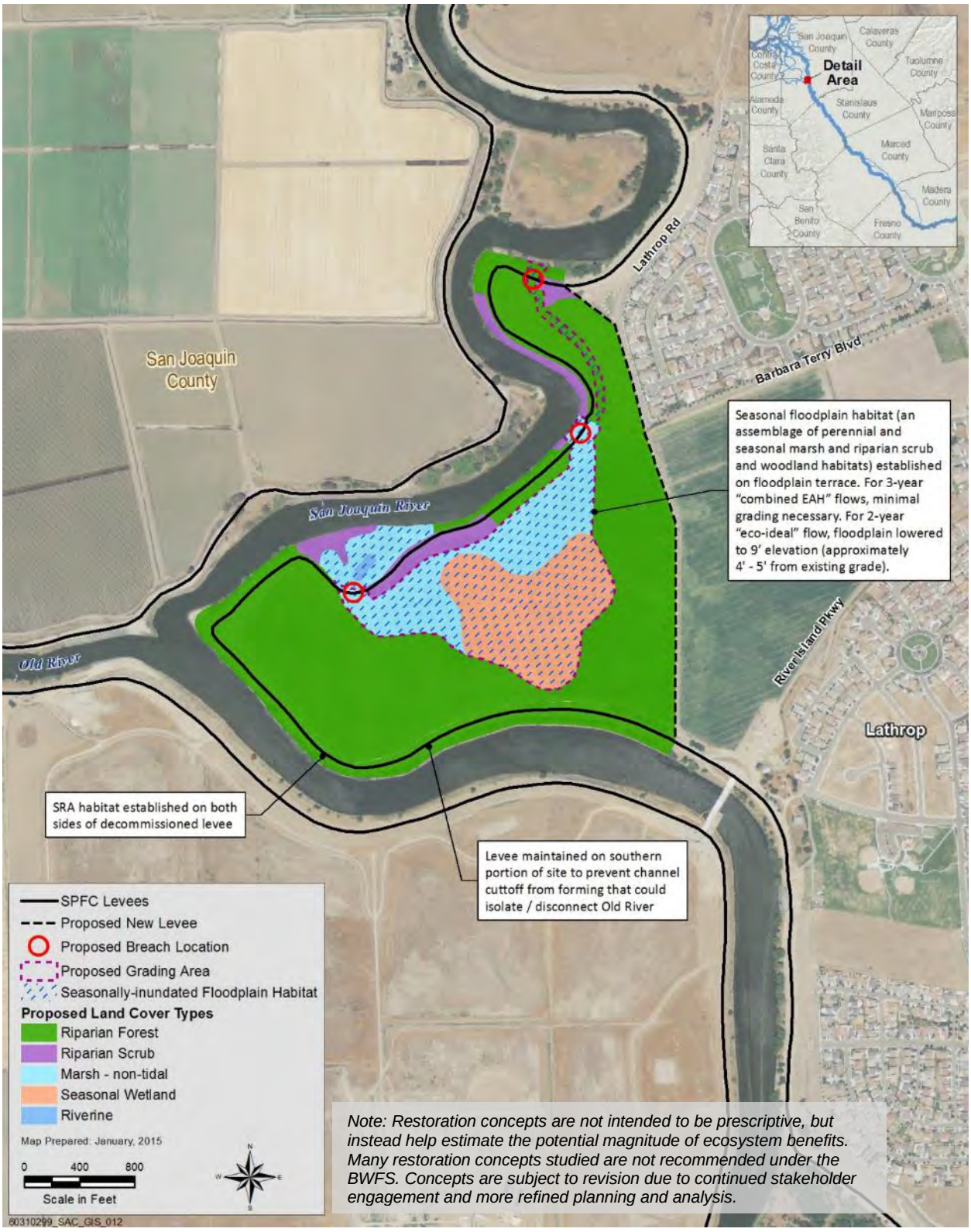


Figure 3-12. RM 52 (Old River) Setback Levee Ecosystem Restoration Concept from CVFPP

Restoration Concept *Source: AECOM, 2014*

3.4.3.c Wise Use of the Floodplain

3.4.3.c.1 Alternative 2 Planned Growth

Planned growth under Alternative 2 would be nearly the same as for Alternative 1, with the exception that the restoration area in the Old River Secondary Levee and Restoration Feature would not be developed. This slightly reduces residential land use for Lathrop (Table 3-10).

Table 3-10. Future-With-Project Use of Land for Alternative 2 (both 2040 and 2065 Planning Horizons)

	Alternative 2 Use of Land (Acres)						
	Agriculture	Residential	Commercial	Industrial	Public	Open Space	**Total (Rounded)**
Stockton	650	1,530	250	170	520	1,380	**4,500**
Lathrop	0	1,830	400	1,530	1,000	2,850	**7,600**
Manteca	450	3,770	210	110	280	690	**5,500**
San Joaquin County	3,150	400	0	40	0	1,220	**4,800**
Total (Rounded)	**4,300**	**7,500**	**900**	**1,800**	**1,800**	**6,100**	**22,400**
Percentage	**19%**	**34%**	**4%**	**8%**	**8%**	**27%**	**100%**

As noted in Section 2.3.1, currently 66% of the area is either open space or agriculture and 34% of the area has been urbanized through residential, commercial, industrial, and public construction. At buildout under Alternative 2, 4,500 acres agriculture and open space areas will be urbanized. The areas in agriculture and open space would decrease to 46%, and developed areas would increase to 54% of the Mossdale Tract area. All development would occur within the cities. It is worth noting that about 1,660 acres of the 4,500 acres that will convert from agriculture and open space use to urban use has had specific plans approved with infrastructure constructed prior to the passage of SB5 in 2007 (Pre-SB5 Areas). That 1,660 acres within the Pre-SB5 Areas is not, in reality, agriculture or open space, rather it is partially developed land.

The population growth under Alternative 2 is estimated to be 42,800, which is slightly less than a doubling of the existing population of 45,000 (Table 3-11).

Table 3-11. Future-With-Project Population for Alternative 2 (both 2040 and 2065 Planning Horizons)

Jurisdiction	**Existing Population**	**Total Projected Growth**		**Buildout Population**
		Post-SB5 Areas	**Pre-SB5 Areas**	
Stockton	17,700	3,400	500	21,600
Lathrop	16,700	3,400	17,400	37,500
Manteca	10,200	17,800	300	28,300
San Joaquin County	400*	0	0	400*
Total	**45,000***	**24,600**	**18,200**	**87,800***

* Population totals do not include an additional population of 1,700 which are temporarily housed in critical facilities in San Joaquin County.

3.4.3.c.2 Alternative 2 Wise Use of the Floodplain Considerations and Measures

3.4.3.c.2.1 Measures for Mitigating Item 1 (Discourage population growth in rural floodplains)

The key feature that distinguishes Alternative 2 from Alternative 1, other than the addition of the Old River Secondary Levee and Restoration feature, is the purchase of permanent development restriction easements on the 5,050-acre area between Lathrop and Stockton shown on Figure 3-9. The Old River Secondary Levee and Restoration feature would also reduce residential development in the deepest floodplain area of Lathrop by another 100 acres over Alternative 1. The 1,300-acre area south of the RD 17 dryland levee in Manteca would be restricted from development based on SB5, as it would be under Alternative 1.

3.4.3.c.2.2 Measures for Mitigating Item 2 (Deep floodplains with rapid-rise flooding)

Measures for Alternative 2 would be the same as for Alternative 1, with the addition of the Old River Secondary Levee and Restoration feature, which would reduce residential development in the deepest floodplain area of Lathrop by another 100 acres.

3.4.3.c.2.3 Measures for Mitigating Item 3 (Limit State investment to areas protected by SPFC facilities)

As with Alternative 1, a composite of failures of the SPFC facilities exposes the entire Mossdale Tract area to flooding. Therefore, the State could be a cost sharing partner in all of the Alternative 2 features.

3.4.3.c.2.4 Measures for Mitigating Item 4 (No increase in Aggregate Life Loss or Property Damage Risk)

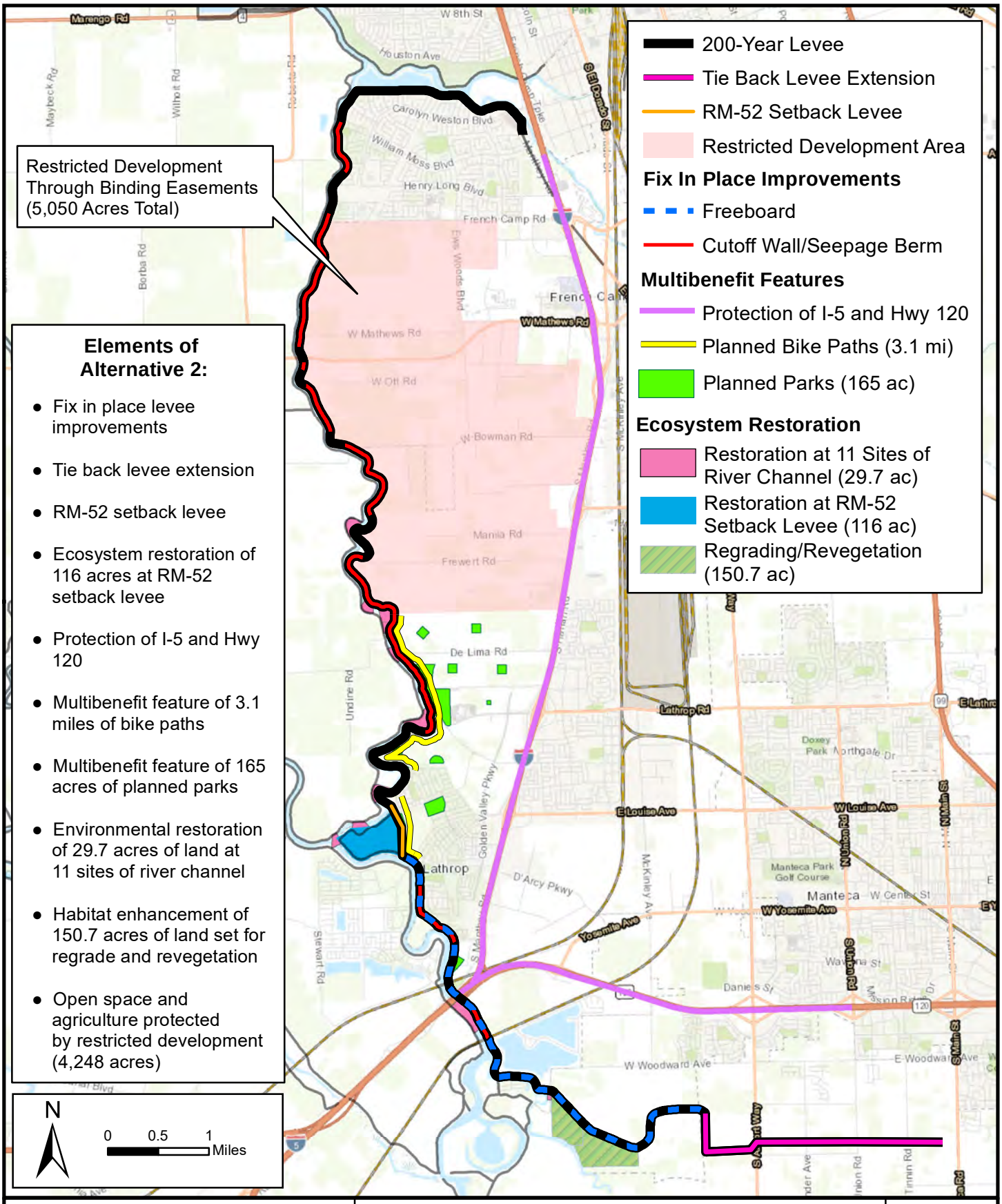
Section 4 presents an analysis of life loss and economic damages for Alternative 2, which demonstrates that the measures proposed will result in a reduction in aggregate risk for both life loss and property damage through the 2065 planning horizon.

3.4.3.c.2.5 Measures for Mitigating Item 5 (Limit Conversion of Ag to Urban)

Measures for Alternative 2 would be the same as for Alternative 1, strengthened by the purchase of 5,050 acres of development restriction easements.

3.4.3.d Alternative 2 Formulation Summary

Key features of Alternative 2 are shown on Figure 3-13.



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MOSSDALE TRACT AREA

Key Features of Alternative 2

FIGURE 3-13

3.4.4 Alternative 3 – Partial Fix-In-Place with Lathrop Dryland Levee

3.4.4.a Levee Improvements

Alternative 3 includes improvements to the levees fronting the cities of Lathrop and Manteca, and a new secondary levee along the northern boundary of Lathrop. This alternative would not include improvements to the primary levee north of the new dryland levee. Improvements to the portion of levees fronting Lathrop and Manteca (south of Station 447+38) would be identical to that portion of Alternative 2.

A new secondary levee would intersect the San Joaquin River levee at Station 447+38 and proceed eastward as shown on Figure 3-14. It is called a secondary levee because the primary levee along the San Joaquin River north of Station 447+38 would remain as-is and operable, continuing to provide flood protection to the portion of the Mossdale Tract area north of the secondary levee. That levee is currently accredited for 100-year level of protection by FEMA.

The secondary levee would be constructed at the northern boundary of the City of Lathrop sphere of influence. It would connect to the San Joaquin River levee, then run approximately 2 miles east, then run generally along Manthey Road northward, ending at a high point in Manthey Road. The new levee would be constructed with a top of levee elevation of 23 ft North American Vertical Datum (NAVD) 88 along most of its length to contain back-flooding from the north of the secondary levee, on the chance that the unimproved primary levee north of Station 447+38 were to fail. If the unimproved levee were to fail just north of the secondary levee tie-in during a 200-year flood for 2040 climate change conditions, breach water would flow northward and pond behind the French Camp Slough left bank levee. Ponding would reach a maximum elevation of 20, assuming implementation of a relief cut of the French Camp Slough left levee (see Section 3.4.9, Residual Risk Measures Common to All Alternatives). Ponded water would pass under I-5 at two interchanges north of the secondary levee and would flood the east side of I-5 to high ground just south of Roth Road (Figure 3-15).

The secondary levee would be constructed to meet the ULDC, with freeboard accommodating wind setup and wave runup, assuming the portion of the Mossdale Tract area north of the secondary levee was flooded. The new levee would also be built with a 50’ wide seepage berm to control under-seepage. In addition, the westernmost 300’ of the levee would include a 60’ deep slurry wall to provide a transition to the primary levee slurry wall.

3.4.4.b Ecosystem Restoration and Multi-benefit Features

Alternative 3 includes the same ecosystem restoration and multi-benefit features as Alternative 2 except that portions of I-5 north of the secondary levee would not have increased flood protection and there would be no change in the protection of agriculture and open space within the study area. The alternative would preserve 5,458 acres of agriculture and open space north of the secondary levee due to a lack of ULOP.

It should be noted that although 3 of the 11 San Joaquin River Channel Margin Restoration sites are north of the Station 447+38 secondary levee, it is assumed that all 11 sites would be incorporated into Alternative 3.



LEGEND

ALIGNMENT (GENERALLY FOLLOWS PL OR ROAD CL)

SECTION

N

REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: MAR 2018

WARNING

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED JM

DRAWN BMC

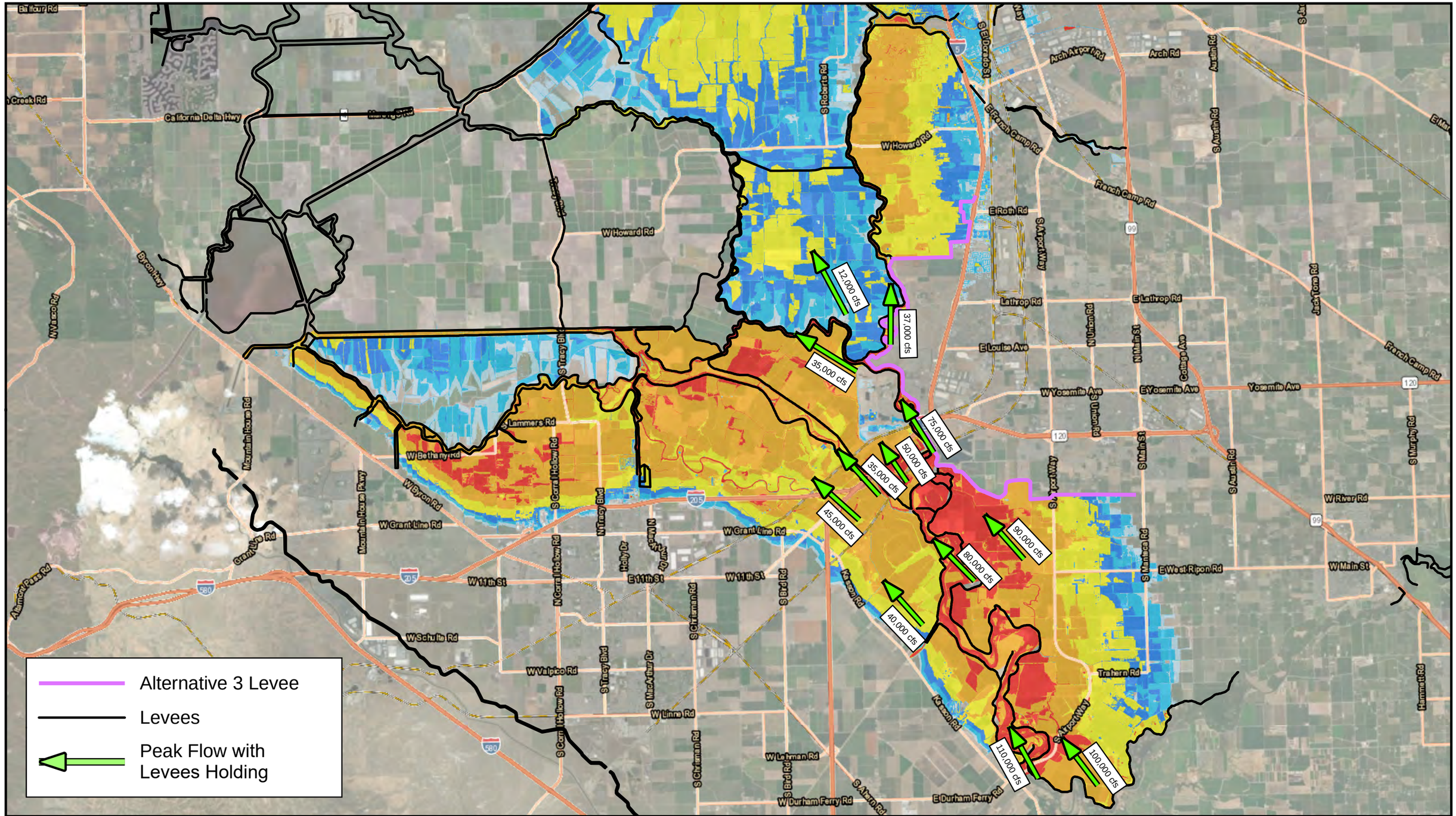
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Alternative 3 New Secondary Levee

SHEET 3-14



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N

Depth (ft)

0 - 1	1 - 3	3 - 5	5 - 10	10 - 15	> 15

0 1 2 Miles

1 in = 2 miles

Mossdale Tract Area

2040 Climate Change
Alternative 3
200-Year Composite Floodplain

FIGURE
3-15

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.

3.4.4.c Wise Use of the Floodplain

3.4.4.c.1 Alternative 3 Planned Growth

Planned development in the City of Stockton would not happen under Alternative 3 because its jurisdiction would not have an ULOP. The Cities of Lathrop and Manteca would experience the same growth as for Alternative 2 (Table 3-12).

Table 3-12. Future-With-Project Use of Land for Alternative 3 (both 2040 and 2065 Planning Horizons)

	Alternative 3 Use of Land (Acres)						
	Agriculture	Residential	Commercial	Industrial	Public	Open Space	**Total (Rounded)**
Stockton	650	1,410	70	170	520	1,680	**4,500**
Lathrop	0	1,830	400	1,530	1,000	2,850	**7,600**
Manteca	450	3,770	210	110	280	690	**5,500**
San Joaquin County	3,150	400	0	40	0	1,220	**4,800**
Total (Rounded)	**4,300**	**7,400**	**700**	**1,800**	**1,800**	**6,400**	**22,400**
Percentage	**19%**	**33%**	**3%**	**8%**	**8%**	**29%**	**100%**

As noted in Section 2.3.1, currently 66% of the area is either open space or agriculture and 34% of the area has been urbanized through residential, commercial, industrial, and public construction. At buildout under Alternative 3, 4,000 acres agriculture and open space areas will be urbanized. The areas in agriculture and open space would decrease to 48%, and developed areas would increase to 52% of the Mossdale Tract area. All development would occur within the cities of Lathrop and Manteca. It is worth noting that about 1,640 of the 4,000 acres that will convert from agriculture and open space use to urban use has had specific plans approved with infrastructure constructed prior to the passage of SB5 in 2007 (Pre-SB5 Areas). That 1,640 acres within the Pre-SB5 Areas is not, in reality, agriculture or open space, rather it is partially developed land.

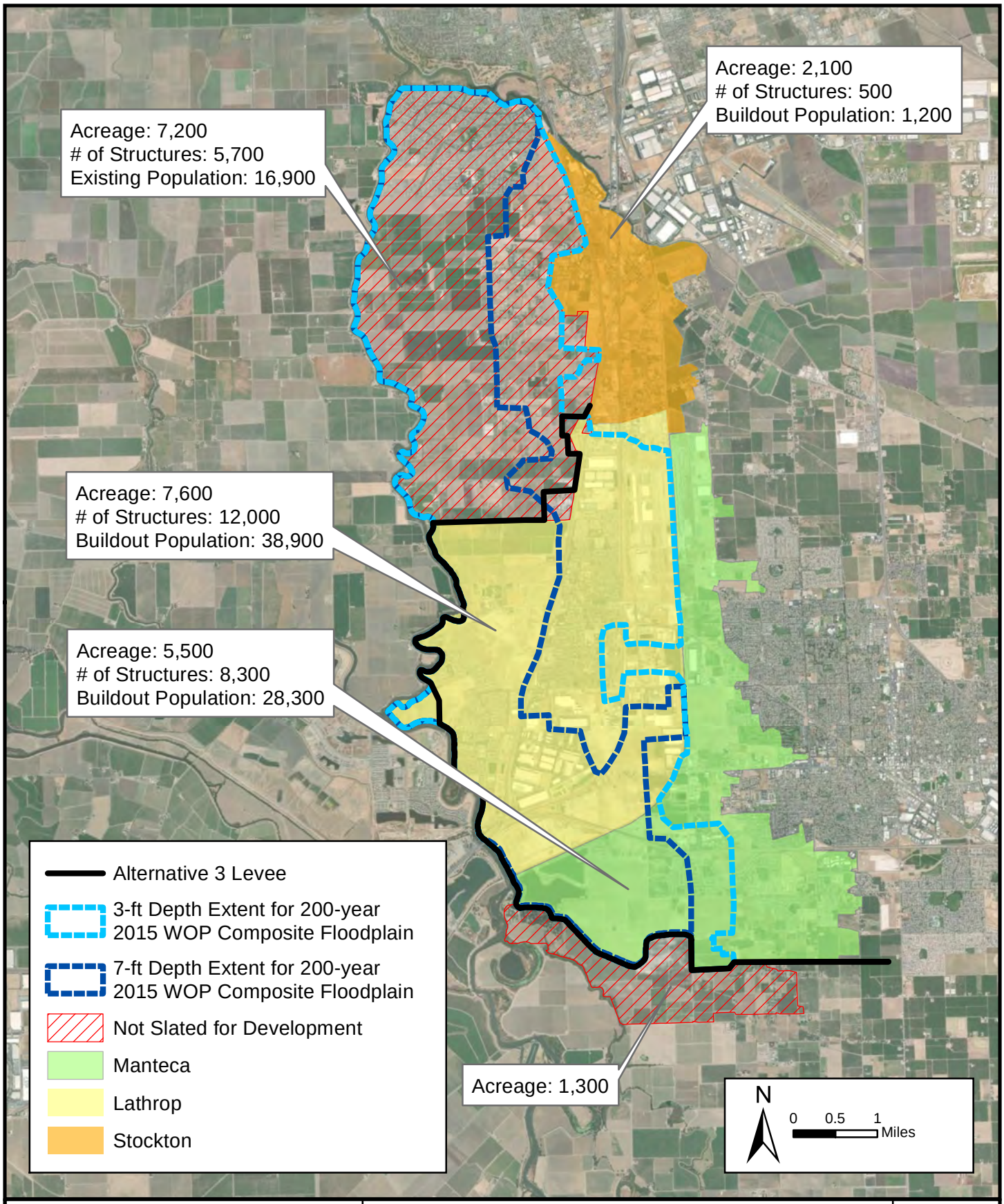
The population growth under Alternative 3 is estimated to be 38,900, an 86% increase over the existing population (Table 3-13).

Table 3-13. Future-With-Project Population for Alternative 3 (both 2040 and 2065 Planning Horizons)

Jurisdiction	**Existing Population**	**Total Projected Growth**		**Buildout Population**
		Post-SB5 Areas	**Pre-SB5 Areas**	
Stockton	17,700	0	0	17,700
Lathrop	16,700	3,400	17,400	37,500
Manteca	10,200	17,800	300	28,300
San Joaquin County	400*	0	0	400*
Total	**45,000***	**21,200**	**17,700**	**83,900***

* Population totals do not include an additional population of 1,700 which are temporarily housed in critical facilities in San Joaquin County.

Figure 3-16 shows the study area, spheres of influence, and estimated Alternative 3 future-with-project structure counts, and populations.



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Alternative 3
Future-With-Project Structures and Population
(both 2040 and 2065 Planning Horizons)

FIGURE
3-16

3.4.4.c.2 Alternative 3 Wise Use of the Floodplain Considerations and Measures

3.4.4.c.2.1 Measures for Mitigating Item 1 (Discourage population growth in rural floodplains)

Under Alternative 3, the 5,050-acre area between Lathrop and Stockton shown on Figure 3-16 would be restricted from growth due to not having an ULOP, as would the 1,300-acre area south of the RD 17 dryland levee in Manteca. The Old River Secondary Levee and Restoration feature would also reduce residential development in the Lathrop by another 100 acres over Alternative 1.

3.4.4.c.2.2 Measures for Mitigating Item 2 (Deep floodplains with rapid-rise flooding)

The lack of ULDC improvements north of Station 447+38 would leave the existing population in that area exposed to more frequent deep floodplain risk from a failure of that unimproved portion of the SPFC. The at-risk population is estimated to be 18,100 permanent residents, plus 1,700 temporary limited mobility residents. This risk will amplify with climate change due to higher frequency of failures, even though population and development would remain unchanged.

3.4.4.c.2.3 Measures for Mitigating Item 3 (Limit State investment to areas protected by SPFC facilities)

As with Alternative 1, a composite of failures of the SPFC facilities exposes the entire Mossdale Tract area to flooding. Therefore, the State could be a cost sharing partner in all of the Alternative 3 features.

3.4.4.c.2.4 Measures for Mitigating Item 4 (No increase in Aggregate Life Loss or Property Damage Risk)

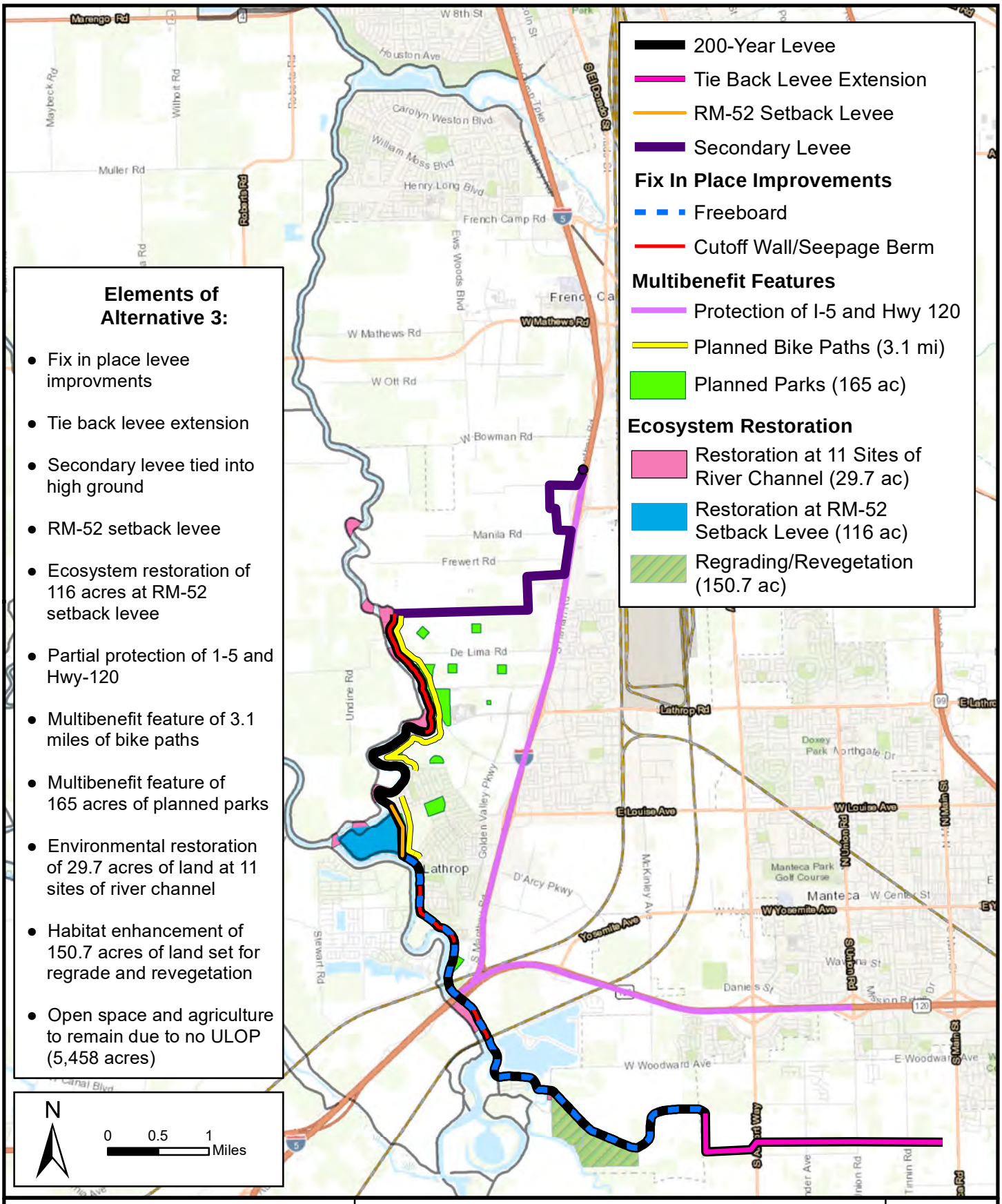
Section 4 presents an analysis of life loss and economic damages for Alternative 3 and demonstrates that the measures proposed will result in an overall reduction in aggregate risk for both life loss and property damage through the 2065 planning horizon at the basin's critical index point LR1. However, for Alternative 3, risk would be amplified at the non-critical index point LR3 due to construction of the new secondary levee. A failure at LR3 would cause deeper ponding south of the new secondary levee, amplifying the damages and life risk in Lathrop.

3.4.4.c.2.5 Measures for Mitigating Item 5 (Limit Conversion of Ag to Urban)

Measures for Alternative 3 would be the same as for Alternative 2, strengthened by SB5 development restriction.

3.4.4.d Alternative 3 Formulation Summary

Key features of Alternative 3 are shown on Figure 3-17.



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Key Features of Alternative 3

FIGURE
3-17

3.4.5 Alternative 4a – Similar to Alternative 2, but with Reduced Easement Purchases, and Added RM-52 Dryland Restoration

3.4.5.a Levee Improvements

Levee improvements for Alternative 4a are identical to Alternative 2 which were described in Section 3.4.3.

3.4.5.b Ecosystem Restoration and Multi-benefit Features

Alternative 4a includes all the multi-benefit and ecosystem restoration features from Alternative 2, plus the following.

3.4.5.b.1 Old River Secondary Levee and Restoration

This feature is slightly modified from Alternative 2 in that it adds 42 acres of dryland habitat east of the secondary levee. As previously mentioned in Section 3.4.3.b.1, the Old River ecosystem restoration feature is conditioned upon landowner willingness to sell. In February 2019, the property on which the Old River secondary levee and restoration area would be located (referred to as the "RM-52 area") was listed for sale. This presented the possibility of acquiring the entire RM-52 area for habitat restoration, including the portion east of the secondary levee.

Under Alternative 4a, the 42 acres east of the secondary levee would be converted to dryland habitat, which is in addition to the 45 acres of marsh/wetland habitat and 71 acres of riparian habitat west of the secondary levee (See Figure 3-18). The dryland habitat that would be created by this alternative is valuable for the survival of the endangered riparian brush rabbit. Currently, there is a large riparian brush rabbit habitat just upstream of the RM-52 area which becomes washed out during large flood events. The dryland habitat under this alternative would provide high ground refugia to keep the rabbits safe during large flood events. The dryland habitat would also benefit Swainson's hawk, Valley elderberry longhorn beetle, Burrowing owl, Giant garter snake, and other key South Delta species.

3.4.5.b.2 Other Multi-Benefit Components

Alternative 4a would provide the same multi-benefit features as Alternative 1 outlined in Section 3.4.2.b.3. The alternative would protect 4,248 acres of agriculture and open space (3,325 acres within the Delta Plan Area; 923 acres within the 1,430 acres of binding easement) from develop under this alternative.

3.4.5.c Wise Use of the Floodplain

3.4.5.c.1 Alternative 4a Planned Growth

Planned growth under Alternative 4a would be the same as for Alternative 2.

3.4.5.c.2 Alternative 4a Wise Use of the Floodplain Considerations and Measures

3.4.5.c.2.1 Measures for Mitigating Item 1 (Discourage population growth in rural floodplains)

Under Alternative 4a, the 5,050-acre area between Lathrop and Stockton shown on Figure 3-9 would be restricted from growth by a combination of the Delta Plan and 1,430 acres of binding easements. The Old River Secondary Levee and Restoration feature would also reduce residential development in the Lathrop by another 100 acres over Alternative 1.

3.4.5.c.2.2 Measures for Mitigating Item 2 (Deep floodplains with rapid-rise flooding)

Measures for Alternative 4a would be the same as for Alternative 2.

3.4.5.c.2.3 Measures for Mitigating Item 3 (Limit State investment to areas protected by SPFC facilities)

As with Alternative 1, a composite of failures of the SPFC facilities exposes the entire Mossdale Tract area to flooding. Therefore, the State could be a cost sharing partner in all of the Alternative 4a features.

3.4.5.c.2.4 Measures for Mitigating Item 4 (No increase in Aggregate Life Loss or Property Damage Risk)

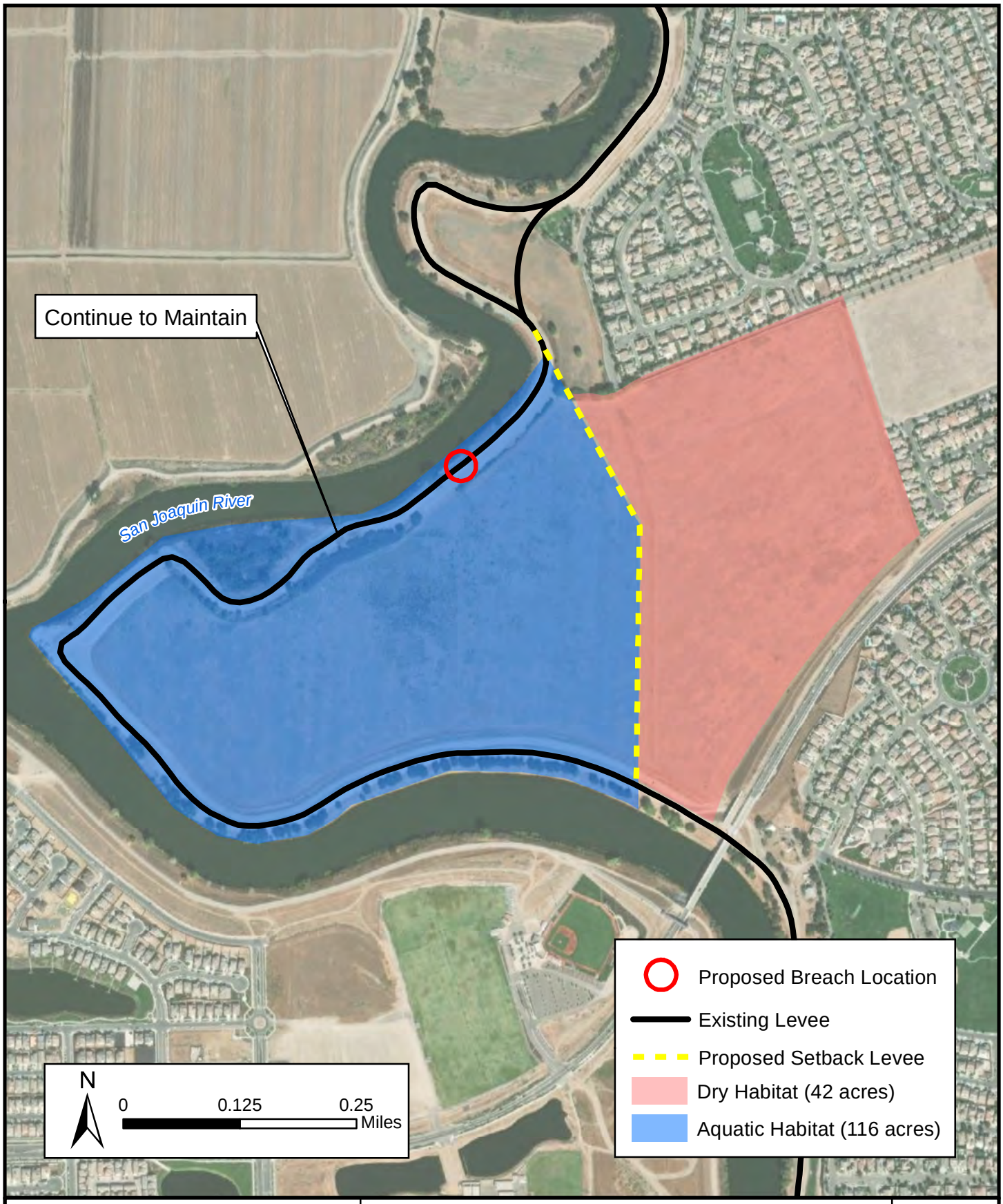
Section 4 presents an analysis of life loss and economic damages for Alternative 4a, which demonstrates that the measures proposed will result in a reduction in aggregate risk for both life loss and property damage through the 2065 planning horizon.

3.4.5.c.2.5 Measures for Mitigating Item 5 (Limit Conversion of Ag to Urban)

Measures for Alternative 4a would be the same as for Alternative 2, except the purchase of development restriction easements is limited to 1,430 acres outside of the Delta Plan.

3.4.5.d Alternative 4a Formulation Summary

Key features of Alternative 4a are shown on Figure 3-19.



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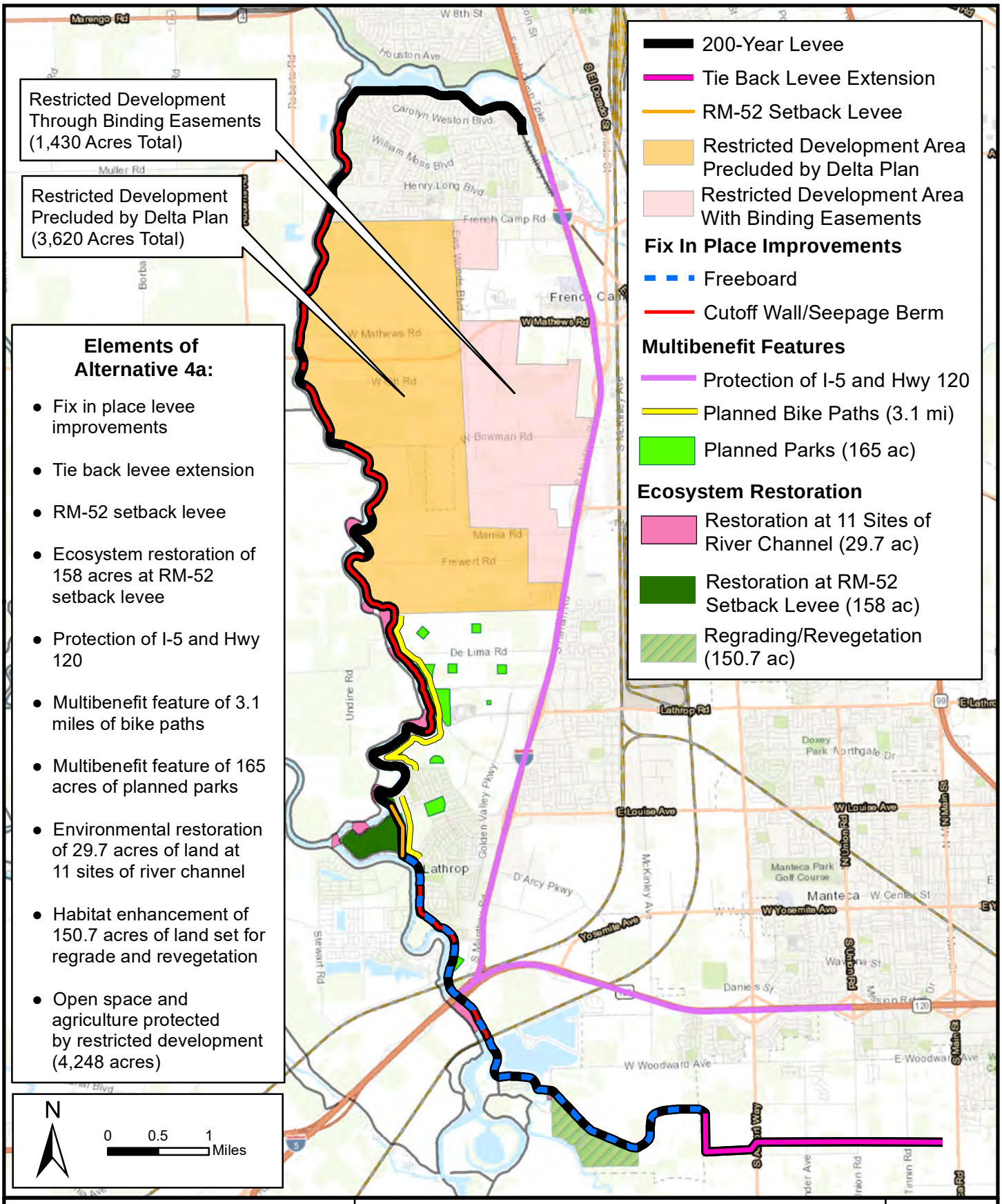
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RM-52 Setback Levee and Restoration under Alternatives 4a and 4b

FIGURE

3-18



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Key Features of Alternative 4a

FIGURE
3-19

3.4.6 Alternative 4b – Similar to Alternative 4a, but with No Easement Purchase

3.4.6.a Levee Improvements

Levee improvements for Alternative 4b are identical to Alternative 2 which were described in Section 3.4.3.

3.4.6.b Ecosystem Restoration and Multi-benefit Features

Alternative 4b includes all the multi-benefit and ecosystem restoration features from Alternative 2, plus the following.

3.4.6.b.1 Old River Secondary Levee and Restoration

Alternative 4b would provide the same Old River secondary levee and restoration feature as Alternative 4a (See Figure 3-18).

3.4.6.b.2 Other Multi-Benefit Components

Alternative 4b would provide the same multi-benefit features as Alternative 1 outlined in Section 3.4.2.b.3.

3.4.6.c Wise Use of the Floodplain

3.4.6.c.1 Alternative 4b Planned Growth

Planned growth under Alternative 4b would be the same as for Alternative 2.

3.4.6.c.2 Alternative 4b Wise Use of the Floodplain Considerations and Measures

3.4.6.c.2.1 Measures for Mitigating Item 1 (Discourage population growth in rural floodplains)

Under Alternative 4b, the 5,050-acre area between Lathrop and Stockton shown on Figure 3-9 would be restricted from growth by a combination of the Delta Plan and 1,430 acres of local assurances. The Old River Secondary Levee and Restoration feature would also reduce residential development in the Lathrop by another 100 acres over Alternative 1.

3.4.6.c.2.2 Measures for Mitigating Item 2 (Deep floodplains with rapid-rise flooding are the greatest concern

Measures for Alternative 4b would be the same as for Alternative 2.

3.4.6.c.2.3 Measures for Mitigating Item 3 (Limit State investment to areas protected by SPFC facilities)

As with Alternative 1, a composite of failures of the SPFC facilities exposes the entire Mossdale Tract area to flooding. Therefore, the State could be a cost sharing partner in all of the Alternative 4b features.

3.4.6.c.2.4 Measures for Mitigating Item 4 (No increase in Aggregate Life Loss or Property Damage Risk)

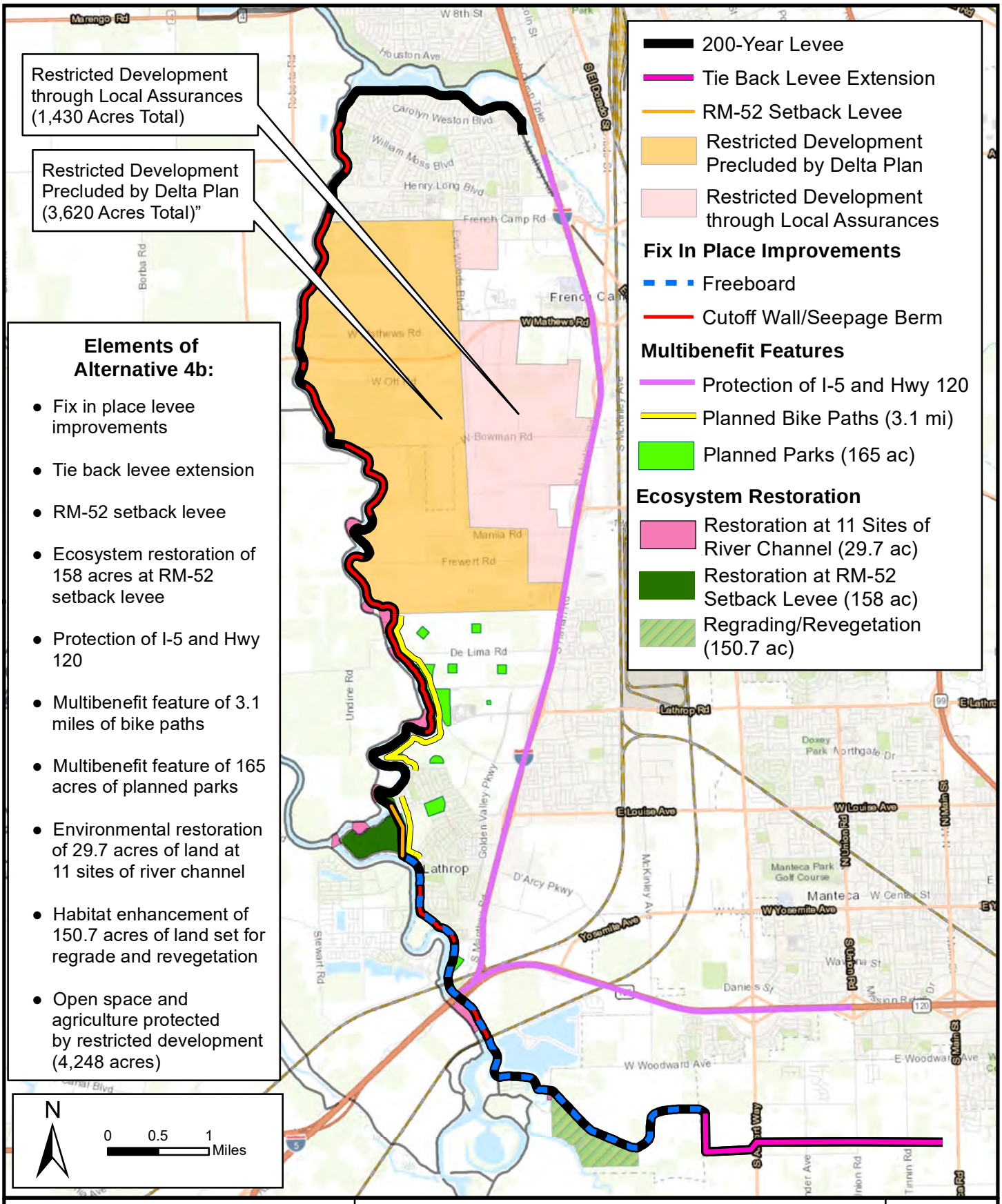
Section 4 presents an analysis of life loss and economic damages for Alternative 4b, which demonstrates that the measures proposed will result in a reduction in aggregate risk for both life loss and property damage through the 2065 planning horizon.

3.4.6.c.2.5 Measures for Mitigating Item 5 (Limit Conversion of Ag to Urban)

Measures for Alternative 4b would be the same as for Alternative 1.

3.4.6.d Alternative 4b Formulation Summary

Key features of Alternative 4b are shown on Figure 3-20.



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Key Features of Alternative 4b

FIGURE 3-20

3.4.7 Alternative 4c – Similar to Alternative 1, but with Easement Purchases, and RM-52 Dryland Restoration

3.4.7.a Levee Improvements

Levee improvements for Alternative 4c are identical to Alternative 1 which were described in Section 3.4.2.

3.4.7.b Ecosystem Restoration and Multi-benefit Features

Alternative 4c includes all the multi-benefit and ecosystem restoration features from Alternative 1, plus the following.

3.4.7.b.1 Old River Secondary Restoration

This feature is slightly modified from Alternative 4a in that it does not include a secondary levee, rather it involves converting the entire RM-52 area to dryland habitat. Without the secondary levee, Alternative 4c frees up an additional 8 acres of habitat which would otherwise be the secondary levee footprint. The restoration area would total 166 acres of dryland habitat. The land acquisition of the RM-52 area and the benefits of dryland habitat are described in Section 3.4.5.b.1. For an overview of this feature, see Figure 3-21.

3.4.7.b.2 Other Multi-Benefit Components

Alternative 4c would provide the same multi-benefit features as Alternative 1 outlined in Section 3.4.2.b.3. The alternative would protect 4,248 acres of agriculture and open space (3,325 acres within the Delta Plan Area; 923 acres within the 1,430 acres of binding easement) from develop under this alternative.

3.4.7.c Wise Use of the Floodplain

3.4.7.c.1 Alternative 4c Planned Growth

Planned growth under Alternative 4c would be the same as for Alternative 2.

3.4.7.c.2 Alternative 4c Wise Use of the Floodplain Considerations and Measures

3.4.7.c.2.1 Measures for Mitigating Item 1 (Discourage population growth in rural floodplains)

Under Alternative 4c, the 5,050-acre area between Lathrop and Stockton shown on Figure 3-9 would be restricted from growth by a combination of the Delta Plan and 1,430 acres of binding easements. The Old River Restoration feature would also reduce residential development in the Lathrop by another 100 acres over Alternative 1.

3.4.7.c.2.2 Measures for Mitigating Item 2 (Deep floodplains with rapid-rise flooding are the greatest concern

Measures for Alternative 4c would be the same as for Alternative 2.

3.4.7.c.2.3 Measures for Mitigating Item 3 (Limit State investment to areas protected by SPFC facilities)

As with Alternative 1, a composite of failures of the SPFC facilities exposes the entire Mossdale Tract area to flooding. Therefore, the State could be a cost sharing partner in all of the Alternative 4c features.

3.4.7.c.2.4 Measures for Mitigating Item 4 (No increase in Aggregate Life Loss or Property Damage Risk)

Section 4 presents an analysis of life loss and economic damages for Alternative 4c, which demonstrates that the measures proposed will result in a reduction in aggregate risk for both life loss and property damage through the 2065 planning horizon.

3.4.7.c.2.5 Measures for Mitigating Item 5 (Limit Conversion of Ag to Urban)

Measures for Alternative 4c would be the same as for Alternative 2, except the purchase of development restriction easements is limited to 1,430 acres outside of the Delta Plan.

3.4.7.d Alternative 4c Formulation Summary

Key features of Alternative 4c are shown on Figure 3-22.



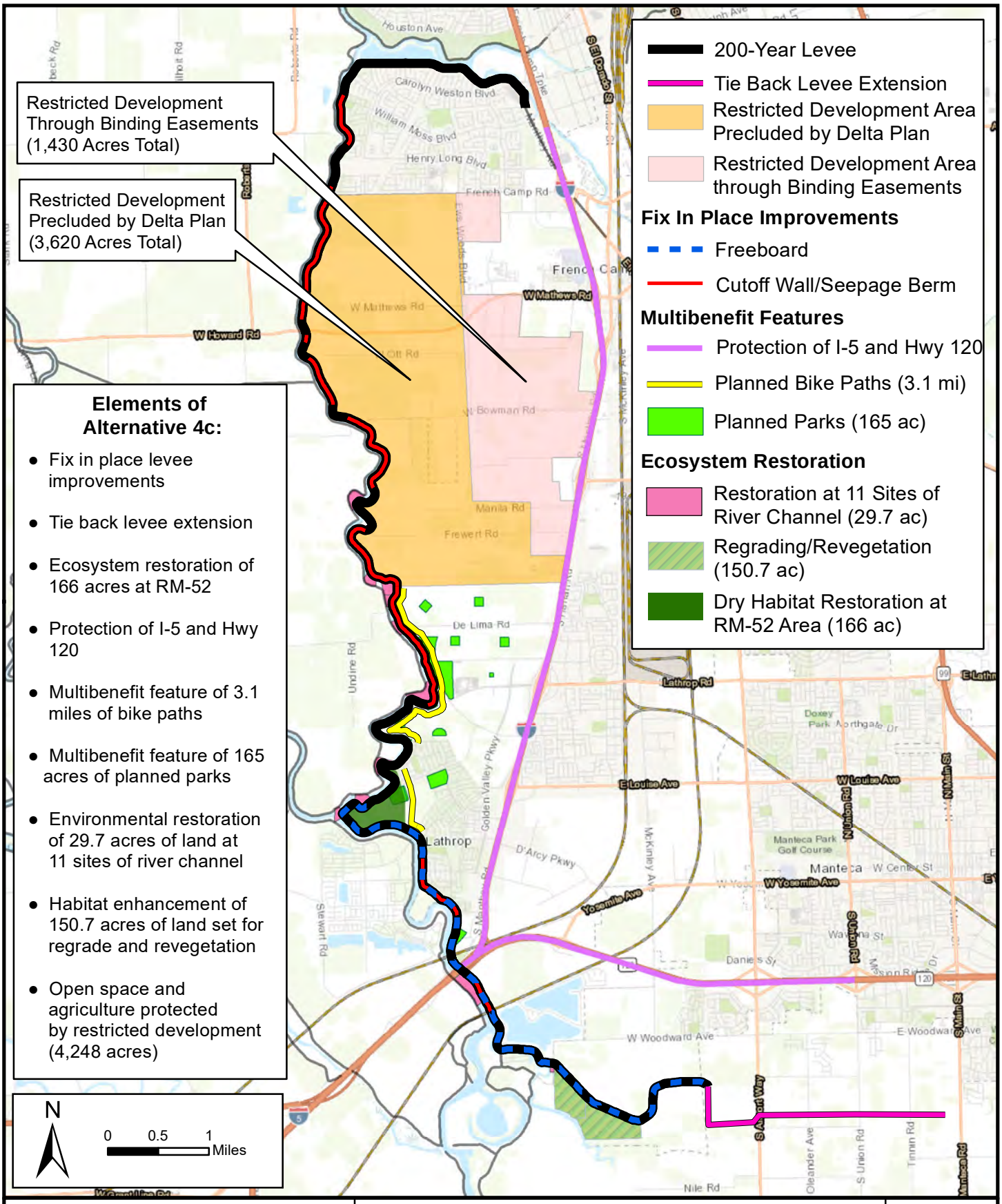
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RM-52 Setback Levee and Restoration under Alternatives 4c and 4d

FIGURE

3-21



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Key Features of Alternative 4c

FIGURE
3-22

3.4.8 Alternative 4d – Similar to Alternative 4c, but with No Easement Purchase

3.4.8.a Levee Improvements

Levee improvements for Alternative 4d are identical to Alternative 1 which were described in Section 3.4.2.

3.4.8.b Ecosystem Restoration and Multi-benefit Features

Alternative 4d includes all the multi-benefit and ecosystem restoration features from Alternative 1, plus the following.

3.4.8.b.1 Old River Secondary Restoration

Alternative 4d would provide the same Old River secondary levee and restoration feature as Alternative 4c (See Figure 3-21).

3.4.8.b.2 Other Multi-Benefit Components

Alternative 4d would provide the same multi-benefit features as Alternative 1 outlined in Section 3.4.2.b.3.

3.4.8.c Wise Use of the Floodplain

3.4.8.c.1 Alternative 4d Planned Growth

Planned growth under Alternative 4d would be the same as for Alternative 2.

3.4.8.c.2 Alternative 4d Wise Use of the Floodplain Considerations and Measures

3.4.8.c.2.1 Measures for Mitigating Item 1 (Discourage population growth in rural floodplains)

Under Alternative 4d, the 5,050-acre area between Lathrop and Stockton shown on Figure 3-9 would be restricted from growth by a combination of the Delta Plan and 1,430 acres of local assurances. The Old River Restoration feature would also reduce residential development in the Lathrop by another 100 acres over Alternative 1.

3.4.8.c.2.2 Measures for Mitigating Item 2 (Deep floodplains with rapid-rise flooding are the greatest concern

Measures for Alternative 4d would be the same as for Alternative 2.

3.4.8.c.2.3 Measures for Mitigating Item 3 (Limit State investment to areas protected by SPFC facilities)

As with Alternative 1, a composite of failures of the SPFC facilities exposes the entire Mossdale Tract area to flooding. Therefore, the State could be a cost sharing partner in all of the Alternative 4d features.

3.4.8.c.2.4 Measures for Mitigating Item 4 (No increase in Aggregate Life Loss or Property Damage Risk)

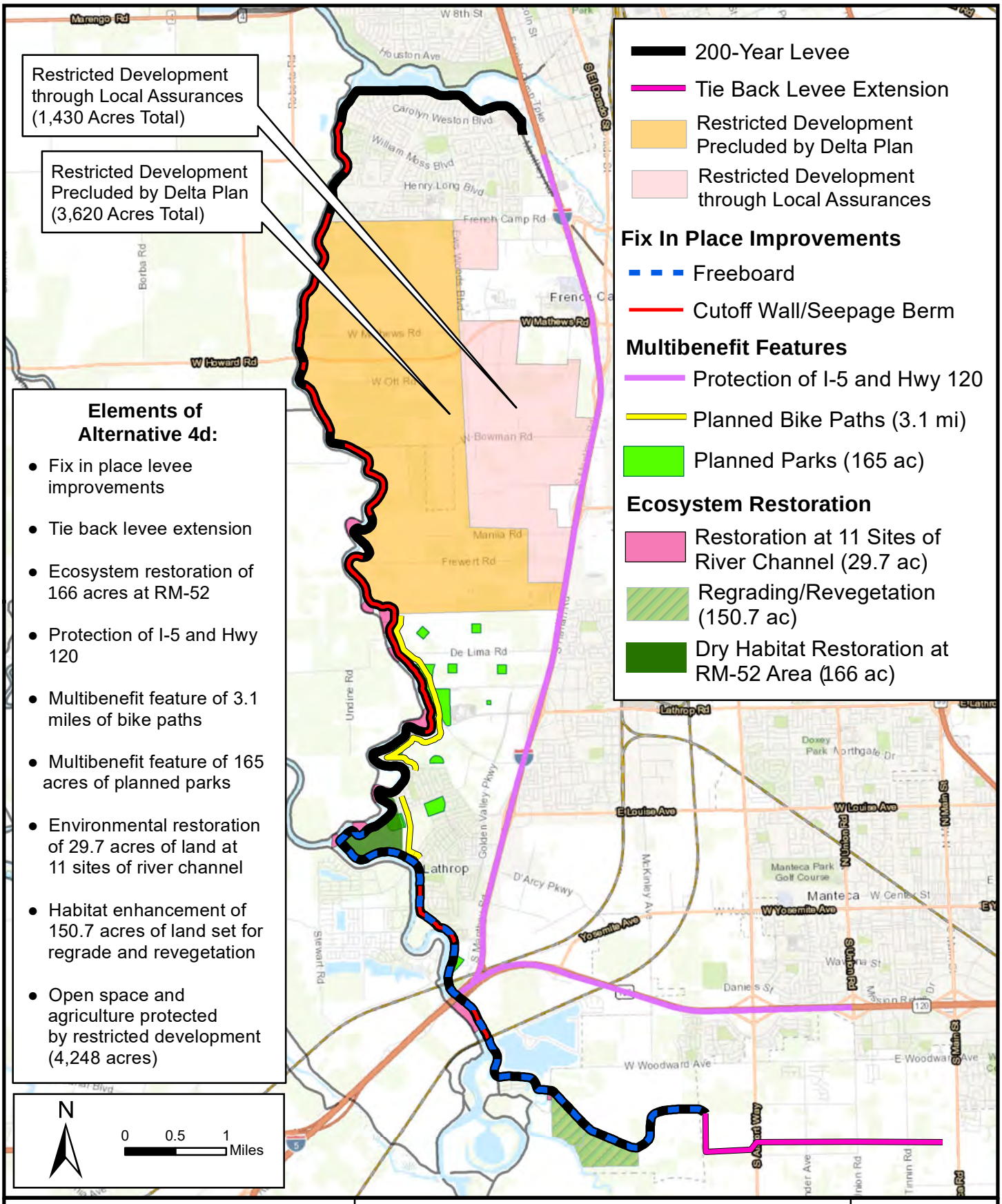
Section 4 presents an analysis of life loss and economic damages for Alternative 4d, which demonstrates that the measures proposed will result in a reduction in aggregate risk for both life loss and property damage through the 2065 planning horizon.

3.4.8.c.2.5 Measures for Mitigating Item 5 (Limit Conversion of Ag to Urban)

Measures for Alternative 4d would be the same as for Alternative 1.

3.4.8.d Alternative 4d Formulation Summary

Key features of Alternative 4d are shown on Figure 3-23.



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Key Features of Alternative 4d

FIGURE

3-23

3.4.9 Residual Risk Management Features Common to All Alternatives

This Section describes non-structural residual risk management features common to the alternatives. The physical facilities for each of the alternatives are intended to provide an ULOP (200-year flood protection) for given portions of the Mossdale Tract area for 2040 climate conditions. Even with these improvements, however, a residual risk of flooding will exist due to floods exceeding the design capacity, and uncertainties affecting the design condition itself, such as uncertainties in hydrology, hydraulics, geotechnical conditions, diligence with maintenance, repairs, rehabilitation, and replacements, burrowing rodent activity, and other unknown hidden defects. Prudent planning dictates that residual risk management features be added to all of the alternatives to address these uncertain risks. The primary focus of residual risk management features is to reduce the potential for loss of life, and to reduce impacts to critical facilities. Economic damages are not the focus of residual risk management planning. The following features are offered by the project sponsors.

3.4.9.a Future residential construction to be mostly 2-story

An effective evacuation plan is key to saving lives in the event of a levee failure. The 2017 Oroville Dam spillway failure underscored the difficulty and unreliability of widespread horizontal evacuations ('horizontal' meaning evacuation horizontally away from the flood danger, as opposed to vertical evacuation where one evacuates to a higher floor). In the Oroville Dam evacuation, nearly 190,000 people in a 3-county area attempted to evacuate by car on a Sunday afternoon at the same time on the same network of roads. Gridlock was experienced over much of the area, with some reporting 6+ hours to get to a safe zone. In the meantime, fear led to desperation in many cases, and incidents of panic and/or rage, health emergencies, and auto accidents were reported. There were several incidences of looting and burglary of the evacuated properties.

Had the incident happened on a school day, parents would have had the added step of picking up their children, which would have amplified all of the difficulties and emotion. And because the event turned out to be a false alarm, some people may ignore a future order to evacuate. So mass horizontal evacuation is not a reliable or repeatable risk management measure.

Levee failure flood waves tend to be most destructive in the immediate vicinity of the break (for example, a 1,000' radius of the break), where velocities are highest. Beyond that zone, flood wave advancement tends to be relatively slow (less than 5 mph) as the floodwaters move down-slope until they pond against a downslope embankment or levee. Depths then slowly build until the obstruction is overtopped, failed, or flanked. Due to RD 17's relief cut plan, discussed in the next section, ultimate depths would not exceed the top of the French Camp Slough left levee near Weston Ranch at the north end of the area, at an elevation of about 20' NAVD88.

Multi-story construction provides a means for vertical evacuation. Vertical evacuation is implementable on short notice, and it is repeatable. Risk of the public ignoring an evacuation order is reduced significantly, assuming proper vertical evacuation and post-flood evacuation procedures are followed.

Current market conditions, as demonstrated by the River Islands development of Lathrop, demonstrate that the market favors 2-story residential construction. Approximately 88% of new residences in River Islands have been constructed as 2-story structures, and 12% are one-story. So even with no added imposed building restrictions, future developments will heavily favor 2-story residential construction, vastly improving the effectiveness of future evacuation orders.

3.4.9.b Relief cut plan for French Camp Slough left levee (already planned)

RD 17's Levee Safety Plan and Emergency Operations Plan include pre-planning for a relief cut of the French Camp Slough left levee adjacent to Weston Ranch in the event of an upstream RD 17 levee

failure and flooding of the protected area. The relief cut would be implemented to relieve interior flooding, not to induce flooding from the river. In other words, the levee would be cut down only when the water on the land side of the levee rose to the level of the river at the location of the cut. Then after the passing of the flood event, the levee would be repaired at the failure location and relief cut location.

3.4.9.c Require all future critical facilities to be outside or elevated above the 500-year floodplain (current FEMA requirement)

Critical facilities, such as emergency management, evacuation centers, evacuation routes, critical utilities (water, wastewater, power, communication), facilities housing limited mobility populations, and critical information storage facilities, warrant greater protection measures. EO 11988 calls for critical facilities to be located outside or above the 500-year floodplain. Local procedures will be put in place to increase awareness and make all efforts to require this.

3.4.9.d Develop a mitigation plan for existing critical facilities in the Mossdale Tract area

Numerous existing critical facilities are located in the Mossdale Tract area (Figure 2-6). This residual risk management feature consists of commitment to development of a mitigation plan covering each of these facilities. Example critical facility mitigation plans could be emergency plans, physical modifications, designation of secondary/backup facilities, and planned relocations. Recommendations would be provided to the owners of the critical facilities, but implementation of the recommendations would be the responsibility of each facility owner.

3.4.9.e Enhanced flood warning and evacuation plan; greater forecast/warning time, designation of dry evacuation routes, favor shelter in place for multi-story residences

With the completion of the physical improvements under Alternatives 1 or 2, the probability of brittle (unexpected) geotechnical failure would be significantly reduced, so that if properly maintained, the predominant post-project failure mode will be overtopping. Emergency actions for an overtopping failure mode are highly dependent on the extent of warning time available.

Since 2015, advances have been made by State and Federal agencies in high water forecasting for the Lower San Joaquin River. During the extended winter 2017 flooding, accurate forecasts were provided on a daily basis, projecting flows and stages at Vernalis and Mossdale 5 days in advance. San Joaquin County Office of Emergency Services (OES) is the focal point of communications with the forecast agencies, and manages communications with local agencies in real time, so that decisions regarding evacuations can now be made well in advance of high water.

The county's Emergency Action Plan (EAP) will be modified to favor shelter in place vertical evacuation where available, with horizontal evacuation enhanced by the greater warning time available. It will also incorporate actions adopted for critical facilities.

3.4.9.f Declared interest in watershed and regional projects which improve flood protection

Local agencies will commit to continuing interest in regional and statewide planning and actions which reduce residual risks to the Mossdale Tract area, such as greater upstream flood storage, improved reservoir flood operations, and improved bypass conveyance between Vernalis and the Delta. The role that local agencies play in any of such action cannot be outlined at this time.

4 Evaluation of Final Array of Alternatives

Section 3.2 presented criteria for evaluation and comparison of alternatives. This section will examine performance of the alternatives against each of the evaluation metrics defined in Table 3-1.

4.1 Quantified Annualized Net Benefits and Benefit Cost Ratio

Each alternative was evaluated for its economic cost and benefit to the region. The monetary costs and benefits are annualized in 2018 dollars.

4.1.1 Costs

4.1.1.a Alternative 1

The estimated cost of improvements to meet ULDC requirements for current climate conditions is summarized in Table 4-1 (see Appendix G for more detail).

Table 4-1. Capital Cost of ULDC Improvements; 2018 Climate Conditions (2018 dollars)

Project No.	Station From	Station To	Description	Cost
2.1	822+80	972+25	Dryland levee reconstruction and seepage berm	$27,765,000
5.1	119+50	192+00	Cutoff wall	$10,224,000
5.2	190+50	297+75	Seepage berm	$19,501,000
5.3	311+00	518+50	Cutoff wall	$35,050,000
10.1	114+00	972+25	Erosion repairs	$9,386,000
12.1	112+73	815+40	Encroachment remediation	$678,000
13.1	571+35	801+00	Pipe penetration rehabilitation	$2,128,000
			Subtotal	$104,732,000
11.1			Right of way acquisition (existing deficiencies)	$12,381,000
11.2			Right of way acquisition (new construction improvements)	$3,900,000
			Subtotal	$16,281,000
			Subtotal	$121,013,000
			Dryland levee extension alternative	$15,872,000
			Total	$136,885,000

The additional estimated capital cost to address levee deficiencies resulting from year 2040 climate change is summarized in Table 4-2 (see Appendix H for more detail).

Table 4-2. Summary of Additional Capital Cost to Meet ULDC Requirements for 2040 Climate Change (2018 dollars)

Project No.	Station From	Station To	Description	Cost
1	192+00	212+00	Widen Seepage Berm	$1,074,000
2	312+30	339+00	Extend Cutoff Wall	$407,000
3	703+00 781+00	741+30 799+50	Cutoff Wall	$9,197,000
4	570+00	822+80	Levee Raise along San Joaquin River	$12,002,000
5	822+80	959+00	Levee Raise along Walthall Slough / Dryland Levee	$7,414,000
6	959+00	1104+00	Dryland Levee Extension (new levee)	$26,493,000
			Total	$56,587,000

Alternative 1 capital costs are summarized in Table 4-3. Capital costs were annualized using a discount rate of 2.75% and a term of 50 years, per USACE Economic Guidance Memorandum 18-01 for FY18.

Cost of the Lower San Joaquin River Channel Margin Restoration feature is estimated to be $20.6M in 2018 dollars (personal communication from Erik Almaas, KSN, 6/14/18). Cost of the Restoration South of the RD 17 Dryland Levee feature is estimated to be $5.0M in 2018 dollars, assuming unit costs from the BWFS (land at $25,000/ac, restoration at $8,000/ac).

Mitigation costs are included in the summary cost table and are further discussed in *Section 4.12-Transfer of Risk Analysis*.

Costs for annual operation, maintenance, and repair of the levee features were estimated based on CVFPP annual unit costs of $50,000/mile for Lower San Joaquin urban levees. RD 17 currently spends approximately $29,300/mile, leaving an unmet need of $20,700/mile in order to maintain existing levees to an urban standard. New levees would require the full $50,000/mile. The obligation of non-Federal sponsors also includes replacement and rehabilitation (rounding out the final 2 R's in the abbreviation OMRR&R for operation, maintenance, repair, replacement, and rehabilitation). However, rehabilitation and replacement are typically handled as un-scheduled and un-budgeted future capital projects which are cost shared and financed. The marginal annual OMR cost for Alternative 1 is estimated to be $519,000 (improved OMR at 18.16-mile existing levee, and 2.75-mile new levee). As noted in Section 3.4, it is assumed that all multi-benefit and ecosystem restoration features would be operated and maintained by others using third party funds.

Table 4-3. Summary of Alternative 1 Capital Costs (2018 dollars)

Description	Cost
ULDC improvements for 2018 climate conditions	
North of Station 447+38 (Alt 3 secondary levee connection point)	$63,122,000
South of Station 447+38	$73,763,000
Subtotal	$136,885,000
Additional improvements to meet ULDC for 2040 climate conditions	
North of Station 447+38	$1,481,000
South of Station 447+38	$55,106,000
Subtotal	$56,587,000
Ecosystem Restoration and Multi-benefit Features	
SJR channel margin restoration	$20,600,000
Restoration of lands south of the RD 17 dryland levee	$4,973,000
Subtotal	$25,573,000
Wise use of floodplain features	$0
Total Capital Cost	$219,045,000
Annualized capital cost (50yr, 2.75% discount rate)	$8,114,000
2018 Annualized mitigation cost	$57,000
2065 Annualized mitigation cost	$481,000
Annualized marginal increase in OMR cost	$519,000
2018 Annualized project cost	$8,690,000
2065 Annualized project cost	$9,114,000

4.1.1.b Alternative 2

Alternative 2 costs would be the same as for Alternative 1, with the additions of the Old River secondary levee and restoration feature, and 5,050 acres of development restriction easements for wise use of the floodplain assurance. The cost of the development restriction easements was estimated using the land value from the BWFS of $25,000/acre, and an easement cost of 95% of fee value (also taken from the BWFS), plus average transaction costs of $50,000/parcel for the 371 parcels involved. Transaction cost per parcel is an average based on experience with similar projects, and includes the cost of a title report, appraisal, surveying, and mapping, right of way (ROW) agent costs, various fees, and legal fees, assuming a certain number of parcels would have to be acquired via eminent domain. Transaction costs would also include re-conveyance to a third party.

The CVFPP estimates the cost of the Old River Secondary Levee and Restoration feature to be $15M in 2018 dollars (0.67 mile of new secondary levee at $13.3M/mile, 118 acres land acquisition $1.2M, and restoration $4.8M). However, that property was listed for sale in February 2019 for $12.5 million for 191 acres, or $65,000/acre. The following unit costs were used to estimate the cost of the setback levee and restoration feature under this alternative: $13.3M/mile of new levee, $65,000/acre of land acquired, and $4.8M for restoration. The feature was estimated to be $19,354,000.

Alternative 2 capital costs are summarized in Table 4-4.

Mitigation costs are included in the summary cost table and are further discussed in *Section 4.12-Transfer of Risk Analysis*.

Costs for annual operation, maintenance, and repair of the new features would be the same as for Alternative 1, with the addition of 0.52 miles of new secondary levee. The marginal annual OMR cost for Alternative 2 is estimated to be $545,000 (18.16-mile modified existing levee, and 3.27-mile new levee).

Table 4-4. Summary of Alternative 2 Capital Costs (2018 dollars)

Description	Cost
ULDC improvements for 2018 climate conditions	
North of Station 447+38 (Alt 3 secondary levee connection point)	$63,122,000
South of Station 447+38	$73,763,000
Subtotal	$136,885,000
Additional improvements to meet ULDC for 2040 climate conditions	
North of Station 447+38	$1,481,000
South of Station 447+38	$55,106,000
Subtotal	$56,587,000
Ecosystem Restoration and Multi-benefit Features	
SJR channel margin restoration	$20,600,000
Restoration of lands south of the RD 17 dryland levee	$4,973,000
Old River secondary levee and restoration	$19,354,000
Subtotal	$44,927,000
Wise use of floodplain features	
Development restriction easements	$138,488,000
Total Capital Cost	$376,887,000
Annualized capital cost (50yr, 2.75% discount rate)	$13,960,000
2018 Annualized mitigation cost	$57,000
2065 Annualized mitigation cost	$481,000
Annualized marginal increase in OMR cost	$545,000
2018 Annualized project cost	$14,562,000
2065 Annualized project cost	$14,986,000

4.1.1.c Alternative 3

Alternative 3 costs are similar to Alternative 2, with the addition of the new Sta 447+38 secondary levee, and elimination of primary levee work north of Sta 447+38. The capital cost of the Sta 447+38 secondary levee is $29.4M (see Appendix I for more detail).

Alternative 3 capital costs are summarized in Table 4-5.

Mitigation costs are included in the summary cost table and are further discussed in *Section 4.12-Transfer of Risk Analysis*.

Costs for annual operation, maintenance, and repair of the new features would be the same as for Alternative 1, with the addition of 0.52 miles of new secondary levee at Old River and 3.7 miles of new secondary levee at Sta 447+38. The 8.22 miles of primary levee north of the Sta 447+38 secondary levee would also need to be maintained to a full urban standard, as it would continue to protect the urban Weston Ranch area of Stockton. The marginal annual OMR cost for Alternative 3 is estimated to be $727,000 (18.16-mile existing levee, and 6.92-mile new levee).

Table 4-5. Summary of Alternative 3 Capital Costs (2018 dollars)

Description	Cost
ULDC improvements for 2018 climate conditions	
North of Station 447+38 (Alt 3 secondary levee connection point)	$0
South of Station 447+38	$73,763,000
Subtotal	$73,763,000
Additional improvements to meet ULDC for 2040 climate conditions	
North of Station 447+38	$0
South of Station 447+38	$55,106,000
Sta 447+38 secondary levee	$29,433,000
Subtotal	$84,539,000
Ecosystem Restoration and Multi-benefit Features	
SJR channel margin restoration	$20,600,000
Restoration of lands south of the RD 17 dryland levee	$4,973,000
Old River secondary levee and restoration	$19,354,000
Subtotal	$44,927,000
Wise use of floodplain features	$0
Total Capital Cost	$203,229,000
Annualized capital cost (50yr, 2.75% discount rate)	$7,528,000
2018 Annualized mitigation cost	$57,000
2065 Annualized mitigation cost	$481,000
Annualized marginal increase in OMR cost	$727,000
2018 Annualized project cost	$8,312,000
2065 Annualized project cost	$8,736,000

4.1.1.d Alternative 4a

Alternative 4a costs would be the same as for Alternative 2, with only 1,430 acres of development restriction easements for wise use of the floodplain assurance and the added dry restoration at RM-52.

Alternative 4a capital costs are summarized in Table 4-6.

Mitigation costs are included in the summary cost table and are further discussed in *Section 4.12-Transfer of Risk Analysis*.

Costs for annual operation, maintenance, and repair of the new features would be the same as for Alternative 2. The marginal annual OMR cost for Alternative 4a is estimated to be $545,000 (18.16-mile modified existing levee, and 3.27-mile new levee).

Table 4-6. Summary of Alternative 4a Capital Costs (2018 dollars)

Description	Cost
ULDC improvements for 2018 climate conditions	
North of Station 447+38 (Alt 3 secondary levee connection point)	$63,122,000
South of Station 447+38	$73,763,000
Subtotal	$136,885,000
Additional improvements to meet ULDC for 2040 climate conditions	
North of Station 447+38	$1,481,000
South of Station 447+38	$55,106,000
Subtotal	$56,587,000
Ecosystem Restoration and Multi-benefit Features	
SJR channel margin restoration	$20,600,000
Restoration of lands south of the RD 17 dryland levee	$4,973,000
Old River secondary levee and restoration	$22,612,000
Subtotal	$48,185,000
Wise use of floodplain features	$47,263,000
Total Capital Cost	$288,920,000
Annualized capital cost (50yr, 2.75% discount rate)	$10,702,000
2018 Annualized mitigation cost	$57,000
2065 Annualized mitigation cost	$481,000
Annualized marginal increase in OMR cost	$545,000
2018 Annualized project cost	$11,304,000
2065 Annualized project cost	$11,728,000

4.1.1.e Alternative 4b

Alternative 4b costs would be the same as for Alternative 4a, without easements purchases.

Alternative 4b capital costs are summarized in Table 4-7.

Mitigation costs are included in the summary cost table and are further discussed in *Section 4.12-Transfer of Risk Analysis*.

Costs for annual operation, maintenance, and repair of the new features would be the same as for Alternative 2. The marginal annual OMR cost for Alternative 4b is estimated to be $545,000 (18.16-mile modified existing levee, and 3.27-mile new levee).

Table 4-7. Summary of Alternative 4b Capital Costs (2018 dollars)

Description	Cost
ULDC improvements for 2018 climate conditions	
North of Station 447+38 (Alt 3 secondary levee connection point)	$63,122,000
South of Station 447+38	$73,763,000
Subtotal	$136,885,000
Additional improvements to meet ULDC for 2040 climate conditions	
North of Station 447+38	$1,481,000
South of Station 447+38	$55,106,000
Subtotal	$56,587,000
Ecosystem Restoration and Multi-benefit Features	
SJR channel margin restoration	$20,600,000
Restoration of lands south of the RD 17 dryland levee	$4,973,000
Old River secondary levee and restoration	$22,612,000
Subtotal	$48,185,000
Wise use of floodplain features	$0
Total Capital Cost	$241,657,000
Annualized capital cost (50yr, 2.75% discount rate)	$8,951,000
2018 Annualized mitigation cost	$57,000
2065 Annualized mitigation cost	$481,000
Annualized marginal increase in OMR cost	$545,000
2018 Annualized project cost	$9,553,000
2065 Annualized project cost	$9,977,000

4.1.1.f Alternative 4c

Alternative 4c costs would be the same as for Alternative 1, with the additions of the RM-52 dryland habitat feature and 1,430 acres of development restriction easements for wise use of the floodplain assurance.

Alternative 4c capital costs are summarized in Table 4-8.

Mitigation costs are included in the summary cost table and are further discussed in *Section 4.12-Transfer of Risk Analysis*.

The marginal annual OMR cost for Alternative 4c is estimated to be $519,000 (improved OMR at 18.16-mile existing levee, and 2.75-mile new levee).

Table 4-8. Summary of Alternative 4c Capital Costs (2018 dollars)

Description	Cost
ULDC improvements for 2018 climate conditions	
North of Station 447+38 (Alt 3 secondary levee connection point)	$63,122,000
South of Station 447+38	$73,763,000
Subtotal	$136,885,000
Additional improvements to meet ULDC for 2040 climate conditions	
North of Station 447+38	$1,481,000
South of Station 447+38	$55,106,000
Subtotal	$56,587,000
Ecosystem Restoration and Multi-benefit Features	
SJR channel margin restoration	$20,600,000
Restoration of lands south of the RD 17 dryland levee	$4,973,000
Old River secondary levee and restoration	$15,749,000
Subtotal	$41,322,000
Wise use of floodplain features	$47,263,000
Total Capital Cost	$282,057,000
Annualized capital cost (50yr, 2.75% discount rate)	$10,448,000
2018 Annualized mitigation cost	$57,000
2065 Annualized mitigation cost	$481,000
Annualized marginal increase in OMR cost	$519,000
2018 Annualized project cost	$11,024,000
2065 Annualized project cost	$11,448,000

4.1.1.g Alternative 4d

Alternative 4d costs would be the same as for Alternative 4c, without easement purchases.

Alternative 4d capital costs are summarized in Table 4-9.

Mitigation costs are included in the summary cost table and are further discussed in *Section 4.12-Transfer of Risk Analysis*.

The marginal annual OMR cost for Alternative 4d is estimated to be $519,000 (improved OMR at 18.16-mile existing levee, and 2.75-mile new levee).

Table 4-9. Summary of Alternative 4d Capital Costs (2018 dollars)

Description	Cost
ULDC improvements for 2018 climate conditions	
North of Station 447+38 (Alt 3 secondary levee connection point)	$63,122,000
South of Station 447+38	$73,763,000
Subtotal	$136,885,000
Additional improvements to meet ULDC for 2040 climate conditions	
North of Station 447+38	$1,481,000
South of Station 447+38	$55,106,000
Subtotal	$56,587,000
Ecosystem Restoration and Multi-benefit Features	
SJR channel margin restoration	$20,600,000
Restoration of lands south of the RD 17 dryland levee	$4,973,000
Old River secondary levee and restoration	$15,749,000
Subtotal	$41,322,000
Wise use of floodplain features	$0
Total Capital Cost	$234,794,000
Annualized capital cost (50yr, 2.75% discount rate)	$8,697,000
2018 Annualized mitigation cost	$57,000
2065 Annualized mitigation cost	$481,000
Annualized marginal increase in OMR cost	$519,000
2018 Annualized project cost	$9,273,000
2065 Annualized project cost	$9,697,000

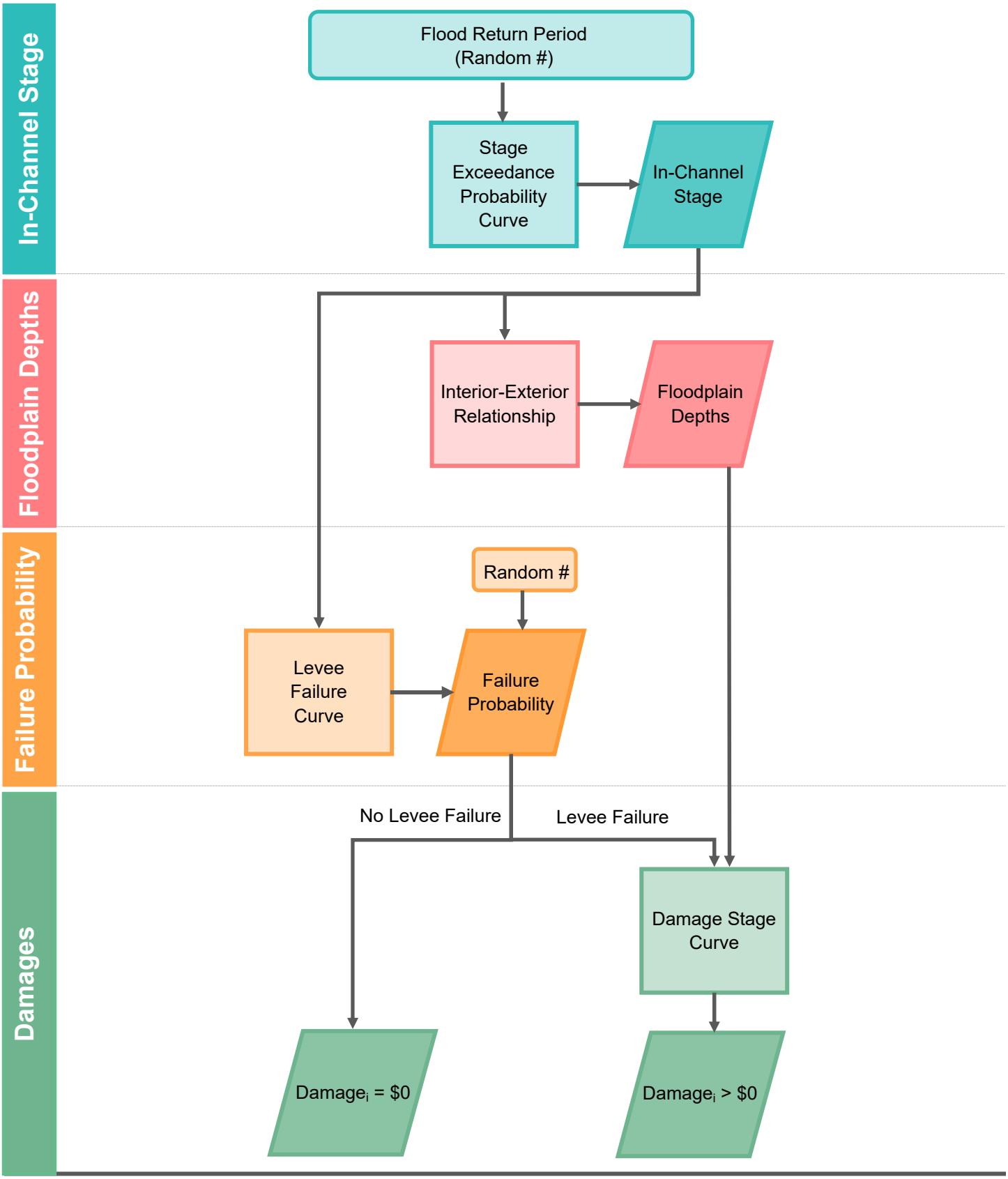
4.1.2 Benefits

The economic benefit of a project is the difference between expected annual damages (EAD) in the without-project scenario minus EAD in the with-project scenario. To calculate the EAD for each scenario, a USACE Hydrologic Engineering Center Flood Damage Analysis (HEC-FDA) model was created. HEC-FDA incorporates hydraulic, hydrologic, geotechnical and structure information and performs a Monte Carlo simulation to determine the amounts of damages that would occur under tens of thousands of hypothetical flood simulations. This set of results is then annualized to determine the EAD of a scenario. Figure 4-1 shows a schematic of a typical HEC-FDA analysis. Year 2018 analyses represent existing climate and development conditions, and 2065 analyses represents future climate and development.

The economic analysis is explained in greater detail in Appendix E.

For Alternatives 1-3, EAD was calculated for six (6) index points taken from the LSJRFS (Figure 4-2). Alternative 4 (all variations) was not modeled using HEC-FDA because its hydraulic, hydrologic, geotechnical and structure information, the model input parameters, are the same as Alternative 2. It is assumed the EAD for Alternative 4 (all variations) is equivalent to that of Alternative 2. Table 4-10 shows the total EAD calculated for each scenario and index point. Alternatives 1 and 2 perform identically for 2018 conditions, but Alternative 2 performs slightly better for 2065 conditions due to eliminating development in the Old River secondary levee restoration area. Poor performance for Alternative 3 is due to higher damages accruing in the urban area north of the Sta 447+38 secondary levee.

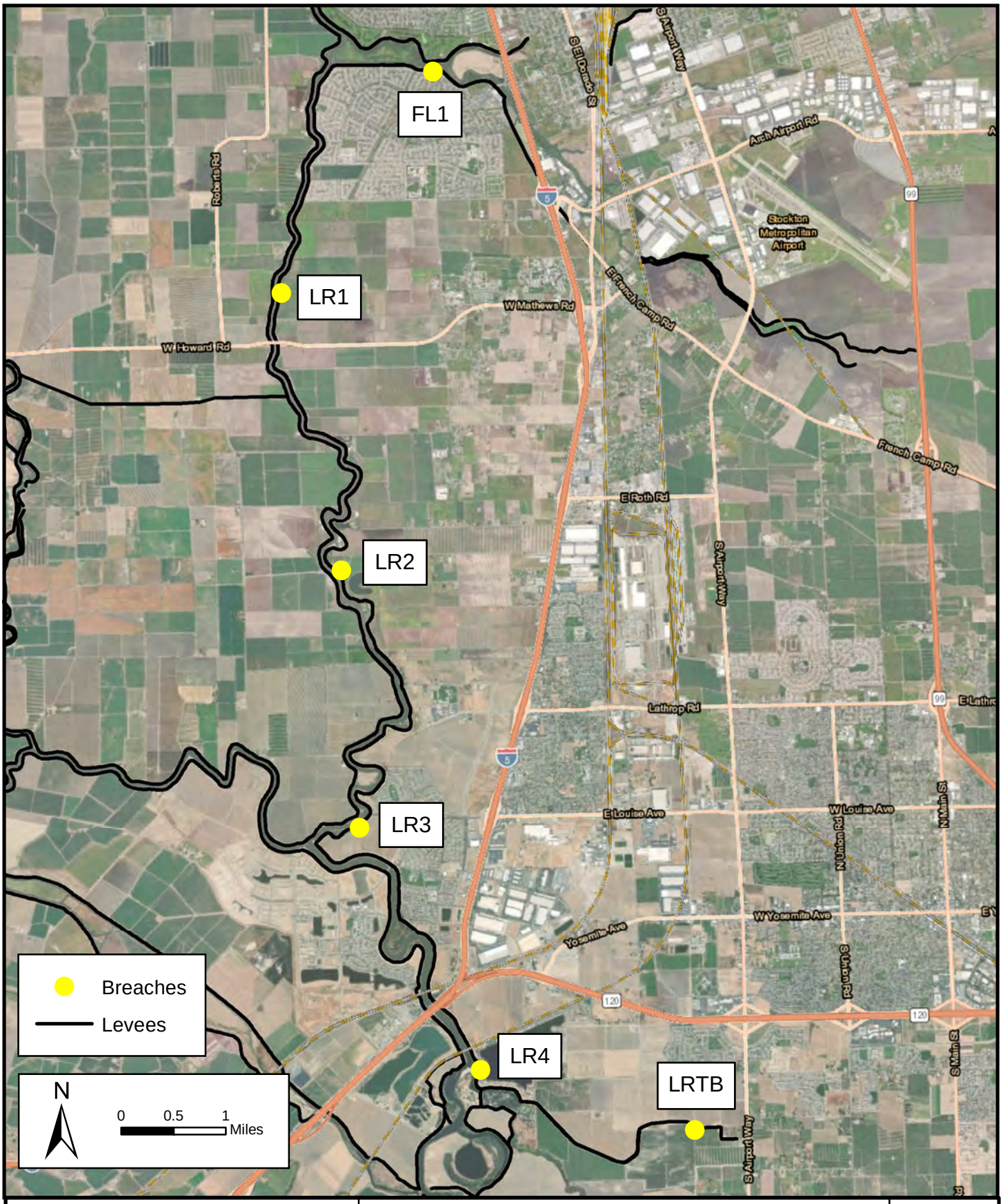
Figure 4-1: FDA Model Framework



Expected Annual Damages

$$EAD = \frac{\sum_{i=1}^{n} Damages_i}{n}$$

Where n is very large (e.g. 10,000-100,000)



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Index Points

FIGURE

4-2

Table 4-10. Summary of annualized damages for planning horizon, breach location, and plan (2018 dollars)

Year	Index Point (Breach Location)		Annualized Damages						
		Without Project	Alternative 1	Alternative 2	Alternative 3	Alternative 4a	Alternative 4b	Alterative 4c	Alternative 4d
2018	FL1	$783,000	$154,000	$154,000	$132,000	$154,000	$154,000	$154,000	$154,000
	LR1	$30,035,000	$803,000	$803,000	**$10,248,000**	$803,000	$803,000	$803,000	$803,000
	LR2	$11,413,000	$1,683,000	$1,683,000	$6,444,000	$1,683,000	$1,683,000	$1,683,000	$1,683,000
	LR3	$6,523,000	$3,751,000	$3,745,000	$4,302,000	$3,745,000	$3,745,000	$3,745,000	$3,745,000
	LR4	**$46,984,000**	**$3,990,000**	**$3,988,000**	$4,034,000	**$3,988,000**	**$3,988,000**	**$3,988,000**	**$3,988,000**
	LRTB	$14,443,000	$3,276,000	$3,276,000	$3,553,000	$3,276,000	$3,276,000	$3,276,000	$3,276,000
2065	FL1	$35,551,000	$840,000	$833,000	$411,000	$833,000	$833,000	$833,000	$833,000
	LR1	$99,405,000	$4,682,000	$4,607,000	**$50,003,000**	$4,607,000	$4,607,000	$4,607,000	$4,607,000
	LR2	$34,449,000	$6,014,000	$5,926,000	$17,015,000	$5,926,000	$5,926,000	$5,926,000	$5,926,000
	LR3	$10,895,000	$5,638,000	$5,497,000	$7,481,000	$5,497,000	$5,497,000	$5,497,000	$5,497,000
	LR4	**$169,938,000**	**$36,378,000**	**$36,011,000**	$37,720,000	**$36,011,000**	**$36,011,000**	**$36,011,000**	**$36,011,000**
	LRTB	$98,037,000	$23,399,000	$23,180,000	$24,247,000	$23,180,000	$23,180,000	$23,180,000	$23,180,000

Bold indicates controlling breach.

The index point with the greatest damages determines the damages for the system in each scenario and is indicated in bold in Table 4-10. With-project damages are also referred to as residual damages. System benefits for each alternative at each planning horizon are computed by subtracting the controlling residual damage value from the controlling without-project value.

The LSJRFS also estimated damages and benefits in Central Stockton accruing to Mossdale improvements. In the without-project condition, USACE estimated that the French Camp Slough right levee would be flanked in floods larger than the 50-year flood, even after construction of the National Economic Development (NED) plan. This is due to the Mossdale Tract Area essentially acting as a flood bypass, with floodwaters re-entering the system at French Camp Slough. With construction of Mossdale improvements, flanking of the French Camp Slough right levee would be greatly reduced, improving flood protection to Central Stockton. USACE estimated annual benefits to be $4,000,000. Because the UFRR FDA analysis did not extend into Central Stockton, USACE's estimate was added to the calculated values from Table 4-10.

Table 4-11 provides the total economic benefits derived from Table 4-10 with the addition of the approximate Central Stockton benefits.

Table 4-11. Total annualized flood damage benefits for each planning horizon and plan including study area and Central Stockton benefit area (2018 dollars)

Alternative	Annual Flood Damage Benefit	
	2018 Conditions	2065 Conditions
1	$46,994,000	$137,560,000
2	$46,996,000	$137,928,000
3	$40,736,000	$123,935,000
4a	$46,996,000	$137,928,000
4b	$46,996,000	$137,928,000
4c	$46,996,000	$137,928,000
4d	$46,996,000	$137,928,000

4.1.3 Net Benefits and Benefit/Cost Ratio

Net benefits are equal to annualized benefits minus costs. USACE planning policy calls for favoring the alternative that reasonably maximizes net benefits. However, USACE also calls for economic efficiency, which is the most efficient use of public funds. The key indicator of efficiency is the benefit cost ratio (BCR). Therefore, both indicators are presented in Table 4-12. Year 2018 calculations of economic performance are of primary interest in comparing alternatives, because USACE policy does not permit use of economic performance based on speculation of future climate conditions. However, Table 4-12 presents economics for 2065 conditions for illustration.

Table 4-12. Net benefits and benefit/cost ratio for each planning horizon and plan (2018 dollars)

Alternative	2018 Conditions		2065 Conditions	
	Net Benefits	Benefit/Cost	Net Benefits	Benefit/Cost
1	$38,304,000	5.41	$128,870,000	15.09
2	$32,434,000	3.23	$123,365,000	9.20
3	$32,424,000	4.90	$115,623,000	14.19
4a	$35,692,000	4.16	$126,623,000	11.76
4b	$37,443,000	4.92	$128,374,000	13.82
4c	$35,972,000	4.26	$126,903,000	12.05
4d	$37,723,000	5.07	$128,654,000	14.22

Note: The net benefits and benefit/cost ratios do not take into account benefits other than flood risk reduction e.g. ecosystem restoration benefits are not included in benefits. However, the costs used in the BCRs include all costs associated with the alternatives (costs outlined in Section 4.1.1) including ecosystem restoration features and mitigation costs.

From the results in Table 4-12, all alternatives meet the Federal interest guideline of a BCR of at least 1.0 for 2018 conditions. Alternatives 2 and 3 both have about the same net benefits, but Alternative 3 is a more efficient use of public funds than Alternative 2 giving it a higher BCR than Alternative 2 but not as a high as Alternatives 1 and 4 (all variations). Alternative 1 has the highest net benefits and BCR among all alternatives.

4.2 Quantified Reduction in Annualized Fatalities

To estimate life loss risk for each scenario, the HEC-FDA model used in economic analysis was also used for life loss estimates using CVFPP methodology and data (see Appendix E for more detail). Instead of using a depth-damage function, however, a depth-mortality function was substituted, and exposed population per structure was substituted for building and contents values. Life loss calculations required additional data:

- Persons per structure based on the residential occupancy type
- Occurrence of people over and under the age of 65
- Percentage of people who remain in the floodplain at the time of flooding

Single family residential and mobile homes properties were assigned 3.04 person per structure (PPS) while multi-family residential properties were assigned 2.85 PPS, based on the 2017 CVFPP. Using the 2017 CVFPP population data, an average population of over 65 was determined to be approximately 7% of the total population. All population sets were reduced by 70% to account for the number of people evacuated in advance of a flood event. The evacuation rate was based on multiple factors and was taken directly from the 2017 CVFPP. HEC-FDA life safety results are presented in Table 4-13.

Table 4-13. Summary of annualized mortality for each planning horizon, breach location, and plan

Year	Index Point (Breach Location)	Annualized Mortality							
		Without Project	Alternative 1	Alternative 2	Alternative 3	Alternative 4a	Alternative 4b	Alternative 4c	Alterative 4d
2018	FL1	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LR1	0.75	0.03	0.03	0.37	0.03	0.03	0.03	0.03
	LR2	0.39	0.11	0.11	0.38	0.11	0.11	0.11	0.11
	LR3	0.36	0.28	0.28	0.35	0.28	0.28	0.28	0.28
	LR4	**1.27**	**0.61**	**0.61**	**0.68**	**0.61**	**0.61**	**0.61**	**0.61**
	LRTB	0.88	0.21	0.21	0.43	0.21	0.21	0.21	0.21
2065	**FL1**	5.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LR1	4.53	0.08	0.08	**2.10**	0.08	0.08	0.08	0.08
	LR2	1.53	0.23	0.23	0.83	0.23	0.23	0.23	0.23
	LR3	0.70	0.13	0.13	0.16	0.13	0.13	0.13	0.13
	LR4	**6.65**	**1.13**	**1.12**	1.39	**1.12**	**1.12**	**1.12**	**1.12**
	LRTB	6.48	0.97	0.97	1.22	0.97	0.97	0.97	0.97

Bold indicates controlling breach.

From the results in Table 4-13, the worst-case for each scenario was considered the controlling index point for the system which is used to determine the total life loss reduction benefit. Table 4-14 shows the total benefit derived from the cost of the controlling index point.

Table 4-14. Total annualized reduction in fatalities for each planning horizon and plan

Alternative	Annual Reduction in Fatalities	
	2018 Conditions	2065 Conditions
1	0.66	5.52
2	0.66	5.53
3	0.59	4.55
4a	0.66	5.53
4b	0.66	5.53
4c	0.66	5.53
4d	0.66	5.53

From the results in Table 4-14, all four alternatives reduce annual fatalities over the without-project condition. Alternatives 1, 2, and 4 (all variations) perform the same, with Alternative 3 trailing slightly.

These results are based on an inexact model and are only reliable as an indicator of *comparative* performance. Actual loss of life under any of the alternatives hinges not only on the adequacy of the constructed features, but also on the effectiveness of the residual risk management features common to all alternatives.

4.3 Improved Evacuation

All of the alternatives include residual risk management features which will improve evacuation. As noted previously, plans which rely on frequent horizontal evacuation rapidly lose effectiveness with every false alarm. Evacuations which stress shelter in place through vertical evacuation to a second floor are far more reliable and repeatable. Additionally, the construction trend in the study area is heavily weighted toward 2-story residential construction. However, there is the same level of protection within the protected areas of all the alternatives. Alternatives 1, 2, and 4 (all variations) both protect the entire study area while Alternative 3 leaves Weston Ranch and other rural areas in the deepest portion of the floodplain where vertical evacuation is less effective. Additionally, the horizontal evacuation for Alternative 3 is also encumbered because there are only a finite number of ways vehicles can cross from west to east under I-5. Alternative 3 leaves three (3) of the six (6) underpasses exposed to flooding which further incumbers evacuations. Based on these criteria, Alternative 3 is weak in this evaluation metric.

In summary, Alternatives 1, 2, and 4 (all variations) perform the same for this metric, and Alternative 3 performs worse.

4.4 Improved Protection of Limited Mobility Populations

Alternatives 1, 2, and 4 (all variations) provide 200-year level of protection for 2040 climate change conditions for all structures and persons within the Mossdale Tract area, including critical jail and hospital facilities housing 1,700 persons with limited mobility.

While Alternative 3 does protect the Cities of Lathrop and Manteca, it does not provide protection to Weston Ranch or the majority of critical facilities housing limited mobility populations, which are in the County area between Stockton and Lathrop. The numerous homes and schools within Weston Ranch as well as San Joaquin County General Hospital and the San Joaquin County jail complex would all be located within the 200-year floodplain for 2040 climate change conditions. The 1,700 temporary

residents associated with the jail and hospital complex would be at higher risk under Alternative 3, along with approximately 4,300 primary school students with limited bus service.

4.5 Ability of the Alternative to be Modified to Adapt to Climate Change

All alternatives have been formulated to address year 2040 climate change and acquire ROW to improve the levee to meet ULDC standards for the 2065 200-year event. All alternatives can be easily modified to adapt to future climate change with minimal effort.

4.6 Conformance with State CVFPP and Delta Plan Growth Policies, and Federal EO 11988

Section 2.2.3.a.1 described State wise use of floodplains policies, and Section 3.4 presented wise use of the floodplain considerations and measures for each of the alternatives which address the five key points of the State's policy governing State investments:

1. Discourage population growth in rural floodplains
2. Deep floodplains with rapid rise flooding are the greatest concern
3. State investments will be limited to areas protected by SPFC facilities
4. Aggregate loss of life risk and property damage risk are held constant or reduced over time
5. Limit conversion of agricultural land to urban uses, and preserve the robust agricultural economy

As demonstrated in Tables 4-12 and 4-14, all alternatives meet point 4 in the list above; none of the alternatives, *acting as a system*, amplify risk (Figures 4-3 and 4-4; Alternative 4 is equivalent to Alternative 2). However, a closer examination of Tables 4-12 and 4-14 reveal that at the non-critical index point LR3 for both 2018 and 2065 conditions, Alternatives 1, 2, and 4 (all variations) reduce both economic damages and life loss as compared to the without-project condition. Alternative 3, however, slightly amplifies life risk for 2018 conditions, and economic damages for 2065 conditions. The reason is that LR3 is just upstream of the Sta 447+38 Secondary Levee, and a failure there would pond behind the secondary levee, exposing Lathrop to deeper flooding than the without-project condition. The risk amplification is minor, so it is unclear whether this would violate State planning policy. If Alternative 3 becomes the favored alternative in the overall comparison, this issue should be revisited. The risk amplification could be eliminated by raising the levee at LR3 an additional increment if necessary.

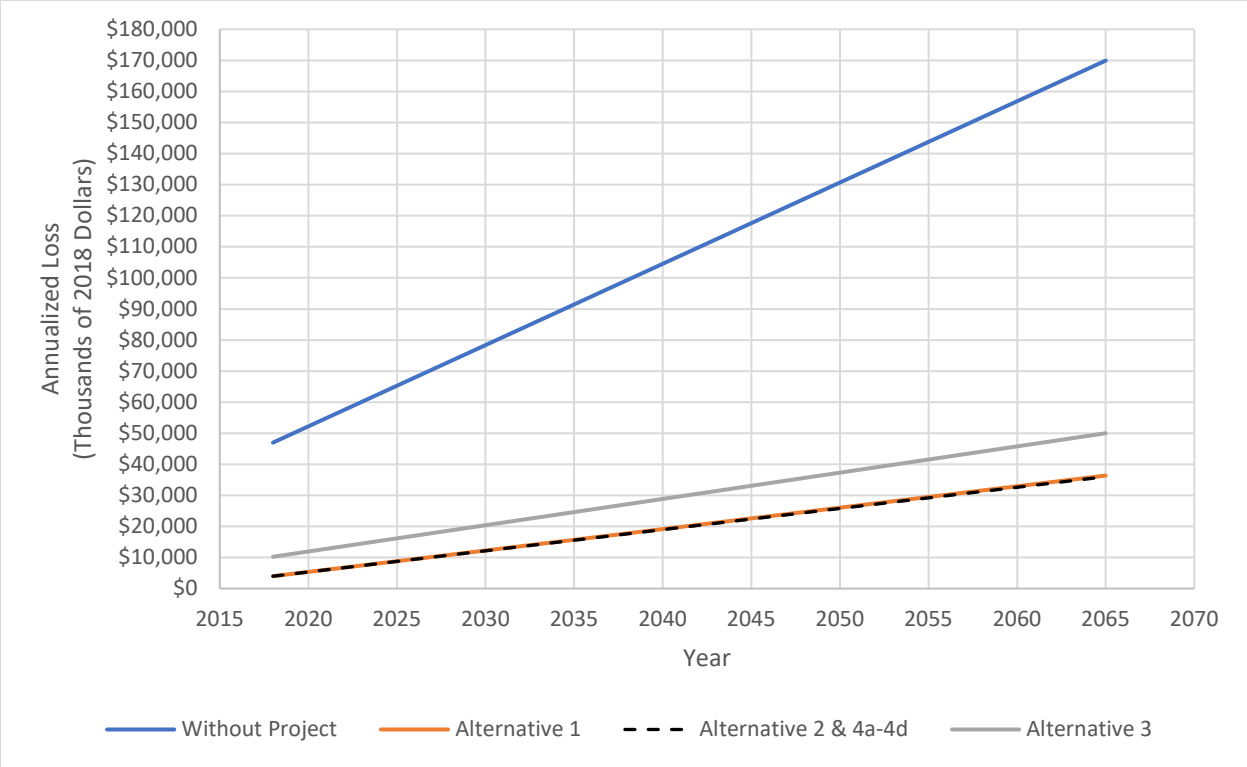


Figure 4-3. Annualized Damages Versus Time (2018 dollars)

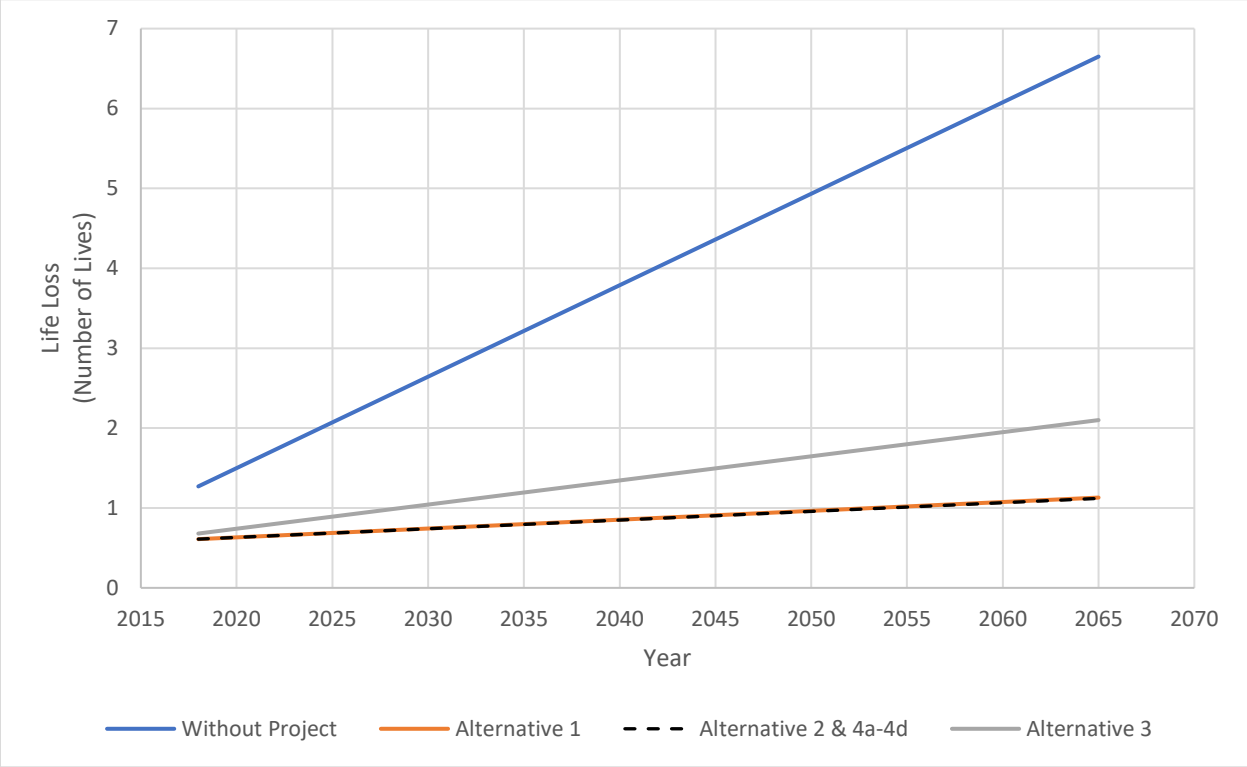


Figure 4-4. Annualized Mortality Versus Time

With the features and mitigations presented, Alternatives 1, 2, and 4 (all variations) perform nearly the same, and Alternative 3 performs worse than the other two. Alternative 2 and 4 (all variations) perform slightly better than Alternative 1, because it includes the Old River Restoration feature, which eliminates 100 acres of Lathrop residential development in the deepest part of the floodplain that is planned for development under Alternative 1. Alternative 2 also includes 5,050 acres of development restriction easements. Alternatives 1, 4b, and 4d include development restrictions on the same 5,050 acres using local assurances on 1,430 acres plus State Delta Plan restrictions on 3,620 acres. Alternatives 4a and 4c include development restrictions on the same 5,050 acres using easements on 1,430 acres plus State Delta Plan restrictions on 3,620 acres.

Alternative 3 performs worse than Alternatives 1, 2, and 4 (all variations) because the area north of the Sta 447+38 Secondary Levee would continue to be protected by an unimproved levee. In addition, the new secondary levee would aggravate flooding in Lathrop in the event of a rare event levee failure at LR3. Therefore, points 2 and 4 in the State policy above would not be addressed as well by Alternative 3.

Section 2.2.3.a.2 described Federal wise use of the floodplain policy under EO 11988.

The USACE provided an analysis of EO 11988 in the LSJRFS, which followed the 8-step procedure outlined in Section 2.2.3.a.2. The USACE analysis concluded:

> *The historic placement of levees in the study area precludes opportunities for restoration or enhancement of natural floodplain values. Setback levees were analyzed for RD 17 but were not economically justified.*
>
> *Based on existing land use planning for further development in RD 17 in the deepest parts of the floodplain (highest life safety consequence), the decision was made to remove the RD 17 alternatives from further consideration (Alternatives 7b, 8b and 9b). The Principles and Guidelines state that Federal investments in water resources should avoid the unwise use of floodplains and flood-prone areas and minimize adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used. While few practicable alternatives to development in the floodplain were identified, it was determined that the proposed development, as shown in the General Plans, is unwise from the perspective of supporting Federal investment for a flood risk management (FRM) project under current land use plans.*

The key factor leading to that conclusion appears to be the *degree* of planned growth in the Mossdale Tract area, as defined by the General Plans of the cities and county. USACE presented a number of other intermediate conclusions from their EO 11988 analysis that bear mention:

1. USACE interpretation of the base floodplain: "*For the purpose of this study, the base floodplain is delineated as all areas that are at risk of being flooded by the 1% Annual Chance Exceedance (ACE) flow; it has been delineated* ***assuming existing levees do not provide protection from the 1% ACE event****. This definition of the base floodplain addresses the USACE requirement in Engineering Regulation (ER) 1105-2-101 to describe a project's performance using risk and uncertainty methods and for purposes of studies ER 1105-2-101, does not require USACE to give deference to the current accreditation for RD 17's levee system provided by the FEMA in 2011. For this reason, the entire study area was evaluated for EO 11988 compliance.*" The USACE uses different methodology in determining whether or not levees would provide protection from the 1% ACE event than FEMA.
2. USACE determined that there were no practicable alternatives, concluding: "*Detailed analyses were performed for the final array that found the* ***structural improvements to be the only practicable and cost-effective possibilities that achieve project objectives.*** *Implementation of*

the proposed structural measures will reduce the flood risk to thousands of commercial, institutional and residential structures and transportation routes."

3. USACE determined that there were beneficial impacts to improving the levees, including protection of existing population and critical infrastructure, and also in eliminating potential growth south of Mossdale Tract area, between the RD 17 dryland levee and the Stanislaus River: "*The existing RD 17 project levees provide FRM for approximately 45,000 people in portions of the cities of Stockton, Lathrop, Manteca and San Joaquin County. The project levees also provide FRM for critical infrastructure including schools, fire and police stations, the county jail, Sharpe Army Depot, a hospital and major transportation routes including Interstate 5 and Highway 120. Inclusion of RD 17 Alternatives will provide improved FRM to this large population and the existing critical infrastructure.*

   Currently, the levee safety program has defined the levee system that incorporates RD 17 as bounded on the north by Walker Slough, west by the San Joaquin River and south by the Stanislaus River. This includes RD 17, RD 2096, RD 2094, RD 2075 and RD 2064 (Figure 3-15). The alternatives that include RD 17 incorporate a tieback extension at the southern end of RD 17, thereby placing a limit on future growth to the south by not providing improvements below Manteca. Without the tie-back extension, levee improvements would have been necessary further upstream on the San Joaquin River and along the Stanislaus River to achieve the same flood risk reduction for the already urbanized portions of RD 17 and would have added about 16,000 acres of land that would be available for future development. These plans are currently under revision and it is likely that the acreage may be reduced. It is unlikely that such a project could be economically justified."

4. USACE determined that there were no expected losses of natural and beneficial floodplain values, and that levee setbacks were not economically justified: "*The natural floodplain was separated from the river channels by the levee system so that the functionality and natural values are severely constrained. Due to the urbanization, there are few opportunities for restoration of the natural floodplain in the study area. As described in Paragraph 5 below, there are 3,250 acres of planned development with infrastructure improvements in place in the Lathrop portion of RD 17. The natural floodplain is not reduced within the study area by the proposed action.*

   Current placement of the levees and activities related to the improvements to those levees reduce the beneficial values of water resources (natural moderation of floods, water quality maintenance and ground water recharge); living resource values (fish, wildlife and plant resources) and cultural resource values (open space, natural beauty, scientific study, outdoor education and recreation). There are some benefits to cultivated resource values (agriculture, aquaculture and forestry) as a result of implementation of proposed improvements.

   A large setback levee was evaluated for a reach of the main stem San Joaquin River adjacent to RD 17, but was not found to be economically justified. This alternative was not evaluated for ecosystem benefits as the study focused on single-purpose FRM plan formulation. Further, degradation of the existing levee may have adverse effects on the flow splits at Paradise Cut and Old River. The alternative was formulated to retain the existing FRM benefits to the area within the setback while retaining the existing flow splits at Old and Middle Rivers."

5. USACE determined that adverse impacts of improving the RD 17 levees centered on potential growth as defined by the General Plans, plus potential for additional growth beyond that: "*The alternatives that include RD 17 would facilitate development of disturbed, but non-urbanized areas of Stockton, Lathrop, Manteca and unincorporated San Joaquin County. The Stockton, Manteca and Lathrop General Plans designated 5,300 acres for urbanization within RD 17. A majority of the acres would be new urbanization versus infill. In addition, 7,200 acres of disturbed but not yet urbanized land would be available for future development should local communities update their General Plans. These plans are currently under revision and it is likely that the acreage may be reduced. The City of Lathrop has recently eliminated 2,055 acres from its Sphere of Influence. Compliance with the Delta Plan will also reduce the potential for development. The RD 17 levee system is currently accredited by FEMA; therefore, the area currently has no Federal restriction associated with development. Implementation of proposed structural improvements will meet certain compliance requirements for SB5. Additional improvements will likely be necessary by non-Federal agencies in order to fully comply with SB5. The penalty for non-compliance is a moratorium on future development until the appropriate level of FRM is attained. Alternatives including RD 17 would facilitate development by providing a higher degree of FRM. Figure 3-17 shows the planned development areas within RD 17 and inundation depths for the base flood (1% (1/100) ACE event). The 1% ACE, sometimes referred to as a "100-year" event, is equivalent to a flood event with a 1% chance of occurring in any given year. Full development of the infill would result in a population increase of approximately 20,000 people."*

The growth projections presented herein reflect significant downward refinement of growth projections than those that were available to USACE at the time the LSJRFS was prepared.

Alternative 1 includes 3,900 acres of residential growth, plus 700 acres of non-residential growth, with 10,300 acres left in agriculture and open space. Alternative 2 and 4 (all variations) are slightly more favorable at 3,800 acres residential and 700 acres non-residential growth, and 10,400 acres left in agriculture and open space. Alternative 3 is slightly more favorable than Alternative 2 at 3,700 acres residential and 500 acres non-residential growth, and 10,700 acres left in agriculture and open space. But all alternatives would be accompanied by about the same growth, and all alternatives would leave approximately 70% of the ag/open space lands undeveloped.

In addition, significant and effective features have been included in the alternatives to mitigate residual risk, such as preference to 2-story residential construction would significantly reduce potential for loss of life by facilitating more reliable and repeatable vertical evacuation and shelter-in-place emergency actions.

4.7 Ecosystem Habitat Created

All alternatives include the San Joaquin River Channel Margin Restoration feature. This feature includes acquisition and restoration of 29.7 acres of land at 11 sites on the water side of the Lower San Joaquin River right levee between Stations 425+00 and 855+00 (Figure 3-6). Restoration would consist of removal of invasive plants such as Arundo, waterside bench grading, and new plantings to create SRA habitat.

All alternatives include the Restoration South of the RD 17 Dryland Levee feature. The City of Manteca currently owns approximately 150.7 acres of land south of the RD 17 dryland levee, just east of Williamson Road (Figure 3-7). This feature would include restoration grading and re-vegetation. For cost

estimating purposes it was assumed that grading would be very minor, and that restoration planting would be in the form of riparian forest. The intent of the concept is to allow public unimproved pedestrian access to the restored land. However, these restoration and access assumptions would be refined in project implementation.

Alternatives 2 and 3 include the Old River Secondary Levee and Restoration feature (Figure 3-12). The concept includes construction of a new secondary levee meeting the ULDC across the historic floodplain at a sharp bend in the San Joaquin River at the Old River distributary. The existing primary levee would remain and would still be improved as part of RD 17's LSRP Phase III as part of the future-without-project condition. All agricultural lands between the primary and secondary levee (approximately 118 ac) would be acquired and converted to riparian, marsh, and inundated floodplain habitat. One short (nominally 100-300') section of the primary levee downstream of the Old River distributary would be degraded to allow backwater flooding of the restored area during higher water events. This configuration would keep the Old River flow split unchanged in order to avoid issues of redirected hydraulic impacts.

As described in Section 3.4.5.b.1, Alternative 4 (all variations) include an aspect of dryland habitat at the RM-52 area. Alternatives 4a and 4b include the Old River Secondary Levee and Restoration feature described above, as well as an additional 42 acres of dryland habitat (Figure 3-18). Alternatives 4c and 4d include acquiring the RM-52 area (166 acres) to be converted to dryland habitat (Figure 3-21).

Alternative 4 (all variations) rated the best, followed by 2 and 3, then 1.

4.8 Multi-Benefit Features and Protection of Open Space

All alternatives create the same additional recreational features (parks and bike paths). Alternatives 1, 2, and 4 (all variations) protect State facilities of I-5 and HWY 120 from the 200-year 2040 climate change event while Alternative 3 would leave the northern portion of I-5 to the same level of protection it currently has. Finally, Alternatives, 1, 4b, and 4d would protect 4,248 acres of agriculture and open space (3,325 acres within the Delta Plan Area; 923 acres within the 1,430 acres of local assurances) from development under this alternative. Alternative 2 would protect 4,248 acres of agriculture and open space within the 5,050 acres of binding easement from develop under this alternative. Alternatives 4a and 4c would protect 4,248 acres of agriculture and open space (3,325 acres within the Delta Plan Area; 923 acres within the 1,430 acres of binding easement) from develop under this alternative. Alternative 3 would leave these areas exposed to flooding in the 200-year event but protect them from being developed through the Delta Plan and non-compliance with SB5. Alternatives 4a and 4c would protect agriculture and open space from flooding and maintain 923 acres from development outside the Delta Plan Area by binding easements.

Under this criterion, Alternatives 2 and 4 (all variations) rated the best, followed by 1 and 3.

4.9 Reduction or Amplification in O&M Effort

All alternatives include additional O&M effort to achieve and maintain an urban levee standard and compliance with PL84-99. The CVFPP identifies required funding of $50,000/mile for this purpose. Existing RD 17 O&M budget equates to approximately $29,000/mile, so all alternatives include the additional $21,000/mile budget to increase O&M effort on the 18.16 miles of existing levee. All four alternatives also include new budget of $50,000/mile for the 2.75 miles RD 17 dryland levee extension.

Alternatives 2, 3, 4a, and 4b include new budget of $50,000/mile for the 0.52-mile Old River Secondary Levee.

Alternative 3 also includes new budget of $50,000/mile for the 3.66-mile Sta 447+38 Secondary Levee. The existing primary levee north of the secondary levee would continue to be operated and maintained to an urban standard.

Under this criterion, Alternatives 1, 4c, and 4d are rated best, followed by 2, 4a, and 4b, then 3.

4.10 Improvement in Management of the Flood Protection System

With the modification of SJAFCA to include the Mossdale Tract Area in its jurisdiction and responsibility, no institutional support changes will be required for any of the alternatives were they to be constructed. Therefore, all alternatives perform equally under this criterion.

4.11 Selection of Preferred Plan

Table 4-15 provides a quantitative comparison of each alternative.

Table 4-15. Quantitative comparison of alternatives

	Alternatives						
	1	**2**	**3**	**4a**	**4b**	**4c**	**4d**
Improve Flood Risk Management – Economic							
2018 Annual Flood Damage Benefit (Thousands of 2018 Dollars)	$ 46,994	$ 46,996	$ 40,736	$ 46,996	$ 46,996	$ 46,996	$ 46,996
2065 Annual Flood Damage Benefit (Thousands of 2018 Dollars)	$ 137,560	$ 137,927	$ 123,935	$ 137,927	$ 137,927	$ 137,927	$ 137,927
Improve Flood Risk Management – Life Safety							
2018 Annualized Life Loss Benefit	0.66	0.66	0.59	0.66	0.66	0.66	0.66
2065 Annualized Life Loss Benefit	5.52	5.53	4.55	5.53	5.53	5.53	5.53
Population Left in Deep 200-Year Floodplain	0	0	16,900	0	0	0	0
Number of East/West Roads Protected	6	6	3	6	6	6	6
Number of Students Protected	9,000	9,000	4,700	9,000	9,000	9,000	9,000
Number of Prisoners Protected	1,500	1,500	0	1,500	1,500	1,500	1,500
Number of Hospital Beds Protected	200	200	0	200	200	200	200
Ecosystem							
Riparian Habitat (Acres)	150.7	222	222	222	222	150.7	150.7
Marsh/Wetlands Habitat (Acres)	0	45	45	45	45	0	0

Table 4-15. Quantitative comparison of alternatives (cont.)

Shaded Riverine Habitat (Acres)	29.7	29.7	29.7	29.7	29.7	29.7	29.7
Dry Habitat (Acres)	0	0	0	42	42	166.9	166.9
Multi-Benefit							
Parks (acres)	165	165	165	165	165	165	165
Bike Paths (miles)	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Open Space/Agriculture Protected (Acres)	4,248	4,248	5,458	4,248	4,248	4,248	4,248
State Highways Protected (miles)	12	12	9	12	12	12	12
Costs							
Total Capital Cost (Thousands of 2018 Dollars)	$ 219,045	$ 376,887	$ 203,229	$ 288,920	$ 241,657	$ 282,057	$ 234,794
Annualized Capital Cost (Thousands of 2018 Dollars)	$ 8,114	$ 13,960	$ 7,528	$ 10,702	$ 8,951	$ 10,448	$ 8,697
Annual OMRRR Cost (Thousands of 2018 Dollars)	$ 519	$ 545	$727	$ 545	$ 545	$ 519	$ 519
2018 Annualized Mitigation Cost (Thousands of 2018 Dollars)	$ 57	$ 57	$ 57	$ 57	$ 57	$ 57	$ 57
2065 Annualized Mitigation Cost (Thousands of 2018 Dollars)	$ 481	$ 481	$ 481	$ 481	$ 481	$ 481	$ 481
2018 Annualized Project Cost (Thousands of 2018 Dollars)	$ 8,690	$ 14,562	$ 8,312	$ 11,304	$ 9,553	$ 11,024	$ 9,273
2065 Annualized Project Cost (Thousands of 2018 Dollars)	$ 9,114	$ 14,986	$ 8,736	$ 11,728	$ 9,977	$ 11,448	$ 9,697
2018 BCR	5.41	3.23	4.90	4.16	4.92	4.26	5.07
2065 BCR	15.09	9.20	14.19	11.76	13.82	12.05	14.22

Table 4-15 applies the qualitative and quantitative evaluations from the preceding sections to the metrics from Table 3-1. Points were awarded based primarily on the relative performance of each alternative in each category, against the points possible for each category. Where quantitative scaling could not be directly applied, judgment was used based on reasoning provided in the previous sections. Table 4-16 provides the alternative scoring criteria outlined for each criterion.

Table 4-16. Alternative Scoring Criteria Outline

CVFPP Goals	UFRR Study Objectives	Evaluation Metrics (based on qualitative rating unless noted)	Total Points Possible	Low Score (<25%)	Moderate Score (25-75%)	High Score (>75%)
Improve Flood Risk Management	Economically achieve 200-year ULOP	Quantified annualized net benefits or benefit/cost ratio	20	Normalized to highest scoring 2018 BCR		
		Quantified reduction in annualized fatalities	20	Normalized to highest scoring 2018 annualized life loss values		
	Reduce residual risk to property, life safety, and critical infrastructure	Improved evacuation	5	Large population left in the floodplain and/or numerous endangered east/west evacuation routes	Moderate population left in the floodplain and/or no endangered east/west evacuation routes	No population left in the floodplain and/or no endangered east/west evacuation routes
		Improved protection of limited mobility populations	10	Normalized to number of limited mobility persons (e.g. prisoners, students, and hospital patients) protected		
	Resilience to future climate change	Ability of the alternative to be modified in the future to adapt to climate change	10	Substantial effort to bring levee to 2065 200-year standards. (e.g. little to no Right of Way (ROW) is purchased for 2065)	Moderate effort to bring levee to 2065 200-year standards. (e.g. Some ROW is purchased for 2065)	Minimal effort to bring levee to 2065 200-year standards. (e.g. all ROW is purchased for 2065)
	Address State and Federal policies for wise use of the floodplain	Conformance with State CVFPP and Delta Plan growth policies, and Federal EO11988	15	Does not address most or all Federal and State policies for wise use of floodplain	Addresses some Federal and State policies for wise use of floodplain	Addresses most or all Federal and State policies for wise use of floodplain
Promote Ecosystem Functions	Incorporate environmental habitat components where possible	Ecosystem habitat created	5	Normalized to largest amount of ecosystem created		
Promote Multi-Benefit Projects		Multi-benefit features created	5	Qualitative scoring based on the amount of multi-benefit features created		
Improved O&M		Reduction or amplification in O&M effort	5	Normalized to minimum O&M costs		
Improve Institutional Support		Improvement in management of the flood protection system	5	Significant change to existing institutional support required	Moderate change to existing institutional support required	No change to existing institutional support required

Table 4-17. Alternative Evaluation Matrix

CVFPP/UFRR Study Goals	UFRR Study Objectives	Evaluation Metrics	Total Points Possible	Alternative						
				1	2	3	4a	4b	4c	4d
Improve Flood Risk Management	Economically achieve 200-year ULOP	Quantified annualized net benefits or benefit/cost ratio	20	20	12	18	15	19	16	19
		Quantified reduction in annualized fatalities	20	20	20	18	20	20	20	20
	Reduce residual risk to property, life safety, and critical infrastructure	Improved evacuation	5	5	5	3	5	5	5	5
		Improved protection of limited mobility populations	10	10	10	3	10	10	10	10
	Resilience to future climate change	Ability of the alternative to be modified in the future to adapt to climate change	10	10	10	10	10	10	10	10
	Address State and Federal policies for wise use of the floodplain	Conformance with State CVFPP and Delta Plan growth policies, and Federal EO11988	15	12	15	9	14	12	14	12
Promote Ecosystem Functions	Incorporate environmental habitat components where possible	Ecosystem habitat created	5	3	4	4	5	5	5	5
Promote Multi-Benefit Projects		Multi-benefit features created	5	4	5	4	5	5	5	5
Improved O&M		Reduction or amplification in O&M effort	5	5	4	2	4	4	5	5
Improve Institutional Support		Improvement in management of the flood protection system	5	5	5	5	5	5	5	5
		Total Points	**100**	**94**	**90**	**76**	**93**	**95**	**95**	**96**

Based on the evaluation presented in Table 4-17, Alternative 4d scores the highest, followed relatively closely by the other variations of Alternative 4 (Alternatives 4a through 4c) and Alternative 1. Alternative 2 fell 6 points behind the leading alternative because of the cost associated with the binding easements. Alternative 3 is a distant third and can therefore be eliminated from further consideration.

The forgoing analysis was circulated to the study partners and key stakeholders for review, followed by a workshop on August 18, 2020 which was held to discuss the alternatives.

In consideration of stakeholder input from the workshop, SJAFCA worked with local agencies to identify five alternative restoration areas to be considered in lieu of the Old River setback levee which was identified as an ecosystem restoration feature in several of the alternatives. As conveyed in DWR's

February 9, 2021 letter to SJAFCA, preliminary discussions with the Division of Multi-Benefit Initiatives indicated that several of SJAFCA's proposed ecosystem enhancement alternatives are viable options that could be considered in lieu of the RM-52 setback when assembling a proposal for future multi-benefit opportunities. For a description of the alternative restoration areas, see Section 5.1.1.

While Alternative 4a did not score the highest, it scored near the top and was the most agreed upon alternative between the local agencies and the State. **Agreement between the State and the local agencies as well as the inclusion of alternative restoration areas pushed Alternative 4a over the edge to be selected as the Preferred Plan.**[1] **Both the Old River restoration area and the alternative restoration areas are being included in the Preferred Plan to allow these options to be further studied and later analyzed in an environmental impact report under California Environmental Quality Act (CEQA).**

4.12 Transfer of Risk Analysis

The conveyance and storage of water during inundation of an area may provide some incidental flood protection to adjacent areas, both upstream and downstream. Water that would be temporarily conveyed through and stored on the Mossdale Tract during flooding would be displaced by a flood risk reduction project. On a gross scale, a project to provide 200-year flood protection to the Mossdale Tract would eliminate storage of approximately 186,500 acre-feet of water on the tract. Providing improved flood protection for the Mossdale Tract may therefore transfer hydraulic impacts to other areas.

A Transfer of Risk Analysis was completed as part of the UFRR study to evaluate these potential hydraulic impacts. Further details on the analysis are provided in Appendix F.

The floodplain was analyzed to quantify the hydraulic impacts of the flood risk reduction project, most notably the dryland levee extension component of the project, which is featured in all the UFRR alternatives. The study team modeled pre- and post-project conditions with the HEC-FDA software to calculate EAD and expected annual life loss (EALL) for nine (9) index locations outside of the Mossdale Tract protection region (Figure 4-5).

The difference between the with- and without-project EAD and EALL then represents the transfer of risk induced by the proposed flood risk reduction project. Transfer of risk was analyzed for the three (3) different hydrologic scenarios: the 2018 analysis year represents current hydrologic conditions, the 2040 analysis year represents climate change hydrology projected to an intermediate planning horizon, and the 2065 analysis year represents climate change hydrology projected to a long-term planning horizon.

Tables 4-18 through 4-20 show the results for the impact areas shown on Figure 4-5. Figure 4-6 shows the change in floodplain depths as a result of the project for the 2040 climate change 200-year levees holding scenario.

[1] The following statement was provided by RD 17: "RD 17 which operates and maintains the levee where the RM-52 setback is located, is opposed to Alternative 4a due to the inclusion of the setback levee. The RM-52 setback is at the critical flow split between the San Joaquin and Old Rivers. Such setback will increase the flood risk to downstream areas including portions of RD 17 which contain critical facilities of the County, City of Stockton and Veteran Affairs as well as other highly developed portions of the City of Stockton including the Regional Wastewater Treatment facility and the Port of Stockton. The habitat benefits arguably provided by such setback can be provided at upstream locations without increasing the flood risk to downstream areas."

Table 4-18. Expected Annual Damages and Life Loss for 2018 – WOP vs. WP over 50-year life of project

Impact Regions	Without Project		With Project		Difference	
	Damages (in Thousands of 2018 Dollars)	Life loss	Damages (in Thousands of 2018 Dollars)	Life loss	Damages (in Thousands of 2018 Dollars)	Life loss
SJ29	$663	0.00	$663	0.00	$0	0.00
SJ30	$641	0.06	$645	0.06	$4	0.00
SJ31	$1,404	0.01	$1,405	0.01	$0*	0.00
SJ36	$4,868	0.15	$4,875	0.15	$6	0.00
SJ38	$793	0.03	$793	0.03	$0	0.00
SJ40	$168	0.01	$169	0.01	$0	0.00
SJ41	$166	0.02	$167	0.02	$1	0.00
SJ42	$554	0.06	$571	0.07	$17	0.01
South of Dryland	$1,936	0.19	$1,963	0.21	$27	0.02
Total	**$11,193**	**0.53**	**$11,251**	**0.56**	**$57**	**0.03**

Table 4-19. Expected Annual Damages and Life Loss for 2040 – WOP vs. WP over 50-year life of project

Impact Regions	Without Project		With Project		Difference	
	Damages (in Thousands of 2018 Dollars)	Life loss	Damages (in Thousands of 2018 Dollars)	Life loss	Damages (in Thousands of 2018 Dollars)	Life loss
SJ29	$1,176	0.00	$1,175	0.00	$0	0.00
SJ30	$1,186	0.14	$1,183	0.14	$0*	0.00
SJ31	$12,751	0.06	$12,738	0.06	$0*	0.00
SJ36	$8,483	0.29	$8,491	0.29	$8	0.00
SJ38	$1,658	0.07	$1,658	0.07	$0	0.00
SJ40	$279	0.01	$278	0.01	$0*	0.00
SJ41	$293	0.04	$303	0.05	$10	0.01
SJ42	$1,446	0.20	$1,572	0.23	$126	0.03
South of Dryland	$4,371	0.68	$4,542	0.77	$171	0.09
Total	**$31,642**	**1.49**	**$31,940**	**1.62**	**$315**	**0.13**

Table 4-20. Expected Annual Damages and Life Loss for 2065 – WOP vs. WP over 50-year life of project

Impact Regions	Without Project		With Project		Difference	
	Damages (in Thousands of 2018 Dollars)	Life loss	Damages (in Thousands of 2018 Dollars)	Life loss	Damages (in Thousands of 2018 Dollars)	Life loss
SJ29	$1,625	0.02	$1,622	0.02	$0*	0.00
SJ30	$1,615	0.18	$1,627	0.19	$12	0.01
SJ31	$18,088	0.18	$18,153	0.18	$65	0.00
SJ36	$12,025	0.45	$12,044	0.47	$19	0.02
SJ38	$1,646	0.07	$1,646	0.07	$0	0.00
SJ40	$388	0.02	$388	0.02	$0	0.00
SJ41	$413	0.06	$422	0.06	$9	0.00
SJ42	$2,033	0.28	$2,108	0.30	$75	0.02
South of Dryland	$7,975	0.92	$8,275	1.02	$300	0.10
Total	**$45,807**	**2.18**	**$46,286**	**2.33**	**$481**	**0.15**

* The difference in with- and without-project damages was negligible.

Considering the large population of the Mossdale Tract area compared to the surrounding rural areas, the marginal transfer of hydraulic impacts is considered unavoidable, and mitigation should be explored consistent with CEQA and principles enforced by the CVFPB. Other regional projects such as an expansion of Paradise Cut could mitigate some of the impacts. In other areas, obtaining flowage easements may be considered. Or, financial assistance with non-structural mitigation measures such as structure elevations, relocations, evacuation planning, and levee relief cuts could be considered.

Hypothetical Mitigation for Induced Damages

Under existing (2018) hydrologic conditions, the project increases the EAD in the region by $57,000 per year, which equates to a 0.5% increase in annual damages. Assuming a benefit-cost ratio of 1.0, a 50-year economic period, and the 2018 federal discount rate of 2.750%, this impact translates to a hypothetical mitigation cost of $1.5M which could be used for a variety of mitigation measures.

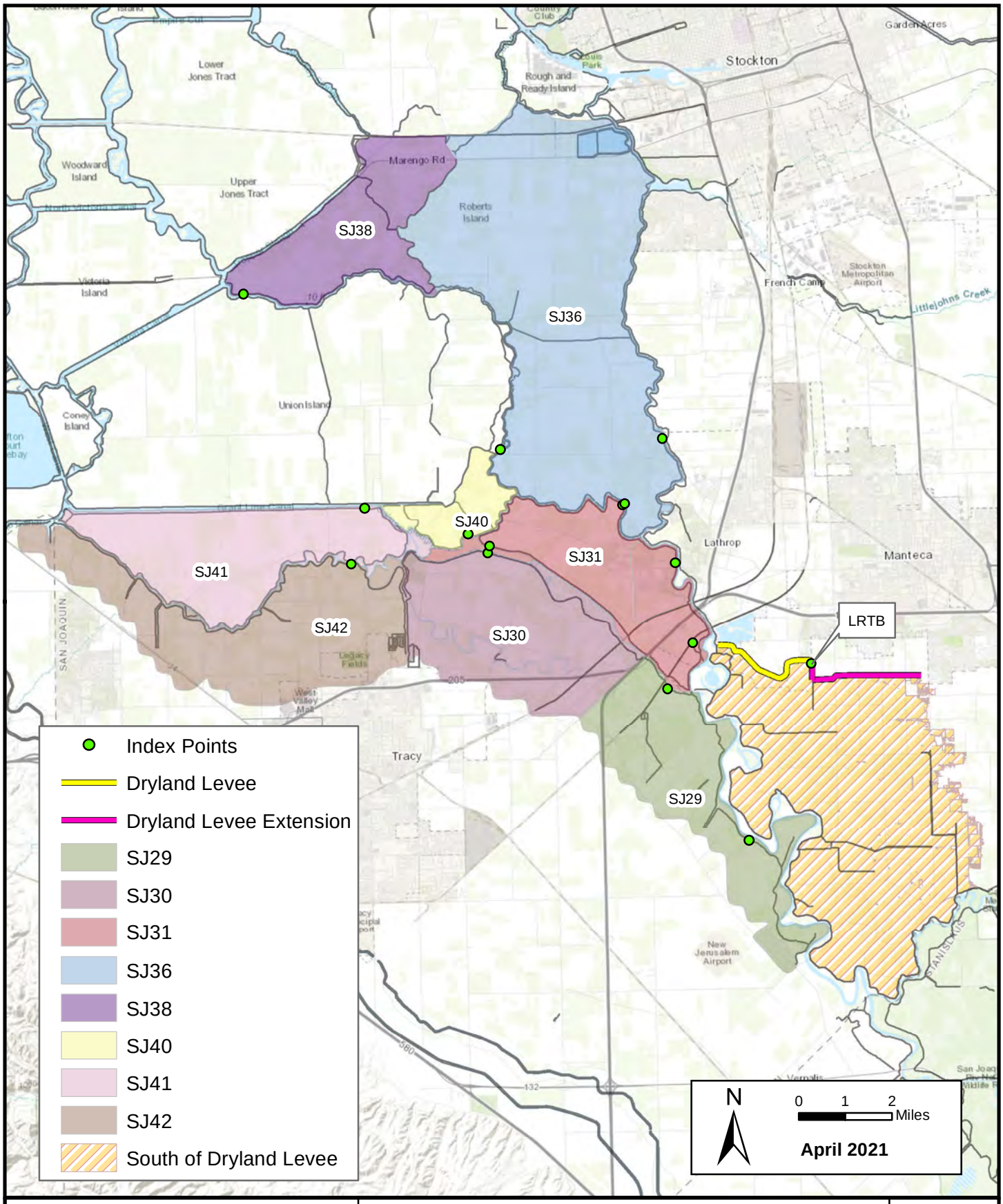
Under future 2040 hydrologic conditions, the project increases the EAD in the region by $315,000 per year. Under future 2065 hydrologic conditions, the project increases the EAD in the region by $481,000 per year. Using the assumptions above, these impacts translate to hypothetical mitigation costs of $8.5M and $13M in 2040 and 2065, respectively.

Hypothetical Mitigation for Induced Life Loss

Under existing (2018) hydrologic conditions, the project increases the EALL in the region by 0.03 lives per year. Under future 2040 hydrologic conditions, the project increases the EALL in the region by 0.13 lives per year. Under future 2065 hydrologic conditions, the project increases the EALL in the region by 0.15 lives per year. Although minimal, this increase can be reduced with targeted mitigation activities. For example, structure elevations can be focused in areas where life risk is the highest. In addition, increased public education and improvements to notification systems can be implemented to improve awareness and warning times.

Transfer of Risk Conclusion

The CEQA/National Environmental Policy Act (NEPA) process will allow for a natural transition and opportunity to advance the UFRR study's hydraulic impact analyses and further define proper mitigation measures through a process that involves other responsible agencies and the public. Impacts to the surrounding environment and population are at the core of what the CEQA/NEPA process is intended for. The UFRR study report includes a solid hydraulic impact analysis that can form the basis for future conversations on appropriate mitigation measures. **Advancing the hydraulic impact and mitigation discussion through the CEQA/NEPA process will allow the community and regional stakeholders to provide input and will prove to be a much more transparent and constructive exercise.**



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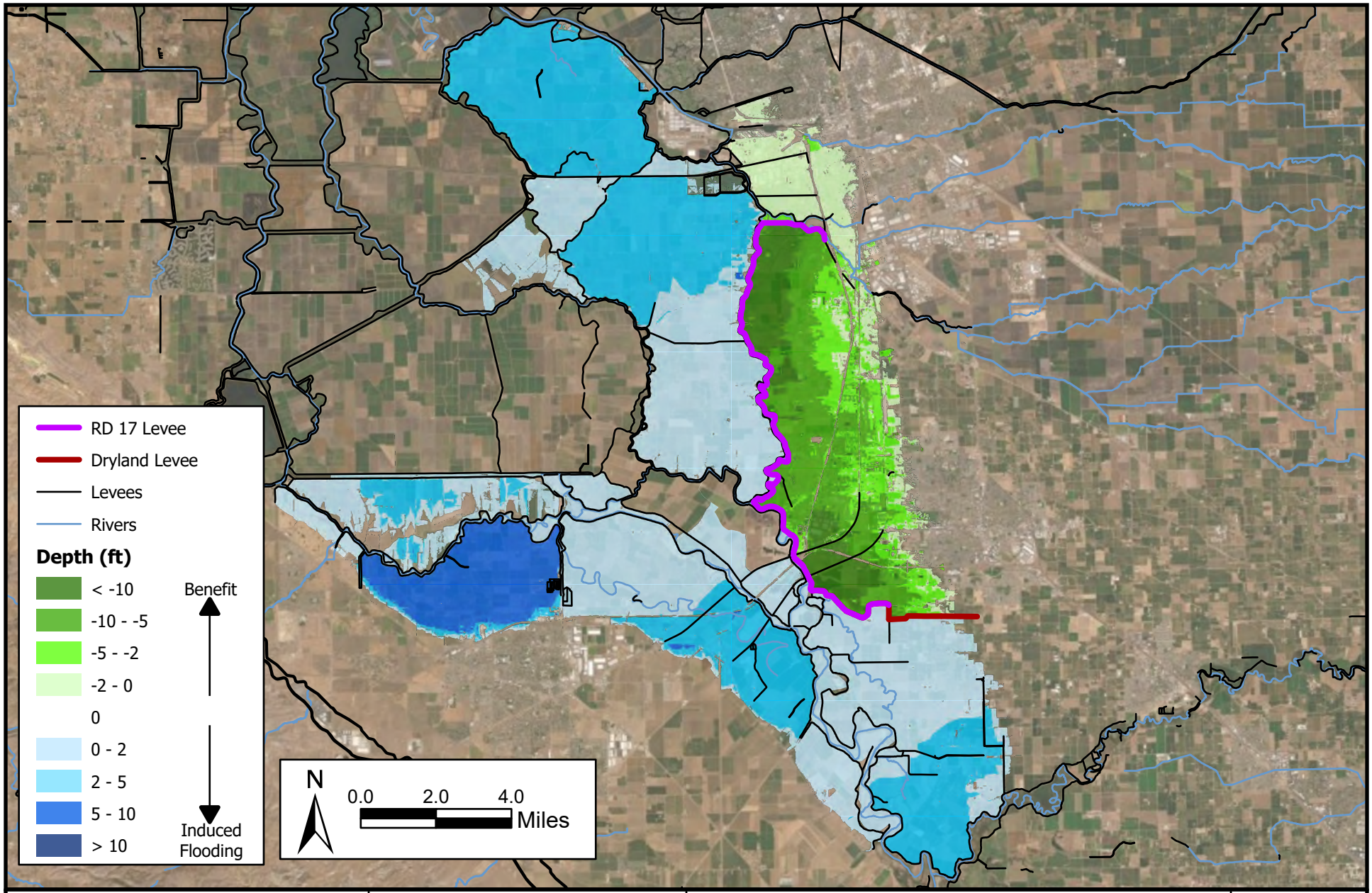
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Transfer of Risk Study Area

FIGURE

4-5



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January 2021

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Year 2040 Climate Conditions
200-Year Floodplain
Project Impacts Levees Holding Scenario

FIGURE

4-6

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.

5 Preferred Plan

Section 4.11 identified Alternative 4a, with the inclusion of alternative restoration areas, as the Preferred Plan for achieving an ULOP for the Mossdale Tract Area. This chapter is intended to propose an implementation plan for this Preferred Plan, plus to identify a longer plan for ULOP resiliency and sustainability in the Mossdale Tract Basin.

5.1 Plan Features

The Preferred Plan features levee improvements, multi-benefit features (particularly ecosystem improvements), limitations on development for wise use of the floodplain, and residual risk management actions. Figure 5-1 shows key features associated with the Preferred Plan. In addition to the key features on the figure, residual risk management actions of the Preferred Plan include:

- Future residential construction to be mostly 2-story
- Relief cut plan for French Camp Slough left levee
- Requirement for all future critical facilities to be outside or elevated above the 500-year floodplain
- Development of a mitigation plan for existing critical facilities in the Mossdale Tract area
- Enhancement of a flood warning and evacuation plan; greater forecast/warning time, designation of dry evacuation routes, shelter in place plans for multi-story residences
- Declared interest in watershed and regional projects which improve flood risk reduction

Further detail on the features of the Preferred Plan can be found in Section 3.4.5 Further detail on residual risk management measures can be found in Section 3.4.9.

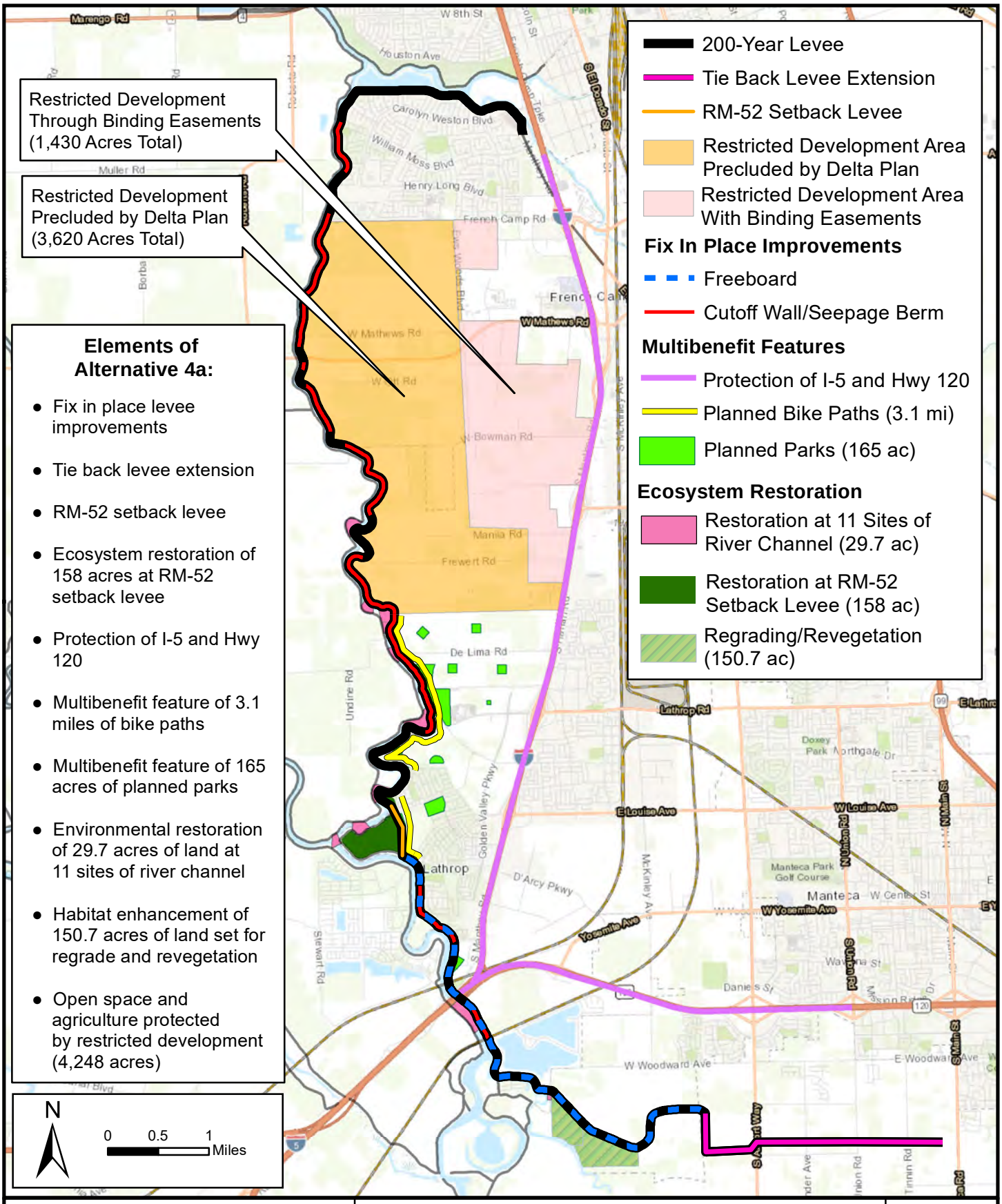
The annualized cost of the Preferred Plan is provided in Table 5-1. Capital costs were annualized using a discount rate of 2.75% and a term of 50 years, per USACE Economic Guidance Memorandum 18-01 for FY18.

Costs for annual operation, maintenance, and repair of the levee features were estimated based on CVFPP annual unit costs of $50,000/mile for Lower San Joaquin urban levees. RD 17 currently spends approximately $29,300/mile, leaving an unmet need of $20,700/mile in order to maintain *existing* levees to an urban standard. *New* levees would require the full $50,000/mile. The obligation of non-Federal sponsors also includes replacement and rehabilitation (rounding out the final 2 R's in the abbreviation OMRR&R). However, rehabilitation and replacement are typically handled as un-scheduled and un-budgeted future capital projects which are cost-shared and financed. It is assumed that all multi-benefit and ecosystem restoration features would be operated and maintained by others using third party funds.

Table 5-1. Summary of Preferred Plan Capital Costs (2018 dollars)

Description	Cost
ULDC improvements for 2018 climate conditions	
North of Station 447+38 (Alt 3 secondary levee connection point)	$63,122,000
South of Station 447+38	$73,763,000
Subtotal	$136,885,000
Additional improvements to meet ULDC for 2040 climate conditions	
North of Station 447+38	$1,481,000
South of Station 447+38	$55,106,000
Subtotal	$56,587,000
Ecosystem Restoration and Multi-benefit Features	
SJR channel margin restoration	$20,600,000
Restoration of lands south of the RD 17 dryland levee	$4,973,000
Old River secondary levee and restoration*	$22,612,000
Subtotal	$48,185,000
Wise use of floodplain features	$47,263,000
Total Capital Cost	$288,920,000
Annualized capital cost (50yr, 2.75% discount rate)	$10,702,000
2018 Annualized mitigation cost	$57,000
2065 Annualized mitigation cost	$481,000
Marginal annualized increase in OMR cost	$545,000
2018 Annualized project cost	$11,304,000
2065 Annualized project cost	$11,728,000

* Capital costs include the RM-52 setback feature but do not include the alternative restoration areas.



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Key Features of the Preferred Plan

FIGURE

5-1

5.1.1 Alternative Restoration Opportunities

Five restoration areas were identified by local agencies as alternatives to the Old River setback (RM-52) feature in Alternative 4a, the preferred alternative. All the properties are located south of the Union Pacific Railroad and north of the confluence with the Stanislaus River. The concept would be to convert the properties from agricultural land to a combination of dryland and aquatic habitat in lieu of the Old River setback feature.

The restoration areas support the Division of Multi-Benefit Initiatives' goals to promote ecosystem processes, habitat, and species by adding natural floodplain, establishing aquatic habitat, and restoring habitat for target species such as the endangered riparian brush rabbit. A summary of the alternative restoration areas is included in Table 5-2. The locations of the alternative restoration areas are shown in Figure 5-2. Preliminary conversations with property owners have helped to identify these locations as viable options.

Table 5-2 – Summary of the Alternative Restoration Areas

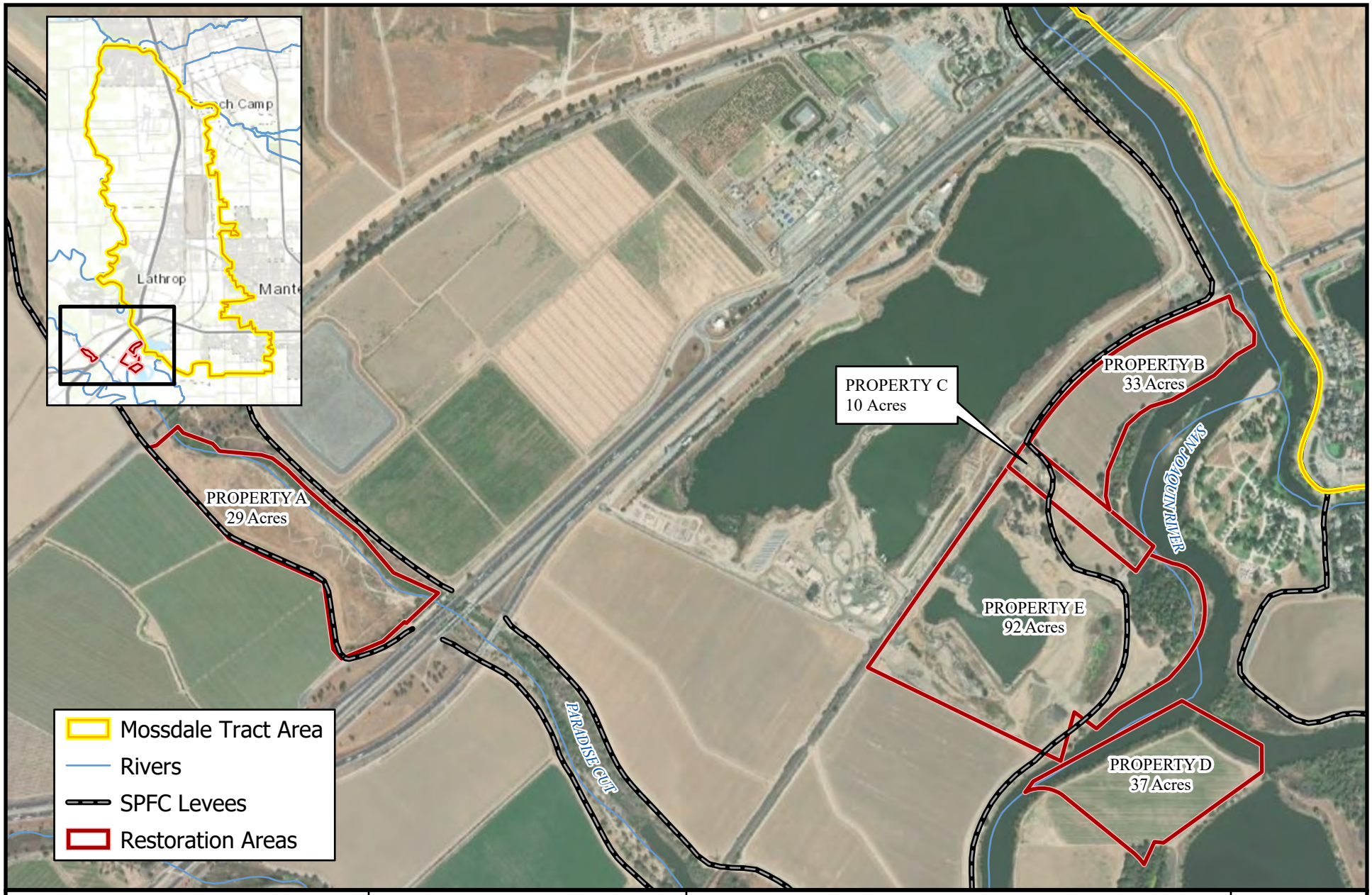
Property	***Location***	***Area (Acres)***	***Proposed Feature***	***Inundation Interval***
A	Paradise Cut waterside	29	29 acres of riparian forest	> 2-year
B	San Joaquin River waterside	33	33 acres of riparian forest	> 2-year
C	San Joaquin River waterside	10	10 acres of riparian forest	> 2-year
D	San Joaquin River waterside	37	37 acres of riparian forest	> 2-year
E	San Joaquin River left bank	92	21 acres of aquatic habitat 71 acres of dryland habitat	> 2-year

Property A

Property A was previously included as a restoration opportunity in the BWFS' State Recommended Plan and is included as an alternative restoration area in this study. Property A is located on the waterside of the SJR levees.

This restoration area has a ground elevation of approximately 10.5 ft-NAVD88. In the 10-year event, the property would be under approximately 7' of water. Based on extrapolation estimates from CVHS flow-frequency curves, this property would have the potential of being inundated in a flow event on Paradise Cut that is greater than or equal to a 2-year event.

This restoration area would provide approximately 29-acres of fish spawning habitat as well as connectivity and accessibility to the river system. It also has the potential to function as transitory storage, thus reducing the downstream flood stage. Due to the location of this property on the waterside of the levee, a new setback levee and/or cutting of the existing levee would not be necessary to create aquatic habitat. This would reduce the capital cost, OMRR&R cost, and potential risk associated with constructing a new setback levee.



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Alternative Restoration Opportunities

FIGURE

5-2

Property B

Property B is located on the waterside of the SJR levees. This restoration area has a ground elevation of approximately 16.5 ft-NAVD88 and would have the potential of being inundated in a flow event on the SJR that is greater than or equal to a 2-year event. Similar to the Property A, this restoration area would provide approximately 33-acres of fish spawning habitat as well as connectivity and accessibility to the river system without the capital cost, OMRR&R cost, and potential risk associated with constructing a new setback levee.

Property C

Property C is located on the waterside of the SJR levees. This restoration area has a ground elevation of approximately 15.5 ft-NAVD88 and would have the potential of being inundated in a flow event on the SJR that is greater than or equal to a 2-year event. Similar to the other properties, this restoration area would provide approximately 10-acres of fish spawning habitat as well as connectivity and accessibility to the river system without the capital cost, OMRR&R cost, and potential risk associated with constructing a new setback levee.

Property D

Property D is located on the waterside of the SJR levees. This restoration area has a ground elevation of approximately 16 ft-NAVD88 and would have the potential of being inundated in a flow event on the SJR that is greater than or equal to a 2-year event. Similar to the other properties, this restoration area would provide approximately 37-acres of fish spawning habitat as well as connectivity and accessibility to the river system without the capital cost, OMRR&R cost, and potential risk associated with constructing a new setback levee.

Property E

Property E is partially located on the waterside and the left bank of the SJR. Property E could provide up to 92-acres a combination of dryland and aquatic habitat. The portion of the property on the waterside of the SJR levees has a ground elevation of approximately 15.5 ft-NAVD88 and would have the potential of being inundated in a flow event on the SJR that is greater than or equal to a 2-year event. This portion of the restoration area would provide approximately 21-acres of fish spawning habitat as well as connection and accessibility to the river system without the capital cost, OMRR&R cost, and potential risk associated with constructing a new setback levee.

The 71-acre portion on the landside would be valuable for the survival of the endangered riparian brush rabbit. The dryland habitat would provide high ground refugia to keep the endangered species safe during large flow events. The dryland habitat would also benefit Swainson's hawk, Valley elderberry longhorn beetle, Burrowing owl, Giant garter snake, and other key South Delta species.

Similar to the Old River feature, all of these restoration areas are conditioned upon landowner willingness to sell, willingness of a conservation agency or non-governmental organization to take over ownership and O&M of the restored lands, and availability of capital funds.

As discussed previously, these properties will be later analyzed in an environmental impact report which is the standard practice under the CEQA process. If the environmental impact report concludes that one or more of these properties would meet the region's restoration habitat needs, then SJAFCA would proceed with negotiations of an acceptable sale on a willing-seller basis.

5.2 Plan Performance

For 2018 climate and development conditions, the Preferred Plan would produce annual flood damage reduction economic benefits of $46,996,000 per year, net benefits of $35,692,000 per year, and a BCR of 4.16.

For 2065 climate and development conditions, economic performance improves substantially, with annual benefits of $137,927,000 per year, net benefits of $126,623,000 per year, and a BCR of 11.76.

Life safety performance exhibits a similar pattern. For 2018 climate and development conditions, the Preferred Plan would reduce annualized fatalities by 0.66 per year. For 2065 climate and development conditions, the Preferred Plan would reduce annualized fatalities by 5.53 per year.

The Preferred Plan also greatly improves flood protection for critical facilities; it will provide 200-year level of protection for 2040 climate change conditions for all structures and persons within the Mossdale Tract area, including critical jail and hospital facilities housing 1,700 persons with limited mobility.

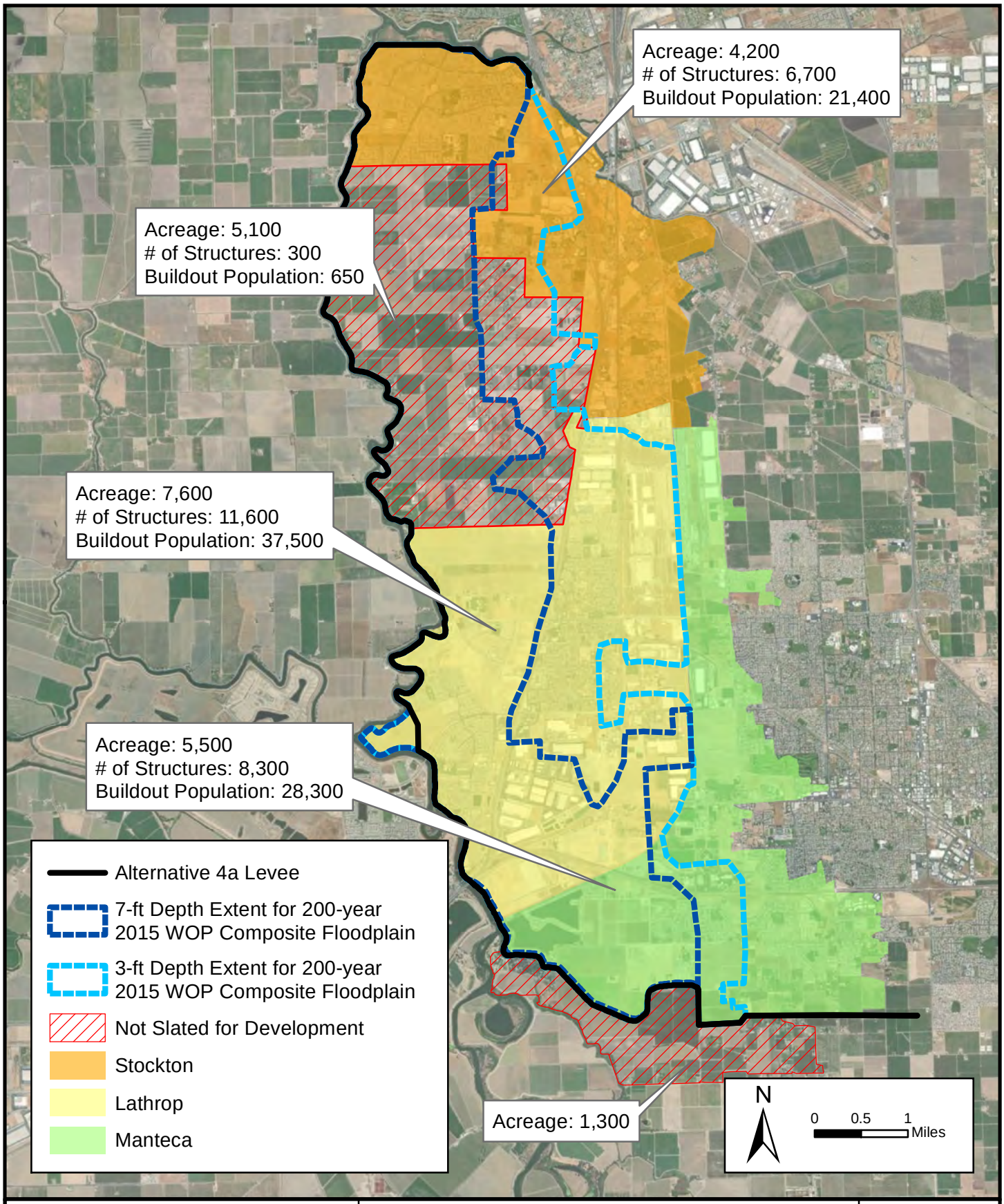
Wise Use of Floodplains

Wise use of the floodplain is achieved through removal of development potential on 5,050-acres of land by the State's Delta Plan and binding easements (Figure 5-3). These development restrictions limit growth in the study area to a buildout population of 87,800, compared to the 2018 population of 45,000. This population results in a significant reduction in risk to life and property from the previous USACE estimates which did not incorporate these development restrictions, while allowing for growth that will help fund a flood risk reduction project.

The CVFPP reaffirms that the State does not promote flood management improvements that induce population growth in *rural* areas and that *urban* flood risk reduction investments will be structured to assure that the aggregate economic and life safety risk are held constant or reduced over time. Figures 5-4 and 5-5 show the estimates for property (annual $ damages) and life risk for both without project (existing levees and 45,000 people) and the UFRR alternatives (improved levees and buildout population) with increasing climate change hydrology. The figures show that the property and life risk with the Preferred Plan is lower than the risk without the project.

Transfer of Risk

The Preferred Plan would result in a relatively minor transfer of hydraulic risk with the enlargement and extension of the southern dryland levee that would redirect major floods around the Mossdale Tract area instead of passing through it. Estimates of increased annual economic and life safety risk to affected areas outside of the Mossdale Tract area total $57,000 per year in economic damages, and 0.03 lives lost per year. The economic damages would justify a capital expenditure of $1.5M to mitigate this increased risk, assuming a BCR of 1.0, a 50-year economic period, and the 2018 federal discount rate of 2.750%.



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MOSSDALE TRACT AREA

Alternative 4a
Future-With-Project Structures and Population (both 2040 and 2065 Planning Horizons)

FIGURE

5-3

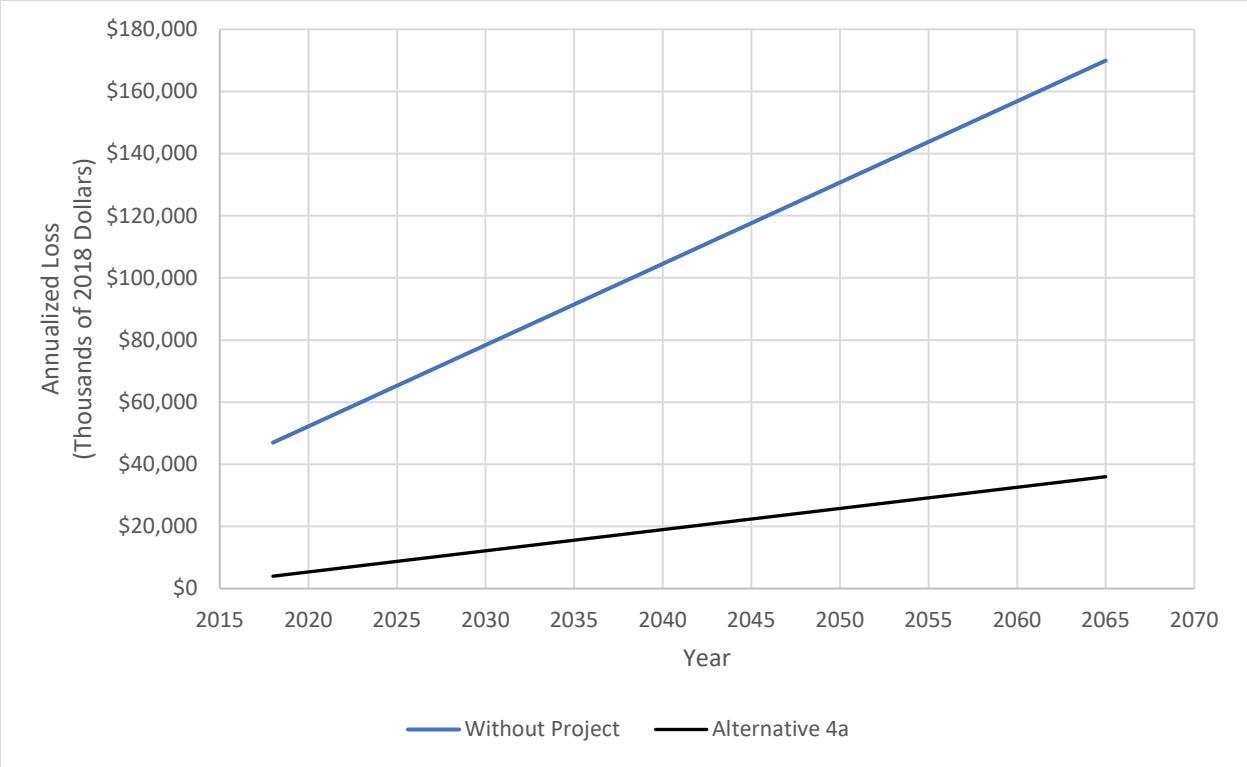


Figure 5-4 Annualized Damage of the Preferred Plan (2018 dollars)

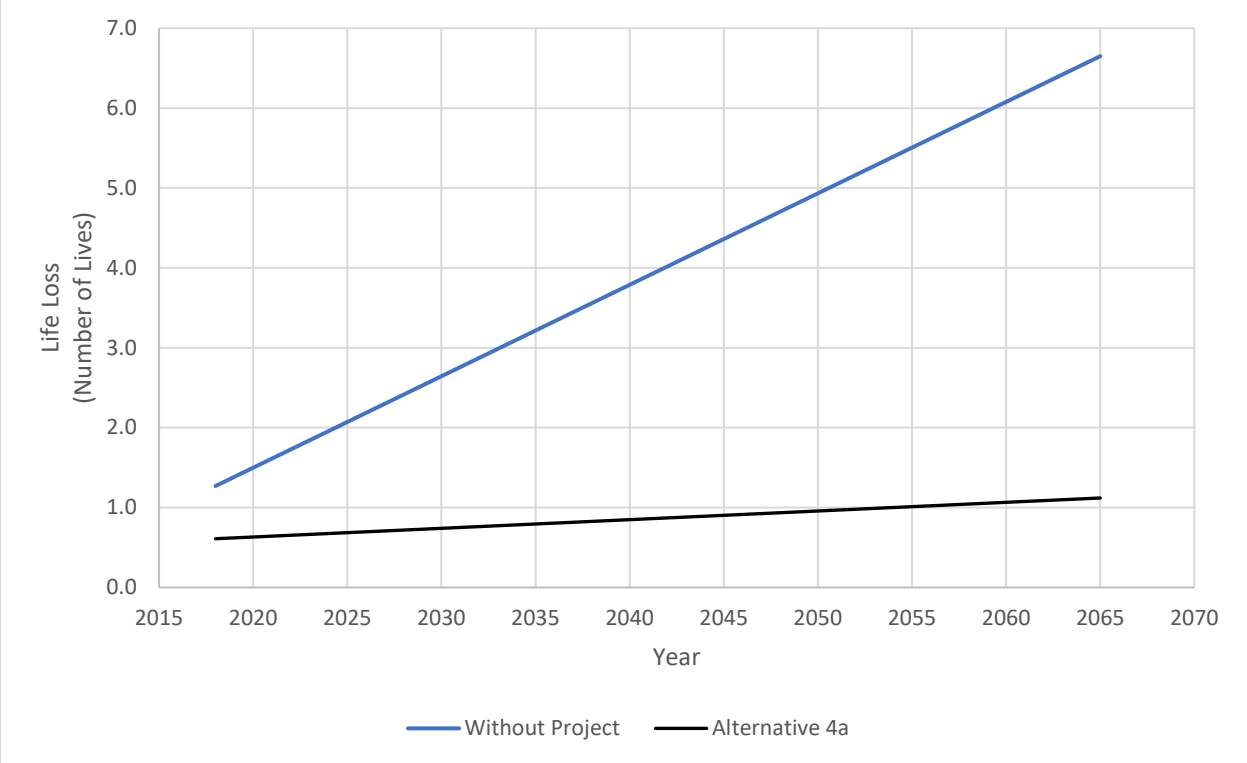


Figure 5-5 Annualized Mortality of the Preferred Plan

5.3 Plan Implementation

5.3.1 Plan Phasing

Because the levees work as a system, the levee improvements must be completed in their entirety in order to achieve their function, and the State's ULOP deadline is fast approaching. So, there is no functional opportunity to phase the Preferred Plan levee improvements. As a practical matter, the levee work will be performed in a series of separate construction bid packages. But these will be executed in a continuous and fast-tracked manner.

One item of levee improvement that does lend itself to phasing is addressed in SJAFCA's climate change adaptation policy (adopted in February 2019). This policy calls for near-term levee improvement projects to include additional stage in the DWSE for an appropriate allowance for climate change, but that design to the full 2065 CVFPP climate change hydrology can be phased. The policy calls to acquire sufficient land to accommodate a levee which will address DWR's estimated year 2065 climate change hydrology, but that the structure does not immediately need to be built to this event.

For the Preferred Plan, the DWSE has been set as the 2040 climate conditions computed water surface profile. The DWSE was capped to be no more than 3-feet greater than the existing (2018) conditions 200-year water surface profile per SJAFCA's climate change policy. The MTOL was then designed to be the DWSE plus either 3-feet or wind-wave height, whichever is greater. As climate science progresses and climate change hydrology predictions are adjusted, the RD 17 levees will be augmented, if necessary, using the additional ROW that will have already been acquired.

The other features of the Preferred Plan beyond the structural flood risk reduction improvements will be phased based on funding opportunities and willing landowner negotiations.

5.3.2 Implementation Schedule

California SB5 (2007) originally set a deadline of 2025 for urban and urbanizing areas to achieve a ULOP in order to avert building restrictions. Further, a ULOP "finding" made in 2025 should have a degree of longevity so that the ULOP is not lost in the near-term due to uncertainties such as changing hydrology due to climate change. In 2020, AB 838 was passed which extended Mossdale's ULOP deadline to 2028 to complete construction. Project close-out is expected to be completed by 2029 (AB 838, 2020).

Implementation of the Preferred Plan will require a number of important preconstruction activities, including completion of a federal study to determine Federal interest (i.e. Phase 2 of the USACE LSJRFS), CEQA and NEPA compliance, federal, State, and local funding activities, engineering field investigations and design, ROW acquisition, and project financing. As noted earlier, levee construction will likely proceed as a number of smaller bid packages, and implementation of multi-benefit features, growth restriction features, and residual risk management features, will proceed based on funding opportunities and land acquisition from willing sellers.

Table 5-6 provides a schedule for planning and budgeting purposes.

Table 5-6. Preferred Plan Schedule

Activity	Start Date	Completion Date
Environmental Documentation	7/1/2021	2/28/2023
Right of Way Acquisition[1]	1/1/2023	1/31/2029
Engineering Design[2]	1/1/2022	12/31/2027
Construction	5/1/2024	12/31/2028
Permitting & Compliance[3]	1/1/2022	3/31/2029

[1] Completion is reflective of possession of the necessary rights to complete the improvements, not necessarily compensation.
[2] It is expected that the project bid packages would be phased and the first package of engineering plans and specifications would be completed in time to commence construction in 2024.
[3] Reflects required permitting and ongoing mitigation and monitoring requirements.

5.3.3 Governance Plan

During the course of this UFRR study, SJAFCA and San Joaquin County facilitated an important examination of flood management governance in San Joaquin County, with particular emphasis on establishing a robust agency to implement projects, primarily in the Metropolitan Stockton and Mossdale Tract areas. The outcome of that effort was a reformulation of SJAFCA.

On November 16, 2017, the Joint Exercise of Powers Agreement (JEPA) was expanded to include the Cities of Lathrop and Manteca. SJAFCA now has a nine- member Board of Directors with two (2) members from the San Joaquin County Flood Control and Water Conservation District and from the Board of Supervisors of the County; two (2) members from Stockton City Council; two (2) members from Lathrop City Council; two (2) members from Manteca City Council; and one (1) member of the public who resides or works within the boundaries of the Agency, appointed by a simple majority of the other Board members.

SJAFCA is empowered to act within the collective boundaries of its members: unincorporated San Joaquin County, and the cities of Stockton, Lathrop, and Manteca (not including the portion of the City of Lathrop west of the San Joaquin River). SJAFCA has “the power and authorization to acquire, construct, operate and maintain Works for the purpose of controlling and conserving waters for the protection of life and property that would or could be damaged by being inundated by still or flowing water.”

5.3.4 Conceptual Financial Plan

The conceptual financial plan presented in this section discusses potential methods to fund the Preferred Plan given standard assumptions regarding federal, State, and local cost sharing. As presented in Section 5.0, the total project cost of the Preferred Plan is estimated at $290,459,000 (Table 5-7).

Table 5-7. Estimated Costs for the Preferred Plan

Project Element	Cost ($)
Levee Improvements	$ 193,472,000
Ecosystem Restoration and Multi-Benefit Features	$ 48,185,000
Wise Use of Floodplain Features	$ 47,263,000
Hypothetical Mitigation Costs	$ 1,539,000
TOTAL	**$ 290,459,000**

The cost of the Preferred Plan is assumed to be shared by the federal, State, and local partners which are the primary beneficiaries of the project. The Preferred Plan includes improvements to federally authorized levees that are part of the SPFC system and provides benefits to an area with 45,000 residents as well as numerous federal, State, and local critical facilities as described throughout this UFRR report.

SJAFCA and CVFPB continue to pursue USACE participation in a Phase 2 of the LSJRFS to explore flood risk management improvements to the Mossdale Tract area. For the purposes of this conceptual finance plan, it is assumed that the Phase 2 LSJRFS will follow completion of this UFRR study and that a federal interest is established. Under this scenario, the typical cost-share for the Preferred Plan is assumed to include a federal cost share of 65% and a non-federal cost share is 35%. Of the non-federal cost-share, it is assumed that the State and local cost share split is 70% and 30%, respectively.

The table below summarizes assumed cost share between federal, State, and local partners for the Preferred Plan.

Table 5-8. Estimated Cost Share for the Preferred Plan

Funding Source	Cost Share (%)	Cost ($)
Federal	65%	$188,798,000
Non-Federal	35%	
State (70% of Non-Federal)		$71,162,000
Local (30% of Non-Federal)		$30,499,000
TOTAL	100%	**$290,459,000**

Federal Funding

The process for garnering federal USACE funding for flood risk reduction projects requires that a federal interest in the project be identified. As discussed, a separate effort to re-engage the USACE in an appropriate level of study to seek federal interest will be launched on a timetable separate from this UFRR study. Historically, once federal interest is determined, federal cost share for typical flood risk reduction projects is at 65% of the total project cost.

State Funding

The Preferred Plan aligns with the State's CVFPP goals of improving flood risk management, improving O&M, promoting ecosystem functions, improving institutional support, and promoting multi-benefit projects.

The State carries out several programs designed to provide funding for multi-benefit flood risk reduction and ecosystem restoration projects that can potentially serve to fund a portion of the 35% non-federal cost share. Based on cost share for similar multi-benefit flood risk reduction projects, the conceptual finance plan assumes that the State will be able to fund 70% of the non-federal cost share, or 24.5% of the total project cost.

Local Funding

The following are existing and potential local funding sources that can be studied as options to fund the remaining 30% of the non-federal cost-share, or 10.5% of the total project cost. These sources were identified by SJAFCA and documented in the Mossdale 2020 Annual APR Update.

- Net revenues from the existing RD 17 Assessment

  - It is expected that some net revenues (after debt service, RD 17 O&M expenses, and pay-as-you-go funding for the final construction of the LSRP will be available to fund the Preferred Plan.

- The Mossdale Tract Area Regional ULOP Levee Impact Fee
  - The Mossdale Tract Area Regional ULOP Development Impact Fee (Regional DIF) is currently paid by property owners developing within the Mossdale Tract 200-year floodplain was adopted by SJAFCA in November 2018 (SJAFCA Resolution 18-21). At that same, time a collection agreement between SJAFCA and its member land use agencies was approved for the fee collections within Mossdale Tract Area. This fee is eligible to fund improvements that would provide ULOP within the Mossdale Tract Area and which are consistent with the levee Improvements identified within the Preferred Plan. The fee is currently structured to fund a portion more than $64 million of improvements over a 40-year time horizon of new development. SJAFCA could update the fee funded improvements and allocate the funding from the existing Fee Program toward the Preferred Plan. An analysis of an updated Fee Program and resulting rates could be explored as part of implementation of the Preferred Plan.
- A new Special Benefit Assessment District
  - SJAFCA has identified and begun the evaluation of a new special benefit assessment district that would overlay the existing RD 17 Assessment. This Overlay Assessment District (OAD) would be levied on properties (parcels) directly receiving flood damage reduction benefit from the construction and long-term O&M of the Project. SJAFCA is advancing the implementation of the OAD and has completed a preliminary evaluation of its feasibility. SJAFCA's current analysis, as part of its Annual Adequate Progress reporting has evaluated rates that could generate up to $7.5 million per year and bond for approximately $90 million. This level of funding would be far in excess of what would be needed under a State/Federal funding scenario. A next step in SJAFCA's evaluation would be to update the analysis to align with a State / Federal Funding Scenario.
- A new Enhanced Infrastructure Financing District
  - A new Enhanced Infrastructure Financing District (EIFD) has been identified and proposed by SJAFCA to fund ULOP improvements as part of its Annual Adequate Progress report. An EIFD is a funding mechanism that captures a portion of the growth in general property taxes and dedicates that growth towards the construction of public infrastructure improvements. For this Project, the proposed EIFD revenue, in conjunction with the OAD revenues, could be pledged to the repayment of bonds, the proceeds of which could fund construction of the Project. SJAFCA started the evaluation of an EIFD in May 2019 in coordination with its member agencies. The current proposal is to form an EIFD by August 2022 so that revenue would start being generated in FY 2022/23. The current evaluations project that EIFD could support approximately $40 million in financing. Under a State / Federal Funding scenario, it is expected that this funding mechanism would not be needed, however, this funding mechanism could be utilized as a back source of funding to match State / Federal funding if needed.

As discussed, the identified funding sources described above have been evaluated as part of SJAFCA's current ULOP efforts progressing in parallel with this Feasibility Study. As part of that evaluation, the feasibility of each mechanism has been analyzed. The following summarizes the potential gross funding that could be generated from each mechanism to support the advancement of a project. Further evaluation is warranted to determine whether the mechanism could be utilized to fund the Preferred

Plan and what the appropriate level of funding from each mechanism should be. Table 5-9 below summarizes the potential funding that could be generated from each of these mechanisms as a source for the Preferred Plan.

Table 5-9. Potential Local Funding Sources and Amounts for the Preferred Plan

Project Element	Potential Funding
RD 17 Assessment	$8,000,000
Development Impact fee	$60,000,000
Overlay Assessment (Revenues & Bonds)	$90,000,000
EIFD (Revenues & Bonds)	$40,000,000
TOTAL	**$198,000,000**

5.4 Basin Plan

The Basin Plan is intended to outline additional long-term projects and actions needed to reduce residual risk and to sustain the ULOP achieved by the Preferred Plan into the future. The Basin, in this case, is the Mossdale Tract area as defined throughout this report.

The Preferred Plan (along with without-project conditions actions) will achieve a ULOP through the year 2040. Although no additional population and growth will occur after 2040, climate change is projected to continue beyond 2040.

Beyond the (1) Preferred Plan, additional Basin Plan projects include:

2. USACE Lower San Joaquin River Feasibility Study, Phase 2 for the Mossdale Tract area
3. Expansion of the Paradise Cut bypass
4. Upstream storage on San Joaquin River Tributaries
    a. Study modifications and alternatives
    b. Design and build modifications

This Basin Plan is consistent with the December 2014 Lower San Joaquin River and Delta South Regional Flood Management Plan (LSJ/DS RFMP) (SJAFCA, 2014) and the 2012 CVFPP (DWR, 2012) State Systemwide Investment Approach (SSIA).

*5.4.1 **Basin Project 2 – USACE** Lower San Joaquin River **Feasibility Study**, Phase 2 for the Mossdale Tract area*

Alternatives for RD 17 improvements were studied in the USACE Integrated Interim Feasibility Report/ Environmental Impact Statement/ Environmental Impact Report. However, as a result of the USACE analysis required for compliance with E.O. 11988, USACE removed the RD 17 alternatives from further consideration in the LSJRFS.

SJAFCA and CVFPB are pursuing USACE participation in Phase 2 of the LSJRFS to explore flood risk management improvements to the Mossdale Tract area. The sponsors will offer the analyses and findings of this UFRR study in an effort to reduce the scope of the federal study.

5.4.2 Basin Project 3 – Expansion of Paradise Cut Bypass

Paradise Cut is an existing high flow bypass that diverts flood flows out of the lower San Joaquin River, upstream of the RD 17 dryland levee. This reduces the hydraulic load on levees downstream on the San Joaquin River, particularly along RD 17 and Central Stockton. Due to sedimentation and other factors, the current capacities of Paradise Cut and the lower San Joaquin River just downstream of Paradise Cut do not meet their original design capacities. In an attempt to remedy this situation, numerous studies have evaluated the benefit and potential hydraulic impacts of expanding Paradise Cut. Potential ecosystem benefits have also been considered.

The first likely improvements/modifications to be made to Paradise Cut are known as the “Base Case Improvements” and are to be implemented by the River Islands Development. A description of the Base Case is provided below. The River Islands development (RD 2062) is required to construct the Base Case improvements pursuant to conditions of a settlement agreement with Natural Resources Defense Council (NRDC) (et. al.) which include:

- Setback the north levee of Paradise Cut between the railroad and I-5 on RD 2107
- Setback levee along RD 2062 between I-205 and Old River (setback approximately 900 to 1,200 feet)
- Remove bench (excavate approximately 5 feet over 40 acres) downstream of the weir (also known as Paradise Dam).
- Increase Paradise Cut flow capacity to nearer the design flow

This is shown graphically in Figure 5-6.

Although the Base Case improvements will partially restore the capacity of Paradise Cut, these improvements will not address the 100,000+ cfs conveyance deficiency due to climate change beyond 2040. Accommodating this magnitude of increased flow would require a major re-envisioning of the south Delta bypass.

Widening the bypass would require obtaining easements or purchase of privately held property adjacent to the bypass. Additionally, diverting increased flows down Paradise Cut would increase the hydraulic load on levees in the Delta South Region. These levees typically have generous freeboard above the 100-year flood stages but are susceptible to erosion and seepage. There are concerns about existing capacity and future vegetation and sedimentation of some channels downstream from Paradise Cut. Also downstream are the export intake facilities of the Central Valley Project and State Water Project, and changes to flow regime could impact them in some way (water quality, sedimentation, levee fragility, fish attraction, etc.). In order to be widely supported by stakeholders, future modifications to Paradise Cut will need to address these challenges.

A Paradise Cut Corridor Management Plan needs to be prepared to further define the project and strengthen stakeholder support. The Management Plan would investigate opportunities for improved flood management and environmental management of the Paradise Cut Corridor. Levee setbacks, and overbank flood storage projects should be analyzed with the intent to improve flood risk management while improving the environment for fish, wildlife, and plants.

A broadly supported alternative for modifying Paradise Cut beyond the Base Case improvements being implemented by the River Islands development does not currently exist. The next step to get support from the stakeholders in the Lower San Joaquin River and Delta South regions is to develop a comprehensive plan for increasing the capacity of Paradise Cut that includes a potential footprint of the expansion and improvements downstream to mitigate the hydraulic impacts.

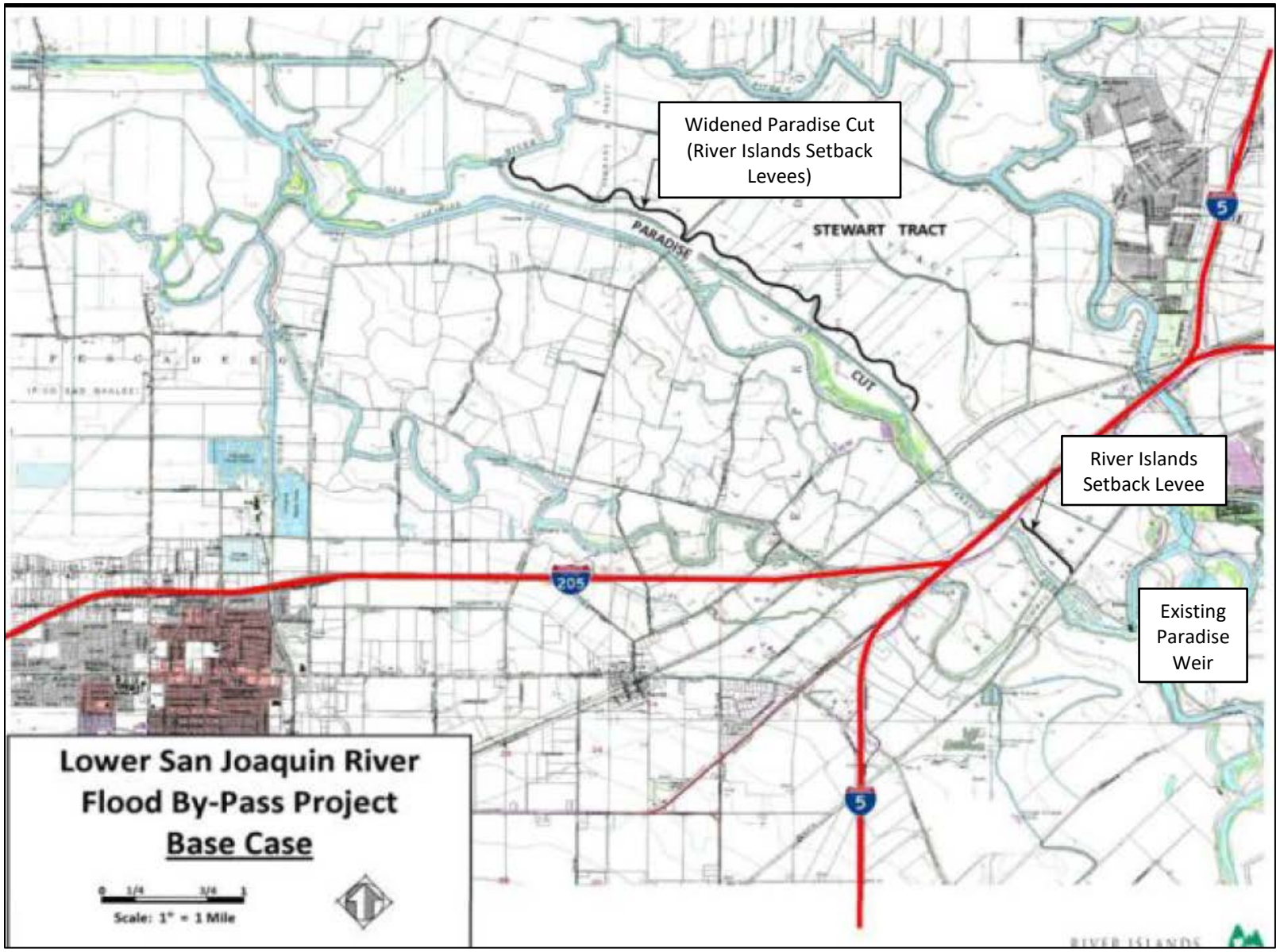


Figure 5-6. Paradise Cut Base Case

5.4.3 Basin Project 3 – Upstream Storage along San Joaquin River Tributaries

During the 1997 flood, two of the major flood control dams in the San Joaquin Valley were forced to engage their spillways. Those two were Friant Dam on the Upper San Joaquin River, and New Don Pedro Dam on the Tuolumne River.

One possible measure to reduce peak flows in the lower San Joaquin River would be to increase flood storage in upstream reservoirs. This could be coupled with coordinated- and forecast-based operation of flood control reservoirs.

Increased flood storage anywhere in the watershed should be considered. Storage could come from expansion of existing reservoirs or constructing new reservoirs. DWR's Enhance Flood System Capacity approach in the CVFPP estimated that about 400,000 acre-feet of new flood storage would be required to effectively manage the 100-year (1% annual chance) flood. Investigations should evaluate smaller and larger storage volumes with an eye to increasing flood system resiliency to better accommodate climate change. In addition, multi-benefits such as water supply, hydropower, and recreation should be considered, with particular emphasis on water supply. With the passing of the Sustainable Groundwater Management Act (SGMA), water users in the San Joaquin Valley have been studying their basins and outlining plans to achieve sustainable groundwater supplies. New or more reliable surface water supplies are in high demand throughout the valley. Flood management alternatives involving re-operation of reservoirs which enhance flood protection but reduce water supply reliability will likely meet objections from stakeholders. Multi-benefit alternatives which improve both flood management and water supply and offer other benefits will be favored.

The following potential storage improvements are provided as examples.

5.4.3.a Millerton Lake

Friant Dam is located on the San Joaquin River, about 20-miles northeast of Fresno. The water body created by the impoundment is known as Millerton Lake. The existing structure, built in 1945, is a 319-ft high concrete gravity dam with a storage capacity of 520,000 acre-feet.

Potential modifications to Friant Dam include a 20-, 60- or 140- foot raise to increase storage.

A 20-foot raise would increase the storage capacity by approximately 105,000 acre-feet. This would require raising the dam and modifying the spillway and spillway chute. It would also require construction of an approximately 3,000-foot-long dike across a low ridge saddle at the southwest margin of the existing reservoir.

A 60-foot raise would entail raising the dam and modifying the spillway and spillway chute. It would also require construction of an approximately 8,500-foot-long dike across a low ridge saddle at the southwest margin of the existing reservoir.

More extensive efforts would be required for a 140-foot raise, which would result in approximately 700,000 acre-feet of additional storage capacity.

An alternative to raising Friant Dam could be the potential Temperance Flat Dam or storage on other tributaries.

5.4.3.b Don Pedro Reservoir

Don Pedro Reservoir is an artificial lake formed by the construction of the New Don Pedro Dam on the Tuolumne River. The 2,030,000 acre-feet of water stored is used by the Modesto Irrigation District (MID) and the Turlock Irrigation District for the irrigation of several hundred square miles of productive Central Valley farmland. Some of the water is treated by the MID and used as drinking water in Modesto.

Additional capacity in this reservoir or in the upstream tributaries improves downstream flood protection on the Tuolumne River and San Joaquin River.

5.4.3.c Coordinated- and Forecast-Based Operation of Reservoirs

This measure is applicable to all upstream reservoirs, however the information presented on this project is focused on the two reservoirs mentioned above. The rainfall event during December 1997 resulted in nearly simultaneous high releases by all reservoirs on the San Joaquin River system and uncontrolled emergency releases at New Don Pedro and Friant Dams. Reservoir operators made initial release decisions on an individual basis. It is believed that coordinating these outflows may have significantly reduced flooding in the Central Valley.

Prior to the large storms in late December 1997, many reservoirs had water elevations at or slightly into their flood storage before the storm arrived. The uncontrolled releases from these reservoirs may have been avoided if the reservoirs released water ahead of the storms, thus increasing available flood storage. Forecast-based operations were not used in 1997, but with advances in technology, are now becoming feasible.

This project would encourage State and local operators to pursue coordinated- and forecast- based operations to enhance and more effectively operate existing reservoirs. This project may work in conjunction with projects to increase physical storage in the existing reservoirs as discussed previously. Figure 5-7 shows the reservoirs upstream of the Regions which collectively can impact peak flows in the San Joaquin River.

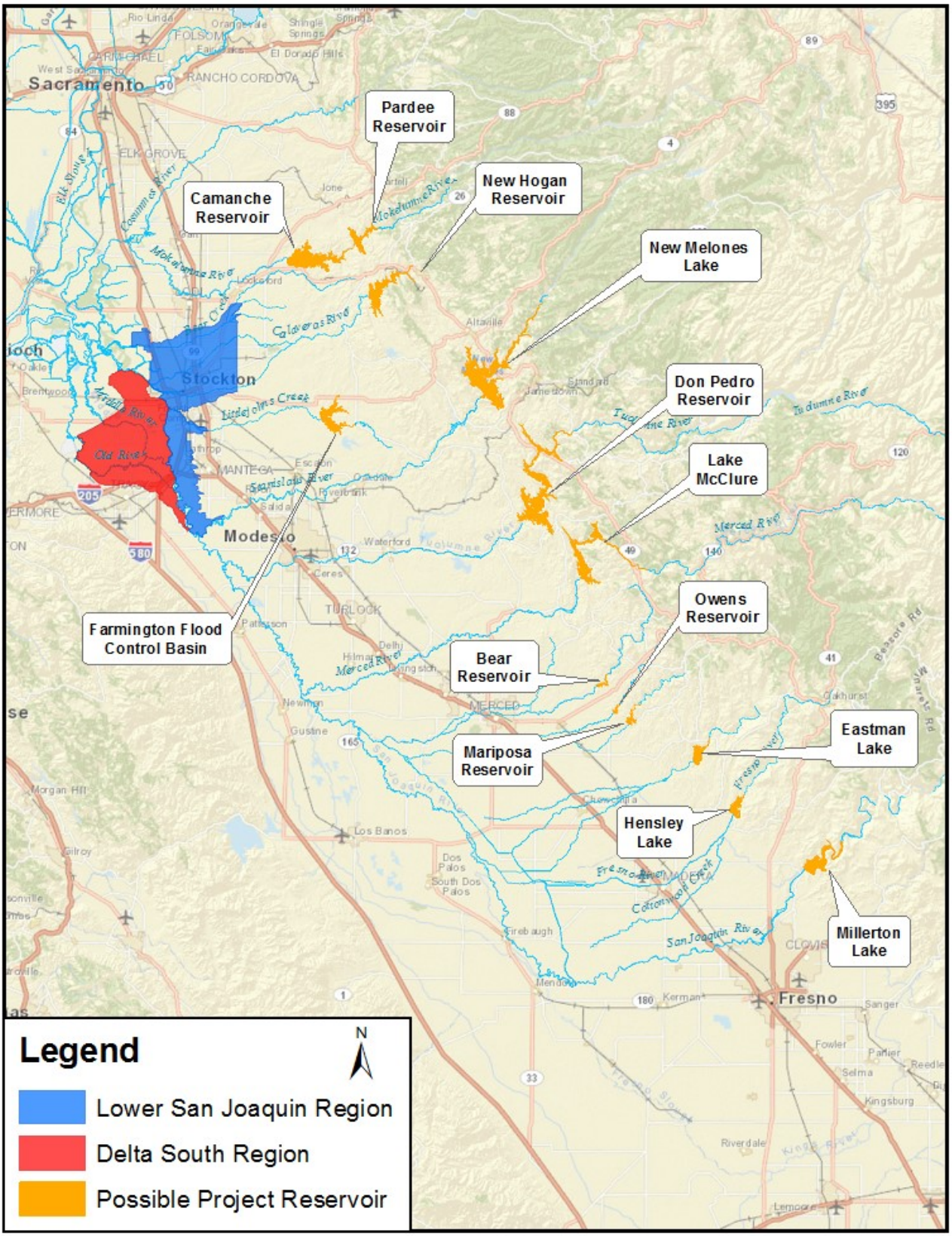


Figure 5-7. Reservoirs within the San Joaquin River system.

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Appendix A
Hydraulics Modeling
Technical Memorandum

Mossdale Tract Area
Urban Flood Risk Reduction:
Hydraulic Modeling Technical Memorandum

Prepared for: ***San Joaquin Area Flood Control Agency*** *May 1, 2019*
Rev. June 10, 2021

Prepared by: Michael Pantell, P.E., C.F.M. & Brittney Salvador, E.I.T.

Reviewed by: Mike Rossiter, P.E., C.F.M. & Dave Peterson, P.E.

1.0 Introduction

This technical memorandum (TM) was developed for the San Joaquin Area Flood Control Agency (SJAFCA) as a part of the DWR Urban Flood Risk Reduction (UFRR) Feasibility Study for the Mossdale Tract Area and outlines the methods and results of the hydraulic analysis required for the UFRR study.

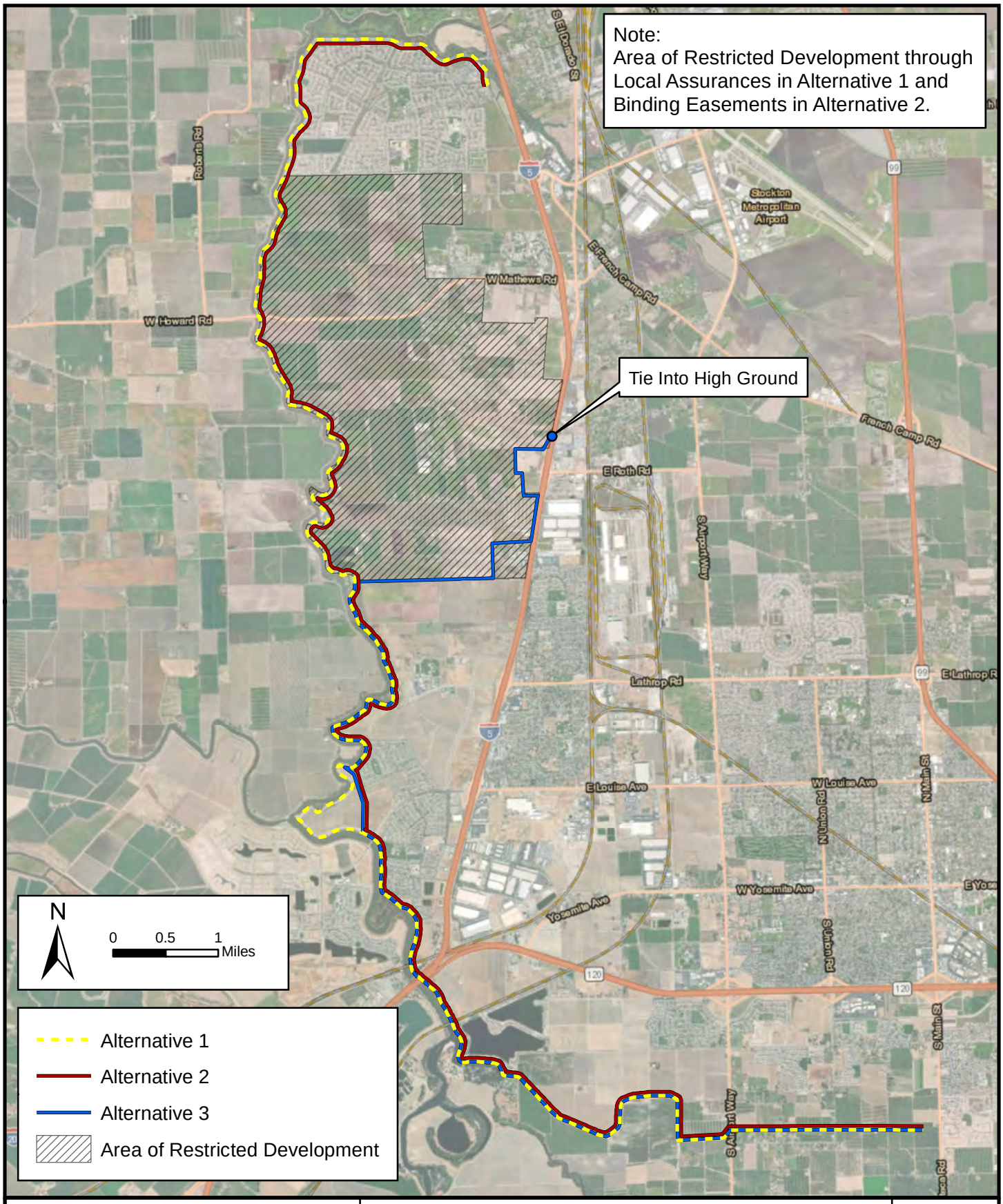
The purpose of the UFRR study is to develop and evaluate various alternatives that will allow Mossdale Tract Area to achieve a 200-year Urban Level of Protection (ULOP) as required under Senate Bill 5 (SB5). The UFRR study proposed three (3) alternatives that would meet the project objectives and evaluated these alternatives according to Urban Level of Design Criteria (ULDC).

The alternatives are presented in Figure 1-1 and are described as follows:

- Alternative 1: Full fix-in-place levee improvements accommodating year 2040 climate change, with local assurances for wise use of the floodplain that would be governed by development prohibitions outlined in the State's Delta Plan.
- Alternative 2: Full fix-in-place levee except for setback levee at river mile 52 with improvements accommodating year 2040 climate change hydrology, with binding easements on 5,050 ac to restrict development.
- Alternative 3: Partial fix-in-place of levees fronting Lathrop and Manteca, plus a new secondary levee along the northern boundary of Lathrop and a setback levee at river mile 52. Levee improvements accommodate year 2040 climate change. Areas north of the new secondary levee would not achieve ULOP.

The UFRR report evaluated each alternative under current hydrologic conditions and tested the resiliency of each alternative to 2065 projected climate change hydrology. To design and evaluate the alternatives, an extensive hydraulic modeling effort was required. This hydraulic modeling was used to determine the following:

- 200-year design water surface profiles for year 2040 hydrologic conditions used to design the minimum top of levee for the project.
- Water surface profiles and floodplains for:
    - Existing hydrologic conditions and for 2065 climate change hydrologic conditions,
    - With- and without-project alternatives
    - Six (6) return periods
- Hydraulic impacts of multi-benefit features



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Mossdale Tract Area

Key Flood Risk Management Features of Alternatives

FIGURE

1-1

2.0 Hydraulic Model

2.1 Model Setup

The hydraulic model used for this study was HEC-RAS v5.0 which was updated from a HEC-RAS v4.1 model used for the 2014 RD 17 Hydraulics Study[1]. The 2014 RD 17 Hydraulic Study HEC-RAS model was derived from the Central Valley Flood Evaluation and Delineation (CVFED) Task Order 25 model. As a part of the 2014 RD 17 Hydraulic Study, the CVFED model was reviewed and model parameters were adjusted including: bridges, stream junctions, lateral structures, storage area connections, inline structures, and debris loading assumptions. This model was calibrated to observed data from a high-water event that occurred in April 2006. Details of the original RD 17 Hydraulic Study model setup and calibration are described in the 2014 RD 17 Hydraulics Study.

For this study, the 2014 RD 17 Hydraulics Study model was updated to HEC RAS v5.0 which has the capability of 2D floodplain modeling. In the process of updating the 2014 RD 17 Hydraulics Study model, many changes were made to the model. Primarily, areas previously represented by storage areas were converted into 2D areas. Break lines were added to the 2D areas which account for terrain that impedes flow such as berms, levees, roads, and railroad tracks. The majority of the break lines were based on the existing storage area connections. These connections were located on high ground that would impede flow between different storage areas which provided a good baseline for the break line locations. Additional break lines were added based on visual observation as well as information provided by DWR.

Culverts were also added into 2D areas to allow for water to pass through break lines where necessary. Culvert location information was gathered from previous studies along with aerial imagery and added to the model. In total, 8 culverts were added to the model, 4 of which were within the Mossdale Tract Region.

Changes were made to the 1D reaches to better model high and low flow events. Since the gate structure along Walthall Slough remains closed for all flow events, Walthall Slough 1D reach was removed from the model and incorporated into a 2D area and the San Joaquin River 1D reach. A lateral structure was added along the San Joaquin River that connected Walthall Slough to the San Joaquin River. Finally, ineffective flow areas and obstructions were refined along the San Joaquin and Old Rivers to better represent the channel geometry.

[1] PBI. *200-Year Freeboard Analysis & Floodplain Mapping within RD 17.* May, 2014

Because of the computational approach used by the 2D areas, terrain elevation and land use information was required. The terrain elevation information was obtained from the CVFED 1-meter resolution LiDAR flown in 2009. Manning's n values, which are based on land use information, were obtained from the FLO2D model that was developed for the 2014 RD 17 Hydraulic Study. The Manning's n-value data was updated to incorporate new developments within the region using county land use data.

Figure 2-1 shows the model geometry used for this study.

Middle River

San Joaquin River

French Camp Slough

Grant Line Canal

Old River

Paradise Cut

Overtopping from Stanislaus River

San Joaquin River at Vernalis

Legend

- River Centerline
- Cross Sections
- Upstream Boundary Conditions
- Storage Areas
- 2D Flow Areas
- Downstream Tidal Boundary Conditions

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING
80 Blue Ravine Rd., Suite 280
Folsom, CA 95630
Phone: (916) 608-2212

N

0 1 2 Miles

Mossdale Tract Area

Hydraulic Model Overview
Updated HES-RAS Version 5.0

FIGURE
2-1

2.2 Calibration and Verification

The HEC-RAS v5.0 model was then calibrated and verified using observed flow hydrographs, stage hydrographs, and high-water marks. While the original 2014 RD 17 model used an April 2006 event for calibration, a larger event that occurred in January 2017 was used for this model. After calibrating the model, the April 2006 event was then run and the results were verified. The model was calibrated primarily to the flow and stage on the San Joaquin River and the portions of Paradise Cut and Old River that are immediately downstream of the San Joaquin River. Figure 2-2 on the following page shows the locations of the gages used for the calibration.

San Joaquin River at Brandt Bridge
CDEC ID: BDT
Type: Stage Hydrograph

Doughty Cut Above Grant Line Canal
CDEC ID: DGL
Type: Stage Hydrograph

Old River at Head
CDEC ID: OH1
Type: Stage Hydrograph

San Joaquin River Blw Old River
CDEC ID: SJL
Type: Flow & Stage Hydrographs

San Joaquin River at Mossdale Bridge
CDEC ID: MSD
Type: Flow & Stage Hydrographs

San Joaquin River near Vernalis
CDEC ID: VNS
Type: Flow & Stage Hydrographs

Legend

River Centerline

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Folsom, CA 95630
Phone: (916) 608-2212

N

0 1 2 Miles

Mossdale Tract Area

Calibration Overview

FIGURE
2-2

To calibrate the model, Manning's n values were multiplied by factors to adjust for flow and stage along the San Joaquin River. Appendix A provides all of the Manning's n values for the calibrated HEC RAS v5.0 model. The resulting 2017 flow and stage hydrographs are provided in Figure 2-3 through Figure 2-9 for the calibration run. Flow data did not exist for the San Joaquin below Old River, hence there is no flow calibration figure at this location. In general, the model slightly over estimated stage (within 0.5') and flow at peak conditions and underestimated flow and stage during low flow conditions. The model was considered a good, albeit slightly conservative representation of the system during a high-flow event.

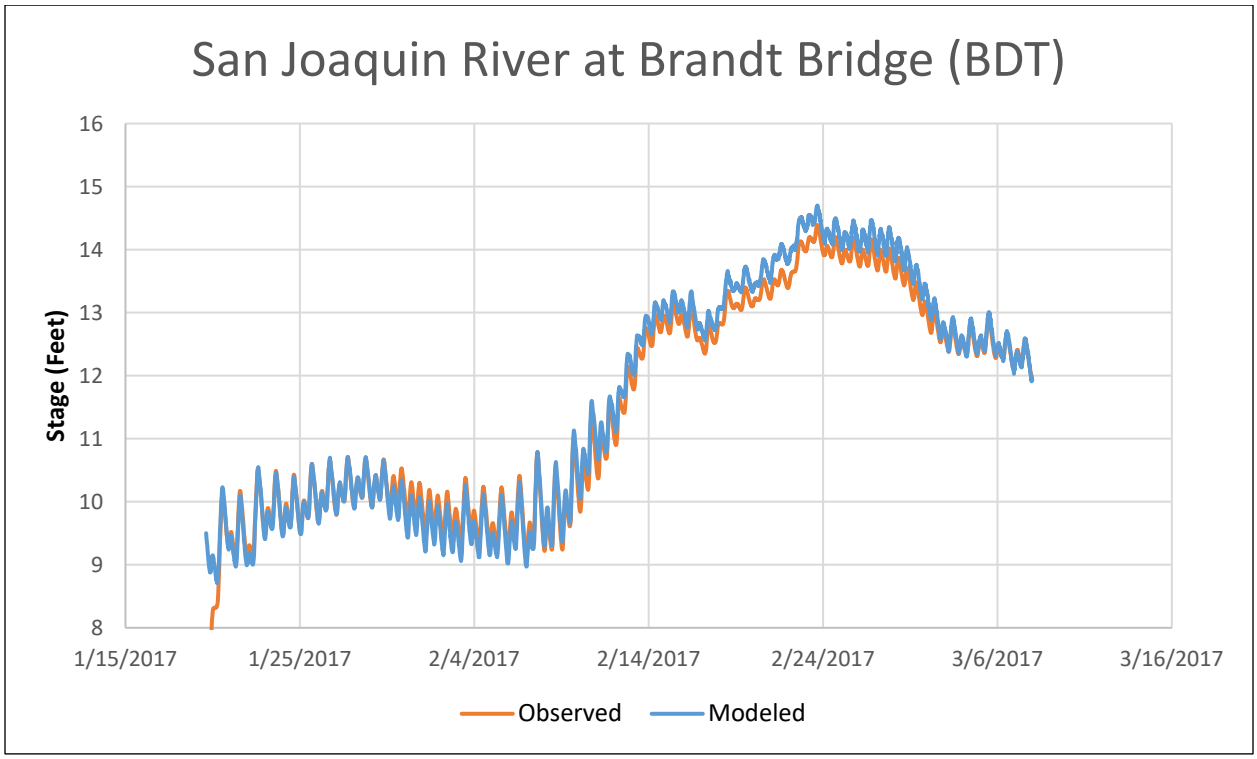


Figure 2-3. Observed Versus Modeled 2017 Stage Hydrographs for San Joaquin River at Brandt Bridge.

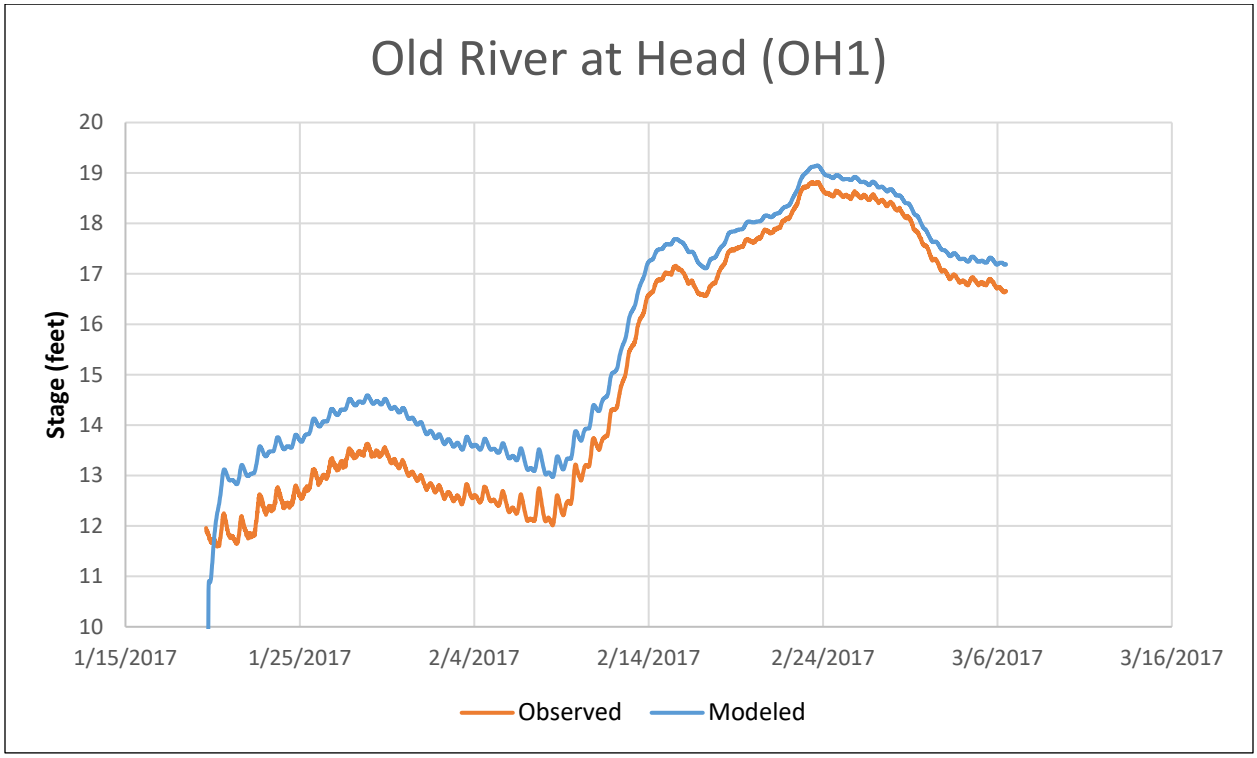


Figure 2-4. Observed Versus Modeled 2017 Simulate Stage Hydrographs for Old River at Head.

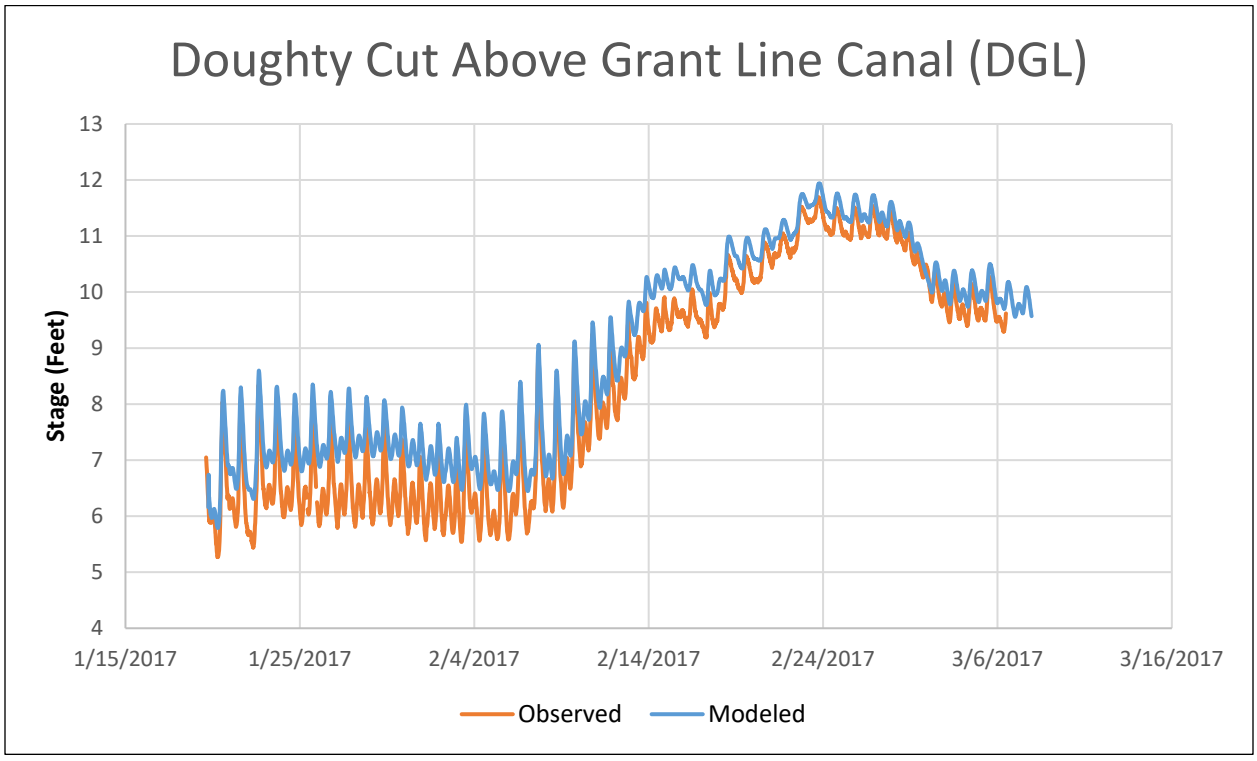


Figure 2-5. Observed Versus Modeled 2017 Stage Hydrographs for Doughty Cut Above Grant Line Canal.

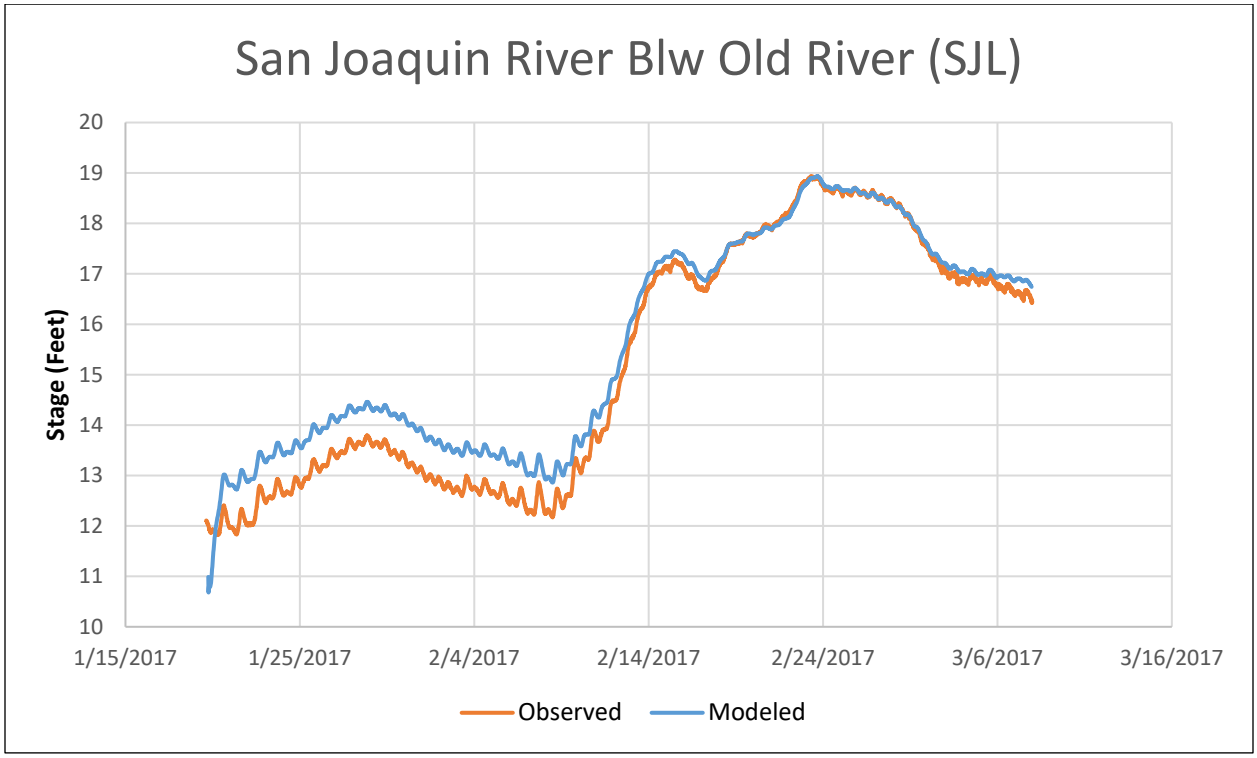


Figure 2-6. Observed Versus Modeled 2017 Stage Hydrographs for San Joaquin River Below Old River.

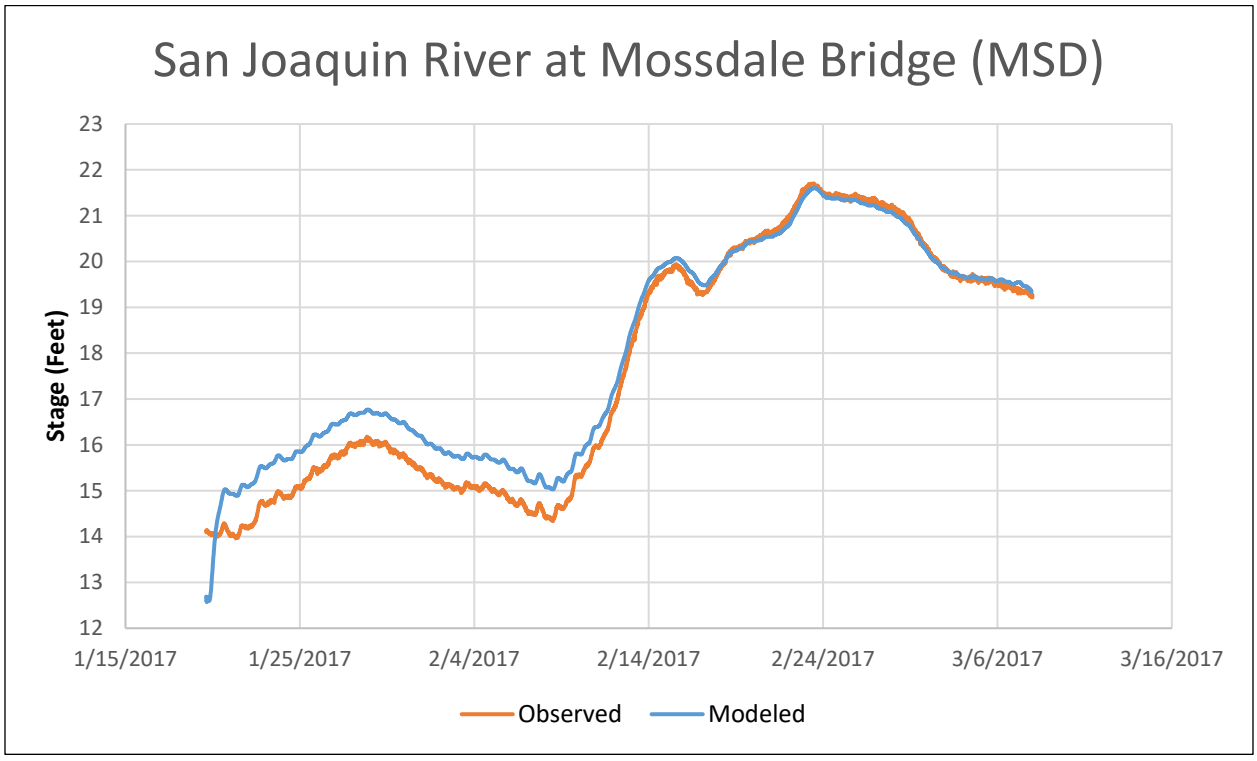


Figure 2-7. Observed Versus Modeled 2017 Stage Hydrographs for San Joaquin River at Mossdale Bridge.

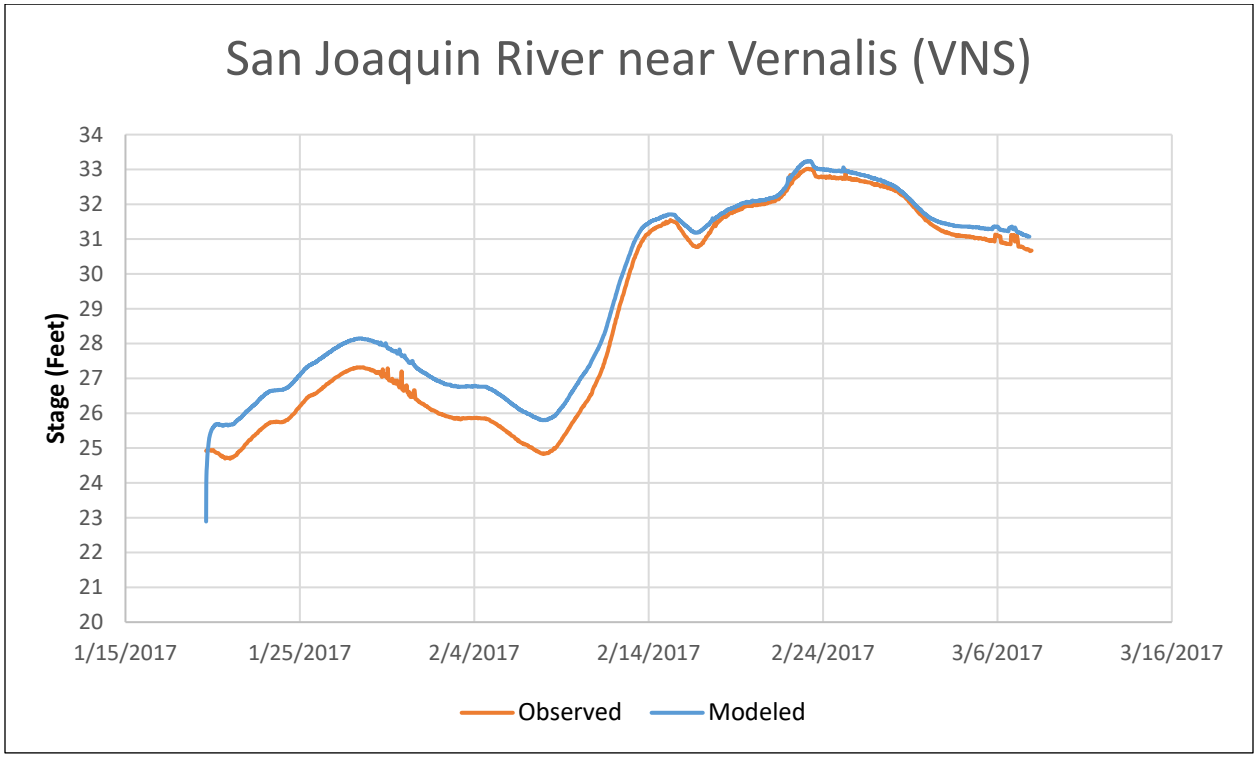


Figure 2-8. Observed Versus Modeled 2017 Stage Hydrographs for San Joaquin River Near Vernalis.

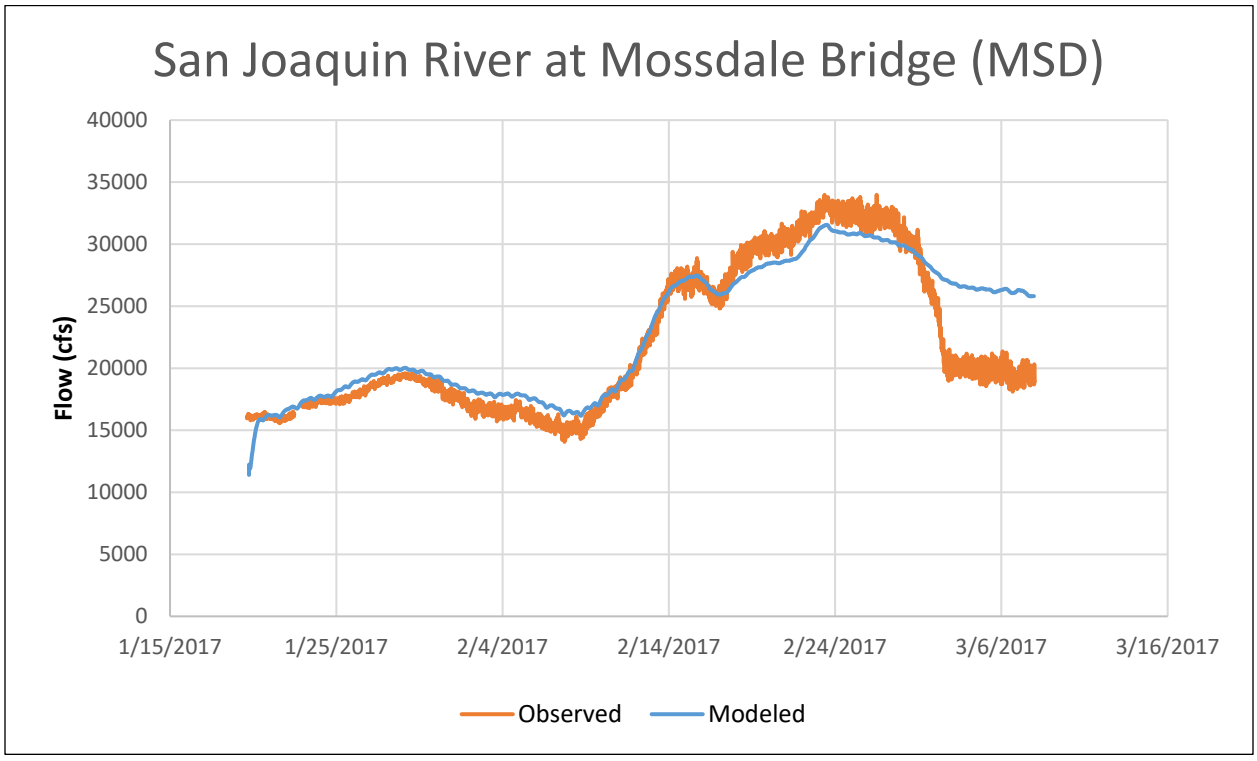


Figure 2-9. Observed Versus Modeled 2017 Flow Hydrographs for San Joaquin River at Mossdale Bridge.

The model was then verified to the high flow event that occurred April 2006. In addition to stage and flow hydrographs at the same locations of the 2017 event, the April 2006 high flow event also had high-water marks along the San Joaquin River, Old River, and Paradise Cut. The maximum water surface profile was used as a best-fit line for the high-water marks. Figure 2-10 through Figure 2-18 show the resulting flow, stage, and high-water mark model verification for the April 2006 event.

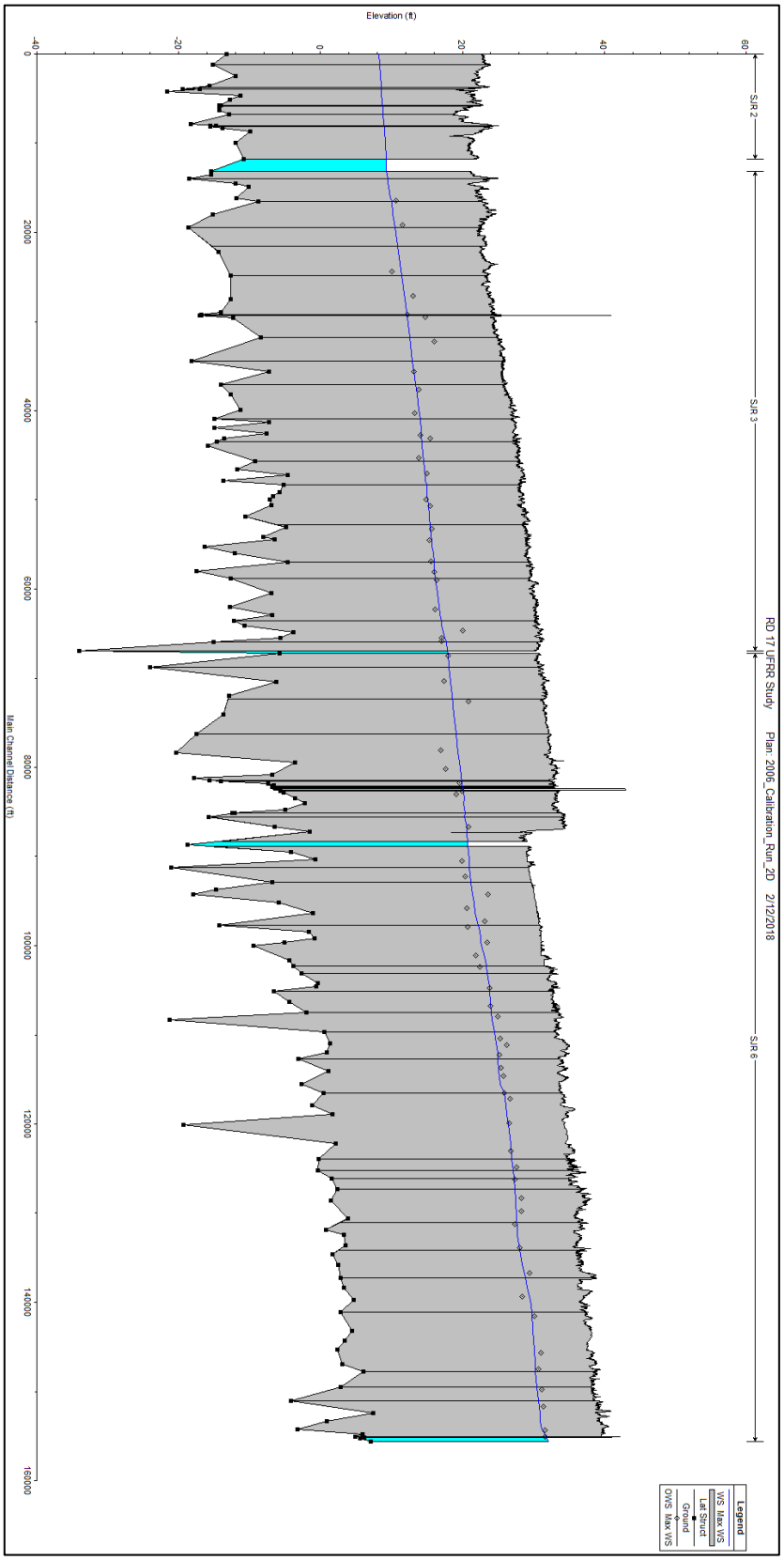


Figure 2-10. Simulated 2006 Water Surface Profile for the San Joaquin River Compared to Observed High Water Marks.

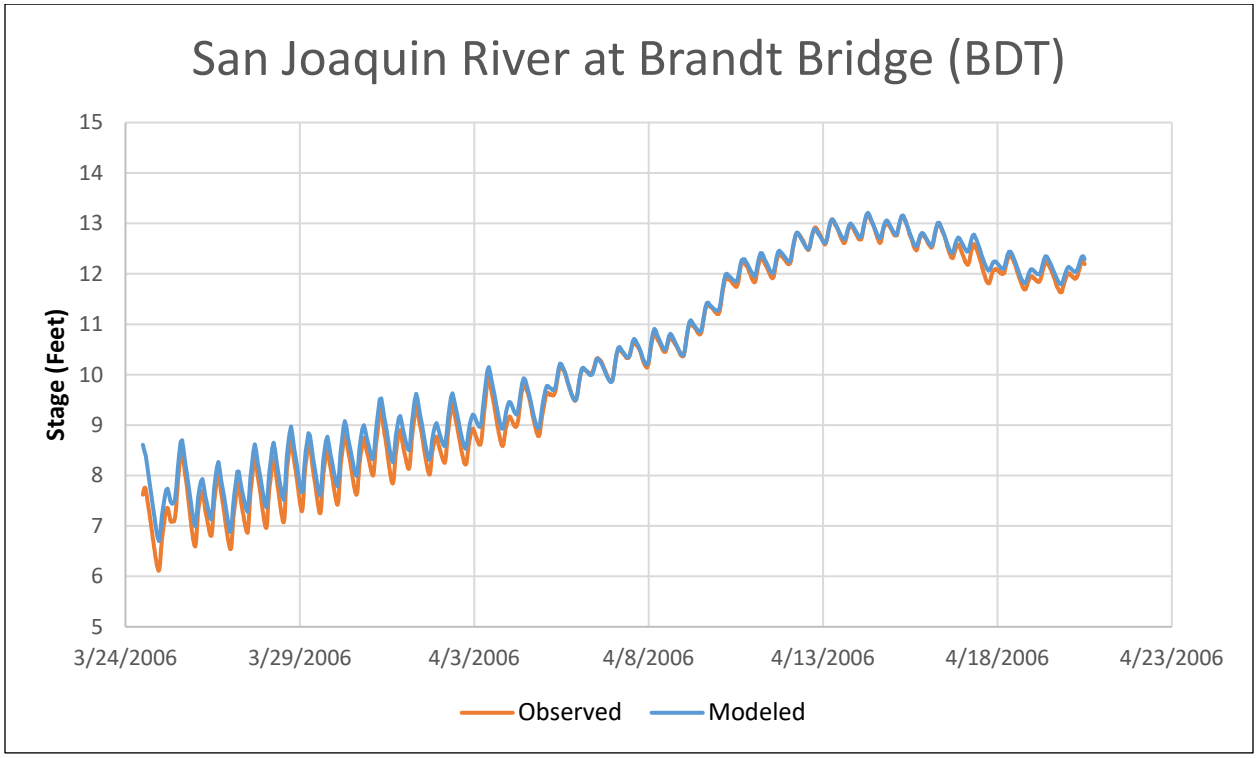


Figure 2-11. Observed Versus Modeled 2006 Stage Hydrographs for San Joaquin River at Brandt Bridge.

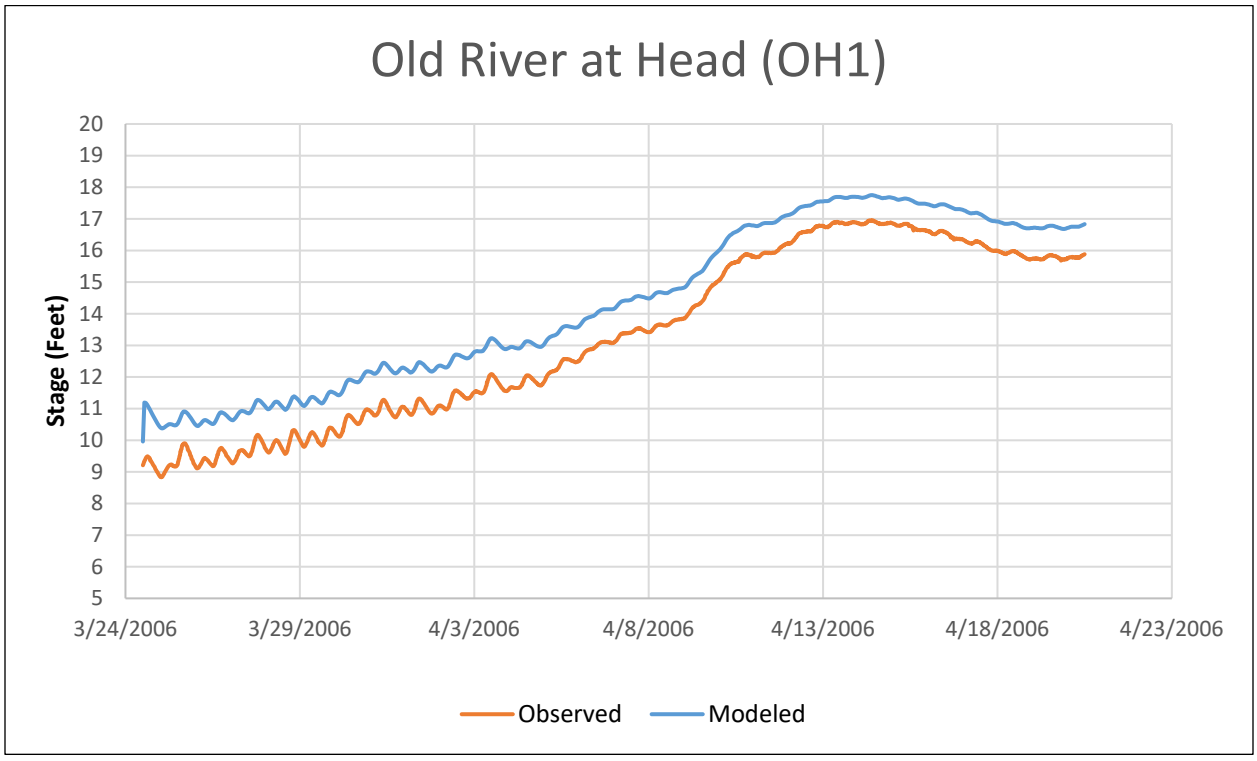


Figure 2-12. Observed Versus Modeled 2006 Stage Hydrographs for Old River at Head.

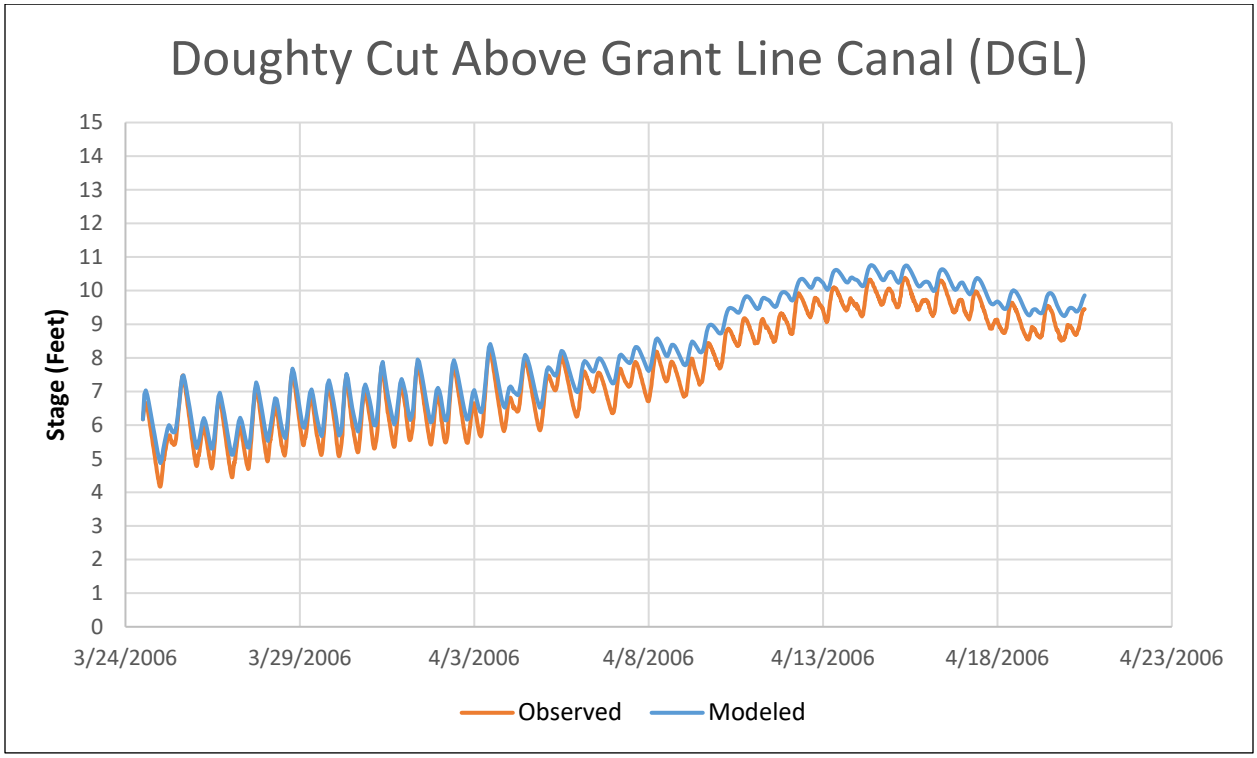


Figure 2-13. Observed Versus Modeled 2006 Stage Hydrographs for Doughty Cut Above Grant Line Canal.

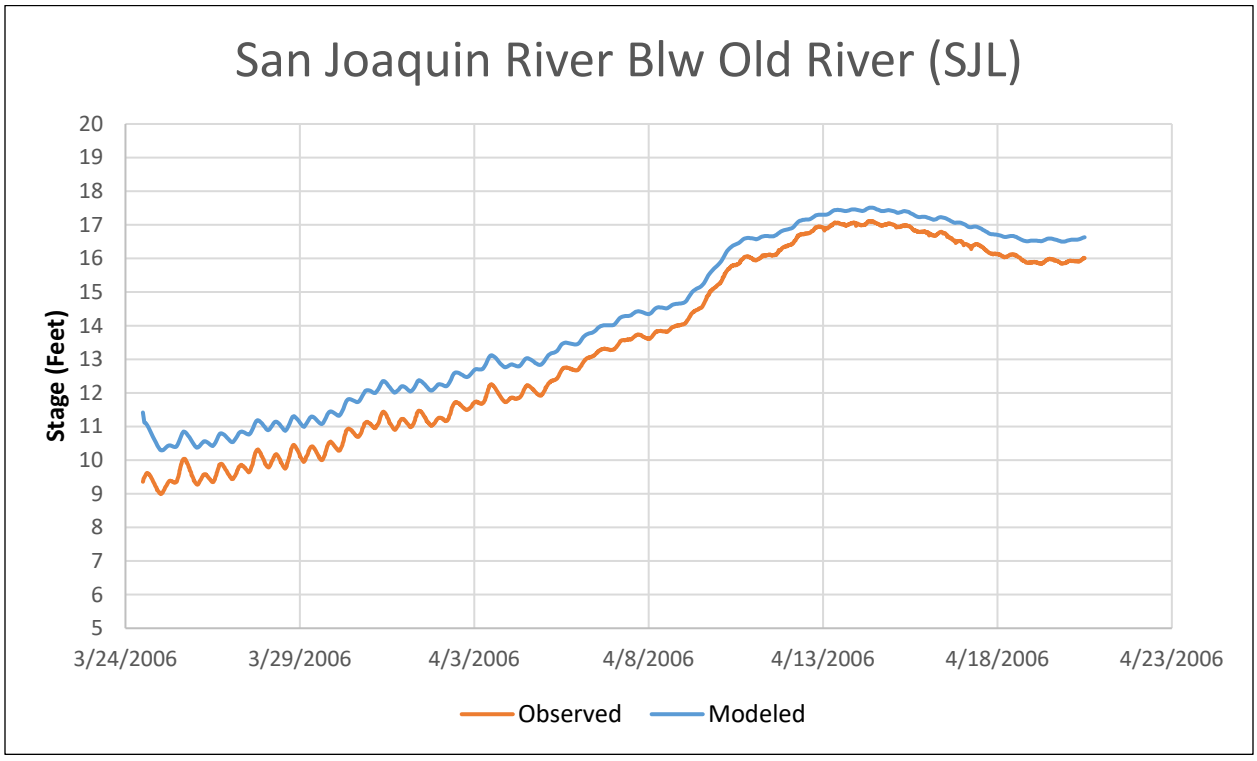


Figure 2-14. Observed Versus Modeled 2006 Stage Hydrographs for San Joaquin River Below Old River.

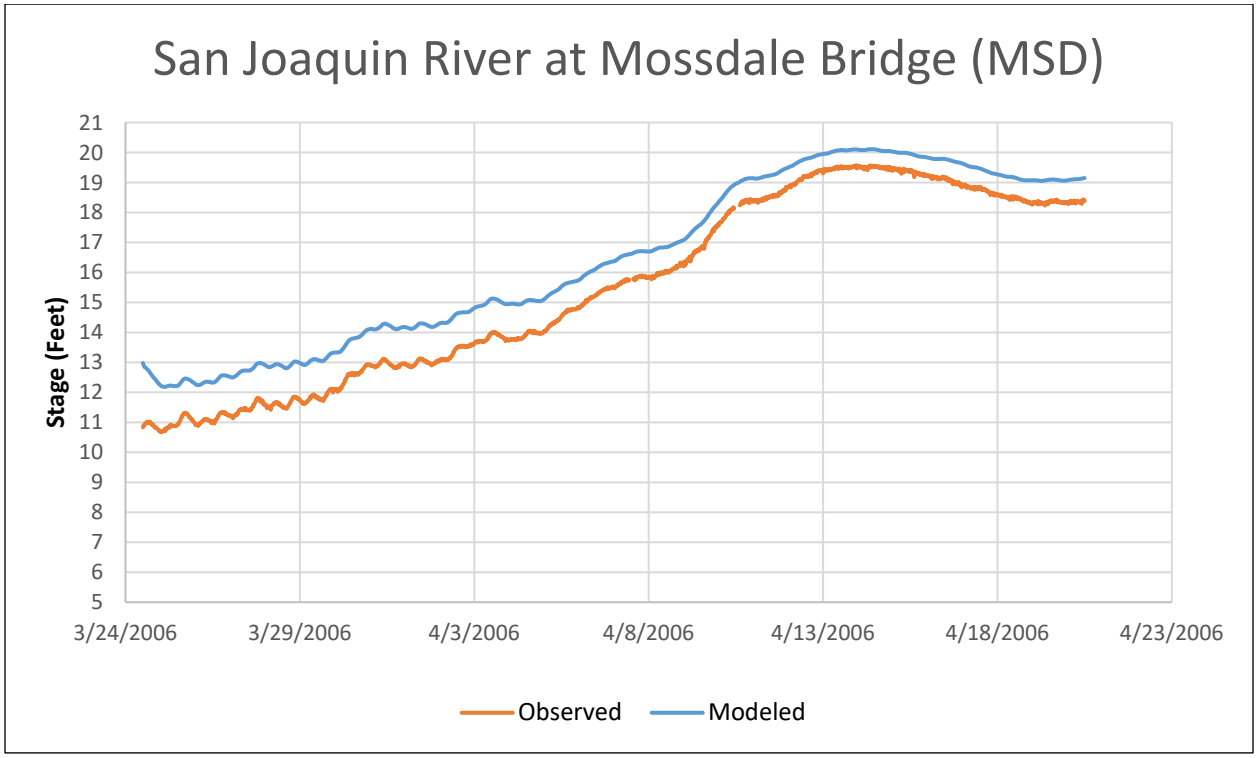


Figure 2-15. Observed Versus Modeled 2006 Stage Hydrographs for San Joaquin River at Mossdale Bridge.

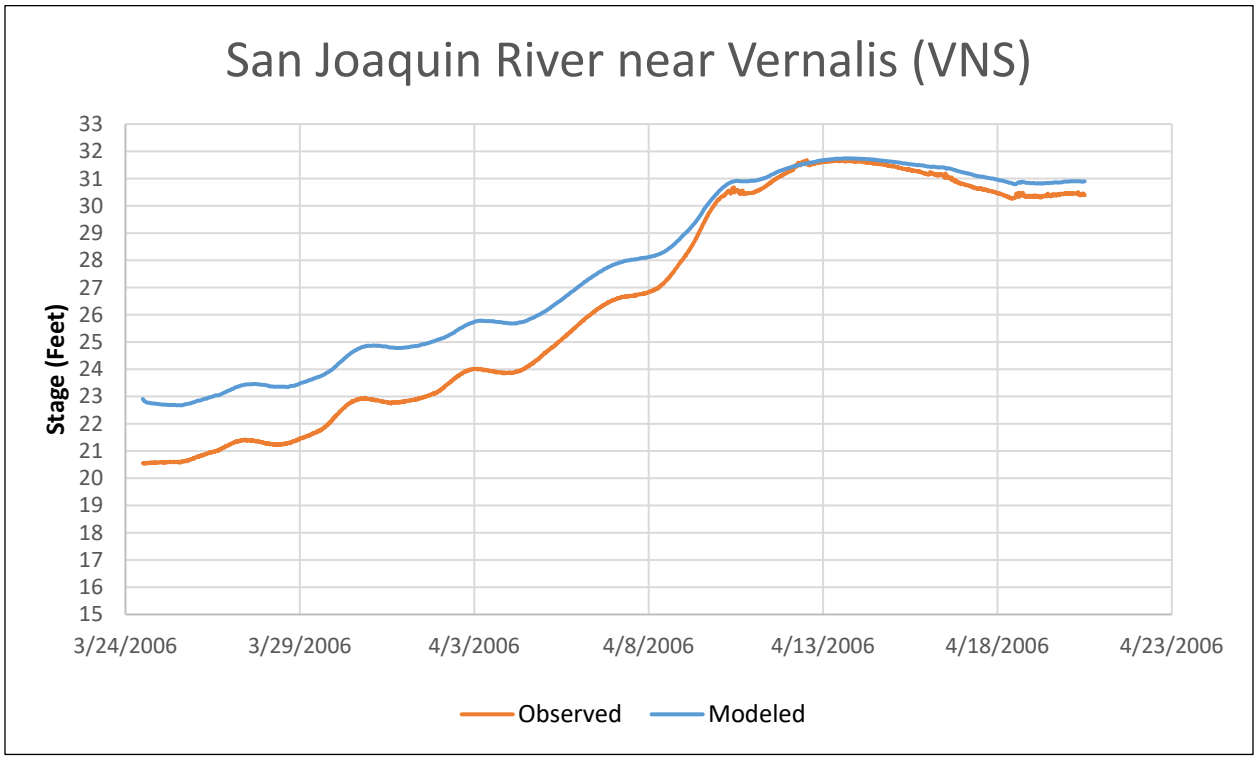


Figure 2-16. Observed Versus Modeled 2006 Stage Hydrographs for San Joaquin River Near Vernalis.

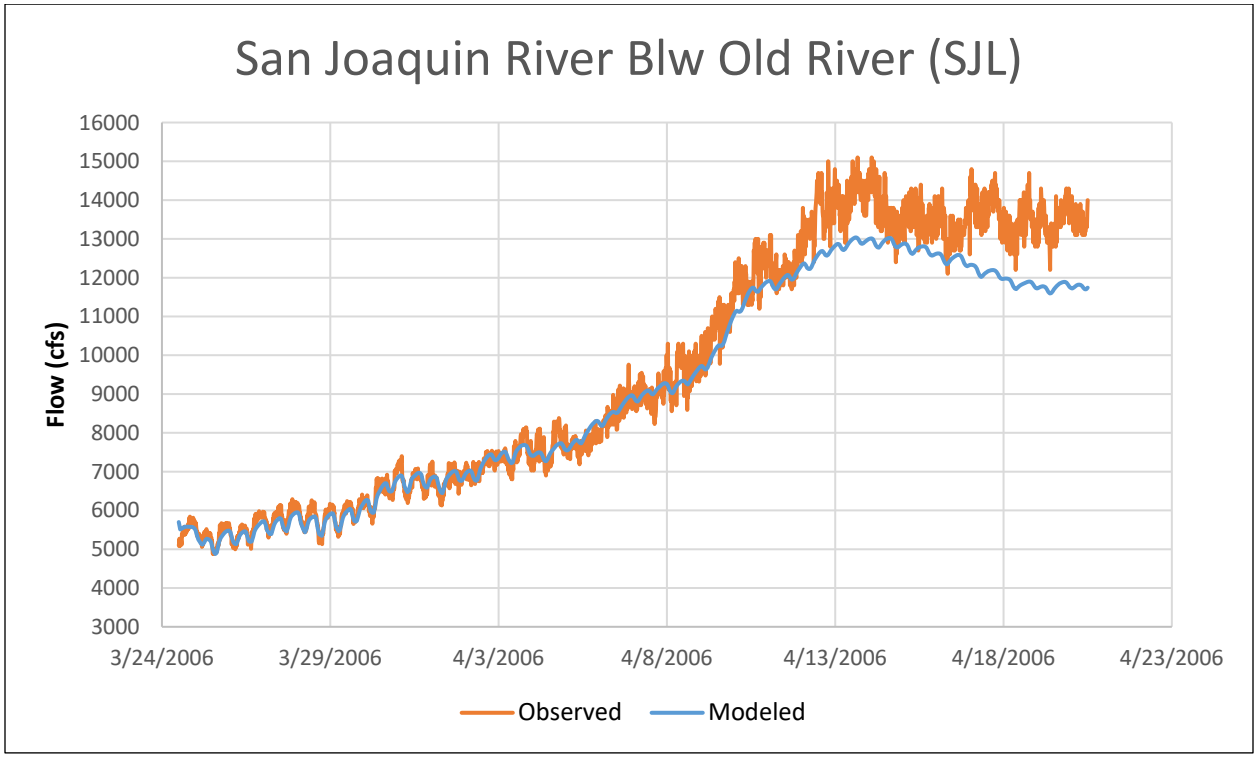


Figure 2-17. Observed Versus Modeled 2006 Flow Hydrographs for San Joaquin River Below Old River.

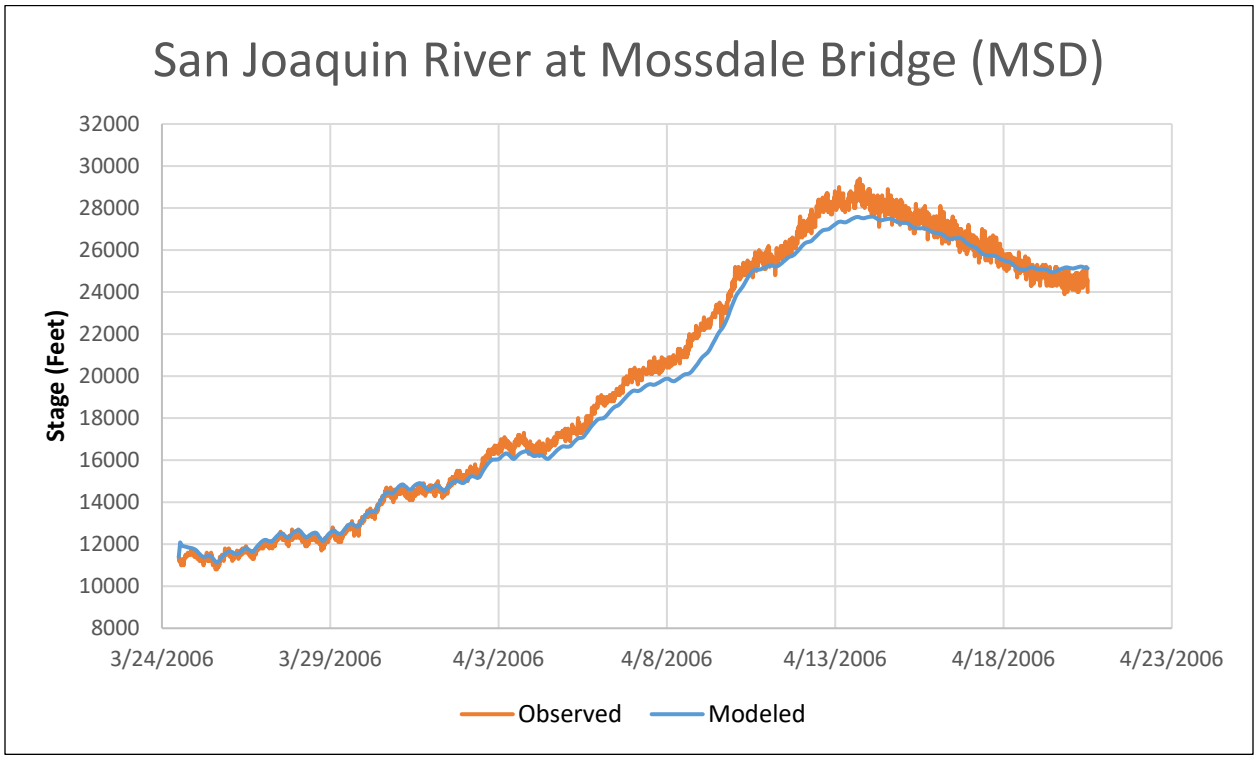


Figure 2-18. Observed Versus Modeled 2006 Flow Hydrographs for San Joaquin River at Mossdale Bridge.

3.0 Hydrology

The hydrology for this model included upstream and downstream boundary condition information for existing (2018) and projected future (2065) with climate change conditions taken from the 2017 Central Valley Flood Protection Plan (CVFPP). The upstream boundary conditions include at-latitude flows (in channel and overbank) for the San Joaquin River at Vernalis, as well as flow inputs for French Camp Slough. The downstream boundary conditions are based on historical Delta stage data on Old River, Middle River, and the San Joaquin River at the Stockton Ship Channel. The 2017 CVFPP updated the hydrology for the whole of the San Joaquin River Basin for each boundary condition except for French Camp inflows because French Camp inflows do not control for the region.

This section details the existing condition and projected 2065 climate change condition hydrology used for this analysis.

3.1 Existing Conditions

3.1.1 Upstream

To model existing conditions, PBI used 2017 CVFPP hydrologic data for inflows into the system for the 10-, 25-, 50-, 100-, 200-, and 500-year return periods. The primary inflow into system and the upstream extents of the HEC-RAS model was the San Joaquin River at Vernalis. This index point includes water in the channel and flow overtopping levees along the San Joaquin and Stanislaus Rivers. The 2017 CVFPP created this data using the Central Valley Hydrologic Study (CVHS) methodology. The following is a simplified step-by-step process of the CVHS methods:

1. Use hydrologic model or historic reservoir inflow information to develop continuous unregulated flow time series at index point location.
2. Create unregulated volume-frequency curves for 1-day, 3-day, 7-day, 15-day, and 30-day durations using Bulletin 17B.
3. Model scaled historic flood events (e.g. 110% of the 1997 event) through ResSIM to develop regulated inflow hydrographs for HEC RAS model. Run these flows in HEC RAS to determine regulated flow time series. These scaled events create estimated low-probability events that have yet to be recorded.
4. Compare unregulated inflow (From step 1) and unregulated volume-frequency curves (from step 2) with the corresponding regulated peak flow for each of the scaled historic events (From step 3) to developed a regulated flow-frequency curve for each historic event. This is done by working from lowest to highest scaled historic regulated events,

determining the unregulated volume that drives the regulated peak flow, and assigning the unregulated volume annual exceedance probability to the regulated peak flow. This step is repeated for all the scaled runs to develop an event-specific flow frequency curve for each event.

5. Combine the regulated flow-frequency curve for the historic events into a single flow-frequency curve.

The 2017 CVFPP updated the Lower San Joaquin River basin HEC RAS model in step 3 using the CVFED TO25 model. This allowed for more accurate hydraulic routing through the San Joaquin River system and improved flow-frequency curves. Figure 3-1 shows the updated flow-frequency curve for existing conditions hydrology for the San Joaquin River at Vernalis index point from the 2017 CVFPP and includes both in channel and overbank flows at Vernalis.

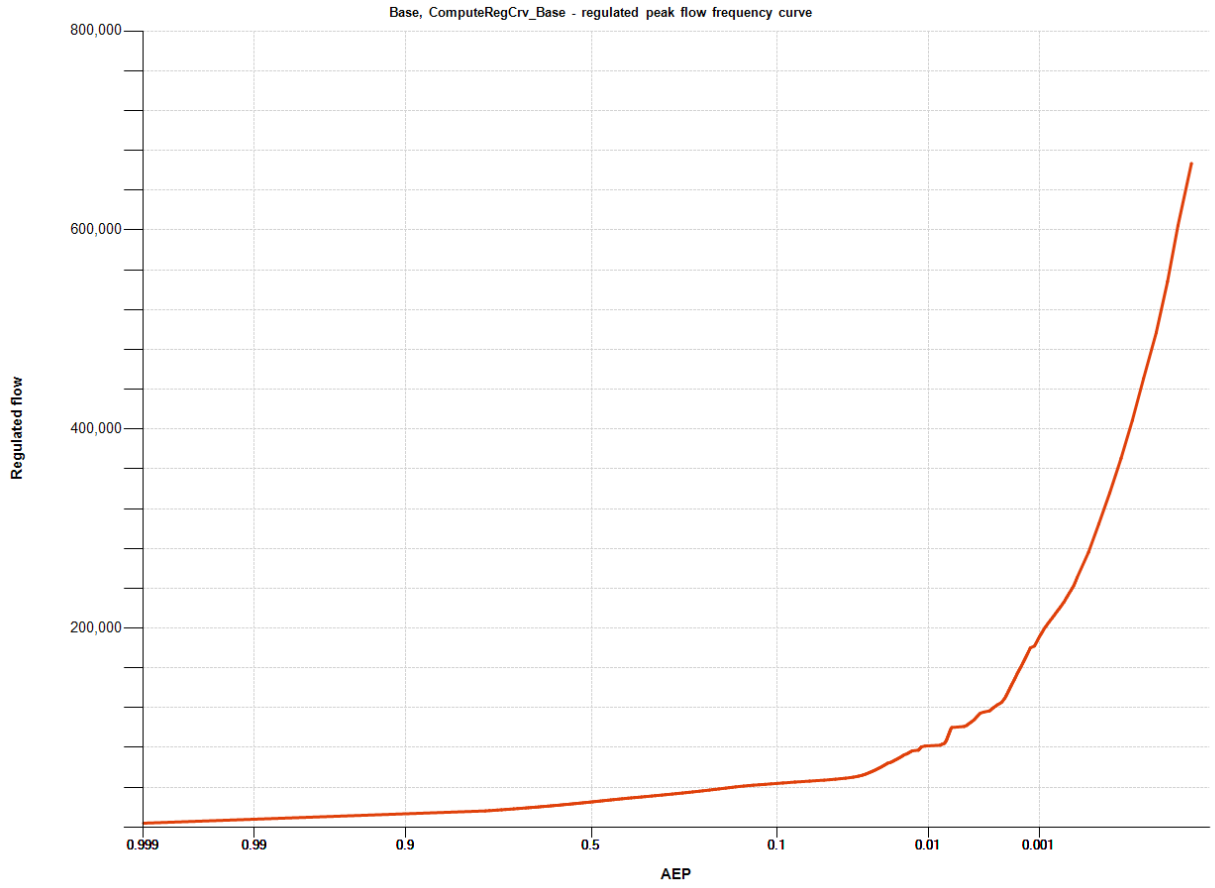


Figure 3-1. Updated flow-frequency curve for the San Joaquin River at the Vernalis at-latitude index point for existing conditions hydrology

From this flow-frequency curve, the 1997 scaled event that most closely matches the peak flow was chosen for the six return periods of interest. The 2017 CVFPP HEC RAS model included breaches throughout the system which does not meet the ULDC requirement that the system be analyzed will levees overtopping without failure. While the breaches in the 2017 CVFPP model do not greatly affect total flow at Vernalis, they do affect where the flow enters the system. Therefore, the scaled historic event that corresponds to the return periods of interest were rerun without breaches and coded into the HEC RAS model. Table 3-1 shows the peak flow for each return period at the Vernalis at-latitiude index point for with- and without-breach scenarios.

Table 3-1. Summary of Peak Flow at Vernalis at-latitude Index Point for existing conditions hydrology

Return Period (Year)	1997 Scale	2017 CVFPP Original Flow (cfs)	Without Breach Flow (cfs)
10	40%	43,868	43,868
25	60%	49,086	49,086
50	80%	64,532	64,532
100	95%	81,625	82,371
200	115%	101,266	95,786
500	140%	136,369	153,864

3.1.2 Downstream

The downstream boundary conditions consist of stage hydrographs at the San Joaquin River at Burns Cutoff, Old River at Grantline Canal, and Middle River at Trapper Slough. The stage at the boundary condition are tidally controlled except during high flow events where they are only tidally influenced. To determine the hydrograph that corresponds to each of the San Joaquin River inflows, CVFPP 2017 used the Resource Management Associates' (RMA) Bay-Delta model. This model uses inflow for the entire Delta including the Sacramento and San Joaquin Rivers and stage hydrograph at the Golden Gate Bridge. Since the RMA Bay-Delta model is a proprietary model, only 10 scenarios were run. Table 3-2 shows which 10 scenarios were run in the RMA Bay-Delta model.

Table 3-2. Summary of Peak Stage at San Joaquin River at Burns Cutoff

Year	Scale	San Joaquin River Vernalis At-Latitude Return Period (Year)	Peak Stage At San Joaquin River at Burns Cutoff (FT NAVD88)
1956	10%	1.5	7.04
1956	100%	50	9.67
1956	120%	80	10.10
1986	40%	6	8.64
1986	60%	10	9.39
1986	100%	25	10.28
1997	115%	200	10.83
1997	140%	500	11.20
1997	160%	1000	11.58
1997	200%	5000	11.96

Of the 10 RMA model runs, only the 1997 115% and 1997 140% coincide with scaled upstream events at the San Joaquin River and could be used directly. In addition, peak stage for the varying scaled historic events are not consistent. For example, the peak stage of 1956 120% (80-year event) is less than the 1986 100% (30-year event). Regardless, from this information the 2012 CVFPP analyzed the correlation of the flows coming down the San Joaquin River to the corresponding Delta stage. Figure 3-2 shows that for the San Joaquin River a 10-year flood event corresponds to a 12-year Delta stage and a 25-year flood event corresponds to a 30-year Delta stage.

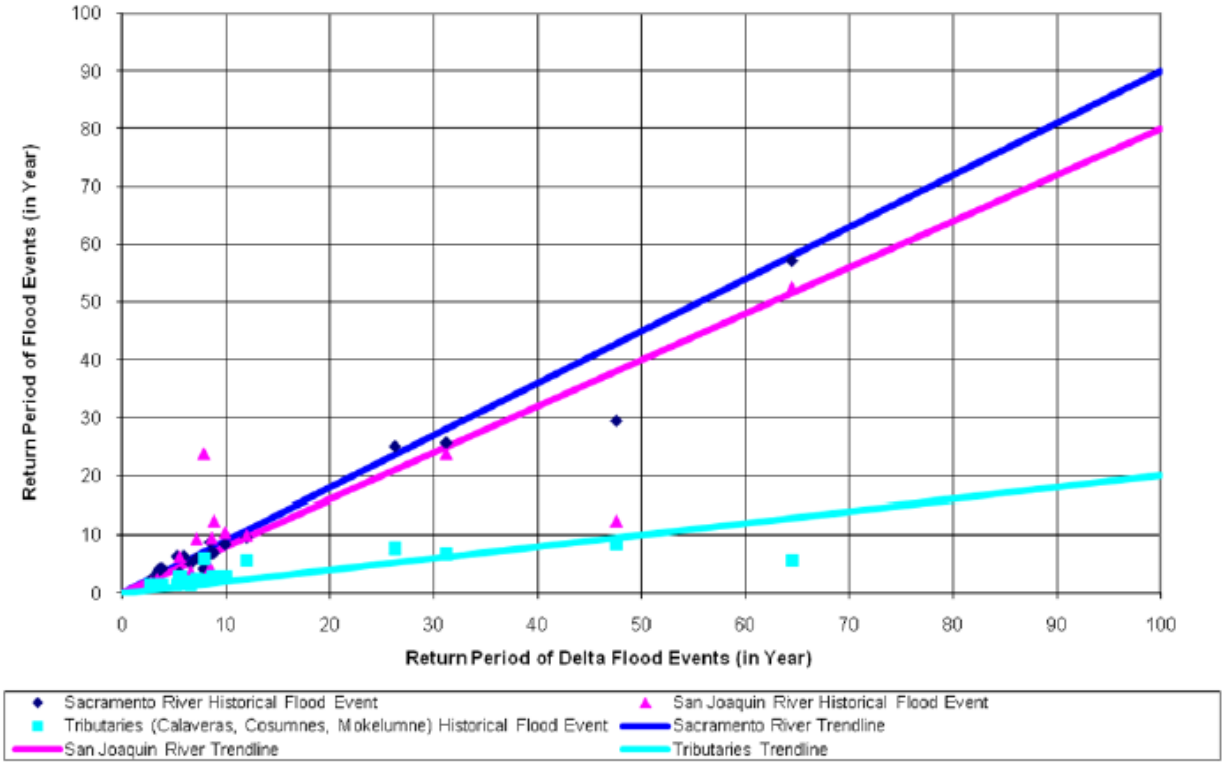


Figure 3-2. Return period of flood events versus delta flood events for San Joaquin River, Sacramento River, and Tributaries

Because the stage of each return periods is different for each boundary condition location, PBI attempted to match the closest scaled RMA model to the corresponding Delta return period at Burns Cutoff. Because the RMA peak stage/return period correlation results are inconsistent it was decided that 1986 event would be used. To do this, a Delta stage-frequency analysis for the San Joaquin River at Burns Cutoff performed by PBI[2] was used to determine the stage for the low return period (10-, 25-, and 50-). Table 3-3 shows the information from Delta Stage Frequency Analysis and the closest corresponding 1986 event.

[2] PBI. *San Joaquin River Delta Base Flood Elevation Refinement Stage Frequency Analysis*. September, 2010.

Table 3-3. Delta Stage Frequency Analysis

Delta Return Period	Stage at Burns Cutoff (Ft NAVD88)	Corresponding SJR inflow return period (From Figure 3-2)	1986 Best Fit Event	Peak 1986 Stage at Burns Cutoff (Ft NAVD88)
12	9.1	10	40%	8.64
30	9.2	25	60%	9.39
62	9.3	50	-	-

From this information, it was approximated that the 1986 40% peak stage represented 1997 40% event (1997 10-year event) and the 1986 60% peak stage represented 1997 60% event (1997 25-year event). While the peak stages do not match identically, they are within 0.5 ft and will not greatly affect the overall hydraulic modeling results. It was decided the peak stage for the 1986 100% event was too high for the 50-year event. For the 50- and 100-year peak stages, the values were interpolated from the peak stages already associated with the given return periods for each boundary condition location.

The peak stages for each boundary condition location for each San Joaquin River return period are shown in Table 3-4.

Table 3-4. Summary of Peak Stages at San Joaquin River Boundary Conditions

Return Period (year)	Peak Stage at Boundary Condition (FT NAVD88)		
	Old River	Middle River	San Joaquin River
10[a]	8.56	8.42	8.64
25[a]	9.55	9.41	9.39
50[b]	10.04	9.88	9.83
100[b]	10.54	10.36	10.17
200	12.35	11.21	10.82
500	14.67	12.35	11.20

[a] These values were matched to the closest available RMA peak stages
[b] These values were interpolated using the RMA results.

For the estimated events, the 1997 downstream boundary conditions were scaled for to match each of the peak stages and coded into the HEC RAS model.

3.2 Projected 2065 Conditions

The boundary conditions for 2065 projected hydrology were derived from data produced as a part of the 2017 CVFPP. The 2017 CVFPP built on previous iterations of the CVFPP, the San Joaquin River Basin Wide Feasibility Study (BWFS), DWR's Climate Change Technical Advisory Group (CCTAG)[3] as well as other supporting documentation. As a general overview of the 2017 CVFPP analysis, three (3) major components contributed to the projected 2065 hydrologic conditions: Sea level rise (SLR), storm surge, and climate change (temperature and precipitation changes).

3.2.1 Sea Level Rise

SLR projections were based on the National Research Council (NRC) analysis[4] which accounted for varying degrees of SLR based on global and regional effects including: glacial melting, El Nino patterns and changes in gravitational pull of ice. This information was used with historical information and numerical models to determine a range of SLR at the Golden Gate Bridge. Table

[3] DWR, CCTAG. *Perspectives and Guidance for Climate Change Analysis.* August, 2015.

[4] National Academy of Sciences. *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*. August, 2012.

3-5 provides the SLR information for the Golden Gate Bridge produced by the NRC.

Table 3-5. NRC-Estimated Value of Future Sea Level Rise at Golden Gate Bridge, California

Year	Range: Low Bound (cm)	Projection (Mean only) (cm)	Range: High Bound (cm)
2030	4.3	14.4	29.7
2050	12.3	28.0	60.8
2062[4]	18.5	38.8 (1.27 feet)	83.1 (2.73 feet)
2100	42.4	91.9	166.4

Source: NRC, 2012
Key:
cm = centimeter(s)

The 2012 CVFPP was originally concerned with a 50-year project of 2062. Since the NRC did not calculate SLR for 2062, a 3rd-order polynomial interpolation was used to estimate the SLR at the Golden Gate Bridge to be 1.27 feet. When the 2017 CVFPP was developing SLR projections DWR decided that 2062 projections would be sufficient to be used for 2067 as well. Since this study is concerned with the 2065 projection it is reasonable to use the 2062 SLR projection data as well.

3.2.2 Storm Surge

When a large storm enters into a tidally controlled region, the low pressure from the storm can induce a rise in the predicted tide. This phenomenon is known as “storm surge.” Since rainfall events are a driving factor for high riverine flow events on the Sacramento and San Joaquin Rivers, the magnitude and timing of the storm surge that corresponds to the rainfall events will affect downstream hydrologic conditions. The 2017 CVFPP determined the timing and magnitude of the storm surge using historic data. The historic data showed the magnitude of the storm surge was correlated to the peak riverine flow, shown in Figure 3-3. While the magnitude was correlated to the riverine flow, the timing of the peak was determined the be approximately 75-hours ahead of the peak riverine inflow regardless of magnitude.

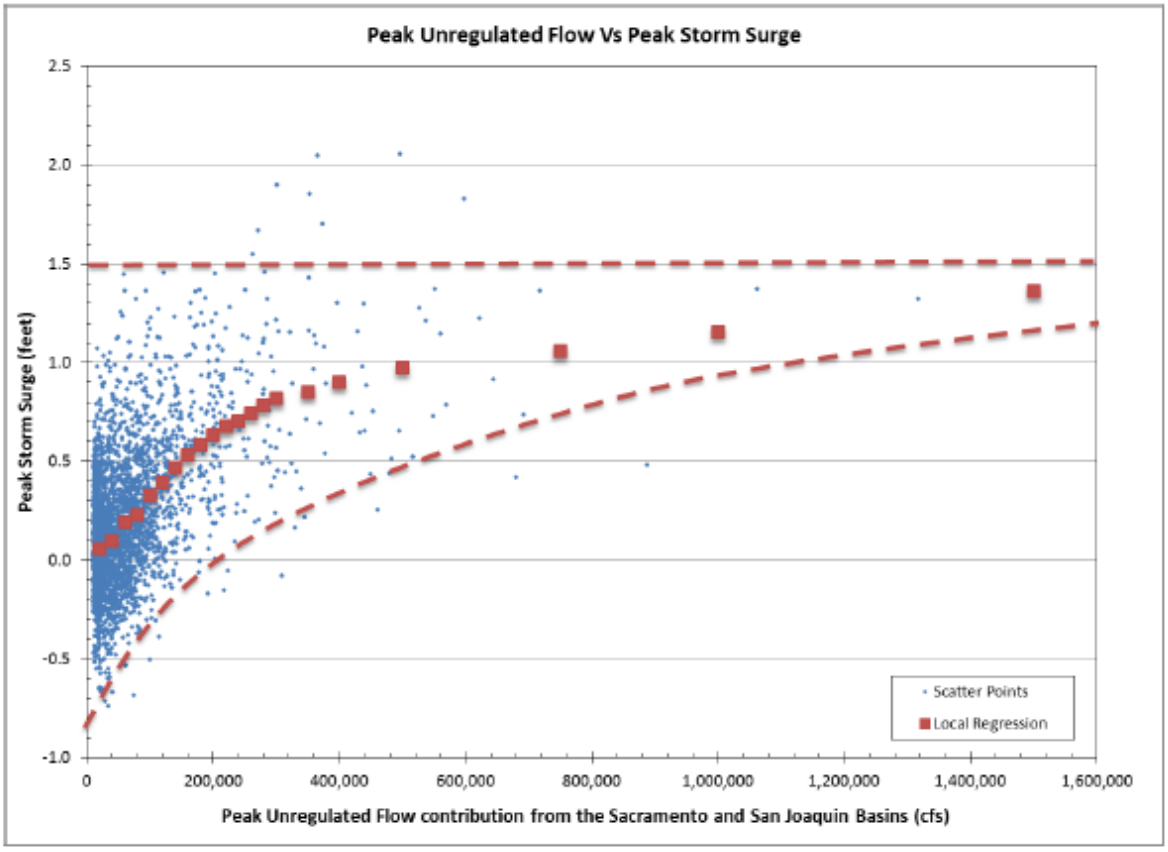


Figure 3-3. Peak Unregulated Flow versus Peak Storm Surge[5]

3.2.3 Climate Change

The San Joaquin River Basin covers a large area which spans an elevation from sea level in the Delta to over 9,800 ft NAVD88 in the Sierra Nevada Mountain Range. The large area and wide range of elevation of the basin creates large flows that derive from snow melt and rainfall runoff. The changes in temperature and precipitation associated with climate change predictions could have a large impact on runoff for the basin and peak flows down the San Joaquin River. To incorporate climate change for this region, the 2017 CVFPP built on an extensive library of models and an array of tools to determine a regulated (i.e. with dams and other flow control structures) flow-frequency curve on the San Joaquin River at Vernalis.

To determine the effects of climate change on the San Joaquin River Basin, the 2017 CVFPP

[5] Department of Water Resources. *"San Joaquin River Basin Wide Feasibility Study: Appendix 5 Estuarine Hydraulics Methodology"* Draft March 2017

started with acquiring temperature and precipitation data from 114 global-scale climate change models. These models produced data points every 70 – 250 miles which is equivalent to about one point for the entire San Joaquin River Basin. These models were too coarse to be used directly and thus downscaled using two methods: Ensemble-Informed method and Locally Organized Constructed Analog method. While these methods vary in approach, both group the data by scenario and use statistical methods to downscale the global climate data to provide climate change values data points every 3.75 miles. This created spatially-varied climate change with normally distributed data at each point.

To translate climate data to flow, a Variable Infiltration Capacity (VIC) macroscale hydrologic routing model of the San Joaquin River Basin was used. The VIC model uses rainfall, snow melt, infiltration and other hydrologic parameters to estimate the amount of water that would be expected in an unregulated (i.e. with dams and flow control structures) system. 96 years (1915 – 2010) of historic temperature and rainfall data was coded into the model with the climate change effect randomly added based on the normally-distributed spatially-varied data. Running the VIC model produced 96 years of continuous unregulated flow data with climate change for various points within the Central Valley including the San Joaquin River at Vernalis.

The VIC climate change model results were then compared to the same VIC without climate change model results at various point throughout the basin. This comparison resulted in climate change scale factors which were then applied to CVHS unregulated flow-frequency curves described in Section 3.1.1. The climate change regulated flow-frequency curves were then calculated from the unregulated flow-frequency curves with climate change scale factors applied using CVHS methodology also detailed in Section 3.1.1. This resulted in regulated flow-frequency curves with the effects of climate change incorporated.

Figure 3-4 shows the 2065 projected climate change regulated flow-frequency curve for San Joaquin River at the Vernalis.

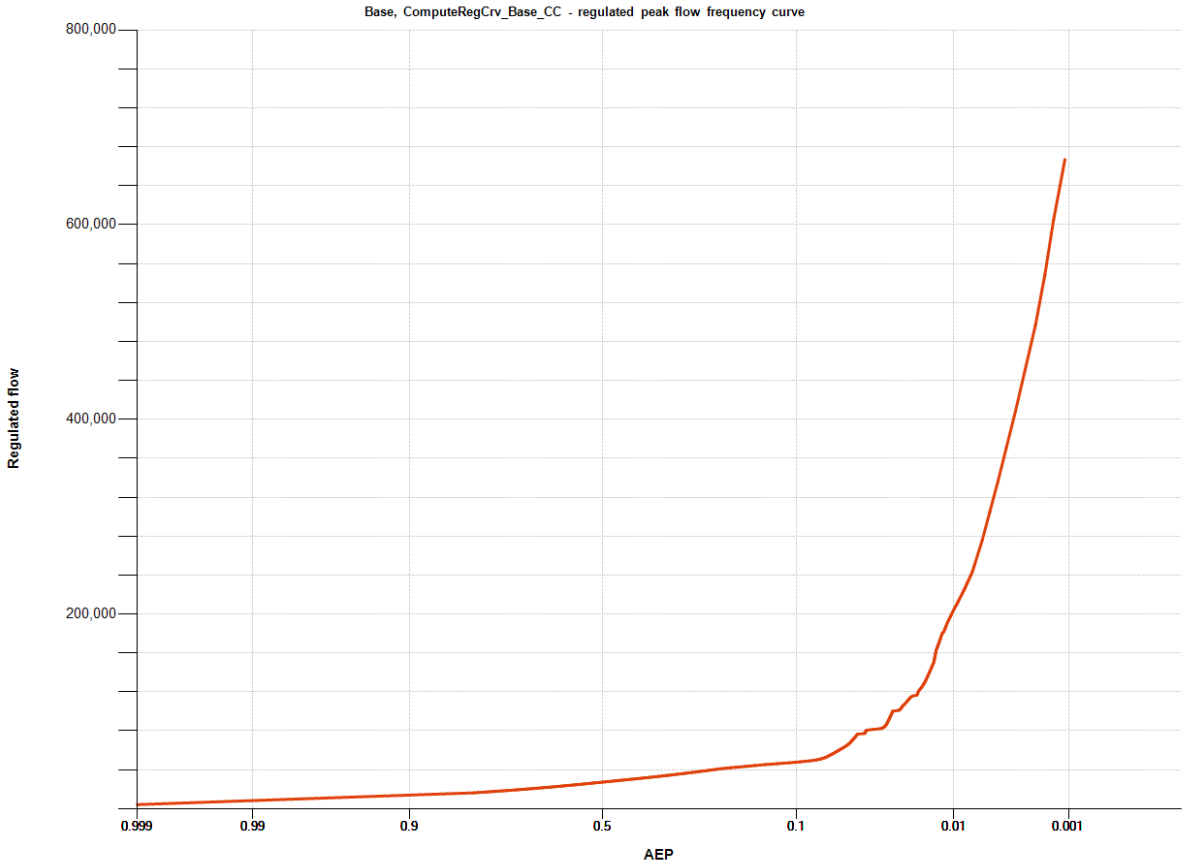


Figure 3-4. Projected 2065 climate change regulated flow-frequency curve for the San Joaquin River at the Vernalis at-latitude index point

From this flow-frequency curve, corresponding scaled 1997 events were chosen, shown in Table 3-6. Scaled 1997 events were developed by CVFPP[6] in the same manner as current condition hydrology (discussed in Section 3.1) with the updated CVFED HEC RAS model. This model was updated using high resolution terrain, bridge surveys and bathymetry. This model also included numerous breaches throughout the San Joaquin River Basin including along the Stanislaus River directly upstream of the San Joaquin River. Per ULDC guidance, the breaches from this model were removed and the model was rerun for each of the flow frequencies under a levees holding scenario. While this did not change the total Vernalis At-Latitude flow, it did change where the flow entered the model. Without breaches, more water entered the San Joaquin River channel

[6] DWR. *Basin-Wide Feasibility Study (BWFS) San Joaquin Basin*, Central Valley Flood Protection Plan (CVFPP). March, 2017.

and less entered over land.

Table 3-6. Summary of 2065 Climate Change Flow Frequency at Vernalis

Return Period (Year)	Flow (cfs)	1997 Scale
10	47,745	60%
25	80,635	95%
50	115,611	120%
100	203,679	160%
200	310,064	200%
500	503,536	260%

3.2.4 Downstream Boundary Conditions

The downstream boundary conditions were developed in a similar way as the existing conditions hydrology. The 2017 CVFPP ran the same RMA model runs as the existing conditions hydrology except with climate change included. The 1997 RMA with climate change model runs matched three (3) San Joaquin River return periods (50-, 100-, and 200-year). These RMA model results were used as downstream boundary conditions directly. Since the 25-year San Joaquin River Vernlias At-latitude flow frequency is the 1997 95% run, the RMA 1997 100% results are a close conservative approximation and was thus used. For the 10-year event the 1986 60% RMA results were used based on the existing conditions boundary conditions discussed in section 3.1.2.

The 500-year peak stages were initially extrapolated from the RMA peak stages but this produced unrealistically high values. The extrapolated stages were several feet above the top of the surrounding levees which would not be realistic. The amount of volume required to flood the Delta to stages several feet above surrounding levee would be far more than the 260% 1997 scaled event coming down the San Joaquin River. For this reason, the 200% 1997 event was also used for the 500-year event.

Table 3-7 shows the peak stage elevation for each of the boundary conditions.

Table 3-7. Summary of Peak Stage Elevations at Downstream Boundary Conditions

Return Period (year)	Peak Stage at Downstream Boundary Condition (FT NAVD88)		
	Old River	Middle River	San Joaquin River
10[a]	10.65	10.55	10.50
25	11.40	11.21	11.12
50	12.87	11.67	11.64
100	15.46	13.04	12.14
200	18.20	13.56	12.46
500 [b]	18.20	13.56	12.46

[a] These values were estimated using known 1997 scaled event peak stages
[b] This value was set to the 200-year event

3.3 2040 Hydrologic Conditions

Each project alternative is being designed to 200-year ULDC standards for 2040 hydrologic conditions. The hydrologic information provided by the 2017 CVFPP does not include projected 2040 climate change condition information. The projected 2040 climate change hydrology was estimated using linear interpolation between the peak flow of the current 200-year hydrograph and the peak flow of the 2065 200-year hydrograph. The 160% scaled 1997 event best matched this interpolated peak flow and was used as the 2040 200-year. Table 3-8 shows the 2040 200-year hydrology information.

Table 3-8. 200-year Event Flows at Vernalis for Current Hydrology and for Future Projected Climate Change Hydrology.

Return Period (year)	2015		2040		2065	
	Flow (cfs)	Scale	Flow (cfs)	Scale	Flow (cfs)	Scale
200	95,786	115%	202,925	160%	310,064	200%

The 2040 200-year event matches the 2065 100-year event, and therefore the 2065 100-year downstream tidal boundary conditions were used for the 2040 event. Table 3-9 shows the peak stage at each of the downstream boundary conditions.

Table 3-9. Summary of Peak Stage Elevations at Boundary Conditions for 2040 hydrologic conditions

Return Period (year)	Peak 2040 Stage at Boundary Condition (FT NAVD88)		
	Old River	Middle River	San Joaquin River
200	15.46	13.04	12.14

4.0 Alternative Features

4.1 Hydraulic Modeling

To evaluate the alternatives for the UFRR Study, model geometries were created from the original without-project calibrated model geometry previously described. Since Alternatives 1 and 2 have the same levee improvements except for the setback levee at river mile 52 (which has no hydraulic impact on the analysis as discussed below), the model geometry and results are identical for the purposes of determine floodplains. For all the alternatives, the levees that were to be improved and the tie back levee extension were raised to the 200-year 2040 WSE plus 3 feet. Additionally, Alternative 3 had a secondary levee added which was also designed to be the 200-year 2040 WSE plus 3 feet.

4.2 Multi-Benefit Features

Each of the proposed alternatives have the same multi-benefit features except for the River Mile 52 (RM 52) wildlife habitat multi-benefit feature on the San Joaquin River. The RM 52 feature will be added in Alternatives 2 and 3 but will not be included in Alternative 1. This feature would be created by adding a setback levee on the right bank of San Joaquin River and degrading the existing San Joaquin River levee downstream of Old River in three locations. (Figure 2-19) The RM 52 region would be regraded to allow for backwater flows. This feature was proposed by DWR in the 2012 CVFPP to increase amount of wildlife habitat in the region.

To model the hydraulic impacts of the RM 52 setback feature, a 2D flow area connection was added to serve as a setback levee. Elevation of the connection varied linearly between the elevations of the northern and southern intersections with existing levees (30.5 ft NAVD88 and 31.68 ft NAVD88, respectively). To model the levee degradation, three (3) 100-foot wide cuts were made in the right bank of the San Joaquin River.



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Mossdale Tract Area

RM 52 Study Area

FIGURE

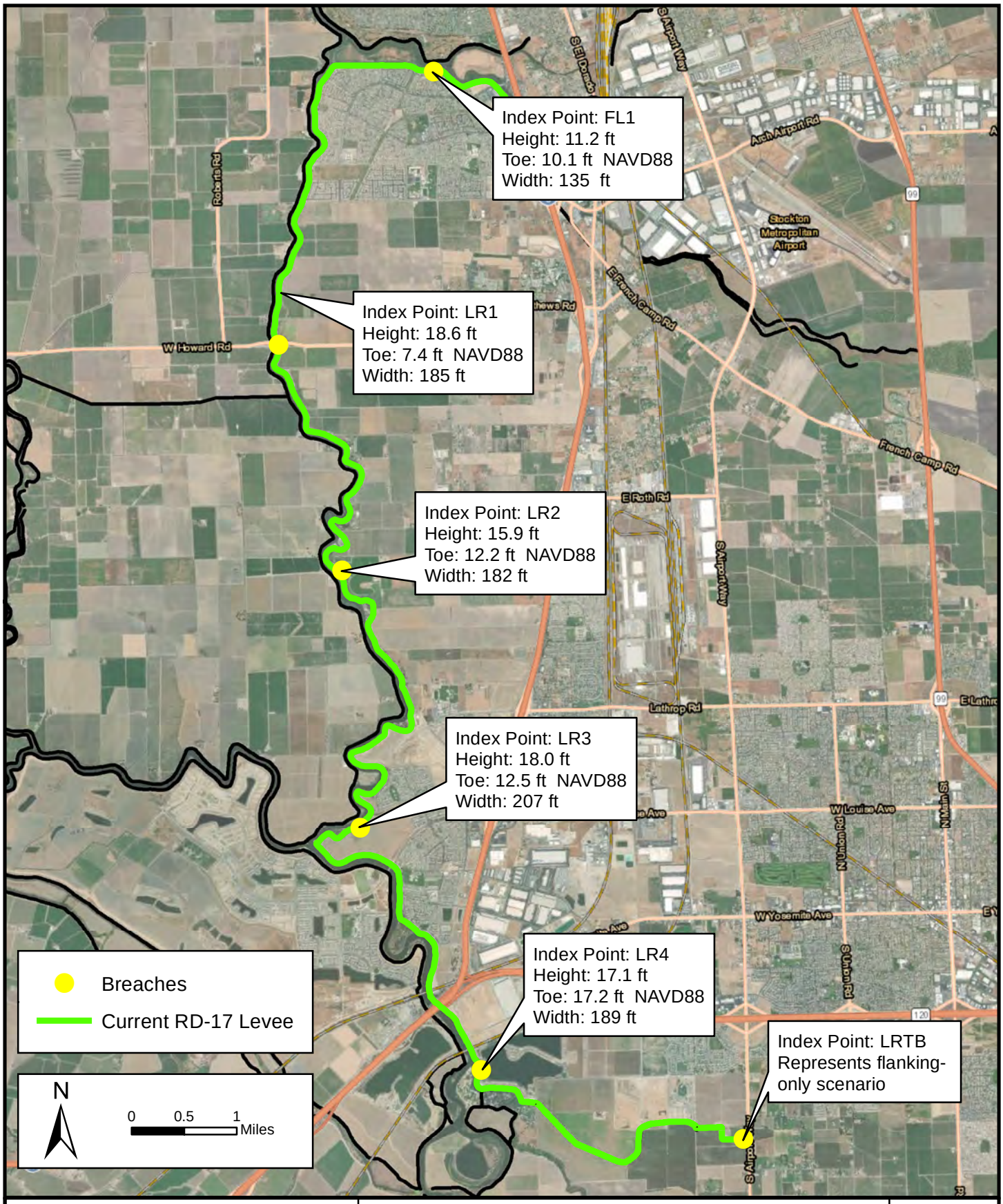
4-1

5.0 Breach Modeling

For the purposes for evaluating each of the alternatives, the UFRR study chose six (6) index point locations based on the 2017 CVFPP analyses. Each of the index points require an associated breach to evaluate the damages associated with a failure at this location. One location is on French Camp Slough (FL1), four are located along the San Joaquin River (LR1 – LR4) and one is located at the end of the dryland tie back levee (LRTB). Because LRTB is at the end of the levee, for without project conditions, LRTB represents flooding that flanks the levee.

The physical breach parameters were determined using the same method used by USACE in the LSRFS. The calculator was developed from a peer reviewed scientific paper[7] and estimates breach width and progression based on levee height. The breach trigger was set to be 0.1 feet below the peak water surface elevation for each return period and location. The breach parameters were kept the same for with- and without-project scenarios except for LRTB. LRTB index point is a flanking scenario for the without-project conditions and therefore does not have a levee breach associated with it. Figure 5-1 shows the breach location and parameters.

[7] Coleman, Stephen E., Andrews, Darryl P., Webby, M. Grant. "Overtopping Breaching of Noncohesive Homogeneous Embankments." *Journal of Hydraulic Engineering*, vol. 128, no. 9. September, 2002.



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Mossdale Tract Area

Index Points & Breach Parameters

FIGURE

5-1

5.1 Relief Cut

The Mossdale Tract levees have a relief cut planned as an emergency response measure in the event that the basin experienced deep ponding. The relief cut is located on the north end near the confluence of French Camp Slough and the San Joaquin River. Per ULDC flood mapping standards, the water surface elevation (WSE) of floodplains can be reduced to the lowest elevation of the levee height to account for relief cuts that would be added during a flood event. For the Mossdale Tract levees, the lowest levee elevation is 19.3 NAVD88 located on French Camp Slough.

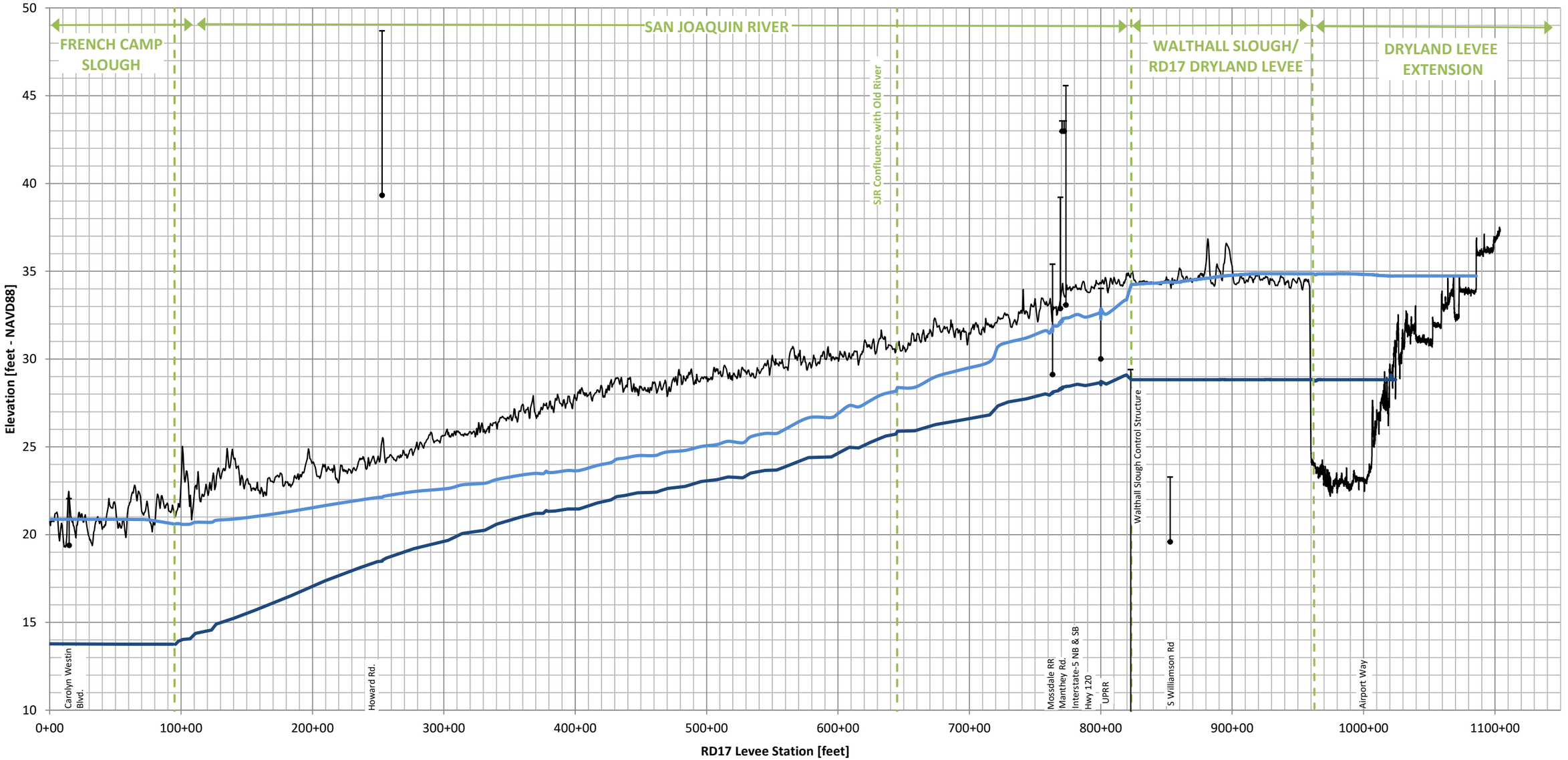
To account for the relief cut scenario and to reduce the WSE in the floodplain to the top of levee elevation, those lateral structures were altered to be a flat weir at elevation 19.3 NAVD88. The weir coefficient was then set to 10,000 which forced enough flow over the lateral structure to maintain the 19.3 ft NAVD88 elevation. The only scenarios that this did not work for were scenarios when the WSE in the French Camp Slough channel was over 19.3 ft NAVD88. For these high flow scenarios, the weir coefficient was set to a standard value of 3 and floodplain elevations were not reduced lower than the receiving water elevations.

6.0 Results

The modeling effort of this study resulted in 193 unique scenarios including three (3) hydrologic conditions, six (6) return periods, six (6) index points, and three (3) project alternative scenarios.

6.1 Water Surface Profiles

Water surface profiles were created for each of the relevant 200-year events for the Mossdale Tract levees and each proposed alternative. Figure 6-1 shows the updated 200-year water surface profiles for the existing and 2065 conditions. Figure 6-2 shows the 200-year water surface profile for Alternatives 1 and 2. Figures 6-3 and 6-4 show the 200-year water surface profile for the Alternative 3 levee and the secondary levee, respectively.



LEGEND

- RD17 Top of Levee
- Stream Junction
- Bridge (Max. Low Chord; Min. OT Elev.)
- PBI 2015 200-year Water Surface Profile
- PBI 2065 200-Year Water Surface Profile

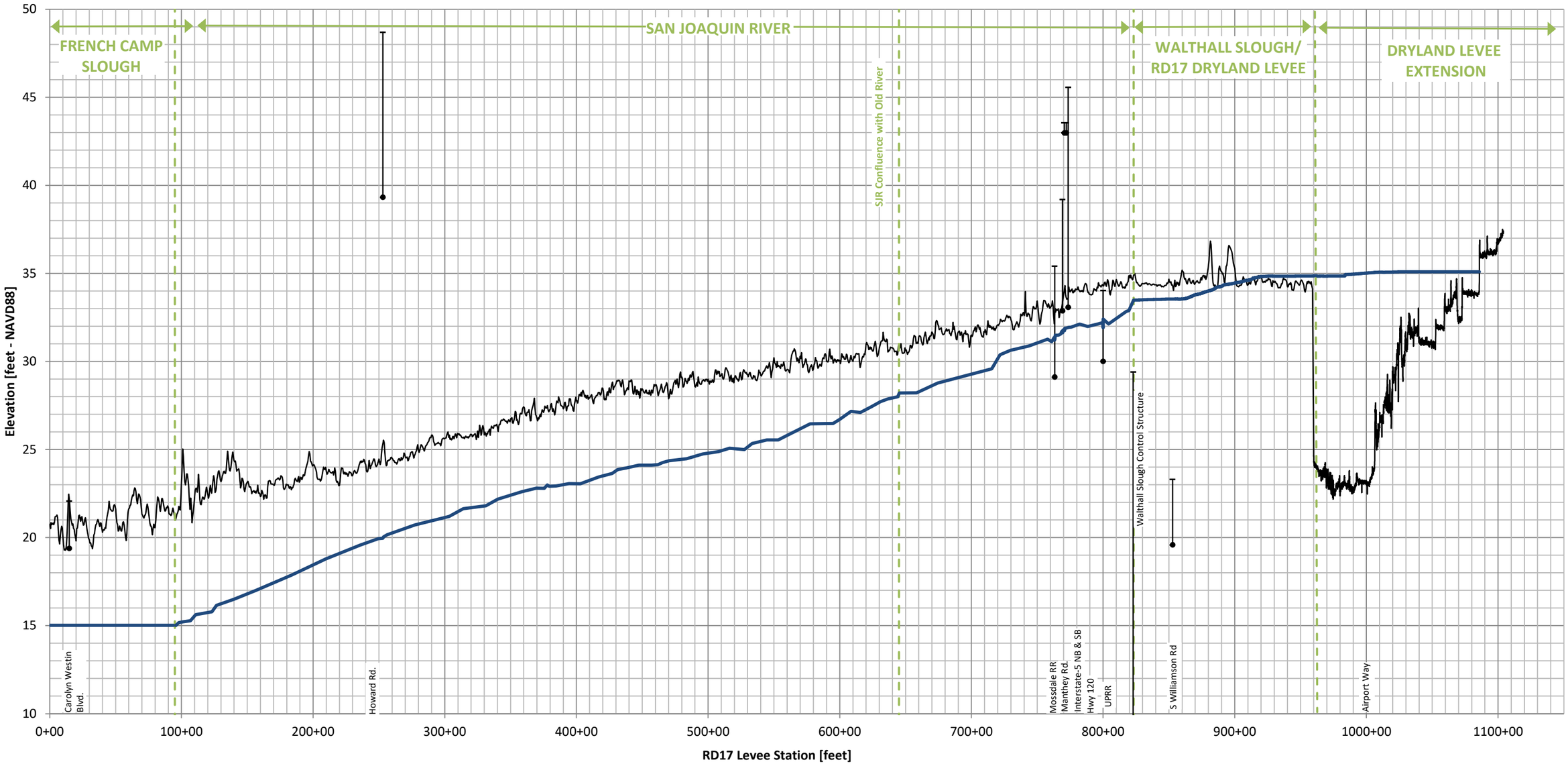
May 2019

Figure 6-1

MOSSDALE TRACT AREA
URBAN FLOOD RISK REDUCTION STUDY

200-year Water Surface Profile
along the RD17 Levee Alignment
-WITHOUT PROJECT-

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LEGEND

- RD17 Top of Levee
- Stream Junction
- Bridge (Max. Low Chord; Min. OT Elev.) PBI 200-year Alternatives 1&2
- Water Surface Profiles

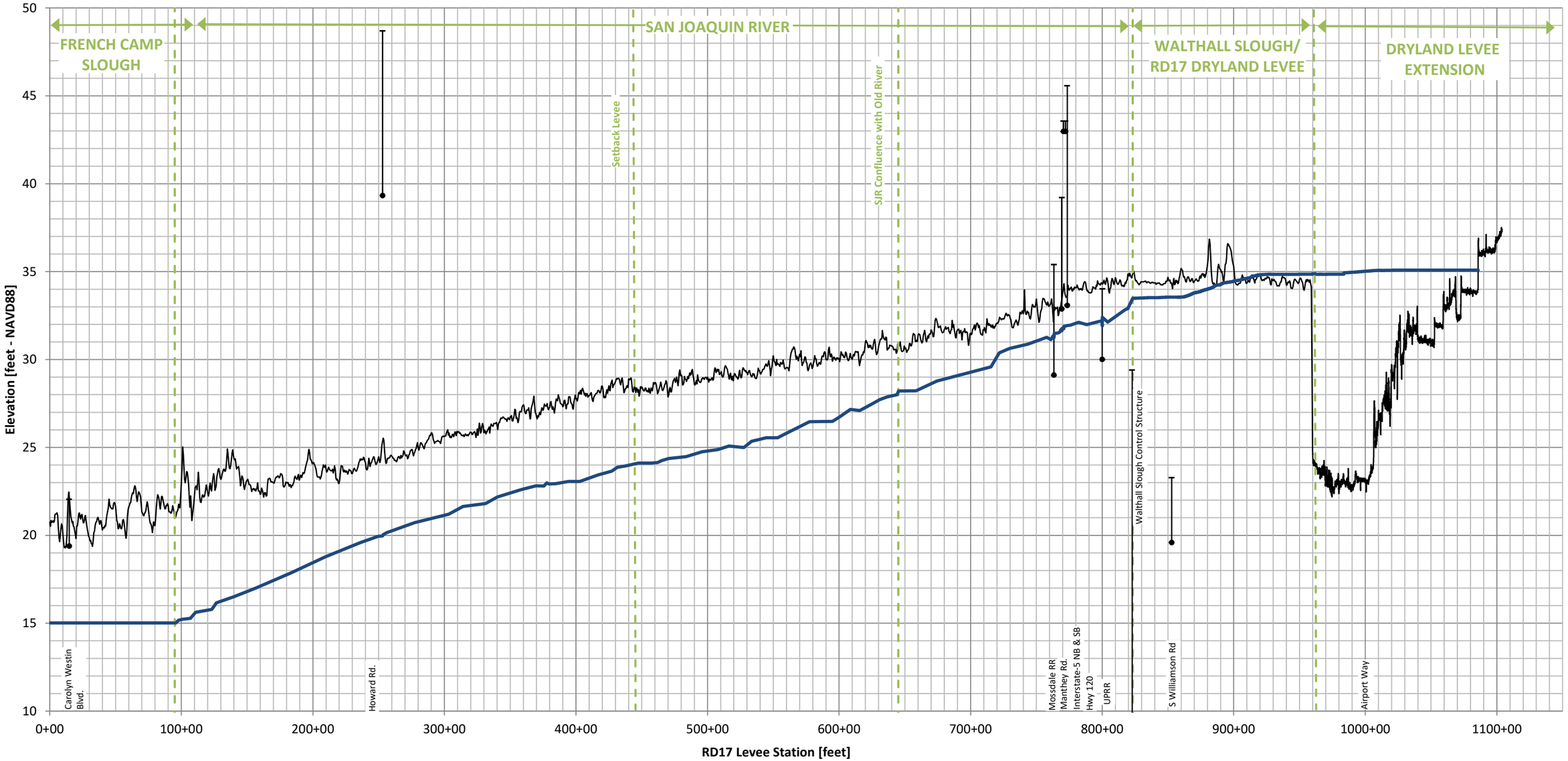
May 2019

Figure 6-2

MOSSDALE TRACT AREA
URBAN FLOOD RISK REDUCTION STUDY

200-year 2040 Water Surface Profile
along the RD17 Levee Alignment
- Alternative 1 and 2-

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LEGEND

- RD17 Top of Levee
- Stream Junction
- Bridge (Max. Low Chord; Min. OT Elev.)
- PBI 200yr 2040 Alternative 3 Water Surface Profile

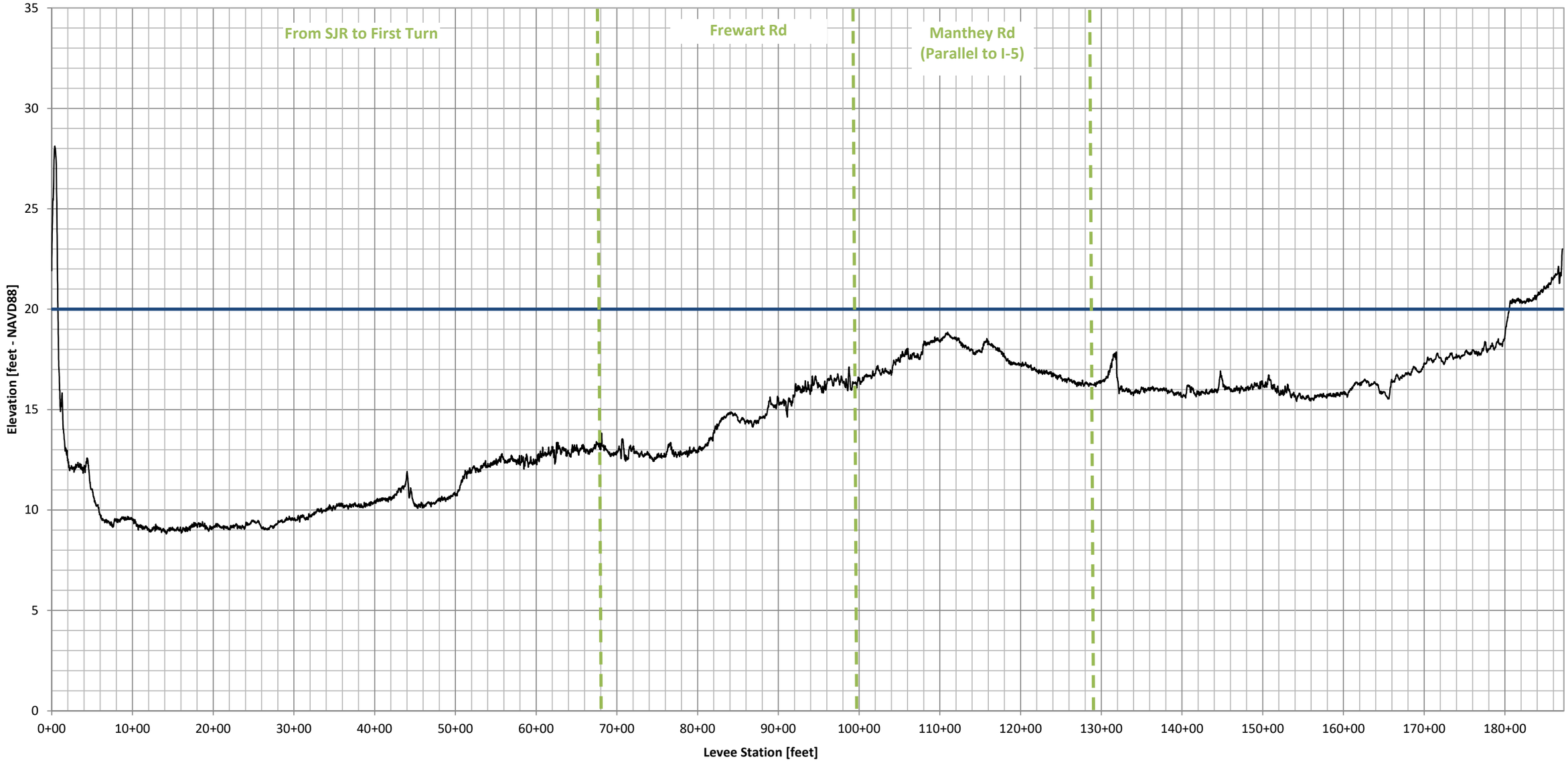
June 2019

FIGURE 6-3

MOSSDALE TRACT AREA
URBAN FLOOD RISK REDUCTION STUDY

200-year 2040 Water Surface Profile
along the RD17 Levee Alignment
-Alternative 3-

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LEGEND

- Existing Ground Elevation
- PBI 2040 200-year Alternative 3 Water Surface Profile

MOSSDALE TRACT AREA
URBAN FLOOD RISK REDUCTION STUDY

200-year Water Surface Profile
along Alternative 3 Secondary Levee

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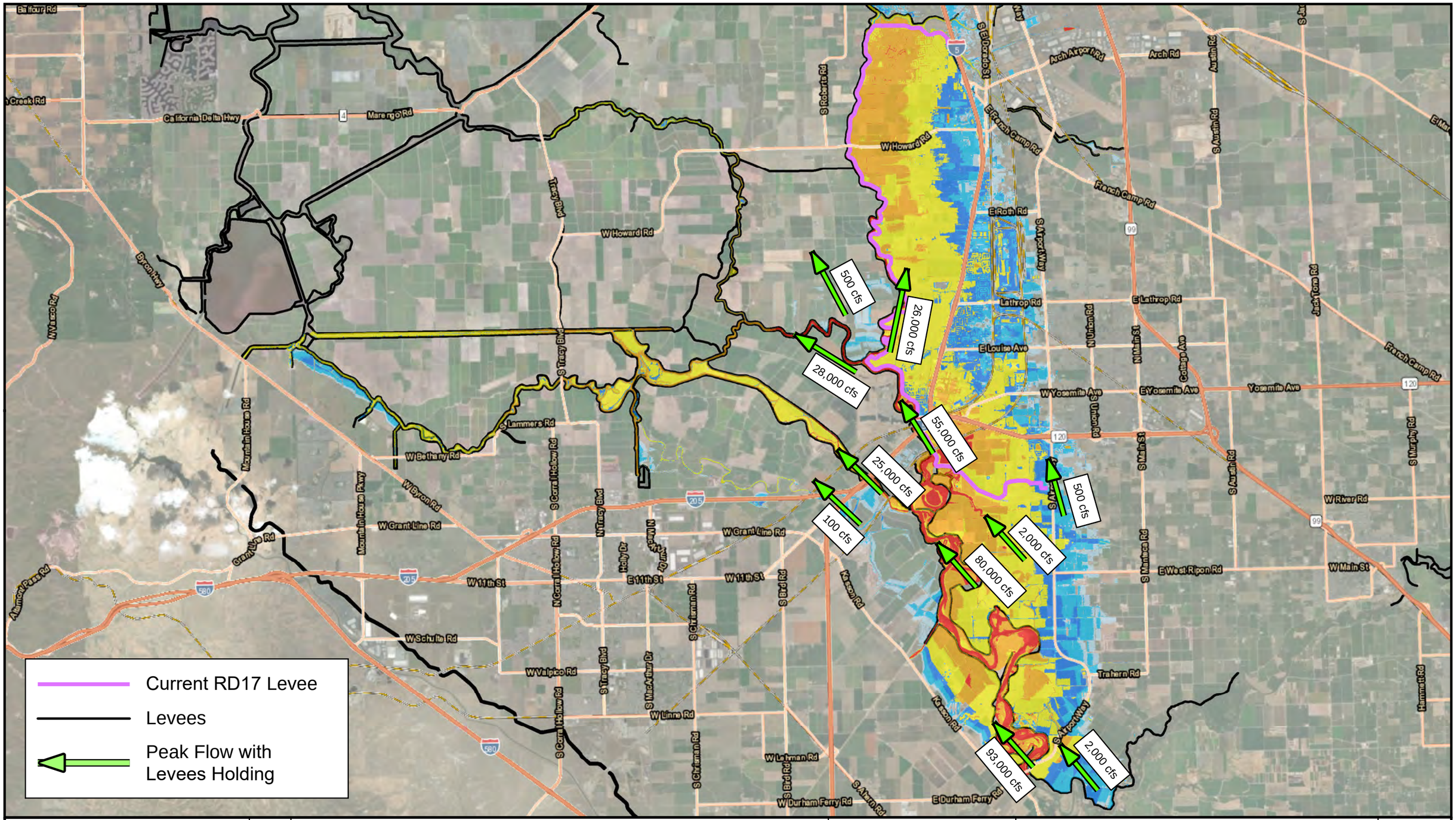
Figure 6-4

June 2019

6.2 Floodplains

Floodplains showing maximum depth and flow paths were created for each of the relevant 200-year events. Figure 6-5 and Figure 6-6 show the 200-year floodplains for the existing and 2065 conditions, respectively. Figure 6-7 shows the 200-year floodplain for Alternatives 1 and 2 under the design 2040 hydrologic conditions. Figures 6-8 show the 2040 200-year floodplain for Alternative 3. The 200-year floodplains for every scenario for the Mossdale Tract Area are provided in Appendix B.

It is important to note that within the timeframe of this UFRR study, the RD 2062 levees on Stewart Tract were improved to 200-year standards. The hydraulic modeling for this study predates the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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N

Depth (ft)

0 - 1	1 - 3	3 - 5	5 - 10	10 - 15	> 15

0 1 2 Miles

1 in = 2 miles

Mossdale Tract Area

Current Conditions 200-Year Composite Floodplain

FIGURE

6-5

Current RD17 Levee

Levees

Peak Flow with Levees Holding

12,000 cfs
32,000 cfs
35,000 cfs
50,000 cfs
30,000 cfs
80,000 cfs
55,000 cfs
40,000 cfs
23,000 cfs
70,000 cfs
53,000 cfs
110,000 cfs
85,000 cfs
50,000 cfs
110,000 cfs
195,000 cfs

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N

Depth (ft)

0 - 1	1 - 3	3 - 5	5 - 10	10 - 15	> 15

0 1 2 Miles

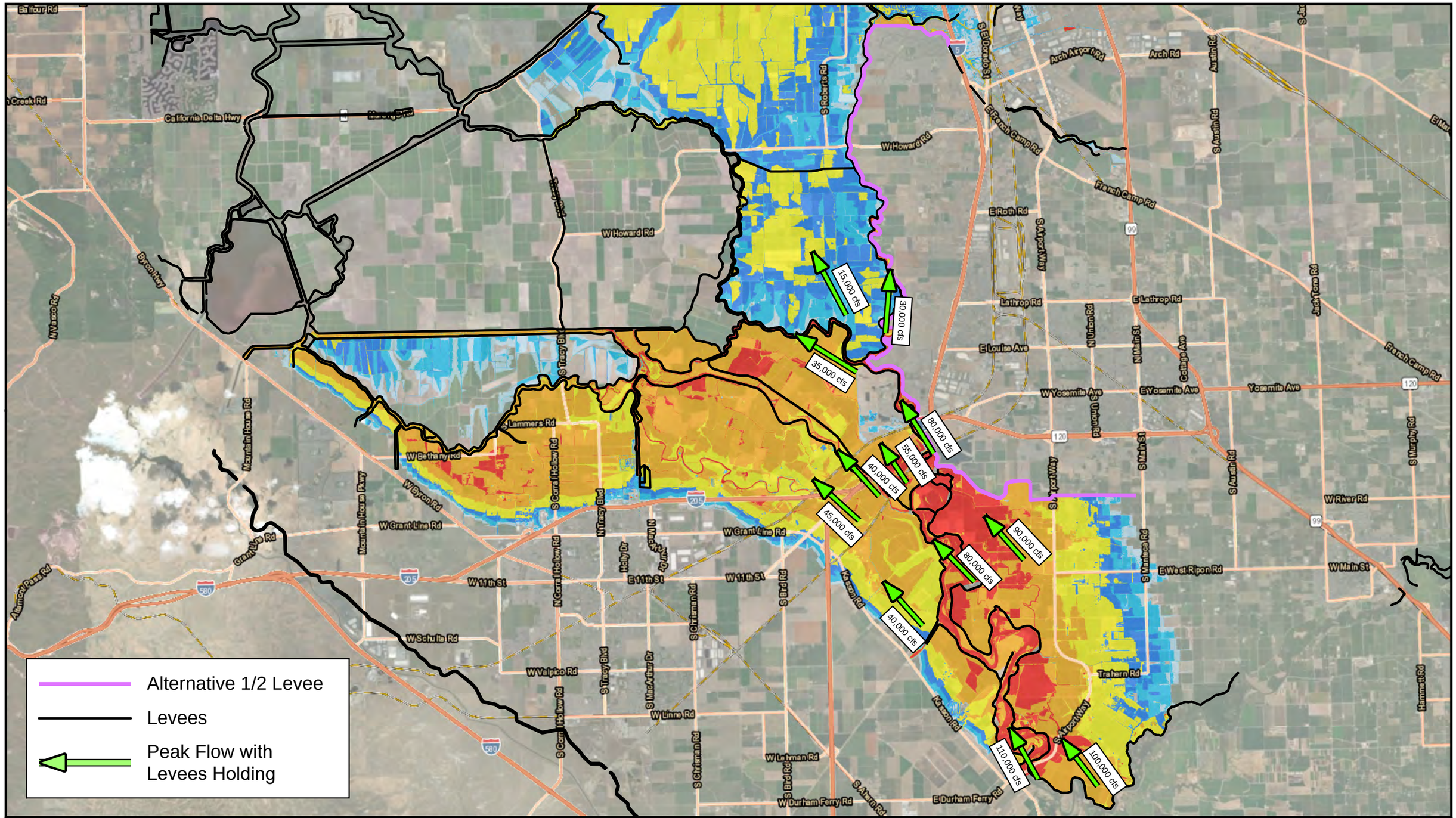
1 in = 2 miles

Mossdale Tract Area

2065 Climate Change Without Project 200-Year Composite Floodplain

FIGURE 6-6

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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N

Depth (ft)

0 - 1	1 - 3	3 - 5	5 - 10	10 - 15	> 15

0 1 2 Miles

1 in = 2 miles

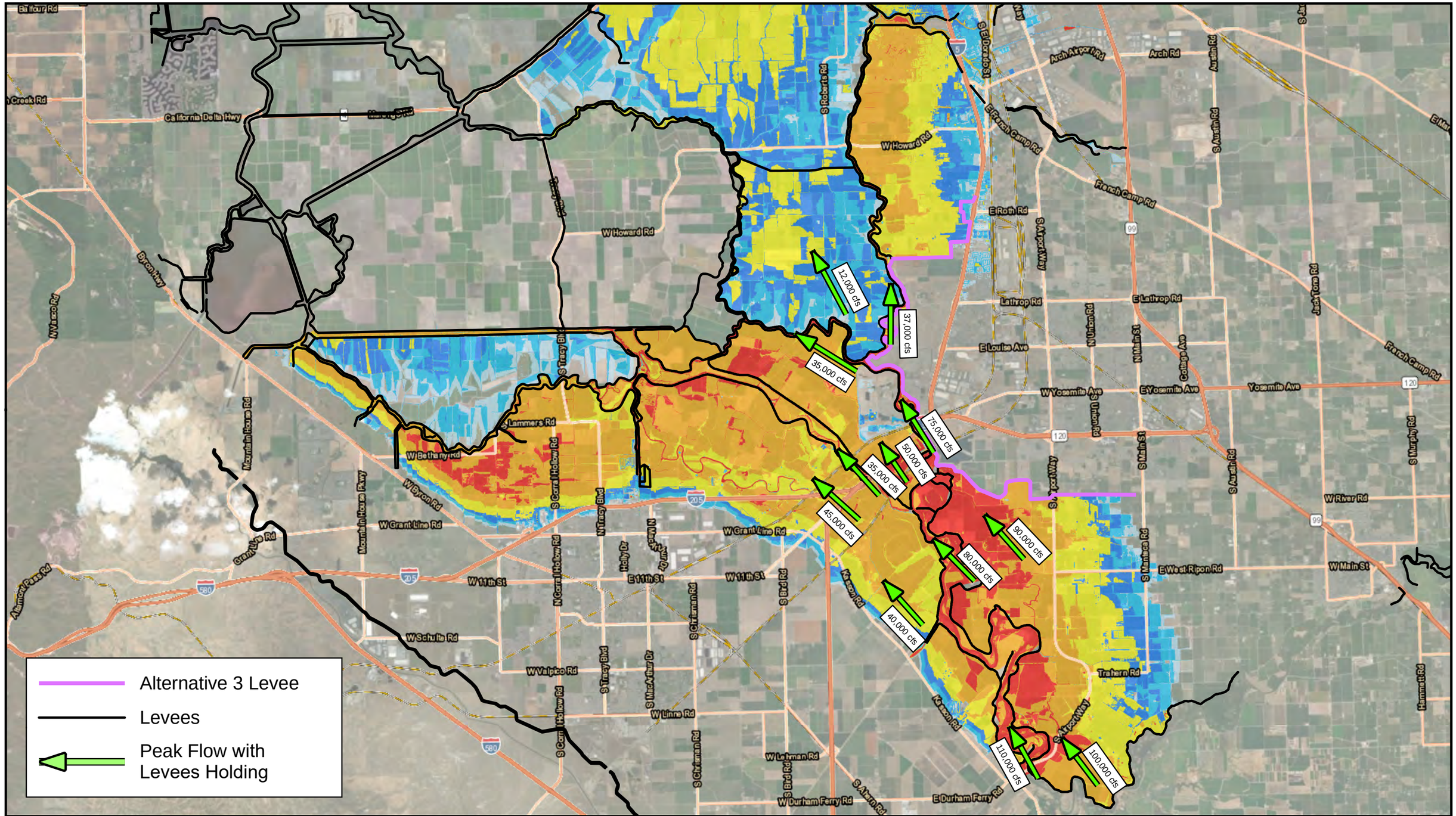
Mossdale Tract Area

2040 Climate Change
Alternative 1/2
200-Year Composite Floodplain

FIGURE

6-7

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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N

Depth (ft)

0 - 1	1 - 3	3 - 5	5 - 10	10 - 15	> 15

0 1 2 Miles

1 in = 2 miles

Mossdale Tract Area

2040 Climate Change
Alternative 3
200-Year Composite Floodplain

FIGURE
6-8

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.

6.3 Multi-Benefit Features

The model was run with the addition of the RM 52 multi-benefit feature shown in Figure 4-1 for 10, 25, 50, 100, 200, and 500-year existing conditions hydrology scenarios. The results from these model runs compared to the Alternative 1 without RM 52 results shows that there is very little change in flow or stage up and downstream of the project site. The greatest changes occur during the 500-year event. Table 6-1 shows the difference in flow and stage for with- and without RM 52 setback levee for 4 locations: San Joaquin River upstream of Old River, San Joaquin River downstream RM 52, San Joaquin River at breach location LR1, and on Old River downstream of the San Joaquin. This table shows that the resulting changes to both flow and water surface elevation due to the addition of the RM 52 feature are minimal.

Table 6-1 Comparison of the RM 52 mutli-benefit feature during 500-year event

	San Joaquin River Upstream of Old River		**San Joaquin River Downstream of RM52**		**San Joaquin River At Breach Location LR1**		**Old River Downstream of San Joaquin River**	
	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)
Without RM52	70492	28.7	30390	25.3	28467	19.3	34129	27.2
With RM52	71178	28.7	31418	25.5	28790	19.4	33938	27.1
Difference	**686**	**0.0**	**1028**	**0.2**	**323**	**0.1**	**-191**	**-0.1**
Difference (%)	**1.0**	**0.0**	**3.4**	**0.8**	**1.1**	**0.5**	**-0.6**	**-0.4**

Appendix A

HEC-RAS N-Value and Ineffective Flow Area Tabulation

SJR				Original							Modified								
	Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5	n #6	n #7	n #1	n #2	n #3	n #4	n #5	n #6	n #7	n #8	n #9
1	6	32.69875 SJR_2015	n	0.045	0.0438	0.055					0.045	0.0416	0.055						
2	6	32.63985 SJR_2010	n	0.045	0.0438	0.045					0.045	0.0416	0.045						
3	6	32.61409 SJR_2005	n	0.045	0.0438	0.04					0.045	0.0416	0.04						
4	6	32.60709 SJR_2000	Bridge																
5	6	32.59781 SJR_1995	n	0.055	0.075	0.04	0.0438	0.04			0.055	0.075	0.04	0.075	0.04	0.0416	0.055	0.075	0.04
6	6	32.59762 R_172119_SJR	Lat Struct																
7	6	32.59743 L_172118_SJR	Lat Struct																
8	6	32.55368 SJR_1990	n	0.075	0.0438	0.045					0.2274	0.075	0.0416	0.045	0.0893	0.1367			
9	6	32.43682 SJR_1985	n	0.045	0.0438	0.055					0.045	0.0416	0.055						
10	6	32.27168 SJR_1980	n	0.045	0.0438	0.055					0.045	0.0416	0.055						
11	6	32.27130 L_170396_SJR	Lat Struct																
12	6	32.10501 SJR_1975	n	0.045	0.0438	0.055					0.045	0.0416	0.055						
13	6	31.83229 SJR_1970	n	0.045	0.0438	0.075					0.045	0.0416	0.075						
14	6	31.83210 R_168077_SJR	Lat Struct																
15	6	31.54575 SJR_1965	n	0.045	0.0438	0.045					0.045	0.0416	0.045						
16	6	31.54537 R_166563_SJR	Lat Struct																
17	6	31.21734 SJR_1960	n	0.045	0.0438	0.055					0.045	0.0416	0.055						
18	6	31.21696 R_164829_SJR	Lat Struct																
19	6	31.21678 L_164828_SJR	Lat Struct																
20	6	31.06034 SJR_1955	n	0.055	0.0438	0.055					0.055	0.0416	0.055						
21	6	30.75031 SJR_1950	n	0.055	0.0438	0.055					0.055	0.0416	0.055						
22	6	30.75012 L_162364_SJR	Lat Struct																
23	6	30.55353 SJR_1945	n	0.045	0.0438	0.055					0.045	0.0416	0.055						
24	6	30.55315 L_161324_SJR	Lat Struct																
25	6	30.34388 SJR_1940	n	0.045	0.0438	0.055					0.045	0.0416	0.055						
26	6	29.94900 SJR_1935	n	0.045	0.0438	0.04					0.045	0.0416	0.04						
27	6	29.94881 R_158133_SJR	Lat Struct																
28	6	29.94862 L_158132_SJR	Lat Struct																
29	6	29.69995 SJR_1930	n	0.045	0.0438	0.04					0.045	0.0416	0.04						
30	6	29.42477 SJR_1925	n	0.04	0.0438	0.075					0.04	0.0416	0.075						
31	6	29.23026 SJR_1921	n	0.045	0.0438	0.075					0.045	0.0416	0.075						
32	6	29.22989 R_154337_SJR	Lat Struct																
33	6	29.22970 L_154336_SJR	Lat Struct																
34	6	29.22856 L_154330_SJR	Lat Struct																
35	6	28.94144 SJR_1920	n	0.04	0.0438	0.04					0.04	0.0416	0.04						
36	6	28.71796 SJR_1915	n	0.04	0.0438	0.045					0.04	0.0416	0.045						
37	6	28.71778 R_151633_SJR	Lat Struct																
38	6	28.53653 SJR_1910	n	0.04	0.0438	0.045					0.04	0.0416	0.045						
39	6	28.31608 SJR_1905	n	0.055	0.0438	0.04					0.055	0.0416	0.04						
40	6	28.20263 SJR_1900	n	0.055	0.04	0.055	0.0438	0.055			0.055	0.04	0.055	0.04	0.0416	0.0416	0.0416	0.055	0.055
41	6	28.20226 R_148911_SJR	Lat Struct																
42	6	27.95794 SJR_1895	n	0.04	0.035	0.0438	0.075				0.04	0.035	0.04	0.0416	0.0416	0.0416	0.04		
43	6	27.57859 SJR_1890	n	0.04	0.035	0.0438	0.04				0.04	0.035	0.0332	0.0416	0.0416	0.04	0.04		
44	6	27.33428 SJR_1875	n	0.04	0.0438	0.04					0.04	0.0416	0.0416	0.0416	0.04				
45	6	27.33409 R_144327_SJR	Lat Struct																
46	6	27.11232 SJR_1870	n	0.04	0.0438	0.04	0.075				0.04	0.0416	0.0416	0.04	0.04	0.04			
47	6	27.11213 R_143155_SJR	Lat Struct																
48	6	26.93902 SJR_1865	n	0.04	0.045	0.0438	0.075	0.045	0.055		0.04	0.04	0.04	0.0416	0.04	0.04	0.04		
49	6	26.93864 R_142239_SJR	Lat Struct																

50	6	26.69812 SJR_1860	n	0.04	0.055	0.0438	0.045				0.04	0.04	0.04	0.0416	0.0416	0.0416	0.04	0.04	
51	6	26.69774 R_140967_SJR	Lat Struct																
52	6	26.37104 SJR_1855	n	0.04	0.0438	0.04					0.04	0.0416	0.04						
53	6	26.37066 L_139240_SJR	Lat Struct																
54	6	25.96992 SJR_1850	n	0.04	0.0438	0.04					0.04	0.0416	0.04						
55	6	25.75591 SJR_1845	n	0.04	0.0438	0.04					0.04	0.0416	0.04						
56	6	25.56689 SJR_1840	n	0.055	0.0438	0.04					0.04	0.0416	0.04						
57	6	25.56651 L_134994_SJR	Lat Struct																
58	6	25.30553 SJR_1835	n	0.045	0.0438	0.04					0.04	0.0416	0.04						
59	6	25.30535 R_133615_SJR	Lat Struct																
60	6	25.30516 L_133614_SJR	Lat Struct																
61	6	25.10421 SJR_1830	n	0.04	0.0438	0.04					0.04	0.0416	0.04						
62	6	24.83055 SJR_1820	n	0.045	0.0438	0.04					0.04	0.0416	0.04						
63	6	24.56976 SJR_1810	n	0.045	0.0438	0.045					0.04	0.0416	0.04						
64	6	24.56938 R_129729_SJR	Lat Struct																
65	6	24.43548 L_129022_SJR	Lat Struct																
66	6	24.43510 SJR_1800	n	0.045	0.0438	0.045					0.04	0.04	0.0416	0.04	0.04				
67	6	24.4 L_129022_SJR	Lat Struct																
68	6	24.24647 L_128024_SJR	Lat Struct																
69	6	24.24628 SJR_1790	n	0.04	0.0438	0.045	0.04				0.04	0.04	0.0416	0.04	0.04	0.04	0.04		
70	6	24.00784 L_126764_SJR	Lat Struct																
71	6	24.00764 SJR_1780	n	0.04	0.0438	0.055	0.04				0.04	0.04	0.0416	0.04	0.04	0.04			
72	6	24.00727 R_126761_SJR	Lat Struct																
73	6	23.74932 SJR_1770	n	0.055	0.0438	0.04					0.04	0.0416	0.04						
74	6	23.74913 L_125398_SJR	Lat Struct																
75	6	23.58606 SJR_1760	n	0.045	0.0438	0.04					0.04	0.04	0.04	0.0416	0.04				
76	6	23.58568 R_124535_SJR	Lat Struct																
77	6	23.37035 SJR_1750	n	0.04	0.0438	0.04	0.055	0.04	0.055		0.04	0.04	0.0416	0.04	0.04	0.04	0.04		
78	6	23.14024 SJR_1740	n	0.055	0.0438	0.055	0.04	0.045			0.04	0.04	0.0416	0.04	0.04	0.04			
79	6	23.13986 R_122181_SJR	Lat Struct																
80	6	23.03172 SJR_1730	n	0.055	0.0438	0.045					0.04	0.04	0.0416	0.04					
81	6	23.03134 L_121608_SJR	Lat Struct																
82	6	22.95880 SJR_1720	n	0.045	0.0438	0.045					0.04	0.0416	0.09						
83	6	22.76354 SJR_1710	n	0.04	0.055	0.0438	0.045				0.04	0.09	0.0416	0.04					
84	6	22.76335 R_120193_SJR	Lat Struct																
85	6	22.59480 R_119303_SJR	Lat Struct																
86	6	22.59442 SJR_1700	n	0.04	0.055	0.0438	0.075				0.0684	0.0897	0.0416	0.04					
87	6	22.48476 SJR_1690	n	0.04	0.0438	0.055					0.0684	0.0416	0.0897						
88	6	22.17757 SJR_1680	n	0.055	0.035	0.0438	0.04				0.0939	0.057	0.0476	0.0416	0.0476	0.0651			
89	6	22.09386 SJR_1670	n	0.055	0.0438	0.04					0.0939	0.0416	0.0651						
90	6	22.09348 L_116656_SJR	Lat Struct																
91	6	22.00788 SJR_1660	n	0.055	0.0438	0.045					0.0939	0.0416	0.0732						
92	6	21.87379 SJR_1650	n	0.04	0.0438	0.045					0.0684	0.0416	0.0732						
93	6	21.72796 SJR_1640	n	0.04	0.0438	0.055					0.0684	0.0416	0.0897						
94	6	21.72777 R_114725_SJR	Lat Struct																
95	6	21.72758 L_114724_SJR	Lat Struct																
96	6	21.48554 SJR_1630	n	0.045	0.0438	0.055					0.0771	0.0416	0.0897						
97	6	21.25998 SJR_1620	n	0.055	0.0438	0.055	0.035	0.04			0.0939	0.0416	0.0897	0.057	0.0651				
98	6	21.08706 SJR_1610	n	0.045	0.0438	0.04					0.0771	0.0476	0.0416	0.0651					
99	6	21.08668 L_111340_SJR	Lat Struct																
100	6	20.97608 L_110756_SJR	Lat Struct																
101	6	20.97570 SJR_1600	n	0.035	0.035	0.04	0.055				0.0597	0.0416	0.0651	0.0897					
102	6	20.82059 SJR_1590	n	0.035	0.035	0.04	0.055	0.035	0.055		0.0597	0.0416	0.0651	0.0897	0.057	0.0897			

103	6	20.82021 R_109933_SJR	Lat Struct																
104	6	20.50942 SJR_1580	n	0.035	0.035	0.04	0.035	0.055			0.0597	0.0332	0.0651	0.057	0.0897				
105	6	20.50923 R_108291_SJR	Lat Struct																
106	6	20.50904 L_108290_SJR	Lat Struct																
107	6	20.33102 SJR_1570	n	0.04	0.035	0.04	0.035	0.055			0.0684	0.0332	0.0651	0.057	0.0897				
108	6	20.18197 SJR_1560	n	0.055	0.035	0.045					0.0939	0.0332	0.0555	0.0732					
109	6	20.02155 SJR_1550	n	0.075	0.035	0.045					0.1281	0.0332	0.0732						
110	6	20.02118 L_105714_SJR	Lat Struct																
111	6	20.01	Lat Struct																
112	6	19.75110 SJR_1540	n	0.04	0.075	0.035	0.045				0.0623	0.111	0.0332	0.0666	0.035	0.055			
113	6	19.75092 R_104287_SJR	Lat Struct								(Not in Modified Model)								
114	6	19.64902 SJR_1530	n	0.04	0.035	0.045					0.0623	0.0332	0.0332	0.0332	0.0666	0.04	0.066		
115	6	19.64883 Copy of SJR_1530	n	0.04	0.035	0.045					(Not in Modified Model)								
116	5	19.43577 Copy of SJR_1520	n	0.04	0.055	0.03	0.045				(Not in Modified Model)								
117	5	19.43558 SJR_1520	n	0.04	0.055	0.03	0.045				0.04	0.055	0.0285	0.045					
118	5	19.43539 R_102621_SJR	Lat Struct																
119	5	19.43520 L_102620_SJR	Lat Struct																
120	5	19.35736 SJR_1510	n	0.055	0.03	0.045					0.0496	0.0285	0.0406						
121	5	19.35017 SJR_1500	Bridge																
122	5	19.34316 SJR_1460	n	0.045	0.03	0.045					0.0406	0.0285	0.0406						
123	5	19.34297 R_102133_SJR	Lat Struct																
124	5	19.34278 L_102132_SJR	Lat Struct																
125	5	19.27308 SJR_1450	n	0.045	0.03	0.045					0.0447	0.0314	0.0447						
126	5	19.13938 SJR_1440	n	0.045	0.03	0.045					0.0447	0.0314	0.0447						
127	5	19.03066 SJR_1430	n	0.045	0.03	0.04					0.0447	0.0314	0.0397						
128	5	18.91438 SJR_1420	n	0.055	0.03	0.04					0.0546	0.0314	0.0397						
129	5	18.87631 SJR_1410	n	0.055	0.03	0.04					0.0546	0.0314	0.0397						
130	5	18.84468 SJR_1300_1400	Bridge																
131	5	18.83597 SJR_1220	n	0.045	0.03	0.04					0.0447	0.0314	0.0397						
132	5	18.82707 SJR_1210	n	0.045	0.03	0.04					0.0447	0.0314	0.0397						
133	5	18.81950 SJR_1200	Bridge																
134	5	18.81325 SJR_1120	n	0.045	0.03	0.04					0.0447	0.0314	0.0397						
135	5	18.80245 SJR_1110	n	0.045	0.03	0.04					0.0447	0.0314	0.0397						
136	5	18.79658 SJR_1100	Bridge																
137	5	18.78559 SJR_1040	n	0.045	0.03	0.045					0.0447	0.0314	0.0447						
138	5	18.78540 R_99189_SJR	Lat Struct																
139	5	18.78522 L_99188_SJR	Lat Struct																
140	5	18.76476 SJR_1030	n	0.045	0.03	0.045					0.0447	0.0314	0.0447						
141	5	18.72878 SJR_1020	n	0.045	0.03	0.045					0.0447	0.0314	0.0447						
142	5	18.67404 SJR_1010	n	0.045	0.03	0.04					0.0447	0.0314	0.0397						
143	5	18.66476 SJR_1000	Bridge																
144	5	18.65662 SJR_995	n	0.04	0.03	0.045					0.0397	0.0314	0.0447						
145	5	18.65643 L_98508_SJR	Lat Struct																
146	5	18.65624 R_98507_SJR	Lat Struct																
147	5	18.60473 SJR_990	n	0.04	0.03	0.045					0.0397	0.0314	0.0447						
148	5	18.54393 SJR_985	n	0.04	0.03	0.045					0.0397	0.0314	0.0447						
149	5	18.27992 SJR_980	n	0.045	0.03	0.055					0.0447	0.0314	0.0546						
150	5	18.07803 SJR_975	n	0.055	0.03	0.045					0.0546	0.0314	0.0447						
151	5	18.07765 L_95452_SJR	Lat Struct																
152	5	17.67198 SJR_970	n	0.035	0.03	0.075					0.0347	0.0314	0.0744						
153	5	17.67179 R_93309_SJR	Lat Struct																
154	5	17.26460 SJR_965	n	0.04	0.03	0.055					0.0397	0.0314	0.0546						
155	5	17.26441 L_91158_SJR	Lat Struct																

156	5	17.26423 R_91157_SJR	Lat Struct																	
157	5	16.86158 SJR_960	n	0.04	0.03	0.055					0.0397	0.0314	0.0546							
158	5	16.86139 L_89030_SJR	Lat Struct																	
159	5	16.55856 SJR_955	n	0.04	0.03	0.055					0.0397	0.0314	0.0546							
160	5	16.24739 SJR_950	n	0.04	0.03	0.055					0.0397	0.0314	0.0546							
161	5	16.24720 R_85787_SJR	Lat Struct																	
162	5	16.24701 L_85786_SJR	Lat Struct																	
163	5	15.96539 SJR_945	n	0.035	0.03	0.045					0.0347	0.0314	0.0447							
164	5	15.96520 Copy of SJR_945	n	0.035	0.03	0.045					0.0347	0.0314	0.0447							
165	3	15.90478 Copy of SJR_940	n	0.04	0.03	0.055					0.0663	0.0315	0.0663							
166	3	15.90459 SJR_940	n	0.04	0.03	0.055					0.0663	0.0315	0.0663							
167	3	15.90440 R_83977_SJR	Lat Struct																	
168	3	15.90421 L_83976_SJR	Lat Struct																	
169	3	15.72145 SJR_935	n	0.04	0.03	0.075					0.0663	0.0315	0.0902							
170	3	15.72126 L_83010_SJR	Lat Struct																	
171	3	15.72108 R_83009_SJR	Lat Struct																	
172	3	15.62505 SJR_930	n	0.035	0.03	0.075					0.0663	0.0315	0.0902							
173	3	15.50801 SJR_925	n	0.075	0.03	0.05					0.0902	0.0315	0.0663							
174	3	15.37203 SJR_920	n	0.065	0.03	0.05					0.0783	0.0315	0.0663							
175	3	15.27392 SJR_915	n	0.045	0.03	0.04					0.0663	0.0315	0.0663							
176	3	15.27374 R_80647_SJR	Lat Struct																	
177	3	15.27355 L_80646_SJR	Lat Struct																	
178	3	15.14855 SJR_910	n	0.035	0.03	0.045					0.0663	0.0315	0.0663							
179	3	14.97791 SJR_905	n	0.055	0.03	0.055					0.0663	0.0315	0.0663							
180	3	14.67413 SJR_900	n	0.055	0.04	0.03	0.05				0.0663	0.0663	0.0663	0.0315	0.0297	0.0663	0.0603			
181	3	14.37167 SJR_895	n	0.04	0.03	0.04					0.0663	0.0315	0.0663							
182	3	14.37148 R_75883_SJR	Lat Struct																	
183	3	14.21940 SJR_890	n	0.035	0.03	0.045					0.0663	0.0315	0.0663							
184	3	14.21902 L_75078_SJR	Lat Struct																	
185	3	14.02944 SJR_885	n	0.035	0.03	0.045					0.042	0.0315	0.0663							
186	3	14.02906 R_74075_SJR	Lat Struct																	
187	3	13.83361 SJR_880	n	0.055	0.03	0.045					0.0661	0.0315	0.0661							
188	3	13.70237 SJR_875	n	0.045	0.03	0.055					0.0661	0.0315	0.0661							
189	3	13.54347 SJR_870	n	0.035	0.03	0.05					0.0661	0.0315	0.0661							
190	3	13.47813 SJR_865	n	0.055	0.03	0.05					0.0661	0.0315	0.0661							
191	3	13.27567 SJR_860	n	0.045	0.03	0.05					0.0661	0.0315	0.0661							
192	3	13.27548 L_70096_SJR	Lat Struct																	
193	3	13.27529 R_70095_SJR	Lat Struct																	
194	3	13.05655 SJR_850	n	0.04	0.03	0.045					0.0591	0.0315	0.0632							
195	3	13.05617 L_68938_SJR	Lat Struct																	
196	3	12.80485 SJR_840	n	0.035	0.03	0.04					0.0514	0.0315	0.0591							
197	3	12.69576 SJR_830	n	0.035	0.03	0.04					0.0514	0.0315	0.0591							
198	3	12.63004 SJR_820	n	0.035	0.03	0.042					0.0514	0.0315	0.0619							
199	3	12.62966 L_66686_SJR	Lat Struct																	
200	3	12.53743 SJR_810	n	0.035	0.03	0.055					0.0514	0.0315	0.0812							
201	3	12.37171 SJR_800	n	0.045	0.03	0.055					0.0663	0.0315	0.0812							
202	3	12.37152 R_65323_SJR	Lat Struct																	
203	3	12.29312 SJR_790	n	0.045	0.03	0.045					0.0603	0.0315	0.0603							
204	3	12.17948 SJR_780	n	0.055	0.03	0.055					0.0735	0.0315	0.0735							
205	3	12.05695 SJR_770	n	0.035	0.03	0.042					0.0466	0.0315	0.0561							
206	3	11.87684 SJR_760	n	0.035	0.03	0.042					0.0466	0.0315	0.0561							
207	3	11.87665 L_62710_SJR	Lat Struct																	
208	3	11.87646 R_62709_SJR	Lat Struct																	

209	3	11.55506 SJR_750	n	0.035	0.03	0.055					0.0466	0.0315	0.0735							
210	3	11.46624 SJR_740	n	0.04	0.03	0.055					0.0534	0.0315	0.0735							
211	3	11.46586 R_60541_SJR	Lat Struct																	
212	3	11.39560 SJR_730	n	0.04	0.03	0.045					0.0534	0.0315	0.0603							
213	3	11.28954 SJR_720	n	0.035	0.03	0.075					0.0466	0.0315	0.1003							
214	3	11.16757 SJR_710	n	0.035	0.03	0.075					0.0466	0.0315	0.0315	0.1003	0.1003					
215	3	11.16719 L_58964_SJR	Lat Struct																	
216	3	11.04163 SJR_700	n	0.035	0.03	0.045					0.0505	0.0363	0.0653							
217	3	10.97061 SJR_690	n	0.055	0.03	0.045					0.0796	0.0363	0.0653							
218	3	10.97042 R_57925_SJR	Lat Struct																	
219	3	10.78197 SJR_680	n	0.035	0.03	0.05					0.0505	0.0363	0.0723							
220	3	10.46493 SJR_670	n	0.035	0.03	0.055					0.0505	0.0363	0.0796							
221	3	10.25982 SJR_660	n	0.04	0.03	0.045					0.0579	0.0363	0.0653							
222	3	10.25963 L_54172_SJR	Lat Struct																	
223	3	10.25945 R_54171_SJR	Lat Struct																	
224	3	09.96987 SJR_650	n	0.045	0.03	0.045					0.0653	0.0363	0.0653							
225	3	09.75283 SJR_640	n	0.04	0.03	0.045					0.0579	0.0363	0.0653							
226	3	09.75264 R_51495_SJR	Lat Struct																	
227	3	09.75245 L_51494_SJR	Lat Struct																	
228	3	09.25019 SJR_630	n	0.035	0.03	0.04					0.0505	0.0363	0.0579							
229	3	09.25000 R_48841_SJR	Lat Struct																	
230	3	09.24981 L_48840_SJR	Lat Struct																	
231	3	08.83542 SJR_620	n	0.035	0.03	0.045					0.0505	0.0363	0.0653							
232	3	08.78296 SJR_610	n	0.035	0.03	0.045					0.0505	0.0363	0.0653							
233	3	08.77785 SJR_600	Bridge																	
234	3	08.77198 SJR_595	n	0.035	0.03	0.04					0.0505	0.0363	0.0579							
235	3	08.77179 L_46316_SJR	Lat Struct																	
236	3	08.77160 R_46315_SJR	Lat Struct																	
237	3	08.72008 SJR_590	n	0.035	0.03	0.045					0.0505	0.0363	0.0653							
238	3	08.44111 SJR_585	n	0.035	0.03	0.045					0.0505	0.0363	0.0653							
239	3	07.93582 SJR_580	n	0.035	0.03	0.05					0.0505	0.0363	0.0723							
240	3	07.93563 R_41901_SJR	Lat Struct																	
241	3	07.93544 L_41900_SJR	Lat Struct																	
242	3	07.43356 SJR_575	n	0.035	0.03	0.05					0.0505	0.0363	0.0723							
243	3	07.43337 R_39249_SJR	Lat Struct																	
244	3	07.43318 L_39248_SJR	Lat Struct																	
245	3	06.92164 SJR_570	n	0.04	0.03	0.04					0.0552	0.0363	0.0552							
246	3	06.92145 L_36546_SJR	Lat Struct																	
247	3	06.92126 R_36545_SJR	Lat Struct																	
248	3	06.64513 SJR_565	n	0.035	0.03	0.04					0.0481	0.0363	0.0552							
249	3	06.36843 SJR_560	n	0.035	0.03	0.04					0.0481	0.0363	0.0552							
250	3	06.36824 R_33625_SJR	Lat Struct																	
251	3	06.36805 L_33624_SJR	Lat Struct																	
252	3	06.29514 SJR_555	n	0.035	0.03	0.042					0.0481	0.0363	0.0579							
253	3	06.29495 L_33238_SJR	Lat Struct																	
254	3	06.05044 SJR_550	n	0.035	0.03	0.045					0.0481	0.0363	0.0622							
255	3	05.97488 SJR_545	n	0.04	0.03	0.055					0.0552	0.0363	0.0759							
256	3	05.87412 SJR_540	n	0.055	0.03	0.055					0.0759	0.0363	0.0759							
257	3	05.87393 R_31015_SJR	Lat Struct																	
258	3	05.78927 SJR_535	n	0.075	0.03	0.055	0.04	0.055			0.1033	0.0363	0.0759	0.0552	0.0721					
259	3	05.71863 SJR_530	n	0.035	0.03	0.055	0.04	0.055			0.0481	0.0363	0.0759	0.0552	0.0721					
260	3	05.71844 Copy of SJR_530	n	0.035	0.03	0.055	0.04	0.055			0.0481	0.0344	0.0363	0.0344	0.0759	0.0552	0.0721			
261	2	05.46939 Copy of SJR_525	n	0.04	0.03	0.04					0.04	0.03	0.04							

262	2	05.46920 SJR_525	n	0.04	0.03	0.04					0.04	0.03	0.04							
263	2	05.46902 R_28877_SJR	Lat Struct																	
264	2	05.46883 L_28876_SJR	Lat Struct																	
265	2	05.11126 SJR_520	n	0.045	0.03	0.05					0.045	0.03	0.05							
266	2	04.87831 SJR_515	n	0.055	0.03	0.05					0.055	0.03	0.05							
267	2	04.80653 SJR_510	n	0.045	0.03	0.045					0.045	0.03	0.045							
268	2	04.76127 SJR_505	n	0.04	0.03	0.04					0.04	0.03	0.04							
269	2	04.75615 SJR_500	Bridge																	
270	2	04.75236 SJR_450	n	0.035	0.03	0.035					0.035	0.03	0.035							
271	2	04.75217 L_25092_SJR	Lat Struct																	
272	2	04.75199 R_25091_SJR	Lat Struct																	
273	2	04.75180 L_25090_SJR	Lat Struct																	
274	2	04.72471 SJR_440	n	0.035	0.03	0.035					0.035	0.03	0.035							
275	2	04.51089 SJR_430	n	0.035	0.03	0.04					0.035	0.03	0.04							
276	2	04.51070 R_23817_SJR	Lat Struct																	
277	2	04.51051 L_23816_SJR	Lat Struct																	
278	2	04.42055 SJR_420	n	0.045	0.03	0.04					0.045	0.03	0.04							
279	2	04.32832 SJR_410	n	0.05	0.03	0.045					0.05	0.03	0.045							
280	2	04.32643 SJR_400	Bridge																	
281	2	04.32396 SJR_350	n	0.04	0.03	0.04					0.04	0.03	0.04							
282	2	04.32377 L_22830_SJR	Lat Struct																	
283	2	04.32359 R_22829_SJR	Lat Struct																	
284	2	04.19726 SJR_340	n	0.04	0.03	0.04					0.04	0.03	0.04							
285	2	04.10616 SJR_330	n	0.045	0.03	0.04					0.045	0.03	0.04							
286	2	04.02870 SJR_320	n	0.035	0.03	0.04					0.035	0.03	0.04							
287	2	03.98155 SJR_310	n	0.035	0.03	0.04					0.035	0.03	0.04							
288	2	03.97492 SJR_300	Bridge																	
289	2	03.97094 SJR_250	n	0.035	0.03	0.055					0.035	0.03	0.055							
290	2	03.97075 L_20966_SJR	Lat Struct																	
291	2	03.97056 R_20965_SJR	Lat Struct																	
292	2	03.90920 R_20641_SJR	Lat Struct																	
293	2	03.90901 SJR_245	n	0.04	0.03	0.04					0.04	0.03	0.04							
294	2	03.70182 SJR_240	n	0.04	0.03	0.04					0.04	0.03	0.04							
295	2	03.45561 SJR_235	n	0.042	0.03	0.035					0.042	0.03	0.035							
296	2	03.45542 R_18245_SJR	Lat Struct																	
297	2	03.45523 L_18244_SJR	Lat Struct																	
298	2	03.23062 SJR_230	n	0.042	0.03	0.04					0.042	0.03	0.04							
299	2	03.23043 Copy of SJR_230	n	0.042	0.03	0.04					0.042	0.03	0.04							
300	1	03.12361 Copy of SJR_225	n	0.045	0.03	0.035					0.045	0.03	0.035							
301	1	03.12342 SJR_225	n	0.045	0.03	0.035					0.045	0.03	0.035							
302	1	03.12323 R_16491_SJR	Lat Struct																	
303	1	03.12304 L_16490_SJR	Lat Struct																	
304	1	02.98933 SJR_220	n	0.035	0.03	0.04					0.035	0.03	0.04							
305	1	02.88214 SJR_215	n	0.035	0.03	0.04					0.035	0.03	0.04							
306	1	02.88195 R_15217_SJR	Lat Struct																	
307	1	02.68707 SJR_210	n	0.035	0.03	0.038					0.035	0.03	0.038							
308	1	02.64104 SJR_205	n	0.035	0.03	0.04					0.035	0.03	0.04							
309	1	02.62987 SJR_200	Bridge																	
310	1	02.61699 SJR_140	n	0.035	0.03	0.055					0.035	0.03	0.055							
311	1	02.61680 R_13817_SJR	Lat Struct																	
312	1	02.61661 L_13816_SJR	Lat Struct																	
313	1	02.57286 SJR_130	n	0.03	0.03	0.042					0.03	0.03	0.042							
314	1	02.53839 SJR_120	n	0.035	0.03	0.045					0.035	0.03	0.045							

315	1	02.52324 SJR_110	n	0.035	0.03	0.045					0.035	0.03	0.045							
316	1	02.51680 SJR_100	Bridge																	
317	1	02.51245 SJR_070	n	0.038	0.03	0.04					0.038	0.03	0.04							
318	1	02.51226 R_13265_SJR	Lat Struct																	
319	1	02.51207 L_13264_SJR	Lat Struct																	
320	1	02.48006 SJR_065	n	0.038	0.03	0.05					0.038	0.03	0.05							
321	1	02.39673 SJR_060	n	0.042	0.03	0.055					0.042	0.03	0.055							
322	1	02.28404 SJR_055	n	0.04	0.03	0.042					0.04	0.03	0.042							
323	1	02.28385 Copy of SJR_055	n	0.04	0.03	0.042					0.04	0.03	0.042							
324	0	02.11643 Copy of SJR_050	n	0.04	0.03	0.042					0.04	0.03	0.042							
325	0	02.11624 SJR_050	n	0.04	0.03	0.042					0.04	0.03	0.042							
326	0	02.11587 L_11172_SJR	Lat Struct																	
327	0	02.11568 R_11171_SJR	Lat Struct																	
328	0	02.00981 SJR_045	n	0.04	0.03	0.05					0.04	0.03	0.05							
329	0	02.00962 R_10611_SJR	Lat Struct																	
330	0	01.79580 SJR_040	n	0.04	0.03	0.05					0.04	0.03	0.05							
331	0	01.79523 R_9479_SJR	Lat Struct																	
332	0	01.61304 SJR_035	n	0.015	0.03	0.055					0.015	0.03	0.055							
333	0	01.61285 L_8516_SJR	Lat Struct																	
334	0	01.46001 R_7709_SJR	Lat Struct																	
335	0	01.35812 R_7171_SJR	Lat Struct																	
336	0	01.35774 SJR_030	n	0.015	0.03	0.055	0.03	0.075	0.03	0.075	0.015	0.03	0.055	0.03	0.075	0.03	0.075			
337	0	01.35736 R_7167_SJR	Lat Struct																	
338	0	01.11153 SJR_025	n	0.015	0.03	0.045					0.015	0.03	0.045							
339	0	00.85301 SJR_020	n	0.015	0.03	0.045					0.015	0.03	0.045							
340	0	00.85263 L_4502_SJR	Lat Struct																	
341	0	00.59771 SJR_015	n	0.015	0.03	0.055					0.015	0.03	0.055							
342	0	00.59753 R_3155_SJR	Lat Struct																	
343	0	00.39355 SJR_010	n	0.015	0.03	0.055					0.015	0.03	0.055							
344	0	00.33181 SJR_005	n	0.015	0.03	0.055					0.015	0.03	0.055							

PSC				Original						Modified					
	Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5	n #6	n #1	n #2	n #3	n #4	n #5	n #6
1	1	05.86541 Copy of PSC_960	n	0.055	0.045	0.055				0.055	0.045	0.055			
2	1	05.86522 PSC_960	n	0.055	0.045	0.055				0.055	0.045	0.055			
3	1	05.86503 L_30968_PSC	Lat Struct												
4	1	05.86484 R_30967_PSC	Lat Struct												
5	1	05.65310 PSC_950	n	0.06	0.045	0.05				0.06	0.045	0.05			
6	1	05.50159 PSC_940	n	0.05	0.045	0.05				0.05	0.045	0.05			
7	1	05.43644 PSC_930	n	0.045	0.045	0.05				0.045	0.045	0.05			
8	1	05.34705 PSC_920	n	0.045	0.045	0.048				0.045	0.045	0.048			
9	1	05.28758 PSC_910	n	0.045	0.045	0.055				0.045	0.045	0.055			
10	1	05.28322 PSC_900	Bridge												
11	1	05.27925 PSC_880	n	0.04	0.045	0.055				0.04	0.045	0.055			
12	1	05.27906 L_27874_PSC	Lat Struct												
13	1	05.27887 R_27873_PSC	Lat Struct												
14	1	05.20008 PSC_870	n	0.075	0.045	0.075				0.075	0.045	0.075			
15	1	05.12792 PSC_860	n	0.075	0.045	0.075				0.075	0.045	0.075			
16	1	05.11599 PSC_845	n	0.075	0.057	0.075				0.075	0.057	0.075			
17	1	05.09914 PSC_840	n	0.075	0.0675	0.075	0.075			0.075	0.0675	0.075			
18	1	04.96827 PSC_830	n	0.075	0.0675	0.075				0.075	0.0675	0.075			
19	1	04.83891 PSC_820	n	0.075	0.0525	0.075				0.075	0.0525	0.075			
20	1	04.68608 PSC_810	n	0.055	0.045	0.045				0.055	0.045	0.045			
21	1	04.68002 PSC_800	Bridge												
22	1	04.67471 PSC_720	n	0.055	0.045	0.045				0.055	0.045	0.045			
23	1	04.67452 L_24682_PSC	Lat Struct												
24	1	04.67434 R_24681_PSC	Lat Struct												
25	1	04.62585 PSC_710	n	0.055	0.045	0.06				0.055	0.045	0.06			
26	1	04.61828 PSC_700	Bridge												
27	1	04.61165 PSC_620	n	0.055	0.045	0.045				0.055	0.045	0.045			
28	1	04.60407 PSC_610	n	0.045	0.045	0.045				0.045	0.045	0.045			
29	1	04.59441 PSC_600	Bridge												
30	1	04.58362 PSC_520	n	0.045	0.045	0.045				0.045	0.045	0.045			
31	1	04.57737 PSC_510	n	0.045	0.045	0.045				0.045	0.045	0.045			
32	1	04.57225 PSC_500	Bridge												
33	1	04.56695 PSC_450	n	0.04	0.055	0.045	0.045			0.04	0.055	0.045	0.045		
34	1	04.56676 R_24113_PSC	Lat Struct												
35	1	04.56657 L_24112_PSC	Lat Struct												
36	1	04.40464 PSC_440	n	0.035	0.045	0.045				0.035	0.045	0.045			
37	1	04.22624 PSC_430	n	0.035	0.045	0.045				0.035	0.045	0.045			
38	1	04.06317 PSC_420	n	0.035	0.045	0.045				0.035	0.045	0.045			
39	1	03.98363 PSC_410	n	0.045	0.045	0.045				0.045	0.045	0.045			
40	1	03.98060 PSC_400	Bridge												
41	1	03.97454 PSC_380	n	0.045	0.045	0.045				0.045	0.045	0.045			
42	1	03.97435 R_20985_PSC	Lat Struct												
43	1	03.97416 L_20984_PSC	Lat Struct												
44	1	03.84651 PSC_370	n	0.04	0.045	0.055	0.04			0.04	0.045	0.055	0.04		
45	1	03.68269 PSC_360	n	0.04	0.033	0.04				0.04	0.033	0.04			
46	1	03.54425 PSC_350	n	0.04	0.065	0.033	0.04			0.04	0.065	0.033	0.04		
47	1	03.38402 PSC_340	n	0.06	0.04	0.033	0.04			0.06	0.04	0.033	0.04		
48	1	03.38383 R_17867_PSC	Lat Struct												
49	1	03.38364 L_17866_PSC	Lat Struct												

50	1	03.24274 PSC_330	n	0.055	0.04	0.033	0.04			0.055	0.04	0.033	0.04		
51	1	03.13346 PSC_320	n	0.055	0.04	0.033	0.04			0.055	0.04	0.033	0.04		
52	1	03.02191 PSC_310	n	0.04	0.033	0.04				0.04	0.033	0.04			
53	1	03.01604 PSC_300	Inl Struct												
54	1	03.01054 PSC_260	n	0.045	0.04	0.033	0.04			0.045	0.04	0.033	0.04		
55	1	03.01035 R_15895_PSC	Lat Struct												
56	1	03.01017 L_15894_PSC	Lat Struct												
57	1	02.92930 PSC_250	n	0.04	0.03	0.055	0.04	0.033	0.04	0.04	0.03	0.055	0.04	0.033	0.04
58	1	02.73498 PSC_240	n	0.04	0.03	0.055	0.04	0.033	0.04	0.04	0.03	0.055	0.04	0.033	0.04
59	1	02.61813 PSC_230	n	0.04	0.03	0.04	0.033	0.04		0.04	0.03	0.04	0.033	0.04	
60	1	02.61264 UN1_300	Bridge												
61	1	02.60714 PSC_220	n	0.04	0.03	0.04	0.033	0.04		0.04	0.03	0.04	0.033	0.04	
62	1	02.60695 R_13765_PSC	Lat Struct												
63	1	02.60676 L_13764_PSC	Lat Struct												
64	1	02.40090 PSC_210	n	0.04	0.03	0.04	0.033	0.04		0.04	0.03	0.04	0.033	0.04	
65	1	02.24920 PSC_160	n	0.04	0.03	0.04	0.033	0.04		0.04	0.03	0.04	0.033	0.04	
66	1	02.24901 R_11875_PSC	Lat Struct												
67	1	02.24882 L_11874_PSC	Lat Struct												
68	1	02.07590 PSC_150	n	0.04	0.03	0.04	0.044	0.033	0.04	0.04	0.03	0.04	0.044	0.033	0.04
69	1	01.71512 PSC_130	n	0.05	0.033	0.044	0.033	0.04		0.05	0.033	0.044	0.033	0.04	
70	1	01.51398 PSC_120	n	0.045	0.033	0.044	0.033	0.04		0.045	0.033	0.044	0.033	0.04	
71	1	01.43558 PSC_110	n	0.04	0.033	0.044	0.033	0.04		0.04	0.033	0.044	0.033	0.04	
72	1	01.42914 PSC_100	Bridge												
73	1	01.42554 PSC_060	n	0.045	0.033	0.044	0.033	0.04		0.045	0.033	0.044	0.033	0.04	
74	1	01.42535 L_7526_PSC	Lat Struct												
75	1	01.42516 R_7525_PSC	Lat Struct												
76	1	01.33141 PSC_050	n	0.045	0.033	0.044	0.033	0.04		0.045	0.033	0.044	0.033	0.04	
77	1	01.18918 PSC_040	n	0.045	0.033	0.044	0.0605	0.033	0.045	0.045	0.033	0.044	0.0605	0.033	0.045
78	1	00.97498 PSC_030	n	0.045	0.033	0.044	0.033	0.045		0.045	0.033	0.044	0.033	0.045	
79	1	00.77707 PSC_020	n	0.045	0.033	0.044	0.033	0.045		0.045	0.033	0.044	0.033	0.045	
80	1	00.77669 R_4101_PSC	Lat Struct												
81	1	00.77650 L_4100_PSC	Lat Struct												
82	1	00.41022 PSC_010	n	0.045	0.033	0.044	0.033	0.045		0.045	0.033	0.044	0.033	0.045	
83	1	00.41003 Copy of PSC_010	n	0.045	0.033	0.044	0.033	0.045		0.045	0.033	0.044	0.033	0.045	

ODR

				Original							Modified						
	Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5	n #6	n #7	n #1	n #2	n #3	n #4	n #5	n #6	n #7
1	4	18.81722 Copy of ODR_392	n	0.04	0.042	0.04					0.049	0.0414	0.049				
2	4	18.81703 ODR_392	n	0.04	0.042	0.04					0.049	0.0414	0.049				
3	4	18.81684 R_99355_ODR	Lat Struct														
4	4	18.81665 L_99354_ODR	Lat Struct														
5	4	18.68143 ODR_390	n	0.04	0.042	0.04					0.049	0.0414	0.049				
6	4	18.68124 R_98639_ODR	Lat Struct														
7	4	18.68105 L_98638_ODR	Lat Struct														
8	4	18.53712 ODR_388	n	0.04	0.042	0.04					0.049	0.0414	0.049				
9	4	18.41988 ODR_386	n	0.04	0.042	0.04					0.049	0.0414	0.049				
10	4	18.30663 ODR_384	n	0.04	0.042	0.045					0.049	0.0414	0.0551				
11	4	18.07443 ODR_382	n	0.04	0.042	0.04					0.049	0.0414	0.049				
12	4	18.07425 L_95434_ODR	Lat Struct														
13	4	18.07406 R_95433_ODR	Lat Struct														
14	4	17.77861 ODR_380	n	0.045	0.042	0.045					0.058	0.0436	0.058				
15	4	17.51005 R_92455_ODR	Lat Struct														
16	4	17.50986 ODR_378	n	0.042	0.042	0.042					0.0542	0.0436	0.0542				
17	4	17.50967 R_92453_ODR	Lat Struct														
18	4	17.30400 ODR_376	n	0.042	0.042	0.035					0.0542	0.0436	0.0452				
19	4	17.12938 ODR_374	n	0.045	0.042	0.035					0.058	0.0436	0.0452				
20	4	17.12919 L_90444_ODR	Lat Struct														
21	4	17.12900 R_90443_ODR	Lat Struct														
22	4	16.95059 ODR_372	n	0.04	0.042	0.04					0.0516	0.0436	0.0516				
23	4	16.72143 ODR_370	n	0.04	0.042	0.055					0.0516	0.0436	0.071				
24	4	16.49606 ODR_368	n	0.04	0.042	0.035					0.0516	0.0436	0.0452				
25	4	16.35193 ODR_366	n	0.045	0.042	0.035					0.058	0.0436	0.0452				
26	4	16.35174 R_86339_ODR	Lat Struct														
27	4	16.35155 L_86338_ODR	Lat Struct														
28	4	16.19720 ODR_364	n	0.045	0.042	0.035					0.058	0.0436	0.0452				
29	4	15.94664 ODR_362	n	0.045	0.042	0.035					0.058	0.0436	0.0452				
30	4	15.84456 ODR_360	n	0.045	0.042	0.04					0.058	0.0436	0.0516				
31	4	15.84437 L_83660_ODR	Lat Struct														
32	4	15.84418 R_83659_ODR	Lat Struct														
33	4	15.71767 ODR_358	n	0.042	0.042	0.04					0.0542	0.0436	0.0516				
34	4	15.29343 R_80751_ODR	Lat Struct														
35	4	15.29305 ODR_356	n	0.045	0.042	0.04					0.0614	0.0461	0.0546				
36	4	14.99325 ODR_354	n	0.042	0.042	0.04					0.0573	0.0461	0.0546				
37	4	14.99287 L_79164_ODR	Lat Struct														
38	4	14.73909 ODR_352	n	0.04	0.042	0.042					0.0546	0.0461	0.0573				
39	4	14.73890 Copy of ODR_352	n	0.04	0.042	0.042					0.0546	0.0461	0.0573				
40	3	14.67564 Copy of ODR_350	n	0.04	0.03	0.042					0.04	0.03	0.042				
41	3	14.67545 ODR_350	n	0.04	0.03	0.042					0.04	0.03	0.042				
42	3	14.67526 R_77487_ODR	Lat Struct														
43	3	14.67507 L_77486_ODR	Lat Struct														
44	3	14.48114 ODR_348	n	0.04	0.03	0.04					0.04	0.03	0.04				
45	3	14.48095 R_76461_ODR	Lat Struct														
46	3	14.48076 L_76460_ODR	Lat Struct														
47	3	14.21220 ODR_346	n	0.04	0.03	0.042					0.04	0.03	0.042				
48	3	14.07073 ODR_344	n	0.042	0.03	0.042					0.042	0.03	0.042				
49	3	13.90464 ODR_342	n	0.04	0.03	0.042					0.04	0.03	0.042				

50	3	13.90445 R_73417_ODR	Lat Struct															
51	3	13.90426 L_73416_ODR	Lat Struct															
52	3	13.79914 ODR_340	n	0.04	0.03	0.045					0.04	0.03	0.045					
53	3	13.63532 ODR_338	n	0.04	0.03	0.045					0.04	0.03	0.045					
54	3	13.63513 R_71995_ODR	Lat Struct															
55	3	13.50029 ODR_336	n	0.04	0.03	0.04					0.04	0.03	0.04					
56	3	13.27851 ODR_334	n	0.045	0.03	0.04					0.045	0.03	0.04					
57	3	13.27832 Copy of ODR_334	n	0.045	0.03	0.04					0.045	0.03	0.04					
58	2	13.02473 Copy of ODR_332	n	0.04	0.03	0.04	0.03	0.055			0.04	0.03	0.04	0.03	0.055			
59	2	13.02454 ODR_332	n	0.04	0.03	0.04	0.03	0.055			0.04	0.03	0.04	0.03	0.055			
60	2	13.02435 L_68770_ODR	Lat Struct															
61	2	13.02416 R_68769_ODR	Lat Struct															
62	2	12.82795 ODR_330	n	0.04	0.03	0.04	0.03	0.04			0.04	0.03	0.04	0.03	0.04			
63	2	12.82776 L_67732_ODR	Lat Struct															
64	2	12.82757 R_67731_ODR	Lat Struct															
65	2	12.68837 ODR_328	n	0.04	0.03	0.04	0.03	0.045			0.04	0.03	0.04	0.03	0.045			
66	2	12.44311 ODR_326	n	0.04	0.03	0.04	0.03	0.045			0.04	0.03	0.04	0.03	0.045			
67	2	12.25164 ODR_324	n	0.045	0.03	0.07	0.04	0.03	0.04		0.045	0.03	0.07	0.04	0.03	0.04		
68	2	12.07172 ODR_322	n	0.045	0.03	0.075	0.04	0.03	0.04		0.045	0.03	0.075	0.04	0.03	0.04		
69	2	12.07153 R_63739_ODR	Lat Struct															
70	2	12.07134 L_63738_ODR	Lat Struct															
71	2	11.88290 ODR_320	n	0.045	0.03	0.055	0.045	0.03	0.045		0.045	0.03	0.055	0.045	0.03	0.045		
72	2	11.74786 ODR_318	n	0.055	0.03	0.055	0.045	0.03	0.045		0.055	0.03	0.055	0.045	0.03	0.045		
73	2	11.74767 R_62029_ODR	Lat Struct															
74	2	11.74748 L_62028_ODR	Lat Struct															
75	2	11.64124 ODR_316	n	0.065	0.03	0.065	0.03	0.045	0.03		0.065	0.03	0.065	0.03	0.045	0.03	0.045	
76	2	11.64105 Copy of ODR_316	n	0.065	0.03	0.065	0.03	0.045	0.03	0.045	0.065	0.03	0.065	0.03	0.045	0.03	0.045	
77	1	11.36946 Copy of ODR_314	n	0.065	0.03	0.05	0.03	0.045		0.045	0.065	0.03	0.05	0.03	0.045			
78	1	11.36927 ODR_314	n	0.065	0.03	0.05	0.03	0.045			0.065	0.03	0.05	0.03	0.045			
79	1	11.36908 L_60030_ODR	Lat Struct															
80	1	11.36889 R_60029_ODR	Lat Struct															
81	1	11.25810 ODR_312	n	0.05	0.03	0.055					0.05	0.03	0.055					
82	1	11.25791 R_59443_ODR	Lat Struct															
83	1	11.10337 ODR_310	n	0.045	0.03	0.075					0.045	0.03	0.075					
84	1	11.10318 L_58626_ODR	Lat Struct															
85	1	10.88235 L_57460_ODR	Lat Struct															
86	1	10.88197 ODR_308	n	0.055	0.03	0.04	0.03	0.075			0.055	0.03	0.04	0.03	0.075			
87	1	10.88159 L_57456_ODR	Lat Struct															
88	1	10.77762 ODR_306	n	0.05	0.03	0.04	0.03	0.075			0.05	0.03	0.04	0.03	0.075			
89	1	10.51834 ODR_304	n	0.055	0.03	0.04	0.1	0.04	0.03		0.055	0.03	0.04	0.1	0.04	0.03	0.075	
90	1	10.25282 ODR_302	n	0.05	0.03	0.04	0.03	0.075		0.075	0.05	0.03	0.04	0.03	0.075			
91	1	10.06400 ODR_301	n	0.05	0.03	0.04	0.03	0.055			0.05	0.03	0.04	0.03	0.055			
92	1	10.06078 ODR_300	Bridge															
93	1	10.05699 ODR_295	n	0.05	0.03	0.04	0.03	0.055			0.05	0.03	0.04	0.03	0.055			
94	1	10.05680 R_53101_ODR	Lat Struct															
95	1	10.05661 L_53100_ODR	Lat Struct															
96	1	09.85832 ODR_290	n	0.07	0.03	0.055	0.03	0.055			0.07	0.03	0.055	0.03	0.055			
97	1	09.59109 ODR_280	n	0.07	0.03	0.065					0.07	0.03	0.065					
98	1	09.42083 ODR_270	n	0.055	0.03	0.06					0.055	0.03	0.06					
99	1	09.35530 ODR_260	n	0.07	0.03	0.09					0.07	0.03	0.09					
100	1	09.24981 ODR_250	n	0.07	0.03	0.1					0.07	0.03	0.1					
101	1	09.24962 R_48839_ODR	Lat Struct															
102	1	09.24943 L_48838_ODR	Lat Struct															

103	1	09.07159 ODR_240	n	0.07	0.03	0.1					0.07	0.03	0.1				
104	1	08.79224 ODR_230	n	0.055	0.03	0.1	0.03	0.1			0.055	0.03	0.1	0.03	0.1		
105	1	08.58827 ODR_220	n	0.07	0.03	0.085					0.07	0.03	0.085				
106	1	08.48297 ODR_210	n	0.07	0.03	0.075					0.07	0.03	0.075				
107	1	08.47558 ODR_200	Bridge														
108	1	08.46668 ODR_180	n	0.1	0.03	0.1					0.1	0.03	0.1				
109	1	08.46649 L_44704_ODR	Lat Struct														
110	1	08.46630 R_44703_ODR	Lat Struct														
111	1	08.237312 ODR_120	n	0.075	0.03	0.075					0.075	0.03	0.075				
112	1	08.24547 ODR_110	n	0.07	0.03	0.075					0.07	0.03	0.075				
113	1	07.96309 ODR_098	n	0.055	0.03	0.055					0.055	0.03	0.055				
114	1	07.88999 ODR_095	n	0.075	0.03	0.055					0.075	0.03	0.055				
115	1	07.88980 R_41659_ODR	Lat Struct														
116	1	07.88961 L_41658_ODR	Lat Struct														
117	1	07.77787 ODR_093	n	0.055	0.03	0.055	0.03	0.055			0.055	0.03	0.055	0.03	0.055		
118	1	07.58090 ODR_090	n	0.07	0.03	0.055					0.07	0.03	0.055				
119	1	07.48810 ODR_087	n	0.07	0.03	0.07					0.07	0.03	0.07				
120	1	07.31443 ODR_085	n	0.075	0.075	0.03	0.055				0.075	0.075	0.03	0.055			
121	1	07.19322 ODR_083	n	0.07	0.03	0.055					0.07	0.03	0.055				
122	1	07.12201 ODR_080	n	0.055	0.03	0.055					0.055	0.03	0.055				
123	1	07.12182 L_37604_ODR	Lat Struct														
124	1	07.12163 R_37603_ODR	Lat Struct														
125	1	07.01501 ODR_078	n	0.045	0.03	0.045					0.045	0.03	0.045				
126	1	06.95800 ODR_075	n	0.042	0.03	0.042					0.042	0.03	0.042				
127	1	06.81899 ODR_073	n	0.055	0.03	0.075	0.03	0.04			0.055	0.03	0.075	0.03	0.04		
128	1	06.73812 ODR_072	n	0.055	0.03	0.04					0.055	0.03	0.04				
129	1	06.57127 ODR_070	n	0.05	0.03	0.042					0.05	0.03	0.042				
130	1	06.57108 L_34696_ODR	Lat Struct														
131	1	06.57089 R_34695_ODR	Lat Struct														
132	1	06.37335 ODR_069	n	0.085	0.03	0.042					0.085	0.03	0.042				
133	1	06.28510 ODR_068	n	0.1	0.03	0.045					0.1	0.03	0.045				
134	1	06.28491 R_33185_ODR	Lat Struct														
135	1	06.28472 L_33184_ODR	Lat Struct														
136	1	06.14173 ODR_066	n	0.055	0.03	0.05					0.055	0.03	0.05				
137	1	06.00935 ODR_065	n	0.045	0.03	0.05					0.045	0.03	0.05				
138	1	05.86692 ODR_063	n	0.05	0.03	0.045					0.05	0.03	0.045				
139	1	05.75878 ODR_062	n	0.045	0.03	0.045					0.045	0.03	0.045				
140	1	05.65424 ODR_060	n	0.07	0.03	0.06					0.07	0.03	0.06				
141	1	05.50273 ODR_059	n	0.07	0.03	0.055					0.07	0.03	0.055				
142	1	05.50254 L_29054_ODR	Lat Struct														
143	1	05.50235 R_29053_ODR	Lat Struct														
144	1	05.43246 ODR_058	n	0.05	0.03	0.055					0.05	0.03	0.055				
145	1	05.30330 ODR_056	n	0.045	0.03	0.065					0.045	0.03	0.065				
146	1	05.23777 ODR_055	n	0.045	0.03	0.065					0.045	0.03	0.065				
147	1	05.10974 ODR_053	n	0.055	0.03	0.045					0.055	0.03	0.045				
148	1	04.96903 ODR_052	n	0.055	0.03	0.055					0.055	0.03	0.055				
149	1	04.96884 L_26236_ODR	Lat Struct														
150	1	04.78532 ODR_050	n	0.055	0.03	0.075					0.055	0.03	0.075				
151	1	04.78494 R_25265_ODR	Lat Struct														
152	1	04.59441 ODR_049	n	0.055	0.03	0.09					0.055	0.03	0.09				
153	1	04.48078 ODR_047	n	0.055	0.03	0.07					0.055	0.03	0.07				
154	1	04.48059 L_23658_ODR	Lat Struct														
155	1	04.48040 R_23657_ODR	Lat Struct														

156	1	04.28817 ODR_046	n	0.055	0.03	0.042	0.03	0.07			0.055	0.03	0.042	0.03	0.07		
157	1	04.14821 ODR_044	n	0.05	0.03	0.042	0.03	0.055			0.05	0.03	0.042	0.03	0.055		
158	1	04.08344 ODR_043	n	0.05	0.03	0.042	0.03	0.055			0.05	0.03	0.042	0.03	0.055		
159	1	03.84575 ODR_042	n	0.042	0.03	0.042					0.042	0.03	0.042				
160	1	03.84556 R_20305_ODR	Lat Struct														
161	1	03.84538 L_20304_ODR	Lat Struct														
162	1	03.69992 ODR_040	n	0.042	0.03	0.042					0.042	0.03	0.042				
163	1	03.50902 ODR_039	n	0.042	0.03	0.045					0.042	0.03	0.045				
164	1	03.50883 R_18527_ODR	Lat Struct														
165	1	03.50864 L_18526_ODR	Lat Struct														
166	1	03.39273 L_17914_ODR	Lat Struct														
167	1	03.39235 ODR_037	n	0.042	0.03	0.048					0.042	0.03	0.048				
168	1	03.39216 R_17911_ODR	Lat Struct														
169	1	03.23990 ODR_036	n	0.04	0.03	0.042					0.04	0.03	0.042				
170	1	03.04066 ODR_034	n	0.042	0.03	0.042					0.042	0.03	0.042				
171	1	02.82797 ODR_033	n	0.04	0.03	0.055					0.04	0.03	0.055				
172	1	02.72703 ODR_031	n	0.04	0.03	0.07	0.03	0.04			0.04	0.03	0.07	0.03	0.04		
173	1	02.65108 ODR_030	n	0.045	0.03	0.045					0.045	0.03	0.045				
174	1	02.65089 R_13997_ODR	Lat Struct														
175	1	02.65070 L_13996_ODR	Lat Struct														
176	1	02.44275 ODR_028	n	0.045	0.03	0.045					0.045	0.03	0.045				
177	1	02.44256 R_12897_ODR	Lat Struct														
178	1	02.44237 L_12896_ODR	Lat Struct														
179	1	02.26511 ODR_026	n	0.042	0.03	0.045					0.042	0.03	0.045				
180	1	02.12212 ODR_025	n	0.042	0.03	0.045					0.042	0.03	0.045				
181	1	01.89447 ODR_023	n	0.045	0.03	0.042					0.045	0.03	0.042				
182	1	01.72534 ODR_022	n	0.045	0.03	0.045					0.045	0.03	0.045				
183	1	01.72515 R_9109_ODR	Lat Struct														
184	1	01.72496 L_9108_ODR	Lat Struct														
185	1	01.44296 ODR_020	n	0.042	0.03	0.045					0.042	0.03	0.045				
186	1	01.27706 ODR_018	n	0.045	0.03	0.042					0.045	0.03	0.042				
187	1	01.04468 ODR_016	n	0.045	0.03	0.045					0.045	0.03	0.045				
188	1	01.04449 R_5515_ODR	Lat Struct														
189	1	01.04430 L_5514_ODR	Lat Struct														
190	1	00.86779 ODR_015	n	0.065	0.03	0.05					0.065	0.03	0.05				
191	1	00.69544 ODR_013	n	0.065	0.03	0.05					0.065	0.03	0.05				
192	1	00.54279 ODR_012	n	0.065	0.03	0.042					0.065	0.03	0.042				
193	1	00.54260 R_2865_ODR	Lat Struct														
194	1	00.54241 L_2864_ODR	Lat Struct														
195	1	00.31969 L_1688_ODR	Lat Struct														
196	1	00.31931 ODR_010	n	0.045	0.03	0.042					0.045	0.03	0.042				
197	1	00.31912 R_1685_ODR	Lat Struct														
198	1	00.18731 ODR_008	n	0.05	0.03	0.05					0.05	0.03	0.05				
199	1	00.18712 Copy of ODR_008	n	0.05	0.03	0.05					0.05	0.03	0.05				

FCS				Original					Modified				
	Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5	n #1	n #2	n #3	n #4	n #5
1	3	06.46350 1312_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
2	3	06.46028 1309_R_FCS	Lat Struct	(Not in Original Model)									
3	3	06.46009 1306_L_FCS	Lat Struct	(Not in Original Model)									
4	3	06.37922 1303_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
5	3	06.23017 1300_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
6	3	06.22733 1297_B_FCS	Bridge	(Not in Original Model)									
7	3	06.22506 1294_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
8	3	06.22165 1291_R_FCS	Lat Struct	(Not in Original Model)									
9	3	06.22146 1288_L_FCS	Lat Struct	(Not in Original Model)									
10	3	06.17108 1285_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
11	3	06.12052 1282_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
12	3	06.08453 1279_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
13	3	06.04987 1276_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
14	3	06.04192 1273_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
15	3	06.03889 1270_B_FCS	Bridge	(Not in Original Model)									
16	3	06.03643 1267_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
17	3	06.03226 1264_R_FCS	Lat Struct	(Not in Original Model)									
18	3	06.03207 1261_L_FCS	Lat Struct	(Not in Original Model)									
19	3	06.01919 1258_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
20	3	05.84382 1255_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
21	3	05.74420 1252_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
22	3	05.73284 1249_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
23	3	05.68208 1246_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
24	3	05.61295 1243_X_FCS	n	(Not in Original Model)					0.04	0.035	0.04		
25	3	05.59155 1240_B_FCS	Bridge	(Not in Original Model)									
26	3	05.58189 1237_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
27	3	05.57773 1234_R_FCS	Lat Struct	(Not in Original Model)									
28	3	05.57754 1231_L_FCS	Lat Struct	(Not in Original Model)									
29	3	05.43171 1228_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
30	3	05.20728 1225_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
31	3	04.99857 1222_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
32	3	04.99440 1219_R_FCS	Lat Struct	(Not in Original Model)									
33	3	04.99422 1216_L_FCS	Lat Struct	(Not in Original Model)									
34	3	04.83077 1213_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
35	3	04.81998 1210_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
36	3	04.61752 1207_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
37	3	04.39745 1204_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
38	3	04.31071 1201_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
39	3	04.29859 1198_X_FCS	n	(Not in Original Model)					0.035	0.035	0.035		
40	3	04.28154 1195_X_FCS	n	(Not in Original Model)					0.05	0.035	0.045		
41	3	04.27870 1192_B_FCS	Bridge	(Not in Original Model)									
42	3	04.27586 1189_X_FCS	n	(Not in Original Model)					0.05	0.035	0.045		
43	3	04.27093 1186_R_FCS	Lat Struct	(Not in Original Model)									
44	3	04.27075 1183_L_FCS	Lat Struct	(Not in Original Model)									
45	3	04.24612 1180_X_FCS	n	(Not in Original Model)					0.05	0.035	0.04		
46	3	04.22662 1177_X_FCS	n	(Not in Original Model)					0.05	0.035	0.04		
47	3	04.22094 1174_B_FCS	Bridge	(Not in Original Model)									
48	3	04.21601 1171_X_FCS	n	(Not in Original Model)					0.05	0.035	0.05		
49	3	04.21222 1168_R_FCS	Lat Struct	(Not in Original Model)									

50	3	04.21203 1165_L_FCS	Lat Struct	(Not in Original Model)									
51	3	04.13135 1162_X_FCS	n	(Not in Original Model)					0.042	0.042	0.042		
52	3	03.96677 1159_X_FCS	n	(Not in Original Model)					0.042	0.042	0.042		
53	3	03.78894 1156_X_FCS	n	(Not in Original Model)					0.07	0.042	0.07		
54	3	03.73610 1153_X_FCS	n	(Not in Original Model)					0.042	0.042	0.042		
55	3	03.73079 1150_B_FCS	Bridge	(Not in Original Model)									
56	3	03.72568 1147_X_FCS	n	(Not in Original Model)					0.042	0.042	0.042		
57	3	03.72549 1144_R_FCS	Lat Struct	(Not in Original Model)									
58	3	03.72151 1141_L_FCS	Lat Struct	(Not in Original Model)									
59	3	03.67758 1138_X_FCS	n	(Not in Original Model)					0.07	0.042	0.042		
60	3	03.63534 1135_X_FCS	n	(Not in Original Model)					0.07	0.042	0.07		
61	3	03.62701 1132_B_FCS	Bridge	(Not in Original Model)									
62	3	03.61697 1129_X_FCS	n	(Not in Original Model)					0.07	0.042	0.07		
63	3	03.61659 1126_L_FCS	Lat Struct	(Not in Original Model)									
64	3	03.61186 1123_R_FCS	Lat Struct	(Not in Original Model)									
65	3	03.50182 1120_X_FCS	n	(Not in Original Model)					0.06	0.045	0.07		
66	3	03.30770 1117_X_FCS	n	(Not in Original Model)					0.06	0.045	0.07		
67	2	03.24918 1111_X_FCS	n	(Not in Original Model)					0.06	0.045	0.07		
68	2	03.24880 1108_L_FCS	Lat Struct	(Not in Original Model)									
69	2	03.24633 1105_R_FCS	Lat Struct	(Not in Original Model)									
70	2	02.99388 1102_L_FCS	Lat Struct	(Not in Original Model)									
71	2	02.99369 1099_X_FCS	n	(Not in Original Model)					0.06	0.04	0.04		
72	2	02.99312 1096_L_FCS	Lat Struct	(Not in Original Model)									
73	2	02.75070 1093_X_FCS	n	(Not in Original Model)					0.06	0.07	0.04	0.07	
74	2	02.50980 FCS_320	n	0.045	0.07	0.04	0.07		0.045	0.07	0.04	0.07	
75	2	02.50923 1087_R_FCS	Lat Struct	(Not in Original Model)									
76	2	02.36794 FCS_310	n	0.045	0.04	0.07			0.045	0.04	0.07		
77	2	02.35999 FCS_300	Bridge										
78	2	02.35204 FCS_220	n	0.045	0.04	0.07			0.045	0.04	0.07		
79	2	02.35033 L_12410	Lat Struct										
80	2	02.34503 FCS_210	n	0.045	0.04	0.07			0.045	0.04	0.07		
81	2	02.33499 FCS_200	Bridge										
82	2	02.32419 FCS_150	n	0.045	0.04	0.07			0.045	0.04	0.07		
83	2	02.32192 L_12260	Lat Struct										
84	2	02.19541 FCS_140	n	0.045	0.04	0.07			0.045	0.04	0.07		
85	2	02.00583 FCS_130	n	0.07	0.04	0.07			0.07	0.04	0.07		
86	2	01.98670 FCS_120	n	0.07	0.04	0.07			0.07	0.04	0.07		
87	2	01.91852 FCS_110	n	0.07	0.04	0.05			0.07	0.04	0.05		
88	2	01.90432 FCS_100	Bridge										
89	2	01.89958 FCS_095	n	0.07	0.04	0.05			0.07	0.04	0.05		
90	2	01.89769 L_10020	Lat Struct										
91	2	01.82004 FCS_090	n	0.07	0.04	0.07			0.07	0.04	0.07		
92	2	01.65375 FCS_080	n	0.07	0.04	0.07			0.07	0.04	0.07		
93	2	01.33615 FCS_070	n	0.07	0.04	0.065			0.07	0.04	0.065		
94	1	01.18445 FCS_060_Copy	n	0.055	0.04	0.04			(Not in Modified Model)				
95	1	01.18426 FCS_060	n	0.055	0.04	0.04			0.055	0.04	0.04		
96	1	01.18009 R_6231	Lat Struct										
97	1	01.17990 L_6230	Lat Struct										
98	1	00.99468 FCS_050	n	0.06	0.04	0.04			0.06	0.04	0.04		
99	1	00.75396 FCS_040	n	0.045	0.065	0.04	0.07	0.045	0.045	0.065	0.04	0.07	0.045
100	1	00.52537 FCS_030	n	0.045	0.065	0.04	0.04		0.045	0.065	0.04	0.04	
101	1	00.52101 R_2751	Lat Struct										
102	1	00.27935 FCS_020	n	0.055	0.065	0.04	0.04		0.055	0.065	0.04	0.04	

103	1	00.06629 FCS_010	n	0.055	0.065	0.04	0.04		0.055	0.065	0.04	0.04	
104	1	0.0661	n	0.055	0.065	0.04	0.04		(Not in Modified Model)				

SJR			Original								
	Reach	RS	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev
1	6	32.69875		960	45.90886						
2	6	32.63985		1326	44.79792						
3	6	32.61409		1426.5	41.72	2003.5		45.52			
4	6	32.59781		1457.315	43.74	2028.685		43.837			
5	6	32.55368		910.59	43.88281						
6	6	32.43682									
7	6	32.27168									
8	6	32.10501									
9	6	31.83229									
10	6	31.54575									
11	6	31.21734									
12	6	31.06034		700	38.7						
13	6	30.75031	0	428.58	28	428.58	1749	23.5			
14	6	30.55353		586.55	20.13						
15	6	30.34388		362.53	33.09						
16	6	29.949		1431.19	28.74						
17	6	29.69995		1157.61	26.38						
18	6	29.42477				769.11		28.87			
19	6	29.23026				824.84		27.26			
20	6	28.71796				1123.84		36.5			
21	6	28.31608	31.68	513.27	28.28	513.27	872.9	28.28	1681	1943.9	38
22	6	28.20263	0	476.02	28.1	476.02	1088.8	25.74			
23	6	27.95794		1736	25.74						
24	6	27.57859		1676	25.74						
25	6	27.33428		1645	25.74						
26	6	27.11232				3170		38			
27	6	26.93902				3382		38			
28	6	26.69812									
29	6	25.96992									
30	6	25.75591									
31	6	23.58606				1378		35			
32	6	23.37035				2550.24		36			

33	6	23.14024		526.64	25.46	2579.1		35			
34	6	23.03172	0	367.62	33.73	367.62	954.36	20			
35	6	22.9588		880	20						
36	6	22.76354	0	1460	21.5	1460	1655.65	19			
37	6	22.59442	0	1406.54	21.5	1406.54	1693.07	19	2833.95	3133.95	32
38	6	22.48476	0	1527.6	21.5						
39	6	22.17757		775.01	21.5						
40	6	22.09386		309.82	21.5						
41	6	21.87379				1103.37		22			
42	6	21.72796				603.93		22			
43	5	21.25998	797	1130	20.99	1130	2872.32	27			
44	5	21.08706				815.12		29			
45	5	20.9757	477.63	825	21.43	825	3309.22	29			
46	5	20.82059	457.85	1503.85	20.06	1503.85	4432.69	29			
47	5	20.50942	425.6	1599.27	20.02	1599.27	4608.54	29			
48	5	20.33102	713.27	1699	18.1	1699	2312.64	29			
49	5	19.7511		340.57	28.87						
50	5	19.64902		630.48	31.72						
51	5	19.64883		630.48	33.11						
52	5	19.43577		814.02	31.62						
53	5	19.43558		816.26	31.59						
54	3	19.35736		84.86	34.09	526.86		34.03			
55	3	19.34316	0	118.105	34.09	315.615	319.405	34.01	537.315	698.97	33.87
56	3	18.87631		150	43.76						
57	3	18.83597		149.045	43.76						
58	3	18.82707		129	43.76	701		36.6			
59	3	18.81325				691.92		36.6			
60	3	18.80245				671.4		40.89			
61	3	18.65662		143.359	32.911						
62	3	18.60473				604.17		22.66			
63	3	15.62505	405.72	789.34	14.66						
64	3	15.50801		249.85	16.76						
65	3	15.37203									
66	3	15.27392		322.05	21.07						
67	3	14.67413									

68	3	13.54347				607.68		30			
69	3	12.37171	470.38	651.41	16.51	651.41	1019.71	28			
70	3	11.46624				447.89		29			
71	3	11.16757				510.54		13.36			
72	3	5.78927		407.66	12.71	629.23		11			
73	3	5.71863				367.32		12			
74	3	5.71844				367.32		12			
75	2	4.76127	501.594	513.594	29.35	674.455	822.022	29.31			
76	2	4.75236	0	398.434	29.35	511.508	532.658	29.35	684.369	831.005	29.31
77	2	4.42055		132.62	7.918845						
78	2	4.32832		331.209	22.74						
79	2	4.32396		332.679	22.37	604.665		22.58			
80	2	4.19726		87.48	9.754333						
81	2	3.98155		410.615	21.96						
82	2	3.97094		412.273	22.09	764.572		22.03			
83	1	2.64104	261.3	295.3	19.63						
84	1	2.61699	0	116.185	23.75	256.8	290.8	19.63	387.815	504.52	23.6
85	1	2.51245	0	110.175	24.41	248.925	262.275	24.41			
86	0	1.35774	878.38	1258.41	10.5	1258.41	1878.07	14.7	1878.07	2377.63	17.21
87	0	1.11153				1226.43		17.52434			

SJR			Modified											
	Reach	RS	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev
1	6	32.69875		960	45.90886									
2	6	32.63985		1326	44.79792									
3	6	32.61409		1426.5	41.72	2003.5		45.52						
4	6	32.59781		1457.315	43.74	2028.685		43.837						
5	6	32.55368		910.59	43.88281									
6	6	32.43682	574.14	706.8	25.42									
7	6	32.27168	460.42	604.24	23.32									
8	6	32.10501	707.09	1198.43	27.42									
9	6	31.83229	50.62	764.9	30.08	1642.29	1931.95	23.03						
10	6	31.54575	41.81	911.37	30.15	1047.94	1120.4	28.36	1223.52	1491.08	26.79			
11	6	31.21734	64.68	424.63	29.62	579.3	714.29	29.52	756.47	829.58	29.73	1763.22	2106.3	27.84
12	6	31.06034	118.11	551.18	30.88	559.06	1834.65	28.26	2507.87	3200.79	28.05			
13	6	30.75031	0	428.58	28	428.58	1749	23.5	2739.13	3246.38	29.73			
14	6	30.55353	0	586.55	20.13	1454.85	2204.01	23.95	2301	2575.25	28.47			
15	6	30.34388	0	362.53	33.09	1307.65	1974.13	29.94						
16	6	29.949		1431.19	28.74									
17	6	29.69995		1157.61	26.38									
18	6	29.42477				769.11		28.87						
19	6	29.23026				824.84		27.26						
20	6	28.71796				1123.84		36.5						
21	6	28.31608	31.68	513.27	28.28	513.27	872.9	28.28						
22	6	28.20263	0	476.02	28.1	476.02	1088.8	25.74						
23	6	27.95794		1736	25.74									
24	6	27.57859		1676	25.74									
25	6	27.33428		1645	25.74									
26	6	27.11232				3170		38						
27	6	26.93902				3382		38						
28	6	26.69812												
29	6	25.96992												
30	6	25.75591												
31	6	23.58606				1378		35						
32	6	23.37035				2550.24		36						

33	6	23.14024		526.64	25.46	2579.1		35						
34	6	23.03172	0	367.62	33.73	367.62	954.36	20						
35	6	22.9588		880	20									
36	6	22.76354	0	1460	21.5	1460	1655.65	19						
37	6	22.59442	0	1406.54	21.5	1406.54	1693.07	19						
38	6	22.48476	0	1527.6	21.5									
39	6	22.17757		775.01	21.5									
40	6	22.09386		309.82	21.5									
41	6	21.87379				1103.37		22						
42	6	21.72796				603.93		22						
43	5	21.25998	797	1130	20.99	1130	2872.32	27						
44	5	21.08706				815.12		29						
45	5	20.9757	477.63	825	21.43	825.02	3309.24	29.58823						
46	5	20.82059	457.85	1503.85	20.06	1503.85	4432.69	29						
47	5	20.50942	425.6	1599.27	20.02	1599.27	4608.54	29						
48	5	20.33102	713.27	1699	18.1	1699	2312.64	29						
49	5	19.7511	0	340.57	28.87	1612.39	2486.2	21.24						
50	5	19.64902	0	630.48	31.72	1538.03	2001.41	17.89						
51	5	19.64883	(Not in Modified Model)											
52	5	19.43577	(Not in Modified Model)											
53	5	19.43558		816.26	31.59									
54	3	19.35736		84.86	34.09	526.86		34.03						
55	3	19.34316	0	118.105	34.09	315.615	319.405	34.01	537.315	698.97	33.87			
56	3	18.87631		150	43.76									
57	3	18.83597		149.045	43.76									
58	3	18.82707		129	43.76	701		36.6						
59	3	18.81325				691.92		36.6						
60	3	18.80245				671.4		40.89						
61	3	18.65662		143.359	32.911									
62	3	18.60473				604.17		22.66						
63	3	15.62505	396.03	788.77	16.83154									
64	3	15.50801	129.91	168.21	18.39	171.85	230.66	17.6						
65	3	15.37203	193.76	262.45	14.77									
66	3	15.27392		322.05	21.07									
67	3	14.67413	139.49	1130.26	16.34									

68	3	13.54347				607.68		30						
69	3	12.37171	470.38	651.41	16.51	651.41	1019.71	28						
70	3	11.46624				447.89		29						
71	3	11.16757				510.54		13.36						
72	3	5.78927		407.66	12.71	629.23		11						
73	3	5.71863				367.32		12						
74	3	5.71844				367.32		12						
75	2	4.76127	501.594	513.594	29.35	674.455	822.022	29.31						
76	2	4.75236	0	398.434	29.35	511.508	532.658	29.35	684.369	831.005	29.31			
77	2	4.42055		132.62	7.918845									
78	2	4.32832		331.209	22.74									
79	2	4.32396		332.679	22.37	604.665		22.58						
80	2	4.19726		87.48	9.754333									
81	2	3.98155		410.615	21.96									
82	2	3.97094		412.273	22.09	764.572		22.03						
83	1	2.64104	261.3	295.3	19.63									
84	1	2.61699	0	116.185	23.75	256.8	290.8	19.63	387.815	504.52	23.6			
85	1	2.51245	0	110.175	24.41	248.925	262.275	24.41						
86	0	1.35774	878.38	1258.41	10.5	1258.41	1878.07	14.7	1878.07	2377.63	17.21			
87	0	1.11153				1226.43		17.52434						

PSC			Original								
1	Reach	RS	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev
2	1	5.86541		272.57	18.85	476.95		19.25			
3	1	5.86522		273.83	19	476.95		18.6			
4	1	5.6531				372.37		18.6			
5	1	5.50159				320.02		18.6			
6	1	5.43644				347.79		18.6			
7	1	5.34705				902.31		23.19			
8	1	5.28758		139	28.16	575		28.85			
9	1	5.27925		171.32	28.15						
10	1	5.20008		354.91	20						
11	1	5.12792		372.67	15						
12	1	5.11599		271.93	16.44						
13	1	5.09914									
14	1	4.96827									
15	1	4.68608				527.5		34.53			
16	1	4.67471		100.615	36.24	531.385		34.53			
17	1	4.61165		128.805	33.93	595.195		33.57			
18	1	4.60407				864.7		33.72			
19	1	4.58362		338.51	33.66	840.49		33.72			
20	1	4.57737		778	27.51	1212		29.73			
21	1	4.56695	77.2	500	24.5	500	714.875	26.45	1152.125	1165.94	29.73
22	1	4.40464									
23	1	4.22624									
24	1	4.06317									
25	1	3.98363		249.3	24.9						
26	1	3.97454		261.335	24.9	1232.665		23.3			
27	1	3.84651		300.11	14	857.77		15.35			
28	1	3.68269		640.77	14	828.16		15.35			
29	1	3.54425		318.65	14	897.87		14.68			
30	1	3.38402		268.35	13.96						
31	1	3.24274		221.61	13.82						
32	1	3.13346		285.03	13.83						
33	1	3.02191	165	300	23	0	165	24			

34	1	3.01054	0	180	24	180	388.08	23			
35	1	2.9293									
36	1	2.73498									
37	1	2.61813	945	1099.8	23.3	761	823	20.63	521.49	739.49	10.5
38	1	2.60714	933.015	1099.8	23.3	761	834.985	20.63	517.32	753.66	10.5
39	1	2.4009									
40	1	2.2492									
41	1	2.0759									
42	1	1.71512	255.24	355.06	12.52						
43	1	1.51398	608.61	627.25	25.85						
44	1	1.43558	0	117.3	25.18	361.6	740.3	25.85	964.28	1111.1	27.6
45	1	1.42554	0	150.735	25.18	368.165	773.735	25.8	970.845	1112.35	27.8
46	1	1.33141	458.25	604.22	25.8						
47	1	1.18918	883.58	1014.71	10.95	305.97	883.58	11.8			
48	1	0.97498	33.92	1039.1	10.16						
49	1	0.77707	274.47	757.91	10.16						
50	1	0.41022	339.04	760.29	9.88						
51	1	0.41003	339.04	760.29	9.88						

PSC			Modified								
1	Reach	RS	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev
2	1	5.86541	0	272.57	18.85	293.23	431.34	10.5	476.95	715.68	19.25
3	1	5.86522	0	273.83	19	295.49	428.41	10.5	476.95	715.68	18.6
4	1	5.6531	262.2	359.03	10.5	372.37	1121.77	18.6			
5	1	5.50159	181.84	310.32	10.5	320.02	1468.9	18.6			
6	1	5.43644	158.25	251.64	10.5	347.79	1374.76	18.6			
7	1	5.34705	178.63	299.44	10.5	902.31	1128.82	23.19			
8	1	5.28758	0	139	28.16	176.84	335.08	10.5	575	671.984	28.85
9	1	5.27925	0	171.32	28.15	189.81	360.59	10.5			
10	1	5.20008	0	354.91	20	364.18	502.53	10.5			
11	1	5.12792	6.02	378.69	19.044	397.78	535.64	10.5			
12	1	5.11599	0	271.93	16.44	375.05	566.28	10.69			
13	1	5.09914	139.48	343.76	18.24						
14	1	4.96827	160.76	191.19	12.94						
15	1	4.68608				527.5		34.53			
16	1	4.67471		100.615	36.24	531.385		34.53			
17	1	4.61165		128.805	33.93	595.195		33.57			
18	1	4.60407				864.7		33.72			
19	1	4.58362		338.51	33.66	840.49		33.72			
20	1	4.57737		778	27.51	1212		29.73			
21	1	4.56695	77.2	500	24.5	500	714.875	26.45	1152.125	1165.94	29.73
22	1	4.40464	139.35	557.41	15.71						
23	1	4.22624	152.51	810.7	13.87						
24	1	4.06317	607.36	1007.36	15.42						
25	1	3.98363		249.3	24.9						
26	1	3.97454	0	261.335	24.9	877.17	1188.98	16.18	1232.665	1342.8	23.3
27	1	3.84651	159.2	309.03	14.68	857.77	1319.06	15.35			
28	1	3.68269	144.48	626.09	15.63	828.16	1440.52	15.35			
29	1	3.54425	160.63	573.68	14.37	897.87	1196.09	14.68			
30	1	3.38402	0	268.35	13.96	343.37	513.49	12.79			
31	1	3.24274	0	221.61	13.82	360.31	495.88	13.7			
32	1	3.13346	0	285.03	13.83	430.32	684.5	13.28			
33	1	3.02191	0	165	24	165	300	23	370.12	639.91	13.53

34	1	3.01054	0	180	24	182.23	350.96	22.77	357.71	643.42	13
35	1	2.9293	273.13	819.4	13.95						
36	1	2.73498	543.14	749.16	13.84						
37	1	2.61813	505.69	734.45	13.32	761	823	20.63	945	1099.8	23.3
38	1	2.60714	496.74	747.81	13.42	761	834.985	20.63	933.015	1099.8	23.3
39	1	2.4009	511.71	634.11	13.95						
40	1	2.2492	1501.69	1629.92	13.42						
41	1	2.0759	1493.25	1600.11	12.69						
42	1	1.71512	255.24	355.06	12.52	365.66	1187.96	13.32			
43	1	1.51398	279.42	607.42	11.32	608.61	627.25	25.85	629.02	882.79	12.06
44	1	1.43558	0	117.3	25.18	361.6	740.3	25.85	964.28	1111.1	27.6
45	1	1.42554	0	150.735	25.18	368.165	773.735	25.8	970.845	1112.35	27.8
46	1	1.33141	458.25	604.22	25.8						
47	1	1.18918	883.58	1014.71	10.95	305.97	883.58	11.8			
48	1	0.97498	324.09	1026.56	10.79						
49	1	0.77707	279.42	755.91	13.11						
50	1	0.41022	339.04	760.29	9.88						
51	1	0.41003	339.04	760.29	9.88						

ODR			Original														
Reach		RS	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev
1	4	18.81722		213.11	16.62												
2	4	18.81703		213.11	16.62												
3	2	12.25164	359.98	495.14	9.3												
4	2	12.07172	533.62	633.47	7.6												
5	2	11.8829	349.32	661.22	9.32	661.22	1887.31	13.96	1887.31	2118.25	12.86						
6	2	11.74786	510	1119.59	8.77	1119.59	2580.35	12.86									
7	2	11.64124	0	222.64	27.17	574.35	961.35	12.05	1594.81	1732.11	11.76						
8	2	11.64105	0	222.64	27.17	574.35	961.35	12.05	1594.81	1732.11	11.76						
9	1	11.36946		311.07	27.28	574.9		23.15									
10	1	11.36927		311.39	27.27	573.25		23.18									
11	1	11.2581		265.05	26.74												
12	1	11.10337				667.37		14									
13	1	10.88197	285.02	1714.06	12.67												
14	1	10.77762	1155.75	1243.22	11.4	337.36	844	13.71									
15	1	10.51834	292.68	685.12	12.1	2684.51	3078.06	11.4	700.74	2497.11	12.49						
16	1	10.25282	274.63	2653.04	11.4												
17	1	10.064	285.5	393.3	14.176	393.3	1936.15	11.4	2176.62	2956.64	14.19						
18	1	10.05699	288.755	408.61	13.63	408.61	1853.22	11.4	2077.6	2939.74	13.5						
19	1	9.85832	512.87	1424.1	12.82	1424.1	1767.11	13.5									
20	1	9.59109		429.63	10.95												
21	1	9.42083				540		23.5									
22	1	8.79224	246.85	356.21	8.94	356.21	843.65	11.22	862.4	1068.63	11.5	1309.23	1600	10.28	1600	2106.44	26.26
23	1	8.48297		75.3	24.3												
24	1	8.46668		40.125	24	386.375		24.52									
25	1	7.96309	691	1372.98	21.5	285.6	691	11.36									
26	1	7.88999				421.24		9.95									
27	1	7.77787				277.37		9.8									
28	1	7.5809		233.15	10.3												
29	1	7.12201		301.36	9.67												
30	1	6.958		98.54	21												
31	1	5.10974		459.36	9												
32	1	4.28817	584.91	853.02	9.97												

33	1	4.14821	440.12	1023.52	8.61												

ODR		Modified															
	Reach	RS	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev
1	4	18.81722		213.11	16.62												
2	4	18.81703		213.11	16.62												
3	2	12.25164	359.98	495.14	9.3												
4	2	12.07172	533.62	633.47	7.6												
5	2	11.8829	349.32	661.22	9.32	661.22	1887.31	13.96	1887	2118.25	12.86						
6	2	11.74786	510	1119.59	8.77	1119.6	2580.35	12.86									
7	2	11.64124	0	222.64	27.17	574.35	961.35	12.05	1595	1732.11	11.76						
8	2	11.64105	0	222.64	27.17	574.35	961.35	12.05	1595	1732.11	11.76						
9	1	11.36946		311.07	27.28	574.9		23.15									
10	1	11.36927		311.39	27.27	573.25		23.18									
11	1	11.2581		265.05	26.74												
12	1	11.10337				667.37		14									
13	1	10.88197	285.02	1714.06	12.67												
14	1	10.77762	1155.75	1243.22	11.4	337.36	844	13.71									
15	1	10.51834	292.68	685.12	12.1	2684.5	3078.06	11.4	700.7	2497.11	12.49						
16	1	10.25282	274.63	2653.04	11.4												
17	1	10.064	285.5	393.3	14.176	393.3	1936.15	11.4	2177	2956.64	14.19						
18	1	10.05699	288.755	408.61	13.63	408.61	1853.22	11.4	2078	2939.74	13.5						
19	1	9.85832	512.87	1424.1	12.82	1424.1	1767.11	13.5									
20	1	9.59109		429.63	10.95												
21	1	9.42083				540		23.5									
22	1	8.79224	246.85	356.21	8.94	356.21	843.65	11.22	862.4	1068.63	11.5	1309	1600	10.3	1600	2106	26.26
23	1	8.48297		75.3	24.3												
24	1	8.46668		40.125	24	386.38		24.52									
25	1	7.96309	691	1372.98	21.5	285.6	691	11.36									
26	1	7.88999				421.24		9.95									
27	1	7.77787				277.37		9.8									
28	1	7.5809		233.15	10.3												
29	1	7.12201		301.36	9.67												
30	1	6.958		98.54	21												
31	1	5.10974		459.36	9												
32	1	4.28817	584.91	853.02	9.97												

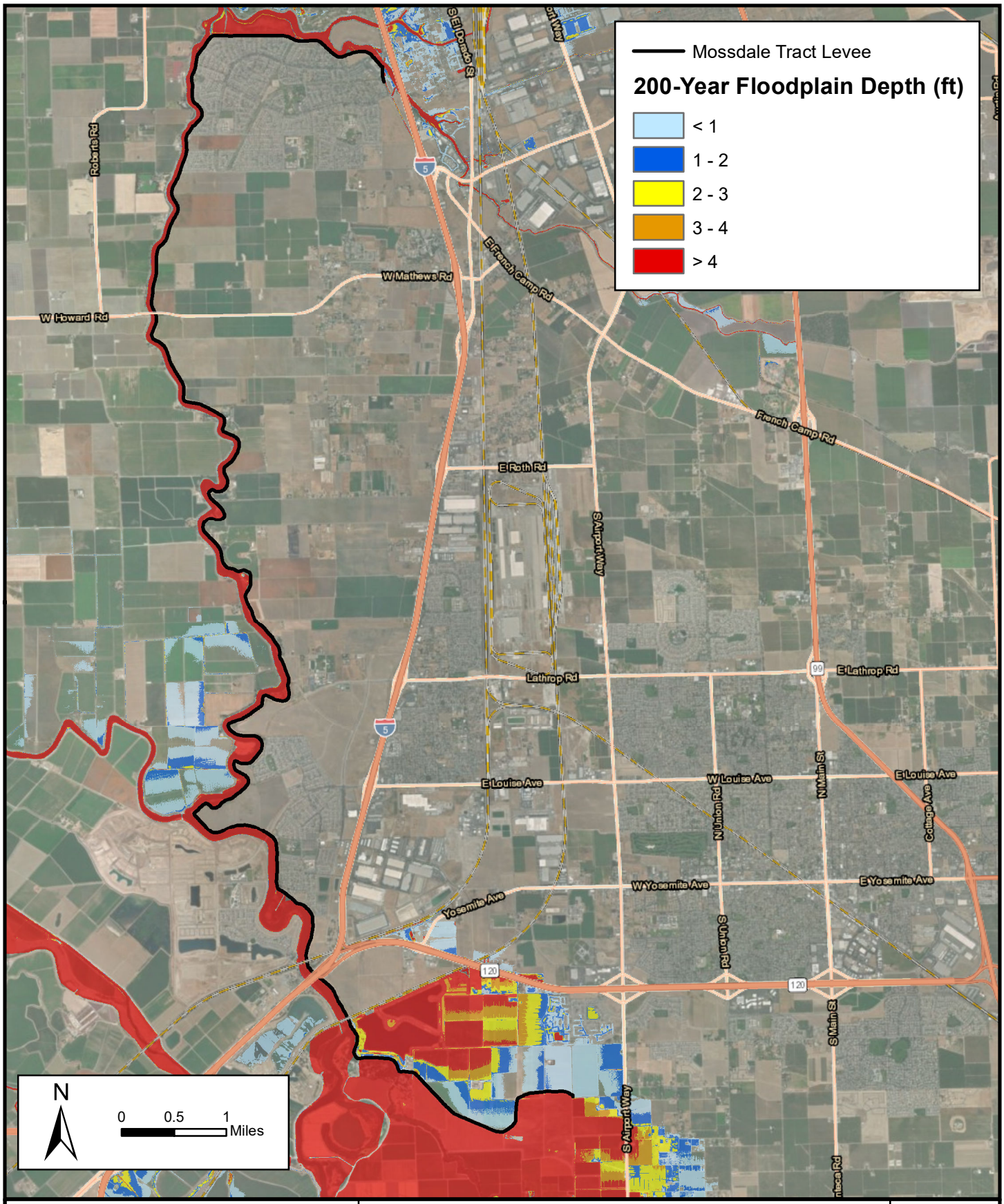
33	1	4.14821	440.12	1023.52	8.61												

FCS		Original							Modified								
	Reach	RS	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev	Left	Right	Elev
1	3	6.4635		(Not in Original Model)								211.8		25.5			
2	3	6.37922		(Not in Original Model)								233.5		24.8			
3	3	6.23017		(Not in Original Model)						176.26	25.2	264.6		24.89			
4	3	6.22506		(Not in Original Model)						190.57	25.2	302.5		24.89			
5	3	6.17108		(Not in Original Model)					0	367.22	24.83	545.5	725.61	24.48	367.22	480.58	24.31
6	3	6.08453		(Not in Original Model)						347.62	24.67	425.7		24.36			
7	3	6.04987		(Not in Original Model)								455		24.34			
8	3	6.04192		(Not in Original Model)						311.37	25	417		23.72			
9	3	6.03643		(Not in Original Model)						302.78	25	408.3		23.74			
10	3	6.01919		(Not in Original Model)					103.48	359.82	25	359.8	393.7	24.62	499.93	731.15	24.11
11	3	5.84382		(Not in Original Model)					96.13	199.61	24.84	537	724.67	23.91	199.61	259.11	23.5
12	3	5.7442		(Not in Original Model)						211	25	301.1		25			
13	3	5.73284		(Not in Original Model)						205.14	25	304.7		25			
14	3	5.68208		(Not in Original Model)						171.7	23.87	296.1		23.95			
15	3	5.61295		(Not in Original Model)						220.9	27						
16	3	4.22662		(Not in Original Model)						23	21.17	141		21.65			
17	3	4.21601		(Not in Original Model)						25.5	21	139.5		21			
18	3	3.7361		(Not in Original Model)								194		19.07			
19	3	3.72568		(Not in Original Model)								208.3		19.72			
20	3	3.61697		(Not in Original Model)						1551.9	20.5						
21	3	3.50182		(Not in Original Model)						333.59	17.68	994.9		14.84			
22	3	3.3077		(Not in Original Model)						1695.4	19.01						
23	2	3.24918		(Not in Original Model)					0	677.33	20.04	677.3	1650.42	18.39			
24	2	2.99369		(Not in Original Model)					0	213.83	32.63	213.8	1812.83	18.8			
25	2	2.7507		(Not in Original Model)					0	405.1	21.34	405.1	1241.31	17.85			
26	2	2.5098	0	653	21.43	653	951.4	18.13	0	653	21.43	653	951.38	18.13			
27	2	2.19541		198.75	16.17					198.75	16.17						
28	2	1.9867				342.83		14.8				342.8		14.8			
29	1	1.18445				473.48		7.62				473.5		7.62			
30	1	1.18426				473.48		7.62	(Not in Modified Model)								
31	1	0.99468		207.66	13.6					207.66	13.6						
32	1	0.75396		894.45	12.81					894.45	12.81						

33	1	0.52537		1161.54	11.42					1161.5	11.42						
34	1	0.27935		731.55	11.64					731.55	11.64						
35	1	0.06629		1447.34	12.45					1447.3	12.45						
36	1	0.0661		1447.34	12.45				(Not in Modified Model)								

Appendix B

200-year Floodplains



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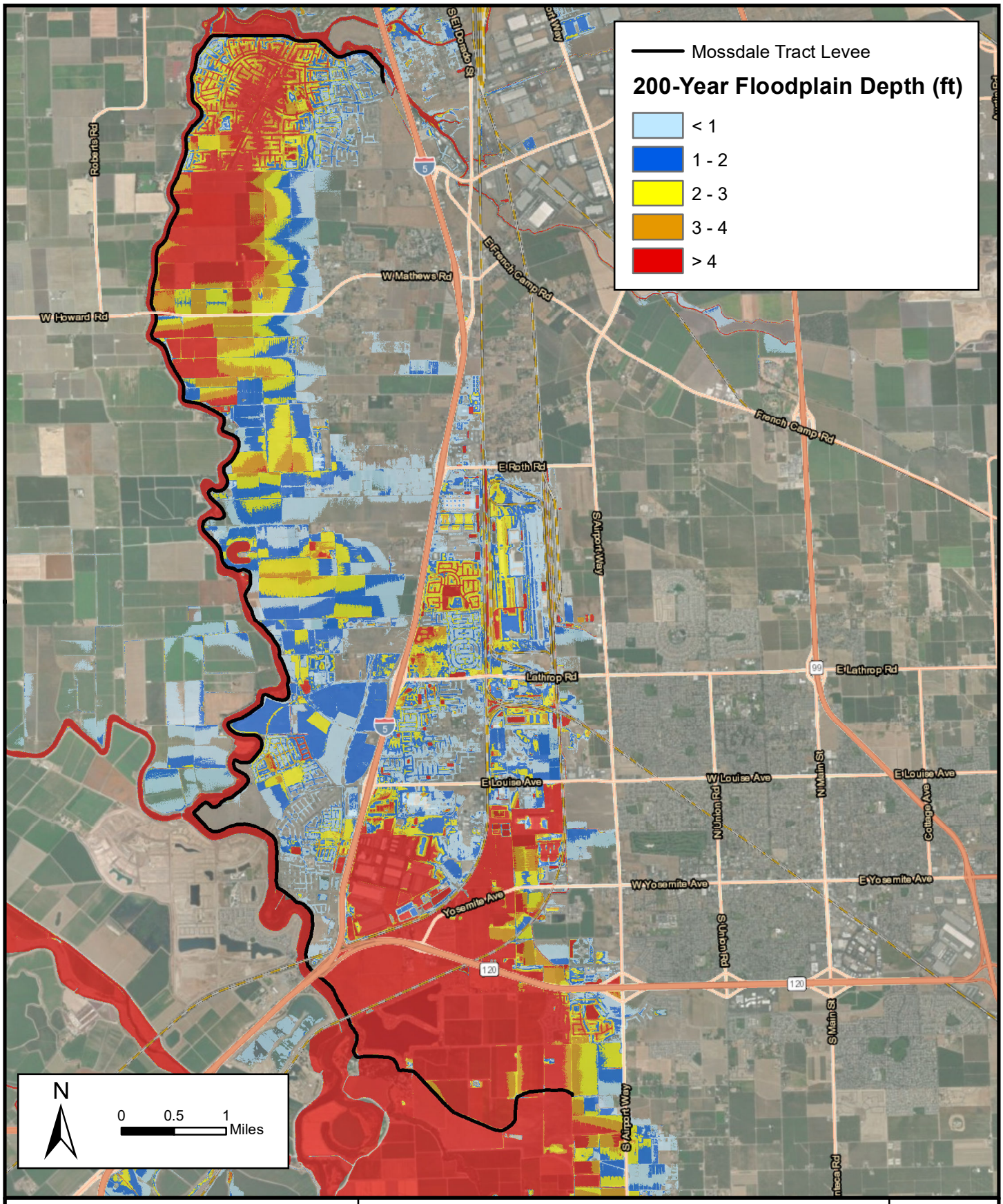
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Without Project

FIGURE

B-1



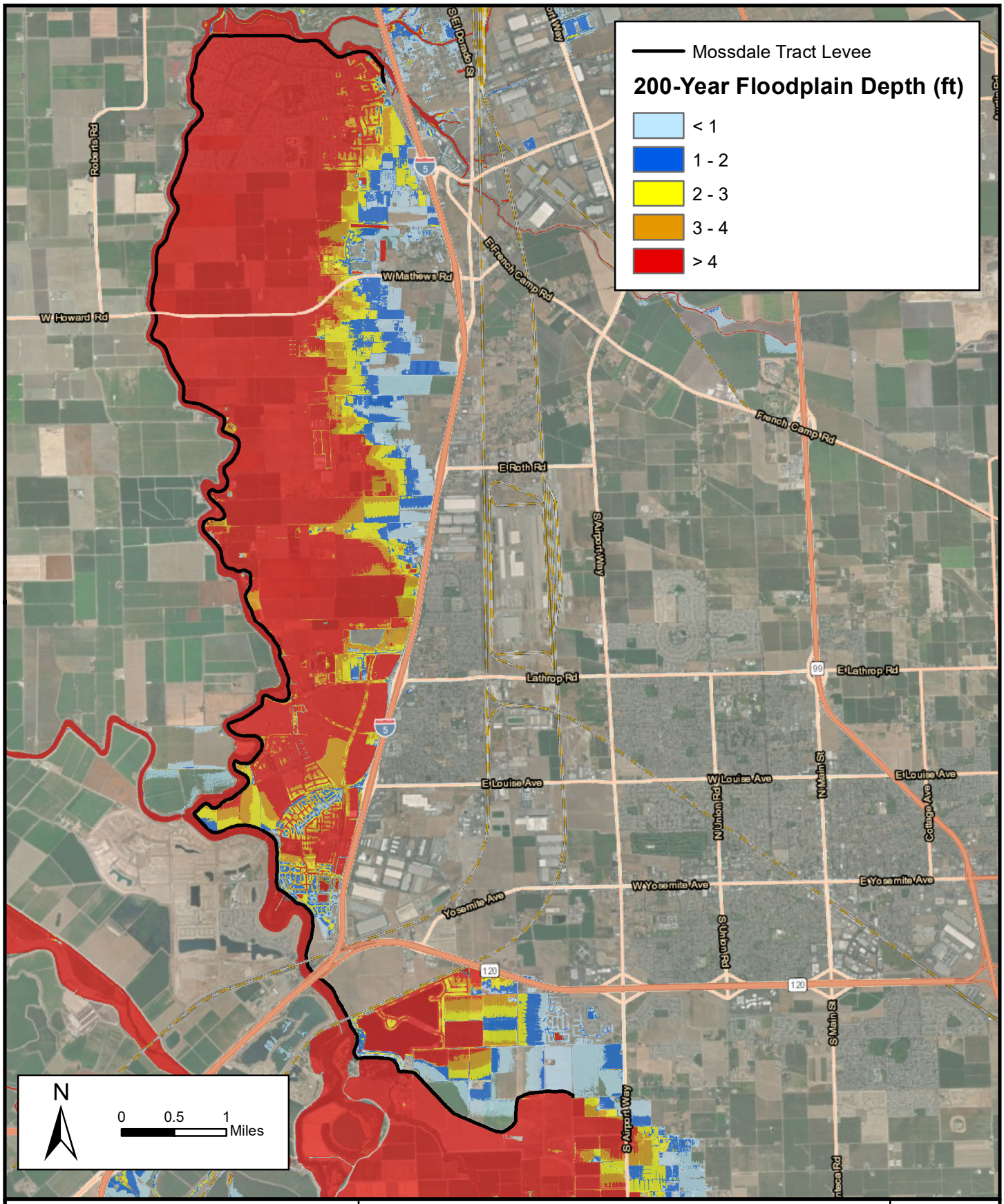
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Folsom, CA 95630
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Without Project FL1

FIGURE

B-2



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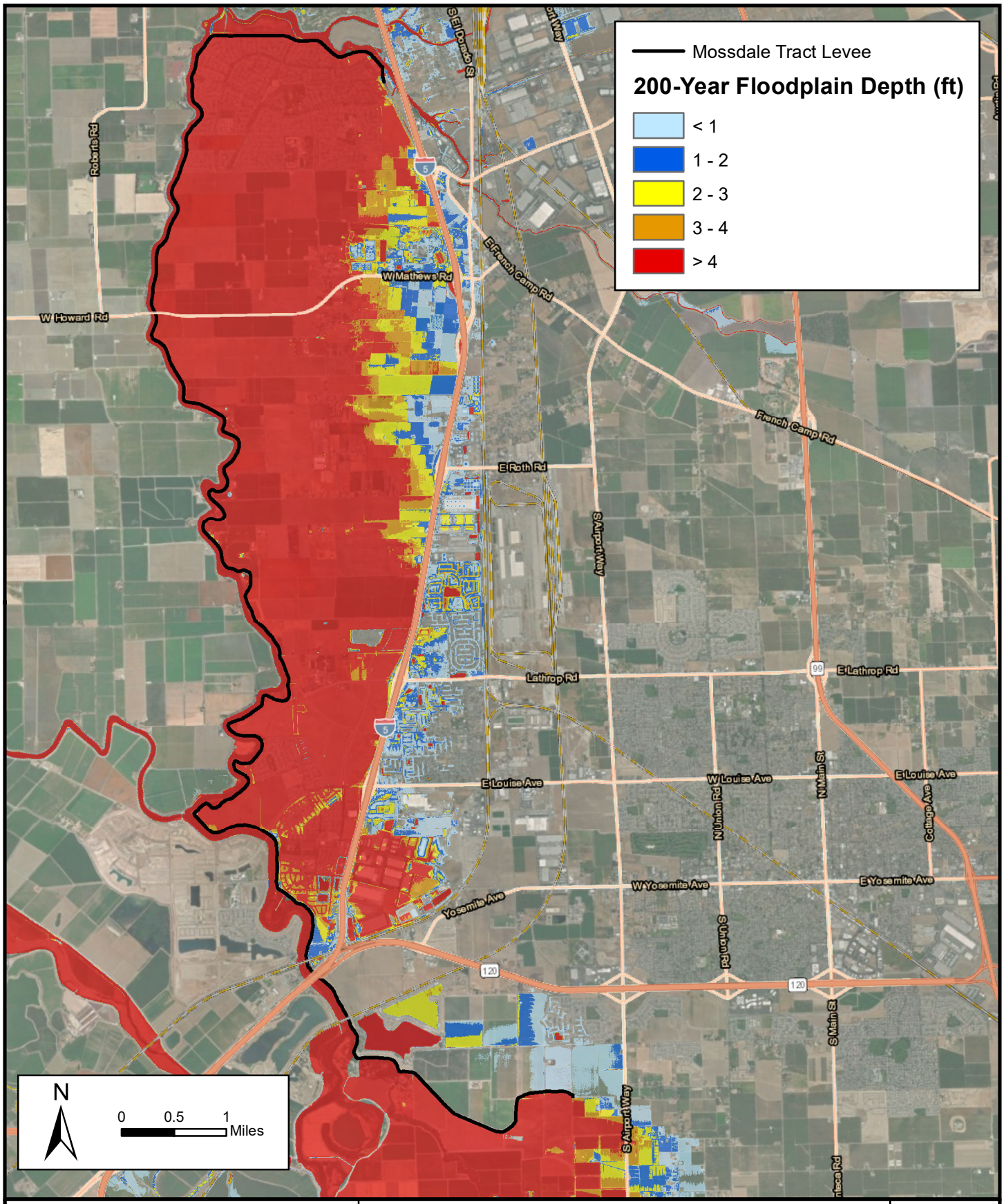
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Without Project LR1

FIGURE

B-3



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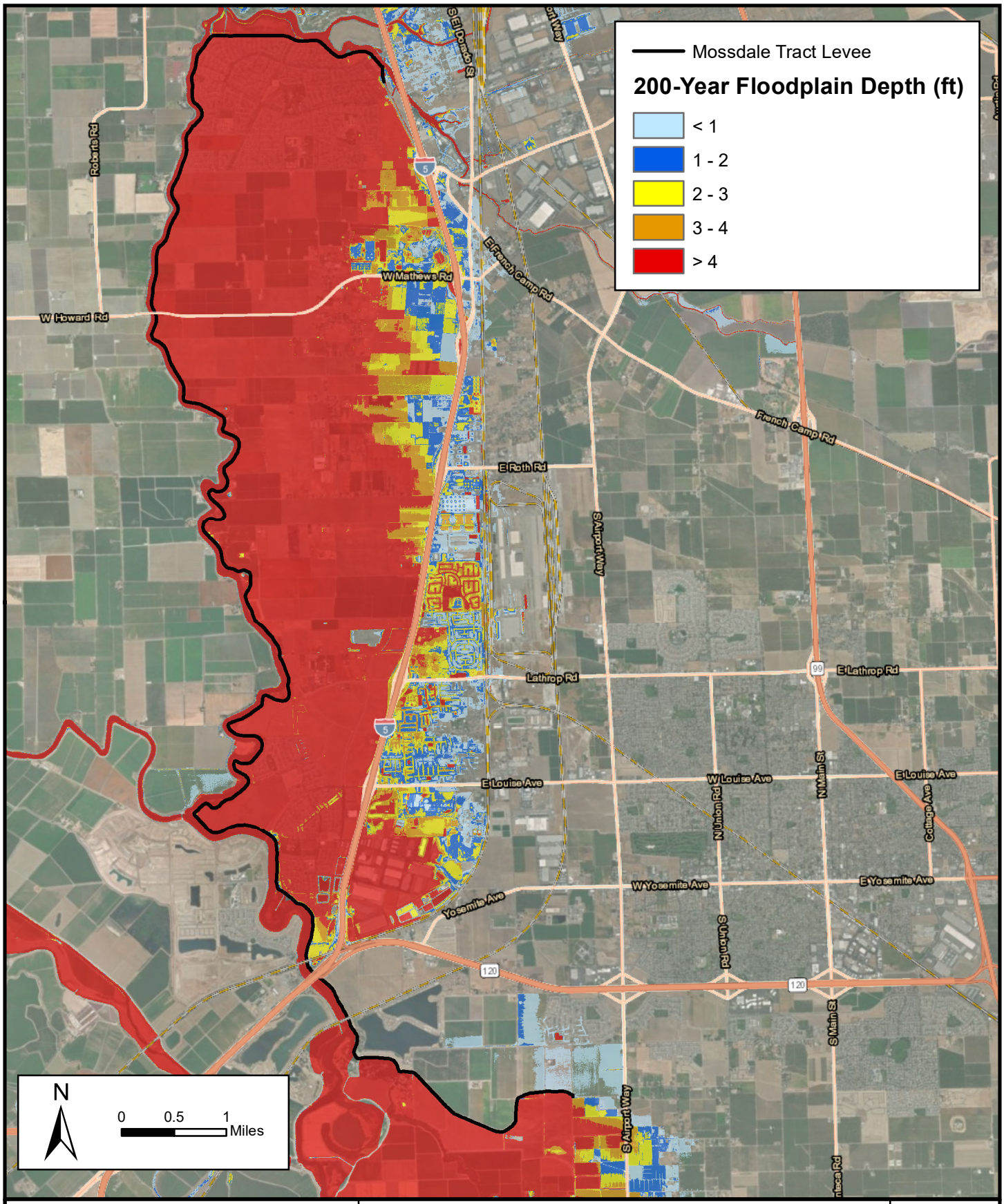
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Without Project LR2

FIGURE

B-4



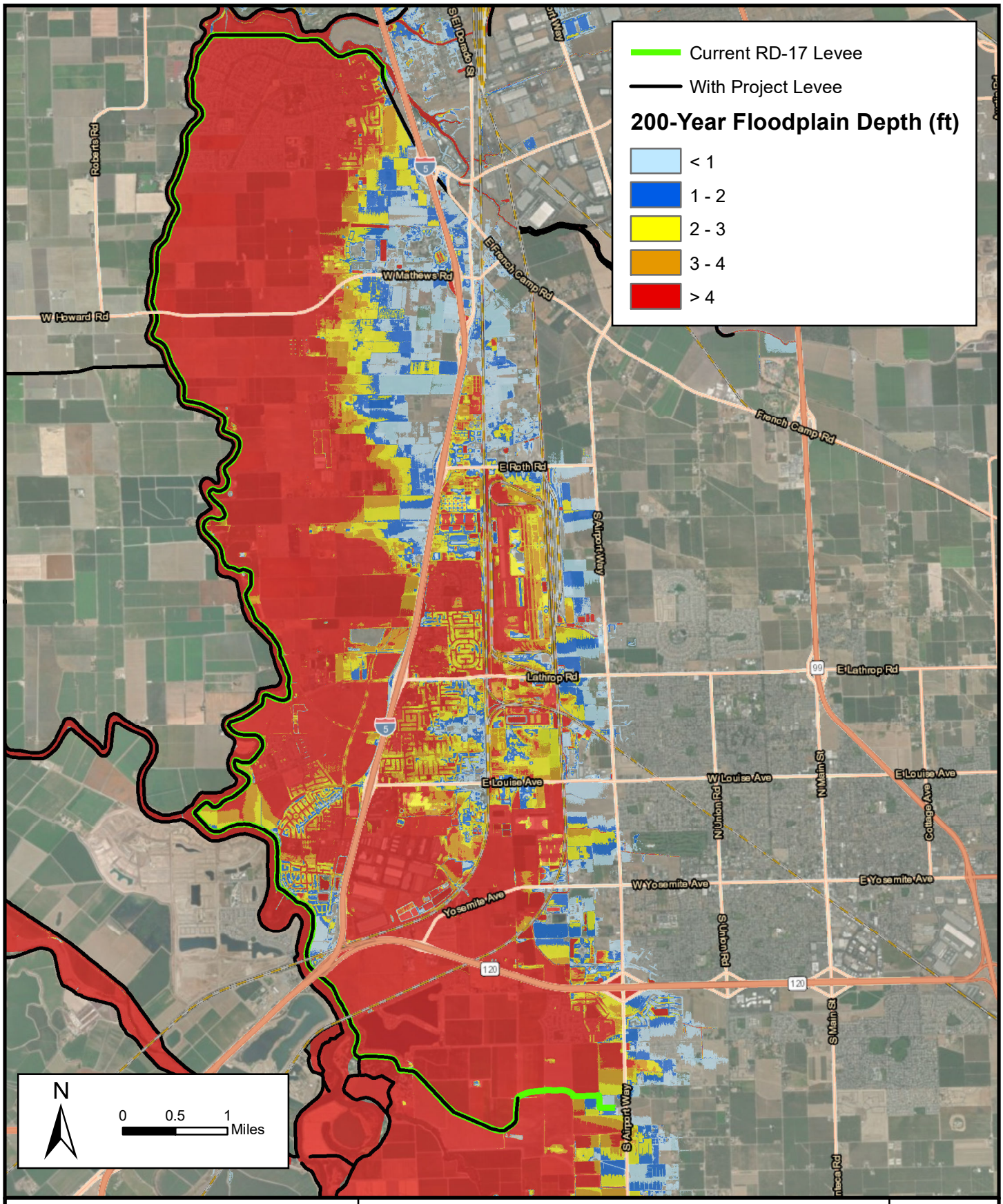
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Without Project LR3

FIGURE

B-5



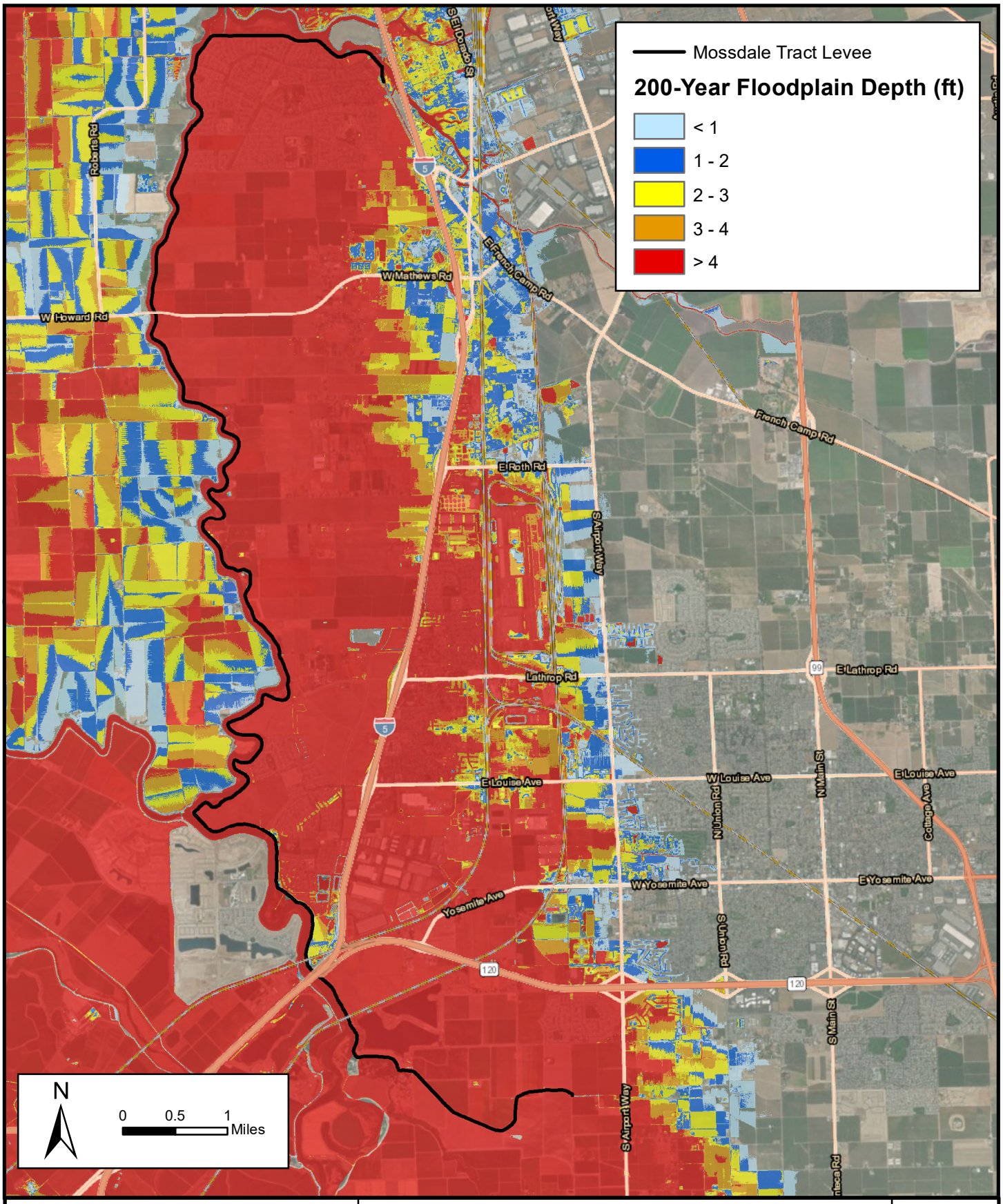
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Without Plan LR4

FIGURE

B-6



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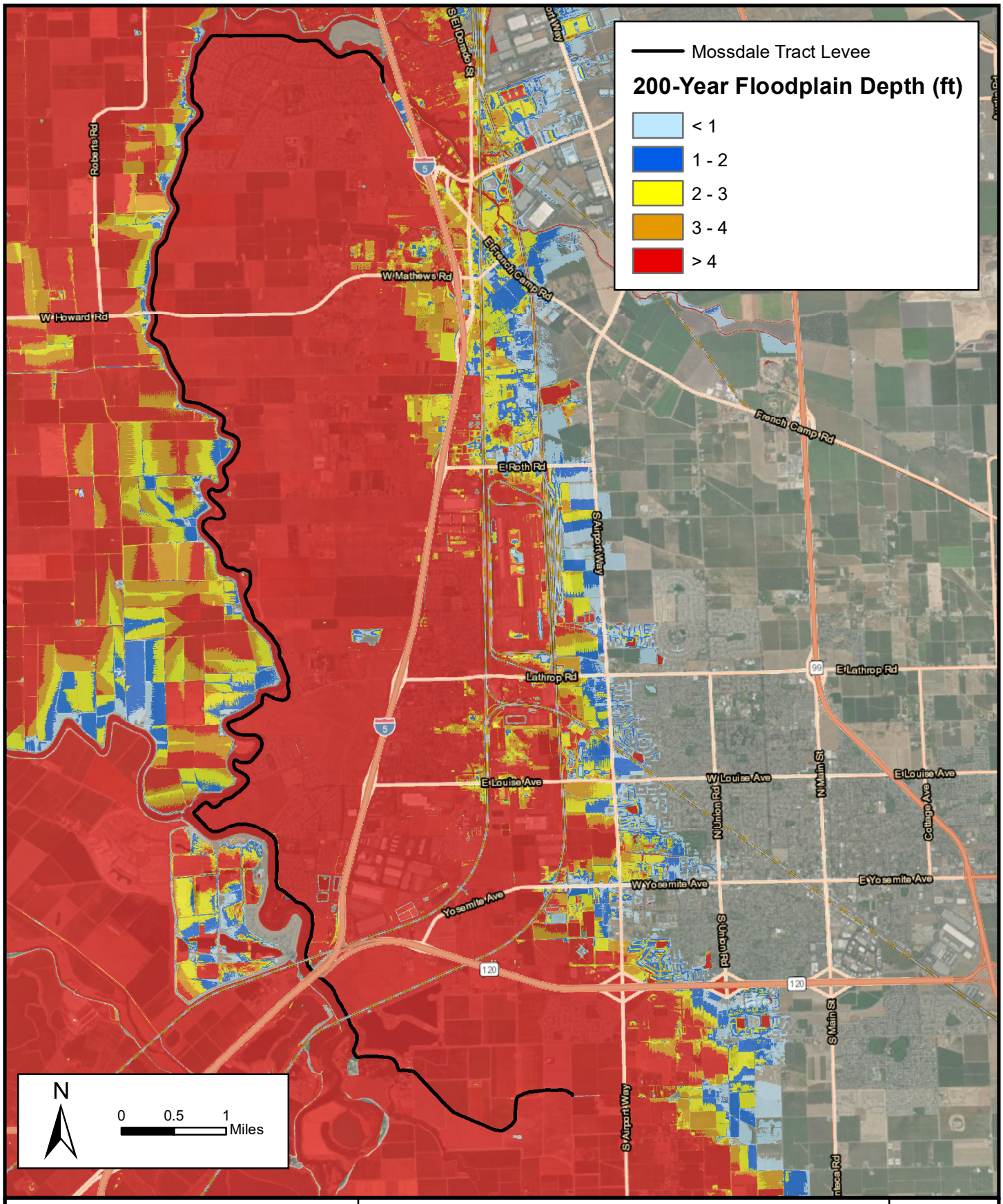
MOSSDALE TRACT AREA

2040 Climate Change 200- Year Floodplain Without Project

FIGURE

B-7

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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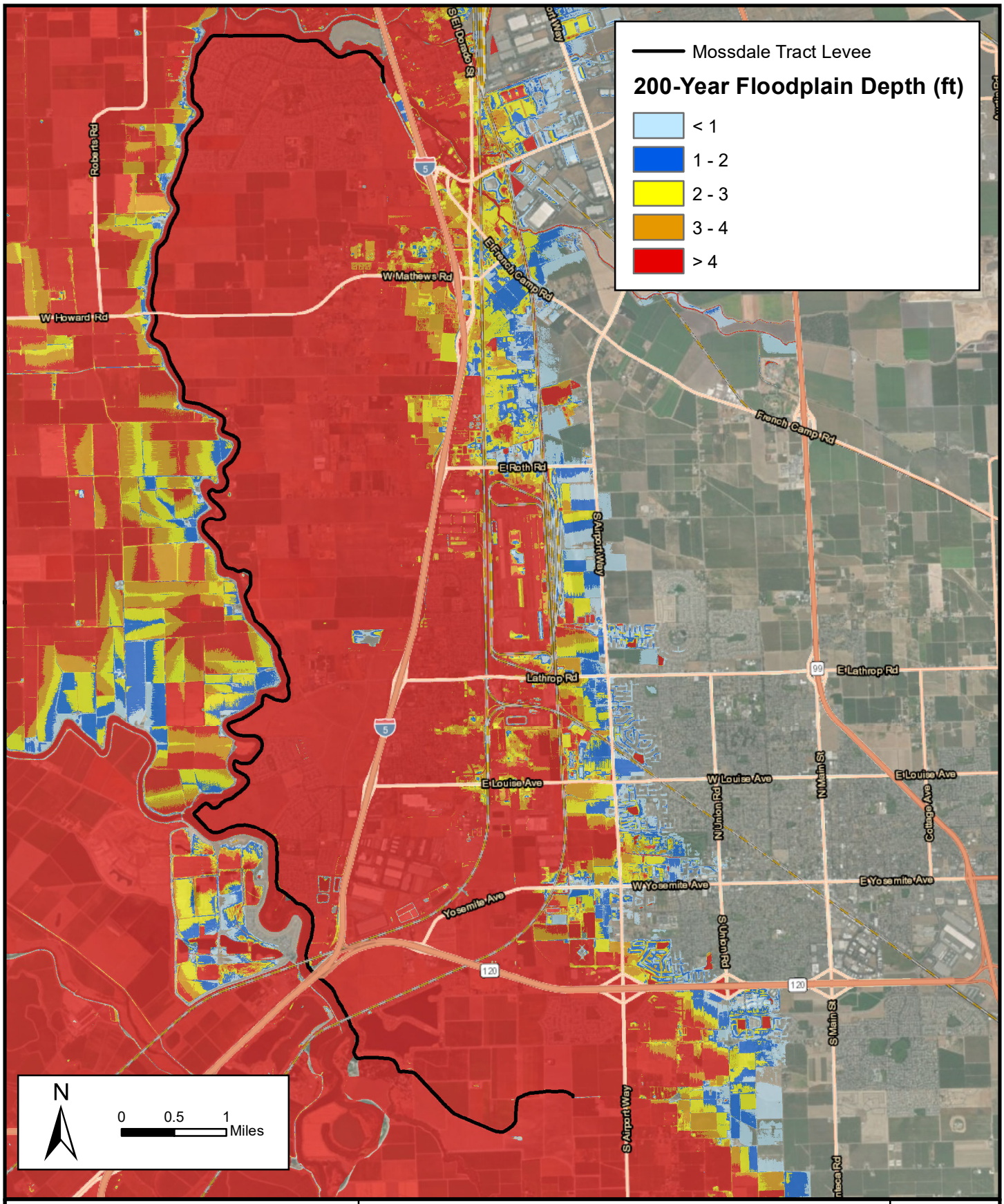
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Without Project

FIGURE

B-8

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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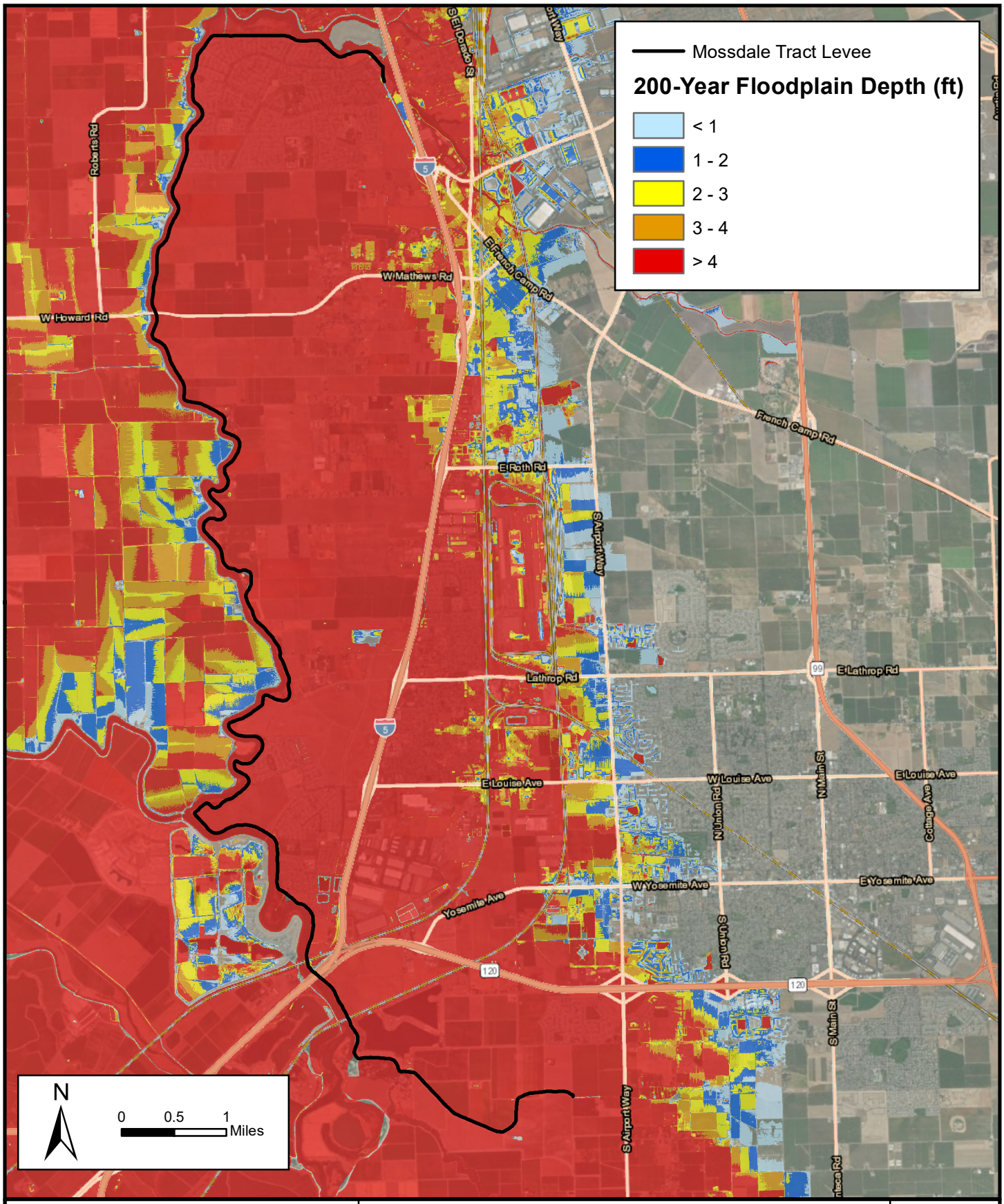
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Without Project FL1

FIGURE

B-9

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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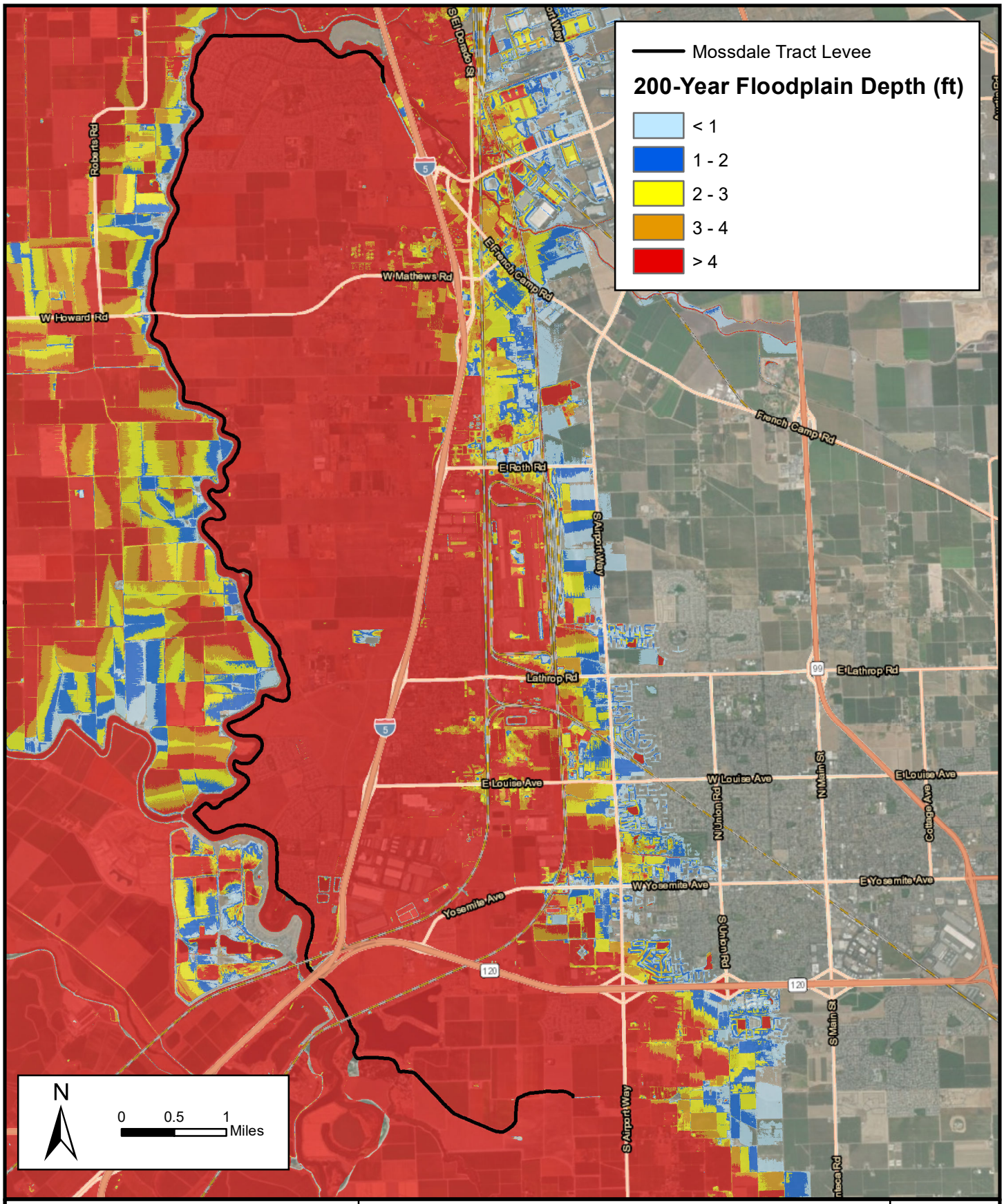
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Without Project LR1

FIGURE

B-10

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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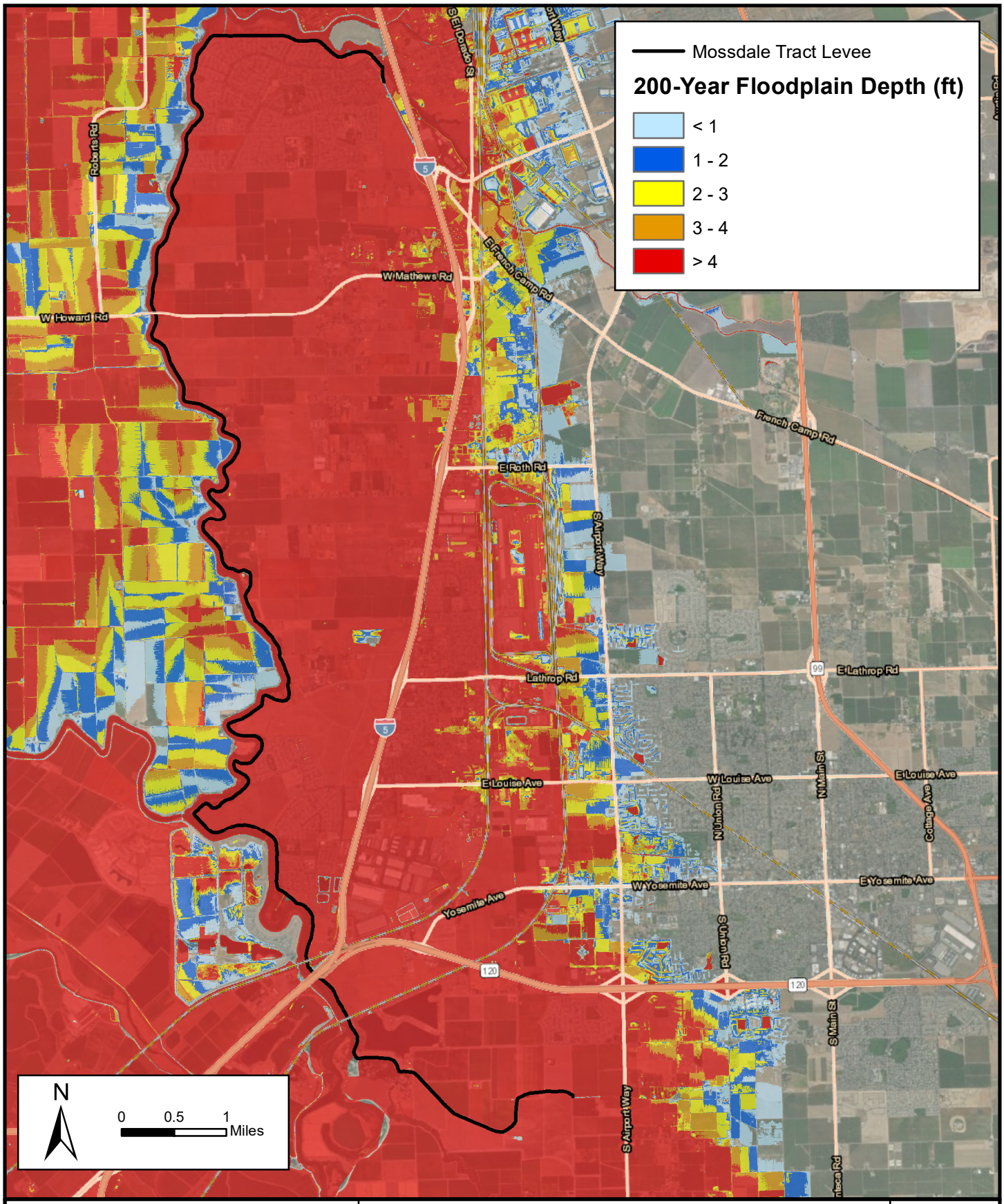
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Without Project LR2

FIGURE

B-11

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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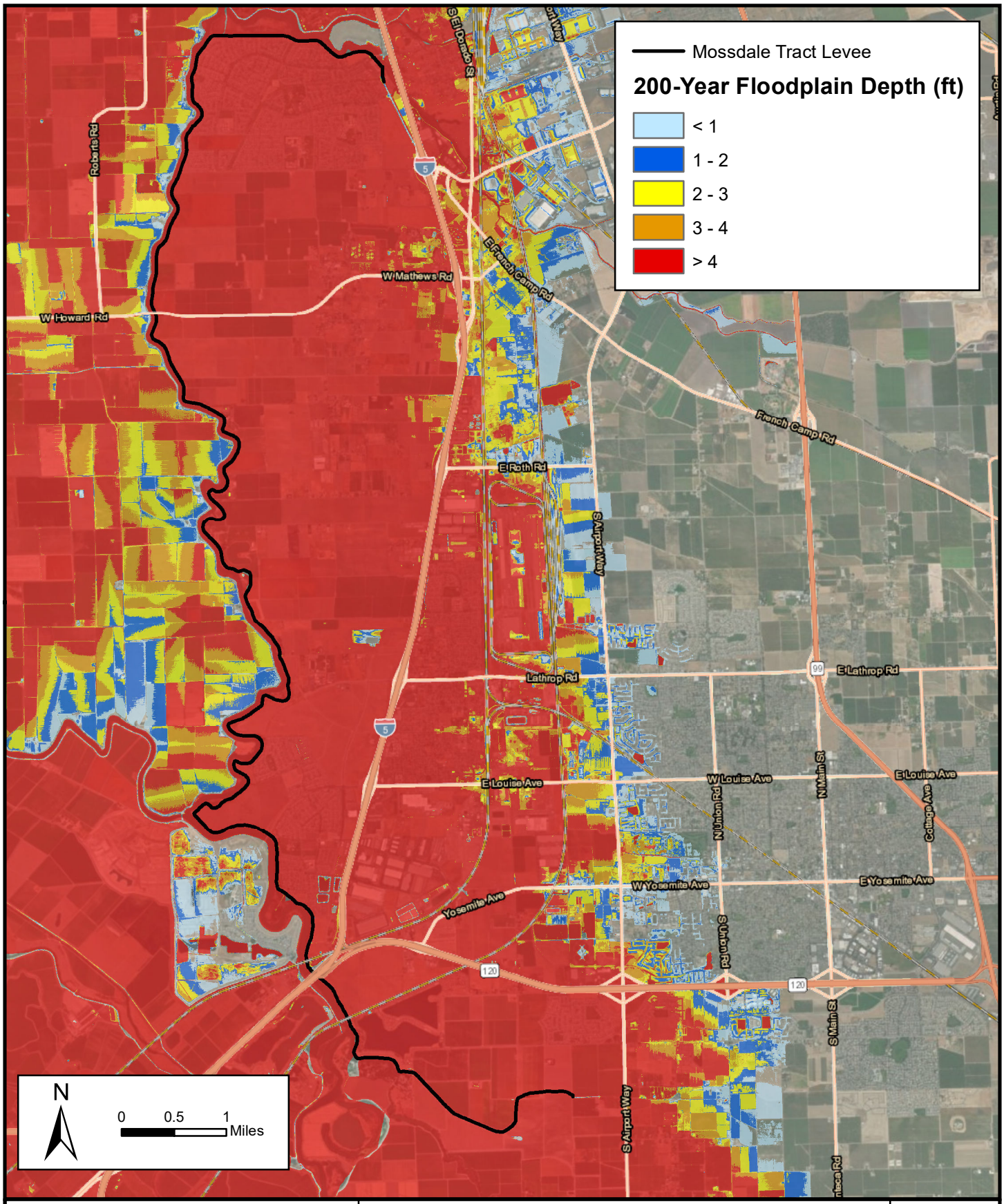
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Without Project LR3

FIGURE

B-12

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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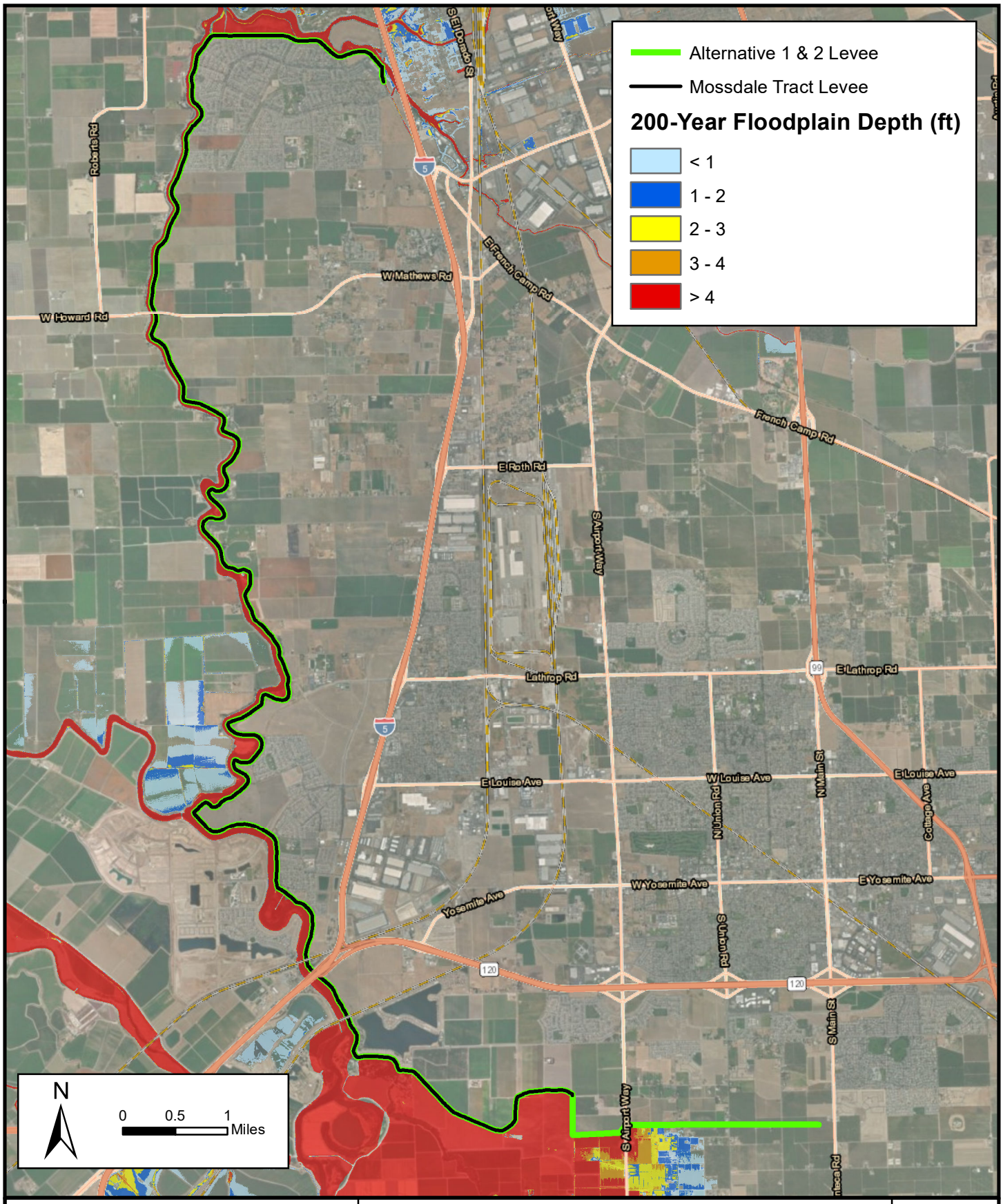
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Without Project LR4

FIGURE

B-13

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



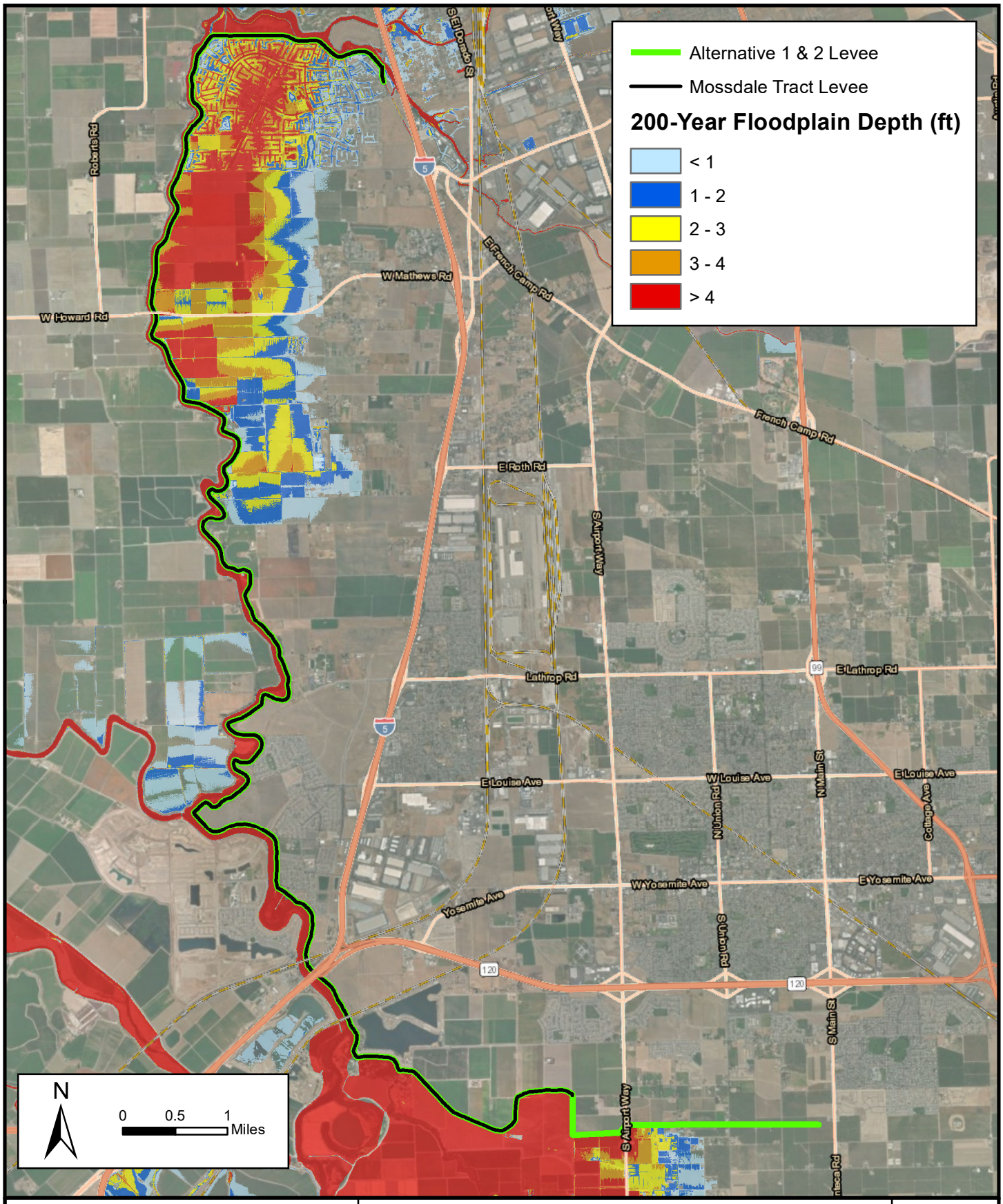
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 1 & 2

FIGURE

B-14



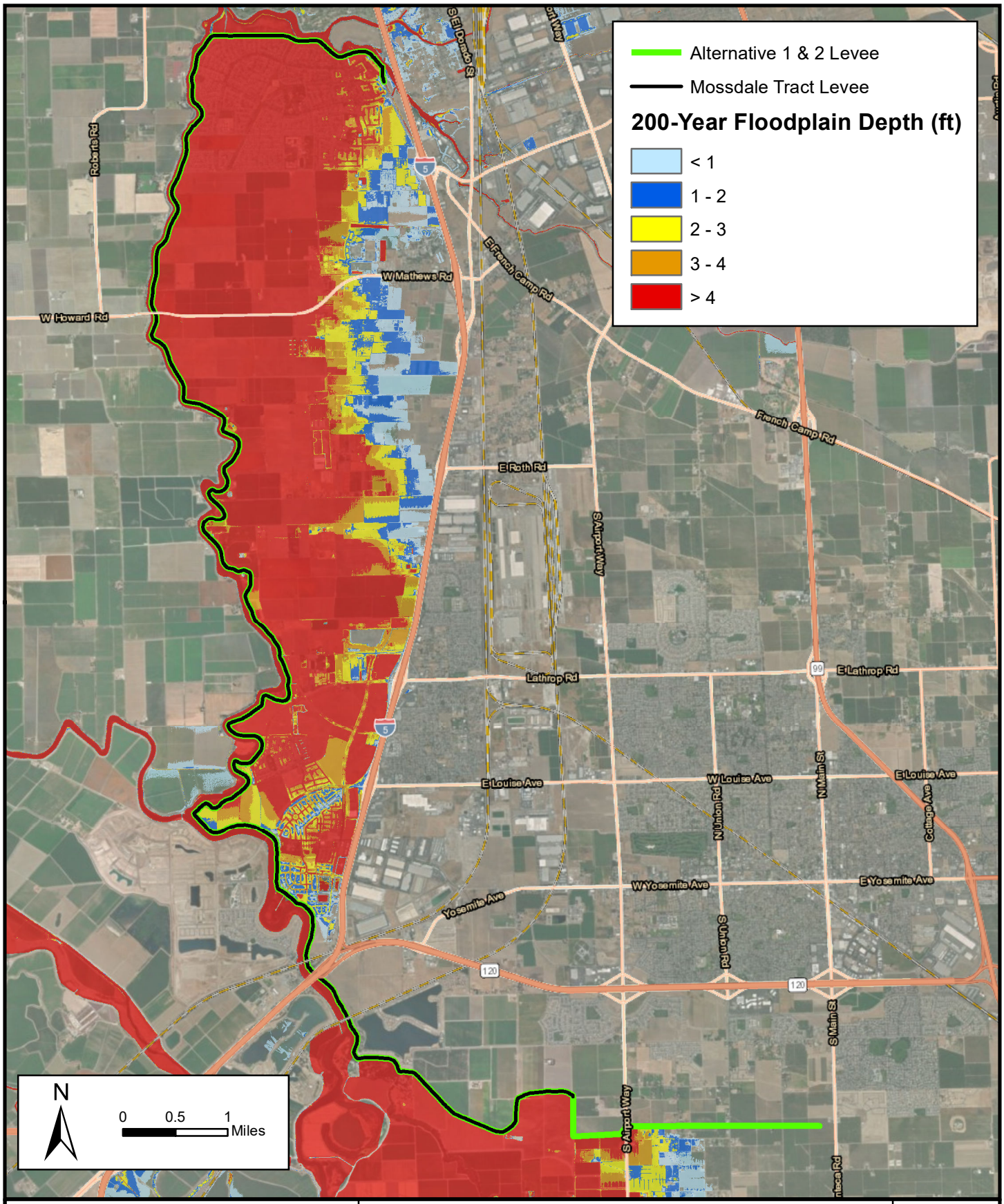
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 1 & 2 FL1

FIGURE

B-15



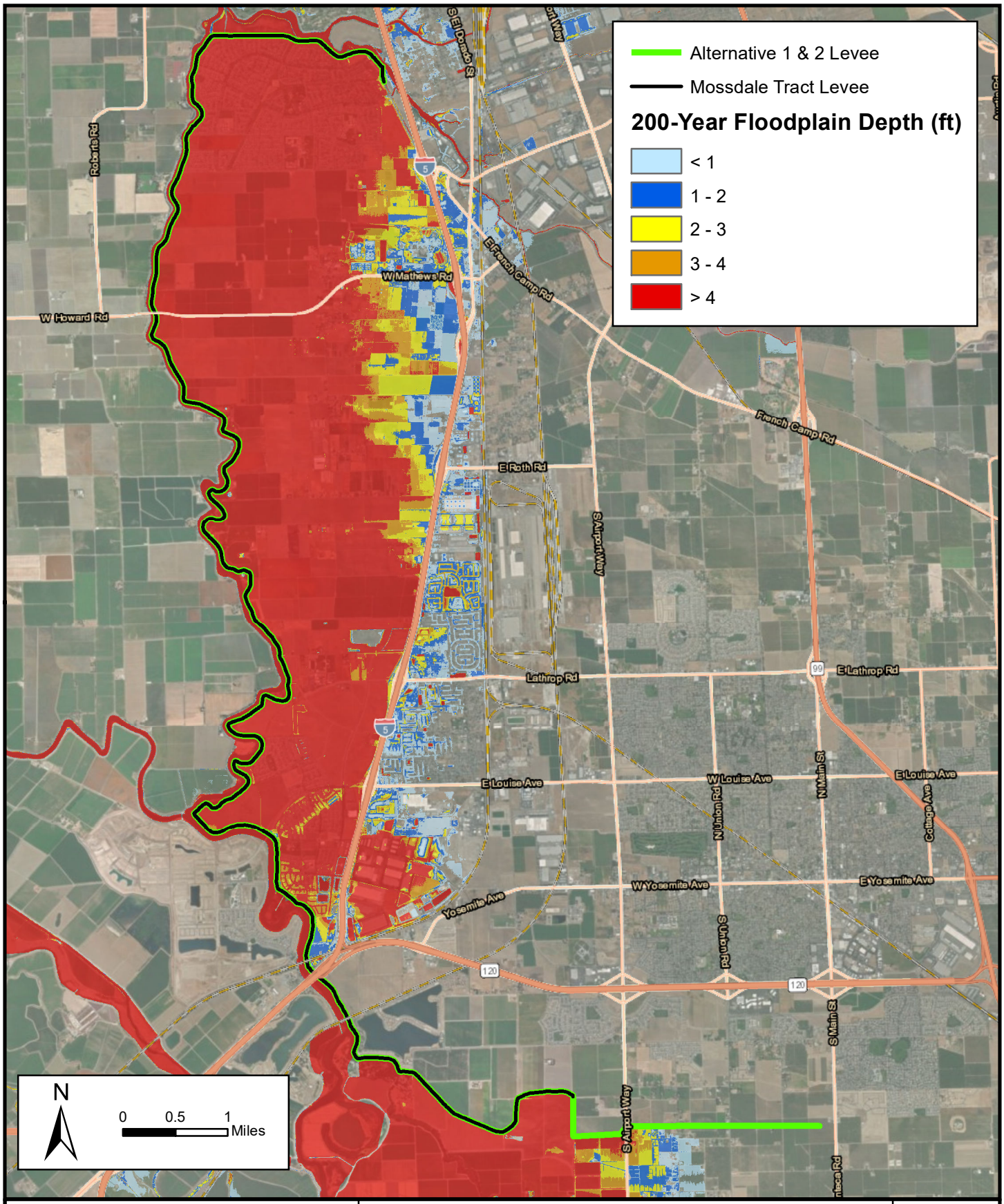
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 1 & 2 LR1

FIGURE

B-16



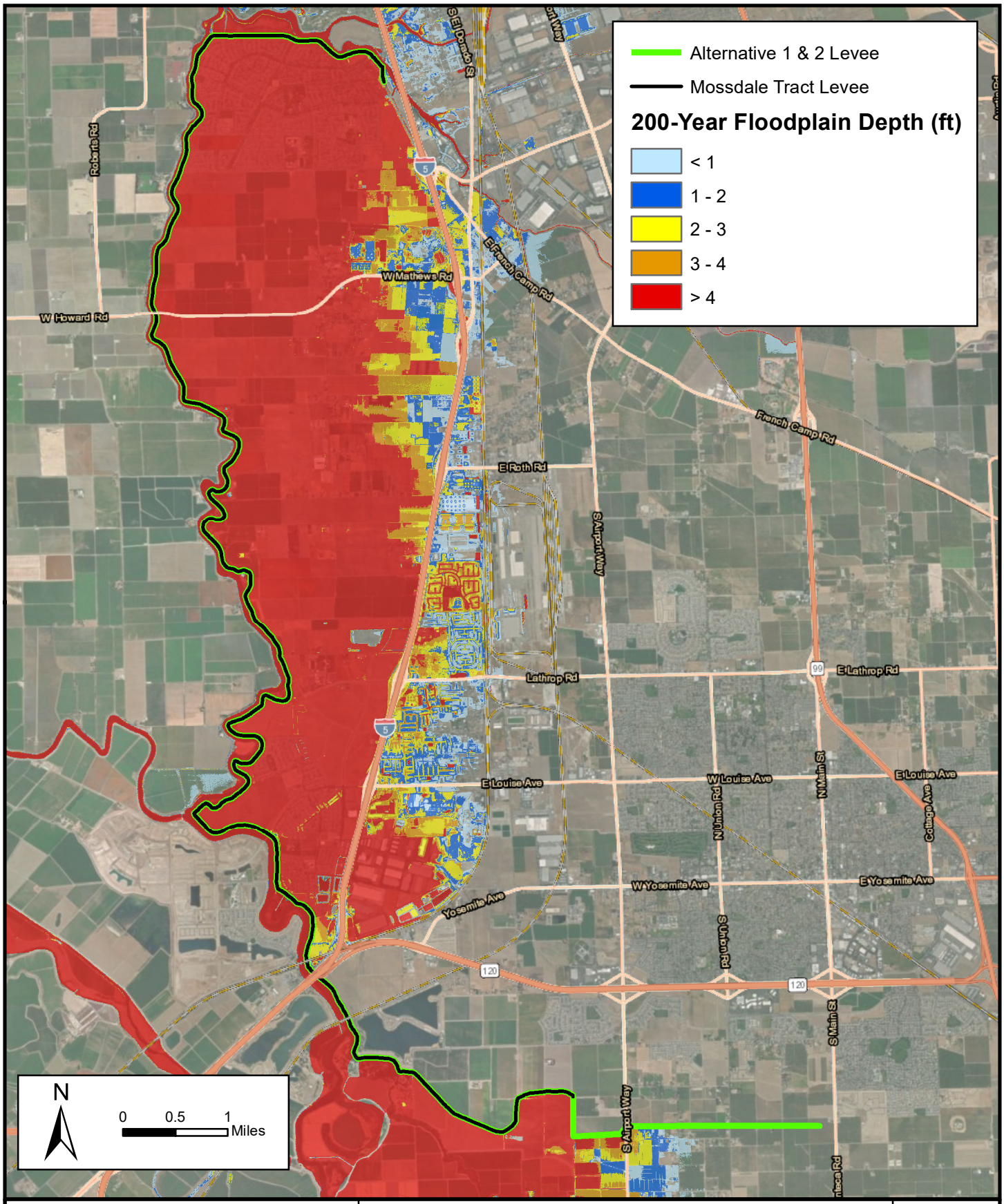
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 1 & 2 LR2

FIGURE

B-17



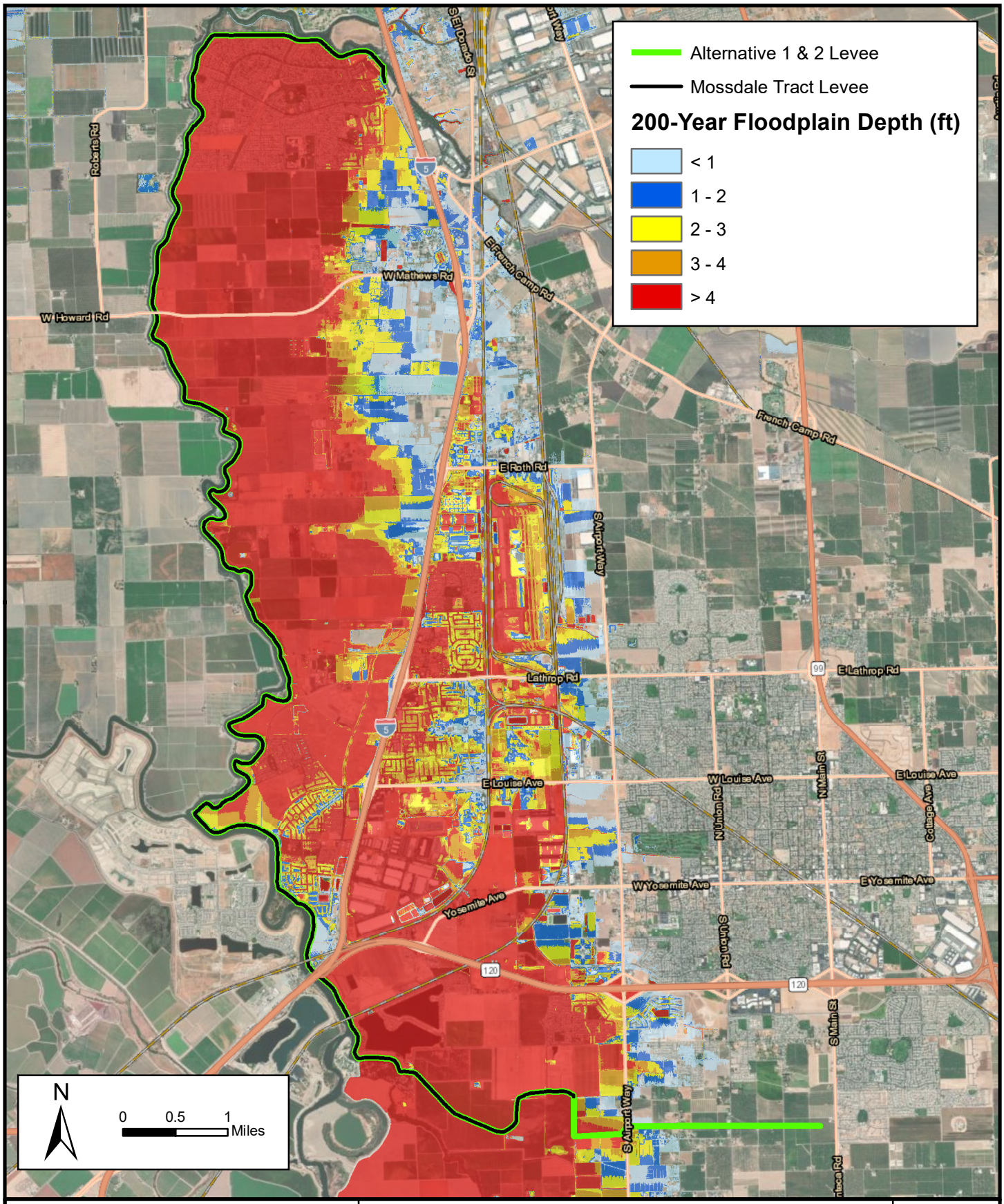
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Current Conditions 200-Year Floodplain Alternative 1 & 2 LR3

FIGURE

B-18



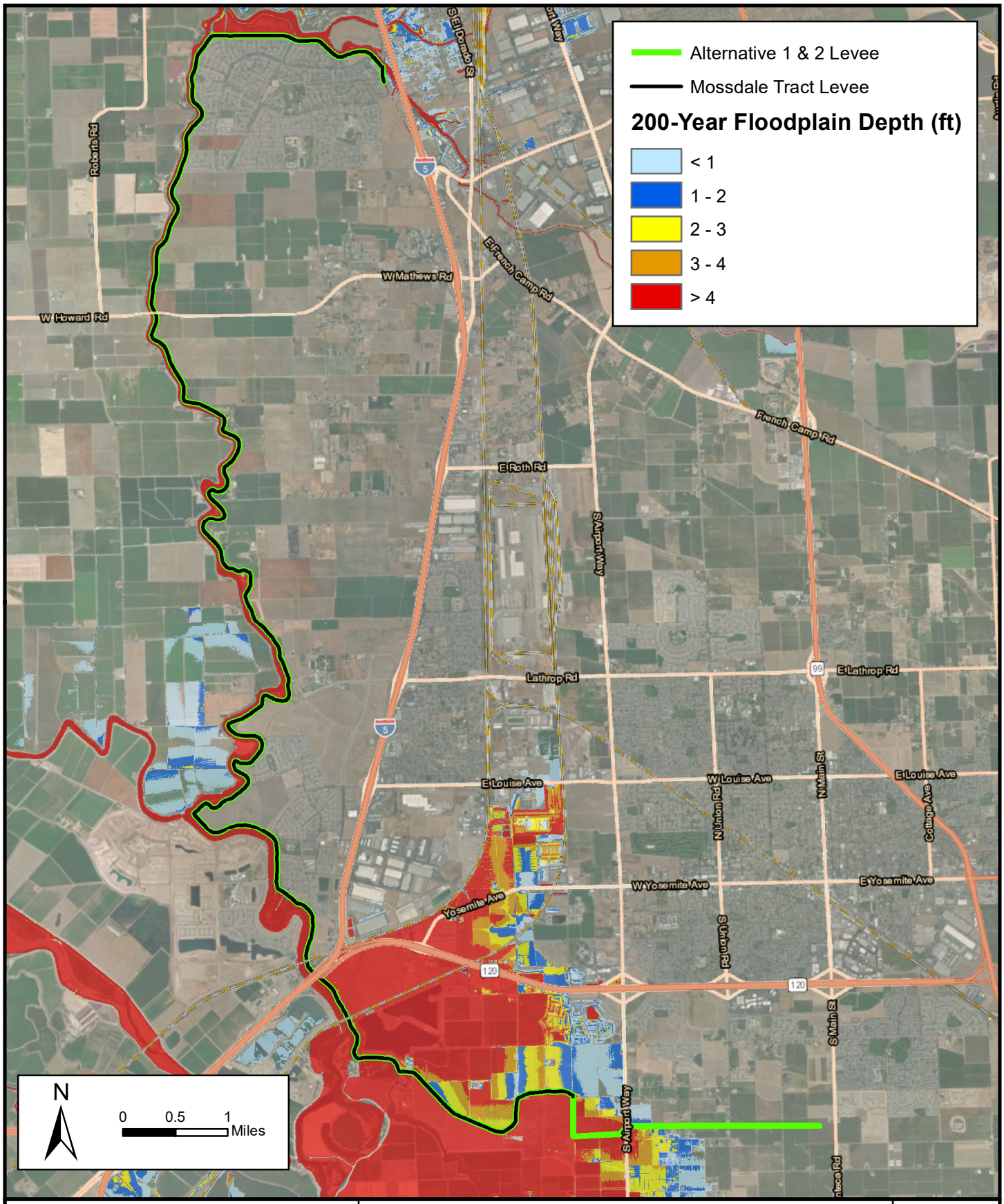
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 1 & 2 LR4

FIGURE

B-19



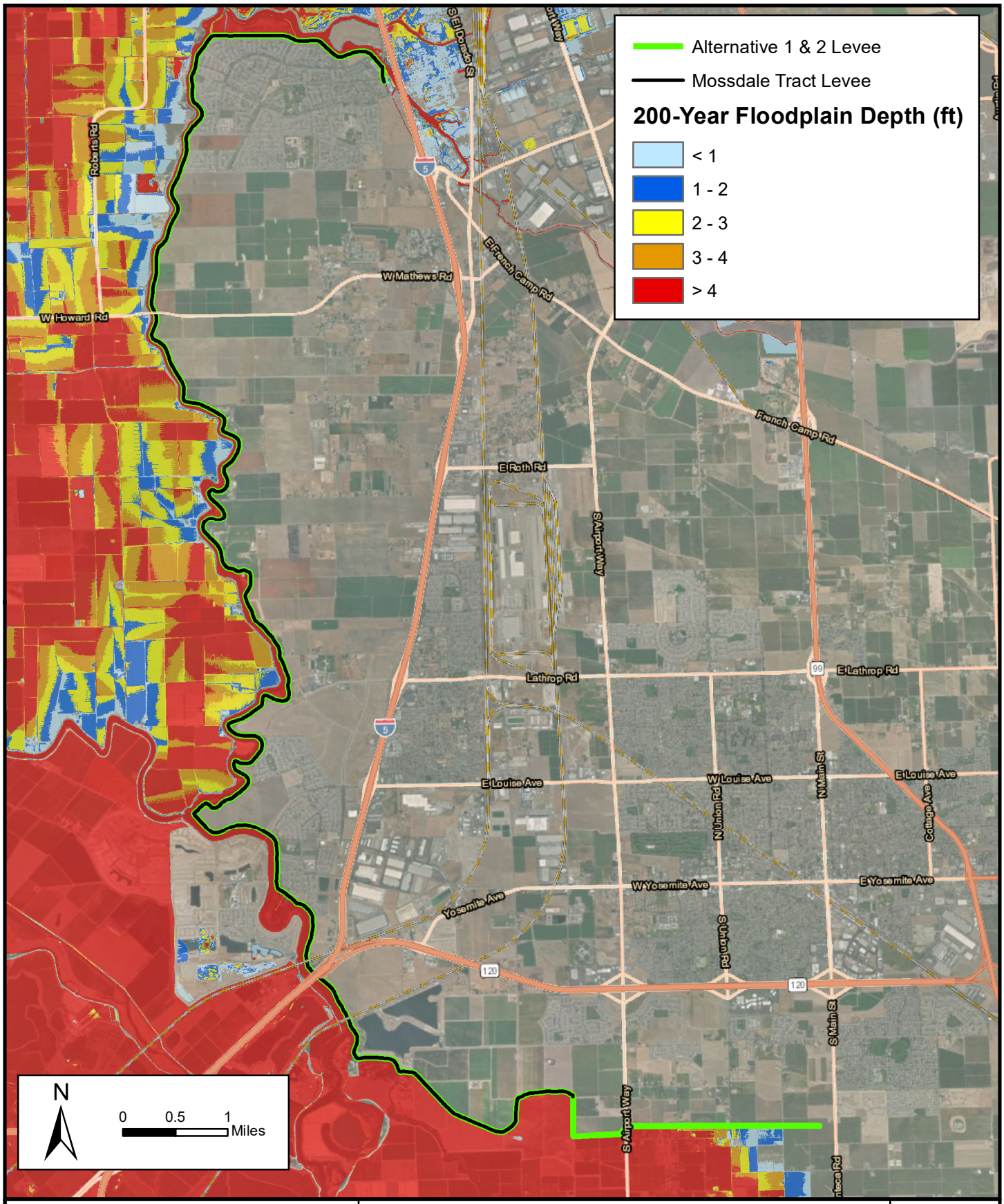
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 1 & 2 LRTB

FIGURE

B-20



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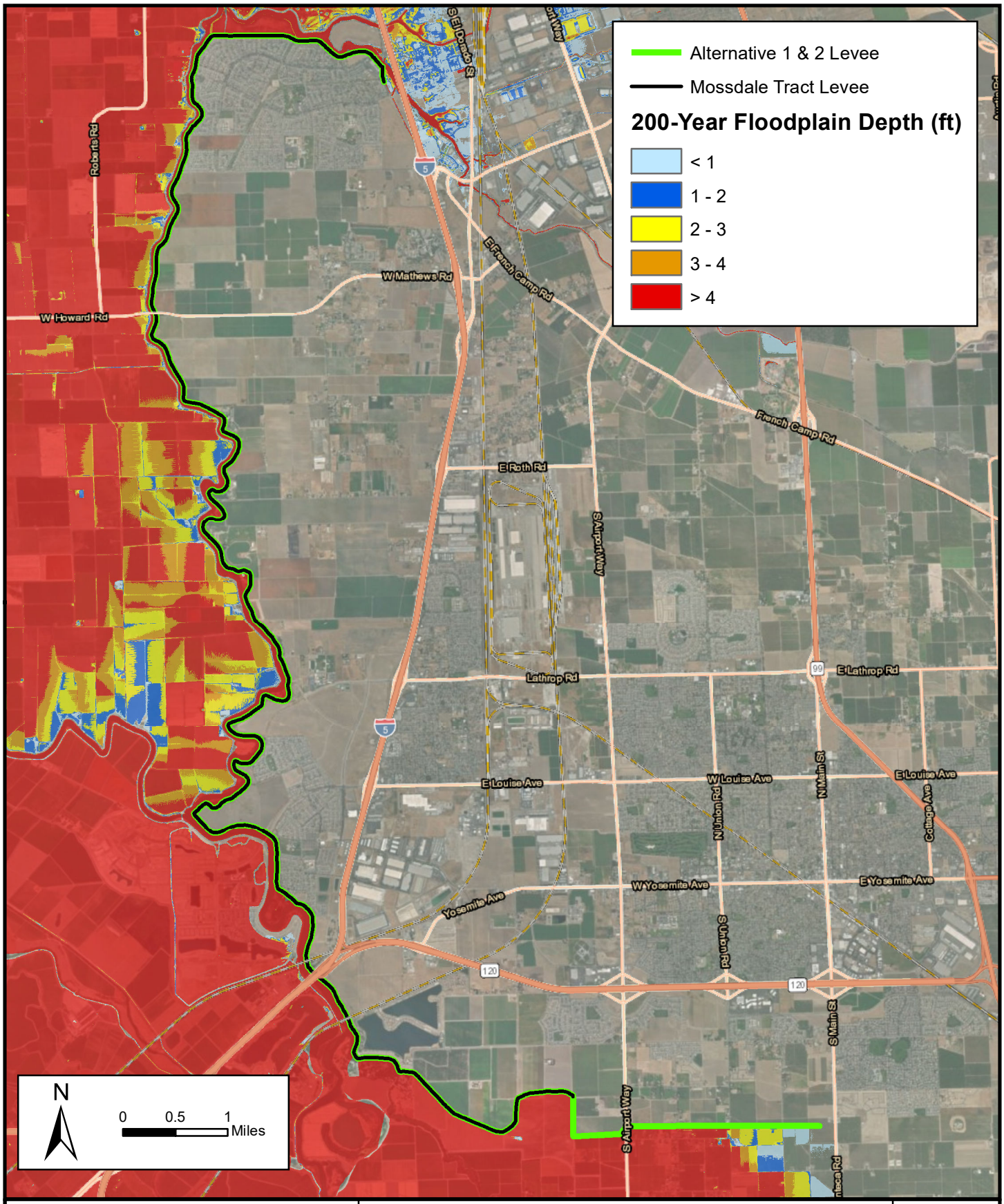
MOSSDALE TRACT AREA

2040 Climate Change 200-Year Floodplain Alternative 1 & 2

FIGURE

B-21

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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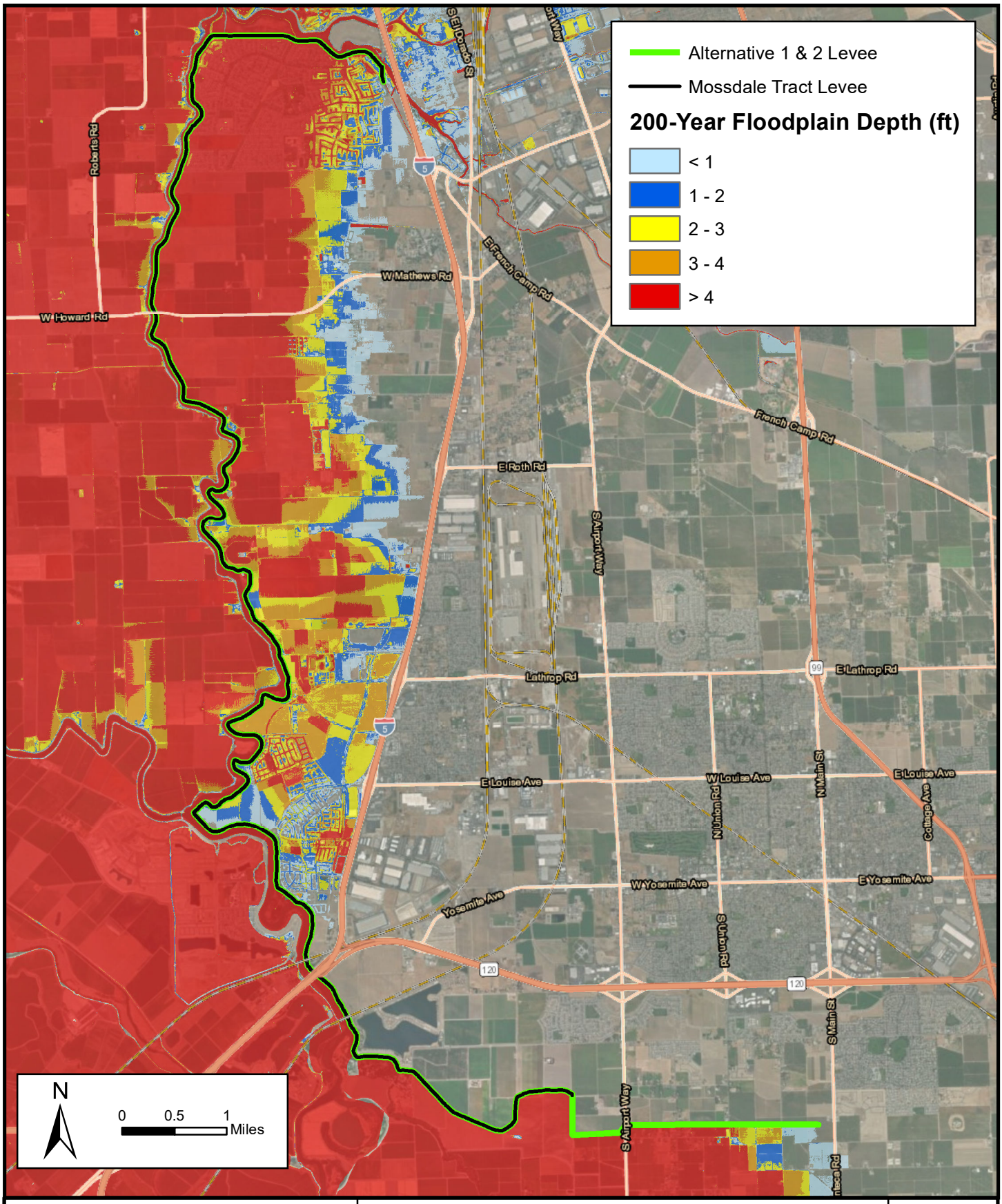
MOSSDALE TRACT AREA

2065 Climate Change 200- Year Floodplain Alternative 1 & 2

FIGURE

B-22

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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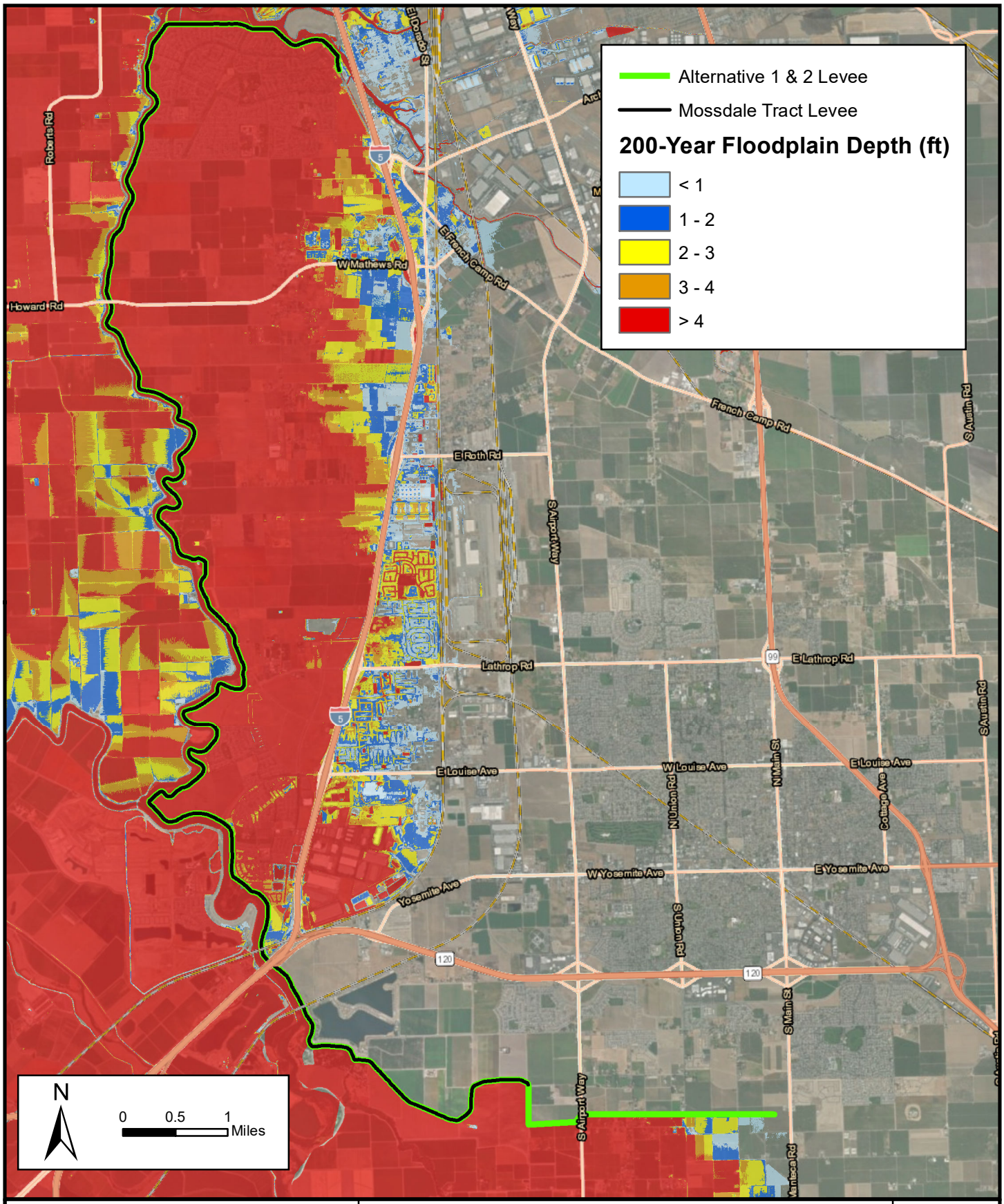
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 1 & 2 FL1

FIGURE

B-23

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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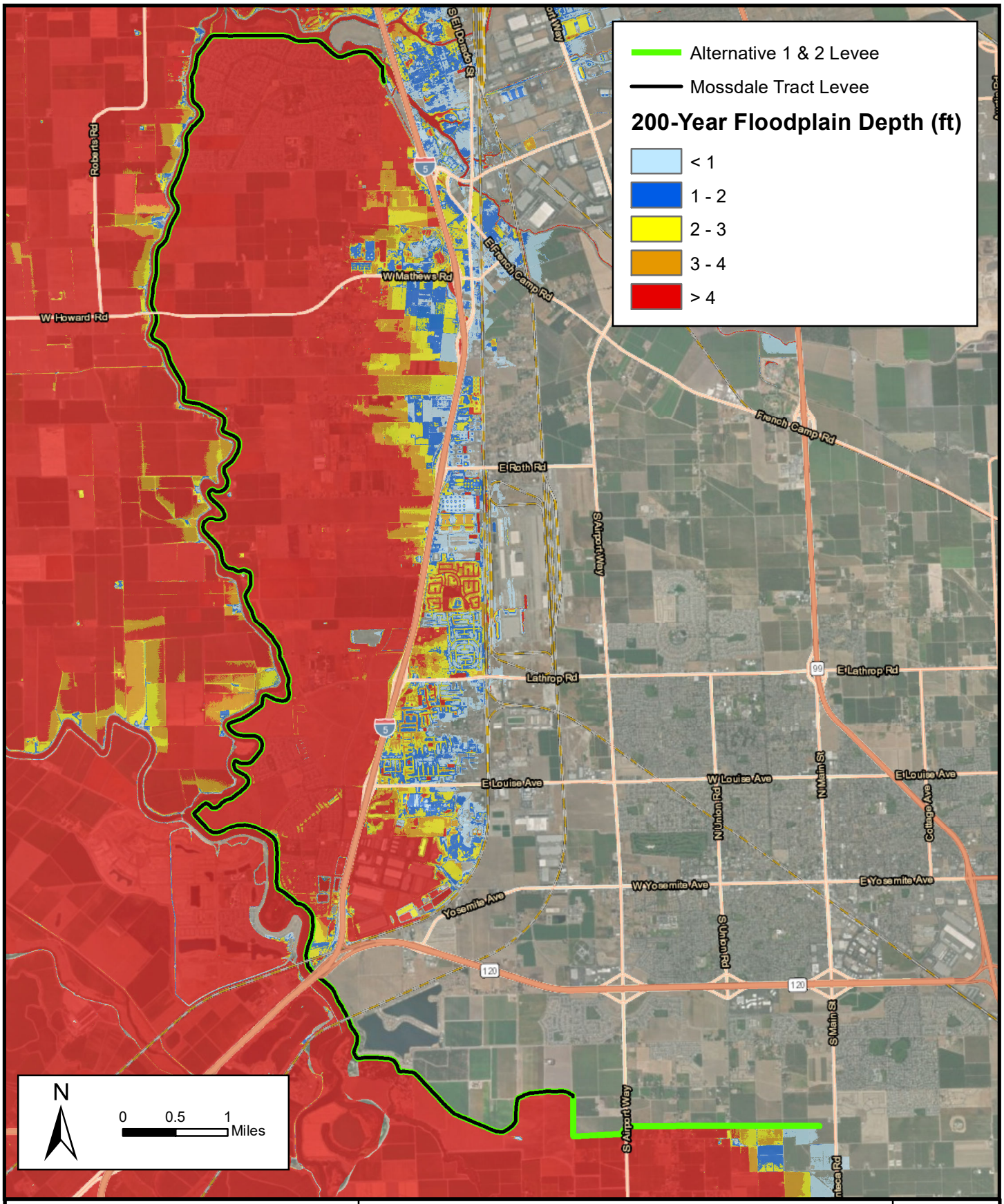
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 1 & 2 LR1

FIGURE

B-24

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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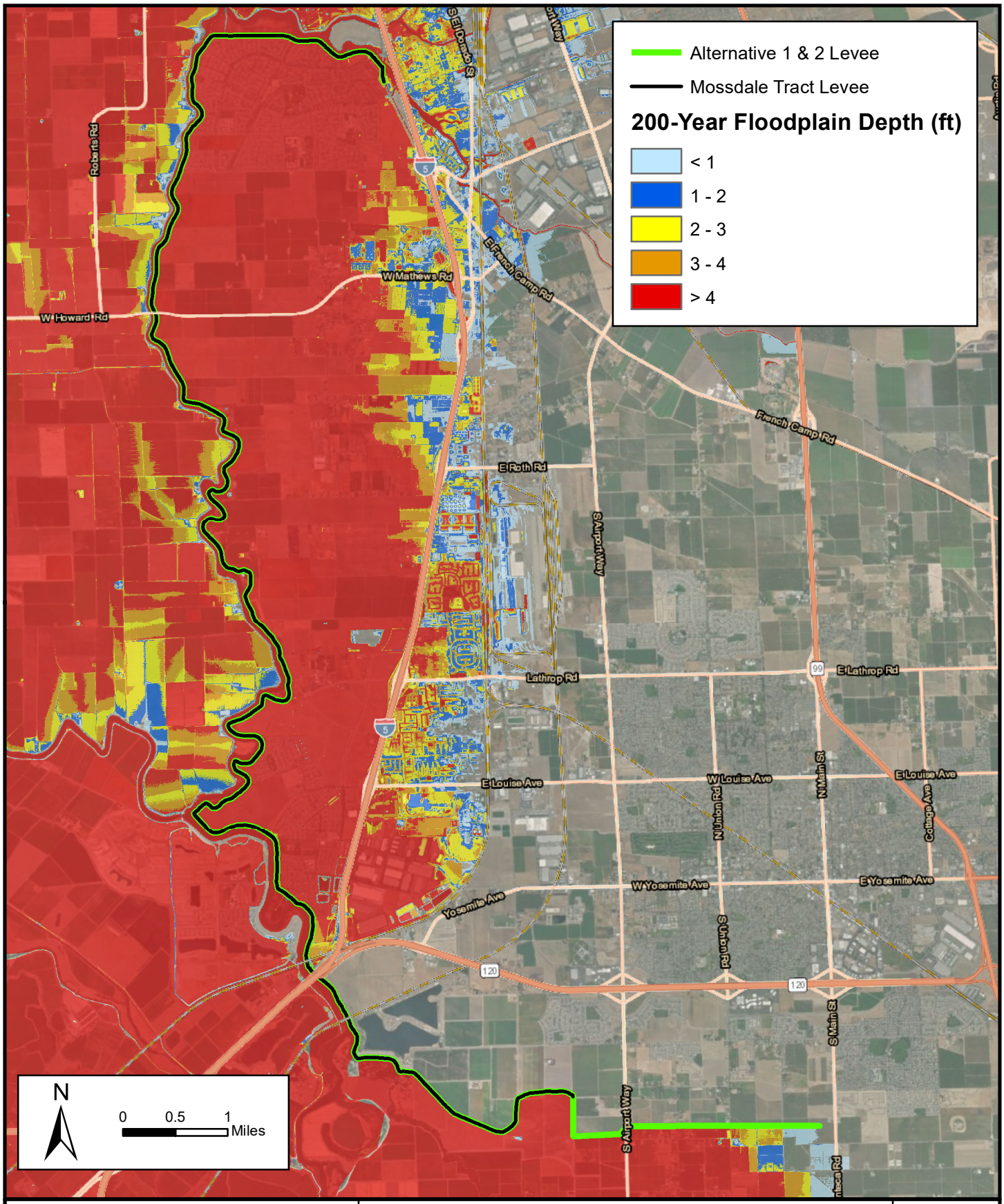
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternate 1 & 2 LR2

FIGURE

B-25

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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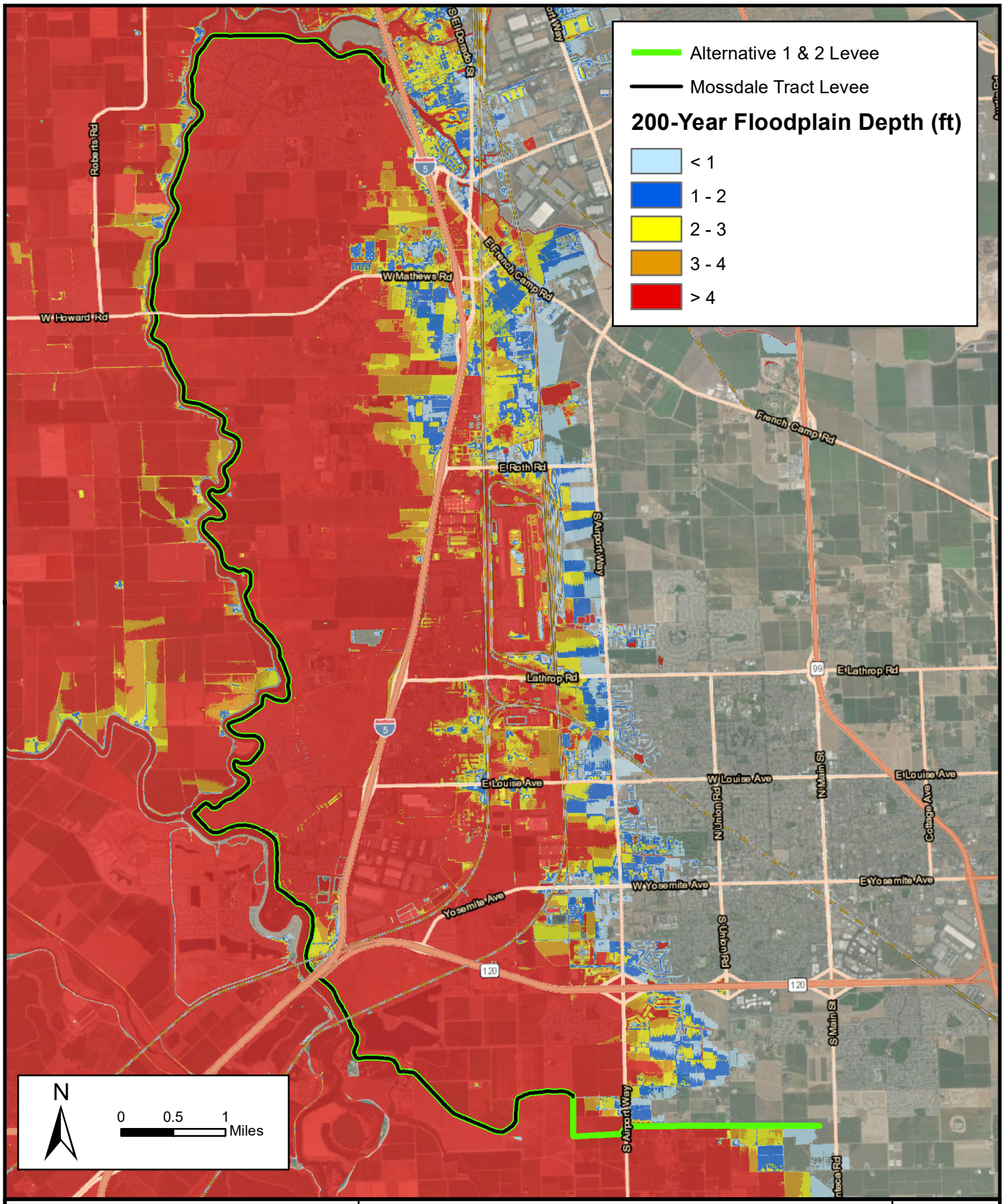
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 1 & 2 LR3

FIGURE

B-26

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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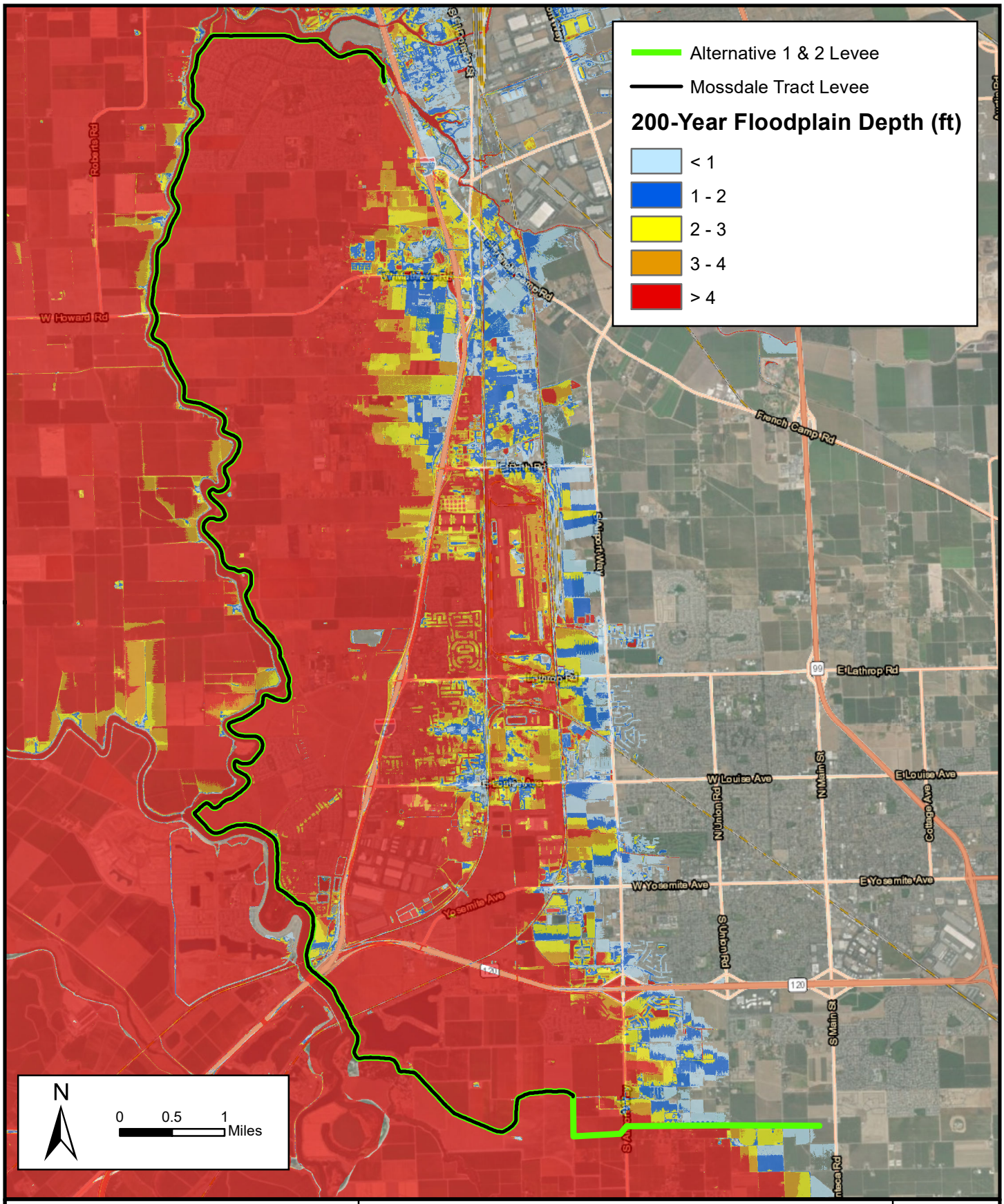
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 1 & 2 LR4

FIGURE

B-27

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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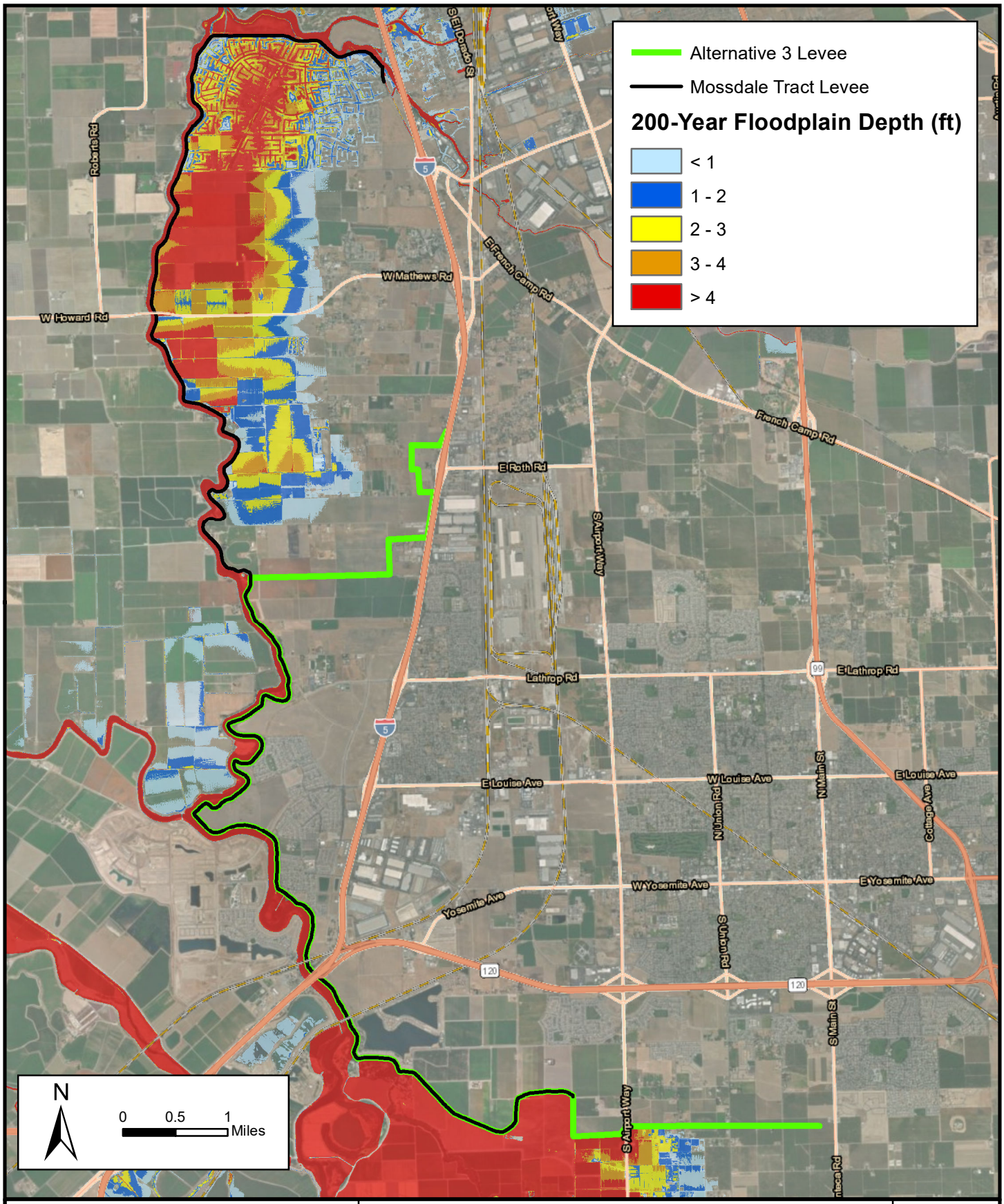
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 1 & 2 LRTB

FIGURE

B-28

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



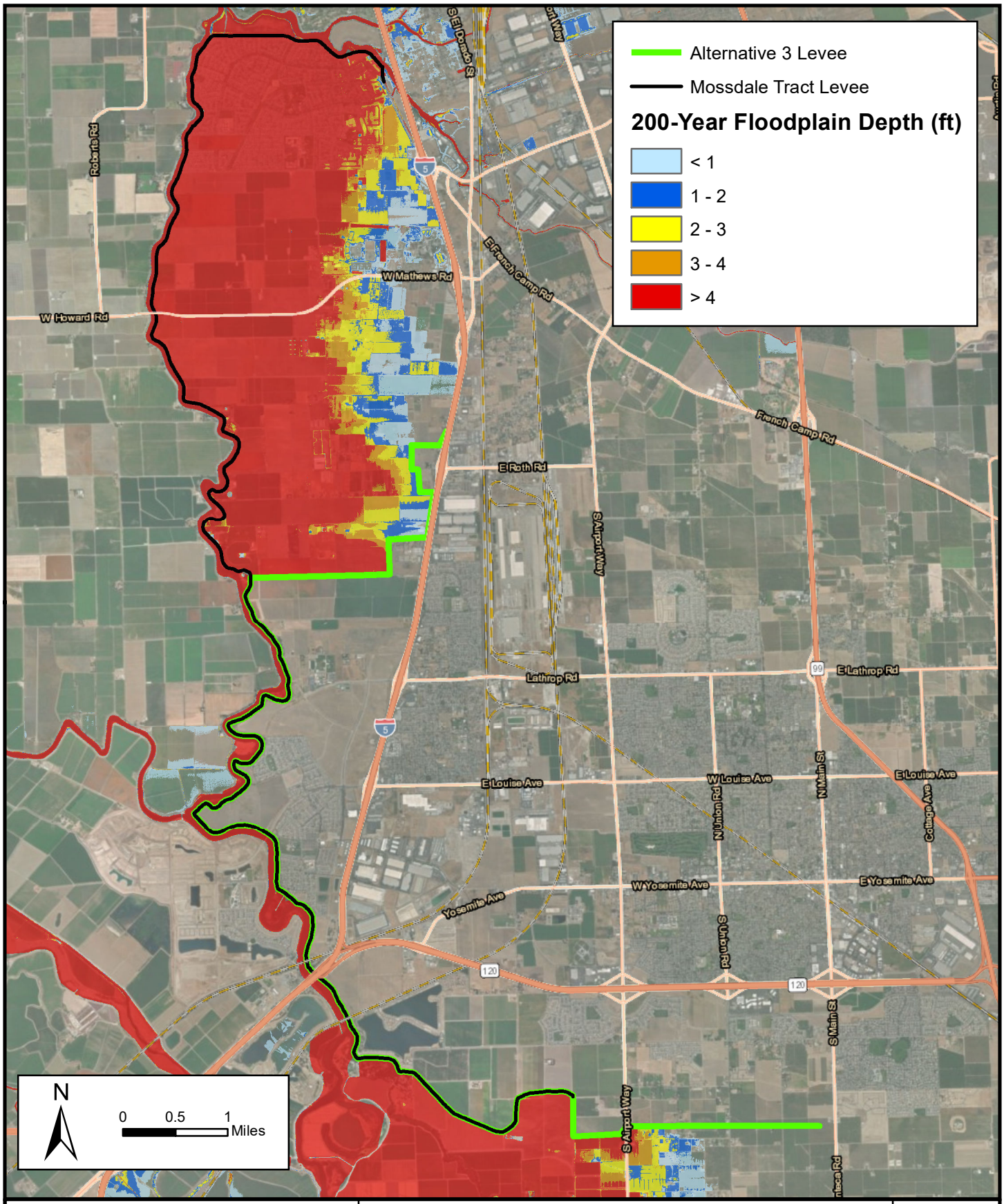
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 3 FL1

FIGURE

B-29



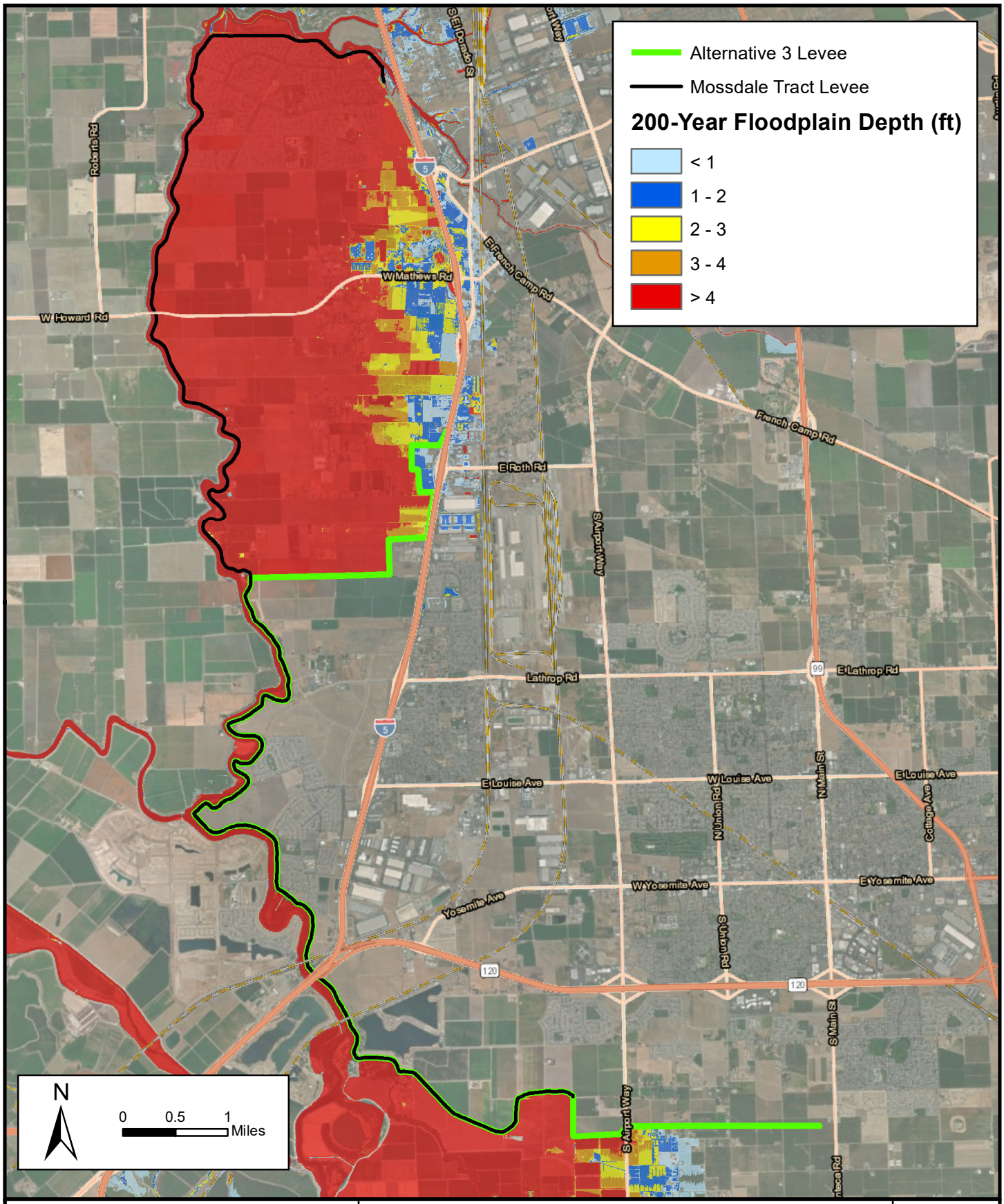
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 3 LR1

FIGURE

B-30



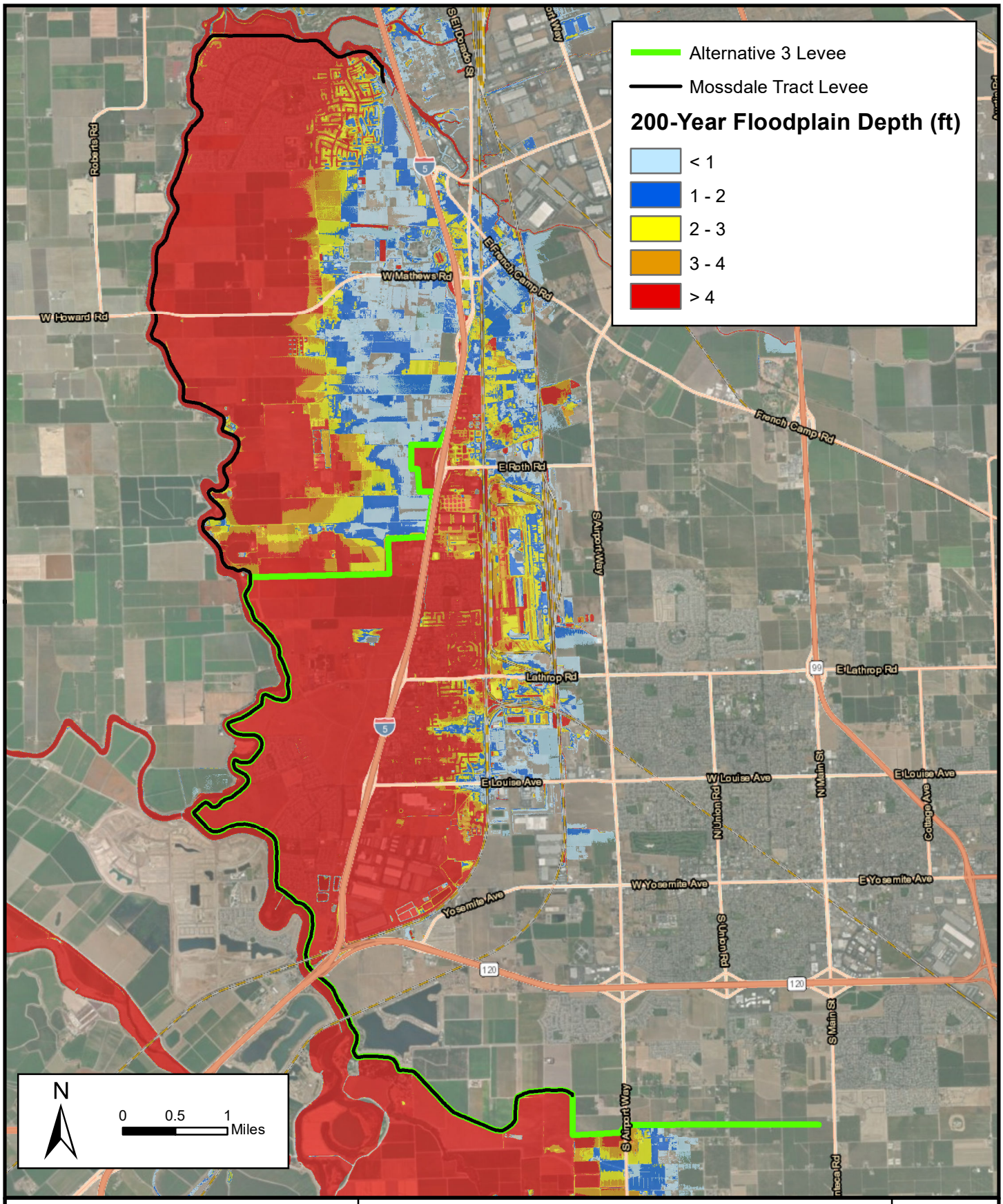
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 3 LR2

FIGURE

B-31



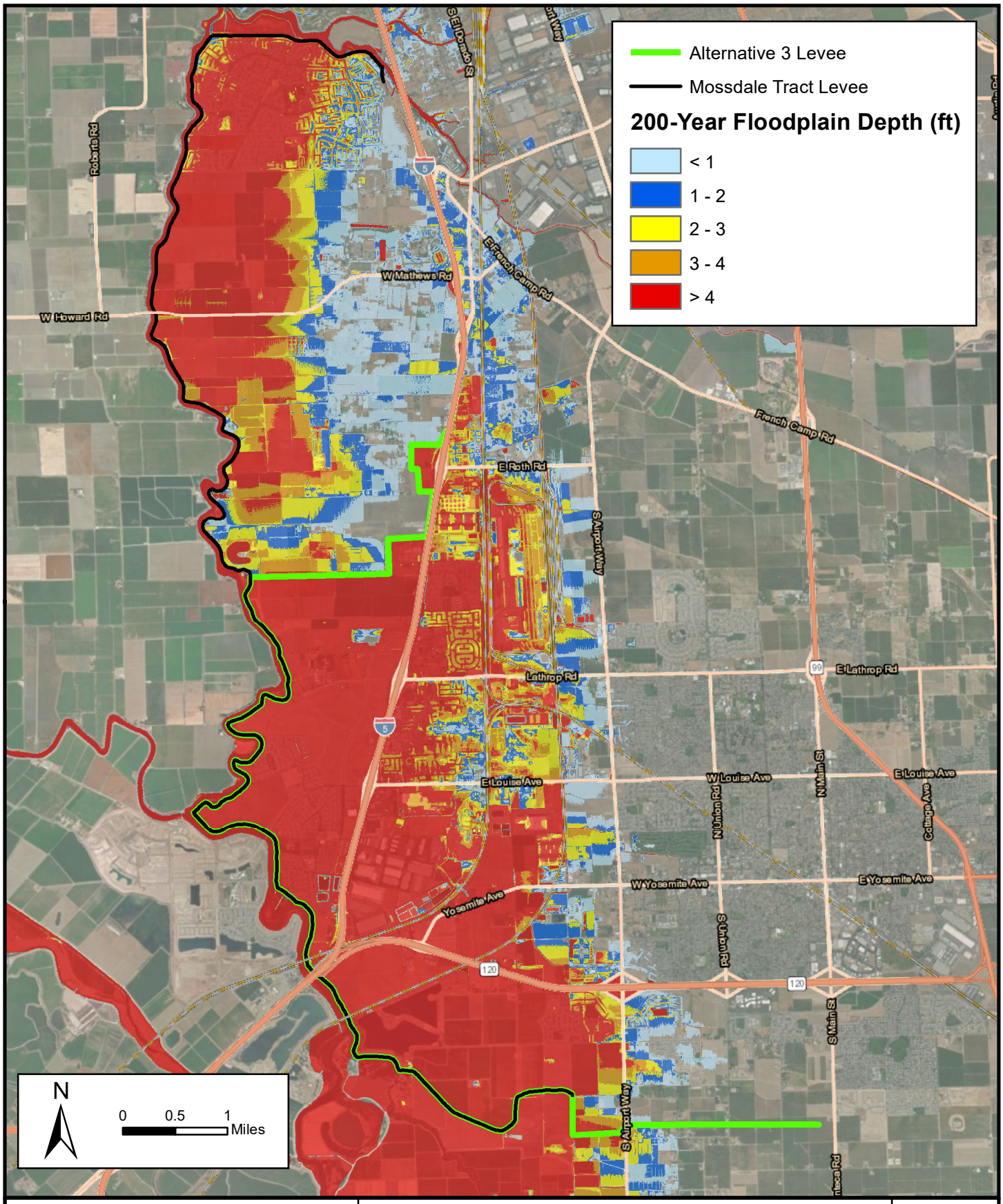
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 3 LR3

FIGURE

B-32



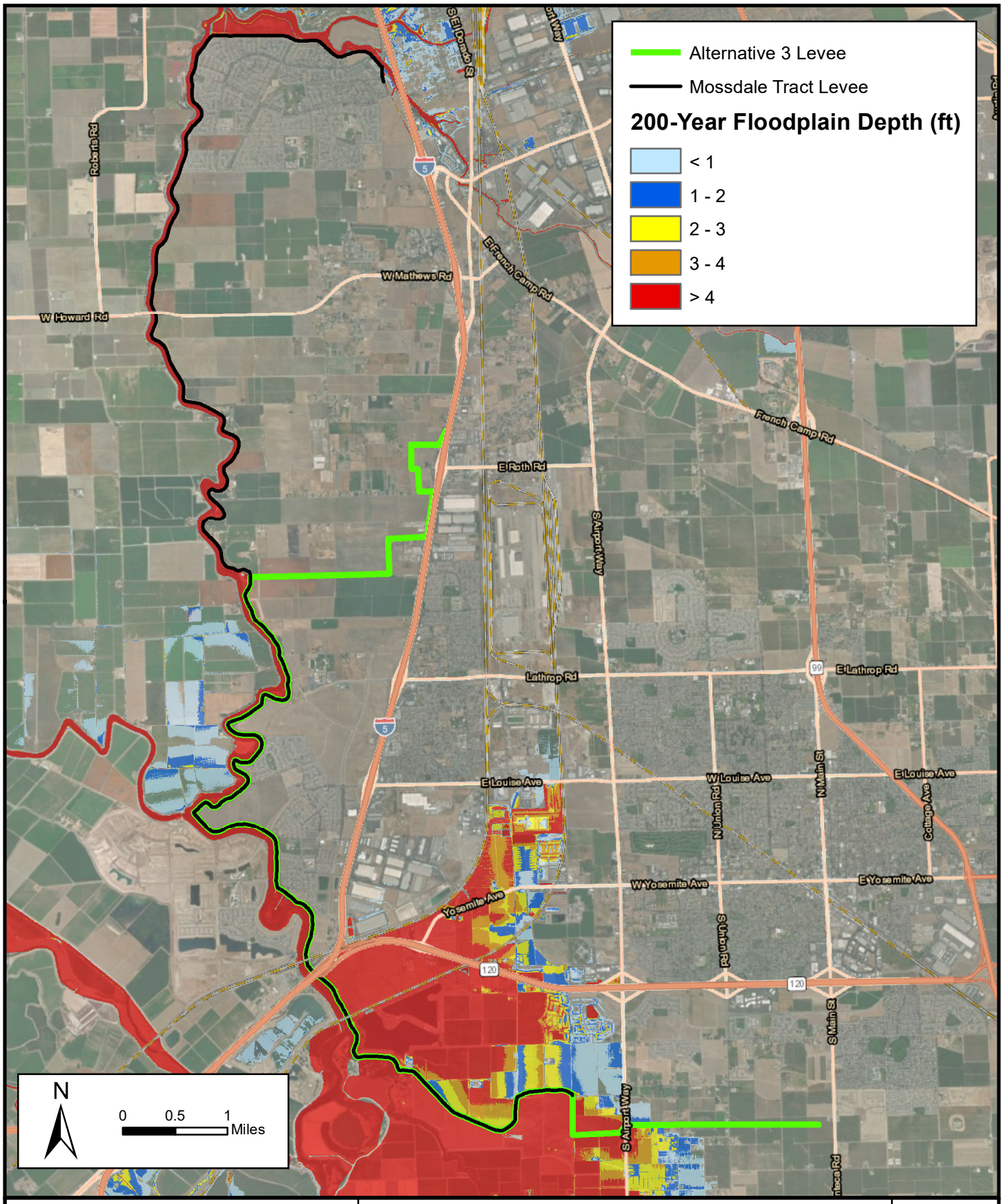
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 3 LR4

FIGURE

B-33



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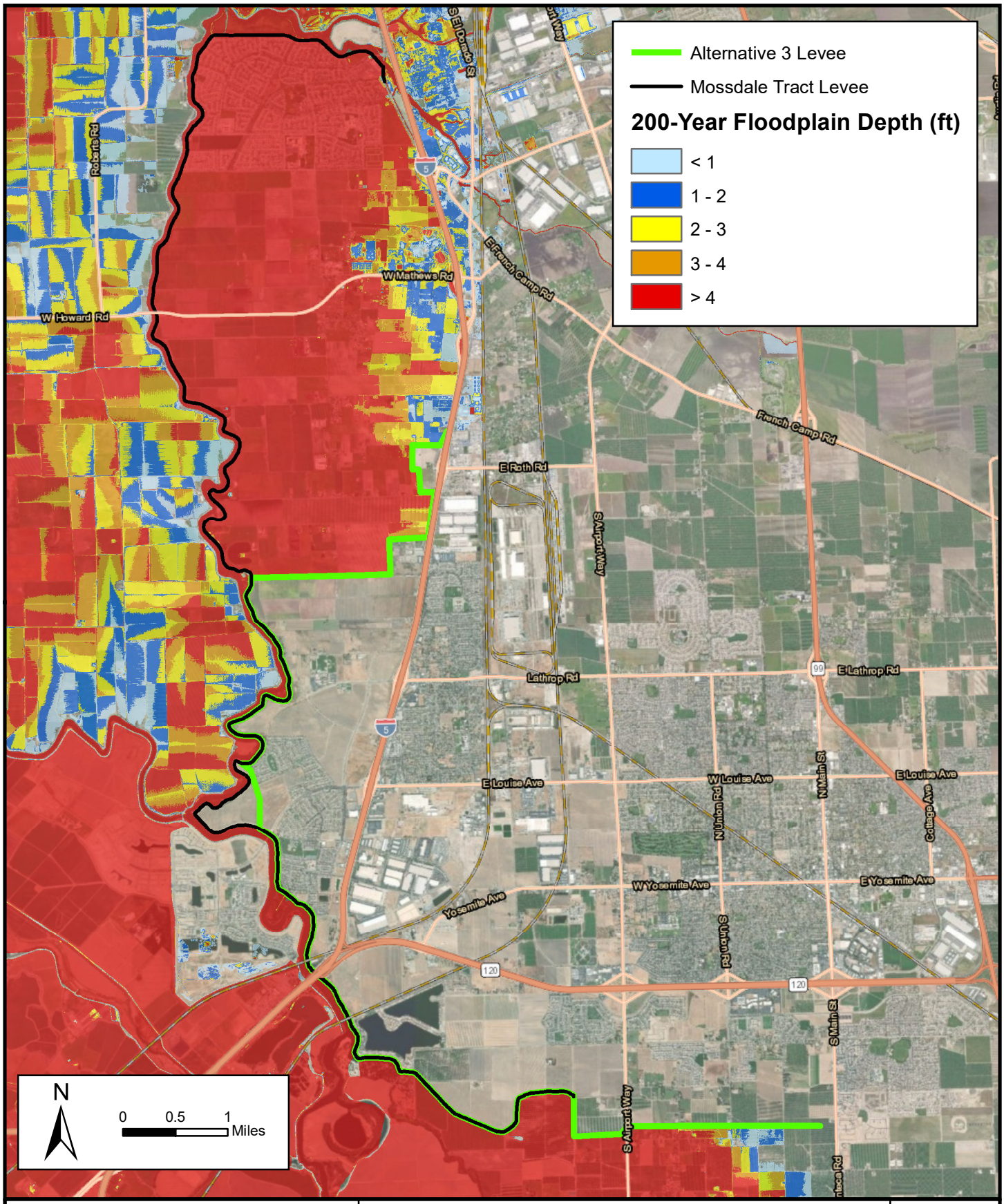
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MOSSDALE TRACT AREA

Current Conditions 200-Year Floodplain Alternative 3 LRTB

FIGURE

B-34



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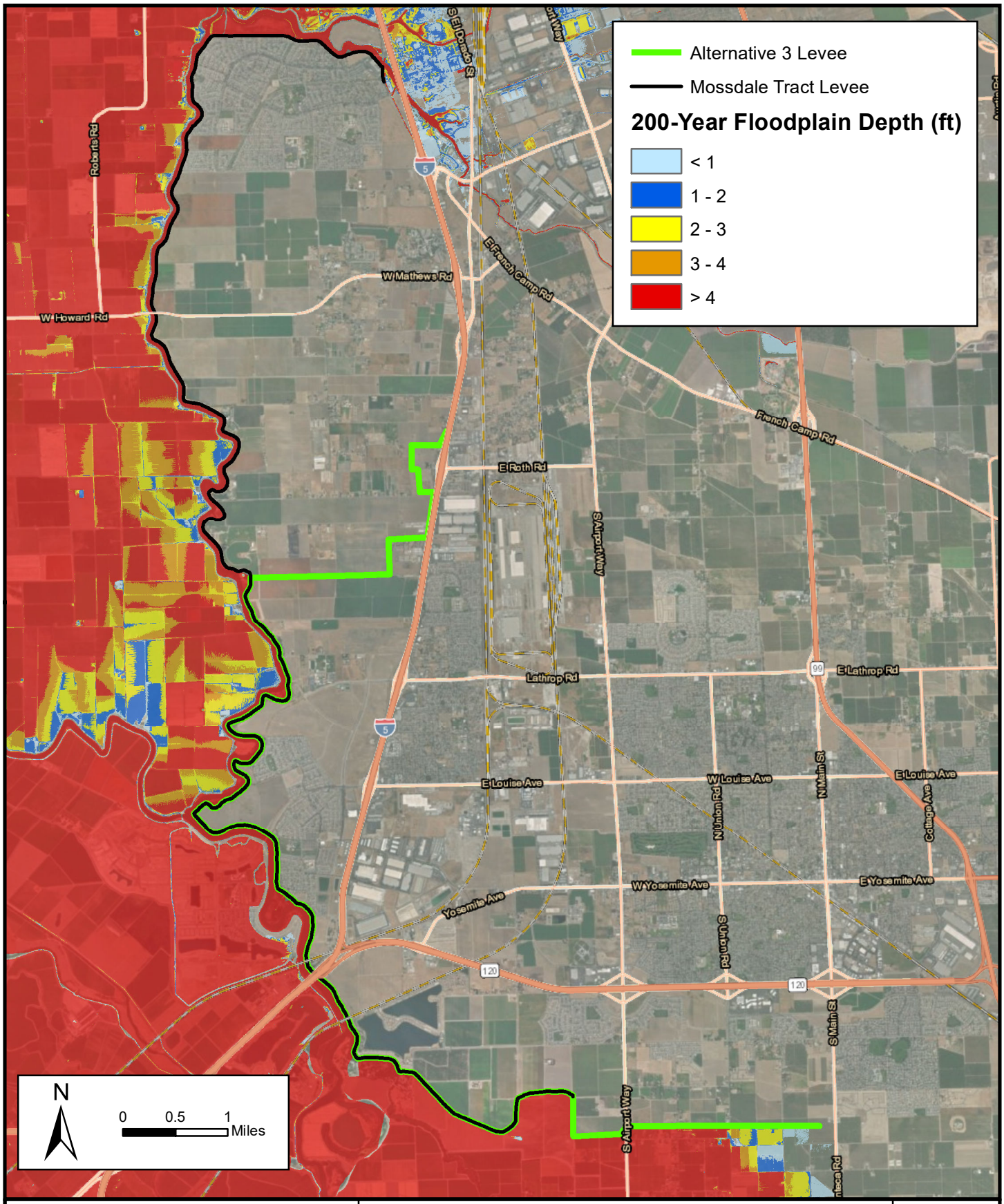
MOSSDALE TRACT AREA

2040 Climate Change 200-Year Floodplain Alternative 3

FIGURE

B-35

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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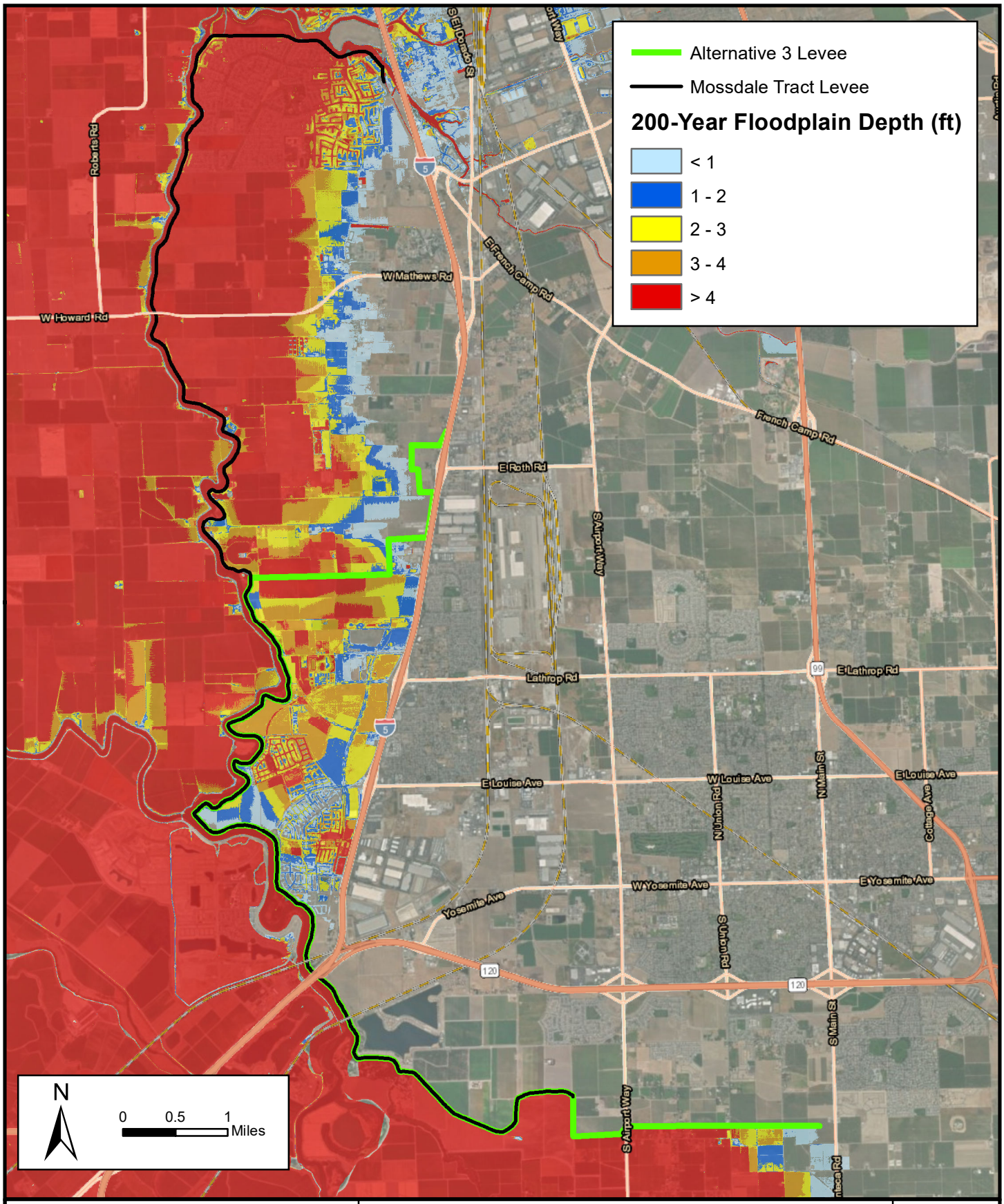
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 3

FIGURE

B-36

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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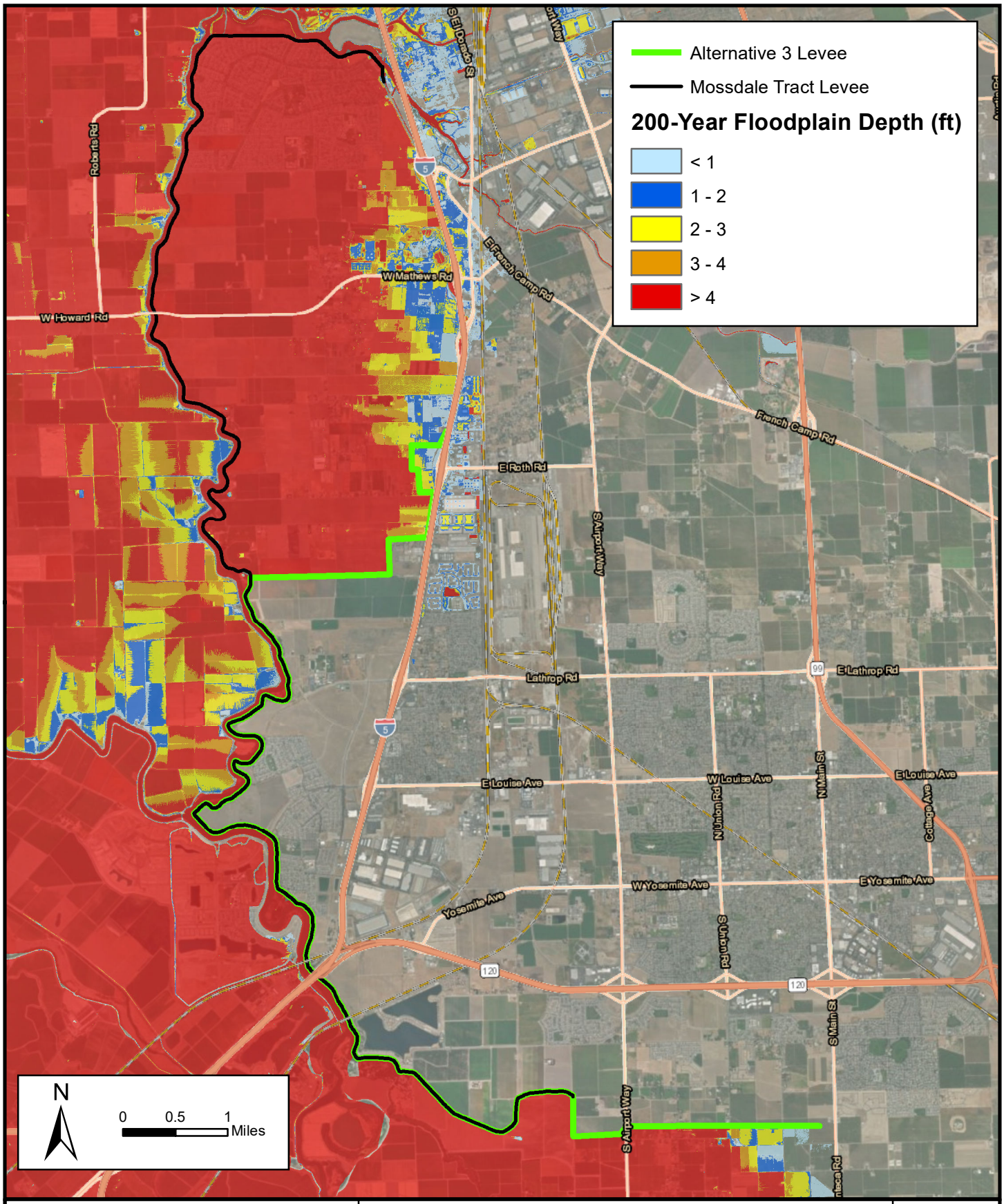
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 3 FL1

FIGURE

B-37

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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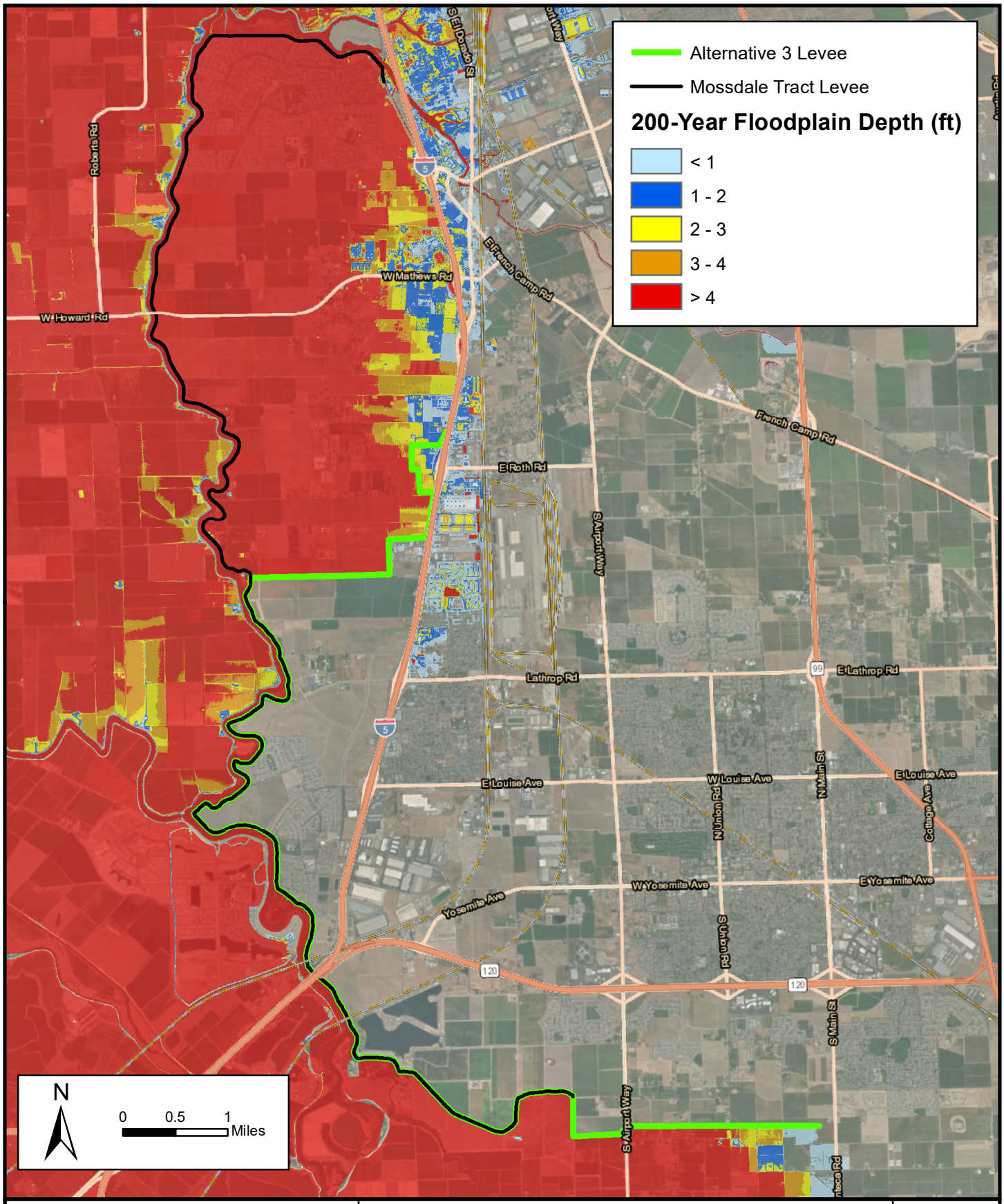
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 3 LR1

FIGURE

B-38

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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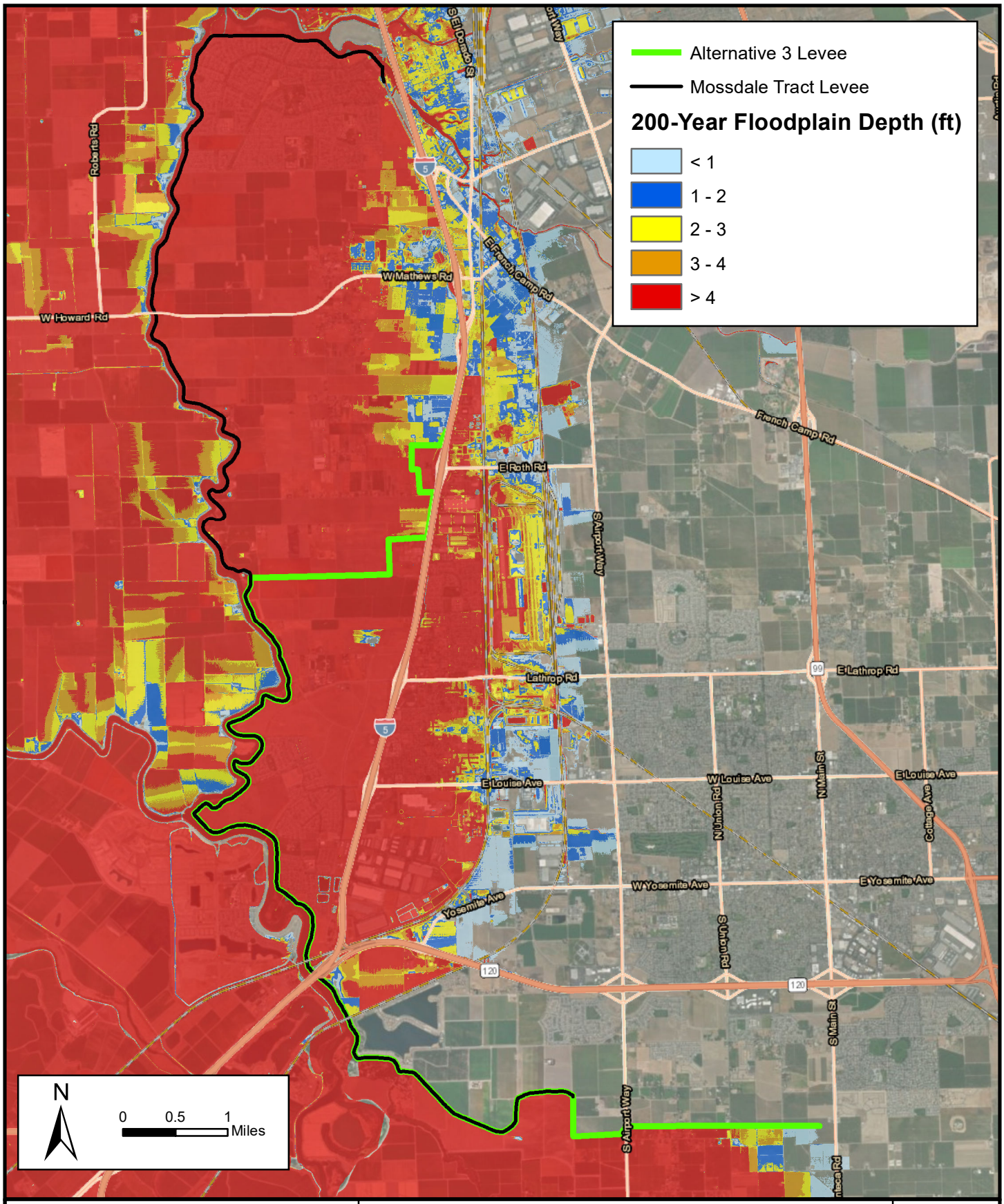
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 3 LR2

FIGURE

B-39

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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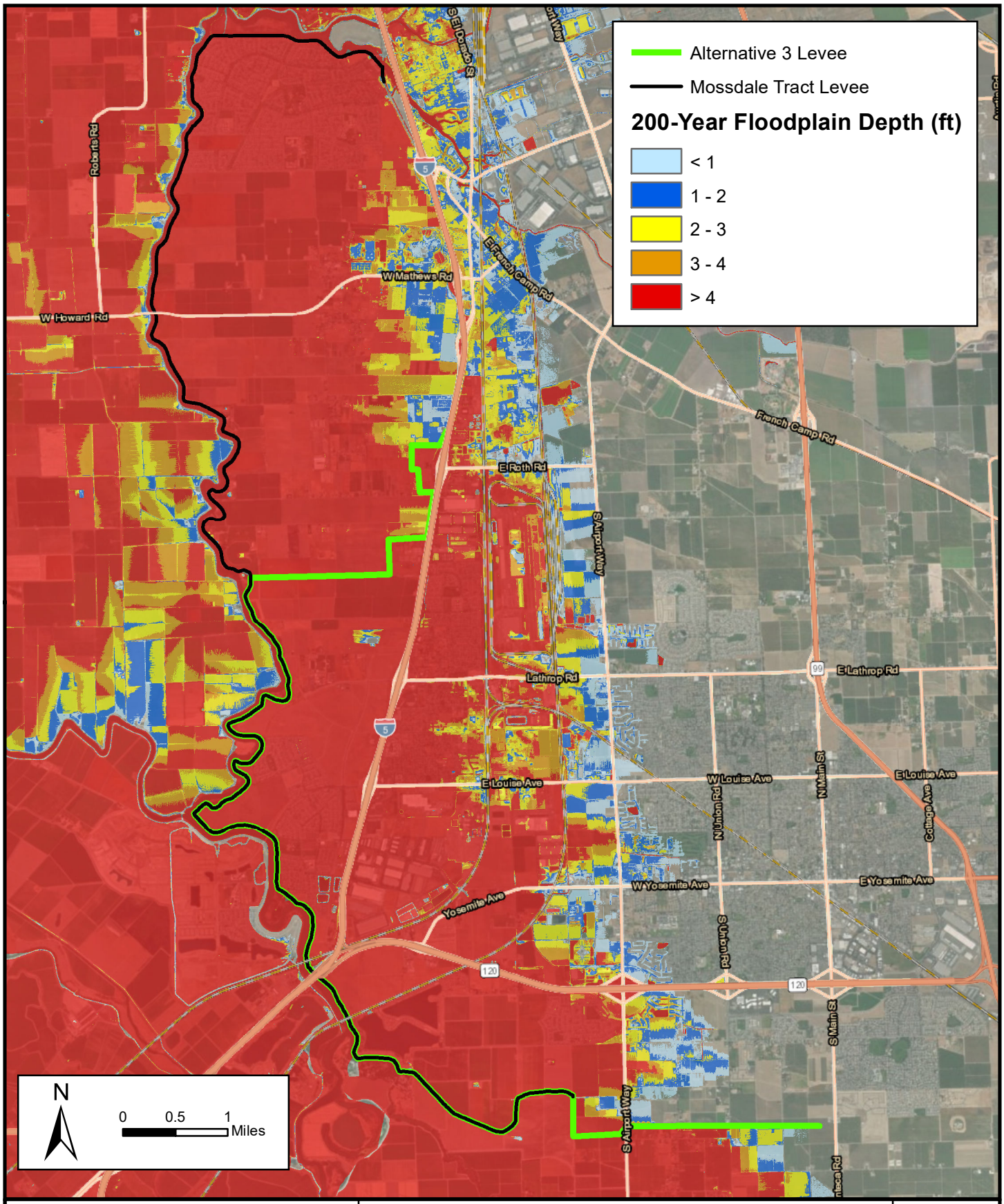
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 3 LR3

FIGURE

B-40

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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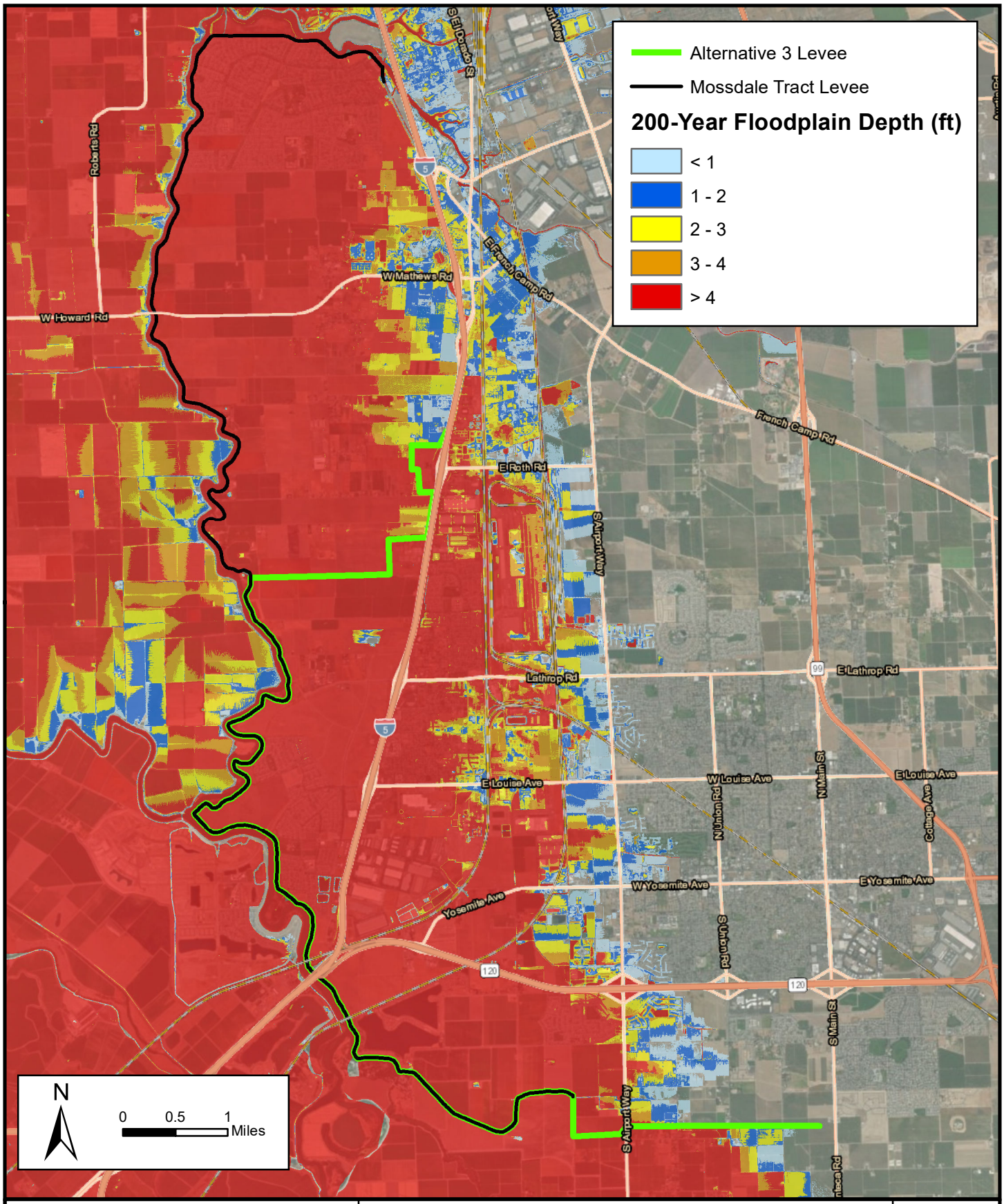
MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 3 LR4

FIGURE

B-41

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.



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MOSSDALE TRACT AREA

2065 Climate Change 200-Year Floodplain Alternative 3 LRTB

FIGURE

B-42

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.

Appendix B
Wind Wave Analysis
Technical Memorandum

TECHNICAL MEMORANDUM

PETERSON . BRUSTAD . INC
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Mossdale Tract Area
Urban Flood Risk Reduction
Wind Wave Analysis

Prepared for: *San Joaquin Area Flood Control Agency* *July 8, 2019*

Prepared by: Michael Pantell, P.E., C.F.M.

Reviewed by: Mike Rossiter, P.E., C.F.M. & Dave Peterson, P.E.

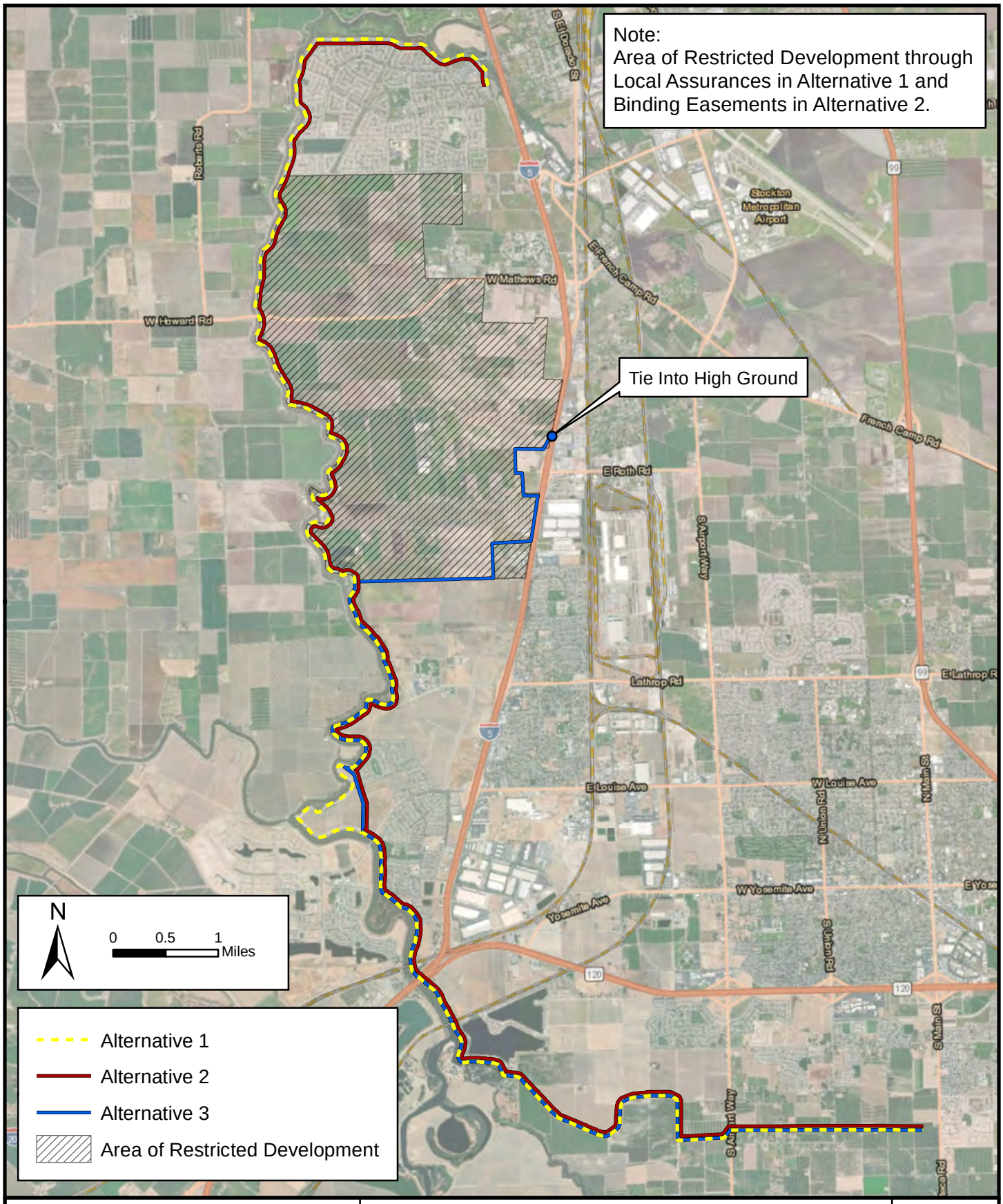
1.0 Introduction

The City of Lathrop was awarded an Urban Flood Risk Reduction (UFRR) grant to study the effects on improving and the Mossdale Tract levees to meet Urban Levee Design Criteria (ULDC) for proposed alternative scenarios. It has been surmised that increased growth induced by the levees meeting ULDC compounded with the effects of climate change could increase the economic damages and risk to life loss in the case of flooding. The UFRR study proposed and evaluated three alternative project designs built to an estimated 2040 climate change conditions.

The alternatives are presented in Figure 1 and are described as follows:

- Alternative 1: Full fix-in-place levee improvements accommodating year 2040 climate change, with local assurances for wise use of the floodplain that would be governed by development prohibitions outlined in the State's Delta Plan.
- Alternative 2: Full fix-in-place levee except for setback levee at river mile 52 with improvements accommodating year 2040 climate change hydrology, with binding easements on 5,050 ac to restrict development.
- Alternative 3: Partial fix-in-place of levees fronting Lathrop and Manteca, plus a new secondary levee along the northern boundary of Lathrop and a setback levee at river mile 52. Levee improvements accommodate year 2040 climate change. Areas north of the new secondary levee would not achieve ULOP.

To determine the minimum top of levee for each alternative to meet ULDC for the 2040 climate change conditions, a wind-wave analysis is required. This technical memorandum outlines the methods and results of the wind wave analysis required to determine the minimum top of levee.



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Mossdale Tract Area

Key Flood Risk Management Features of Alternatives

FIGURE

1

2.0 Wind-Wave Analysis

The methodology for determining the wind setup and wave runup values for this study follow the requirements presented in the ULDC. The wind setup and wave runup calculations are based on the potential wind speed, wind direction, fetch length, and water depth along the fetch line. Guidance for developing these parameters is given in the following USACE documents:

- *Coastal Engineering Manual, EM 1110-2-1100 (CEM)*
- *Shore Protection Manual (SPM)*
- *Process for the National Flood Insurance Program Levee System Evaluation, EC 1110-2-6067*

The wind wave analysis presented in this section is for the dryland levee and Alternative 3 secondary levee. The riverine section was analyzed in a previous study[1] and it was determined that the wind setup and wave run height was limited due to short fetches. Since an increase in water surface elevation does not affect the fetch length, the same wind wave effects will be used for this study for the riverine section.

2.1 Wind Speed and Duration

The ULDC defines the wind speed to be used as that which has a 50 percent non-exceedance probability in any year during a 50-year design period. This criterion yields a design wind speed with a return period of 72.6 years, or an annual probability of 0.0138. For this study, 57 years of hourly wind speed data were analyzed from the shared National Oceanic and Atmospheric Administration (NOAA) and Western Regional Climate Center (WCRR) weather station at the Stockton Metropolitan Airport. The period of record was from 1948 - 2014. No data was available from 1955 to 1962, but the remaining 57 years of data was available. Prior to use in the wind setup and wave runup calculations, the computed design wind speed was standardized to a 10-meter observation level using the CEM 1/7 rule (CEM Equation II-2-9). For fetch lengths less than 16km, the CEM recommends a factor of 1.2 to increase the wind speed for over water conditions.

[1] Peterson Brustad Inc. "*ULDC Analysis of the RD 17 Levee Wind Setup and Wave Runup Calculations"* Prepared for Cities of Lathrop and Manteca, December 21, 2015.

The ULDC also states that the wind speed duration to be used in these calculations should be less than one-hour duration. The CEM notes that the wind duration that generates maximum wave runup is a function of the fetch length and the wind speed. When the fetch is limited CEM Figure II-2-3 can be used to provide an equivalent duration for wave generation. For the fetch lengths analyzed in this study, the equivalent wind speed durations ranged from 60 to 90 minutes. To meet the requirements of the ULDC, a one-hour wind speed duration was selected for all conditions. This selection represents a conservative approach to the calculation of wind setup and wave runup.

2.2 Wind Analysis

The wind data from the Stockton Metropolitan Airport weather station is recorded as an hourly average wind speed with the prevailing wind direction in degrees. For this analysis, the wind speeds were separated into wind direction categories:

- North (337.5 to 22.5 degrees)
- Northeast (22.5 to 67.5 degrees)
- East (67.5 to 112.5 degrees)
- Southeast (112.5 to 157.5 degrees)
- South (157.5 to 202.5 degrees)
- Southwest (202.5 to 247.5 degrees)
- West (247.5 to 292.5 degrees)
- Northwest (292.5 to 337.5 degrees)

The wind speed data was then analyzed using HEC-SSP to perform a generalized frequency analysis to determine the 72.6-year return period wind speed for each wind direction. The resulting wind speeds represent the 72.6-year return period, 60-minute wind speed at an elevation of 7.9m over land. For use in the wind setup and wave runup calculations, these wind speeds must be corrected for an elevation of 10m over water. Table 1 presents the HEC-SSP output wind speed for each wind direction category along with the necessary elevation and over water corrections. Note that for the remainder of the wind setup and wave runup analysis, the wind speeds presented in the “Corrected for Over Water Wind Speed” column will be used.

Table 1: Design wind speed for each wind direction

Wind Direction	72.6-year Return Period, 60-minute Wind Speed (mph)		
	Observed at Stockton Metropolitan Airport Weather Station	Corrected for 10m Elevation	Corrected for Over Water Wind Speed
North	47	49	58
Northeast	26	27	32
East	34	35	42
Southeast	47	49	58
South	51	53	63
Southwest	37	38	46
West	39	40	48
Northwest	44	46	55

2.3 Water Depth

The water depth at the toe of the levee at the design water surface elevation is used in the calculation of wave runup. The average water depth across the entire fetch length is used in the calculation of wind setup. For the purposes of this study, it is assumed that the design water surface elevation is the median 2040 200-year water surface elevation. Hydraulic modeling results[2] were used to determine average depths along the fetch lines.

2.4 Fetch Length

The fetch is defined as the region in which the wind speed and direction are reasonably constant. In dryland settings, the fetch is limited by the extent of the floodplain or structures in the floodplain. For the purposes of this study, the 2040 200-year floodplain with existing structures removed will be used. Under these circumstances the fetch length will be determined by extending 9 radials from the point of interest at 3-degree intervals until they intercept the edge of the floodplain or a structure. The average of the 9 radial lengths

[2] Peterson Brustad Inc. "*Mossdale Tract Area Urban Flood Risk Reduction: Hydraulic Modeling Technical Memorandum"* Prepared for the San Joaquin Area Flood Control Agency. May 1, 2019.

represents the fetch length for a given wind direction.

A fetch length calculator developed by the United States Geologic Survey[3] was used determine the fetch length at every point along both the dryland levee and Alternative 3 secondary levee. Figures 2 and 3 present the fetch lengths for each of the pertinent wind direction along the dryland levee and Alternative 3 secondary levee, respectively.

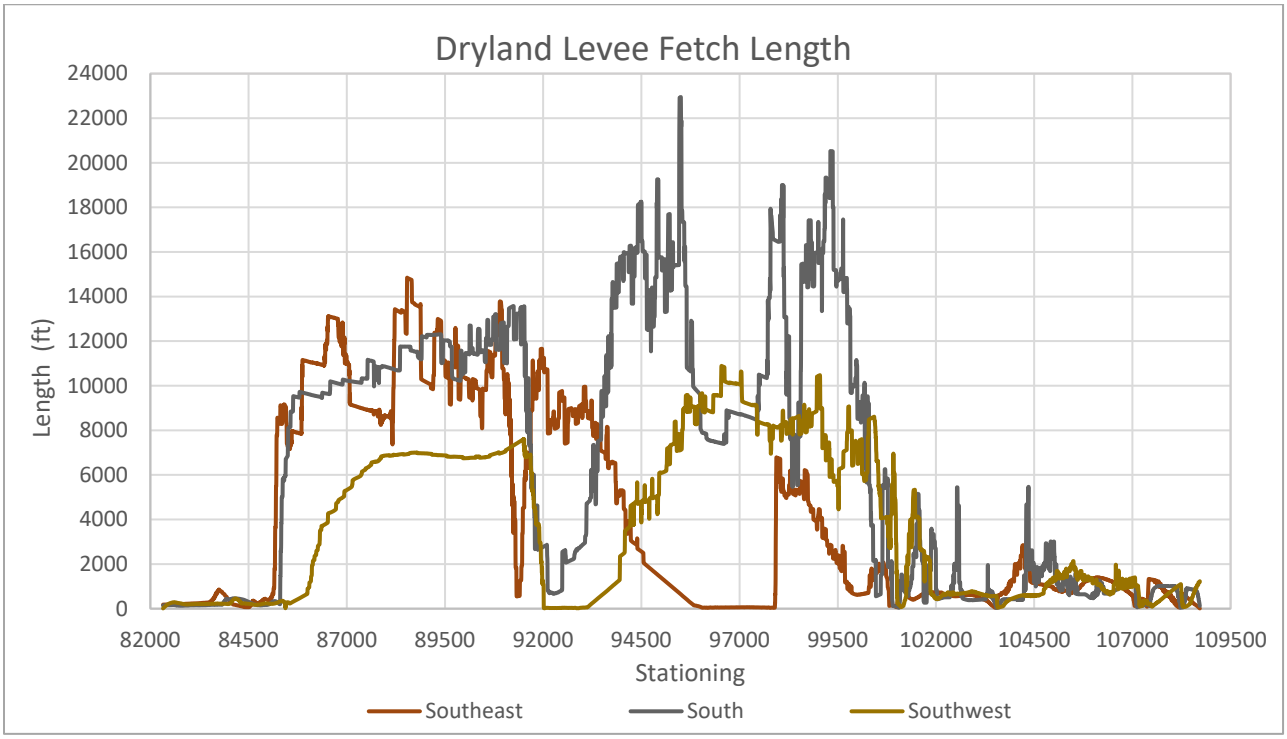


Figure 2: Fetch Lengths along the Dryland Levee

[3] *Application of Wind Fetch and Wave Models for Habitat Rehabilitation and Enhancement Projects - 2012 Update*, Jason Rohweder, James T. Rogala, Barry L. Johnson, Dennis Anderson, Steve Clark, Ferris Chamberlin, David Potter, and Kip Runyon

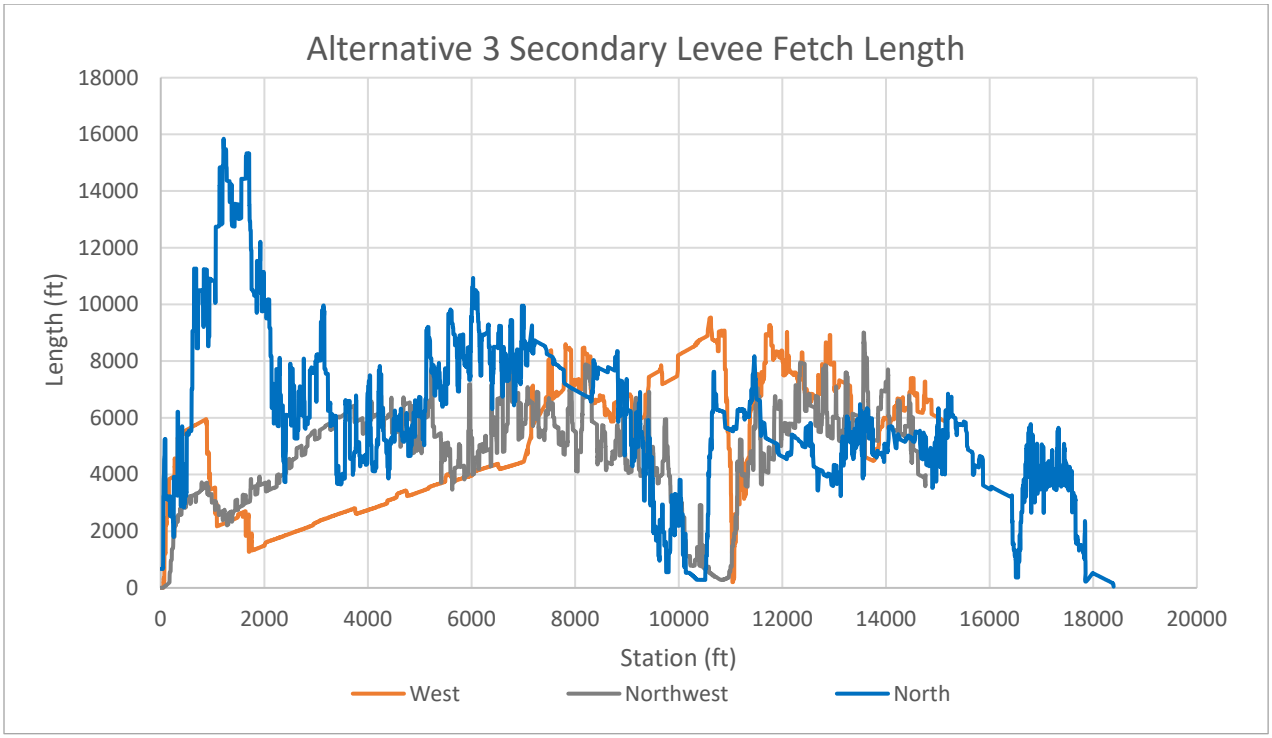


Figure 3: Fetch Lengths along the Alternative 3 Secondary Levee

2.5 Wind Setup

When wind blows over water it exerts a shear stress on the water surface. Although the wind shear stress is usually very small, its effect, when integrated over a large body of water, can result in an increase of water level at the leeward end. This effect is called wind setup. Wind setup can be estimated for small bodies of water based on Equation 15-1, USACE *Hydrologic Engineering Requirements for Reservoirs* (EM 1110-2-1420):

$$S = \frac{U^2 F}{1400d}$$

Where: S = wind setup (ft)
U = average wind speed (mph)
F = fetch distance (miles)
d = average water depth along the fetch line (ft)

This equation is known as the Zeider Zee equation which is most appropriate for large reservoirs. For shallow water bodies, the Sibul equation below is more appropriate.

$$S = d * 2.44 * 10^{-5} * \left(\frac{F}{d}\right)^{1.66} * \left(\frac{U^2}{F*g}\right)^{\left(2.02*\left(\frac{F}{d}\right)^{-0.0768}\right)}$$

Where: S = wind setup (ft)
d = average water depth along the fetch line (ft)
F = fetch distance (ft)
U = average wind speed (ft/sec)
g = gravitational constant = 32.2 ft/sec

Recent USACE study suggested averaging the two equations when dealing with shallow impoundments (*Design Criteria Memorandum 2*, USACE/South Florida Water Management District, 2006). For average water depths greater than 16 feet, the calculated wind setup height was derived from the Zeider Zee equation only. Where average water depths were estimated to be less than 16 feet, the calculated wind setup height was taken by averaging the Zeider Zee equation and the Sibul equation.

The average water depth along the fetch line was estimated using the 2040 200-year flood depth for dryland levee and Alternative 3 secondary levee. The average depth along the fetch line was approximately 15 feet at the west end of the dryland levee and decreases to 2 feet on the east end. For the Alternative 3 secondary levee, an average depth of 8 feet was used.

Figures 4 and 5 show the resulting wind setup height at each point along the dryland levee and alternative 3 secondary levee. These figures show that maximum wind set up is less than 1 foot deep for both levees.

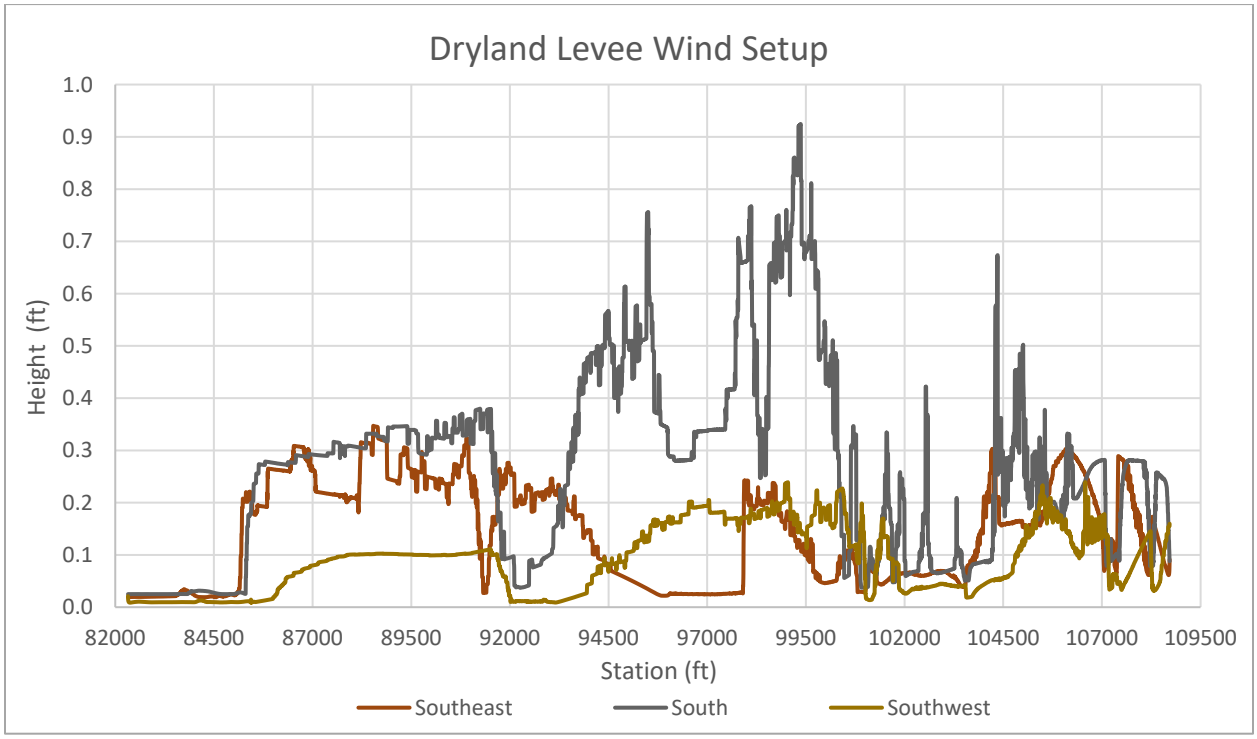


Figure 4: Wind Setup Height along Dryland Levee

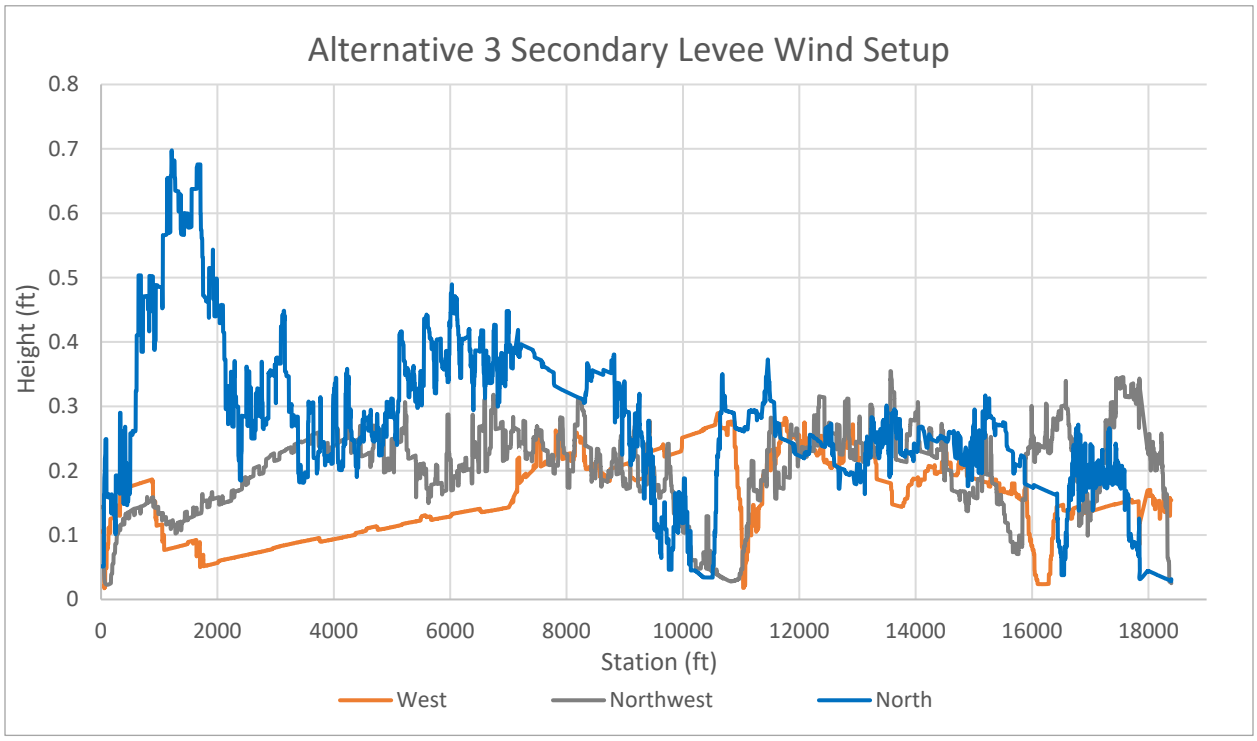


Figure 5: Wind Setup Height along Alternative 3 Secondary Levee

2.6 Wave Runup

Wave runup is defined as the vertical height above the still water level to which an incident wave will run up the bank of the levee. The wave runup depends primarily on the levee bank slope, the water depth at the levee toe, fetch length, wind speed, and wave approach angle. One method to determine wave runup determines the 2% wave runup elevation, which represents the elevation above the still water level that is exceeded by only 2% of the waves. Before the wave runup can be calculated, the wave characteristics must be determined – specifically the significant wave height and the peak wave period. These two parameters were determined using CEM Equation II-2-36:

$$\frac{g*H_{mo}}{u_f^2} = 0.0413 * \left(\frac{g*X}{u_f^2}\right)^{\frac{1}{2}} \quad \text{and} \quad \frac{g*T_p}{u_f} = 0.651 * \left(\frac{g*X}{u_f^2}\right)^{\frac{1}{3}}$$

Where:

H_{mo} = significant wave height (m)

T_p = peak wave period (sec)

X = fetch length (m)

g = gravitational constant = 9.8 m/sec

u_f = friction velocity (m/sec)

$= (C_D * U_{10}^2)^{\frac{1}{2}}$

C_D = drag coefficient

$= 0.001 * (1.1 + 0.035 * U_{10})$

U_{10} = wind speed at 10 m elevation (m/sec)

Wave runup on a structure depends on the type of wave breaking. Wave breaker types are identified by their surf similarity parameter. With the wave characteristics defined, H_{mo} and T_p can be used to determine the surf similarity parameter per CEM Equation VI-5-2:

$$\varepsilon_p = \frac{\tan(\alpha)}{\sqrt{\frac{2\pi * H_{mo}}{g * T_p^2}}}$$

Where:

ε_p = surf similarity parameter

$\tan(\alpha)$ = waterside slope of levee (assumed 1V:3H for all wind direction conditions)

After defining the wave and wave breaking characteristics, the 2% wave runup elevation can be calculated per CEM Equation VI-5-3:

$$R_{2\%} = H_{mo} * \left(A * \varepsilon_p + C\right) * \gamma_r * \gamma_b * \gamma_h * \gamma_\beta$$

Where:

- $R_{2\%}$ = 2% wave runup elevation (ft)
- A, C = coefficients dependent on ε_p ($\varepsilon_p < 2$, A = 1.6, C = 0 and ($2 < \varepsilon_p < 9$, A = -0.2, C = 4.5 per CEM Table VI-5-2)
- γ_r = reduction factor for levee slope roughness (assumed $\gamma_r = 0.55$ for 1 layer of rip rap along the dryland levee per CEM Table VI-5-3)
- γ_b = reduction factor for influence of a berm = 1
- γ_h = reduction factor for influence of shallow waves = 1
- γ_β = reduction factor for influence of angle of incidence, β, of the waves on the levee
  = $1 - 0.0022 * \beta$

Several factors can influence a wave as it travels along a fetch line and approaches a levee. Berms, shallow water environments, and vegetation can all serve to reduce wave runup. It was determined that the influence due to berms and shallow waves were both minimal. Thus, γ_r and γ_b were both set equal to one (1). Per CEM Table VI-5-3, the reduction factor for levee slope roughness was set to 0.55 to account for the rip rap in the levee design. Finally, the reduction factor due to the include of angle of incidence was calculated for both levee reaches for each pertinent wind direction at all points along each levee. Figure 6 and 7 shows the reduction factor used for the influence of angle of incidence at every point along each of the levee systems for each wind direction.

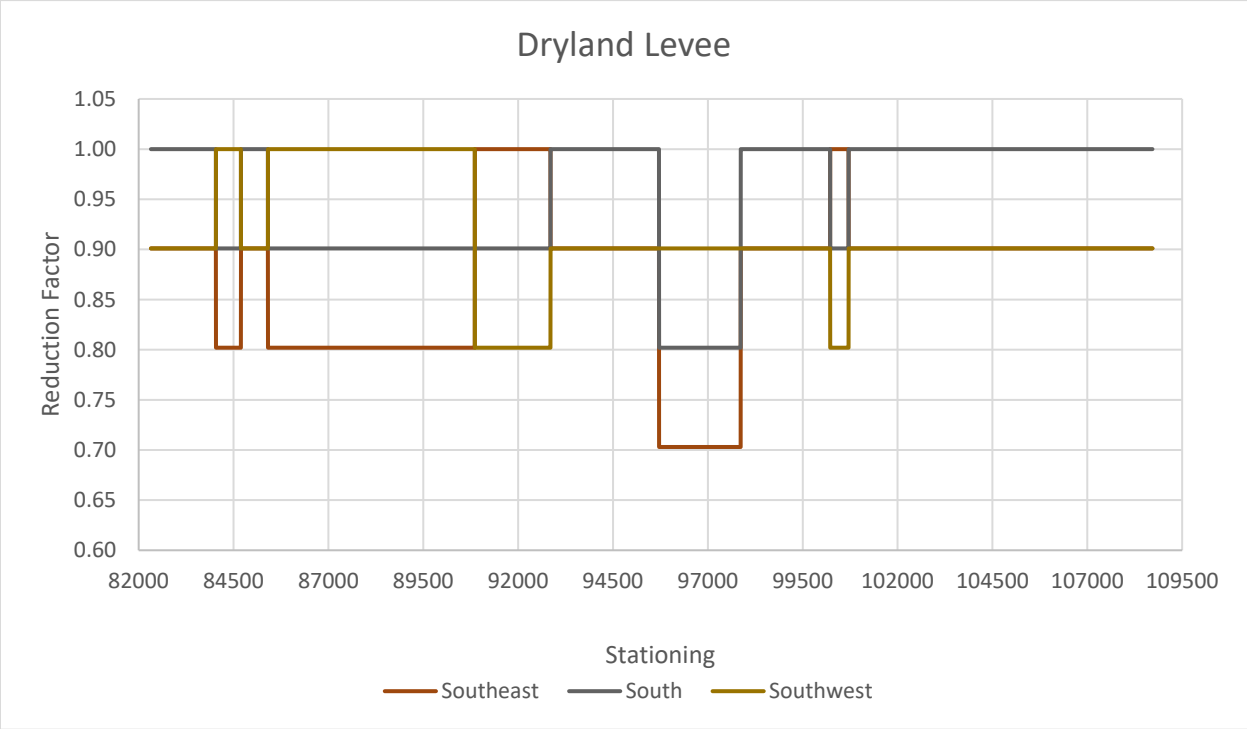


Figure 6: Reduction Factor for the Influence Angle of Incidence at Every Point along the Dryland Levee

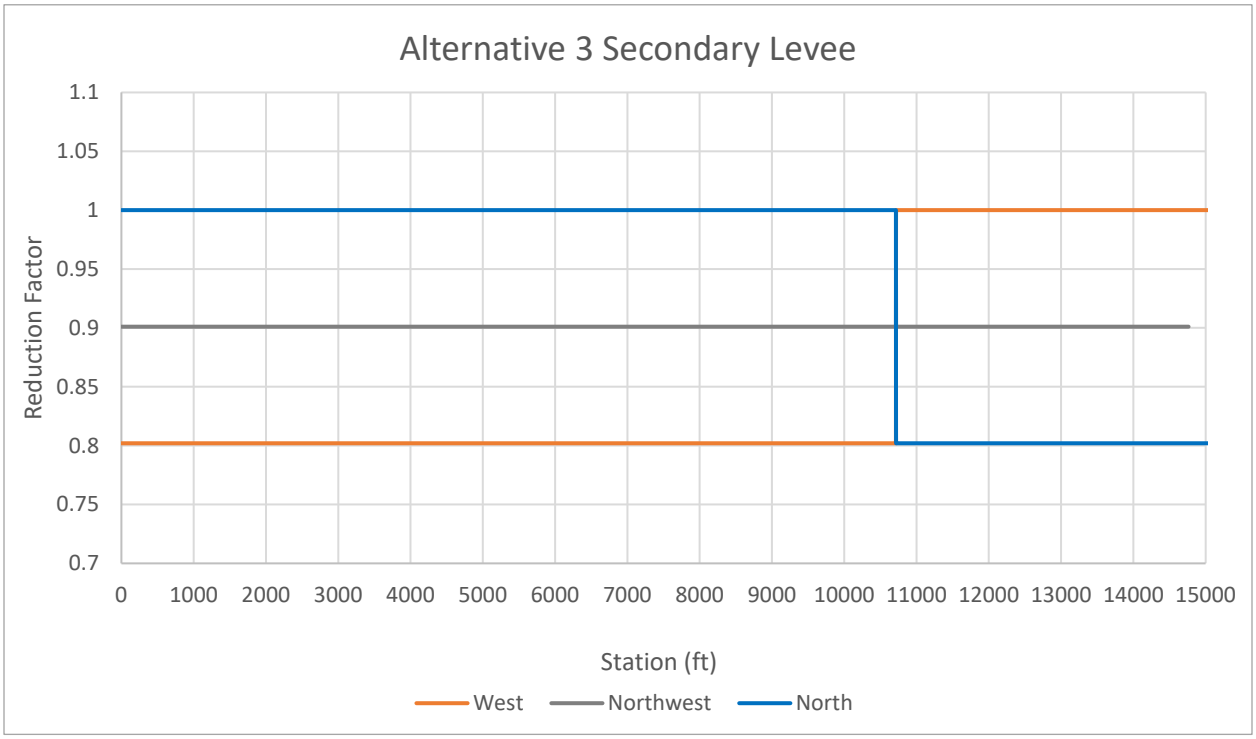


Figure 7: Reduction Factor for the Influence Angle of Incidence at Every Point along the Alternative 3 Secondary Levee

Figure 8 and 9 show the wave runup heights for both dryland levee and the alternative 3 secondary levee. The wave runup height ranges from 0.5 to over 6 feet.

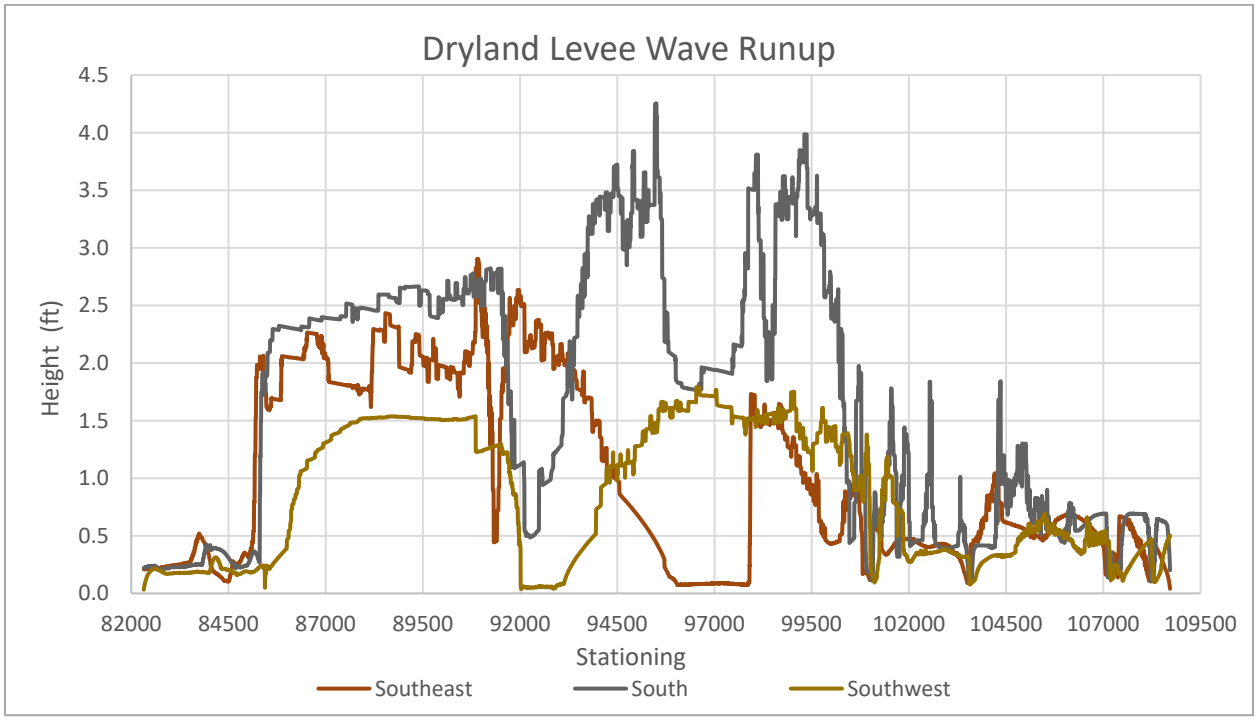


Figure 8: Wave Runup Height for the Dryland Levee

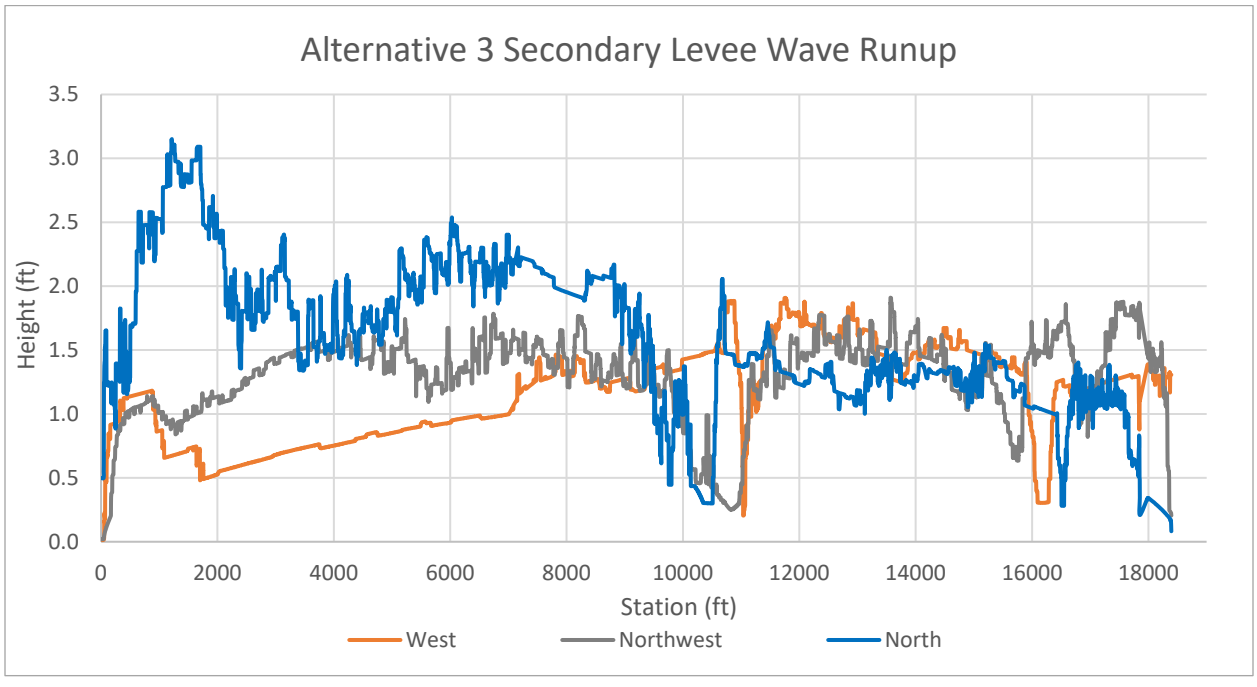


Figure 9: Wave Runup Height for the Alternative 3 Secondary Levee

3.0 Conclusions

Figure 10 and 11 shows the combined wind setup and wave run up height for every point along both levee systems for each pertinent wind direction. From the wind setup and wave runup sections it can be seen that the wave runup height accounts for the majority of the total wind wave height on each levee.

Per ULDC guidelines, the minimum needed freeboard of a levee is 3 feet and the maximum wind wave effect is 6 feet.

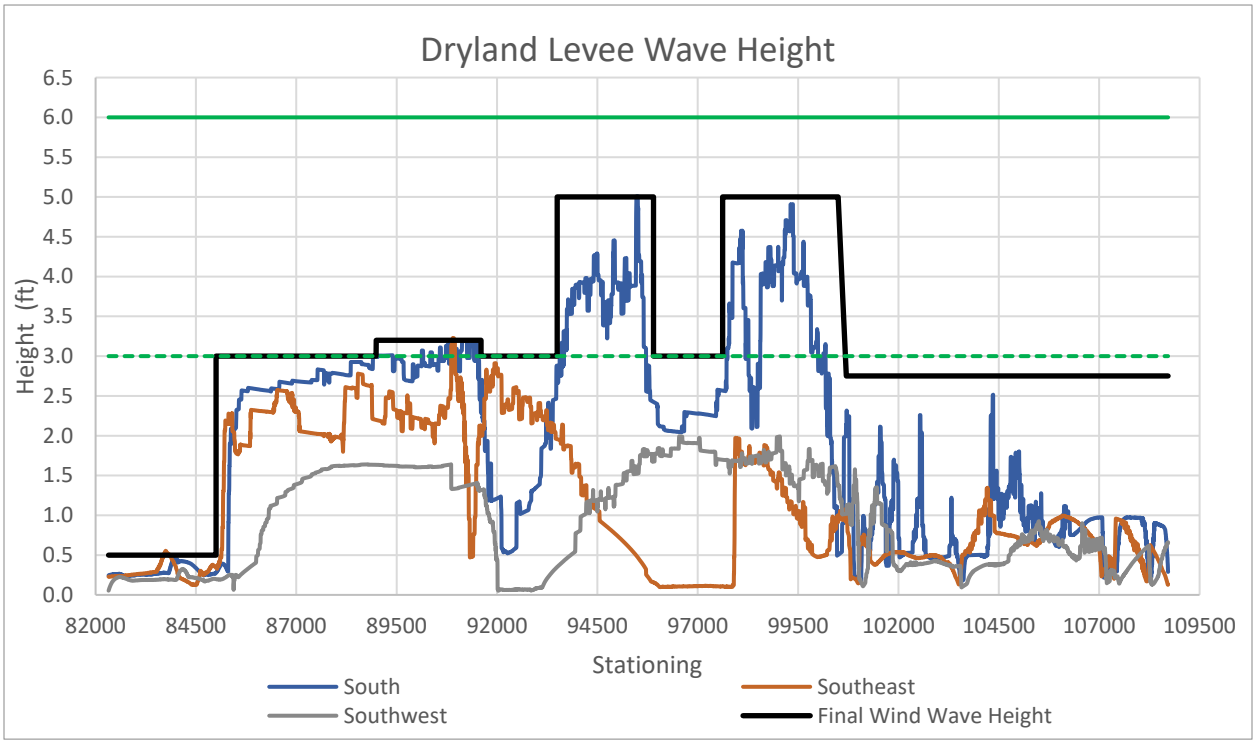


Figure 10: Combined Wind Setup and Wave Runup Height for Every Point Along the Dryland Levee

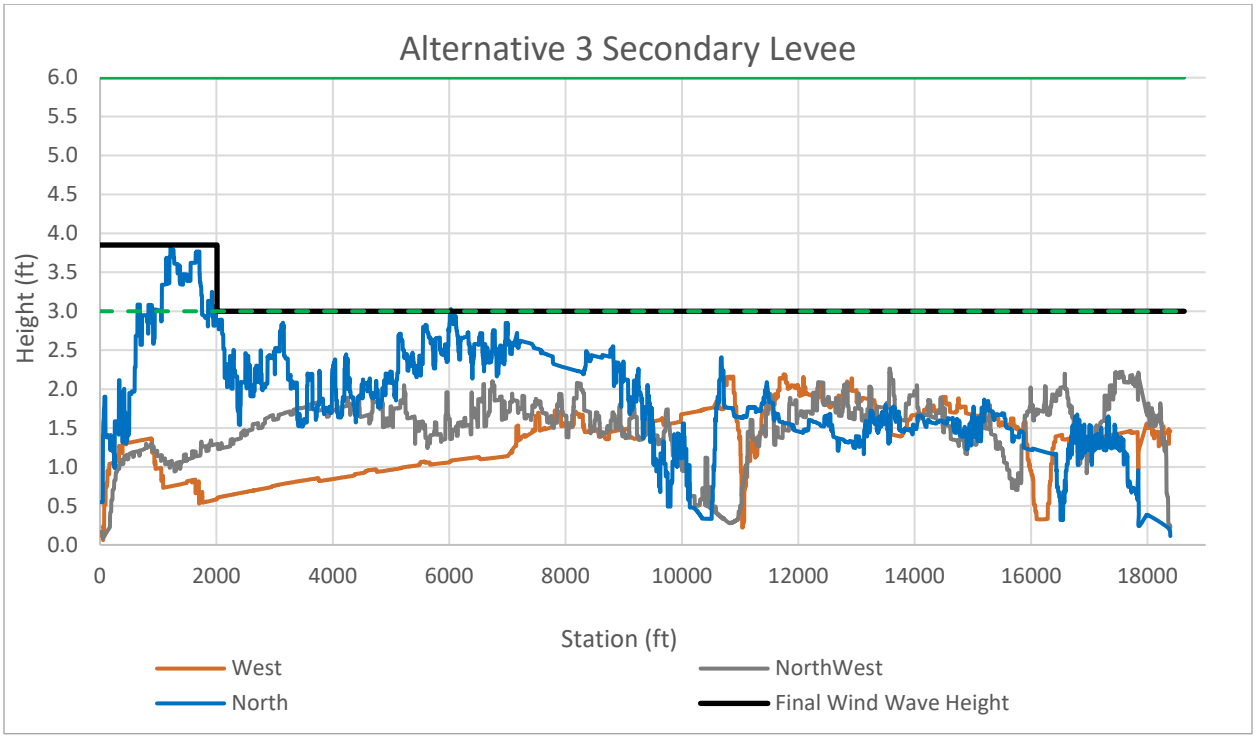


Figure 11: Combined Wind Setup and Wave Runup Height for Every Point Along the Alternative 3 Secondary Levee

Appendix C

Design Water Surface Elevation & Minimum Top of Levee Technical Memorandum

TECHNICAL MEMORANDUM

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Mossdale Tract Area
Urban Flood Risk Reduction:
Design Water Surface Elevation & Minimum Top of Levee

Prepared for: ***San Joaquin Area Flood Control Agency*** *June 11, 2021*

Prepared by: Brittney Salvador, E.I.T.

Reviewed by: Mike Rossiter, P.E., C.F.M.

Introduction

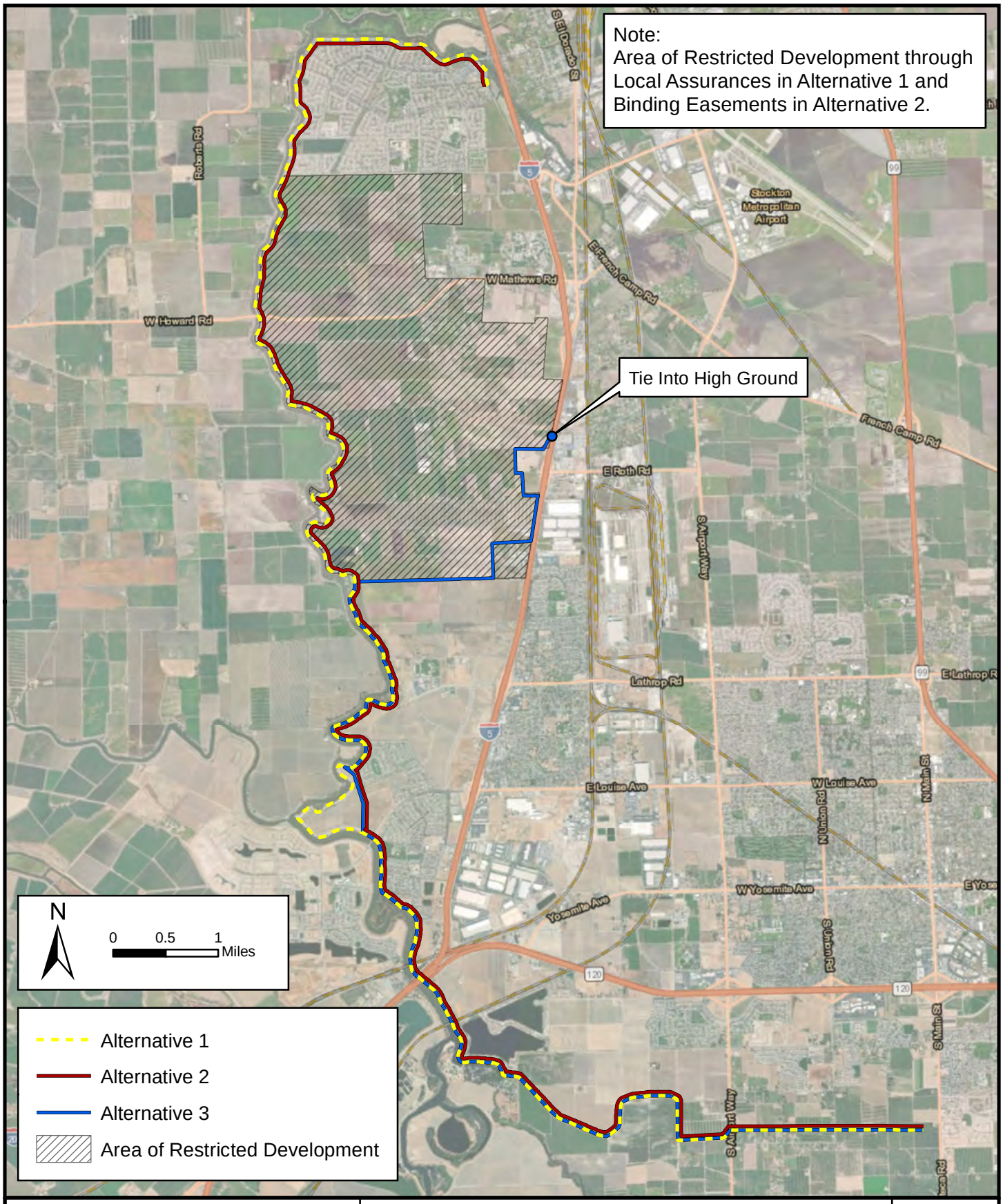
This technical memorandum (TM) was produced to outline the methodology of the Design Water Surface Elevation (DWSE) and Minimum Top of Levee (MTOL) for Mossdale Tract Area Urban Flood Risk Reduction (UFRR) study alternatives.

The alternatives are presented in Figure 1 and are described as follows:

- Alternative 1: Full fix-in-place levee improvements accommodating year 2040 climate change, with local assurances for wise use of the floodplain that would be governed by development prohibitions outlined in the State's Delta Plan.
- Alternative 2: Full fix-in-place levee except for setback levee at river mile 52 with improvements accommodating year 2040 climate change hydrology, with binding easements on 5,050 ac to restrict development.
- Alternative 3: Partial fix-in-place of levees fronting Lathrop and Manteca, plus a new secondary levee along the northern boundary of Lathrop and a setback levee at river mile 52. Levee improvements accommodate year 2040 climate change. Areas north of the new secondary levee would not achieve ULOP.

Alternative 4 was later added to the UFRR study and has the same structural improvements as Alternative 2.

Guidance from the Department of Water Resources (DWR) Urban Levee Design Criteria (ULDC) was used in analysis of the DWSE and MTOL.



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Mossdale Tract Area

Key Flood Risk Management Features of Alternatives

FIGURE

1

Background

As outlined by ULDC, the DWSE is the 200-year water surface profile plus adjustments and other considerations. ULDC states:

> *"The civil engineer needs to consider making adjustments to the DWSE and whether there are other scenarios that could increase the DWSE as a result of nearby or upstream levee or floodwall breaches… Based on the potential for underestimating the DWSE, the civil engineer should consider increasing the DWSE to account for the potential increases in water surface associated with climate change, updated hydrology, updated hydraulic models, and sea level rise."*

For analysis of Mossdale levee improvements, two scenarios were considered:

- 2040 Climate Change Hydrology: Used as basis for DWSE in planning for the physical levee embankment and top of levee height in Mossdale ULDC improvements
- 2065 CVFPP Climate Change Hydrology: Used as basis for (a) geotechnical improvements to the Mossdale levee, and (b) identifying right-of-way (ROW) acquisition footprint

The decision to use the above events as the basis for planning Mossdale levee improvements is based on SJAFCA's 2019 Climate Change policy which states that there should be:

> *"…the inclusion of some additional measure of stage in levee design [to account for climate change]. This additional stage will differ in different reaches to be determined by SJAFCA staff based upon input from consultants and partner agencies, but is expected to be in the zero to three-foot range."*

Right of way (ROW) requirements will also be increased per SJAFCA's policy:

> *"Where real estate is being acquired for project improvements (and where land use coordination as described below is not adequate), SJAFCA will acquire the necessary real estate to support potential future levee raises and/or extensions based on the 2017 CVFPP climate change hydrology."*

The 2040 climate change scenario was chosen for the basis of physical levee embankment improvements because it (a) is roughly 20yrs out in the future which is the duration of the ULDC finding for the Mossdale system, and (b) it's an intermediate estimate between the present-day 200yr event and the CVFPP 2065 climate change event which aligns with the intent of SJAFCA's

climate change policy.

Analysis

Considerations for the development of the DWSE and MTOL are described in this section.

Estimation of 2040 Climate Change Hydrology

A detailed discussion of the hydrologic analysis and the hydraulic modeling performed to calculate the 2040 climate change 200-year water surface profile is provided in Appendix A of the main UFRR study report. In general, the 2040 climate change hydrology was estimated through linear interpolation between present day peak flows and 2065 CVFPP climate change peak flows. The linear interpolation was considered to be a conservative assumption when estimating 2040 hydrology. In reality, the curve between present-day hydrology and future climate change hydrology will likely take the form of an exponential path rather than a linear path.

Consideration of Upstream Levee Breaches

The DWSE for the Mossdale dryland levee improvements is estimated based on hydraulic model results of ponded WSELs behind the dryland levee during the 2040 climate change 200-year scenario. Breaches of uncertified levees along the right bank of the San Joaquin River between Walthall Slough and Vernalis have the potential to increase ponding behind the Mossdale dryland levee.

Breach scenarios of these upstream levees were considered and sensitivity analyses conducted, but ultimately the upstream breach scenarios did not have notable impacts to the WSELs along the dryland levee for the particular flow event analyzed. The 2040 climate change 200-year scenario is extreme enough where water overtops the right bank levees along the San Joaquin River and the floodplain behind the dryland levee is filled up to the point where the ponded area is weiring over the Walthall Slough control structure, and its nearby levees, back into the San Joaquin River.

Breaching the upstream levees was inconsequential to the WSELs along the dryland levee during this type of extreme flow event and was therefore not included in the hydraulic modeling for the final DWSE.

Consideration of Mizuno Farms Relief Cut

The Mizuno Farms relief cut is a fully planned and documented emergency response measure located along the right bank San Joaquin River levee just upstream of Walthall Slough. This relief cut is used to dewater the area behind the Mossdale dryland levee in the event it is flooded. The floodwaters behind the dryland levee are able to flow through the relief cut and back into the San Joaquin River which can serve to decrease WSELs along the dryland levee.

The Mizuno Farms relief cut was considered as part of the hydraulic analyses for the DWSE, but was ultimately not a factor in determining the DWSE. The relief cut can only be effective if the receiving waters on the downstream side of the cut are low enough to accept the flow. For the 2040 climate change 200-year scenario, the San Joaquin River stages are high enough where the relief cut is ineffective at reducing WSELs behind the dryland levee.

Final Design Water Surface Elevations (DWSE)

As discussed previously, this analysis incorporated climate change by basing the DWSE for physical levee embankment improvements on the 2040 climate change 200-year water surface profile. In areas where the 2040 climate change 200-year WSEL was more than 3-feet higher than the 200-year WSEL for present-day hydrology, the DWSE was capped to be no more than the 200-year present-day WSEL plus 3-feet. This decision was made in accordance with SJAFCA's climate change policy.

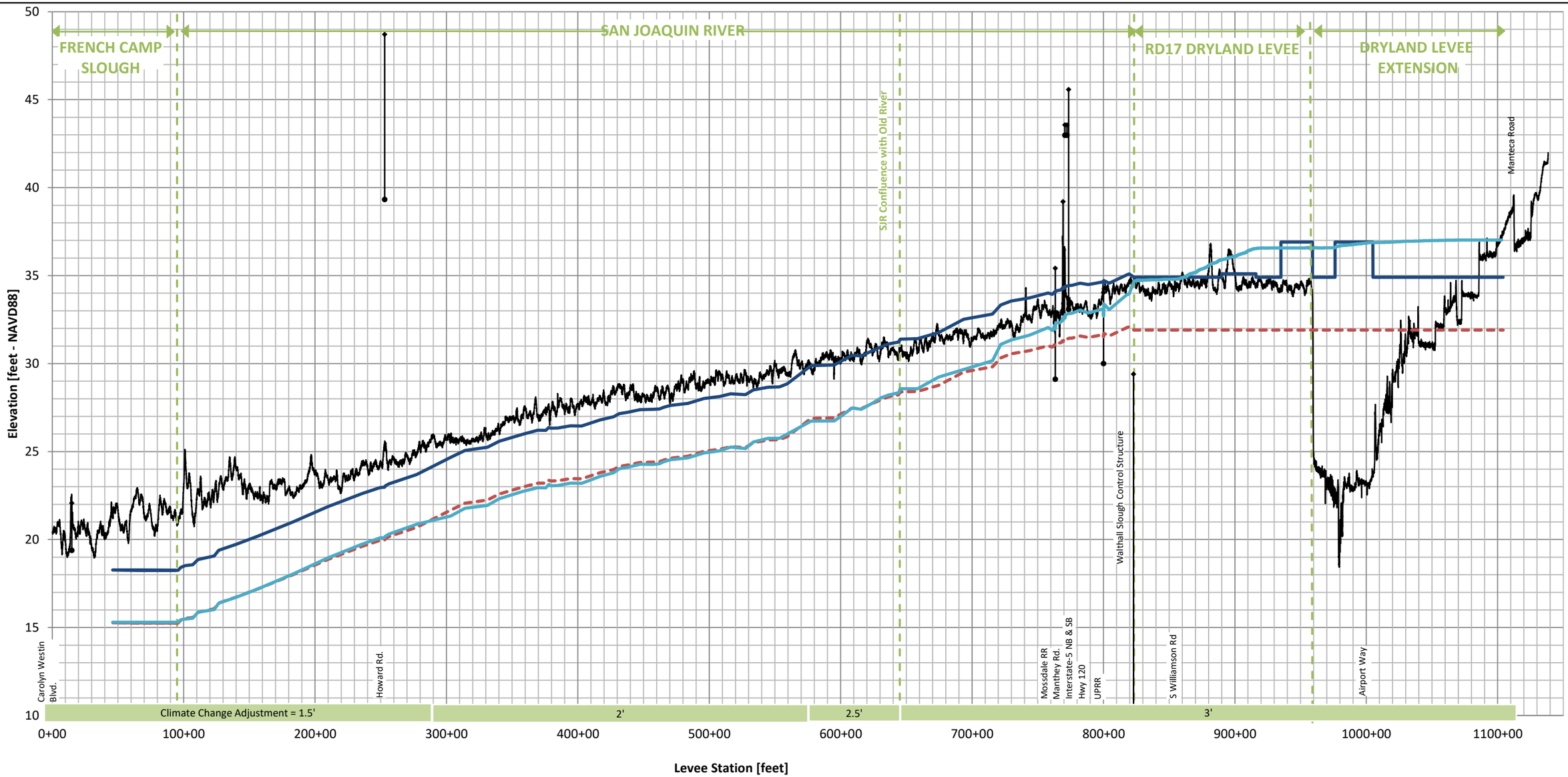
For the CVFPP 2065 climate change scenario that was used in geotechnical and right-of-way planning, WSELs were not capped and the full 2065 water surface profile was used as the DWSE for these project elements.

Minimum Top of Levee

The MTOL as defined by ULDC is the DWSE plus the greater of (a) three feet or (b) wind setup and wave runup (wind/wave) height (up to six feet). The DWSE for physical levee embankment improvements was used for determination of the MTOL. A separate wind/wave analysis was conducted for the Mossdale Tract Area Urban Flood Risk Reduction study and is provided as an appendix to the report. The results of the analysis showed that no wind/wave heights were greater than 3 feet for the levee reaches along French Camp Slough and the San Joaquin River. However, along the dryland levee there were some segments where wind/wave heights were calculated to be up to 5-feet. The DWSE plus the specified freeboard was used to arrive at the MTOL.

Results

The DWSE and MTOL profiles are shown in Figure 2 for the existing levee alignment and the dryland levee extension (Alternatives 1 & 2), and in Figure 3 for the Alternative 3 secondary levee.



LEGEND

- RD17 Top of Levee
- Stream Junction
- Bridge (Max. Low Chord; Min. OT Elev.)
- Design Water Surface Elevation for Physical Levee Embankment Improvements
- Design Water Surface Elevation for Geotechnical and Right-of-Way Improvements
- Minimum Top of Levee

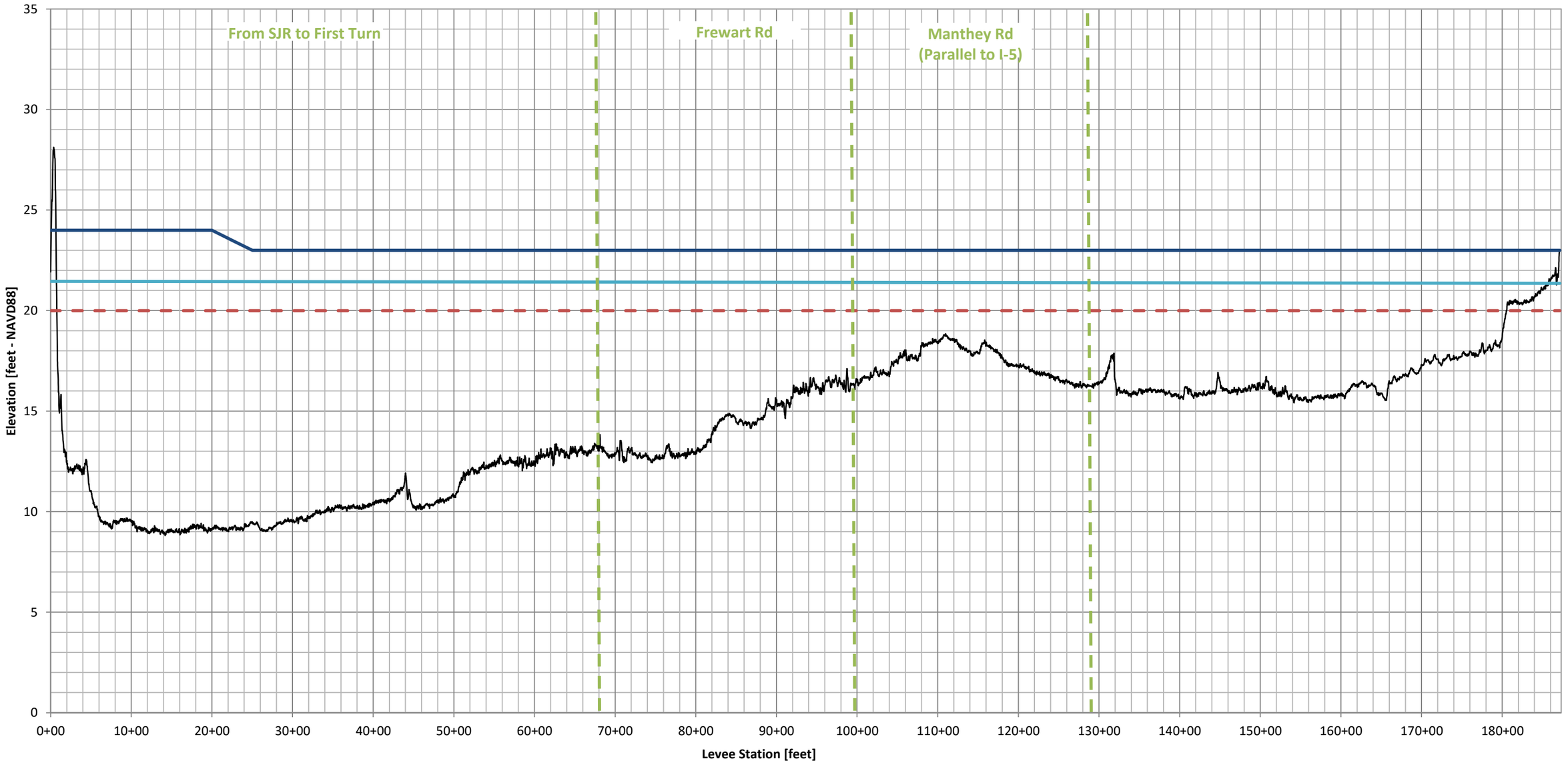
June 2021

Figure 2

MOSSDALE TRACT AREA
URBAN FLOOD RISK REDUCTION STUDY

Design Water Surface Elevation & Minimum Top of Levee

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LEGEND

- Existing Ground Elevation
- Design Water Surface Elevation for Physical Levee Embankment Improvements
- Design Water Surface Elevation for Geotechnical and Right-of-Way Improvements
- Minimum Top of Levee

Figure 3

June 2021

MOSSDALE TRACT AREA
URBAN FLOOD RISK REDUCTION STUDY

Design Water Surface Elevation &
Minimum Top of Levee

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Appendix D

Larsen Wurzel & Associates, Inc. RD17 Area: Financial Plan Implementation – Summary of Financial Analyses. Administrative Review Draft Report. September 2017.

LWA

LARSEN WURZEL
& Associates, Inc.
2450 Venture Oaks Way, Suite 240
Sacramento, CA 95833

PUBLIC FINANCE
& MANAGEMENT
RESOLVED

RD17 Area:

Financing Plan Implementation – Summary of Financial Analyses

ADMINISTRATIVE REVIEW DRAFT REPORT

September 22, 2017

Prepared for: Cities of Lathrop, Manteca, and Stockton, San Joaquin County, and Reclamation District No. 17

Prepared by: Larsen Wurzel & Associates, Inc. & Economic & Planning System, Inc.

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LIST OF ATTACHMENTS

Attachment A – Development Absorption Projections

- Final Updated Technical Memorandum: RD 17 Area Financing Plan Implementation Updated Development Absorption Projections prepared by LWA dated August 18, 2017

Attachment B – Fiscal Impact Analyses

- Attachment B1 – RD 17 Area Finance Plan Implementation Fiscal Impact Analysis - City of Lathrop prepared by Economic & Planning Systems, Inc.
- Attachment B2 – RD 17 Area Finance Plan Implementation Fiscal Impact Analysis - City of Manteca prepared by Economic & Planning Systems, Inc.
- Attachment B3 – RD 17 Area Finance Plan Implementation Fiscal Impact Analysis - City of Manteca prepared by Economic & Planning Systems, Inc.
- Attachment B4 – RD 17 Area Finance Plan Implementation Fiscal Impact Analysis - City of Manteca prepared by Economic & Planning Systems, Inc.

Attachment C – No Project Alternative Analyses

- RD 17 Area Finance Plan Implementation Fiscal Impact Analysis — No Project Alternative prepared by Economic & Planning Systems, Inc.

Attachment D – Development Feasibility Analyses

- RD 17 Area Finance Plan Implementation Support Feasibility Analysis prepared by Economic & Planning Systems, Inc.

Attachment E – Development Fee Comparison

- Development Fee Comparison Tables prepared by Larsen Wurzel & Associates, Inc.

Attachment F – Overlay Assessment Analysis

- Updated Technical Memorandum - RD 17 Area: Overlay Assessment Rate Analysis prepared by Larsen Wurzel & Associates, Inc.

Attachment G – EIFD Revenue Analysis

- RD 17 Area Finance Plan Implementation EIFD Revenue Analysis prepared by Economic & Planning Systems, Inc.

Attachment H – Updated Financing Plan Tables

- Updated Tables 4, 5, Appendix A and E17 from the ULOP APR prepared by Larsen Wurzel & Associates, Inc.

EXECUTIVE SUMMARY

Larsen Wurzel & Associates, Inc. (LWA) and Economic & Planning Systems, Inc. (EPS) have been engaged to support the implementation of a Finance Plan for 200-year flood protection for the Reclamation District 17 (RD 17) Basin (the Finance Plan). The Finance Plan is described in the *RD 17 Area: Adequate Progress Report for Urban Level of Protection*, June 14, 2016 (Adequate Progress Report or APR) (updated on June 13, 2017). An integral part of the Finance Plan's implementation is the establishment of a new governance entity responsible for advancing 200-year flood protection in the RD 17 Area (the "200-Year Project"). LWA & EPSs' support for the implementation of the Finance Plan is to help the Local Agencies (the Cities of Lathrop & Manteca as well as the City of Stockton & San Joaquin County) evaluate participation in the new governance entity. Currently, the preferred approach for participation in a governance entity by the Local Agencies is to amend the San Joaquin Area Flood Control Agency's (SJAFCA's) joint exercise of powers agreement (JEPA) to include the Cities of Lathrop and Manteca as new members. With this addition, SJAFCA would have membership consisting of all the Local Agencies. The Local Agencies met on January 4, 2017 to identify a series of analyses and conceptualize a scope of work that, upon its completion, would inform the threshold decision to participate in the governance entity (amend the SJAFCA JEPA) and determine whether financial participation through an Enhanced Infrastructure Financing District would be feasible. The following presents a summary of the analyses that were completed by LWA in coordination with its sub-consultant, Economic & Planning Systems, Inc. (EPS). The definitive goal of these technical analyses was to draw conclusions and recommendations for the participation in a governance entity advancing the 200-Year Project.

The analyses included the following:

- **Development Absorption Projections** – LWA and EPS prepared detailed information regarding planned and existing development within the basin including the timing and absorption rate of new development. The information feeds into the following supporting analyses.

- **Fiscal Impact Analyses -** EPS prepared multiple fiscal impact analyses, one for each jurisdiction, so that, at a high level, the impacts of participation in the potential Enhanced Infrastructure Funding District (EIFD) could be evaluated by each agency. These analyses compared forecasts of the General Fund revenues generated (through property tax, sales tax, and other City or County revenue sources) with the cost of providing General Fund municipal services to the project area. The main goal of these analyses was to help inform discussions regarding participation in an EIFD.

- **No Project Alternative Analysis** - In concert with LWA and the jurisdictions, EPS prepared a financial model to estimate the potential General Fund impacts to the jurisdictions if assessed value growth stagnates and/or if assessed values decrease in portions of the basin that may no longer be available for development due to the regulatory impacts on new development of SB-5 and Urban Level of Flood Protection requirements.

- **Development Feasibility Analyses** - LWA and EPS coordinated on the preparation of an analysis evaluating the feasibility of new development to bear all or a portion of the cost of the 200-Year Project. The analysis tested that feasibility by evaluating the total infrastructure cost burdens and residual land values for three land use prototypes that are included in the planned development analysis and expected to take place within the RD 17 Area.

- **Fee Comparison Analysis –** To add supporting context to the feasibility analysis of new development bearing the cost of the 200-Year Project, LWA researched and compiled data regarding development impact fees charged for levee and flood control improvements in other comparable jurisdictions throughout California's Central Valley. The analysis compared the relative cost of similar improvements funded by new development in other urban Central Valley jurisdictions.

- **Overlay Assessment Rate Analysis** - LWA evaluated the effectiveness of an overlay assessment district (a new assessment in addition RD 17's current Mossdale Tract Assessment) to fund a portion of the 200-Year Project. This analysis was designed to support a determination of potentially feasible assessment rates for a proposed overlay assessment district to assess the effectiveness of a Rate Structure that apportions more benefit to new development versus existing development. This analysis also included a projection of assessment revenues informing the update to the ULOP APR Financing Plan.

- **EIFD Revenue Projection Analysis** - With support from LWA and the other analyses, EPS prepared an excel model to forecast potential EIFD revenues assuming an EIFD were formed and each jurisdiction participated by pledging a portion of eligible property tax revenues to the EIFD. The analysis forecasted assessed value and property tax revenue growth including estimates for both existing and new development. This analysis was utilized, in conjunction with the Updated Financing Plan, to determine an amount of EIFD revenues needed to ensure a feasible Financing Plan. Further, this information analyzed the resulting additional net Fiscal Impacts of the EIFD to determine the feasibility of an initial property tax allocation rate to the EIFD.

- **Update to APR ULOP Financing Plan** - As part of the synthesis of the above analyses and to support key conclusions and recommendations, LWA updated the ULOP Financing Plan presented within the APR to incorporate the following;
    - Assumed necessary EIFD revenues;
    - Updated projected Development Impact Fee revenues based on the DAP;
    - Updated projected Overlay Assessment revenues; and,
    - Revised borrowing assumptions.

  The purpose of this update was to help determine the gross level of EIFD revenues needed to finance the Project within the regulatory time frame and to further determine whether the Agencies could potentially

bear the amount of redirected Property Tax revenues to an EIFD. This analysis was closely coordinated with the updated EIFD revenue projection analysis.

Summary of Key Conclusions & Recommendations

The following summarizes key conclusions of drawn from the analysis as further discussed below:

- The update to Financing Plan presented in the ULOP APR, given assumptions regarding costs, projected development, and the completion of future recommended supporting evaluations needed for implementation, demonstrates that the identified revenues mechanisms could support the 200-Year Project as currently presented.
    - The Updated Financing Plan and associated EIFD Revenue Analysis conclude that EIFD revenues generating a total $112.7 million between 2018-19 and 2051-52 are needed to fund and finance the Project. These amounts are based upon an initial 34% property tax allocation rate with that rate falling to 28% in 2025-26 and then being constrained by the maximum amount needed for debt service of approximately $3.8 million per year.
- The Fiscal Analyses conclude that, in the long term, there would be a positive Fiscal Impact to the Local Agencies resulting from completion of the 200-Year Project. Further, the No Project Alternative analyses show that there would be negative fiscal impacts to the Local Agencies as a result of not completing the project.
    - The analyses show that beyond 2030 there are positive fiscal impacts due to future development and, in addition to quantified negative fiscal impacts demonstrated by the conservative the No Project Alternative analysis, LWA identified other expected direct fiscal impacts that could result from reduced investment as result of the regulatory impacts of SB5 in the basin. These include less unsecured property tax revenues and less sales tax revenues due to reduced business and commercial investment in the basin.
    - However, the Fiscal Impact Analyses, along with the EIFD revenue projection analysis, demonstrates that there is limited ability for the Cities to allocate property tax revenue to the 200-Year Project before 2025. In the long term, after 2030, the demand for EIFD revenue would be less than the positive fiscal impacts of completing the project if the EIFD property tax allocations were limited by the amount needed for debt financing. To finalize the analysis of net Fiscal Impact after EIFD contributions on an individual jurisdiction by jurisdiction basis, additional analysis taking into consideration the amount of property tax allocation by each jurisdiction would be needed.

- The Development Feasibility Analyses conclude that there is limited ability for residential development to absorb additional infrastructure burden costs. Non-residential development may be able to absorb additional costs.

    - LWA recommends that further evaluation should take place as part of transitioning the development fee to SJAFCA to administer on a regional basis. The Fee comparison analysis demonstrates that the current Interim RD 17 ULOP fee is comparable to other fees in the Central Valley for the same purpose.

- An Overlay Assessment District levying $5.5 million per year with the described apportionment approach results in what LWA feel's is a potentially feasible rate structure. Additional analysis is needed to finalize this effort.

    - LWA's conclusions are based upon a rate structure that would effectively double the average annual assessment rate (from $67 to of $134) for Single Family Residential development. Further, when taking into consideration the resulting apportionment of benefits, 40% of the benefit would be allocated to planned development. This result helps support potential passage of future property owner Proposition 218 ballot proceeding. However, additional analysis is needed to ensure that the resulting credit quality of Assessment District revenues can be bonded. This analysis would entail a more detailed review of the concentration of assessments (i.e. top assessees / property owners) the amount of assessment on undeveloped and public properties as well as the criteria for administration of the assessment.

Given the conclusions above, LWA recommends that the Local Agencies move forward with amending the SJAFCA JEPA and implementing the needed governance entity to continue to advance the 200-year Project. LWA also recommends that once SJAFCA seats its new members, that recommended analyses described above take place as part of implementation of each funding mechanism. Further, LWA recommends that the local agencies, through SJAFCA, develop a set of implementation and financing plan principles that support advancement of the 200-Year Project. These principles should address, among other things, items such as;

- The frequency and scope of regular Finance Plan updates;
    - How often the development fee program is reviewed and updated – at minimum, AB 1600 requires regular 5-year updates;
    - The level of development entitlement before land is considered part of the allocation base for the development impact fee – should all land identified for urban development within a City's Sphere of Influence be included, or should the threshold be something more certain;
    - How often should the Development Absorption Projections be reviewed and updated and should standard (more conservative or less conservative) assumptions be applied to future development as part of those regular updates;

  - How often the Fiscal Analyses updated as part of administering the EIFD;
  - How General Plan Land Use Element changes are incorporated into the financing plan;
- How fees credits are applied to developers that provide advance funding for the project (are credits applied on a first permit basis, last permit basis, or proportionate basis) or is that left up to each jurisdiction;
- How SJAFCA operating costs would be apportioned to each member agency prior to the establishment of a new sustainable funding mechanism that is able to fund SJAFCA operational costs and, how and when advances by the local agencies for interim operating costs and prior efforts are reimbursed.
- Common adherence by all local agencies to the Financing Plan concept that all property developing in the 200-Year floodplain contributes to 200-Year Project implementation. (i.e. all land use agencies agree to impose of a common set of conditions on all discretionary land use entitlements and, to the extent feasible, building permit issuances)

These issues, among others should be addressed once SJAFCA is established as the lead implementing governance agency for the 200-Year Project.

DEVELOPMENT ABSORPTION PROJECTIONS

The DAP analysis is used as the basis for the fiscal analyses, the EIFD revenue projections, and the associated update to the financing plan necessary to support continued project implementation and associated findings of Urban Level of Protection (ULOP) Adequate Progress for the land use agencies in the RD 17 Area.

An initial projection of development buildout was prepared in support of the Adequate Progress Report. The data supporting the ultimate buildout of the basin was originally compiled from varying sources including agency planning staff and developer/land owner interests. This information was refined in support of the more detailed scope of work to prepare a time dependent absorption schedule of planned development. The absorption schedule was reviewed multiple times by agency staff before being finalized. The finalized DAP and the methodology for its development can be found in **Attachment A,** the *Final Updated Technical Memorandum: RD 17 Area Financing Plan Implementation Updated Development Absorption Projections* prepared by LWA dated August 18, 2017.

The following describes the key conclusions of the absorption research and analysis contained in **Appendix A**.

City of Lathrop

The City of Lathrop is projected to develop 7,816 residential dwelling units and 23,424.4 thousand square feet of nonresidential building between 2018 and the 2060 buildout.

City of Manteca

The City of Manteca is projected to develop 3,888 residential dwelling units and 1,555.1 thousand square feet of nonresidential building between 2018 and the 2060 buildout. Additionally, the city is expected to annex areas with projected development of 1,101 residential dwelling units.

City of Stockton

The City of Stockton is projected to develop 1,549 residential dwelling units and 722.2 thousand square feet of non-residential building between 2018 and the 2060 buildout. Additionally, the city is expected to annex area with projected development of 733.7 thousand square feet of building.

San Joaquin County

Including the development within the cities and projected annex areas, San Joaquin County, in total, is expected to have 14,494 residential dwelling units and 26,475.4 thousand square feet of building develop between 2018 and the 2060 buildout. These projections include 140 residential dwelling units in the Oakwood Shores development which is not currently planned for annexation to a specific city.

Key Conclusion & Recommendations

The Financing Plan is highly dependent upon the future projections of new development. The analyses supporting the development impact fee program, future overlay assessment and EIFD revenues are all impacted by projections of planned new development. To administer the Financing Plan and implement future updates, it will be important to develop a clear set of principles for incorporating data from the land use agencies regarding planned development. These principles should be developed, adopted and periodically reviewed by SJAFCA as regional entity charged with implementing the 200-Year Project. This will ensure that data from the land use agencies is consistent and the costs of program are fairly apportioned to each benefitting jurisdiction.[1] An example principle could be – "For purposes of a development fee program, planned new development will (or will not) include an estimate for any identified lands within a land use agencies general plan designated as an urban use within a City's Sphere of Influence."

LWA recommends that the future governance entity adopt a set of Financing Plan policies that address, among other items, the policy associated with making estimates for planned future development.

FISCAL IMPACT ANALYSES

Fiscal Impact Analyses were prepared for each Local Agency based on estimates of cumulative planned development in the RD 17 Area between 2018 and 2060, as presented in the DAP. The purpose of the Fiscal Impact Analyses is to compare forecasts of revenues generated for each agency's General Fund (e.g., property

[1] In this case, "jurisdiction" is intended to mean both property owners (in the context of a fee program and assessment) as well as the agency itself (in the context of an EIFD).

tax revenue, sales tax revenue) with the General Fund cost of providing services to new development. The results of these analyses help to inform the extent to which jurisdictions could feasibly allocate funds to an EIFD to support the funding and financing of the 200-Year Project. An analysis of the fiscal impacts to a jurisdiction assuming an estimated contribution to an EIFD is part of the required content of the Infrastructure Financing Plan this is prepared as part of the EIFD formation process.[2]

Attachment B (Sub-attachments **B1** through **B4**) presents the finalized Fiscal Impact Analyses prepared for each jurisdiction. The table sets for each jurisdiction include two summary tables (Table 1 in each sub-attachment provides a high-level summary and Table 2 in each sub-attachment provides additional detail of General Fund revenues and expenditures) and technical appendices (Appendices A through D in each sub-attachment) which detail land use, General Fund budget and other assumptions, and the methodologies used to estimate annual impacts.

Summary Results

In general, these analyses demonstrate that new development results in an annual net fiscal surplus for each city's General Fund after 2030 through buildout (2060).[3] In the near term, however, new development is anticipated to result in modest annual net fiscal deficits for each city. For the County's General Fund, new development is estimated to produce net fiscal surpluses over the entire buildout period (2020 through 2060). Refer to **Table 1** for a summary of impacts to each jurisdiction. Unless assumptions are further refined that would change the outcome of these analyses, each jurisdiction appears to have available property tax revenues to allocate to an EIFD.

City of Lathrop

At buildout (2060), planned development is estimated to result in an annual net fiscal deficit of $316,000 for Lathrop's General Fund. After initial annual net fiscal deficits of $119,000 (2020) and $367,000 (2025), planned development is estimated to result in annual net fiscal surpluses of $333,000 (2030), $1.5 million (2040), and $591,000 (2050). The net fiscal impacts from new development include supplemental Services Community Facilities District (CFD) Special Tax revenues based on existing, approved Services CFD annual special tax rates. The City of Lathrop will implement Service CFDs to mitigate deficits as individual projects are entitled and annual special tax rates may vary from those shown in this analysis.

City of Manteca

At buildout (2060), planned development is estimated to result in an annual net fiscal surplus of $1.1 million for Manteca's General Fund. After initial annual net fiscal deficits of $91,000 (2020) and $254,000 (2025),

[2] An Infrastructure Financing Plan (IFP) is required by Government Code 53398.63 and the requirement to include an analysis of fiscal impacts in the IFP is required by 53398.63 (d)(7).

[3] New development in the City of Lathrop does not produce an annual net fiscal surplus at buildout (2060), although annual net fiscal surpluses are estimated in previous periods. It is anticipated that Lathrop will implement a Services Community Facilities District (CFD) to mitigate any deficits resulting from individual projects.

Table 1
RD 17 Area Finance Plan Implementation
Fiscal Impact Analysis
Summary of Annual Fiscal Impacts by Jurisdiction (2016$)

Item	Estimated Annual Revenues/Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
City of Lathrop Annual Fiscal Impact						
Annual General Fund Revenues [1]	$2,164,000	$4,825,000	$10,013,000	$14,120,000	$18,036,000	$21,953,000
Annual General Fund Expenditures	$2,283,000	$5,192,000	$9,680,000	$12,621,000	$17,445,000	$22,269,000
Net General Fund Surplus/(Deficit)	**($119,000)**	**($367,000)**	**$333,000**	**$1,499,000**	**$591,000**	**($316,000)**
City of Manteca Annual Fiscal Impact						
Annual General Fund Revenues	$557,000	$1,789,000	$3,111,000	$6,740,000	$8,946,000	$8,946,000
Annual General Fund Expenditures	$648,000	$2,043,000	$2,958,000	$5,531,000	$7,832,000	$7,832,000
Net General Fund Surplus/(Deficit)	**($91,000)**	**($254,000)**	**$153,000**	**$1,209,000**	**$1,114,000**	**$1,114,000**
City of Stockton Annual Fiscal Impact						
Annual General Fund Revenues	$120,000	$1,859,000	$2,764,000	$4,615,000	$5,356,000	$5,827,000
Annual General Fund Expenditures	$127,000	$1,279,000	$1,781,000	$2,683,000	$2,839,000	$2,938,000
Net General Fund Surplus/(Deficit)	**($7,000)**	**$580,000**	**$984,000**	**$1,932,000**	**$2,517,000**	**$2,889,000**
San Joaquin County Annual Fiscal Impact						
Annual General Fund Revenues	$2,529,000	$7,273,000	$13,201,000	$20,636,000	$26,592,000	$30,230,000
Annual General Fund Expenditures	$1,405,000	$3,960,000	$6,025,000	$9,116,000	$12,648,000	$14,778,000
Net General Fund Surplus/(Deficit)	**$1,124,000**	**$3,313,000**	**$7,176,000**	**$11,520,000**	**$13,944,000**	**$15,452,000**

fiscals

Source: EPS.

[1] Includes supplemental annual special tax revenue to fund General Fund services. Special tax revenue is based on existing, approved Services Community Facilities District (CFD) annual special tax rates. Actual Services CFD special tax rates may vary and will be established as projects are entitled, on an as needed basis.

planned development is estimated to result in annual net fiscal surpluses ranging from $153,000 (2030) to $1.1 million (2050).

City of Stockton

At buildout (2060), planned development is estimated to result in an annual net fiscal surplus of $2.9 million for Stockton's General Fund. In 2020, planned development is estimated to result in a nominal, annual net fiscal deficit of $7,000. All intervening phases are estimated to result in annual net fiscal surpluses ranging from $580,000 (2025) to $2.5 million (2050).

San Joaquin County

At buildout (2060), planned development is estimated to result in an annual net fiscal surplus of $15.5 million for the County's General Fund. In all preceding phases, planned development is estimated to result in annual net fiscal surpluses ranging from $1.1 million (2020) to $13.9 million (2050).

Key Conclusions

The following key conclusions can be drawn from the results of the Fiscal Impact analyses.

- In general, there are medium term (after 2030) and long term (at buildout) positive or neutral fiscal impacts to all jurisdictions resulting from new development within the RD 17 Area. Therefore, from an operating budget perspective, completion of the 200-Year Project is expected to have positive fiscal benefits to the region.
- However, in the near term, before 2025, there would be limited ability for tax Increment generated from new development to be allocated from the Cities to an EIFD because of the estimated annual net fiscal deficit from new development.

FISCAL IMPACT – NO PROJECT ALTERNATIVE ANALYSIS

The No Project Alternative Analysis evaluates the estimated impacts to each Local Agency's General Fund if the 200-Year Project is not completed. The No Project Alternative Analysis is based on Fiscal Year 2016-17 assessed values of existing development in the RD 17 Area, as provided by the County Assessor. The No Project Alternative technical analysis is presented in **Attachment C**.

For each Local Agency, existing development is categorized as either "Improved Land" or "Unimproved and Agricultural Land."

- Improved Land includes nonagricultural parcels with assessed values for land and improvements. Improved Land is anticipated to retain its current value even if the 200-Year Project is not completed.

- Unimproved and Agricultural Land includes parcels with an assessed value for land only, except for some agricultural parcels which have an assessed value for land and improvements (e.g., barn, machinery). Under this category, the No Project Alternative Analysis assumes that a portion of parcels zoned as "Agricultural" or "Vacant" are currently assessed based on their future development potential and will lose value if flood certification is not obtained and these parcels are no longer developable. For all other land under this category, the No Project Alternative Analysis assumes the current value will not change. For instance, unimproved parcels zoned as residential and nonresidential land are not anticipated to change in value because it is assumed that these parcels have yet to be correctly categorized as "improved" or are being planned for imminent development and are not speculatively valued. In addition, unimproved, agricultural land located in the Delta Plan Area is precluded from future development and is not anticipated to change in value if flood certification is not obtained.

For those parcels that are estimated to lose value, the No Project Alternative uses an average value per acre of $6,000, which represents the average land value per acre for all agricultural parcels in the RD 17 Area. For each jurisdiction, the No Project Alternative assumes a portion of Agricultural and Vacant land will lose value commensurate with the percentage of land required to accommodate planned development over the next 15 years (by 2030).

A reduction in assessed value will impact property tax revenues to each Local Agency. **Table 1** of the No Project Alternative Analysis table set provides an overview of the reduction in property tax revenues for each jurisdiction. **Table 2** shows the reduction in assessed value for each jurisdiction. Technical appendices (Appendix A through D) show the assumptions and methodology used to estimate the No Project Alternative Analysis impacts for each jurisdiction.

City of Lathrop

The No Project Alternative is anticipated to result in a reduction of approximately $99,000 annually in property tax revenues to Lathrop's General Fund.

City of Manteca

The No Project Alternative is anticipated to result in a reduction of approximately $85,000 annually in property tax revenues to Manteca's General Fund.

City of Stockton

The No Project Alternative is anticipated to result in a reduction of approximately $18,000 annually in property tax revenues to Stockton's General Fund.

San Joaquin County

The No Project Alternative is anticipated to result in a reduction of approximately $338,000 annually in property tax revenues to the County's General Fund.

Key Conclusions

The following key conclusions can be drawn from the results of the No Project Alternative Fiscal Impact analyses.

- Utilizing the conservative assumptions stated above, all Local Agencies would experience a decline in General Fund property tax revenues in the near-term due to the regulatory impacts of not complying with SB 5.
- In addition to the property tax revenue declines addressed in this analysis, it is expected that there would be other direct fiscal impacts that would result from reduced investment due to regulatory impacts of SB5 in the RD 17 Area. These impacts have not been quantified as part of these analyses. It is expected that these impacts would be due to declines in unsecured property tax revenues and less sales tax revenues due to reduced business and commercial investment (and reinvestment after unsecured assets depreciate) in the area.

DEVELOPMENT FEASIBILITY ANALYSIS

The purpose of the Development Feasibility Analyses is to determine whether there is sufficient capacity for typical new development in the RD 17 Area to bear additional infrastructure cost burdens and remain financially feasible. The Development Feasibility Analyses, provided in **Attachment D,** comprise infrastructure cost burden and residual land value estimates, based on current fees, bond debt, and development cost estimates, for three development prototypes in prominent development areas within each of the local agencies. The three prototypes were determined by the jurisdictions to be representative of the types of new development each may be currently experiencing. The initial three tables of the table set provide the results of the infrastructure cost burden and residual land value analysis for prototypical single-family residential, multifamily residential, and industrial development projects in each jurisdiction.

- **Table 1** provides the results of the Single-Family Residential Feasibility Analysis. The analysis is based on a 2,500-square foot dwelling unit with a density of 5 units per acre. The infrastructure burden varies from about $85,000 per unit in Manteca (Trails of Manteca) to about $163,200 per unit in Lathrop (Stanford Crossing). Unit development costs are estimated to range from approximately $296,000 to $305,000 per unit. Combined, the total cost per unit exceeds the estimated home sales price for Lathrop ($9,000 per unit), Stockton ($73,000 per unit), and the Stockton Annexation Area ($73,000 per unit). Single-family homes in the Trails of Manteca project in Manteca are estimated to result in a positive land residual value of $69,000 per unit.

- **Table 2** provides the results of the Multifamily Residential Feasibility Analysis. The analysis is based on a 200-unit project, an average unit size of 1,000 square feet, and a density of 20 units per acre. Given estimated infrastructure burdens and unit development costs, the total cost per unit exceeds the estimated capitalized value per unit in every jurisdiction. The negative residual land value ranges from $57,000 per unit in Manteca, $61,000-$62,000 per unit in Stockton and the Stockton Annexation Area, and $77,000 per unit in Lathrop.

- **Table 3** provides the results of the Industrial Feasibility Analysis. The analysis is based on a 250,000-gross building square foot industrial building on 11.5 acres (a 0.50 floor area ratio). With estimated infrastructure and unit development costs, a prototypical industrial project is estimated to yield a positive residual land value in all the jurisdictions.

Appendix A in **Attachment D** provides detailed residual land value analysis assumptions. **Appendices B** through **D** provide the detailed infrastructure cost burden assumptions for each of the three development prototypes in each jurisdiction as well as in three comparable areas outside of the RD 17 Area. It is important to note that the infrastructure cost burdens in the analysis currently account for only the Interim ULOP Levee Impact fees adopted in Lathrop and Manteca. An Interim ULOP Levee Impact Fee is not currently imposed in Stockton or the County. Further, the analysis does not reflect any proposed land secured bond debt associated with the proposed Overlay Assessment. **Appendix E** shows an additional cost burden analysis for a prototypical retail development project in each jurisdiction as well as in three comparable areas outside of the RD 17 Area. **Appendices F** and **G** provide data to support assessed value assumptions and fee credits for the Stanford Crossing Specific Plan, respectively.

Key Conclusions & Next Steps

The following key conclusions can be drawn from the results of the Development Feasibility Analyses.

In general, based on current market conditions impacting finished development values and the costs to develop and construct new development, there is;

- Limited to no capacity for new Single-Family Residential development to absorb additional costs to fund new infrastructure improvements;
- No capacity for new Multifamily Residential development to absorb costs for additional infrastructure improvements; and
- Limited capacity for new Industrial development to absorb costs for additional infrastructure improvements.

It is important to note that this analysis is static and based on the current assumptions for completed development values which change over time. A logical next step in the Finance Plan Implementation would be to transition the Interim ULOP Levee Impact Fees currently being collected in Lathrop and Manteca to the new governance entity that will oversee the 200-Year Project. As part of this transition, the current

development projections underpinning the nexus study supporting the Interim Fees as well as the allocation methodology should be revisited.

DEVELOPMENT FEE STUDY COMPARISON

The Development Fee Study Comparison (**Attachment E)** compares the current development impact fees The Development Fee Study Comparison (**Attachment E)** analyses the current development impact fees funding urban flood control infrastructure from the follow six comparable fee studies:

- Three Rivers Levee Fee for the Three Rivers Levee Improvement Authority and Yuba County.
- Sacramento Area Flood Control Agency Development Impact Fee for SAFCA, City of Sacramento, and Sacramento County (*Outside of the Natomas Basin*)
- Reclamation District 1000 DIF & SAFCA DIF for SAFCA, RD 1000, City of Sacramento, Sacramento County, and Sutter County (*Inside the Natomas Basin*)
- West Sacramento Area Flood Control Agency In-Lieu Levee Fee for WSAFCA and City of West Sacramento
- Yuba City & Sutter County flood component of the Capital Facility Fees for Yuba City and Sutter County
- Wheatland Levee Fee for the City of Wheatland

The analysis calculates the comparable fees for the same prototype developments for Single-Family Residential, Multifamily Residential, Retail, and Industrial developments utilized in the Feasibility Analysis presented in **Attachment D**.

Key Conclusions & Next Steps

The following key conclusions can be drawn from the results of the Develop Fee Comparison Analysis.

- The current Interim ULOP Levee Impact Fee rates adopted by the Cities of Lathrop and Manteca are at the median or just below the median comparable flood control fee rate and in all cases less than average fee.

Any future recalculation of the fee should continue to monitor how the fee compares to other jurisdictions.

OVERLAY ASSESSMENT ANALYSIS

The goal of the Overlay Assessment (OA) Analysis was two-fold. First, was to conceptualize and analyze A) a fee rate structure that addressed a benefit apportionment approach that allocated more benefit to developing properties and B) the resulting fee rates to determine whether they resulted in rates that could be approved

by property owners through Proposition 218 ballot proceeding process. Second, was to analyze, given future development absorption projections, the resulting schedule of expected assessment revenues for incorporation into the updated Financing Plan.

The OA Analysis (**Attachment F**) was prepared by reviewing the current RD 17 Mossdale Tract benefit assessment and apportionment methodology as described in the Reclamation District No. 17 Mossdale Tract Assessment Engineer's Report prepared by Kjeldsen, Sinnock & Neudeck, Inc. (KSN) dated May 15, 2008 (RD 17 ER) and by making adjustments to the methodology to account for the following:

- Inclusion of all properties within the 200-Year Floodplain Basin within San Joaquin County (SJC 200-YFP Basin).
- Allocating a greater amount of benefit to properties designated for development.

The memorandum included within **Attachment F** describes the methodology and approach for determining the resulting average per parcel rates and associated benefit apportionment between Vacant properties planned for development and Developed property. **Table 3** in the Technical Memorandum shows that, with a total annual initial assessment of $5.5 million, the resulting average per parcel rate for Single-Family Residential development would be approximately $70 annually. Further, **Table 3** shows that Single-Family Residential properties (totaling approximately 12,500 parcels) would carry 15.4% of the total weight of the OA and Undeveloped properties (Vacant Non-Agricultural parcels) would carry a combined 40% of the total weight of the OA.

Key Conclusions & Next Steps

The following key conclusions can be drawn from the results of the Overlay Assessment Analysis.

An annual total assessment of $5.5 million with the described apportionment approach, results in a potentially feasible rate structure for existing Single-Family development, however, a more refined analysis will need to take place to evaluate other risk characteristics associated with analysis. This future evaluation needs to address risk characteristics including:

- Concentration of Assessments (i.e. top assessees/property owners);
- The concentration of the assessment on vacant properties and public properties;
- The ability of planned development to bear the cost associated with the amount of benefit apportioned to thereto (feasibility of proposed assessment rates); and,
- The feasibility of administering the assessment given the benefit apportionment approach as described in **Attachment F**.

EIFD REVENUE PROJECTION ANALYSIS

An EIFD is a form of tax increment financing contingent upon the growth in assessed value and resulting growth in property tax revenues. The purpose of the EIFD Analysis is to forecast annual revenues available to fund 200-Year Project improvements, assuming an EIFD is formed and each jurisdiction participates by pledging a portion of eligible property tax revenues. The EIFD Analysis is provided in **Attachment G**.

The EIFD Analysis assumes formation of an EIFD in Fiscal Year 2018-19. The analysis is based on existing assessed values and jurisdictional General Fund property tax allocations in both the existing jurisdictional boundaries and in annexation areas for Tax Rate Areas (TRAs) within the RD 17 Area boundary only. In addition, the analysis relies on projected new development as shown in the DAP and average assessed values for new development consistent with values used in the Fiscal Impact Analyses, and assumes existing and new development grows at an annual rate of 3 percent. The EIFD Analysis also is based on an initial percentage of property tax increment to the EIFD of 34 percent and an ongoing percentage of property tax increment to the EIFD of 28 percent beginning in FY 2025-26. The initial 34 percent allocation to the EIFD has been determined based upon the amount of annual EIFD revenues needed to support the Updated ULOP APR Financing Plan given the cash flow needs and conceptual financing strategy for 200-year Project. The later 28 percent rate beyond 2025-26 was also determined based on financing strategy and early debt service required for a proposed Tax Allocation Bond (TAB) financing. EIFD revenues have been modeled based on a continuing allocation of 28 percent. Assumptions underpinning the EIFD Analysis are summarized in Table 4 in **Attachment G**.

Table 1 and Table 2 provide a cumulative and annual summary of potential EIFD revenues derived from incremental annual growth in assessed values and the assumed EIFD allocation for each jurisdiction. Table 3 provides a summary of annual net fiscal impacts to each jurisdiction both before and after the estimated EIFD allocation.[4]

Tables 5 through 15 illustrate estimated annual and cumulative EIFD revenue and property tax revenue, net of EIFD revenue, to City and County General Funds in each jurisdiction, based on assessed value growth in the existing city boundaries as well as future annexation areas within the current RD 17 boundary. Appendices A

[4] The EIFD contribution is estimated based on the incremental growth of existing and new development, while the fiscal impact analysis evaluates the incremental impacts from new development only. Thus, netting out the EIFD contribution from the net fiscal impacts to each jurisdiction overestimates the reduction in property tax revenues related to new development. However, for Lathrop and Manteca and the County, the EIFD contribution predominantly comprises revenue from the incremental growth of new development; in Stockton, about 50 percent of the EIFD contribution comprises revenue from the incremental growth of new development. This table is intended to illustrate general impacts. Further analyses will be required to determine the exact net fiscal impacts less the EIFD contribution related to new development only.

through E provide details regarding annual development projections, the assessed value of new development, projected tax increment to City and County General Funds and the EIFD, and the calculations for determining the City and County General Fund property tax allocations in existing city boundaries, the unincorporated County, and future annexation areas.

Key Conclusions

Based on the assumptions outlined above, approximately $670 million in cumulative real dollars could be generated based on incremental growth of existing and new assessed value within the RD 17 boundary between FY 2018-19 and FY 2060-61. However, the amount of EIFD revenue needed to support a Tax Allocation Bond (TAB) financing supported by EIFD revenues is far less (reference the Update to ULOP APR Financing Plan below). Beyond Fiscal Year 2025-26, approximately $3.8 million is needed annually from an EIFD to support conceptualized financing plan. In total, approximately $112.7 million of EIFD revenues are needed through 2051-52. This analysis has been integrated into the Financing Plan update described further below. Additional Key Conclusions and recommendations related to the EIFD are discussed in the next section further below.

UPDATE TO ULOP APR FINANCING PLAN

As part of LWA's preparation of the ULOP APR, LWA prepared a financing plan that conceptualized the new revenue sources (a Development Impact Fee, Overlay Assessment District and EIFD) and outlined a financing strategy to fund and finance the implementation of the 200-Year Project by 2025. As noted previously, the goal of an updated Financing Plan is to support the feasibility evaluation of an EIFD to financing the project. While the prior analyses inform the evaluation, feasibility and capacity of the conceptualized new revenues sources, the goal of updating the Financing Plan is to determine the demand for these revenues sources to ensure that they still meet the feasibility standards identified in the prior analyses.

The last update to the Finance Plan was completed as part of the 2017 Annual Update to the ULOP APR completed on June 13, 2017. The update in June addressed the following:

- The most recent expenditures incurred by RD 17 on Phase 3 LSRP work;
- The refinance of RD 17's bonds for Phase 3 work; and,
- The implementation of the Interim Development Impact Fees by Lathrop and Manteca.

The 2017 Annual Update did not incorporate the DAP analysis completed. Further, there were no updates to Phase 4 project costs.

This Update to the Finance Plan starts where the 2017 Annual Update left off and addresses the following;

- An updated revenue stream for the Development Impact Fee based upon the DAP;

- An updated revenue stream for Overlay Assessment based on the analysis included within Overlay Assessment Analysis memorandum;
- An updated EIFD revenue stream based upon EPS's EIFD revenue analysis and initial property tax allocation rates as described above; and finally,
- An updated bonding analysis securitizing future Assessment District and EIFD revenues to finance construction expenditures by 2025.

Attachment H presents the Tables from the ULOP APR that have been updated as part of this effort as follows;

- **Table 4** presents an updated Sources and Uses Statement from the ULOP APR Financing Plan that reflects the revised projected total sources through 2026. The highlighted cells in the analysis are those have been updated as part of this financial analysis effort.
- **Table 5** presents the annual cash flow analysis supporting **Table 4**. The highlighted rows have been updated as part of this effort.
- **Appendix A** presents tables supporting the updated development fee revenues based upon the DAP.
- **Table E17** presents the updated summary of the EIFD and Assessment District revenues utilized to fund the initial cash flow needs of the 200-Year Project on a PayGo basis and service the revised proposed bond issuances shown in **Table 5**.

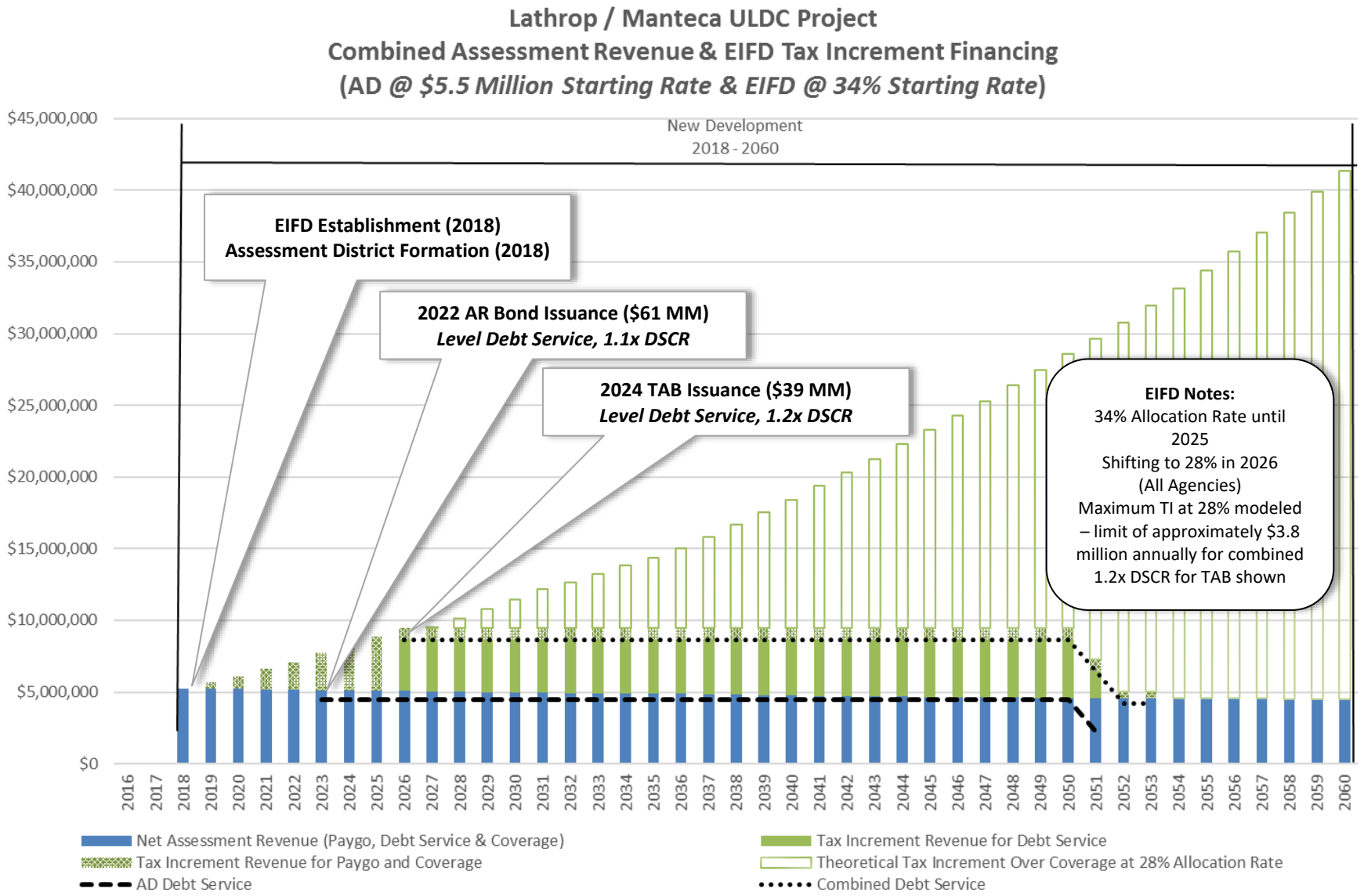
Finally, an updated **Figure 1** presenting the financing approach for a series of borrowings as further described has been prepared.

The updated Financing Plan assumes the following borrowings take place:

- A 2022 borrowing yielding $61 million in proceeds (approximately $68.355 Million Par) takes place. This borrowing would be secured by an established assessment district with several years of collection history and rate covenant of 1.1x Maximum Annual Debt Service. The current financing plan assumes a 30-Year issues with 5% interest rate with level debt services. The issue is sized for 1 year of capitalized interest and a 50% of Maximum Annual Debt Service reserve fund.
- A 2024 borrowing yielding $39 million is proceeds (approximately $52.12 million Par) takes place. This borrowing would be secured by a pledge of Tax Increment from the EIFD as well as an assumption that debt service coverage could be met with a backup pledge of any net assessment revenues. The current financing plan assumes a 30-year issues with 7% interest rate with level debt service. The issues sized for 2 years of capitalized interest and 1x Maximum Annual Debt Service Reserve Fund.

The goal of the financing assumptions is to be conservative at this early planning stage, yet detailed enough to design a revenue structure that has strong enough credit qualities to ensure that a borrowing can be underwritten in the future. To that end, additional analysis needs to take to place to evaluate the feasibility of bonding these revenue streams.

Figure 1: Combined Assessment Revenue & EIFD Tax Increment Financing



As noted previously, to ensure that the Assessment District can secure a borrowing, additional analysis needs to take place to evaluate the tax payer concentration, property development status and ownership. However, these factors need to be balanced against the ability to ensure that a proposed Assessment District can pass a property owner Proposition 218 ballot proceeding. In addition, to ensure that future TABs can be issued, the property tax allocated to the EIFD needs to be "seasoned" enough to ensure that there is a sufficient base of assessed value increment supporting the borrowing that can weather potential declines in the real estate market. Currently the borrowing assumes a 1.2x Debt Service Coverage ratio with concept that this coverage can be supported by a back-up pledge of Net Assessment District revenues. When the time is appropriate (once sufficient tax increment has been realized), this structure will need to be evaluated further to address the feasibility for underwriting the bond issuance. However, a peer review of the borrowing assumptions would be appropriate as a next step for SJAFCA as it would move forward with Financing Plan implementation efforts.

This Financing Plan Update has refined the EIFD Revenue Analysis previously presented as part of the Updated ULOP APR. As shown in Attachment G and further described above, the EIFD revenue analysis has been prepared to present an initial starting property tax revenue allocation rate of 34 percent that shifts to 28 percent in 2025-26. This results in modeled capacity of approximately $670 million through 2060. However, the Updated Financing plan need shown in Table E17 (and demonstrated in **Figure 1** above) is approximately $112.7 million between 2018-19 and 2051-52.

However, to meet the revenue demands of Project for a planned 2025 completion, the Tax Increment needed to support the contemplated financing could exceed the General Fund capacity of each of the participating Local Agencies in the near term (prior to 2025-26) depending upon the structure of the Infrastructure Financing Plan for the EIFD. That is, the amount of property tax revenues needed to be allocated from each participating agency, might exceed the potential near term fiscal deficits projected by the Fiscal Analyses depending upon the amount of property tax revenue allocated. As a result, the Financing Plan, as currently presented, needs further review and refinement. More specifically, this review and refinement should entail an evaluation of the structure of the EIFD Property Tax Allocation rates to be incorporated into an Infrastructure Financing Plan (i.e., which Agency is committing how much) relative to the Net Fiscal Impact of the EIFD on each agency's General Fund.

Finally, to ensure that any potential short falls in funding are shored up in the future and to further the common goal of reducing the local burden of the Project, SJAFCA as the future lead governance entity should continue to evaluate and position the 200-Year Project for other non-local funding sources. This would include continuing to pursue future State grant funding opportunities (Proposition 1, a potential June 2018 Parks and Water Bond measure,[5] any future State funding programs that evolve out of the Central Flood Protection Plan's implementation) and USACE Civil Works funding. This effort should focus on how the 200-Year Project

[5] Reference Senate Bill 5 (2017-18) "California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access For All Act of 2018" which proposes a measure to be placed before the California voters on the June 2018 primary ballot. This measure includes $550 million for various flood protection efforts – Chapter 11.5 (Section 80145).

can be positioned with or combined with a larger set of improvements & projects that advance multi-benefit objectives. For the 200-Year Project to be successful at competing for these limited funds, SJAFCA, with leadership and funding support from the local agencies, will need to advance the 200-Year Project so that when non-local funding opportunities present themselves, SJAFCA will be able to demonstrate that the 200-Year Project is ready for implementation in the near term.

Key Conclusions & Recommendations

The update to the ULOP APR Financing Plan concludes that:

- The Financing Plan for the 200-Year Project is feasible with the following clarifying assumptions;
    - The Development Absorption Projections presented in **Attachment A**;
    - Interim near-term funding is advanced by the local agencies to continue funding mechanism implementation;
    - The Development Fee Program is implemented on a Regional Basis throughout the Basin;
    - Further analysis into the feasibility of the Overlay Assessment District and an associated assessment revenue bond issuance that evaluates – tax payer concentration, property development status and taxable ownership status and other factors that would affect approval by property owners through a Proposition 218 balloting process and the credit quality of the revenue stream;
    - Upon completion of this evaluation, an Overlay Assessment District is implemented and collecting revenues by FY 2018-19;
    - Additional efforts evaluating and finalizing the key provisions of an Infrastructure Financing Plan for an EIFD are completed. This evaluation and analysis should address the initial property tax revenue allocation rates by participating agencies and the associated net fiscal impacts after EIFD contributions;
    - Upon completion of this evaluation, an EIFD is implemented and collecting revenues by FY 2018-19; and,
    - Further analysis into the feasibility of the issuance of Tax Allocation Bonds by the proposed EIFD a point in time in the future when Tax Increment has been realized.

In addition to the items noted above recommending additional analyses furthering Financing Plan Implementation, SJAFCA, as the new lead governance entity, should also work to advance the 200-year Project in a manner that best positions the Project for future non-Local funding (State and Federal). This effort should include; 1) evaluation of how the Project could be presented as a component of a larger regional or systemwide effort advancing multi-benefit objectives; and 2) identifying and developing strategies to address policy related concerns of resource agencies, regulatory authorities and stakeholders in the region. These efforts should be taking place early on and continually advanced as they help secure future non-Local funding sources. A key factor in garnering non-Local funding is readiness. When and if funding is made available, SJAFCA will need to be able to demonstrate project readiness and the ability to implement the 200-Year project in the near-term to be competitive for this funding.

ATTACHMENT A:
DEVELOPMENT ABSORPTION PROJECTIONS

- Final Updated Technical Memorandum: RD 17 Area Financing Plan Implementation Updated Development Absorption Projections prepared by LWA dated August 18, 2017

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Final Updated Technical Memorandum

RD 17 Area Financing Plan Implementation

Updated Development Absorption Projections *August 18, 2017*

Prepared by: Megan Jonsson
Reviewed by: Seth Wurzel, CGFM

Purpose

This memorandum has been prepared by Larsen Wurzel & Associates, Inc. (LWA) in support of the RD 17 Basin Financing Plan Implementation task for the purpose of providing information regarding the synthesis and intended use of the Development Absorption Projections (DAP). It is intended that the DAP will be used as the basis for the fiscal analyses, the Enhanced Infrastructure Financing District (EIFD) revenue projections, and the ongoing updates of the financing plan necessary to support continued findings of ULOP Adequate Progress for the land use agencies in the RD 17 Basin. This memorandum has been updated from the May 5, 2017 version to reflect comments received on the development projections from the land use agencies in the RD 17 Basin.

Methodology

The starting point for the preparation of the attached DAP is contained in the RD 17 Area: Adequate Progress Report for Urban Level of Protection Final Report June 14, 2016. This information was originally compiled from varying sources depending on the Agency and development area. Information for the City of Lathrop was obtained from planning staff and land owner interests. Information for the City of Manteca was obtained in a compiled format from planning staff. As part of this update, revision was made through coordination with City and County staff as described further below.

Generally, for this analysis, LWA utilized the dwelling unit densities and non-residential building coverage percentages previously provided in support of the land use analyses supporting the ULOP Adequate Progress Report Financial Plan and Interim Develop Impact Fee Nexus Study. Whereas, in order to provide a conservative estimate for the purposes of calculating fees LWA generally defaults to lower more standardized coverage ratios for non-residential development, for this analysis, LWA utilized the target densities and coverage percentages previously provided. However, in cases where no dwelling unit or square footage information had been previously provided (only acreage) the following default dwelling unit densities and floor area ratios[1] (FAR) were used:

- Single-Family Residential: six dwelling units per acre
- Multifamily Residential: 15 dwelling units per acre
- Non-residential: FAR of 0.3

[1] A floor area ratio is the relationship of building square feet to land square feet

Where no specific absorptions information was provided, Residential was assumed to develop 80 dwelling units per year and non-residential was assumed to develop 50,000 square feet per year. For developments that included residential and non-residential land designations, non-residential absorption was delayed by two years following residential absorption.

City of Lathrop

City of Lathrop staff provided LWA with updated remaining development projections intended to support the City's Integrated Water Resources Master Plan (IWRMP) Update. These projections included development absorption assumptions in five-year increments from 2020 through 2040 and a lump-sum amount of development for buildout thereafter. Each of the five-year projections were spread evenly over the preceding yearly timeframe and buildout was spread evenly over the subsequent 20 years (2041 through 2060). While it had previously been determined appropriate to use the respective area's specific plan limits and updated developer provided information for Commercial and Industrial developments in South Lathrop, Lathrop Gateway, Cross Roads, and Historic/East Lathrop, City of Lathrop staff requested to further refine development projections across the city after the Final Update Memorandum dated May 17, 2017. Changes to the DAP for City of Lathrop were as follows:

- In South Lathrop, Lathrop Gateway, Cross Roads, and Historic/East Lathrop the FAR for commercial and industrial development was reverted from 0.4 back to 0.3, matching the rest of the city's development.
- In Lathrop Gateway, the Buildout development was pulled forward to begin in 2026 and to be completed by 2040. The total amount of development was not changed.
- For fiscal impact analyses, the City refined mixed-use area definitions and allocations between sales tax generating uses (retail) and non-sales tax generating uses (office/service commercial). This refinement provided more detail for the split of uses originally defined as commercial into respective categories of retail versus non-retail in development areas.

City of Manteca

City of Manteca staff provided LWA with an inventory of finished, entitled, master plan, and pending lots/units in addition to tentative development subdivision maps. The information from these sources was compiled and projected according to estimated timing provided by the City staff. Terra Ranch development was assumed to commence in 2018, followed by Cerri and Future Development; follow by Denali; finally followed by Oakwood Trails and The Trails of Manteca.

In the case of the Oleander and Sundance developments, only those developable parcels determine to be within the 200-Year Floodplain (based upon an overlay of the GIS based 200-Year Floodplain boundary with the tentative subdivision map) were included in the attached DAP. The reaming vacant lots in Oleander were assumed to buildout in 2020 and Sundance was assumed to develop its remaining units the following year.

City of Stockton

LWA surveyed the remaining Weston Ranch developable parcels through aerial photographs and obtained assessor's parcel data through an online service. The City of Lathrop also provided an inventory of vacant land parcels compiled by Lathrop/Weston Ranch Realty. These two sources of data were verified to match.

Development was assumed to commence in 2020 with the assumption that City of Stockton would have satisfied the ULOP Adequate Progress Finding requirement by that time.

San Joaquin County

Although it was assumed in the Adequate Progress Report and Interim Development Impact Fee Nexus Study that 1,400 acres of undeveloped agricultural land currently located in the unincorporated portion of the County would be developed after annexation to City of Stockton, based on an analysis by County Staff, it has since been determined that this assumption might be impractical.

The City of Stockton, as part of an update to its General Plan, is currently considering a reduction of its sphere of influence in the RD 17 Area back to the current city limits at the Southern border of Weston Ranch. Further, this area is not slated for development in the County's current General Plan and there are no plans by the County to provide urban services in the area south of Weston Ranch. As a result, the County has determined that it would be inappropriate to assume that there would be any development in this area because there is no plan at this time by any land use agency for the provision of municipal services.

Future Stockton Annexation Area

With these factors considered, it is also acknowledged that the proposed Veteran's Affairs (VA) Hospital site is within the current City of Stockton's sphere of influence, south of Weston Ranch and growth along the I-5 corridor between Weston Ranch and the VA hospital is likely in the future. As part of the City's ongoing General Plan update, preferred land use alternatives have been reviewed and input has been provided by the City Council as part of that process. As a result, and in coordination with City planning staff, the absorption analysis has been updated to reflect an estimated 70 acres of planned commercial development. Approximately 30 acres is assumed to develop with a FAR of 0.2 and approximately 40 acres at a FAR of 0.3 for a total of just over 773,700 square feet of commercial development assumed to begin in 2027 at 25,000 square feet per year.

Future Manteca Annexation Area

As part of the City of Manteca's review and after consideration of the planned development time horizon, City staff has identified approximately 275 acres within the City's Sphere of Influence and 200-Year Floodplain that could be assumed to develop as low density residential with an average density of four dwelling units per acre commencing in 2035 at 80 dwelling units per year.

Oakwood Shores

Oakwood Shores is located in the unincorporated portion of San Joaquin county west of Manteca's City limit but within the City's sphere of influence. Although the development has been identified as a small community not subject to the SB5 development restrictions, it will benefit from the levee Project and therefore has been included in the DAP with the assumption that remaining development would contribute funding as a result of this benefit. The remaining Single-Family residential development has been included within the updated analysis.

Next Steps

LWA has developed the attached updated DAP based on meetings with representative staff from the Cities of Lathrop, Manteca, Stockton, and San Joaquin County and their follow-on review. LWA will be utilizing the attached information to support the previously discussed analyses.

RD 17 Area Financing Plan Implementation
Development Absorption Projections
(Dwelling Units and 1,000's of Sq. Ft.)

Development Area / Project [1]	Units	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	203
City of Lathrop [2]																							
Central Lathrop																							
High Density Residential	du	-	-	-	54.8	54.8	54.8	54.8	54.8	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variable Density Residential	du	200.0	200.0	200.0	145.2	145.2	145.2	145.2	145.2	181.8	181.8	181.8	181.8	181.8	-	-	-	-	-	-	-	-	
Residential/Mixed Use	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Variable Density Residential Flex	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Office	ksf	41.4	41.4	41.4	25.5	25.5	25.5	25.5	25.5	26.1	26.1	26.1	26.1	26.1	28.0	28.0	28.0	28.0	28.0	51.0	51.0	51.0	51
Office Commercial (20% Retail / 80% Non-Retail)	ksf	41.4	41.4	41.4	25.5	25.5	25.5	25.5	25.5	26.1	26.1	26.1	26.1	26.1	28.0	28.0	28.0	28.0	28.0	51.0	51.0	51.0	51
Neighborhood Commercial (50% Retail / 50% Non-Retail)	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
P-SP, Neighborhood Commercial (0% Retail / 100% Non-Retail)	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Specialty Commercial (50% Retail / 50% Non-Retail)	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Parks	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Schools	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Central Lathrop du		***200.0***	***200.0***	***200.0***	***200.0***	***200.0***	***200.0***	***200.0***	***200.0***	***181.8***	***181.8***	***181.8***	***181.8***	***181.8***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Central Lathrop ksf		***82.8***	***82.8***	***82.8***	***51.0***	***51.0***	***51.0***	***51.0***	***51.0***	***52.3***	***52.3***	***52.3***	***52.3***	***52.3***	***55.9***	***55.9***	***55.9***	***55.9***	***55.9***	***101.9***	***101.9***	***101.9***	***101.***
Mossdale Landing																							
Low Density Residential	du	-	-	-	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	-	-	-	-	-	-	-	-	
Medium Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
High Density Residential	du	20.7	20.7	20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial (20% Retail / 80% Non-Retail)	ksf	-	-	-	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	-	-	-	-	-	-	-	-	
Community Park	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Neighborhood Park	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Schools	ksf	-	-	-	42.3	42.3	42.3	42.3	42.3	-	-	-	-	-	-	-	-	-	-	-	-	-	
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Mossdale Landing du		***20.7***	***20.7***	***20.7***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Mossdale Landing ksf		***0.0***	***0.0***	***0.0***	***50.2***	***50.2***	***50.2***	***50.2***	***50.2***	***7.8***	***7.8***	***7.8***	***7.8***	***7.8***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Mossdale Landing East																							
Low Density Residential	du	12.7	12.7	12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Medium Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
High Density Residential	du	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial (20% Retail / 80% Non-Retail)	ksf	4.4	4.4	4.4	52.3	52.3	52.3	52.3	52.3	287.5	287.5	287.5	287.5	287.5	-	-	-	-	-	-	-	-	
Parks	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Mossdale Landing East du		***30.7***	***30.7***	***30.7***	***18.0***	***18.0***	***18.0***	***18.0***	***18.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Mossdale Landing East ksf		***4.4***	***4.4***	***4.4***	***52.3***	***52.3***	***52.3***	***52.3***	***52.3***	***287.5***	***287.5***	***287.5***	***287.5***	***287.5***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Mossdale Landing South																							
Medium Density Residential	du	-	-	-	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	-	-	-	-	-	-	-	-	
High Density Residential	du	50.0	50.0	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial (20% Retail / 80% Non-Retail)	ksf	-	-	-	13.1	13.1	13.1	13.1	13.1	183.0	183.0	183.0	183.0	183.0	-	-	-	-	-	-	-	-	
Parks	ksf	-	-	-	13.1	13.1	13.1	13.1	13.1	-	-	-	-	-	-	-	-	-	-	-	-	-	
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Mossdale Landing South du		***50.0***	***50.0***	***50.0***	***14.0***	***14.0***	***14.0***	***14.0***	***14.0***	***14.0***	***14.0***	***14.0***	***14.0***	***14.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Mossdale Landing South ksf		***0.0***	***0.0***	***0.0***	***26.1***	***26.1***	***26.1***	***26.1***	***26.1***	***183.0***	***183.0***	***183.0***	***183.0***	***183.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Mossdale Landing Other																							
Low Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Mossdale Landing Other du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Mossdale Landing Other ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
South Lathrop																							
Light Industrial / R&D Flex	ksf	596.7	596.7	596.7	173.6	173.6	173.6	173.6	173.6	-	-	-	-	-	-	-	-	-	-	-	-	-	
Office	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Office Commercial (20% Retail / 80% Non-Retail)	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Open Space	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal South Lathrop du		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal South Lathrop ksf		***596.7***	***596.7***	***596.7***	***173.6***	***173.6***	***173.6***	***173.6***	***173.6***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***

RD 17 Area Financing Plan Implementation
Development Absorption Projections
(Dwelling Units and 1,000's of Sq. Ft.)

Development Area / Project [1]	Units	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	203
Lathrop Gateway																							
Light Industrial / R&D Flex	ksf	-	-	-	-	-	-	-	-	109.5	109.5	109.5	109.5	109.5	109.5	109.5	109.5	109.5	109.5	219.0	219.0	219.0	219
Office	ksf	-	-	-	-	-	-	-	-	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	91.3	91.3	91.3	91
Office Commercial (20% Retail / 80% Non-Retail)	ksf	-	-	-	-	-	-	-	-	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	91.3	91.3	91.3	91
Open Space	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Lathrop Gateway du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Lathrop Gateway ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***200.8***	***200.8***	***200.8***	***200.8***	***200.8***	***200.8***	***200.8***	***200.8***	***200.8***	***200.8***	***401.6***	***401.6***	***401.6***	***401.***
Cross Roads																							
Industrial	ksf	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	
Commercial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Cross Roads du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Cross Roads ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Historic/East Lathrop																							
Low Density Residential	du	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1
Medium Density Residential	du	9.0	9.0	9.0	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.8	5.8	5.8	5
High Density Residential	du	2.3	2.3	2.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1
Commercial (20% Retail / 80% Non-Retail)	ksf	65.3	65.3	65.3	39.2	39.2	39.2	39.2	39.2	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52.3	52
Industrial	ksf	108.9	108.9	108.9	65.3	65.3	65.3	65.3	65.3	130.7	130.7	130.7	130.7	130.7	261.4	261.4	261.4	261.4	261.4	522.7	522.7	522.7	522
Parks	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Schools	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Historic/East Lathrop du		***12.7***	***12.7***	***12.7***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.0***	***8.4***	***8.4***	***8.4***	***8.***
Subtotal Historic/East Lathrop ksf		***174.2***	***174.2***	***174.2***	***104.5***	***104.5***	***104.5***	***104.5***	***104.5***	***183.0***	***183.0***	***183.0***	***183.0***	***183.0***	***313.6***	***313.6***	***313.6***	***313.6***	***313.6***	***575.0***	***575.0***	***575.0***	***575.***
Subtotal City of Lathrop du		**314.0**	**314.0**	**314.0**	**246.6**	**246.6**	**246.6**	**246.6**	**246.6**	**210.4**	**210.4**	**210.4**	**210.4**	**210.4**	**8.0**	**8.0**	**8.0**	**8.0**	**8.0**	**8.4**	**8.4**	**8.4**	**8.**
Subtotal City of Lathrop ksf		**858.0**	**858.0**	**858.0**	**457.7**	**457.7**	**457.7**	**457.7**	**457.7**	**914.3**	**914.3**	**914.3**	**914.3**	**914.3**	**570.4**	**570.4**	**570.4**	**570.4**	**570.4**	**1,078.5**	**1,078.5**	**1,078.5**	**1,078.**
City of Manteca [3][4][5][6]																							
Terra Ranch																							
Single-Family	du	80.0	80.0	52.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Multifamily	du	-	-	28.0	80.0	80.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Terra Ranch du		***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***12.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Cerri																							
Single-Family	du	-	-	-	-	20.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	75.0	-	-	-	-	-	-	-	-	
Subtotal Cerri du		***0.0***	***0.0***	***0.0***	***0.0***	***20.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***75.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Future Development																							
Multifamily	du	-	-	-	-	80.0	80.0	73.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial	ksf	-	-	-	-	-	-	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	62.2	-	
Industrial	ksf	-	-	-	-	-	-	50.0	50.0	50.0	50.0	50.0	50.0	58.1	-	-	-	-	-	-	-	-	
Subtotal Future Development du		***0.0***	***0.0***	***0.0***	***0.0***	***80.0***	***80.0***	***73.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Future Development ksf		***0.0***	***0.0***	***0.0***	***0.0***	***80.0***	***80.0***	***73.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Denali																							
Single Family	du	-	-	-	-	-	-	-	-	-	-	-	-	80.0	80.0	80.0	75.0	-	-	-	-	-	
Commercial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0	50.0	50.0	19.9	-	-	-	
Subtotal Denali du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***80.0***	***80.0***	***80.0***	***75.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Denali ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***50.0***	***50.0***	***50.0***	***19.9***	***0.0***	***0.0***	***0.0***	***0.***
The Trails of Manteca																							
Single-Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80.0	80.0	80.0	80.0	80
Subtotal The Trails of Manteca du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.***
Oakwood Trails																							
Single-Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80.0	80.0	80.0	80
Commercial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0	50
Subtotal Oakwood Trails du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***80.0***	***80.0***	***80.0***	***80.***
Subtotal Oakwood Trails ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***50.0***	***50.***
Oleander [7]																							
Single-Family	du	-	-	87.0						-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Oleander du		***0.0***	***0.0***	***87.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***

RD 17 Area Financing Plan Implementation
Development Absorption Projections
(Dwelling Units and 1,000's of Sq. Ft.)

Development Area / Project [1]	Units	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	203
Sundance [7]																							
Single-Family	du	-	-	-	80.0	80.0	80.0	80.0	27.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Sundance du		***0.0***	***0.0***	***0.0***	***80.0***	***80.0***	***80.0***	***80.0***	***27.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal City of Manteca du		***80.0***	***80.0***	***167.0***	***160.0***	***260.0***	***252.0***	***233.0***	***107.0***	***80.0***	***80.0***	***80.0***	***80.0***	***155.0***	***80.0***	***80.0***	***75.0***	***0.0***	***80.0***	***160.0***	***160.0***	***160.0***	***160.***
Subtotal City of Manteca ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***108.1***	***50.0***	***100.0***	***100.0***	***100.0***	***69.9***	***50.0***	***62.2***	***50.0***	***50.***
City of Stockton																							
Weston Ranch [8][9][10]																							
Single Family	du	-	-	80.0	80.0	80.0	80.0	80.0	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
Multifamily	du	-	-	-	152.0	153.0	-	-	-	150.0	150.0		-	-	-	80.0	80.0	80.0	80.0	80.0	80.0	16.0	
Commercial	ksf	-	-	-	-	250.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25
Subtotal City of Stockton du		***0.0***	***0.0***	***80.0***	***232.0***	***233.0***	***80.0***	***80.0***	***48.0***	***150.0***	***150.0***	***0.0***	***0.0***	***0.0***	***0.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***16.0***	***0.***
Subtotal City of Stockton ksf		***0.0***	***0.0***	***0.0***	***0.0***	***250.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.***
San Joaquin County [11]																							
Future Stockton Annex																							
Single Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Multifamily	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Commercial [12]	ksf	-	-	-	-	-	-	-	-	-	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25
Industrial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Future Stockton Annex du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Future Stockton Annex ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.***
Future Manteca Annex																							
Single-Family [13]	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80.0	80.0	80.0	80.0	80
Subtotal Future Manteca Annex du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.***
Oakwood Shores [14]																							
Single-Family	du	80.0	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Subtotal Oakwood Shores du		***80.0***	***60.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal San Joaquin County du		***80.0***	***60.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.***
Subtotal San Joaquin County ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.***
Total RD 17 Basin Dwelling Units		**474.0**	**454.0**	**561.0**	**638.6**	**739.6**	**578.6**	**559.6**	**401.6**	**440.4**	**440.4**	**290.4**	**290.4**	**365.4**	**88.0**	**168.0**	**163.0**	**88.0**	**248.0**	**328.4**	**328.4**	**264.4**	**248.**
Total RD 17 Basin Square Feet		**858.0**	**858.0**	**858.0**	**457.7**	**707.7**	**482.7**	**582.7**	**582.7**	**1,039.3**	**1,064.3**	**1,064.3**	**1,064.3**	**1,072.4**	**670.4**	**720.4**	**720.4**	**720.4**	**690.2**	**1,178.5**	**1,190.7**	**1,178.5**	**1,178.**

Source: City of Lathrop, City of Manteca, City of Stockton, San Joaquin County, ParcelQuest, LWA

Indicates an update from the May 17, 2017 version.

[1] All residential is reported by dwelling units. All non-residential is reported by 1,000 square feet.
[2] Lathrop projections are assumed to be the similar as those presented in the Lathrop Water Master Plan Draft 23 December 2016; some adjustments were made as outlined in the technical memorandum. Non-residential is assumed to have a FAR consistent with target coverage percentage provided by City in support of the ULOP Adequate Progress Report Financial Plan. If no target was provided the default FAR is assumed to be 0.3.
[3] Manteca residential assumed to develop at 80 dwelling units per year.
[4] Manteca commercial and industrial assumed to develop at 50,000 square feet per year.
[5] Manteca absorption modeled per 03/20/2017 meeting with City staff. Developments sequenced as follows: Terra Ranch, followed by Cerri and Future Development, followed by Denali, followed by Oakwood Trails and The Trails of Manteca.
[6] Manteca adevelopments including residential and non-residential, delayed absorption of non-residential two years following residential absorption.
[7] Manteca Oleander and Sundance developments were analyzed and only those developable parcels determine to be within the 200-Year Flood Plain were included.
[8] Stockton Single-Family Residential assumed to develop at 80 dwelling units per year starting in 2020.
[9] Stockton Multifamily assumed to develop the 15.23 acre northern designation in 2021 over two years, 15 acres of eastern development in 2026 over two years, and remaining 24.78 eastern acreage to begin development in 2032 at 80 dwelling units per year.
[10] Stockton Commercial assumed to develop 250,000 square feet in 2022 followed by 25,000 square feet per year thereafter.
[11] Although San Joaquin County was assumed to have 1,400 acres of development per RD 17 Area: Adequate Progress Report for Urban Level of Protection Final Report June 14, 2016, this development was removed due to several factors highlighted by San Joaquin County staff.
[12] Stockton has indicated the potential for Commercial development within the City's Sphere of Influence, south of Weston Ranch, due to the proposed Veteran's Affair Hospital. This area is assumed to begin development in 2027 at 25,000 square feet per year.
[13] Manteca has indicated the potential for development of approximately 275 acres of land within the City's Sphere of Influence, designated as low density residential in the City's General Plan Update, an assumed density of 4 dwelling units per acre is projected to begin absorption in 2035 at 80 dwelling units per year.
[14] Oakwood Shores is located in the unincorporated area in San Joaquin County and will benefit from the levee Project.

RD 17 Area Financing Plan Implementation
Development Absorption Projections
(Dwelling Units and 1,000's of Sq. Ft.)

Development Area / Project [1]	Units	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Tot
City of Lathrop [2]																							
Central Lathrop																							
High Density Residential	du	-	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	**375.**
Variable Density Residential	du	-	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	131.5	**4,864.**
Residential/Mixed Use	du	-	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	32.6	**651.**
Variable Density Residential Flex	du	-	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	**428.**
Office	ksf	51.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	**1,576.**
Office Commercial (20% Retail / 80% Non-Retail)	ksf	51.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	**1,576.**
Neighborhood Commercial (50% Retail / 50% Non-Retail)	ksf	-	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	**164.**
P-SP, Neighborhood Commercial (0% Retail / 100% Non-Retail)	ksf	-	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	**145.**
Specialty Commercial (50% Retail / 50% Non-Retail)	ksf	-	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	**103.**
Parks	ksf	-	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	75.1	**1,502.**
Schools	ksf	-	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	35.9	**718.**
Public Landscaping	ksf	-	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	30.1	**601.**
Subtotal Central Lathrop du		***0.0***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***190.5***	***6,318.***
Subtotal Central Lathrop ksf		***101.9***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***241.8***	***6,388.***
Mossdale Landing																							
Low Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**66.**
Medium Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
High Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**62.**
Commercial (20% Retail / 80% Non-Retail)	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**78.**
Community Park	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Neighborhood Park	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Schools	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**211.**
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Subtotal Mossdale Landing du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***128.***
Subtotal Mossdale Landing ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***290.***
Mossdale Landing East																							
Low Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**38.**
Medium Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
High Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**144.**
Commercial (20% Retail / 80% Non-Retail)	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1,711.**
Parks	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Subtotal Mossdale Landing East du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***182.***
Subtotal Mossdale Landing East ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1,711.***
Mossdale Landing South																							
Medium Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**140.**
High Density Residential	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**150.**
Commercial (20% Retail / 80% Non-Retail)	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**980.**
Parks	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**65.**
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Subtotal Mossdale Landing South du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***290.***
Subtotal Mossdale Landing South ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1,045.***
Mossdale Landing Other																							
Low Density Residential	du	-	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	**658.**
Subtotal Mossdale Landing Other du		***0.0***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***32.9***	***658.***
Subtotal Mossdale Landing Other ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
South Lathrop																							
Light Industrial / R&D Flex	ksf	-	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	**2,905.**
Office	ksf	-	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	**57.**
Office Commercial (20% Retail / 80% Non-Retail)	ksf	-	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	**57.**
Open Space	ksf	-	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	**274.**
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Subtotal South Lathrop du		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Subtotal South Lathrop ksf		***0.0***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***31.8***	***3,294.***

RD 17 Area Financing Plan Implementation
Development Absorption Projections
(Dwelling Units and 1,000's of Sq. Ft.)

Development Area / Project [1]	Units	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Tot
Lathrop Gateway																							
Light Industrial / R&D Flex	ksf	219.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2,190.**
Office	ksf	91.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**912.**
Office Commercial (20% Retail / 80% Non-Retail)	ksf	91.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**912.**
Open Space	ksf	-	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	**274.**
Public Landscaping	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Subtotal Lathrop Gateway du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Lathrop Gateway ksf		***401.6***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***13.7***	***4,290.***
Cross Roads																							
Industrial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Commercial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Subtotal Cross Roads du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Cross Roads ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Historic/East Lathrop																							
Low Density Residential	du	1.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	**34.**
Medium Density Residential	du	5.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	**164.**
High Density Residential	du	1.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**42.**
Commercial (20% Retail / 80% Non-Retail)	ksf	52.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1,176.**
Industrial	ksf	522.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5,227.**
Parks	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Schools	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.**
Subtotal Historic/East Lathrop du		***8.4***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***240.***
Subtotal Historic/East Lathrop ksf		***575.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***6,403.***
Subtotal City of Lathrop du		**8.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**7,816.**
Subtotal City of Lathrop ksf		**1,078.5**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**287.3**	**23,424.**
City of Manteca [3][4][5][6]																							
Terra Ranch																							
Single-Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**212.**
Multifamily	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**200.**
Subtotal Terra Ranch du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***412.***
Cerri																							
Single-Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**655.**
Subtotal Cerri du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***655.***
Future Development																							
Multifamily	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**233.**
Commercial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**712.**
Industrial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**358.**
Subtotal Future Development du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***233.***
Subtotal Future Development ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1,070.***
Denali																							
Single Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**315.**
Commercial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**169.**
Subtotal Denali du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***315.***
Subtotal Denali ksf		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***169.***
The Trails of Manteca																							
Single-Family	du	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	43.0	-	-	-	-	-	-	-	-	-	-	-	1,163
Subtotal The Trails of Manteca du		***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***43.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1,163.***
Oakwood Trails																							
Single-Family	du	80.0	80.0	80.0	80.0	36.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**676.**
Commercial	ksf	50.0	50.0	50.0	50.0	14.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**314.**
Subtotal Oakwood Trails du		***80.0***	***80.0***	***80.0***	***80.0***	***36.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***676.***
Subtotal Oakwood Trails ksf		***50.0***	***50.0***	***50.0***	***50.0***	***14.9***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***314.***
Oleander [7]																							
Single-Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**87.**
Subtotal Oleander du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***87.***

RD 17 Area Financing Plan Implementation
Development Absorption Projections
(Dwelling Units and 1,000's of Sq. Ft.)

Development Area / Project [1]	Units	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Tot
Sundance [7]																							
Single-Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	347
Subtotal Sundance du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***347.***
Subtotal City of Manteca du		***160.0***	***160.0***	***160.0***	***160.0***	***116.0***	***80.0***	***80.0***	***80.0***	***80.0***	***43.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***3,888.***
Subtotal City of Manteca ksf		***50.0***	***50.0***	***50.0***	***50.0***	***14.9***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1,555.***
City of Stockton																							
Weston Ranch [8][9][10]																							
Single Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**448**
Multifamily	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1,101**
Commercial	ksf	25.0	22.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**722**
Subtotal City of Stockton du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1,549.***
Subtotal City of Stockton ksf		***25.0***	***22.2***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***722.***
San Joaquin County [11]																							
Future Stockton Annex																							
Single Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0**
Multifamily	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0**
Commercial [12]	ksf	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	23.7	-	-	-	**773**
Industrial	ksf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0**
Subtotal Future Stockton Annex du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.***
Subtotal Future Stockton Annex ksf		***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***23.7***	***0.0***	***0.0***	***0.0***	***773.***
Future Manteca Annex																							
Single-Family [13]	du	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	61.0	-	-	-	-	-	-	-	-	-	-	-	-	**1,101**
Subtotal Future Manteca Annex du		***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***61.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1,101.***
Oakwood Shores [14]																							
Single-Family	du	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	140
Subtotal Oakwood Shores du		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***140.***
Subtotal San Joaquin County du		***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***80.0***	***61.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1,241.***
Subtotal San Joaquin County ksf		***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***25.0***	***23.7***	***0.0***	***0.0***	***0.0***	***773.***
Total RD 17 Basin Dwelling Units		**248.4**	**465.4**	**465.4**	**465.4**	**421.4**	**385.4**	**385.4**	**385.4**	**366.4**	**268.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**225.4**	**14,494**
Total RD 17 Basin Square Feet		**1,178.5**	**384.5**	**362.3**	**362.3**	**327.2**	**312.3**	**312.3**	**312.3**	**312.3**	**312.3**	**312.3**	**312.3**	**312.3**	**312.3**	**312.3**	**312.3**	**312.3**	**311.0**	**287.3**	**287.3**	**287.3**	**26,475**

Source: City of Lathrop, City of Manteca, City of Stockton, San Joaquin County, ParcelQuest, LWA

Indicates an update from the May 17, 2017 version.

[1] All residential is reported by dwelling units. All non-residential is reported by 1,000 square feet.
[2] Lathrop projections are assumed to be the similar as those presented in the Lathrop Water Master Plan Draft 23 December 2016; some adjustments were made as outlined in the technical memorandum. Non-residential is assumed to have a FAR consistent with target coverage percentage provided by City in support of the ULOP Adequate Progress Report Financial Plan. If no target was provided the default FAR is assumed to be 0.3.
[3] Manteca residential assumed to develop at 80 dwelling units per year.
[4] Manteca commercial and industrial assumed to develop at 50,000 square feet per year.
[5] Manteca absorption modeled per 03/20/2017 meeting with City staff. Developments sequenced as follows: Terra Ranch, followed by Cerri and Future Development, followed by Denali, followed by Oakwood Trails and The Trails of Manteca.
[6] Manteca adevelopments including residential and non-residential, delayed absorption of non-residential two years following residential absorption.
[7] Manteca Oleander and Sundance developments were analyzed and only those developable parcels determine to be within the 200-Year Flood Plain were included.
[8] Stockton Single-Family Residential assumed to develop at 80 dwelling units per year starting in 2020.
[9] Stockton Multifamily assumed to develop the 15.23 acre northern designation in 2021 over two years, 15 acres of eastern development in 2026 over two years, and remaining 24.78 eastern acreage to begin development in 2032 at 80 dwelling units per year.
[10] Stockton Commercial assumed to develop 250,000 square feet in 2022 followed by 25,000 square feet per year thereafter.
[11] Although San Joaquin County was assumed to have 1,400 acres of development per RD 17 Area: Adequate Progress Report for Urban Level of Protection Final Report June 14, 2016, this development was removed due to several factors highlighted by San Joaquin County staff.
[12] Stockton has indicated the potential for Commercial development within the City's Sphere of Influence, south of Weston Ranch, due to the proposed Veteran's Affair Hospital. This area is assumed to begin development in 2027 at 25,000 square feet per year.
[13] Manteca has indicated the potential for development of approximately 275 acres of land within the City's Sphere of Influence, designated as low density residential in the City's General Plan Update, an assumed density of 4 dwelling units per acre is projected to begin absorption in 2035 at 80 dwelling units per year.
[14] Oakwood Shores is located in the unincorporated area in San Joaquin County and will benefit from the levee Project.

ATTACHMENT B:
FISCAL IMPACT ANALYSES

- Attachment B1 – RD 17 Area Finance Plan Implementation Fiscal Impact Analysis - City of Lathrop prepared by Economic & Planning Systems, Inc.
- Attachment B2 – RD 17 Area Finance Plan Implementation Fiscal Impact Analysis - City of Manteca prepared by Economic & Planning Systems, Inc.
- Attachment B3 – RD 17 Area Finance Plan Implementation Fiscal Impact Analysis - City of Manteca prepared by Economic & Planning Systems, Inc.
- Attachment B4 – RD 17 Area Finance Plan Implementation Fiscal Impact Analysis - City of Manteca prepared by Economic & Planning Systems, Inc.

DRAFT Discussion Tables

RD 17 Area Finance Plan Implementation

Fiscal Impact Analysis—City of Lathrop

The Economics of Land Use

Prepared by:

Economic & Planning Systems, Inc. (EPS)

September 20, 2017

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List of Tables

Table 1 Summary of Annual Surplus/Deficits 1

Table 2 Estimated Annual Revenues and Expenditures 2

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Table 1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Summary of Annual Surplus/Deficits (2016$)

City of Lathrop

Item	Estimated Annual Revenues/Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
Annual Fiscal Impact						
Annual General Fund Revenues	$1,742,000	$3,978,000	$8,533,000	$11,896,000	$15,242,000	$18,589,000
Annual General Fund Expenditures	$2,283,000	$5,192,000	$9,680,000	$12,621,000	$17,445,000	$22,269,000
Net General Fund Surplus/(Deficit)	**($540,000)**	**($1,214,000)**	**($1,147,000)**	**($725,000)**	**($2,203,000)**	**($3,680,000)**
Estimated Special Tax (ST) Revenue [1]	$422,000	$847,000	$1,480,000	$2,224,000	$2,794,000	$3,364,000
Net General Fund Surplus/(Deficit) (with ST Revenues)	**($119,000)**	**($367,000)**	**$333,000**	**$1,499,000**	**$591,000**	**($316,000)**

sum

Source: EPS.

[1] See Table E-1 for more details on special tax revenues.

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Table 2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Annual Revenues and Expenditures (2016$)

City of Lathrop

Item	Estimated Annual Revenues/Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
General Fund						
Annual General Fund Revenues						
Property Tax	$689,700	$1,573,200	$3,219,200	$4,567,600	$5,947,800	$7,328,100
Property Tax in Lieu of VLF	$309,700	$667,500	$1,289,600	$1,799,300	$2,328,100	$2,857,000
Property Transfer Tax	$31,500	$70,000	$125,900	$154,600	$220,200	$285,900
Sales and Use Tax	$321,000	$779,400	$2,225,300	$3,170,000	$3,723,500	$4,277,100
Transient Occupancy Tax	$63,400	$144,000	$271,400	$357,600	$490,300	$623,100
Franchise Tax	$99,100	$225,300	$424,700	$559,500	$767,200	$975,000
Licenses and Permits	$217,400	$494,100	$931,500	$1,227,100	$1,682,700	$2,138,300
Fines	$10,600	$24,100	$45,400	$59,800	$82,100	$104,300
Total Annual General Fund Revenues	**$1,742,400**	**$3,977,600**	**$8,533,000**	**$11,895,500**	**$15,241,900**	**$18,588,800**
Annual General Fund Expenditures						
General Government	$180,500	$410,200	$773,400	$1,018,800	$1,397,100	$1,775,300
Human Resources	$35,200	$80,000	$150,800	$198,700	$272,500	$346,300
Central Services	$77,400	$176,000	$331,800	$437,100	$599,400	$761,700
Finance and Information Technology	$336,200	$764,000	$1,440,400	$1,897,500	$2,602,100	$3,306,600
Animal Services	$56,500	$128,400	$242,100	$318,900	$437,400	$555,800
Community Development	$270,900	$615,700	$1,160,800	$1,529,100	$2,096,900	$2,664,600
Culture and Recreation	$128,000	$295,200	$447,700	$459,100	$767,300	$1,075,500
Police Services	$1,093,700	$2,485,500	$4,686,000	$6,173,000	$8,465,100	$10,757,200
Public Works	$104,300	$237,000	$446,800	$588,500	$807,100	$1,025,600
Total Annual General Fund Expenditures	**$2,282,700**	**$5,192,000**	**$9,679,800**	**$12,620,700**	**$17,444,900**	**$22,268,600**
Net General Fund Surplus/(Deficit)	**($540,300)**	**($1,214,400)**	**($1,146,800)**	**($725,200)**	**($2,203,000)**	**($3,679,800)**
Estimated Special Tax (ST) Revenue [1]	$421,700	$847,200	$1,480,200	$2,224,100	$2,794,000	$3,363,800
Net General Fund Surplus/(Deficit) (with ST Revenue)	**($118,600)**	**($367,200)**	**$333,400**	**$1,498,900**	**$591,000**	**($316,000)**

det sum

Source: EPS.

[1] See Table E-1 for more details on special tax revenues.

APPENDICES:

Appendix A: General Assumptions

Appendix B: General Fund Revenue Analysis

Appendix C: General Fund Expenditure Analysis

Appendix D: Supporting Tables for Revenue and Expenditure Analyses

Appendix E: Special Tax Revenue Calculation

APPENDIX A:

General Assumptions

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Table A-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
General Assumptions

	City of Lathrop

Item	Assumption
General Assumptions	
Base Fiscal Year [1]	FY 2016-17
General Demographic Characteristics	
City of Lathrop	
Population [2]	22,112
Employees [3]	5,500
City of Lathrop Persons Served [4]	**24,862**

gen assumps

Source: California Department of Finance; City of Lathrop; Lathrop-Manteca Fire District; EPS.

[1] Reflects the City of Lathrop Fiscal Year 2016-17 adopted budget. Revenues and expenditures are in 2016 dollars. This analysis does not reflect changes in values resulting from inflation or appreciation.

[2] Based on population estimates from the California Department of Finance (DOF) data for January 1, 2016.

[3] US Census Onthemap.ces.census.gov estimated a total of 4,795 jobs in Lathrop, CA in 2014. California EDD reports an annual average growth rate of 2.29% since 2014 for the Stockton Lodi MSA. EPS escalated 2014 employment figure to arrive at 2016 employment estimate, adjusted by an additional 10% to account for self-employed workers, and rounded to the nearest hundred employees.

[4] Defined as total City population plus half of total employees within the City.

Table A-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Cumulative Land Use

City of Lathrop

Land Use	Cumulative Dwelling Units/Square Footage											
	2020 [1]		2025		2030		2040		2050		Buildout (2060)	
	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.
Development Projections in Current City Limits [2]												
Residential Land Uses												
Owner-Occupied Residential												
Low Density Residential	42	-	81	-	120	-	132	-	464	-	796	-
Medium Density Residential	27	-	124	-	221	-	277	-	291	-	304	-
Variable Density Residential	600	-	1,326	-	2,235	-	2,235	-	3,550	-	4,864	-
Subtotal Owner-Occupied Residential	**669**	**-**	**1,531**	**-**	**2,576**	**-**	**2,644**	**-**	**4,304**	**-**	**5,964**	**-**
Renter Occupied Residential												
Variable Density Residential Flex	-	-	-	-	-	-	-	-	214	-	428	-
High Density Residential	273	-	644	-	651	-	665	-	719	-	773	-
Residential/Mixed Use	-	-	-	-	-	-	-	-	326	-	651	-
Subtotal Renter-Occupied Residential	**273**	**-**	**644**	**-**	**651**	**-**	**665**	**-**	**1,259**	**-**	**1,852**	**-**
Subtotal Residential	**942**	**-**	**2,175**	**-**	**3,227**	**-**	**3,309**	**-**	**5,563**	**-**	**7,816**	**-**
Nonresidential Land Uses												
Retail	-	66,647	-	204,514	-	806,851	-	1,127,246	-	1,274,195	-	1,421,145
Service Commercial	-	266,587	-	818,057		3,227,404		4,508,983		4,968,388		5,427,794
Office	-	124,146	-	251,559	-	610,439	-	1,689,692	-	2,089,573	-	2,489,454
Industrial	-	326,700	-	653,400	-	1,306,800	-	5,227,200	-	5,227,200	-	5,227,200
Light Industrial/R&D Flex	-	-	-	-	-	547,549	-	2,190,197	-	2,190,197	-	2,190,197
Subtotal Nonresidential	**-**	**784,080**	**-**	**1,927,530**	**-**	**6,499,043**	**-**	**14,743,318**	**-**	**15,749,554**	**-**	**16,755,790**
Total All Land Uses	**942**	**784,080**	**2,175**	**1,927,530**	**3,227**	**6,499,043**	**3,309**	**14,743,318**	**5,563**	**15,749,554**	**7,816**	**16,755,790**
Development Projections in Annexation Area [3]												
Nonresidential Land Uses												
Retail	-	-	-	-	-	-	-	-	-	11,500	-	23,000
Service Commercial	-	-	-	-	-	-	-	-	-	45,999	-	91,999
Office	-	-	-	-	-	-	-	-	-	-	-	-
Industrial	-	-	-	-	-	-	-	-	-	-	-	-
Light Industrial/R&D Flex	-	1,790,005	-	2,658,031	-	2,658,031	-	2,658,031	-	2,781,524	-	2,905,016
Subtotal Nonresidential	**-**	**1,790,005**	**-**	**2,658,031**	**-**	**2,658,031**	**-**	**2,658,031**	**-**	**2,839,023**	**-**	**3,020,015**
Total All Land Uses	**-**	**1,790,005**	**-**	**2,658,031**	**-**	**2,658,031**	**-**	**2,658,031**	**-**	**2,839,023**	**-**	**3,020,015**

Table A-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Cumulative Land Use

City of Lathrop

Land Use	Cumulative Dwelling Units/Square Footage											
	2020 [1]		2025		2030		2040		2050		Buildout (2060)	
	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.
Total City of Lathrop Development Projections												
Residential Land Uses												
Owner-Occupied Residential												
Low Density Residential	42	-	81	-	120	-	132	-	464	-	796	-
Medium Density Residential	27	-	124	-	221	-	277	-	291	-	304	-
Variable Density Residential	600	-	1,326	-	2,235	-	2,235	-	3,550	-	4,864	-
Subtotal Owner-Occupied Residential	**669**	**-**	**1,531**	**-**	**2,576**	**-**	**2,644**	**-**	**4,304**	**-**	**5,964**	**-**
Renter Occupied Residential												
Variable Density Residential Flex	-	-	-	-	-	-	-	-	214	-	428	-
High Density Residential	273	-	644	-	651	-	665	-	719	-	773	-
Residential/Mixed Use	-	-	-	-	-	-	-	-	326	-	651	-
Subtotal Renter-Occupied Residential	**273**	**-**	**644**	**-**	**651**	**-**	**665**	**-**	**1,259**	**-**	**1,852**	**-**
Subtotal Residential	**942**	**-**	**2,175**	**-**	**3,227**	**-**	**3,309**	**-**	**5,563**	**-**	**7,816**	**-**
Nonresidential Land Uses												
Retail	-	66,647	-	204,514	-	806,851	-	1,127,246	-	1,285,695	-	1,444,145
Service Commercial	-	266,587	-	818,057	-	3,227,404	-	4,508,983	-	5,014,388	-	5,519,793
Office	-	124,146	-	251,559	-	610,439	-	1,689,692	-	2,089,573	-	2,489,454
Industrial	-	326,700	-	653,400	-	1,306,800	-	5,227,200	-	5,227,200	-	5,227,200
Light Industrial/R&D Flex	-	1,790,005	-	2,658,031	-	3,205,580	-	4,848,228	-	4,971,721	-	5,095,213
Subtotal Nonresidential	**-**	**2,574,085**	**-**	**4,585,561**	**-**	**9,157,074**	**-**	**17,401,349**	**-**	**18,588,577**	**-**	**19,775,804**
Total All Land Uses	**942**	**2,574,085**	**2,175**	**4,585,561**	**3,227**	**9,157,074**	**3,309**	**17,401,349**	**5,563**	**18,588,577**	**7,816**	**19,775,804**

land use

Source: City of Lathrop; LWA; EPS.

[1] The time span for development included in this analysis is 2018 to 2060.
[2] Includes development projections in Central Lathrop, Mossdale Landing, Lathrop Gateway, Crossroads, and Historic/East Lathrop.
[3] Includes development projections in the South Lathrop Specific Plan.

Table A-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Cumulative Occupied Dwelling Units and Building Square Footage

City of Lathrop

Land Use	Vacancy Rate [1]	Occupied Dwelling Units/Building Square Feet 2020	2025	2030	2040	2050	Buildout (2060)
Development Projections in Current City Limits							
Residential Land Uses				*Occupied Dwelling Units*			
Owner-Occupied Residential							
Low Density Residential	6.5%	39	76	112	123	434	744
Medium Density Residential	6.5%	25	116	207	259	272	284
Variable Density Residential	6.5%	561	1,240	2,090	2,090	3,319	4,548
Subtotal Owner-Occupied Residential		**626**	**1,431**	**2,409**	**2,472**	**4,024**	**5,576**
Renter-Occupied Residential							
Variable Density Residential Flex	6.5%	-	-	-	-	200	400
High Density Residential	6.5%	255	602	609	622	672	723
Residential/Mixed Use	6.5%	-	-	-	-	304	609
Subtotal Renter-Occupied Residential		**255**	**602**	**609**	**622**	**1,177**	**1,732**
Subtotal Residential		**881**	**2,034**	**3,017**	**3,094**	**5,201**	**7,308**
Nonresidential Land Uses				*Occupied Building Square Feet*			
Retail	7.5%	61,648	189,176	746,337	1,042,702	1,178,631	1,314,559
Service Commercial	7.5%	246,593	756,703	2,985,349	4,170,809	4,595,759	5,020,709
Office	7.5%	114,835	232,692	564,656	1,562,965	1,932,855	2,302,745
Industrial	7.5%	302,198	604,395	1,208,790	4,835,160	4,835,160	4,835,160
Light Industrial/R&D Flex	7.5%	-	-	506,483	2,025,932	2,025,932	2,025,932
Subtotal Nonresidential		**725,274**	**1,782,965**	**6,011,615**	**13,637,569**	**14,568,337**	**15,499,105**
Development Projections in Annexation Area							
Nonresidential Land Uses				*Occupied Building Square Feet*			
Retail	7.5%	-	-	-	-	10,637	21,275
Service Commercial	7.5%	-	-	-	-	42,549	85,099
Office	7.5%	-	-	-	-	-	-
Industrial	7.5%	-	-	-	-	-	-
Light Industrial/R&D Flex	7.5%	1,655,754	2,458,679	2,458,679	2,458,679	2,572,910	2,687,140
Subtotal Nonresidential		**1,655,754**	**2,458,679**	**2,458,679**	**2,458,679**	**2,626,096**	**2,793,514**

Table A-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Cumulative Occupied Dwelling Units and Building Square Footage

City of Lathrop

Land Use	Vacancy Rate [1]	Occupied Dwelling Units/Building Square Feet 2020	2025	2030	2040	2050	Buildout (2060)
Total City of Lathrop Development Projections							
Residential Land Uses				*Occupied Dwelling Units*			
Owner-Occupied Residential							
Low Density Residential	6.5%	39	76	112	123	434	744
Medium Density Residential	6.5%	25	116	207	259	272	284
Variable Density Residential	6.5%	561	1,240	2,090	2,090	3,319	4,548
Subtotal Owner-Occupied Residential		**626**	**1,431**	**2,409**	**2,472**	**4,024**	**5,576**
Renter-Occupied Residential							
Variable Density Residential Flex	6.5%	-	-	-	-	200	400
High Density Residential	6.5%	255	602	609	622	672	723
Residential/Mixed Use	6.5%	-	-	-	-	304	609
Subtotal Renter-Occupied Residential		**255**	**602**	**609**	**622**	**1,177**	**1,732**
Subtotal Residential		**881**	**2,034**	**3,017**	**3,094**	**5,201**	**7,308**
Nonresidential Land Uses				*Occupied Building Square Feet*			
Retail	7.5%	61,648	189,176	746,337	1,042,702	1,189,268	1,335,834
Service Commercial	7.5%	246,593	756,703	2,985,349	4,170,809	4,638,309	5,105,808
Office	7.5%	114,835	232,692	564,656	1,562,965	1,932,855	2,302,745
Industrial	7.5%	302,198	604,395	1,208,790	4,835,160	4,835,160	4,835,160
Light Industrial/R&D Flex	7.5%	1,655,754	2,458,679	2,965,162	4,484,611	4,598,842	4,713,072
Subtotal Nonresidential		**2,381,028**	**4,241,644**	**8,470,294**	**16,096,248**	**17,194,433**	**18,292,619**

occupied

Source: California Department of Finance; City of Lathrop; San Joaquin County; Costar; LWA; EPS.

[1] For details pertaining to vacancy rate assumptions, refer to Table A-5.

Table A-4
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Cumulative Estimated Population and Employees

City of Lathrop

Land Use	Assumption [1]	Estimated Population/Employees 2020	2025	2030	2040	2050	Buildout (2060)
Project Residents							
Residential Land Uses	*PPH*						
Owner-Occupied Residential							
Low Density Residential	3.20	126	242	359	395	1,388	2,382
Medium Density Residential	3.20	81	371	661	829	869	910
Variable Density Residential	3.20	1,795	3,967	6,687	6,687	10,620	14,553
Subtotal Owner-Occupied Residential		**2,002**	**4,581**	**7,707**	**7,911**	**12,878**	**17,844**
Renter-Occupied Residential							
Variable Density Residential Flex	2.50	-	-	-	-	500	1,000
High Density Residential	2.50	638	1,505	1,522	1,554	1,681	1,807
Residential/Mixed Use	2.50	-	-	-	-	761	1,522
Subtotal Renter-Occupied Residential		**638**	**1,505**	**1,522**	**1,554**	**2,942**	**4,329**
Subtotal Residential		**2,640**	**6,086**	**9,229**	**9,465**	**15,819**	**22,173**
Total Resident Population		**2,640**	**6,086**	**9,229**	**9,465**	**15,819**	**22,173**
Project Employees							
Nonresidential Land Uses	*Sq. Ft. per Emp.*						
Retail	400	154	473	1,866	2,607	2,973	3,340
Service Commercial	400	616	1,892	7,463	10,427	11,596	12,765
Office	300	383	776	1,882	5,210	6,443	7,676
Industrial	2,000	151	302	604	2,418	2,418	2,418
Light Industrial/R&D Flex	2,000	828	1,229	1,483	2,242	2,299	2,357
Subtotal Nonresidential		**2,132**	**4,672**	**13,298**	**22,904**	**25,729**	**28,554**
Total Employee Population		**2,132**	**4,672**	**13,298**	**22,904**	**25,729**	**28,554**
Project Persons Served		**3,706**	**8,422**	**15,878**	**20,917**	**28,684**	**36,450**

pop

Source: California Department of Finance; EPS.

[1] For persons per household and square feet per employee assumptions, refer to Table A-5.

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Table A-5
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Land Use Assumptions

City of Lathrop

Land Use	Estimated Assessed Value [1]	Property Turnover Rate [2]	Vacancy Rate [3]	Persons Per Household/ Sq. Ft. per Employee [4]
Residential Land Uses	*per Unit*			
Owner-Occupied Residential				
Low Density Residential	$450,000	14.3%	6.5%	3.20
Medium Density Residential	$425,000	14.3%	6.5%	3.20
Variable Density Residential	$425,000	14.3%	6.5%	3.20
Renter Occupied Residential				
Variable Density Residential Flex	$180,000	6.7%	6.5%	2.50
High Density Residential	$180,000	6.7%	6.5%	2.50
Residential/Mixed Use	$180,000	6.7%	6.5%	2.50
Nonresidential Land Uses	*per Sq. Ft.*			
Retail	$200	5.0%	7.5%	400
Service Commercial	$200	5.0%	7.5%	400
Office	$150	5.0%	7.5%	300
Industrial	$85	5.0%	7.5%	2,000
Light Industrial/R&D Flex	$85	5.0%	7.5%	2,000

lu assum

Source: California Department of Finance; The Gregory Group; San Joaquin County; Costar; Colliers, International; CBRE; EPS.

[1] Residential assessed values are based on sales data of comparable products as obtained through The Gregory Group. Nonresidential values per square foot based on comparable transaction data obtained from Costar and CBRE.

[2] Owner-occupied residential assumed to turn over once every 7 years and renter-occupied residential is assumed to turn over once every 15 years. Nonresidential uses are assumed to turn over once every 20 years.

[3] Residential vacancy rates obtained from the US Census American Community Survey, 2015 estimates. Commercial and industrial vacancy rates based on Costar and Colliers International market reports for the Stockton/Modesto area.

[4] Persons per household figures obtained from the US Census American Community Survey, 2015 estimates. Square feet per employee values are based on empirical research for proposed land uses.

APPENDIX B:

General Fund Revenue Analysis

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Table B-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Revenue-Estimating Procedures Based on City of Lathrop FY 2016-17 Budget (2016$)

City of Lathrop

Item	Estimating Procedure	Case Study Reference	FY 2016-17 Budgeted General Fund Revenues	Offsetting Revenues	FY 2016-17 Budgeted Net General Fund Revenues	Service Population [1]	Revenue Multiplier
General Fund Revenues							
Property Tax	Case Study	Table B-3	$3,530,000	-	$3,530,000	N/A	-
Property Tax in Lieu of VLF	Case Study	Table B-3	$1,400,000	-	$1,400,000	N/A	-
Property Transfer Tax [2]	Case Study	Table B-4	$0	-	$0	N/A	-
Sales and Use Tax	Case Study	Table B-5	$2,500,000	-	$2,500,000	N/A	-
Prop. 172 Public Safety Sales Tax [3]	[3]	-	$0	-	$0	N/A	-
Transient Occupancy Tax	Persons Served	-	$425,000	-	$425,000	24,862	$17.09
Franchise Tax	Persons Served	-	$665,000	-	$665,000	24,862	$26.75
Licenses and Permits	Persons Served	-	$1,458,505	-	$1,458,505	24,862	$58.66
Intergovernmental Revenue	[4]	-	$35,000	-	$35,000	N/A	-
Current Service Charges	[5]	-	$3,416,058	($3,416,058)	$0	N/A	-
Fines	Persons Served	-	$71,125	-	$71,125	24,862	$2.86
Use of Money and Property	[4]	-	$61,800	-	$61,800	N/A	-
Other	[4]	-	$214,660	-	$214,660	N/A	-
Indirect Cost/Transfer In	[4]	-	$4,065,707	-	$4,065,707	N/A	-
Subtotal General Fund Revenues			**$17,842,855**	**($3,416,058)**	**$14,426,797**		

rev pro

Source: City of Lathrop FY 2016-17 Adopted Budget; EPS.

[1] Refer to Table A-1 for details.
[2] City Property Transfer Tax revenues are included in the Property Tax total.
[3] Cities that did not receive property tax or exist in 1980 are ineligible for Proposition 172 revenues. The City of Lathrop incorporated in 1989 and is therefore ineligible to receive Proposition 172 revenue.
[4] This revenue source is not expected to be affected by anticipated development and therefore is not evaluated in this analysis.
[5] This revenue source is dedicated to and directly offsets costs as shown in Table C-1.

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Table B-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Annual Project Revenues by Phase (2016$)

City of Lathrop

Revenues	Source	Cumulative Estimated Annual Revenues					
		2020	2025	2030	2040	2050	Buildout (2060)
General Fund							
Property Tax	Table B-3	$689,700	$1,573,200	$3,219,200	$4,567,600	$5,947,800	$7,328,100
Property Tax in Lieu of VLF	Table B-3	$309,700	$667,500	$1,289,600	$1,799,300	$2,328,100	$2,857,000
Property Transfer Tax	Table B-4	$31,500	$70,000	$125,900	$154,600	$220,200	$285,900
Sales and Use Tax	Table B-5	$321,000	$779,400	$2,225,300	$3,170,000	$3,723,500	$4,277,100
Transient Occupancy Tax	-	$63,400	$144,000	$271,400	$357,600	$490,300	$623,100
Franchise Tax	-	$99,100	$225,300	$424,700	$559,500	$767,200	$975,000
Licenses and Permits	-	$217,400	$494,100	$931,500	$1,227,100	$1,682,700	$2,138,300
Fines	-	$10,600	$24,100	$45,400	$59,800	$82,100	$104,300
Total Annual General Fund Revenues		**$1,742,400**	**$3,977,600**	**$8,533,000**	**$11,895,500**	**$15,241,900**	**$18,588,800**

rev

Source: City of Lathrop FY 2016-17 Adopted Budget; EPS.

Table B-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Annual Property Tax Revenues (2016$)

City of Lathrop

Item	Assumption/ Source	Formula	Estimated Property Tax Revenues (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Assessed Value of New Development	Table D-2							
Assessed Value of New Development in Current City Limits		*a*	$447,553,200	$1,066,407,050	$2,271,016,515	$3,257,878,268	$4,259,761,428	$5,261,644,588
Assessed Value of New Development in Annexation Area		*b*	$152,150,406	$225,932,652	$225,932,652	$225,932,652	$247,929,363	$269,926,074
Total Assessed Value		***c = a + b***	**$599,703,606**	**$1,292,339,702**	**$2,496,949,167**	**$3,483,810,920**	**$4,507,690,791**	**$5,531,570,662**
Property Tax Revenue (1% of Assessed Value)	1.0000%							
Property Tax Revenue in Current City Limits		*d = a * 1.00%*	$4,475,532	$10,664,071	$22,710,165	$32,578,783	$42,597,614	$52,616,446
Property Tax Revenue in Annexation Area		*e = b * 1.00%*	$1,521,504	$2,259,327	$2,259,327	$2,259,327	$2,479,294	$2,699,261
Total Property Tax Revenue		***f = d + e***	**$5,997,036**	**$12,923,397**	**$24,969,492**	**$34,838,109**	**$45,076,908**	**$55,315,707**
Estimated Property Tax Allocation								
Estimated Property Tax Allocation in Current City Limits [1]								
City of Lathrop General Fund	13.6639%	*g = d * 13.66%*	$611,530	$1,457,123	$3,103,083	$4,451,517	$5,820,475	$7,189,434
Other Agencies/ERAF	86.3361%	*h = d * 86.34%*	$3,864,002	$9,206,948	$19,607,082	$28,127,266	$36,777,139	$45,427,012
Property Tax Allocation in Annexation Area [2]								
City of Lathrop General Fund	5.1375%	*i = e * 5.14%*	$78,167	$116,072	$116,072	$116,072	$127,373	$138,674
Other Agencies/ERAF	94.8625%	*j = e * 94.86%*	$1,443,337	$2,143,254	$2,143,254	$2,143,254	$2,351,920	$2,560,587
Total City of Lathrop General Fund Property Tax		***k = g + i***	**$689,697**	**$1,573,195**	**$3,219,156**	**$4,567,589**	**$5,947,848**	**$7,328,108**
Property Tax In-Lieu of Motor Vehicle In-Lieu Fee Revenue (VLF)								
Total Citywide Assessed Value [3]		*l*	$2,710,640,574	$2,710,640,574	$2,710,640,574	$2,710,640,574	$2,710,640,574	$2,710,640,574
Total Assessed Value of Project		*m*	$599,703,606	$1,292,339,702	$2,496,949,167	$3,483,810,920	$4,507,690,791	$5,531,570,662
Total Assessed Value		*n = l + m*	**$3,310,344,180**	**$4,002,980,276**	**$5,207,589,741**	**$6,194,451,494**	**$7,218,331,365**	**$8,242,211,236**
Percent Change in AV		*o = m / l*	22.12%	47.68%	92.12%	128.52%	166.30%	204.07%
Property Tax In-Lieu of VLF [4]	**$1,400,000**	***p = o * $1,400,000***	**$309,737**	**$667,472**	**$1,289,632**	**$1,799,329**	**$2,328,146**	**$2,856,963**

prop tax

Source: City of Lathrop; San Joaquin County Auditor-Controller; EPS.

[1] Reflects the average property tax allocation to the City General Fund for all TRAs within the 200-year flood plain that are within the boundaries of the City of Lathrop. TRAs include: 007-000, 007-002, 007-007, 007-008, 007-010, 007-012, 007-013, 007-014, 007-022, 007-029, 007-032, 007-041, 007-043, 007-046, 007-047, 007-048, 007-049, 007-071, and 007-074.
[2] Refer to Table D-1 for details.
[3] Reflects Assessed Valuation for FY 2016-17. Includes Citywide secured, unsecured, homeowner exemption, and public utility roll.
[4] Property tax in-lieu of VLF amount derived from the City of Lathrop FY 2016-17 Annual Budget. Refer to Table B-1 for details.

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Table B-4
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Real Property Transfer Tax (2016$)

City of Lathrop

Item	Assumption/ Source	Estimated Annual Property Transfer Tax Revenue (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Rate per $1,000 of AV	$0.55						
Project Assessed Value	Table D-2						
Owner-Occupied Residential		$285,375,000	$652,700,000	$1,097,800,000	$1,127,000,000	$1,840,800,000	$2,554,600,000
Renter-Occupied Residential		$49,140,000	$115,920,000	$117,180,000	$119,700,000	$226,530,000	$333,360,000
Nonresidential		$265,188,606	$523,719,702	$1,281,969,167	$2,237,110,920	$2,440,360,791	$2,643,610,662
Total Assessed Value		**$599,703,606**	**$1,292,339,702**	**$2,496,949,167**	**$3,483,810,920**	**$4,507,690,791**	**$5,531,570,662**
Turnover Rate							
Owner-Occupied Residential	14.30%						
Renter-Occupied Residential	6.70%						
Nonresidential	5.00%						
Annual Transfer Tax Revenue [1]							
Owner-Occupied Residential		$22,445	$51,335	$86,342	$88,639	$144,779	$200,919
Renter-Occupied Residential		$1,811	$4,272	$4,318	$4,411	$8,348	$12,284
Nonresidential		$7,293	$14,402	$35,254	$61,521	$67,110	$72,699
Total Annual Transfer Tax Revenue		**$31,548**	**$70,009**	**$125,914**	**$154,570**	**$220,236**	**$285,903**

transfer

Source: San Joaquin County Auditor Assessor; City of Lathrop; EPS.

[1] Formula for Transfer Tax = Assessed Value/$1,000 * Rate per $1,000 of Assessed Value * Turnover rate.

Table B-5
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Annual Taxable Sales and Use Tax Revenue (2016$)

City of Lathrop

Item	Formula	Source/ Assumptions	Annual Sales Tax Revenue 2020	2025	2030	2040	2050	Buildout (2060)
Estimated Annual Taxable Sales								
Annual Taxable Sales from Market Support (Residents and Employees)	*a*		$17,876,312	$40,901,002	$69,837,667	$81,639,932	$122,392,266	$163,144,600
Annual Taxable Sales from Onsite Commercial Uses	*b*		$14,222,777	$37,034,687	$152,696,491	$235,356,557	$249,960,119	$264,563,681
Annual Taxable Sales from New Development	*c = a + b*		**$32,099,089**	**$77,935,690**	**$222,534,158**	**$316,996,489**	**$372,352,385**	**$427,708,282**
Annual Sales Tax Revenue [1]								
Bradley Burns Local Sales Tax Revenue	*d = c * 1.0000%*	1.0000%	$320,991	$779,357	$2,225,342	$3,169,965	$3,723,524	$4,277,083
City of Lathrop Prop 172 Public Safety Sales Tax Revenue [2]	*f = d * 0.0000%*	0.0000%	-	-	-	-	-	-

sales

Source: City of Lathrop; California State Board of Equalization; EPS.

[1] This analysis excludes Measure C sales tax revenues. Approved by voters in November 2012, Measure C enacts a permanent one percent "general purpose tax" rate to generate revenue that may be used by the City to pay for general City operations and programs, including public safety provided by the City or through contract with entities such as the County Sheriff Department and Lathrop Manteca Fire District.
[2] Cities that did not receive property tax or incorporate by 1980 are ineligible for Proposition 172 revenues. The City of Lathrop incorporated in 1989 and is therefore ineligible to receive Proposition 172 revenue.

Table B-5A
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Annual Taxable Sales from Proposed Development, Market Support Method (2016$)

City of Lathrop

Annual Taxable Sales from Market Support	Assumption	Estimated Annual Taxable Sales (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Annual Taxable Sales from New Residents							
Residential Development	Table A-3			*Occupied Dwelling Units*			
Owner-Occupied Residential		626	1,431	2,409	2,472	4,024	5,576
Renter-Occupied Residential		255	602	609	622	1,177	1,732
Total Residential Development		**881**	**2,034**	**3,017**	**3,094**	**5,201**	**7,308**
Taxable Retail Expenditures	*per Household [1]*			*Taxable Retail Expenditures*			
Low Density Residential	$25,000	$15,637,875	$35,787,125	$60,214,000	$61,803,500	$100,606,000	$139,408,500
High Density Residential	$15,000	$3,828,825	$9,032,100	$9,130,275	$9,326,625	$17,650,463	$25,974,300
Total Taxable Retail Expenditures		**$19,466,700**	**$44,819,225**	**$69,344,275**	**$71,130,125**	**$118,256,463**	**$165,382,800**
Estimated Citywide Capture from New Households [2]	**80%**	**$15,573,360**	**$35,855,380**	**$55,475,420**	**$56,904,100**	**$94,605,170**	**$132,306,240**
Estimated Taxable Sales inside Project Area	50%	$7,786,680	$17,927,690	$27,737,710	$28,452,050	$47,302,585	$66,153,120
Estimated Taxable Sales outside Project Area	50%	$15,573,360	$17,927,690	$27,737,710	$28,452,050	$47,302,585	$66,153,120
Annual Taxable Sales from New Employment							
Taxable Sales from New Employment							
Employees	Table A-4	2,132	4,672	13,298	22,904	25,729	28,554
Average Daily Taxable Sales per New Employee	$10.00						
Work Days per Year	240						
Taxable Sales from New Employees [3]	50%						
Total Taxable Sales from New Employees		**$2,558,836**	**$5,606,247**	**$15,958,053**	**$27,484,258**	**$30,874,552**	**$34,264,845**
Estimated Citywide Capture from New Employees [2]	**90%**	**$2,302,952**	**$5,045,622**	**$14,362,247**	**$24,735,832**	**$27,787,096**	**$30,838,360**
Estimated Taxable Sales inside Project Area	70%	$1,612,066	$3,531,936	$10,053,573	$17,315,083	$19,450,967	$21,586,852
Estimated Taxable Sales outside Project Area	30%	$690,886	$1,513,687	$4,308,674	$7,420,750	$8,336,129	$9,251,508
Total Annual Taxable Sales from Market Support		**$17,876,312**	**$40,901,002**	**$69,837,667**	**$81,639,932**	**$122,392,266**	**$163,144,600**
Taxable City Sales inside Project Area		$9,398,746	$21,459,626	$37,791,283	$45,767,133	$66,753,552	$87,739,972
Taxable City Sales outside Project Area		$16,264,246	$19,441,377	$32,046,384	$35,872,800	$55,638,714	$75,404,628

sales a

Source: Costar; Gregory Group; Bureau of Labor Statistics; City of Lathrop; EPS.

[1] For details pertaining to resident and employee estimates, refer to Table A-4.
[2] Represents the portion of household and employee retail expenditures estimated to take place within the City of Lathrop.
[3] Taxable sales from employees discounted by 50 percent to account for employees who are also residents.

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Table B-5B
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Annual Taxable Sales from Onsite Nonresidential (2016$)

City of Lathrop

Item	Annual Taxable Sales per Sq. Ft. [1]	Estimated Annual Taxable Sales (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Annual Taxable Sales from Onsite Commercial Development							
Retail	$250	$15,412,073	$47,293,909	$186,584,291	$260,675,564	$297,317,010	$333,958,457
Industrial	$5	$1,510,988	$3,021,975	$6,043,950	$24,175,800	$24,175,800	$24,175,800
Light Industrial/R&D Flex	$5	$8,278,772	$12,293,394	$14,825,809	$22,423,055	$22,994,208	$23,565,361
Total		**$25,201,832**	**$62,609,278**	**$207,454,051**	**$307,274,418**	**$344,487,018**	**$381,699,618**
Less Total Annual Taxable Sales from Market Support (within the Project) [2]		$9,398,746	$21,459,626	$37,791,283	$45,767,133	$66,753,552	$87,739,972
Annual Sales Less Market Support		**$15,803,086**	**$41,149,652**	**$169,662,768**	**$261,507,285**	**$277,733,466**	**$293,959,646**
	Shift from Existing Retail						
Less Shift of Sales from Existing Retail to the Project [3]	10%	$1,580,309	$4,114,965	$16,966,277	$26,150,729	$27,773,347	$29,395,965
Total Nonresidential Taxable Sales		**$14,222,777**	**$37,034,687**	**$152,696,491**	**$235,356,557**	**$249,960,119**	**$264,563,681**

sales b

Source: U.S. Department of Labor Bureau of Labor Statistics; Urban Land Institute; EPS.

[1] Commercial taxable sales assumptions based on an analysis of data from ULI's Dollars & Cents of Shopping Centers: 2008 and escalated to current dollars. Industrial taxable sales per square foot based on research of industrial development, this analysis includes a conservative taxable sales per square foot assumption representing onsite business-to-business sales activity.
[2] Estimated in Table B-5A.
[3] Represents a discount factor to account for taxable sales transactions that may shift from the City's existing retail centers to those included in the Project.

APPENDIX C:

General Fund Expenditure Analysis

Table C-1 Expenditure-Estimating Procedures based on City of Lathrop FY 2016–17 Budget..... 17

Table C-2 Estimated Annual General Fund Expenditures..... 18

Table C-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Expenditure-Estimating Procedures Based on City of Lathrop FY 2016-17 Budget

City of Lathrop

Item	Estimating Procedure	FY 2016-17 Budgeted Expenditures	Less Offsetting Revenue	FY 2016-17 Net City Expenditures	Population or Persons Served	FY 2016-17 Avg. Cost	Adjustment Factor [1]	Net FY 2016-17 Avg. Cost
General Fund [2]								
General Government	Persons Served	$1,282,427	($71,500)	$1,210,927	24,862	$48.71	100%	$48.71
Human Resources	Persons Served	$236,173	-	$236,173	24,862	$9.50	100%	$9.50
Central Services	Persons Served	$519,550	-	$519,550	24,862	$20.90	100%	$20.90
Finance and Information Technology	Persons Served	$2,340,782	($85,400)	$2,255,382	24,862	$90.72	100%	$90.72
Animal Services	Persons Served	$381,101	($2,000)	$379,101	24,862	$15.25	100%	$15.25
Community Development	Persons Served	$1,871,312	($53,812)	$1,817,500	24,862	$73.10	100%	$73.10
Culture and Recreation	Per Capita	$1,231,359	($158,800)	$1,072,559	22,112	$48.51	100%	$48.51
Police Services [3]	Persons Served	$7,361,552	($24,300)	$7,337,252	24,862	$295.12	100%	$295.12
Public Works	Persons Served	$3,719,789	($3,020,246)	$699,543	24,862	$28.14	100%	$28.14
Subtotal Annual General Fund Expenditures		**$18,944,045**	**($3,416,058)**	**$15,527,987**				
Debt Service	[4]	$626,250	-	$626,250	NA	-	-	-
Transfer Out	[4]	$108,198	-	$108,198	NA	-	-	-
Total Annual General Fund Expenditures		**$19,678,493**	**($3,416,058)**	**$16,262,435**				

exp

Source: City of Lathrop FY 2016-17 Adopted Budget; EPS.

[1] An adjustment factor may be used to reflect the fact that new employees may not increase certain General Fund department expenditures at a 1:1 ratio. This analysis does not assume an adjustment.
[2] With the exception of Police expenditures, this analysis estimates impacts of proposed development on City General Fund expenditures only. Fire services are provided to the City by the Lathrop Manteca Fire District and are excluded from this analysis.
[3] Police costs include expenditures allocated to the General Fund, COPS, Mossdale, and Measure C.
[4] This expenditure category is not expected to be affected by the project and not evaluated as part of this analysis.

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Table C-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Annual General Fund Expenditures (2016$)

City of Lathrop

Expenditure Category	Estimated Annual Expenditure [1]					
	2020	2025	2030	2040	2050	Buildout (2060)
General Fund						
General Government	$180,503	$410,203	$773,367	$1,018,785	$1,397,067	$1,775,349
Human Resources	$35,204	$80,004	$150,834	$198,699	$272,477	$346,255
Central Services	$77,445	$175,998	$331,814	$437,111	$599,414	$761,716
Finance and Information Technology	$336,191	$764,014	$1,440,416	$1,897,513	$2,602,072	$3,306,632
Animal Services	$56,509	$128,421	$242,116	$318,948	$437,375	$555,803
Community Development	$270,919	$615,681	$1,160,759	$1,529,111	$2,096,880	$2,664,650
Culture and Recreation	$128,045	$295,211	$447,665	$459,121	$767,327	$1,075,534
Police Services	$1,093,702	$2,485,505	$4,685,988	$6,173,025	$8,465,111	$10,757,198
Public Works	$104,275	$236,971	$446,768	$588,544	$807,075	$1,025,605
Total Annual General Fund Expenditures	**$2,282,793**	**$5,192,008**	**$9,679,726**	**$12,620,856**	**$17,444,798**	**$22,268,741**

exp est

Source: City of Lathrop FY 2016-17 Adopted Budget; EPS.

[1] Annual expenditure estimated on a per persons served or per capita basis. Refer to Table C-1 for estimating procedure and Table A-5 for population and employment estimates.

APPENDIX D:

Supporting Tables for Revenue and Expenditure Analyses

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Table D-3 Estimated Average Annual Household Income 22

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Table D-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Preliminary Property Tax Allocations for Annexation Area

City of Lathrop

Tax Code	Entity	Existing Tax Rate Area (TRA) Post-ERAF Distribution: TRA 102-004 [1]	Adjusted Existing Base Revenue [1]	Property Tax Sharing Agreement [2]	Newly Created TRA [3]: 007-092 Base Revenue	Newly Created TRA [3]: 007-092 Post-ERAF Distribution
Formula		*a*	*b*	*c*	*d = c * $41,854*	*e = d / $162,934*
Subject to Detachment						
10001	County General Fund	21.47880%	$34,996	80%	$33,483	20.54993%
10527	Road District #5	4.20920%	$6,858	-	-	0.00000%
40600	City of Lathrop	0.00000%	-	20%	$8,371	5.13748%
	Subtotal	**25.68800%**	**$41,854**	**100%**	**$41,854**	**20.54993%**
Not Subject to Detachment						
10618	County Library	1.73420%	$2,826	-	$2,826	1.73416%
12601	Manteca Unified School District	28.50000%	$46,435	-	$46,435	28.49933%
13001	San Joaquin Delta Community College	3.85840%	$6,287	-	$6,287	3.85830%
13201	San Joaquin County Office of Education	1.38660%	$2,259	-	$2,259	1.38655%
14901	Lathrop-Manteca Fire District (LMFD)	9.35930%	$15,249	-	$15,249	9.35907%
16001	San Joaquin Flood Control	0.16920%	$276	-	$276	0.16920%
21901	Mosquito Abatement	0.75950%	$1,237	-	$1,237	0.75949%
22001	Reclamation District #17	0.92480%	$1,507	-	$1,507	0.92478%
41100	Education Revenue Augmentation Fund (ERAF)	27.62000%	$45,005	-	$45,005	27.62172%
	Subtotal	**74.31200%**	**$121,081**	**0%**	**$121,081**	**74.31259%**
Total		**100.00000%**	**$162,934**	**100%**	**$162,934**	**100.00000%**

TRA

Source: San Joaquin County Auditor-Controller; EPS.

[1] Provided by the San Joaquin County Auditor-Controller.
[2] Based on the most recent tax-sharing agreement between San Joaquin County and the City of Lathrop dated November 2012 related to annexed areas to the City.
[3] The newly created TRA 007-092 will be effective in FY 2017-18. Base revenue and distribution estimated herein may differ from the final values when the TRA becomes effective.

Table D-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Cumulative Assessed Valuation (2016$)

City of Lathrop

Item	Rounded Value per Unit/Sq. Ft. [1]	Total Assessed Value (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Development Projections in Current City Limits							
Residential Land Uses	*per Unit*						
Owner-Occupied Residential							
Low Density Residential	$450,000	$18,900,000	$36,450,000	$54,000,000	$59,400,000	$208,800,000	$358,200,000
Medium Density Residential	$425,000	$11,475,000	$52,700,000	$93,925,000	$117,725,000	$123,462,500	$129,200,000
Variable Density Residential	$425,000	$255,000,000	$563,550,000	$949,875,000	$949,875,000	$1,508,537,500	$2,067,200,000
Subtotal Owner-Occupied Residential		**$285,375,000**	**$652,700,000**	**$1,097,800,000**	**$1,127,000,000**	**$1,840,800,000**	**$2,554,600,000**
Renter Occupied Residential							
Variable Density Residential Flex	$180,000	-	-	-	-	$38,520,000	$77,040,000
High Density Residential	$180,000	$49,140,000	$115,920,000	$117,180,000	$119,700,000	$129,420,000	$139,140,000
Residential/Mixed Use	$180,000	-	-	-	-	$58,590,000	$117,180,000
Subtotal Renter-Occupied Residential		**$49,140,000**	**$115,920,000**	**$117,180,000**	**$119,700,000**	**$226,530,000**	**$333,360,000**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	$13,329,360	$40,902,840	$161,370,198	$225,449,136	$254,839,068	$284,229,000
Service Commercial	$200	$53,317,440	$163,611,360	$645,480,792	$901,796,544	$993,677,652	$1,085,558,760
Office	$150	$18,621,900	$37,733,850	$91,565,843	$253,453,860	$313,435,980	$373,418,100
Industrial	$85	$27,769,500	$55,539,000	$111,078,000	$444,312,000	$444,312,000	$444,312,000
Light Industrial/R&D Flex	$85	-	-	$46,541,682	$186,166,728	$186,166,728	$186,166,728
Subtotal Nonresidential		**$113,038,200**	**$297,787,050**	**$1,056,036,515**	**$2,011,178,268**	**$2,192,431,428**	**$2,373,684,588**
Total All Land Uses		**$447,553,200**	**$1,066,407,050**	**$2,271,016,515**	**$3,257,878,268**	**$4,259,761,428**	**$5,261,644,588**
Development Projections in Annexation Area							
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	-	-	-	-	$2,299,968	$4,599,936
Service Commercial	$200	-	-	-	-	$9,199,872	$18,399,744
Office	$150	-	-	-	-	-	-
Industrial	$85	-	-	-	-	-	-
Light Industrial/R&D Flex	$85	$152,150,406	$225,932,652	$225,932,652	$225,932,652	$236,429,523	$246,926,394
Subtotal Nonresidential		**$152,150,406**	**$225,932,652**	**$225,932,652**	**$225,932,652**	**$247,929,363**	**$269,926,074**
Total All Land Uses		**$152,150,406**	**$225,932,652**	**$225,932,652**	**$225,932,652**	**$247,929,363**	**$269,926,074**

Table D-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Cumulative Assessed Valuation (2016$)

City of Lathrop

Item	Rounded Value per Unit/Sq. Ft. [1]	Total Assessed Value (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Total City of Lathrop Development Projections							
Residential Land Uses							
Owner-Occupied Residential	*per Unit*						
Low Density Residential	$450,000	$18,900,000	$36,450,000	$54,000,000	$59,400,000	$208,800,000	$358,200,000
Medium Density Residential	$425,000	$11,475,000	$52,700,000	$93,925,000	$117,725,000	$123,462,500	$129,200,000
Variable Density Residential	$425,000	$255,000,000	$563,550,000	$949,875,000	$949,875,000	$1,508,537,500	$2,067,200,000
Subtotal Owner-Occupied Residential		**$285,375,000**	**$652,700,000**	**$1,097,800,000**	**$1,127,000,000**	**$1,840,800,000**	**$2,554,600,000**
Renter-Occupied Residential							
Variable Density Residential Flex	$180,000	-	-	-	-	$38,520,000	$77,040,000
High Density Residential	$180,000	$49,140,000	$115,920,000	$117,180,000	$119,700,000	$129,420,000	$139,140,000
Residential/Mixed Use	$180,000	-	-	-	-	$58,590,000	$117,180,000
Subtotal Renter-Occupied Residential		**$49,140,000**	**$115,920,000**	**$117,180,000**	**$119,700,000**	**$226,530,000**	**$333,360,000**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	$13,329,360	$40,902,840	$161,370,198	$225,449,136	$257,139,036	$288,828,936
Service Commercial	$200	$53,317,440	$163,611,360	$645,480,792	$901,796,544	$1,002,877,524	$1,103,958,504
Office	$150	$18,621,900	$37,733,850	$91,565,843	$253,453,860	$313,435,980	$373,418,100
Industrial	$85	$27,769,500	$55,539,000	$111,078,000	$444,312,000	$444,312,000	$444,312,000
Light Industrial/R&D Flex	$85	$152,150,406	$225,932,652	$272,474,334	$412,099,380	$422,596,251	$433,093,122
Subtotal Nonresidential		**$265,188,606**	**$523,719,702**	**$1,281,969,167**	**$2,237,110,920**	**$2,440,360,791**	**$2,643,610,662**
Total All Land Uses		**$599,703,606**	**$1,292,339,702**	**$2,496,949,167**	**$3,483,810,920**	**$4,507,690,791**	**$5,531,570,662**

AV

Source: Costar; CBRE; The Gregory Group; EPS.

[1] Refer to Table A-5 for details.

Table D-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Average Annual Household Income (2016$)

City of Lathrop

Residential Land Use	Estimated Home Value [1]	Total Annual Mortgage or Rent [2]	Estimated Household Income [3]	Taxable Expenditures as a Percent of Income [4]	Annual Taxable Expenditures per Household (Rounded)
Owner-Occupied Residential					
Low Density Residential	$450,000	$32,191	$92,000	27%	$25,000
Medium Density Residential	$425,000	$30,402	$87,000	27%	$24,000
Variable Density Residential	$425,000	$30,402	$87,000	27%	$24,000
Renter-Occupied Residential					
Variable Density Residential Flex	$180,000	$18,000	$51,000	29%	$15,000
High Density Residential	$180,000	$18,000	$51,000	29%	$15,000
Residential/Mixed Use	$180,000	$18,000	$51,000	29%	$15,000

income

Source: Costar; The Gregory Group; Bureau of Labor Statistics; EPS.

[1] See Table A-5 for detail on estimated values for owner-occupied units.

[2] Based on a 5%, 30-year fixed-rate mortgage with a 20% down payment, $150 monthly Homeowner's association dues and 2% annual taxes and insurance.
High density residential based on an average monthly rent assumption of $1,500 based on data on similar multifamily residential obtained from Costar and an average size of 1,000 square feet.

[3] Assumes 35% of income dedicated to housing costs (mortgage, taxes, insurance, and HOA dues) or rent payments. Rounded to the nearest $1,000.

[4] Based on household expenditures data from the Bureau of Labor Statistics, 2015 Consumer Expenditure Survey.

APPENDIX E:

Special Tax Revenue Calculation

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Table E-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Potential Special Tax Revenue

Land Use	Estimated Special Tax Rate [1]	2020 Units/ Square Feet	2020 Estimated Special Tax Revenue	2025 Units/ Square Feet	2025 Estimated Special Tax Revenue	2030 Units/ Square Feet	2030 Estimated Special Tax Revenue
Residential Land Uses							
Owner-Occupied Residential	*per Unit*	*units*		*units*		*units*	
Low Density Residential	$240	42	$10,080	81	$19,440	120	$28,800
Medium Density Residential	$240	27	$6,480	124	$29,760	221	$53,040
Variable Density Residential	$240	600	$144,000	1,326	$318,240	2,235	$536,400
Subtotal Owner-Occupied Residential		**669**	**$160,560**	**1,531**	**$367,440**	**2,576**	**$618,240**
Renter Occupied Residential							
Variable Density Residential Flex	$120	0	$0	0	$0	0	$0
High Density Residential	$120	273	$32,760	644	$77,280	651	$78,120
Residential/Mixed Use	$120	0	$0	0	$0	0	$0
Subtotal Renter-Occupied Residential		**273**	**$32,760**	**644**	**$77,280**	**651**	**$78,120**
Subtotal Residential		**942**	**$193,320**	**2,175**	**$444,720**	**3,227**	**$696,360**
Nonresidential Land Uses	*per 1,000 S.F.*	*Sq. Ft.*		*Sq. Ft.*		*Sq. Ft.*	
Retail	$80	66,647	$5,332	204,514	$16,361	806,851	$64,548
Service Commercial	$80	266,587	$21,327	818,057	$65,445	3,227,404	$258,192
Office	$90	124,146	$11,173	251,559	$22,640	610,439	$54,940
Industrial	$90	326,700	$29,403	653,400	$58,806	1,306,800	$117,612
Light Industrial/R&D Flex	$90	1,790,005	$161,100	2,658,031	$239,223	3,205,580	$288,502
Subtotal Nonresidential		**2,574,085**	**$228,335**	**4,585,561**	**$402,475**	**9,157,074**	**$783,794**
Total Estimated Special Tax Revenue			**$421,655**		**$847,195**		**$1,480,154**

Source: Mossdale Landscape and Lighting Maintenance District Final Annual Engineers Report, Fiscal Year 2017/18; City of Lathrop; EPS.

[1] Refer to Table E-2 for details.

Table E-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Potential Special Tax Revenue

Land Use	Estimated Special Tax Rate [1]	2040 Units/ Square Feet	2040 Estimated Special Tax Revenue	2050 Units/ Square Feet	2050 Estimated Special Tax Revenue	Buildout (2060) Units/ Square Feet	Buildout (2060) Estimated Special Tax Revenue
Residential Land Uses							
Owner-Occupied Residential	*per Unit*	*units*		*units*		*units*	
Low Density Residential	$240	132	$31,680	464	$111,360	796	$191,040
Medium Density Residential	$240	277	$66,480	291	$69,720	304	$72,960
Variable Density Residential	$240	2,235	$536,400	3,550	$851,880	4,864	$1,167,360
Subtotal Owner-Occupied Residential		**2,644**	**$634,560**	**4,304**	**$1,032,960**	**5,964**	**$1,431,360**
Renter Occupied Residential							
Variable Density Residential Flex	$120	0	$0	214	$25,680	428	$51,360
High Density Residential	$120	665	$79,800	719	$86,280	773	$92,760
Residential/Mixed Use	$120	0	$0	326	$39,060	651	$78,120
Subtotal Renter-Occupied Residential		**665**	**$79,800**	**1,259**	**$151,020**	**1,852**	**$222,240**
Subtotal Residential		**3,309**	**$714,360**	**5,563**	**$1,183,980**	**7,816**	**$1,653,600**
Nonresidential Land Uses	*per 1,000 S.F.*	*Sq. Ft.*		*Sq. Ft.*		*Sq. Ft.*	
Retail	$80	1,127,246	$90,180	1,285,695	$102,856	1,444,145	$115,532
Service Commercial	$80	4,508,983	$360,719	5,014,388	$401,151	5,519,793	$441,583
Office	$90	1,689,692	$152,072	2,089,573	$188,062	2,489,454	$224,051
Industrial	$90	5,227,200	$470,448	5,227,200	$470,448	5,227,200	$470,448
Light Industrial/R&D Flex	$90	4,848,228	$436,341	4,971,721	$447,455	5,095,213	$458,569
Subtotal Nonresidential		**17,401,349**	**$1,509,759**	**18,588,577**	**$1,609,971**	**19,775,804**	**$1,710,183**
Total Estimated Special Tax Revenue			**$2,224,119**		**$2,793,951**		**$3,363,783**

special tax

Source: Mossdale Landscape and Lighting Maintenance District Final Annual Engineers Report, Fiscal Year 2017/18; City of Lathrop; EPS.

[1] Refer to Table E-2 for details.

Table E-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Lathrop
Estimated Potential Special Tax Rate

Land Use	EDU's [1]	Total Special Tax Rate [2]	General Fund Share [3]	Preliminary General Fund Special Tax Rate (Rounded)
Residential Land Uses				
Owner-Occupied Residential	*per Unit*	*per Unit*		*per Unit*
Low Density Residential	1.00	$252.67	95%	$240
Medium Density Residential	1.00	$252.67	95%	$240
Variable Density Residential	1.00	$252.67	95%	$240
Renter Occupied Residential				
Variable Density Residential Flex	0.50	$126.34	95%	$120
High Density Residential	0.50	$126.34	95%	$120
Residential/Mixed Use	0.50	$126.34	95%	$120
Nonresidential Land Uses	*per 1,000 S.F.*	*per 1,000 S.F.*		*per 1,000 S.F.*
Retail	0.33	$83.38	95%	$80
Service Commercial	0.33	$83.38	95%	$80
Office	0.39	$98.54	95%	$90
Industrial	0.39	$98.54	95%	$90
Light Industrial/R&D Flex	0.39	$98.54	95%	$90
		tax rate		

Source: Mossdale Landscape and Lighting Maintenance District Final Annual Engineers Report, Fiscal Year 2017/18; City of Lathrop; EPS.

[1] EDUs based on the relationship of maximum tax rates by land use established in the existing Mossdale and Stanford Crossing CFDs for service.

[2] Includes supplemental annual special tax revenue to fund General Fund services. Special tax revenue is based on existing, approved Services Community Facilities District (CFD) annual special tax rates. Actual Services CFD special tax rates may vary and will be established as projects are entitled, on an as needed basis. This analysis does not apply a special tax rate on undeveloped parcels. If applied, additional revenues would be generated beyond those shown in this analysis.

[3] The City estimates that 95% of all CFD revenue collected in the Mossdale Landscape and Lighting Maintenance District is used for General Fund service expenditures.

DRAFT Discussion Tables

RD 17 Area Finance Plan Implementation

Fiscal Impact Analysis—City of Manteca

The Economics of Land Use

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Table 1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Summary of Annual Surplus/Deficits (2016$)

City of Manteca

Item	Estimated Annual Revenues/Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
Annual Fiscal Impact						
Annual General Fund Revenues	$557,000	$1,789,000	$3,111,000	$6,740,000	$8,946,000	$8,946,000
Annual General Fund Expenditures	$648,000	$2,043,000	$2,958,000	$5,531,000	$7,832,000	$7,832,000
Net General Fund Surplus/(Deficit)	**($91,000)**	**($254,000)**	**$153,000**	**$1,209,000**	**$1,114,000**	**$1,114,000**

sum

Source: EPS.

Table 2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Estimated Annual Revenues and Expenditures (2016$)

City of Manteca

Item	Estimated Annual Revenues / Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
Annual General Fund Revenues						
Property Taxes	$230,200	$735,800	$1,121,400	$2,126,100	$2,938,400	$2,938,400
Property Tax In-Lieu of Vehicle License Fees	$170,700	$486,200	$726,800	$1,446,400	$2,073,100	$2,073,100
Real Property Transfer Tax	$15,700	$40,700	$59,500	$119,700	$176,500	$176,500
Sales and Use Taxes	$85,200	$348,400	$933,000	$2,523,000	$3,030,300	$3,030,300
Public Safety Sales and Use Tax	$2,100	$8,500	$22,600	$61,200	$73,500	$73,500
Transient Occupancy Tax	$16,600	$52,700	$76,900	$143,900	$203,200	$203,200
Licenses and Permits	$100	$200	$300	$500	$700	$700
Business Licenses	$10,900	$34,500	$50,400	$94,300	$133,200	$133,200
Franchise Fees	$25,900	$82,200	$120,000	$224,500	$317,000	$317,000
Total General Fund Revenue	**$557,400**	**$1,789,200**	**$3,110,900**	**$6,739,600**	**$8,945,900**	**$8,945,900**

Table 2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Estimated Annual Revenues and Expenditures (2016$)

City of Manteca

Item	Estimated Annual Revenues / Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
Annual General Fund Expenditures						
General Government						
Legislation and Policy	$14,900	$47,200	$68,900	$129,000	$182,100	$182,100
Legal Services	$3,400	$10,700	$15,600	$29,200	$41,300	$41,300
City Administration	$11,400	$36,200	$52,900	$99,000	$139,700	$139,700
Public Works Administration	$4,200	$13,400	$19,600	$36,600	$51,700	$51,700
Non Departmental	$56,500	$179,200	$261,500	$489,400	$691,000	$691,000
Human Resources	$9,700	$30,700	$44,800	$83,900	$118,400	$118,400
Fiscal and Revenue Management	$11,100	$35,300	$51,600	$96,500	$136,200	$136,200
Fleet Maintenance	$11,300	$35,900	$52,400	$98,000	$138,400	$138,400
Subtotal General Government	**$122,500**	**$388,600**	**$567,300**	**$1,061,600**	**$1,498,800**	**$1,498,800**
Public Safety						
Police Protection	$283,600	$899,500	$1,312,700	$2,456,600	$3,468,200	$3,468,200
Animal Services	$2,600	$8,100	$11,800	$22,100	$31,200	$31,200
Fire Protection	$163,900	$519,700	$758,500	$1,419,400	$2,003,900	$2,003,900
Subtotal Public Safety	**$450,100**	**$1,427,300**	**$2,083,000**	**$3,898,100**	**$5,503,300**	**$5,503,300**
Parks, Recreation, and Community Services						
Parks Maintenance	$56,800	$170,700	$229,300	$426,000	$620,900	$620,900
Library	$2,400	$7,300	$9,800	$18,300	$26,700	$26,700
Recreational and Senior Services	$9,200	$27,600	$37,000	$68,800	$100,300	$100,300
Subtotal Parks, Recreation, and Community Svcs	**$68,400**	**$205,600**	**$276,100**	**$513,100**	**$747,900**	**$747,900**
Public Utilities						
Storm Drainage	$6,300	$20,100	$29,400	$55,000	$77,600	$77,600
Subtotal Public Utilities	**$6,300**	**$20,100**	**$29,400**	**$55,000**	**$77,600**	**$77,600**
Transportation						
Streets	$400	$1,200	$1,700	$3,300	$4,600	$4,600
Subtotal Transportation	**$400**	**$1,200**	**$1,700**	**$3,300**	**$4,600**	**$4,600**
Total General Fund Expenditures	**$647,700**	**$2,042,800**	**$2,957,500**	**$5,531,100**	**$7,832,200**	**$7,832,200**
Net General Fund Surplus/(Deficit)	**($90,300)**	**($253,600)**	**$153,400**	**$1,208,500**	**$1,113,700**	**$1,113,700**

detsum

Source: EPS.

APPENDICES:

Appendix A: General Assumptions

Appendix B: General Fund Revenue Analysis

Appendix C: General Fund Expenditure Analysis

Appendix D: Supporting Tables for Revenue and Expenditure Analyses

APPENDIX A:

General Assumptions

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Table A-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
General Assumptions

	City of Manteca
Item	**Assumption**
General Assumptions	
Base Fiscal Year [1]	FY 2016-17
General Demographic Characteristics	
City of Manteca	
Population [2]	73,841
Employees [3]	18,100
City of Manteca Persons Served [4]	**82,891**

gen assumps

Source: California Department of Finance; EDD; U.S. Census LED; EPS.

[1] Reflects the City of Manteca Fiscal Year 2016-17 adopted budget. Revenues and expenditures are in 2016 dollars. This analysis does not reflect changes in values resulting from inflation or appreciation.
[2] Based on population estimates from the California Department of Finance (DOF) data for January 1, 2016.
[3] US Census Onthemap.ces.census.gov estimated a total of 15,574 jobs in Manteca, CA in 2014. California EDD reports an annual average growth rate of 2.79% since 2014 for the Stockton-Lodi MSA. EPS escalated 2014 employment figure to arrive at 2016 employment estimate, adjusted by an additional 10% to account for self-employed workers, and rounded to the nearest hundred employees.
[4] Persons served is defined as total population plus half of total employees. Used to estimate specific revenues and expenditures that are assumed to be impacted by growth in resident and employment populations and to avoid double counting of employees who reside in the City.

Table A-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Cumulative Land Use Projections

City of Manteca

Land Use	Cumulative Dwelling Units/Square Footage											
	2020 [1]		2025		2030		2040		2050		Buildout (2060)	
	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.
Development Projections in Current City Limits [2]												
Residential Land Uses [4]												
Low Density Residential	299	-	906	-	1,381	-	2,496	-	3,455	-	3,455	-
High Density Residential	28	-	433	-	433	-	433	-	433	-	433	-
Subtotal Residential	**327**	-	**1,339**	-	**1,814**	-	**2,929**	-	**3,888**	-	**3,888**	-
Nonresidential Land Uses												
Retail	-	-	-	100,000	-	350,000	-	1,032,090	-	1,197,029	-	1,197,029
Industrial	-	-	-	100,000	-	358,063	-	358,063	-	358,063	-	358,063
Subtotal Nonresidential	**-**	**-**	**-**	**200,000**	**-**	**708,063**	**-**	**1,390,153**	**-**	**1,555,092**	**-**	**1,555,092**
Total All Land Uses	**327**	**-**	**1,339**	**200,000**	**1,814**	**708,063**	**2,929**	**1,390,153**	**3,888**	**1,555,092**	**3,888**	**1,555,092**
Development Projections in Annexation Areas [3]												
Residential Land Uses [4]												
Low Density Residential	140	-	140	-	140	-	620	-	1,241	-	1,241	-
High Density Residential	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Residential	**140**	-	**140**	-	**140**	-	**620**	-	**1,241**	-	**1,241**	-
Nonresidential Land Uses												
Retail	-	-	-	-	-	-	-	-	-	-	-	-
Industrial	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Nonresidential	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total All Land Uses	**140**	**-**	**140**	**-**	**140**	**-**	**620**	**-**	**1,241**	**-**	**1,241**	**-**
Total City of Manteca Development Projections												
Residential Land Uses [4]												
Low Density Residential	439	-	1,046	-	1,521	-	3,116	-	4,696	-	4,696	-
High Density Residential	28	-	433	-	433	-	433	-	433	-	433	-
Subtotal Residential	**467**	-	**1,479**	-	**1,954**	-	**3,549**	-	**5,129**	-	**5,129**	-
Nonresidential Land Uses												
Retail	-	-	-	100,000	-	350,000	-	1,032,090	-	1,197,029	-	1,197,029
Industrial	-	-	-	100,000	-	358,063	-	358,063	-	358,063	-	358,063
Subtotal Nonresidential	**-**	**-**	**-**	**200,000**	**-**	**708,063**	**-**	**1,390,153**	**-**	**1,555,092**	**-**	**1,555,092**
Total All Land Uses	**467**	**-**	**1,479**	**200,000**	**1,954**	**708,063**	**3,549**	**1,390,153**	**5,129**	**1,555,092**	**5,129**	**1,555,092**

lu

Source: City of Manteca; LWA; EPS.

[1] The time span for development is 2018 to 2060.
[2] Includes development projections in Terra Ranch, Cerri, Denali, the Trails of Manteca, Oakwood Trails, Oleander, Sundance, and the Future Development Area.
[3] Includes development projections in the Manteca Annexation Area, and Oakwood Shores.
[4] For the purpose of this analysis, low density residential is considered to be owner-occupied and high density residential is assumed to be renter-occupied.

Table A-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Cumulative Occupied Dwelling Units and Building Square Footage

City of Manteca

Land Use	Vacancy Rate [1]	Occupied Dwelling Units/Building Square Feet					
		2020	2025	2030	2040	2050	Buildout (2060)
Development Projections in Current City Limits							
Residential Land Uses				*Occupied Dwelling Units*			
Low Density Residential	6.5%	280	847	1,291	2,334	3,230	3,230
High Density Residential	6.5%	26	405	405	405	405	405
Subtotal Residential Land Uses		**306**	**1,252**	**1,696**	**2,739**	**3,635**	**3,635**
Nonresidential Land Uses				*Building Square Feet*			
Retail	7.5%	-	92,500	323,750	954,683	1,107,252	1,107,252
Industrial	7.5%	-	92,500	331,208	331,208	331,208	331,208
Subtotal Nonresidential		**-**	**185,000**	**654,958**	**1,285,892**	**1,438,460**	**1,438,460**
Development Projections in Annexation Areas							
Residential Land Uses				*Occupied Dwelling Units*			
Low Density Residential	6.5%	131	131	131	580	1,160	1,160
High Density Residential	6.5%	-	-	-	-	-	-
Subtotal Residential Land Uses		**131**	**131**	**131**	**580**	**1,160**	**1,160**
Nonresidential Land Uses				*Building Square Feet*			
Retail	7.5%	-	-	-	-	-	-
Industrial	7.5%	-	-	-	-	-	-
Subtotal Nonresidential		**-**	**-**	**-**	**-**	**-**	**-**
Total City of Manteca Development Projections							
Residential Land Uses				*Occupied Dwelling Units*			
Low Density Residential	6.5%	410	978	1,422	2,913	4,391	4,391
High Density Residential	6.5%	26	405	405	405	405	405
Subtotal Residential Land Uses		**437**	**1,383**	**1,827**	**3,318**	**4,796**	**4,796**
Nonresidential Land Uses				*Building Square Feet*			
Retail	7.5%	-	92,500	323,750	954,683	1,107,252	1,107,252
Industrial	7.5%	-	92,500	331,208	331,208	331,208	331,208
Subtotal Nonresidential		**-**	**185,000**	**654,958**	**1,285,892**	**1,438,460**	**1,438,460**

occupied

Source: California Department of Finance; City of Manteca; Costar; LWA; EPS.

[1] For details pertaining to vacancy rate assumptions, refer to Table A-5.

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Table A-4
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Cumulative Estimated Population and Employees

City of Manteca

Land Use	Assumption [1]	Estimated Population/Employees 2020	2025	2030	2040	2050	Buildout (2060)
Project Residents							
Residential Land Uses	*PPH*						
Low Density Residential	3.20	1,313	3,130	4,551	9,323	14,050	14,050
High Density Residential	2.50	65	1,012	1,012	1,012	1,012	1,012
Subtotal Residential Land Uses		**1,379**	**4,142**	**5,563**	**10,335**	**15,063**	**15,063**
Total Resident Population		**1,379**	**4,142**	**5,563**	**10,335**	**15,063**	**15,063**
Project Employees							
Nonresidential Land Uses	*Sq. Ft. per Emp.*						
Retail	400	-	231	809	2,387	2,768	2,768
Industrial	2,000	-	231	828	828	828	828
Subtotal Nonresidential		**-**	**463**	**1,637**	**3,215**	**3,596**	**3,596**
Total Employee Population		**-**	**463**	**1,637**	**3,215**	**3,596**	**3,596**
Project Persons Served		**1,379**	**4,373**	**6,382**	**11,943**	**16,861**	**16,861**

pop

Source: California Department of Finance; EPS.

[1] For persons per household and square feet per employee assumptions, refer to Table A-5.

Table A-5
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Land Use Assumptions

City of Manteca

Land Use	Estimated Assessed Value [1]	Property Turnover Rate [2]	Vacancy Rate [3]	Persons per Household/ Sq. Ft. per Employee [4]
Residential Land Uses	*per Unit*			
Owner-Occupied Residential				
Low Density Residential	$450,000	14.3%	6.5%	3.20
Renter-Occupied Residential				
High Density Residential	$180,000	6.7%	6.5%	2.50
Nonresidential Land Uses	*per Sq. Ft.*			
Retail	$200	5.0%	7.5%	400
Industrial	$85	5.0%	7.5%	2,000

lu assum

Source: California Department of Finance; The Gregory Group; San Joaquin County; Costar; Colliers, International; CBRE; EPS.

[1] Residential assessed values are based on sales data of comparable products as obtained through The Gregory Group. Nonresidential values per square foot based on comparable transaction data obtained from Costar and CBRE.
[2] Owner-occupied residential is assumed to turn over once every 7 years and renter-occupied residential is assumed to turn over once every 15 years. Nonresidential uses are assumed to turn over once every 20 years.
[3] Residential vacancy rates obtained from the US Census American Community Survey, 2015 estimates. Commercial and industrial vacancy rates based on Costar and Colliers International market reports for the Stockton/Modesto area.
[4] Persons per household figures obtained from the US Census American Community Survey, 2015 estimates. Square feet per employee values are based on empirical research for proposed land uses.

APPENDIX B:

General Fund Revenue Analysis

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Table B-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Revenue-Estimating Procedures Based on City of Manteca FY 2016-17 Budget (2016$)

City of Manteca

Item	Estimating Procedure	Case Study Reference	FY 2016-17 Budgeted General Fund Revenues	Offsetting Revenues	FY 2016-17 Budgeted Net General Fund Revenues	Service Population [1]	Revenue Multiplier
General Fund Revenues							
Property Taxes	Case Study	Table B-3	$7,126,100	-	$7,126,100	NA	-
Property Tax In-Lieu of Vehicle License Fees	Case Study	Table B-3	$5,581,000	-	$5,581,000	NA	-
Real Property Transfer Tax	Case Study	Table B-4	$355,000	-	$355,000	NA	-
Sales and Use Taxes	Case Study	Table B-5	$11,335,000	-	$11,335,000	NA	-
Public Safety Sales and Use Tax	Case Study	Table B-5	$275,000	-	$275,000	NA	-
Transient Occupancy Tax	Persons Served	-	$999,000	-	$999,000	82,891	$12.05
Licenses and Permits	Persons Served	-	$280,870	($277,870)	$3,000	82,891	$0.04
Business Licenses	Persons Served	-	$655,000	-	$655,000	82,891	$7.90
Franchise Fees	Persons Served	-	$1,558,215	-	$1,558,215	82,891	$18.80
Excise Tax	[2]	-	$450,000	-	$450,000	NA	-
Intergovernmental	[2]	-	$483,630	($453,630)	$30,000	NA	-
Charges for Services	[2]	-	$4,845,870	($2,839,510)	$2,006,360	NA	-
Fines and Forfeitures	Persons Served	-	$276,500	($276,500)	$0	82,891	$0.00
Use of Money & Property	[2]	-	$705,000	-	$705,000	NA	-
All Other Revenue	[2]	-	$53,070	-	$53,070	NA	-
Total General Fund Revenues			**$34,979,255**	**($3,847,510)**	**$31,131,745**		
Fund Reserves			$8,003,790				
Total General Fund Revenues (Incl. Reserves)			**$42,983,045**				

rev pro

Source: City of Manteca FY 2016-17 Adopted Budget; EPS.

[1] Refer to Table A-1 for details.
[2] This revenue source is not expected to be affected by anticipated development and therefore is not evaluated in this analysis.

Table B-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Estimated Annual General Fund Revenues (2016$)

City of Manteca

Revenue Category	Case Study Reference	Estimated Annual Revenue (Rounded)					
		2020	2025	2030	2040	2050	Buildout (2060)
General Fund Revenues							
Property Taxes	Table B-3	$230,200	$735,800	$1,121,400	$2,126,100	$2,938,400	$2,938,400
Property Tax In-Lieu of Vehicle License Fees	Table B-3	$170,700	$486,200	$726,800	$1,446,400	$2,073,100	$2,073,100
Real Property Transfer Tax	Table B-4	$15,700	$40,700	$59,500	$119,700	$176,500	$176,500
Sales and Use Taxes	Table B-5	$85,200	$348,400	$933,000	$2,523,000	$3,030,300	$3,030,300
Public Safety Sales and Use Tax	Table B-5	$2,100	$8,500	$22,600	$61,200	$73,500	$73,500
Transient Occupancy Tax	-	$16,600	$52,700	$76,900	$143,900	$203,200	$203,200
Licenses and Permits	-	$100	$200	$300	$500	$700	$700
Business Licenses	-	$10,900	$34,500	$50,400	$94,300	$133,200	$133,200
Franchise Fees	-	$25,900	$82,200	$120,000	$224,500	$317,000	$317,000
Fines and Forfeitures	-	-	-	-	-	-	-
Total General Fund Revenue		**$557,400**	**$1,789,200**	**$3,110,900**	**$6,739,600**	**$8,945,900**	**$8,945,900**

rev

Source: City of Manteca FY 2016-17 Adopted Budget; EPS.

Table B-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Estimated Annual Property Tax Revenues (2016$)

City of Manteca

Item	Assumption/ Source	Formula	Estimated Property Tax Revenues (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Assessed Value of New Development	Table D-2							
Assessed Value of New Development in Current City Limits		*a*	$139,590,000	$514,140,000	$799,825,355	$1,437,993,355	$1,902,531,115	$1,902,531,115
Assessed Value of New Development in Annexation Area		*b*	$63,000,000	$63,000,000	$63,000,000	$279,000,000	$558,450,000	$558,450,000
Total Assessed Value		***c = a + b***	**$202,590,000**	**$577,140,000**	**$862,825,355**	**$1,716,993,355**	**$2,460,981,115**	**$2,460,981,115**
Property Tax Revenue (1% of Assessed Value)	1.0000%							
Property Tax Revenue in Current City Limits		*d = a * 1.00%*	$1,395,900	$5,141,400	$7,998,254	$14,379,934	$19,025,311	$19,025,311
Property Tax Revenue in Annexation Areas		*e = b * 1.00%*	$630,000	$630,000	$630,000	$2,790,000	$5,584,500	$5,584,500
Total Property Tax Revenue		***f = d + e***	**$2,025,900**	**$5,771,400**	**$8,628,254**	**$17,169,934**	**$24,609,811**	**$24,609,811**
Estimated Property Tax Allocation								
Property Tax Allocation in Current City Limits [1]								
City of Manteca General Fund	13.4990%	*g = d * 13.50%*	$188,433	$694,038	$1,079,686	$1,941,150	$2,568,230	$2,568,230
Other Agencies/ERAF	86.5010%	*h = d * 86.50%*	$1,207,467	$4,447,362	$6,918,568	$12,438,784	$16,457,081	$16,457,081
Property Tax Allocation in Annexation Areas [2]								
City of Manteca General Fund	6.6282%	*i = e * 6.63%*	$41,758	$41,758	$41,758	$184,926	$370,151	$370,151
Other Agencies/ERAF	93.3718%	*j = e * 93.37%*	$588,242	$588,242	$588,242	$2,605,074	$5,214,349	$5,214,349
Total City of Manteca General Fund Property Tax		***k = g + i***	**$230,190**	**$735,796**	**$1,121,443**	**$2,126,076**	**$2,938,380**	**$2,938,380**
Property Tax In-Lieu of Motor Vehicle In-Lieu Fee Revenue (VLF)								
Total Citywide Assessed Value [3]		*l*	$6,625,186,105	$6,625,186,105	$6,625,186,105	$6,625,186,105	$6,625,186,105	$6,625,186,105
Total Assessed Value of Project		*m*	$202,590,000	$577,140,000	$862,825,355	$1,716,993,355	$2,460,981,115	$2,460,981,115
Total Assessed Value		*n = l + m*	**$6,827,776,105**	**$7,202,326,105**	**$7,488,011,460**	**$8,342,179,460**	**$9,086,167,220**	**$9,086,167,220**
Percent Change in AV		*o = m / l*	3.06%	8.71%	13.02%	25.92%	37.15%	37.15%
Property Tax In-Lieu of VLF [4]	**$5,581,000**	***p = o * $5,581,000***	**$170,660**	**$486,178**	**$726,837**	**$1,446,380**	**$2,073,109**	**$2,073,109**

prop tax

Source: City of Manteca; San Joaquin County Auditor-Controller; EPS.

[1] Reflects the average property tax allocation to the City's General Fund for all TRAs within the 200-year flood plain that are within the City's boundary and not included in a redevelopment area. TRAs include: 002-000, 002-060, 002-063, 002-064, 002-087, and 002-088.
[2] Reflects the estimated property tax allocation to the City's General Fund of TRAs anticipated to annex into the City of Manteca within the boundary of the flood basin. Refer to Table D-1 for details.
[3] Reflects Assessed Valuation for FY 2016-17. Includes Citywide secured, unsecured, homeowner exemption, and public utility roll.
[4] Property tax in-lieu of VLF amount derived from the City of Manteca FY 2016-17 Annual Budget. Refer to Table B-1 for details.

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Table B-4
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Real Property Transfer Tax (2016$)

City of Manteca

Description	Assumption/ Source	Estimated Annual Property Transfer Tax Revenue (2016$)					
		2020	2025	2030	2040	2050	Buildout (2060)
Rate per $1,000 of AV	$0.55						
Project Assessed Value	Table D-2						
Low Density Residential		$197,550,000	$470,700,000	$684,450,000	$1,402,200,000	$2,113,200,000	$2,113,200,000
High Density Residential		$5,040,000	$77,940,000	$77,940,000	$77,940,000	$77,940,000	$77,940,000
Nonresidential		-	$28,500,000	$100,435,355	$236,853,355	$269,841,115	$269,841,115
Total Assessed Value		**$202,590,000**	**$577,140,000**	**$862,825,355**	**$1,716,993,355**	**$2,460,981,115**	**$2,460,981,115**
Turnover Rate							
Low Density Residential	14.30%						
High Density Residential	6.70%						
Nonresidential	5.00%						
Annual Transfer Tax Revenue [1]							
Low Density Residential		$15,537	$37,021	$53,832	$110,283	$166,203	$166,203
High Density Residential		$186	$2,872	$2,872	$2,872	$2,872	$2,872
Nonresidential		-	$784	$2,762	$6,513	$7,421	$7,421
Total Annual Transfer Tax Revenue		**$15,723**	**$40,676**	**$59,466**	**$119,669**	**$176,496**	**$176,496**

transfer

Source: City of Manteca; San Joaquin County Auditor-Controller; EPS.

[1] Formula for Transfer Tax = Assessed Value/$1,000 * Rate per $1,000 of Assessed Value * Turnover rate.

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Table B-5
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Estimated Annual Taxable Sales and Use Tax Revenue (2016$)

City of Manteca

Item	Formula	Source/ Assumptions	Annual Sales Tax Revenue					
			2020	2025	2030	2040	2050	Buildout (2060)
Estimated Annual Taxable Sales								
Annual Taxable Sales from Market Support (Residents and Employees)	*a*		$8,523,460	$24,917,960	$35,069,347	$66,599,367	$96,557,302	$96,557,302
Annual Taxable Sales from Onsite Commercial Uses	*b*		-	$9,925,758	$58,234,671	$185,699,510	$206,472,179	$206,472,179
Annual Taxable Sales from New Development	*c = a + b*		**$8,523,460**	**$34,843,718**	**$93,304,019**	**$252,298,877**	**$303,029,481**	**$303,029,481**
Annual Sales Tax Revenue								
Bradley Burns Local Sales Tax Revenue	*d = c * 1.0000%*	1.0000%	$85,235	$348,437	$933,040	$2,522,989	$3,030,295	$3,030,295
City of Manteca Prop 172 Public Safety Sales Tax Revenue [1]	*e = d * 2.4261%*	2.4261%	$2,068	$8,453	$22,637	$61,211	$73,518	$73,518

sales

Source: City of Manteca; California State Board of Equalization; EPS.

[1] Calculated as the ratio of Proposition 172 Public Safety Tax revenue to total sales tax revenue based on the FY 2016-17 Budget. Any variation in the relationship between Proposition 172 Public Safety Tax revenue and total sales tax revenue affecting the estimate of this revenue source is estimated to be nominal.

Table B-5A
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Estimated Annual Taxable Sales from Proposed Development, Market Support Method (2016$)

City of Manteca

Annual Taxable Sales from Market Support	Assumption	Estimated Annual Taxable Sales (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Annual Taxable Sales from New Residents							
Residential Development	Table A-3			*Occupied Dwelling Units*			
Low Density Residential		410	978	1,422	2,913	4,391	4,391
High Density Residential		26	405	405	405	405	405
Total Residential Development		**437**	**1,383**	**1,827**	**3,318**	**4,796**	**4,796**
Taxable Retail Expenditures	*per Household [1]*			*Taxable Retail Expenditures*			
Low Density Residential	$25,000	$10,261,625	$24,450,250	$35,553,375	$72,836,500	$109,769,000	$109,769,000
High Density Residential	$15,000	$392,700	$6,072,825	$6,072,825	$6,072,825	$6,072,825	$6,072,825
Total Taxable Retail Expenditures		**$10,654,325**	**$30,523,075**	**$41,626,200**	**$78,909,325**	**$115,841,825**	**$115,841,825**
Estimated Citywide Capture from New Households [2]	**80%**	**$8,523,460**	**$24,418,460**	**$33,300,960**	**$63,127,460**	**$92,673,460**	**$92,673,460**
Estimated Taxable Sales inside Project Area [3]	50%	-	$12,209,230	$16,650,480	$31,563,730	$46,336,730	$46,336,730
Estimated Taxable Sales outside Project Area	50%	$8,523,460	$12,209,230	$16,650,480	$31,563,730	$46,336,730	$46,336,730
Annual Taxable Sales from New Employment							
Taxable Sales from New Employment							
Employees	Table A-4	-	463	1,637	3,215	3,596	3,596
Average Daily Taxable Sales per New Employee	$10.00						
Work Days per Year	240						
Taxable Sales from New Employees [3]	50%						
Total Taxable Sales from New Employees		**-**	**$555,000**	**$1,964,875**	**$3,857,675**	**$4,315,380**	**$4,315,380**
Estimated Citywide Capture from New Employees [2]	**90%**	**-**	**$499,500**	**$1,768,387**	**$3,471,907**	**$3,883,842**	**$3,883,842**
Estimated Taxable Sales inside Project Area	70%	-	$349,650	$1,237,871	$2,430,335	$2,718,689	$2,718,689
Estimated Taxable Sales outside Project Area	30%	-	$149,850	$530,516	$1,041,572	$1,165,153	$1,165,153
Total Annual Taxable Sales from Market Support		**$8,523,460**	**$24,917,960**	**$35,069,347**	**$66,599,367**	**$96,557,302**	**$96,557,302**
Taxable City Sales inside Project Area		-	$12,558,880	$17,888,351	$33,994,065	$49,055,419	$49,055,419
Taxable City Sales outside Project Area		$8,523,460	$12,359,080	$17,180,996	$32,605,302	$47,501,883	$47,501,883

sales a

Source: Costar; Gregory Group; Bureau of Labor Statistics; City of Manteca; EPS.

[1] For details pertaining to resident and employee estimates, refer to Table A-4.
[2] Represents the portion of household and employee retail expenditures estimated to take place within the City of Manteca.
[3] As no commercial development is anticipated until the second phase on development, it is assumed that no household spending can occur within the project area until this time.
[4] Taxable sales from employees discounted by 50 percent to account for employees who are also residents.

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Table B-5B
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Estimated Annual Taxable Sales from Onsite Nonresidential (2016$)

City of Manteca

Item	Annual Taxable Sales per Sq. Ft. [1]	Estimated Annual Taxable Sales (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Annual Taxable Sales from Onsite Commercial Development							
Retail	$250	-	$23,125,000	$80,937,500	$238,670,813	$276,812,910	$276,812,910
Industrial	$5	-	$462,500	$1,656,041	$1,656,041	$1,656,041	$1,656,041
Total		**-**	**$23,587,500**	**$82,593,541**	**$240,326,854**	**$278,468,951**	**$278,468,951**
Less Total Annual Taxable Sales from Market Support (within the Project) [2]		-	$12,558,880	$17,888,351	$33,994,065	$49,055,419	$49,055,419
Annual Sales Less Market Support		**-**	**$11,028,620**	**$64,705,190**	**$206,332,789**	**$229,413,532**	**$229,413,532**
	Shift from Existing Retail						
Less Shift of Sales from Existing Regional and Community Retail to the Project [3]	10%	-	$1,102,862	$6,470,519	$20,633,279	$22,941,353	$22,941,353
Total Nonresidential Taxable Sales		**-**	**$9,925,758**	**$58,234,671**	**$185,699,510**	**$206,472,179**	**$206,472,179**

sales b

Source: U.S. Department of Labor Bureau of Labor Statistics; Urban Land Institute; EPS.

[1] Commercial taxable sales assumptions based on an analysis of data from ULI's Dollars & Cents of Shopping Centers: 2008 and escalated to current dollars. Industrial taxable sales per square foot based on research of industrial development, this analysis includes a conservative taxable sales per square foot assumption representing onsite business-to-business sales activity.
[2] Estimated in Table B-5A.
[3] Represents a discount factor to account for taxable sales transactions that may shift from the City's existing retail centers to those included in the Project.

APPENDIX C:

General Fund Expenditure Analysis

Table C-1 Expenditure-Estimating Procedures based on City of Manteca FY 2016–17 Budget..... 16

Table C-2 Estimated Annual General Fund Expenditures..... 17

Table C-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Expenditure-Estimating Procedures Based on City of Manteca FY 2016-17 Budget (2016$)

City of Manteca

Item	Estimating Procedure	FY 2016-17 Budgeted Expenditures	Less Offsetting Revenue	FY 2016-17 Net City Expenditures	Population or Persons Served	FY 2016-17 Avg. Cost	Adjustment Factor [1]	Net FY 2016-17 Avg. Cost
General Fund Expenditures								
General Government								
Legislation and Policy	Persons Served	$895,320	-	$895,320	82,891	$10.80	100%	$10.80
Legal Services	Persons Served	$203,000	-	$203,000	82,891	$2.45	100%	$2.45
City Administration	Persons Served	$978,905	($292,061)	$686,844	82,891	$8.29	100%	$8.29
Public Works Administration	Persons Served	$1,209,360	($955,129)	$254,231	82,891	$3.07	100%	$3.07
Non Departmental	Persons Served	$3,397,030	-	$3,397,030	82,891	$40.98	100%	$40.98
Human Resources	Persons Served	$582,085	-	$582,085	82,891	$7.02	100%	$7.02
Fiscal and Revenue Management	Persons Served	$1,174,920	($505,320)	$669,600	82,891	$8.08	100%	$8.08
Fleet Maintenance	Persons Served	$680,420	-	$680,420	82,891	$8.21	100%	$8.21
Subtotal General Government		**$9,121,040**	**($1,752,510)**	**$7,368,530**				
Public Safety								
Police Protection [2]	Persons Served	$18,045,734	($995,130)	$17,050,604	82,891	$205.70	100%	$205.70
Animal Services	Persons Served	$431,265	($277,870)	$153,395	82,891	$1.85	100%	$1.85
Fire Protection [2]	Persons Served	$10,682,350	($830,595)	$9,851,755	82,891	$118.85	100%	$118.85
Subtotal Public Safety		**$29,159,349**	**($2,103,595)**	**$27,055,754**				
Parks, Recreation, and Community Services								
Parks Maintenance	Per Capita	$3,676,320	($632,500)	$3,043,820	73,841	$41.22	100%	$41.22
Library	Per Capita	$130,690	-	$130,690	73,841	$1.77	100%	$1.77
Recreational and Senior Services	Per Capita	$491,555	-	$491,555	73,841	$6.66	100%	$6.66
Subtotal Parks, Recreation, and Community Svcs		**$4,298,565**	**($632,500)**	**$3,666,065**				
Public Utilities								
Storm Drainage	Persons Served	$381,451	-	$381,451	82,891	$4.60	100%	$4.60
Subtotal Public Utilities		**$381,451**	**-**	**$381,451**				
Transportation								
Streets	Persons Served	$22,640	-	$22,640	82,891	$0.27	100%	$0.27
Subtotal Transportation		**$22,640**	**-**	**$22,640**				
Total General Fund Expenditures		**$42,983,045**	**($4,488,605)**	**$38,494,440**				

exp

Source: City of Manteca FY 2016-17 Adopted Budget; EPS.

[1] An adjustment factor may be used to reflect the fact that new employees may not increase certain General Fund department expenditures at a 1:1 ratio. This analysis does not assume an adjustment.
[2] In addition to General Fund expenditures, police and fire protection budgets include expenditures related to the public safety sales tax (Fund 320), SAFER grant (Fund 120), and endowment funds (Fund 330).

Table C-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Estimated Annual General Fund Expenditures (2016$)

City of Manteca

Expenditure Category	Estimated Annual Expenditure [1]					
	2020	2025	2030	2040	2050	Buildout (2060)
General Fund						
General Government						
Legislation and Policy	$14,894	$47,234	$68,929	$128,994	$182,115	$182,115
Legal Services	$3,377	$10,710	$15,629	$29,247	$41,292	$41,292
City Administration	$11,426	$36,235	$52,879	$98,957	$139,709	$139,709
Public Works Administration	$4,229	$13,412	$19,573	$36,628	$51,712	$51,712
Non Departmental	$56,511	$179,215	$261,533	$489,429	$690,981	$690,981
Human Resources	$9,683	$30,709	$44,814	$83,864	$118,400	$118,400
Fiscal and Revenue Management	$11,139	$35,326	$51,552	$96,473	$136,202	$136,202
Fleet Maintenance	$11,319	$35,896	$52,385	$98,032	$138,402	$138,402
Subtotal General Government	**$122,580**	**$388,736**	**$567,293**	**$1,061,626**	**$1,498,814**	**$1,498,814**
Public Safety						
Police Protection	$283,646	$899,526	$1,312,703	$2,456,577	$3,468,219	$3,468,219
Animal Services	$2,552	$8,093	$11,810	$22,100	$31,202	$31,202
Fire Protection	$163,889	$519,742	$758,473	$1,419,398	$2,003,920	$2,003,920
Subtotal Public Safety	**$450,088**	**$1,427,361**	**$2,082,986**	**$3,898,075**	**$5,503,341**	**$5,503,341**
Parks, Recreation, and Community Services						
Parks Maintenance	$56,842	$170,729	$229,313	$426,030	$620,898	$620,898
Library	$2,441	$7,330	$9,846	$18,292	$26,659	$26,659
Recreational and Senior Services	$9,180	$27,572	$37,032	$68,801	$100,271	$100,271
Subtotal Parks, Recreation, and Community Svcs	**$68,462**	**$205,631**	**$276,191**	**$513,123**	**$747,828**	**$747,828**
Public Utilities						
Storm Drainage	$6,346	$20,124	$29,367	$54,958	$77,590	$77,590
Subtotal Public Utilities	**$6,346**	**$20,124**	**$29,367**	**$54,958**	**$77,590**	**$77,590**
Transportation						
Streets	$377	$1,194	$1,743	$3,262	$4,605	$4,605
Subtotal Transportation	**$377**	**$1,194**	**$1,743**	**$3,262**	**$4,605**	**$4,605**
Total Annual General Fund Expenditures	**$647,851**	**$2,043,046**	**$2,957,581**	**$5,531,044**	**$7,832,178**	**$7,832,178**

exp est

Source: City of Manteca FY 2016-17 Adopted Budget; EPS.

[1] Annual expenditure estimated on a per persons served or per capita basis. Refer to Table C-1 for estimating procedure and Table A-5 for population and employment estimates.

APPENDIX D:

Supporting Tables for Revenue and Expenditure Analyses

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Table D-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Preliminary Property Tax Allocations for Annexation Areas

City of Manteca

Tax Code	Entity	Existing Tax Rate Area (TRA) Post-ERAF Distribution [1]		Gross Revenue (FY 2016-17) [1]			Property Tax Sharing Agreement [2]	Post Annexation Average	
		TRA 102-136	TRA 102-001	TRA 102-136	TRA 102-001	Total		Base Revenue	Post-ERAF Distribution
Formula		*a*	*b*	*e*	*f*	*g = e + f*	*h*	*e = d * $396,888*	*f = e / $1,197,578*
Subject to Detachment									
10001	County General	20.32600%	20.29360%	$228,594	$14,804	$243,398	80%	$317,510	26.51271%
10527	Road District 5	3.97920%	3.97840%	$44,751	$2,902	$47,653	-	-	0.00000%
14901	Lathrop-Manteca Rural Fire	8.83690%	8.84610%	$99,384	$6,453	$105,837	-	-	0.00000%
40200	City of Manteca	0.00000%	0.00000%	-	-	-	20%	$79,378	6.62818%
	Subtotal	**33.14210%**	**33.11810%**	**$372,728**	**$24,160**	**$396,888**	**100%**	**$396,888**	**33.14089%**
Not Subject to Detachment									
10618	County Library	1.63940%	1.63910%	$18,437	$1,196	$19,633	-	$19,633	1.63940%
12601	Manteca Unified Schools	26.94230%	26.93720%	$303,000	$19,651	$322,650	-	$322,650	26.94192%
13001	S.J. Delta Comm College	3.64750%	3.64670%	$41,021	$2,660	$43,681	-	$43,681	3.64745%
13201	County Office Of Education	1.28960%	1.31780%	$14,501	$961	$15,463	-	$15,463	1.29115%
16001	Sjc Flood Control	0.16000%	0.15990%	$1,799	$117	$1,916	-	$1,916	0.15997%
21901	Sjc Mosquito Abatement	0.71800%	0.71790%	$8,075	$524	$8,598	-	$8,598	0.71797%
24601	South San Joaquin Irrigation	5.41160%	5.41660%	$60,861	$3,951	$64,813	-	$64,813	5.41200%
41100	ERAF - Educational Revenue Augmentation Fund	27.04950%	27.04670%	$304,205	$19,731	$323,936	-	$323,936	27.04926%
	Subtotal	**66.85790%**	**66.88190%**	**$751,899**	**$48,791**	**$800,690**	**0%**	**$800,690**	**66.85911%**
Total		**100.00000%**	**100.00000%**	**$1,124,627**	**$72,951**	**$1,197,578**	**100%**	**$1,197,578**	**100.00000%**

TRA

Source: San Joaquin County Auditor-Controller; EPS.

[1] Provided by the San Joaquin County Auditor-Controller.
[3] Based on the most recent tax-sharing agreement between San Joaquin County and the City of Manteca dated December 2014

Table D-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Cumulative Assessed Valuation (2016$)

City of Manteca

Item	Rounded Value per Unit/Sq. Ft. [1]	Total Assessed Value (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Development Projections in Current City Limits							
Residential Land Uses	*per Unit*						
Low Density Residential	$450,000	$134,550,000	$407,700,000	$621,450,000	$1,123,200,000	$1,554,750,000	$1,554,750,000
High Density Residential	$180,000	$5,040,000	$77,940,000	$77,940,000	$77,940,000	$77,940,000	$77,940,000
Subtotal Residential		**$139,590,000**	**$485,640,000**	**$699,390,000**	**$1,201,140,000**	**$1,632,690,000**	**$1,632,690,000**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	-	$20,000,000	$70,000,000	$206,418,000	$239,405,760	$239,405,760
Industrial	$85	-	$8,500,000	$30,435,355	$30,435,355	$30,435,355	$30,435,355
Subtotal Nonresidential		**-**	**$28,500,000**	**$100,435,355**	**$236,853,355**	**$269,841,115**	**$269,841,115**
Total All Land Uses		**$139,590,000**	**$514,140,000**	**$799,825,355**	**$1,437,993,355**	**$1,902,531,115**	**$1,902,531,115**
Development Projections in Annexation Areas							
Residential Land Uses	*per Unit*						
Low Density Residential	$450,000	$63,000,000	$63,000,000	$63,000,000	$279,000,000	$558,450,000	$558,450,000
High Density Residential	$180,000	-	-	-	-	-	-
Subtotal Residential		**$63,000,000**	**$63,000,000**	**$63,000,000**	**$279,000,000**	**$558,450,000**	**$558,450,000**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	-	-	-	-	-	-
Industrial	$85	-	-	-	-	-	-
Subtotal Nonresidential		**-**	**-**	**-**	**-**	**-**	**-**
Total All Land Uses		**$63,000,000**	**$63,000,000**	**$63,000,000**	**$279,000,000**	**$558,450,000**	**$558,450,000**
Total City of Manteca Development Projections							
Residential Land Uses	*per Unit*						
Low Density Residential	$450,000	$197,550,000	$470,700,000	$684,450,000	$1,402,200,000	$2,113,200,000	$2,113,200,000
High Density Residential	$180,000	$5,040,000	$77,940,000	$77,940,000	$77,940,000	$77,940,000	$77,940,000
Subtotal Residential		**$202,590,000**	**$548,640,000**	**$762,390,000**	**$1,480,140,000**	**$2,191,140,000**	**$2,191,140,000**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	-	$20,000,000	$70,000,000	$206,418,000	$239,405,760	$239,405,760
Industrial	$85	-	$8,500,000	$30,435,355	$30,435,355	$30,435,355	$30,435,355
Subtotal Nonresidential		**-**	**$28,500,000**	**$100,435,355**	**$236,853,355**	**$269,841,115**	**$269,841,115**
Total All Land Uses		**$202,590,000**	**$577,140,000**	**$862,825,355**	**$1,716,993,355**	**$2,460,981,115**	**$2,460,981,115**

AV

Source: Costar; CBRE; The Gregory Group; EPS.

[1] Refer to Table A-5 for details.

Table D-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Manteca
Estimated Average Annual Household Income (2016$)

City of Manteca

Residential Land Use	Estimated Home Value [1]	Total Annual Mortgage or Rent [2]	Estimated Household Income [3]	Taxable Expenditures as a Percentage of Income [4]	Annual Taxable Expenditures per Household (Rounded)
Owner-Occupied Residential					
Low Density Residential	$450,000	$32,191	$92,000	27%	$25,000
Renter-Occupied Residential					
High Density Residential	$180,000	$18,000	$51,000	29%	$15,000

income

Source: Costar; Gregory Group; Bureau of Labor Statistics; EPS.

[1] See Table A-5 for detail on estimated values for residential units.

[2] Based on a 5%, 30-year fixed-rate mortgage with a 20% down payment, $150 monthly Homeowner's association dues and 2% annual taxes and insurance.
High density residential based on an average monthly rent assumption of $1,500 based on data on similar multifamily residential obtained from Costar with an average unit size of 1,000 square feet.

[3] Assumes 35% of income dedicated to housing costs (mortgage, taxes, insurance, and HOA dues) or rent payments. Rounded to the nearest $1,000.

[4] Based on household expenditures data from the Bureau of Labor Statistics, 2015 Consumer Expenditure Survey.

DRAFT Discussion Tables

RD 17 Area Finance Plan Implementation

Fiscal Impact Analysis—City of Stockton

Prepared by:

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EPS #162095

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Table 2 Estimated Annual Revenues and Expenditures 2

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Table 1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Summary of Annual Surplus/Deficits (2016$)

City of Stockton

Item	Estimated Annual Revenues / Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
Annual Fiscal Impact						
Annual General Fund Revenues	$120,000	$1,859,000	$2,764,000	$4,615,000	$5,356,000	$5,827,000
Annual General Fund Expenditures	$127,000	$1,279,000	$1,781,000	$2,683,000	$2,839,000	$2,938,000
Net General Fund Surplus/(Deficit)	**($7,000)**	**$580,000**	**$984,000**	**$1,932,000**	**$2,517,000**	**$2,889,000**

sum

Source: EPS.

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Table 2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Estimated Annual Revenues and Expenditures (2016$)

City of Stockton

Item	Estimated Annual Revenues / Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
Annual General Fund Revenues						
Property Tax	$40,300	$411,700	$548,700	$800,800	$843,900	$869,000
Property Tax in Lieu of VLF	$27,400	$279,600	$383,800	$583,100	$640,500	$677,100
Property Transfer Tax	$2,000	$15,300	$18,500	$24,500	$26,000	$27,000
Sales and Use Tax	$11,400	$733,200	$1,222,100	$2,298,000	$2,867,100	$3,230,200
Prop. 172 Public Safety Sales Tax	$400	$24,300	$40,600	$76,300	$95,200	$107,200
Utility User Taxes	$21,800	$221,700	$309,500	$468,100	$496,800	$515,200
Franchise Taxes	$8,200	$83,400	$116,300	$176,000	$186,800	$193,700
Transient Occupancy Tax	$1,700	$17,600	$24,500	$37,100	$39,400	$40,800
Business License Tax	$7,000	$71,300	$99,500	$150,500	$159,700	$165,600
Licenses and Permits	-	$400	$600	$900	$1,000	$1,000
Total Annual General Fund Revenue	**$120,200**	**$1,858,500**	**$2,764,100**	**$4,615,300**	**$5,356,400**	**$5,826,800**
Annual General Fund Expenditures						
General Government Administration	$11,900	$120,500	$168,200	$254,400	$270,100	$280,000
Police Services	$70,600	$716,400	$999,900	$1,512,300	$1,605,200	$1,664,400
Fire Services	$24,200	$245,300	$342,400	$517,800	$549,600	$569,900
Public Works	$7,500	$76,100	$106,200	$160,600	$170,400	$176,700
Economic Development	$2,100	$21,000	$29,300	$44,300	$47,100	$48,800
Office of Violence Prevention	$900	$9,600	$13,400	$20,300	$21,500	$22,300
Library	$3,400	$29,300	$39,300	$55,900	$55,900	$55,900
Recreation	$3,000	$25,500	$34,200	$48,600	$48,600	$48,600
Entertainment Venues	$2,600	$22,400	$30,100	$42,700	$42,700	$42,700
Downtown Marina	$100	$1,100	$1,500	$2,100	$2,100	$2,100
Golf Courses	$500	$5,000	$7,000	$10,600	$11,200	$11,600
Development Services	$600	$6,500	$9,100	$13,700	$14,600	$15,100
Total Annual General Fund Expenditures	**$127,400**	**$1,278,700**	**$1,780,600**	**$2,683,300**	**$2,839,000**	**$2,938,100**
Net General Fund Surplus/(Deficit)	**($7,200)**	**$579,800**	**$983,500**	**$1,932,000**	**$2,517,400**	**$2,888,700**

det sum

Source: EPS.

APPENDICES:

Appendix A: General Assumptions

Appendix B: General Fund Revenue Analysis

Appendix C: General Fund Expenditure Analysis

Appendix D: Supporting Tables for Revenue and Expenditure Analyses

APPENDIX A:

General Assumptions

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Table A-2 Cumulative Land Use Projections A-2

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Table A-4 Cumulative Estimated Population and Employees A-4

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Table A-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
General Assumptions

	City of Stockton
Item	**Assumption**
General Assumptions	
Base Fiscal Year [1]	FY 2016-17
General Demographic Characteristics	
City of Stockton	
Population [2]	315,592
Employees [3]	115,300
City of Stockton Persons Served [4]	**373,242**

gen assumps

Source: California Department of Finance; EDD; U.S. Census LED; EPS.

[1] Reflects the City of Stockton Fiscal Year 2016-17 adopted budget. Revenues and expenditures are in 2016 dollars. This analysis does not reflect changes in values resulting from inflation or appreciation.
[2] Based on population estimates from the California Department of Finance (DOF) data for January 1, 2016.
[3] US Census Onthemap.ces.census.gov estimated a total of 99,221 jobs in Stockton, CA in 2014. California EDD reports an annual average growth rate of 2.79% since 2014 for the Stockton-Lodi MSA. EPS escalated 2014 employment figure to arrive at 2016 employment estimate, adjusted by an additional 10% to account for self-employed workers, and rounded to the nearest hundred employees.
[4] Persons served is defined as total population plus half of total employees. Used to estimate specific revenues and expenditures that are assumed to be impacted by growth in resident and employment populations and to avoid double counting of employees who reside in the City.

Table A-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Cumulative Land Use Projections

City of Stockton

Land Use	Cumulative Dwelling Units/Building Square Footage											
	2020 [1]		2025		2030		2040		2050		Buildout (2060)	
	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.
Development Projections in Current City Limits [2]												
Residential Land Uses [4]												
Low Density Residential	80	-	448	-	448	-	448	-	448	-	448	-
High Density Residential	-	-	305	-	605	-	1,101	-	1,101	-	1,101	-
Subtotal Residential	**80**	**-**	**753**	**-**	**1,053**	**-**	**1,549**	**-**	**1,549**	**-**	**1,549**	**-**
Nonresidential Land Uses												
Retail	-	-	-	325,000	-	450,000	-	700,000	-	722,229	-	722,229
Subtotal Nonresidential	**-**	**-**	**-**	**325,000**	**-**	**450,000**	**-**	**700,000**	**-**	**722,229**	**-**	**722,229**
Total All Land Uses	**80**	**-**	**753**	**325,000**	**1,053**	**450,000**	**1,549**	**700,000**	**1,549**	**722,229**	**1,549**	**722,229**
Development Projections in Annexation Areas [3]												
Residential Land Uses [4]												
Low Density Residential	-	-	-	-	-	-	-	-	-	-	-	-
High Density Residential	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Residential	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Nonresidential Land Uses												
Retail	-	-	-	-	-	100,000	-	350,000	-	600,000	-	773,713
Subtotal Nonresidential	**-**	**-**	**-**	**-**	**-**	**100,000**	**-**	**350,000**	**-**	**600,000**	**-**	**773,713**
Total All Land Uses	**-**	**-**	**-**	**-**	**-**	**100,000**	**-**	**350,000**	**-**	**600,000**	**-**	**773,713**
Total City of Stockton Development Projections												
Residential Land Uses [4]												
Low Density Residential	80	-	448	-	448	-	448	-	448	-	448	-
High Density Residential	-	-	305	-	605	-	1,101	-	1,101	-	1,101	-
Subtotal Residential	**80**	**-**	**753**	**-**	**1,053**	**-**	**1,549**	**-**	**1,549**	**-**	**1,549**	**-**
Nonresidential Land Uses												
Retail	-	-	-	325,000	-	550,000	-	1,050,000	-	1,322,229	-	1,495,942
Subtotal Nonresidential	**-**	**-**	**-**	**325,000**	**-**	**550,000**	**-**	**1,050,000**	**-**	**1,322,229**	**-**	**1,495,942**
Total All Land Uses	**80**	**-**	**753**	**325,000**	**1,053**	**550,000**	**1,549**	**1,050,000**	**1,549**	**1,322,229**	**1,549**	**1,495,942**

lu

Source: City of Stockton; LWA; EPS.

[1] The time span for development included in this analysis is 2018 to 2060.
[2] Includes development projections in Weston Ranch.
[3] Includes development projections in the future Stockton Annexation Area.
[4] For the purpose of this analysis, low density residential is considered to be owner-occupied and high density residential is assumed to be renter-occupied.

Table A-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Cumulative Occupied Dwelling Units and Building Square Footage

City of Stockton

Land Use	Vacancy Rate [1]	Occupied Dwelling Units/Building Square Feet					
		2020	2025	2030	2040	2050	Buildout (2060)
Development Projections in Current City Limits							
Residential Land Uses				*Occupied Dwelling Units*			
Low Density Residential	6.5%	75	419	419	419	419	419
High Density Residential	6.5%	-	285	566	1,029	1,029	1,029
Subtotal Residential Land Uses		**75**	**704**	**985**	**1,448**	**1,448**	**1,448**
Nonresidential Land Uses				*Occupied Building Square Feet*			
Retail	7.5%	-	300,625	416,250	647,500	668,062	668,062
Subtotal Nonresidential		**-**	**300,625**	**416,250**	**647,500**	**668,062**	**668,062**
Development Projections in Annexation Areas							
Residential Land Uses				*Occupied Dwelling Units*			
Low Density Residential	6.5%	-	-	-	-	-	-
High Density Residential	6.5%	-	-	-	-	-	-
Subtotal Residential Land Uses		**-**	**-**	**-**	**-**	**-**	**-**
Nonresidential Land Uses				*Occupied Building Square Feet*			
Retail	7.5%	-	-	92,500	323,750	555,000	715,684
Subtotal Nonresidential		**-**	**-**	**92,500**	**323,750**	**555,000**	**715,684**
Total City of Stockton Development Projections							
Residential Land Uses				*Occupied Dwelling Units*			
Low Density Residential	6.5%	75	419	419	419	419	419
High Density Residential	6.5%	-	285	566	1,029	1,029	1,029
Subtotal Residential Land Uses		**75**	**704**	**985**	**1,448**	**1,448**	**1,448**
Nonresidential Land Uses				*Occupied Building Square Feet*			
Retail	7.5%	-	300,625	508,750	971,250	1,223,062	1,383,746
Subtotal Nonresidential		**-**	**300,625**	**508,750**	**971,250**	**1,223,062**	**1,383,746**

occupied

Source: California Department of Finance; City of Stockton; Costar; LWA; EPS.

[1] For details pertaining to vacancy rate assumptions, refer to Table A-5.

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Table A-4
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Cumulative Estimated Population and Employees

City of Stockton

Land Use	Assumption [1]	Estimated Population/Employees					
		2020	2025	2030	2040	2050	Buildout (2060)
Project Residents							
Residential Land Uses	*PPH*						
Low Density Residential	3.20	239	1,340	1,340	1,340	1,340	1,340
High Density Residential	2.50	0	713	1,414	2,574	2,574	2,574
Subtotal Residential Land Uses		**239**	**2,053**	**2,754**	**3,914**	**3,914**	**3,914**
Total Resident Population		**239**	**2,053**	**2,754**	**3,914**	**3,914**	**3,914**
Project Employees							
Nonresidential Land Uses	*Sq. Ft. per Emp.*						
Retail	400	0	752	1,272	2,428	3,058	3,459
Subtotal Nonresidential		**0**	**752**	**1,272**	**2,428**	**3,058**	**3,459**
Total Employee Population		**0**	**752**	**1,272**	**2,428**	**3,058**	**3,459**
Project Persons Served		**239**	**2,429**	**3,390**	**5,128**	**5,443**	**5,644**

pop

Source: California Department of Finance; EPS.

[1] For persons per household and square feet per employee assumptions, refer to Table A-5.

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Table A-5
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Land Use Assumptions

City of Stockton

Land Use	Estimated Assessed Value [1]	Property Turnover Rate [2]	Vacancy Rate [3]	Persons Per Household/ Sq. Ft. per Employee [4]
Residential Land Uses [3]	*per Unit*			*PPH*
Low Density Residential	$325,000	14.3%	6.5%	3.20
High Density Residential	$180,000	6.7%	6.5%	2.50
Nonresidential Land Uses	*per Sq. Ft.*			*Sq. Ft. per Emp.*
Retail	$200	5.0%	7.5%	400

lu assum

Source: California Department of Finance; The Gregory Group; City of Stockton; Costar; Colliers, International; CBRE; EPS.

[1] Low Density Residential assessed values are based on sales data of comparable products obtained through The Gregory Group. High density and nonresidential values per square foot based on comparable transaction data obtained from Costar and CBRE.
[2] Owner-occupied residential (low density) assumed to turn over once every 7 years and renter-occupied (high density) residential is assumed to turn over once every 15 years. Nonresidential uses are assumed to turn over once every 20 years.
[3] Residential vacancy rates obtained from the US Census American Community Survey, 2015 estimates, for San Joaquin County. Commercial and industrial vacancy rates based on Q1 2017 Costar and Q4 2016 Colliers International market reports for the Stockton/Modesto area.
[4] Persons per household figures obtained from the US Census American Community Survey, 2015 estimates. Square feet per employee values are based on empirical research for proposed land uses.

APPENDIX B:

General Fund Revenue Analysis

Table B-1	Revenue-Estimating Procedures based on City of Stockton FY 2016-17 Budget	B-1
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Table B-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Revenue-Estimating Procedures Based on City of Stockton FY 2016-17 Budget (2016$)

City of Stockton

Item	Estimating Procedure	Case Study Reference	FY 2016-17 Budgeted General Fund Revenues	Offsetting Revenue	FY 2016-17 Budgeted Net General Fund Revenues	Service Population [1]	Revenue Multiplier
General Fund Revenues							
Taxes							
Property Tax	Case Study	Table B-3	$31,670,000	-	$31,670,000	N/A	-
Property Tax in Lieu of VLF	Case Study	Table B-3	$21,416,000	-	$21,416,000	N/A	-
Property Transfer Tax	Case Study	Table B-4	$720,000	-	$720,000	N/A	-
Sales and Use Tax	Case Study	Table B-5	$45,706,000	-	$45,706,000	N/A	-
Measure A	[2]	-	$30,161,000	-	$30,161,000	N/A	-
Prop. 172 Public Safety Sales Tax	Case Study	Table B-5	$1,517,000	-	$1,517,000	N/A	-
Utility User Taxes	Persons Served	-	$34,070,000	-	$34,070,000	373,242	$91.28
Franchise Taxes	Persons Served	-	$12,808,000	-	$12,808,000	373,242	$34.32
Transient Occupancy Tax	Persons Served	-	$2,700,000	-	$2,700,000	373,242	$7.23
Business License Tax	Persons Served	-	$10,955,000	-	$10,955,000	373,242	$29.35
Total Taxes			**$191,723,000**	**-**	**$191,723,000**	N/A	-
Licenses and Permits	Persons Served	-	$422,693	($353,561)	$69,132	373,242	$0.19
Intergovernmental Revenue	[3]	-	$1,931,128	($197,128)	$1,734,000	N/A	-
Charges for Services	[4]	-	$7,479,252	($7,479,252)	-	N/A	-
Uses of Money and Property	[3]	-	$3,161,133	($226,631)	$2,934,502	N/A	-
Sale of Fixed Assets	[3]	-	$500,000	-	$500,000	N/A	-
Fines and Forfeitures	[4]	-	$858,507	($858,507)	-	N/A	-
Reimbursements/Other Revenue	[3]	-	$6,620,536	($2,301,930)	$4,318,606	N/A	-
Subtotal General Fund Revenue			**$212,696,249**	**($11,417,009)**	**$201,279,240**		
Transfers In	[3]	-	$1,996,094	-	$1,996,094	N/A	-
Total General Fund Revenue			**$214,692,343**	**($11,417,009)**	**$203,275,334**		

rev

Source: City of Stockton Fiscal Year 2016-17 Approved Annual Budget; EPS.

[1] Refer to Table A-1.
[2] Measure A is a 0.75% transaction and use tax approved by voters in November 2013 and is set to expire in 2024 or sooner if certain conditions are met. As it is unknown if Measure A will be extended beyond the initial 10 year period, it has been excluded from this analysis.
[3] These revenue sources are not anticipated to be impacted by development included in this analysis.
[4] Based on the City of Stockton Fiscal Year 2016-17 Approved Annual Budget, these revenue categories are fully offset by expenditures as shown on Table C-1.

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Table B-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Estimated Annual General Fund Revenues (2016$)

City of Stockton

Revenue Category	Case Study Reference	Estimated Annual Revenue (Rounded)					
		2020	2025	2030	2040	2050	Buildout (2060)
General Fund Revenues							
Property Tax	Table B-3	$40,300	$411,700	$548,700	$800,800	$843,900	$869,000
Property Tax in Lieu of VLF	Table B-3	$27,400	$279,600	$383,800	$583,100	$640,500	$677,100
Property Transfer Tax	Table B-4	$2,000	$15,300	$18,500	$24,500	$26,000	$27,000
Sales and Use Tax	Table B-5	$11,400	$733,200	$1,222,100	$2,298,000	$2,867,100	$3,230,200
Prop. 172 Public Safety Sales Tax	Table B-5	$400	$24,300	$40,600	$76,300	$95,200	$107,200
Utility User Taxes	-	$21,800	$221,700	$309,500	$468,100	$496,800	$515,200
Franchise Taxes	-	$8,200	$83,400	$116,300	$176,000	$186,800	$193,700
Transient Occupancy Tax	-	$1,700	$17,600	$24,500	$37,100	$39,400	$40,800
Business License Tax	-	$7,000	$71,300	$99,500	$150,500	$159,700	$165,600
Licenses and Permits	-	-	$400	$600	$900	$1,000	$1,000
Total General Fund Revenue		**$120,200**	**$1,858,500**	**$2,764,100**	**$4,615,300**	**$5,356,400**	**$5,826,800**

rev est

Source: City of Stockton Fiscal Year 2016-17 Approved Annual Budget; EPS.

Table B-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Estimated Annual Property Tax Revenues (2016$)

City of Stockton

Item	Assumption/ Source	Formula	Estimated Property Tax Revenues (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Assessed Value of New Development	Table D-2							
Assessed Value of New Development in Current City Limits		*a*	$26,000,000	$265,487,000	$344,487,000	$483,767,000	$488,212,831	$488,212,831
Assessed Value of New Development in Annexation Area		*b*	-	-	$20,000,000	$70,000,000	$120,000,000	$154,742,544
Total Assessed Value		***c = a + b***	**$26,000,000**	**$265,487,000**	**$364,487,000**	**$553,767,000**	**$608,212,831**	**$642,955,375**
Property Tax Revenue (1% of Assessed Value)	1.0000%							
Property Tax Revenue in Current City Limits		*d = a * 1.00%*	$260,000	$2,654,870	$3,444,870	$4,837,670	$4,882,128	$4,882,128
Property Tax Revenue in Annexation Areas		*e = b * 1.00%*	-	-	$200,000	$700,000	$1,200,000	$1,547,425
Total Property Tax Revenue		***f = d + e***	**$260,000**	**$2,654,870**	**$3,644,870**	**$5,537,670**	**$6,082,128**	**$6,429,554**
Estimated Property Tax Allocation								
Property Tax Allocation in Current City Limits [1]								
City of Stockton General Fund	15.5075%	*g = d * 15.51%*	$40,320	$411,705	$534,215	$750,203	$757,098	$757,098
Other Agencies/ERAF	84.4925%	*h = d * 84.49%*	$219,680	$2,243,165	$2,910,655	$4,087,467	$4,125,030	$4,125,030
Property Tax Allocation in Annexation Areas [2]								
City of Stockton General Fund	7.2320%	*i = e * 7.23%*	-	-	$14,464	$50,624	$86,784	$111,909
Other Agencies/ERAF	92.7680%	*j = e * 92.77%*	-	-	$185,536	$649,376	$1,113,216	$1,435,516
Total City of Stockton General Fund Property Tax		***k = g + i***	**$40,320**	**$411,705**	**$548,678**	**$800,827**	**$843,881**	**$869,007**
Property Tax In-Lieu of Motor Vehicle In-Lieu Fee Revenue (VLF)								
Total Citywide Assessed Value [3]		*l*	$20,337,129,485	$20,337,129,485	$20,337,129,485	$20,337,129,485	$20,337,129,485	$20,337,129,485
Total Assessed Value of Project		*m*	$26,000,000	$265,487,000	$364,487,000	$553,767,000	$608,212,831	$642,955,375
Total Assessed Value		*n = l + m*	**$20,363,129,485**	**$20,602,616,485**	**$20,701,616,485**	**$20,890,896,485**	**$20,945,342,316**	**$20,980,084,860**
Percent Change in AV		*o = m / l*	0.13%	1.31%	1.79%	2.72%	2.99%	3.16%
Property Tax In-Lieu of VLF [4]	**$21,416,000**	***p = o * $21,416,000***	**$27,379**	**$279,571**	**$383,823**	**$583,144**	**$640,478**	**$677,064**

prop tax

Source: City of Stockton; San Joaquin County Auditor-Controller; EPS.

[1] Reflects the average property tax allocation to the City's General Fund for all TRAs within the 200-year flood plain that are within the City's boundary. TRAs include: 003-159, 003-206, 003-238, 003,240, 003-289, 003-312, 003-463, and 003-464.
[2] Refer to Table D-1 for details.
[3] Reflects Assessed Valuation for FY 2016-17. Includes Citywide secured, unsecured, homeowner exemption, and public utility roll.
[4] Property tax in-lieu of VLF amount derived from the City of Stockton FY 2016-17 Annual Budget. Refer to Table B-1 for details.

Table B-4
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Real Property Transfer Tax (2016$)

City of Stockton

Description	Assumption/ Source	Estimated Annual Property Transfer Tax Revenue (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Rate per $1,000 of AV	$0.55						
Project Assessed Value	Table D-2						
Low Density Residential		$26,000,000	$145,587,000	$145,587,000	$145,587,000	$145,587,000	$145,587,000
High Density Residential		-	$54,900,000	$108,900,000	$198,180,000	$198,180,000	$198,180,000
Nonresidential		-	$65,000,000	$110,000,000	$210,000,000	$264,445,831	$299,188,375
Total Assessed Value		**$26,000,000**	**$265,487,000**	**$364,487,000**	**$553,767,000**	**$608,212,831**	**$642,955,375**
Turnover Rate							
Low Density Residential	14.30%						
High Density Residential	6.70%						
Nonresidential	5.00%						
Annual Transfer Tax Revenue [1]							
Low Density Residential		$2,045	$11,450	$11,450	$11,450	$11,450	$11,450
High Density Residential		-	$2,023	$4,013	$7,303	$7,303	$7,303
Nonresidential		-	$1,788	$3,025	$5,775	$7,272	$8,228
Total Annual Transfer Tax Revenue		**$2,045**	**$15,261**	**$18,488**	**$24,528**	**$26,026**	**$26,981**

transfer

Source: City of Stockton; San Joaquin County Auditor-Controller; EPS.

[1] Formula for Transfer Tax = Assessed Value/$1000 * Rate per $1,000 of Assessed Value * Turnover rate.

Table B-5
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Estimated Annual Taxable Sales and Use Tax Revenue (2016$)

City of Stockton

Item	Formula	Source/ Assumptions	Annual Sales Tax Revenue 2020	2025	2030	2040	2050	Buildout (2060)
Estimated Annual Taxable Sales								
Annual Taxable Sales from Market Support (Residents and Employees)	*a*		$1,136,960	$10,600,195	$14,528,133	$21,342,003	$22,021,895	$22,455,742
Annual Taxable Sales from Onsite Commercial Uses	*b*		-	$62,724,433	$107,683,838	$208,455,321	$264,684,682	$300,565,318
Annual Taxable Sales from New Development	*c = a + b*		**$1,136,960**	**$73,324,629**	**$122,211,970**	**$229,797,324**	**$286,706,577**	**$323,021,061**
Annual Sales Tax Revenue								
Bradley Burns Local Sales Tax Revenue	*d = c * 1.0000%*	1.0000%	$11,370	$733,246	$1,222,120	$2,297,973	$2,867,066	$3,230,211
City of Stockton Prop 172 Public Safety Sales Tax Revenue [1]	*e = d * 3.3190%*	3.3190%	$377	$24,337	$40,563	$76,271	$95,159	$107,212

sales

Source: City of Stockton; California State Board of Equalization; EPS.

[1] Calculated as the ratio of Proposition 172 Public Safety Tax revenue to total sales tax revenue based on the FY 2016-17 Budget. Any variation in the relationship between Proposition 172 Public Safety Tax revenue and total sales tax revenue affecting the estimate of this revenue source is estimated to be nominal.

Table B-5A
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Estimated Annual Taxable Sales from Proposed Development, Market Support Method (2016$)

City of Stockton

Annual Taxable Sales from Market Support	Assumption	Estimated Annual Taxable Sales (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Annual Taxable Sales from New Residents							
Residential Development	Table A-3			*Occupied Dwelling Units*			
Low Density Residential		75	419	419	419	419	419
High Density Residential		-	285	566	1,029	1,029	1,029
Total Residential Development		**75**	**704**	**985**	**1,448**	**1,448**	**1,448**
Taxable Retail Expenditures	*per Household [1]*			*Taxable Retail Expenditures*			
Low Density Residential	$19,000	$1,421,200	$7,958,009	$7,958,009	$7,958,009	$7,958,009	$7,958,009
High Density Residential	$15,000	-	$4,277,625	$8,485,125	$15,441,525	$15,441,525	$15,441,525
Total Taxable Retail Expenditures		**$1,421,200**	**$12,235,634**	**$16,443,134**	**$23,399,534**	**$23,399,534**	**$23,399,534**
Estimated Citywide Capture from New Households [2]	**80%**	**$1,136,960**	**$9,788,508**	**$13,154,508**	**$18,719,628**	**$18,719,628**	**$18,719,628**
Estimated Taxable Sales inside Project Area [3]	50%	-	$4,894,254	$6,577,254	$9,359,814	$9,359,814	$9,359,814
Estimated Taxable Sales outside Project Area	50%	$1,136,960	$4,894,254	$6,577,254	$9,359,814	$9,359,814	$9,359,814
Annual Taxable Sales from New Employment							
Taxable Sales from New Employment							
Employees	Table A-4	-	752	1,272	2,428	3,058	3,459
Average Daily Taxable Sales per New Employee	$10.00						
Work Days per Year	240						
Taxable Sales from New Employees [4]	50%						
Total Taxable Sales from New Employees		**-**	**$901,875**	**$1,526,250**	**$2,913,750**	**$3,669,186**	**$4,151,239**
Estimated Citywide Capture from New Employees [2]	**90%**	**-**	**$811,688**	**$1,373,625**	**$2,622,375**	**$3,302,267**	**$3,736,115**
Estimated Taxable Sales inside Project Area	70%	-	$568,181	$961,538	$1,835,663	$2,311,587	$2,615,280
Estimated Taxable Sales outside Project Area	30%	-	$243,506	$412,088	$786,713	$990,680	$1,120,834
Total Annual Taxable Sales from Market Support		**$1,136,960**	**$10,600,195**	**$14,528,133**	**$21,342,003**	**$22,021,895**	**$22,455,742**
Taxable City Sales inside Project Area		-	$5,462,435	$7,538,791	$11,195,476	$11,671,401	$11,975,094
Taxable City Sales outside Project Area		$1,136,960	$5,137,760	$6,989,341	$10,146,526	$10,350,494	$10,480,648

sales a

Source: Costar; Gregory Group; Bureau of Labor Statistics; City of Stockton; EPS.

[1] For details pertaining to resident and employee estimates, refer to Table A-4.
[2] Represents the portion of household and employee retail expenditures estimated to take place within the City of Stockton.
[3] As no commercial development is anticipated until the second phase on development, it is assumed that no household spending can occur within the project area until this time.
[4] Taxable sales from employees discounted by 50 percent to account for employees who are also residents.

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Table B-5B
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Estimated Annual Taxable Sales from Onsite Nonresidential (2016$)

City of Stockton

Item	Annual Taxable Sales per Sq. Ft. [1]	Estimated Annual Taxable Sales (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Annual Taxable Sales from Onsite Commercial Development							
Retail	$250	-	$75,156,250	$127,187,500	$242,812,500	$305,765,492	$345,936,559
Total		**-**	**$75,156,250**	**$127,187,500**	**$242,812,500**	**$305,765,492**	**$345,936,559**
Less Total Annual Taxable Sales from Market Support (within the Project) [2]		-	$5,462,435	$7,538,791	$11,195,476	$11,671,401	$11,975,094
Annual Sales Less Market Support		**-**	**$69,693,815**	**$119,648,709**	**$231,617,024**	**$294,094,091**	**$333,961,465**
	Shift from Existing Retail						
Less Shift of Sales from Existing Regional and Community Retail to the Project [3]	10%	-	$6,969,381	$11,964,871	$23,161,702	$29,409,409	$33,396,146
Total Nonresidential Taxable Sales		**-**	**$62,724,433**	**$107,683,838**	**$208,455,321**	**$264,684,682**	**$300,565,318**

sales b

Source: U.S. Department of Labor Bureau of Labor Statistics; Urban Land Institute; EPS.

[1] Commercial taxable sales assumptions based on an analysis of data from ULI's Dollars & Cents of Shopping Centers: 2008 and escalated to current dollars. Industrial taxable sales per square foot based on research of industrial development, this analysis includes a conservative taxable sales per square foot assumption representing onsite business-to-business sales activity.
[2] Estimated in Table B-5A.
[3] Represents a discount factor to account for taxable sales transactions that may shift from the City's existing retail centers to those included in the Project.

APPENDIX C:

General Fund Expenditure Analysis

Table C-1 Expenditure-Estimating Procedures based on City of Stockton FY 2016–17 Budget C-1

Table C-2 Estimated Annual General Fund Expenditures C-2

Table C-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Expenditure-Estimating Procedures Based on City of Stockton FY 2016-17 Budget (2016$)

City of Stockton

Item	Estimating Procedure	FY 2016-17 Budgeted Expenditures [1]	Less Offsetting Revenue	FY 2016-17 Net City Expenditures	Population or Persons Served	FY 2016-17 Avg. Cost	Adjustment Factor [2]	Net FY 2016-17 Avg. Cost
General Fund								
General Government Administration	Persons Served	$18,796,098	($276,745)	$18,519,353	373,242	$49.62	100%	$49.62
Police Services	Persons Served	$117,259,634	($7,182,962)	$110,076,672	373,242	$294.92	100%	$294.92
Fire Services	Persons Served	$41,494,183	($3,803,621)	$37,690,562	373,242	$100.98	100%	$100.98
Public Works	Persons Served	$11,717,575	($29,750)	$11,687,825	373,242	$31.31	100%	$31.31
Economic Development	Persons Served	$3,350,666	($123,931)	$3,226,735	373,242	$8.65	100%	$8.65
Office of Violence Prevention	Persons Served	$1,475,682	-	$1,475,682	373,242	$3.95	100%	$3.95
Library	Per Capita	$4,504,000	-	$4,504,000	315,592	$14.27	100%	$14.27
Recreation	Per Capita	$3,915,000	-	$3,915,000	315,592	$12.41	100%	$12.41
Entertainment Venues	Per Capita	$3,445,000	-	$3,445,000	315,592	$10.92	100%	$10.92
RDA Successor Agency	[3]	$200,000	-	$200,000	N/A	-	100%	-
Downtown Marina	Per Capita	$170,000	-	$170,000	315,592	$0.54	100%	$0.54
Capital Improvement	[3]	$1,933,000	-	$1,933,000	N/A	-	100%	-
Golf Courses	Per Capita	$650,000	-	$650,000	315,592	$2.06	100%	$2.06
Grant Match	[3]	$300,000	-	$300,000	N/A	-	100%	-
Development Services	Persons Served	$1,000,000	-	$1,000,000	373,242	$2.68	100%	$2.68
Subtotal Annual General Fund Expenditures		**$210,210,838**	**($11,417,009)**	**$198,793,829**				
Debt Service	[3]	$1,443,873	-	$1,443,873	N/A	-	100%	-
Contingency	[3]	$2,000,000	-	$2,000,000	N/A	-	100%	-
Total Annual General Fund Expenditures		**$213,654,711**	**($11,417,009)**	**$202,237,702**				

exp

Source: City of Stockton Fiscal Year 2016-17 Approved Annual Budget; City of Stockton; EPS.

[1] Represents the approved FY 2016-17 budgeted expenditures as ammended by the July, 2016 labor Memorandum of Understanding between the City of Stockton and the Stockton Police Officers Association and Fire Services Management Unit.
[2] An adjustment factor may be used to reflect the fact that new employees may not increase certain General Fund department expenditures at a 1:1 ratio. This analysis does not assume an adjustment.
[3] This expenditure category is not expected to be affected by the project and not evaluated as part of this analysis.

Table C-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Estimated Annual General Fund Expenditures (2016$)

City of Stockton

Expenditure Category	Estimated Annual Expenditure [1]					
	2020	2025	2030	2040	2050	Buildout (2060)
General Fund						
General Government Administration	$11,876	$120,522	$168,224	$254,436	$270,054	$280,020
Police Services	$70,592	$716,366	$999,904	$1,512,336	$1,605,166	$1,664,403
Fire Services	$24,171	$245,286	$342,370	$517,828	$549,614	$569,896
Public Works	$7,495	$76,063	$106,169	$160,578	$170,435	$176,725
Economic Development	$2,069	$20,999	$29,311	$44,332	$47,053	$48,790
Office of Violence Prevention	$946	$9,604	$13,405	$20,274	$21,519	$22,313
Library	$3,416	$29,303	$39,311	$55,857	$55,857	$55,857
Recreation	$2,969	$25,471	$34,170	$48,553	$48,553	$48,553
Entertainment Venues	$2,613	$22,413	$30,068	$42,724	$42,724	$42,724
Downtown Marina	$129	$1,106	$1,484	$2,108	$2,108	$2,108
Golf Courses	$493	$5,003	$6,983	$10,562	$11,210	$11,624
Development Services	$641	$6,508	$9,084	$13,739	$14,582	$15,120
Total Annual General Fund Expenditures	**$127,412**	**$1,278,643**	**$1,780,482**	**$2,683,327**	**$2,838,875**	**$2,938,132**

exp est

Source: City of Stockton Fiscal Year 2016-17 Approved Annual Budget; EPS.

[1] Annual expenditure estimated on a per persons served or per capita basis. Refer to Table C-1 for estimating procedure and Table A-5 for population and employment estimates.

APPENDIX D:

Supporting Tables for Revenue and Expenditure Analyses

Table D-1 Preliminary Property Tax Allocations for Annexation Area D-1

Table D-2 Cumulative Assessed Valuation D-2

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Table D-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Preliminary Property Tax Allocations for Annexation Area

City of Stockton

Tax Code	Entity	Existing Tax Rate Area (TRA) Post-ERAF Distribution [1]		Gross Revenue (FY 2016-17) [1]			Property Tax Sharing Agreement [2]	Post Annexation Average	
		TRA 102-135	TRA 102-032	TRA 102-135	TRA 102-032	Total		Base Revenue	Post-ERAF Distribution
Formula		*a*	*b*	*e*	*f*	*g = e + f*	*h*	*e = d * $278,126*	*f = e / $769,158*
Subject to Detachment									
10001	County General	22.29650%	22.30610%	$172,291	($796)	$171,495	80%	$222,501	28.92784%
10527	Road District 1	4.26040%	4.26030%	$32,921	($152)	$32,769	-	-	0.00000%
14401	French Camp-Mc Kinley Rural Fire	9.60300%	9.60300%	$74,205	($343)	$73,862	-	-	0.00000%
40400	City of Stockton	0.00000%	0.00000%	-	-	-	20%	$55,625	7.23196%
	Subtotal	**36.15990%**	**36.16940%**	**$279,417**	**($1,291)**	**$278,126**	**100%**	**$278,126**	**36.15980%**
Not Subject to Detachment									
10618	County Library	1.80010%	1.80010%	$13,910	($64)	$13,846	-	$13,846	1.80013%
12601	Manteca Unified Schools	29.58380%	29.58380%	$228,602	($1,056)	$227,546	-	$227,546	29.58378%
13001	S.J. Delta Comm College	4.00510%	4.00510%	$30,949	($143)	$30,806	-	$30,806	4.00514%
13201	County Office Of Education	1.43850%	1.42890%	$11,116	($51)	$11,065	-	$11,065	1.43855%
16001	Sjc Flood Control	0.17560%	0.17570%	$1,357	($6)	$1,351	-	$1,351	0.17564%
21901	Sjc Mosquito Abatement	0.78840%	0.78840%	$6,092	($28)	$6,064	-	$6,064	0.78838%
41100	ERAF - Educational Revenue Augmentation Fund	26.04860%	26.04860%	$201,285	($930)	$200,355	-	$200,355	26.04859%
	Subtotal	**63.84010%**	**63.83060%**	**$493,311**	**($2,279)**	**$491,032**	-	**$491,032**	**63.84020%**
Total		**100.00000%**	**100.00000%**	**$772,729**	**($3,570)**	**$769,158**	**100%**	**$769,158**	**100.00000%**

TRA

Source: San Joaquin County Auditor-Controller; EPS.

[1] Provided by the San Joaquin County Auditor-Controller.
[2] Based on the most recent tax-sharing agreement between San Joaquin County and the City of Stockton dated March 2005 related to annexed areas to the City.

Table D-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Cumulative Assessed Valuation (2016$)

City of Stockton

Item	Rounded Value per Unit/Sq. Ft. [1]	Total Assessed Value (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Development Projections in Current City Limits							
Residential Land Uses	*per Unit*						
Low Density Residential	$325,000	$26,000,000	$145,587,000	$145,587,000	$145,587,000	$145,587,000	$145,587,000
High Density Residential	$180,000	-	$54,900,000	$108,900,000	$198,180,000	$198,180,000	$198,180,000
Subtotal Residential		**$26,000,000**	**$200,487,000**	**$254,487,000**	**$343,767,000**	**$343,767,000**	**$343,767,000**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	-	$65,000,000	$90,000,000	$140,000,000	$144,445,831	$144,445,831
Subtotal Nonresidential		**-**	**$65,000,000**	**$90,000,000**	**$140,000,000**	**$144,445,831**	**$144,445,831**
Total All Land Uses		**$26,000,000**	**$265,487,000**	**$344,487,000**	**$483,767,000**	**$488,212,831**	**$488,212,831**
Development Projections in Annexation Areas							
Residential Land Uses	*per Unit*						
Low Density Residential	$325,000	-	-	-	-	-	-
High Density Residential	$180,000	-	-	-	-	-	-
Subtotal Residential		**-**	**-**	**-**	**- - -**		
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	-	-	$20,000,000	$70,000,000	$120,000,000	$154,742,544
Subtotal Nonresidential		**-**	**-**	**$20,000,000**	**$70,000,000**	**$120,000,000**	**$154,742,544**
Total All Land Uses		**-**	**-**	**$20,000,000**	**$70,000,000**	**$120,000,000**	**$154,742,544**
Total City of Stockton Development Projections							
Residential Land Uses	*per Unit*						
Low Density Residential	$325,000	$26,000,000	$145,587,000	$145,587,000	$145,587,000	$145,587,000	$145,587,000
High Density Residential	$180,000	-	$54,900,000	$108,900,000	$198,180,000	$198,180,000	$198,180,000
Subtotal Residential		**$26,000,000**	**$200,487,000**	**$254,487,000**	**$343,767,000**	**$343,767,000**	**$343,767,000**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	-	$65,000,000	$110,000,000	$210,000,000	$264,445,831	$299,188,375
Subtotal Nonresidential		**-**	**$65,000,000**	**$110,000,000**	**$210,000,000**	**$264,445,831**	**$299,188,375**
Total All Land Uses		**$26,000,000**	**$265,487,000**	**$364,487,000**	**$553,767,000**	**$608,212,831**	**$642,955,375**

AV

Source: Costar; CBRE; The Gregory Group; EPS.

[1] Refer to Table A-5 for details.

Table D-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - City of Stockton
Estimated Average Annual Household Income (2016$)

City of Stockton

Residential Land Use	Estimated Home Value [1]	Total Annual Mortgage or Rent [2]	Estimated Household Income [3]	Taxable Expenditures as a Percent of Income [4]	Annual Taxable Expenditures per Household (Rounded)
Owner-Occupied Residential					
Low Density Residential	$325,000	$23,249	$66,000	29%	$19,000
Renter-Occupied Residential					
High Density Residential	$180,000	$18,000	$51,000	29%	$15,000

income

Source: Costar; Gregory Group; Bureau of Labor Statistics; EPS.

[1] See Table A-5 for detail on estimated values for residential units.
[2] Based on a 5%, 30-year fixed-rate mortgage with a 20% down payment, $150 monthly Homeowner's association dues and 2% annual taxes and insurance.
High density residential based on an average monthly rent assumption of $1,500 based on data on similar multifamily residential obtained from Costar with an average unit size of 1,000 square feet.
[3] Assumes 35% of income dedicated to housing costs (mortgage, taxes, insurance, and HOA dues) or rent payments. Rounded to the nearest $1,000.
[4] Based on household expenditures data from the Bureau of Labor Statistics, 2015 Consumer Expenditure Survey.

DRAFT Discussion Tables

RD 17 Area Finance Plan Implementation

Fiscal Impact Analysis—San Joaquin County

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August 21, 2017

EPS #162095

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Table 1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Summary of Annual Surplus/Deficits (2016$)

San Joaquin County

Item	Estimated Annual Revenues/Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
Annual Fiscal Impact						
Annual General Fund Revenues	$2,529,000	$7,273,000	$13,201,000	$20,636,000	$26,592,000	$30,230,000
Annual General Fund Expenditures	$1,405,000	$3,960,000	$6,025,000	$9,116,000	$12,648,000	$14,778,000
Net General Fund Surplus/(Deficit)	**$1,124,000**	**$3,313,000**	**$7,176,000**	**$11,520,000**	**$13,944,000**	**$15,452,000**

sum

Source: EPS.

1

Table 2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Estimated Annual Revenues and Expenditures (2016$)

San Joaquin County

Item	Estimated Annual Revenues/Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
Annual General Fund Revenues						
Property Tax	$1,581,300	$4,130,900	$7,139,400	$10,964,600	$14,389,100	$16,393,200
Property Tax in Lieu of VLF	$723,400	$2,206,400	$4,034,700	$6,083,800	$7,787,900	$8,955,100
Property Transfer Tax	$49,700	$129,100	$206,600	$300,300	$422,800	$489,100
Prop. 172 Public Safety Sales Tax	$143,000	$717,600	$1,682,600	$3,076,400	$3,701,900	$4,053,600
Licenses, Permits, and Franchise	$15,700	$44,000	$67,800	$104,500	$143,700	$167,500
Motor Vehicle License Fee	$1,400	$4,000	$5,700	$7,700	$11,300	$13,400
Fines, Forfeitures and Penalties	$14,800	$41,400	$63,800	$98,500	$135,400	$157,800
Total General Fund Revenue	**$2,529,300**	**$7,273,400**	**$13,200,600**	**$20,635,800**	**$26,592,100**	**$30,229,700**
Annual General Fund Expenditures						
General Government						
Legislative & Administrative	$50,800	$142,500	$219,500	$338,600	$465,400	$542,700
Finance	$196,700	$551,700	$849,600	$1,310,900	$1,801,600	$2,100,700
County Counsel	$8,900	$25,100	$38,600	$59,500	$81,800	$95,400
Human Resources	$8,500	$23,700	$36,500	$56,300	$77,400	$90,300
Elections	$18,800	$52,800	$81,300	$125,400	$172,300	$200,900
Property Management	$42,100	$118,100	$181,800	$280,500	$385,600	$449,600
Other General	$34,400	$96,500	$148,700	$229,400	$315,300	$367,600
Total General Government	**$360,200**	**$1,010,400**	**$1,556,000**	**$2,400,600**	**$3,299,400**	**$3,847,200**
Public Protection						
Judicial	$260,600	$730,900	$1,125,700	$1,736,800	$2,387,000	$2,783,200
Police Protection	$140,500	$394,000	$606,800	$936,200	$1,286,700	$1,500,300
Detention and Corrections	$379,200	$1,063,800	$1,638,300	$2,527,700	$3,474,000	$4,050,600
Protective Inspection	$24,800	$69,600	$107,100	$165,300	$227,200	$264,900
Other Protection	$12,700	$35,500	$54,700	$84,400	$115,900	$135,200
Total Public Protection	**$817,800**	**$2,293,800**	**$3,532,600**	**$5,450,400**	**$7,490,800**	**$8,734,200**

Table 2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Estimated Annual Revenues and Expenditures (2016$)

San Joaquin County

Item	Estimated Annual Revenues/Expenditures (Rounded)					
	2020	2025	2030	2040	2050	Buildout (2060)
Health and Sanitation						
Health Services	$98,000	$282,700	$403,900	$545,800	$800,900	$947,200
Total Health and Sanitation	**$98,000**	**$282,700**	**$403,900**	**$545,800**	**$800,900**	**$947,200**
Public Assistance						
Administration	$55,500	$159,900	$228,500	$308,800	$453,100	$535,900
Aid Programs	$3,700	$10,600	$15,200	$20,500	$30,100	$35,500
General Relief	$18,800	$54,100	$77,300	$104,500	$153,300	$181,300
Other Assistance	$34,000	$98,100	$140,100	$189,400	$277,900	$328,600
Veterans Services	$1,200	$3,500	$5,100	$6,800	$10,000	$11,900
Total Public Assistance	**$113,200**	**$326,200**	**$466,200**	**$630,000**	**$924,400**	**$1,093,200**
Education						
Agriculture Education	$2,000	$6,000	$8,000	$11,000	$17,000	$20,000
Total Education	**$2,000**	**$6,000**	**$8,000**	**$11,000**	**$17,000**	**$20,000**
Recreation						
Recreation Services	$12,000	$35,000	$50,000	$67,000	$98,000	$116,000
Cultural Services	$2,000	$6,000	$8,000	$11,000	$17,000	$20,000
Total Recreation	**$14,000**	**$41,000**	**$58,000**	**$78,000**	**$115,000**	**$136,000**
Total General Fund Expenditures	**$1,405,200**	**$3,960,100**	**$6,024,700**	**$9,115,800**	**$12,647,500**	**$14,777,800**
Net General Fund Surplus/(Deficit)	**$1,124,100**	**$3,313,300**	**$7,175,900**	**$11,520,000**	**$13,944,600**	**$15,451,900**

det sum

Source: EPS.

APPENDICES:

Appendix A: General Assumptions

Appendix B: General Fund Revenue Analysis

Appendix C: General Fund Expenditure Analysis

Appendix D: Supporting Tables for Revenue and Expenditure Analyses

APPENDIX A:

General Assumptions

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Table A-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
General Assumptions

	San Joaquin County

Item	Assumption
General Assumptions	
Base Fiscal Year [1]	FY 2016-17
General Demographic Characteristics	
San Joaquin County	
Population [2]	733,383
Employees [3]	250,100
San Joaquin County Persons Served [4]	**858,433**

gen assumps

Source: California Department of Finance; EDD; U.S. Census LED; EPS.

[1] Reflects the County of San Joaquin Fiscal Year 2016-17 adopted budget. Revenues and expenditures are in 2016 dollars. This analysis does not reflect changes in values resulting from inflation or appreciation.
[2] Based on population estimates from the California Department of Finance (DOF) data
[3] US Census Onthemap.ces.census.gov estimated a total of 215,186 jobs in San Joaquin County in 2014. California EDD reports an annual average growth rate of 2.79% since 2014 for the Stockton-Lodi MSA. EPS escalated 2014 employment figure to arrive at 2016 employment estimate, adjusted by an additional 10% to account for self-employed workers, and rounded to the nearest hundred employees.
[4] Persons served is defined as total population plus half of total employees. Used to estimate specific revenues and expenditures that are assumed to be impacted by growth in resident and employment populations and to avoid double counting of employees who reside in the City.

Table A-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Cumulative Land Use Projections

San Joaquin County

	Cumulative Dwelling Units/Square Footage											
	2020 [1]		2025		2030		2040		2050		Buildout (2060)	
Land Use	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.
Development Projections in Current City Limits [2]												
Residential Land Uses [4]												
Owner-Occupied Residential												
Low Density Residential	421	-	1,435	-	1,949	-	3,076	-	4,367	-	4,699	-
Medium Density Residential	27	-	124	-	221	-	277	-	291	-	304	-
Variable Density Residential	600	-	1,326	-	2,235	-	2,235	-	3,550	-	4,864	-
Subtotal Owner-Occupied Residential	**1,048**	**-**	**2,885**	**-**	**4,405**	**-**	**5,588**	**-**	**8,207**	**-**	**9,867**	**-**
Renter-Occupied Residential												
Residential/Mixed Use	-	-	-	-	-	-	-	-	326	-	651	-
Variable Density Residential Flex	-	-	-	-	-	-	-	-	214	-	428	-
High Density Residential	301	-	1,382	-	1,689	-	2,199	-	2,253	-	2,307	-
Subtotal Renter-Occupied Residential	**301**	**-**	**1,382**	**-**	**1,689**	**-**	**2,199**	**-**	**2,793**	**-**	**3,386**	**-**
Subtotal Residential	**1,349**	**-**	**4,267**	**-**	**6,094**	**-**	**7,787**	**-**	**10,999**	**-**	**13,253**	**-**
Nonresidential Land Uses												
Retail	-	66,647	-	629,514	-	1,606,851	-	2,859,336	-	3,193,453	-	3,340,403
Service Commercial	-	266,587	-	818,057	-	3,227,404	-	4,508,983	-	4,968,388	-	5,427,794
Office	-	124,146	-	251,559	-	610,439	-	1,689,692	-	2,089,573	-	2,489,454
Industrial	-	326,700	-	753,400	-	1,664,863	-	5,585,263	-	5,585,263	-	5,585,263
Light Industrial/R&D Flex	-	-	-	-	-	547,549	-	2,190,197	-	2,190,197	-	2,190,197
Subtotal Nonresidential	**-**	**784,080**	**-**	**2,452,530**	**-**	**7,657,106**	**-**	**16,833,471**	**-**	**18,026,875**	**-**	**19,033,111**
Total All Land Uses	**1,349**	**784,080**	**4,267**	**2,452,530**	**6,094**	**7,657,106**	**7,787**	**16,833,471**	**10,999**	**18,026,875**	**13,253**	**19,033,111**
Development Projections in Annexation Areas [2]												
Residential Land Uses [4]												
Owner-Occupied Residential												
Low Density Residential	140	-	140	-	140	-	620	-	1,241	-	1,241	-
Medium Density Residential	-	-	-	-	-	-	-	-	-	-	-	-
Variable Density Residential	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Owner-Occupied Residential	**140**	**-**	**140**	**-**	**140**	**-**	**620**	**-**	**1,241**	**-**	**1,241**	**-**
Renter-Occupied Residential												
Residential/Mixed Use	-	-	-	-	-	-	-	-	-	-	-	-
Variable Density Residential Flex	-	-	-	-	-	-	-	-	-	-	-	-
High Density Residential	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Renter-Occupied Residential	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Residential	**140**	**-**	**140**	**-**	**140**	**-**	**620**	**-**	**1,241**	**-**	**1,241**	**-**
Nonresidential Land Uses												
Retail	-	-	-	-	-	100,000	-	350,000	-	611,500	-	796,712
Service Commercial	-	-	-	-	-	-	-	-	-	45,999	-	91,999
Office	-	-	-	-	-	-	-	-	-	-	-	-
Industrial	-	-	-	-	-	-	-	-	-	-	-	-
Light Industrial/R&D Flex	-	1,790,005	-	2,658,031	-	2,658,031	-	2,658,031	-	2,781,524	-	2,905,016
Subtotal Nonresidential	**-**	**1,790,005**	**-**	**2,658,031**	**-**	**2,758,031**	**-**	**3,008,031**	**-**	**3,439,023**	**-**	**3,793,728**
Total All Land Uses	**140**	**1,790,005**	**140**	**2,658,031**	**140**	**2,758,031**	**620**	**3,008,031**	**1,241**	**3,439,023**	**1,241**	**3,793,728**

Table A-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Cumulative Land Use Projections

San Joaquin County

Land Use	Cumulative Dwelling Units/Square Footage											
	2020 [1]		2025		2030		2040		2050		Buildout (2060)	
	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.	Dwelling Units	Building Sq. Ft.
Total San Joaquin County Development Projections												
Residential Land Uses [4]												
Owner-Occupied Residential												
Low Density Residential	561	-	1,575	-	2,089	-	3,696	-	5,608	-	5,940	-
Medium Density Residential	27	-	124	-	221	-	277	-	291	-	304	-
Variable Density Residential	600	-	1,326	-	2,235	-	2,235	-	3,550	-	4,864	-
Subtotal Owner-Occupied Residential	**1,188**	**-**	**3,025**	**-**	**4,545**	**-**	**6,208**	**-**	**9,448**	**-**	**11,108**	**-**
Renter-Occupied Residential												
Residential/Mixed Use	-	-	-	-	-	-	-	-	326	-	651	-
Variable Density Residential Flex	-	-	-	-	-	-	-	-	214	-	428	-
High Density Residential	301	-	1,382	-	1,689	-	2,199	-	2,253	-	2,307	-
Subtotal Renter-Occupied Residential	**301**	**-**	**1,382**	**-**	**1,689**	**-**	**2,199**	**-**	**2,793**	**-**	**3,386**	**-**
Subtotal Residential	**1,489**	**-**	**4,407**	**-**	**6,234**	**-**	**8,407**	**-**	**12,240**	**-**	**14,494**	**-**
Nonresidential Land Uses												
Retail	-	66,647	-	629,514	-	1,706,851	-	3,209,336	-	3,804,953	-	4,137,115
Service Commercial	-	266,587	-	818,057	-	3,227,404	-	4,508,983	-	5,014,388	-	5,519,793
Office	-	124,146	-	251,559	-	610,439	-	1,689,692	-	2,089,573	-	2,489,454
Industrial	-	326,700	-	753,400	-	1,664,863	-	5,585,263	-	5,585,263	-	5,585,263
Light Industrial/R&D Flex	-	1,790,005	-	2,658,031	-	3,205,580	-	4,848,228	-	4,971,721	-	5,095,213
Subtotal Nonresidential	**-**	**2,574,085**	**-**	**5,110,561**	**-**	**10,415,137**	**-**	**19,841,502**	**-**	**21,465,898**	**-**	**22,826,838**
Total All Land Uses	**1,489**	**2,574,085**	**4,407**	**5,110,561**	**6,234**	**10,415,137**	**8,407**	**19,841,502**	**12,240**	**21,465,898**	**14,494**	**22,826,838**

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Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; LWA; EPS.

[1] The time span for development included in this analysis is 2018 to 2060.
[2] Includes development projections in incorporated cities of Lathrop, Manteca, and Stockton
[3] Includes development projections in the future Stockton annexation area, the future Manteca Annexation area, and the Oakwood Shores and South Lathrop developments.
[4] For purposes of this analysis, residential units were categorized as owner- or renter-occupied based on assumed density.

Table A-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Cumulative Occupied Dwelling Units and Building Square Footage

San Joaquin County

Land Use	Vacancy Rate [1]	Occupied Dwelling Units/Building Square Feet 2020	2025	2030	2040	2050	Buildout (2060)
Development Projections in Current City Limits							
Residential Land Uses				*Occupied Dwelling Units*			
Owner-Occupied Residential							
Low Density Residential	6.5%	394	1,342	1,822	2,876	4,083	4,394
Medium Density Residential	6.5%	25	116	207	259	272	284
Variable Density Residential	6.5%	561	1,240	2,090	2,090	3,319	4,548
Subtotal Owner-Occupied Residential		**980**	**2,697**	**4,119**	**5,225**	**7,674**	**9,226**
Renter-Occupied Residential							
Residential/Mixed Use	6.5%	-	-	-	-	304	609
Variable Density Residential Flex	6.5%	-	-	-	-	200	400
High Density Residential	6.5%	281	1,292	1,579	2,056	2,107	2,157
Subtotal Renter-Occupied Residential		**281**	**1,292**	**1,579**	**2,056**	**2,611**	**3,166**
Subtotal Residential		**1,261**	**3,990**	**5,698**	**7,281**	**10,284**	**12,392**
Nonresidential Land Uses				*Occupied Building Square Feet*			
Retail	7.5%	61,648	582,301	1,486,337	2,644,886	2,953,944	3,089,873
Service Commercial	7.5%	246,593	756,703	2,985,349	4,170,809	4,595,759	5,020,709
Office	7.5%	114,835	232,692	564,656	1,562,965	1,932,855	2,302,745
Industrial	7.5%	302,198	696,895	1,539,998	5,166,368	5,166,368	5,166,368
Light Industrial/R&D Flex	7.5%	-	-	506,483	2,025,932	2,025,932	2,025,932
Subtotal Nonresidential		**725,274**	**2,268,590**	**7,082,823**	**15,570,960**	**16,674,859**	**17,605,627**
Development Projections in Annexation Areas							
Residential Land Uses				*Occupied Dwelling Units*			
Owner-Occupied Residential							
Low Density Residential	6.5%	131	131	131	580	1,160	1,160
Medium Density Residential	6.5%	-	-	-	-	-	-
Variable Density Residential	6.5%	-	-	-	-	-	-
Subtotal Owner-Occupied Residential		**131**	**131**	**131**	**580**	**1,160**	**1,160**
Renter-Occupied Residential							
Residential/Mixed Use	6.5%	-	-	-	-	-	-
Variable Density Residential Flex	6.5%	-	-	-	-	-	-
High Density Residential	6.5%	-	-	-	-	-	-
Subtotal Renter-Occupied Residential		**-**	**-**	**-**	**-**	**-**	**-**
Subtotal Residential		**131**	**131**	**131**	**580**	**1,160**	**1,160**
Nonresidential Land Uses				*Occupied Building Square Feet*			
Retail	7.5%	-	-	92,500	323,750	565,637	736,959
Service Commercial	7.5%	-	-	-	-	42,549	85,099
Office	7.5%	-	-	-	-	-	-
Industrial	7.5%	-	-	-	-	-	-
Light Industrial/R&D Flex	7.5%	1,655,754	2,458,679	2,458,679	2,458,679	2,572,910	2,687,140
Subtotal Nonresidential		**1,655,754**	**2,458,679**	**2,551,179**	**2,782,429**	**3,181,096**	**3,509,198**

Table A-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Cumulative Occupied Dwelling Units and Building Square Footage

San Joaquin County

Land Use	Vacancy Rate [1]	Occupied Dwelling Units/Building Square Feet 2020	2025	2030	2040	2050	Buildout (2060)
Total San Joaquin County Development Projections							
Residential Land Uses				*Occupied Dwelling Units*			
Owner-Occupied Residential							
Low Density Residential	6.5%	525	1,473	1,953	3,456	5,243	5,554
Medium Density Residential	6.5%	25	116	207	259	272	284
Variable Density Residential	6.5%	561	1,240	2,090	2,090	3,319	4,548
Subtotal Owner-Occupied Residential		**1,111**	**2,828**	**4,250**	**5,804**	**8,834**	**10,386**
Renter-Occupied Residential							
Residential/Mixed Use	6.5%	-	-	-	-	304	609
Variable Density Residential Flex	6.5%	-	-	-	-	200	400
High Density Residential	6.5%	281	1,292	1,579	2,056	2,107	2,157
Subtotal Renter-Occupied Residential		**281**	**1,292**	**1,579**	**2,056**	**2,611**	**3,166**
Subtotal Residential		**1,392**	**4,121**	**5,829**	**7,861**	**11,445**	**13,552**
Nonresidential Land Uses				*Occupied Building Square Feet*			
Retail	7.5%	61,648	582,301	1,578,837	2,968,636	3,519,582	3,826,832
Service Commercial	7.5%	246,593	756,703	2,985,349	4,170,809	4,638,309	5,105,808
Office	7.5%	114,835	232,692	564,656	1,562,965	1,932,855	2,302,745
Industrial	7.5%	302,198	696,895	1,539,998	5,166,368	5,166,368	5,166,368
Light Industrial/R&D Flex	7.5%	1,655,754	2,458,679	2,965,162	4,484,611	4,598,842	4,713,072
Subtotal Nonresidential		**2,381,028**	**4,727,269**	**9,634,002**	**18,353,389**	**19,855,955**	**21,114,825**

occupied

Source: California Department of Finance; San Joaquin County; Costar; LWA; EPS.

[1] For details pertaining to vacancy rate assumptions, refer to Table A-5.

Table A-4
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Cumulative Estimated Population and Employees

San Joaquin County

Land Use	Assumption [1]	Estimated Population/Employees 2020	2025	2030	2040	2050	Buildout (2060)
Project Residents							
Residential Land Uses	*PPH*						
Owner-Occupied Residential							
Low Density Residential	3.20	1,679	4,712	6,250	11,058	16,779	17,772
Medium Density Residential	3.20	81	371	661	829	869	910
Variable Density Residential	3.20	1,795	3,967	6,687	6,687	10,620	14,553
Subtotal Owner-Occupied Residential		**3,555**	**9,050**	**13,598**	**18,574**	**28,268**	**33,235**
Renter-Occupied Residential							
Residential/Mixed Use	2.50	-	-	-	-	761	1,522
Variable Density Residential Flex	2.50	-	-	-	-	500	1,000
High Density Residential	2.50	704	3,230	3,948	5,140	5,266	5,393
Subtotal Renter-Occupied Residential		**704**	**3,230**	**3,948**	**5,140**	**6,527**	**7,915**
Subtotal Residential		**4,259**	**12,280**	**17,546**	**23,714**	**34,795**	**41,150**
Total Resident Population		**4,259**	**12,280**	**17,546**	**23,714**	**34,795**	**41,150**
Project Employees							
Nonresidential Land Uses	*Sq. Ft. per Emp.*						
Retail	400	154	1,456	3,947	7,422	8,799	9,567
Service Commercial	400	287	582	1,412	3,907	4,832	5,757
Office	300	383	776	1,882	5,210	6,443	7,676
Industrial	2,000	151	348	770	2,583	2,583	2,583
Light Industrial/R&D Flex	2,000	828	1,229	1,483	2,242	2,299	2,357
Subtotal Nonresidential		**1,803**	**4,391**	**9,494**	**21,364**	**24,956**	**27,940**
Total Employee Population		**1,803**	**4,391**	**9,494**	**21,364**	**24,956**	**27,940**
Project Persons Served		**5,161**	**14,476**	**22,293**	**34,396**	**47,273**	**55,120**

pop

Source: California Department of Finance; EPS.

[1] For persons per household and square feet per employee assumptions, refer to Table A-5.

Table A-5
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Land Use Assumptions

San Joaquin County

Land Use	Estimated Assessed Value [1]	Property Turnover Rate [2]	Vacancy Rate [3]	Persons per Household/ Sq. Ft. per Employee [4]
Residential Land Uses	*per Unit*			
Owner-Occupied Residential				
Low Density Residential [5]	$440,000	14.3%	6.5%	3.20
Medium Density Residential	$425,000	14.3%	6.5%	3.20
Variable Density Residential	$425,000	14.3%	6.5%	3.20
Renter-Occupied Residential				
Residential/Mixed Use	$180,000	6.7%	6.5%	2.50
Variable Density Residential Flex	$180,000	6.7%	6.5%	2.50
High Density Residential	$180,000	6.7%	6.5%	2.50
Nonresidential Land Uses	*per Sq. Ft.*			
Retail	$200	5.0%	7.5%	400
Service Commercial	$200	5.0%	7.5%	400
Office	$150	5.0%	7.5%	300
Industrial	$85	5.0%	7.5%	2,000
Light Industrial/R&D Flex	$85	5.0%	7.5%	2,000

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Source: California Department of Finance; The Gregory Group; San Joaquin County; Costar; Colliers, International; CBRE; EPS.

[1] Residential assessed values are based on sales data of comparable products as obtained through The Gregory Group. Nonresidential values per square foot based on comparable transaction data obtained from Costar and CBRE.

[2] Owner-occupied residential assumed to turn over once every 7 years and renter-occupied residential is assumed to turn over once every 15 years. Nonresidential uses are assumed to turn over once every 20 years.

[3] Residential vacancy rates obtained from the US Census American Community Survey, 2015 estimates. Commercial and industrial vacancy rates based on Costar and Colliers International market reports for the Stockton/Modesto area.

[4] Persons per household figures obtained from the US Census American Community Survey, 2015 estimates. Square feet per employee values are based on empirical research for proposed land uses.

[5] Assessed value per unit for low density residential is a weighted average of estimates for all jurisdictions. The assessed value per unit for low density residential is assumed to be $325,000 in the City of Stockton and $450,000 in the Cities of Manteca and Lathrop.

APPENDIX B:

General Fund Revenue Analysis

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Table B-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Revenue-Estimating Procedures Based on San Joaquin County FY 2016-17 Budget (2016$)

San Joaquin County

Item	Estimating Procedure	Case Study Reference	FY 2016-17 Budgeted General Fund Revenues	Offsetting Revenue	FY 2016-17 Budgeted Net General Fund Revenues	Service Population [1]	Revenue Multiplier
General Fund Revenues							
Property Tax	Case Study	Table B-3	$131,092,257	($157,953)	$130,934,304	N/A	-
Property Tax in Lieu of VLF	Case Study	Table B-3	$77,698,000	-	$77,698,000	N/A	-
Property Transfer Tax	Case Study	Table B-4	$2,860,000	-	$2,860,000	N/A	-
Sales and Use Tax	[2]	-	$20,258,000	-	$20,258,000	N/A	-
Prop. 172 Public Safety Sales Tax	Case Study	Table B-5	$51,000,000	-	$51,000,000	N/A	-
Transient Occupancy Tax	[3]	-	$400,000	($400,000)	$0	N/A	-
Licenses, Permits, and Franchise	Persons Served	-	$7,039,086	($4,429,836)	$2,609,250	858,433	$3.04
Intergovernmental Revenue	[3]	-	$413,752,083	($461,604,158)	($47,852,075)	N/A	-
Motor Vehicle License Fee	Per Capita	-	$238,000	-	$238,000	733,383	$0.32
Current Service Charges	[3]	-	$37,114,547	($34,648,071)	$2,466,476	N/A	-
Fines, Forfeitures and Penalties	Persons Served	-	$7,050,100	($4,592,100)	$2,458,000	858,433	$2.86
Use of Money and Property	[3]	-	$1,331,560	($791,760)	$539,800	N/A	-
Other Taxes - Racehorse	[3]	-	$2,000	-	$2,000	N/A	-
Miscellaneous Revenues	[3]	-	$2,246,142	($2,283,942)	($37,800)	N/A	-
Other	[3]	-	$52,797,312	($46,897,312)	$5,900,000	N/A	-
Subtotal General Fund Revenue			**$804,879,087**	**($555,805,132)**	**$249,073,955**		
Contingency Fund	[3]	-	$13,921,761	($13,921,761)	$0	N/A	-
Total General Fund Revenue			**$818,800,848**	**($569,726,893)**	**$249,073,955**		

rev pro

Source: San Joaquin County Fiscal Year 2016-17 Approved Annual Budget; EPS.

[1] Refer to Table A-1.
[2] It is assumed that all sales tax revenue generated by the project will be contained within City boundaries; therefore, no sales and use tax is calculated in this analysis.
[3] This revenue source is not expected to be affected by anticipated development and therefore is not evaluated in this analysis.

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Table B-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Estimated Annual General Fund Revenues (2016$)

San Joaquin County

Revenue Category	Case Study Reference	Estimated Annual Revenue (Rounded)					
		2020	2025	2030	2040	2050	Buildout (2060)
General Fund Revenues							
Property Tax	Table B-3	$1,581,300	$4,130,900	$7,139,400	$10,964,600	$14,389,100	$16,393,200
Property Tax in Lieu of VLF	Table B-3	$723,400	$2,206,400	$4,034,700	$6,083,800	$7,787,900	$8,955,100
Property Transfer Tax	Table B-4	$49,700	$129,100	$206,600	$300,300	$422,800	$489,100
Prop. 172 Public Safety Sales Tax	Table B-5	$143,039	$717,620	$1,682,631	$3,076,397	$3,701,910	$4,053,634
Licenses, Permits, and Franchise	-	$15,700	$44,000	$67,800	$104,500	$143,700	$167,500
Motor Vehicle License Fee	-	$1,400	$4,000	$5,700	$7,700	$11,300	$13,400
Fines, Forfeitures and Penalties	-	$14,800	$41,400	$63,800	$98,500	$135,400	$157,800
Total General Fund Revenue		**$2,529,339**	**$7,273,420**	**$13,200,631**	**$20,635,797**	**$26,592,110**	**$30,229,734**

rev

Source: San Joaquin County Fiscal Year 2016-17 Approved Annual Budget; EPS.

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Table B-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Estimated Annual Property Tax Revenues (2016$)

San Joaquin County

Item	Assumption/ Source	Formula	Estimated Property Tax Revenues (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Assessed Value of New Development	Table D-2							
Assessed Value of New Development in Current City Limits		*a*	$618,933,200	$1,887,679,450	$3,451,834,270	$5,204,874,023	$6,662,830,774	$7,661,393,934
Assessed Value of New Development in Annexation Area		*b*	$213,750,406	$287,532,652	$307,532,652	$568,732,652	$913,969,363	$970,708,618
Total Assessed Value		***c = a + b***	**$832,683,606**	**$2,175,212,102**	**$3,759,366,922**	**$5,773,606,675**	**$7,576,800,137**	**$8,632,102,552**
Property Tax Revenue (1% of Assessed Value)	1.0000%							
Property Tax Revenue in Current City Limits		*d = a * 1.00%*	$6,189,332	$18,876,795	$34,518,343	$52,048,740	$66,628,308	$76,613,939
Property Tax Revenue in Annexation Areas		*e = b * 1.00%*	$2,137,504	$2,875,327	$3,075,327	$5,687,327	$9,139,694	$9,707,086
Total Property Tax Revenue		***f = d + e***	**$8,326,836**	**$21,752,121**	**$37,593,669**	**$57,736,067**	**$75,768,001**	**$86,321,026**
Estimated Property Tax Allocation								
Estimated Property Tax Allocation in Current City Limits [1]								
San Joaquin County General Fund	18.9910%	*g = d * 18.99%*	$1,175,415	$3,584,889	$6,555,372	$9,884,567	$12,653,370	$14,549,739
Other Agencies/ERAF	81.0090%	*h = d * 81.01%*	$5,013,917	$15,291,906	$27,962,971	$42,164,173	$53,974,938	$62,064,200
Property Tax Allocation in Annexation Areas [2]								
San Joaquin County General Fund	26.9288%	*i = e * 26.93%*	$405,933	$546,053	$584,035	$1,080,079	$1,735,718	$1,843,471
Other Agencies/ERAF	73.0712%	*j = e * 73.07%*	$1,731,571	$2,329,274	$2,491,292	$4,607,247	$7,403,976	$7,863,615
Total San Joaquin County General Fund Property Tax		***k = g + i***	**$1,581,348**	**$4,130,941**	**$7,139,407**	**$10,964,646**	**$14,389,087**	**$16,393,210**
Property Tax In-Lieu of Motor Vehicle In-Lieu Fee Revenue (VLF)								
Total Countywide Assessed Value [3]		*l*	$66,473,297,283	$66,473,297,283	$66,473,297,283	$66,473,297,283	$66,473,297,283	$66,473,297,283
Total Assessed Value of Project		*m*	$618,933,200	$1,887,679,450	$3,451,834,270	$5,204,874,023	$6,662,830,774	$7,661,393,934
Total Assessed Value		*n = l + m*	**$67,092,230,483**	**$68,360,976,733**	**$69,925,131,553**	**$71,678,171,306**	**$73,136,128,057**	**$74,134,691,217**
Percent Change in AV		*o = m / l*	0.93%	2.84%	5.19%	7.83%	10.02%	11.53%
Property Tax In-Lieu of VLF [4]	**$77,698,000**	***p = o * $77,698,000***	**$723,446**	**$2,206,434**	**$4,034,712**	**$6,083,771**	**$7,787,919**	**$8,955,099**

prop tax

Source: San Joaquin County; San Joaquin County Auditor-Controller; EPS.

[1] Reflects the average property tax allocation to the County General Fund for all TRAs within the 200-year flood plain that are within the boundaries of the Cities of Lathrop, Manteca, and Stockton. TRAs include: 002-000, 002-060, 002-063, 002-064, 002-087, 002-088, 003-159, 003-206, 003-238, 003-240, 003-289, 003-312, 003463, 003-464, 007-000, 007-002, 007-007, 007-008, 007-010, 007-012, 007-013, 007-014, 007-022, 007-029, 007-032, 007-041, 007-043, 007-046, 007-047, 007-048, 007-049, 007-071, and 007-074.
[2] Refer to Table D-1 for details.
[3] Reflects Assessed Valuation for FY 2016-17. Includes countywide secured, unsecured, homeowner exemption, and public utility roll.
[4] Property tax in-lieu of VLF amount derived from the San Joaquin County FY 2016-17 Annual Budget. Refer to Table B-1 for details.

Prepared by EPS 8/21/2017

Table B-4
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Real Property Transfer Tax (2016$)

San Joaquin County

Item	Assumption/ Source	Estimated Annual Property Transfer Tax Revenue (2016$)					
		2020	2025	2030	2040	2050	Buildout (2060)
Rate per $1,000 of AV	$0.55						
Project Assessed Value	Table D-2						
Owner-Occupied Residential		$513,315,000	$1,309,232,400	$1,962,942,400	$2,693,822,400	$4,099,502,400	$4,809,982,400
Renter-Occupied Residential		$54,180,000	$248,760,000	$304,020,000	$395,820,000	$502,650,000	$609,480,000
Nonresidential		$265,188,606	$617,219,702	$1,492,404,522	$2,683,964,275	$2,974,647,737	$3,212,640,152
Total Assessed Value		**$832,683,606**	**$2,175,212,102**	**$3,759,366,922**	**$5,773,606,675**	**$7,576,800,137**	**$8,632,102,552**
Turnover Rate							
Owner-Occupied Residential	14.30%						
Renter-Occupied Residential	6.70%						
Nonresidential	5.00%						
Annual Transfer Tax Revenue [1]							
Owner-Occupied Residential		$40,372	$102,971	$154,385	$211,869	$322,426	$378,305
Renter-Occupied Residential		$1,997	$9,167	$11,203	$14,586	$18,523	$22,459
Nonresidential		$7,293	$16,974	$41,041	$73,809	$81,803	$88,348
Total Annual Transfer Tax Revenue		**$49,661**	**$129,111**	**$206,630**	**$300,264**	**$422,751**	**$489,112**

transfer

Source: San Joaquin County Auditor Assessor; San Joaquin County; EPS.

[1] Formula for Transfer Tax = Assessed Value/$1,000 * Rate per $1,000 of Assessed Value * Turnover rate.

Table B-5
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Estimated Annual Taxable Sales and Use Tax Revenue (2016$)

San Joaquin County

Item	Formula	Source/ Assumptions	Annual Sales Tax Revenue 2020	2025	2030	2040	2050	Buildout (2060)
Estimated Annual Taxable Sales								
Annual Taxable Sales from Market Support (Residents and Employees)	*a*	Table B-5A	$26,435,076	$74,025,482	$109,655,942	$156,627,518	$224,899,388	$264,223,418
Annual Taxable Sales from Onsite Commercial Uses	*b*	Table B-5B	$10,474,306	$111,147,494	$324,525,846	$637,198,312	$730,332,194	$781,766,046
Annual Taxable Sales from Total Net New Development	*c = a + b*		**$36,909,382**	**$185,172,976**	**$434,181,788**	**$793,825,830**	**$955,231,582**	**$1,045,989,464**
County Prop 172 Public Safety Sales Tax Revenue								
County Prop 172 Sales Tax Rate	*d*	0.50%						
County Share of Prop 172 Revenue [1]	*e*	95.00%						
Adjustment for Unincorporated County Costs [2]	*f*	81.59%						
County Prop 172 Public Safety Sales Tax Revenue	***g = c * d * e * f***		**$143,039**	**$717,620**	**$1,682,631**	**$3,076,397**	**$3,701,910**	**$4,053,634**

sales

Source: San Joaquin County; California State Board of Equalization; EPS.

[1] Provided by San Joaquin County.
[2] Represents an adjustment made to account for the portion of Proposition 172 revenues allocated to services provided only to the unincorporated portions of the County.

Table B-5A
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Estimated Annual Taxable Sales from Proposed Development, Market Support Method (2016$)

San Joaquin County

Annual Taxable Sales from Market Support	Assumption	Estimated Annual Taxable Sales (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Annual Taxable Sales from New Residents							
Residential Development	Table A-3			*Occupied Dwelling Units*			
Low Density Residential		525	1,473	1,953	3,456	5,243	5,554
Medium Density Residential		25	116	207	259	272	284
Variable Density Residential		561	1,240	2,090	2,090	3,319	4,548
Residential/Mixed Use		0	0	0	0	304	609
Variable Density Residential Flex		0	0	0	0	200	400
High Density Residential		281	1,292	1,579	2,056	2,107	2,157
Total Residential Development		**1,392**	**4,121**	**5,829**	**7,861**	**11,445**	**13,552**
Taxable Retail Expenditures	*per Household [1]*			*Taxable Retail Expenditures*			
Low Density Residential	$24,000	$12,588,840	$35,342,102	$46,876,262	$82,937,342	$125,842,622	$133,292,702
Medium Density Residential	$24,000	$605,880	$2,782,560	$4,959,240	$6,215,880	$6,518,820	$6,821,760
Variable Density Residential	$24,000	$13,464,000	$29,755,440	$50,153,400	$50,153,400	$79,650,780	$109,148,160
Residential/Mixed Use	$15,000	-	-	-	-	$4,565,138	$9,130,275
Variable Density Residential Flex	$15,000	-	-	-	-	$3,001,350	$6,002,700
High Density Residential	$15,000	$4,221,525	$19,382,550	$23,688,225	$30,840,975	$31,598,325	$32,355,675
Total Taxable Retail Expenditures		**$30,880,245**	**$87,262,652**	**$125,677,127**	**$170,147,597**	**$251,177,035**	**$296,751,272**
Estimated Countywide Capture from New Households [2]	**80%**	$24,704,196	$69,810,122	$100,541,702	$136,118,078	$200,941,628	$237,401,018
Estimated Taxable Sales Inside Project Area	50%	$12,352,098	$34,905,061	$50,270,851	$68,059,039	$100,470,814	$118,700,509
Estimated Taxable Sales Outside Project Area	50%	$12,352,098	$34,905,061	$50,270,851	$68,059,039	$100,470,814	$118,700,509
Annual Taxable Sales from New Employment							
Taxable Sales from New Employment							
Employees	Table A-4	1,803	4,391	9,494	21,364	24,956	27,940
Average Daily Taxable Sales per New Employee	$10.00						
Work Days per Year	240						
Taxable Sales from New Employees [3]	50%						
Total Taxable Sales from New Employees		**$2,163,600**	**$5,269,200**	**$11,392,800**	**$25,636,800**	**$29,947,200**	**$33,528,000**
Estimated Citywide Capture from New Employees [1]	**90%**	$1,730,880	$4,215,360	$9,114,240	$20,509,440	$23,957,760	$26,822,400
Estimated Taxable Sales Inside Project Area	70%	$1,211,616	$2,950,752	$6,379,968	$14,356,608	$16,770,432	$18,775,680
Estimated Taxable Sales Outside Project Area	30%	$519,264	$1,264,608	$2,734,272	$6,152,832	$7,187,328	$8,046,720
Total Annual Taxable Sales from Market Support		**$26,435,076**	**$74,025,482**	**$109,655,942**	**$156,627,518**	**$224,899,388**	**$264,223,418**
Taxable City Sales Inside Project Area		$13,563,714	$37,855,813	$56,650,819	$82,415,647	$117,241,246	$137,476,189
Taxable City Sales Outside Project Area		$12,871,362	$36,169,669	$53,005,123	$74,211,871	$107,658,142	$126,747,229

sales a

Source: Costar; Gregory Group; Bureau of Labor Statistics; San Joaquin County; EPS.

[1] For details pertaining to resident and employee estimates, refer to Table A-4.
[2] Represents the portion of household and employee retail expenditures estimated to take place in San Joaquin County.
[3] Taxable sales from employees discounted by 50% to account for employees who also are residents.

DRAFT

Table B-5B
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Estimated Annual Taxable Sales from On-Site Nonresidential (2016$)

San Joaquin County

Item	Annual Taxable Sales per Sq. Ft. [1]	Estimated Annual Taxable Sales (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Annual Taxable Sales from On-Site Commercial Development							
Nonresidential Land Use							
Retail	$250	$15,412,073	$145,575,159	$394,709,291	$742,158,876	$879,895,413	$956,707,926
Industrial	$5	$1,510,988	$3,484,475	$7,699,991	$25,831,841	$25,831,841	$25,831,841
Light Industrial/R&D Flex	$5	$8,278,772	$12,293,394	$14,825,809	$22,423,055	$22,994,208	$23,565,361
Total		**$25,201,832**	**$161,353,028**	**$417,235,092**	**$790,413,772**	**$928,721,462**	**$1,006,105,129**
Less Total Annual Taxable Sales from Market Support (in the Project) [2]		$13,563,714	$37,855,813	$56,650,819	$82,415,647	$117,241,246	$137,476,189
Annual Sales Less Market Support		**$11,638,118**	**$123,497,215**	**$360,584,273**	**$707,998,125**	**$811,480,216**	**$868,628,940**
	Shift from Existing Retail						
Less Shift of Sales from Existing Regional and Community Retail to the Project [3]	10%	$1,163,812	$12,349,722	$36,058,427	$70,799,812	$81,148,022	$86,862,894
Total Nonresidential Taxable Sales		**$10,474,306**	**$111,147,494**	**$324,525,846**	**$637,198,312**	**$730,332,194**	**$781,766,046**

sales b

Source: Costar; Gregory Group; Bureau of Labor Statistics; EPS.

[1] Commercial taxable sales assumptions based on an analysis of data from ULI's Dollars & Cents of Shopping Centers: 2008 and escalated to current dollars. Industrial taxable sales per square foot based on research of industrial development, this analysis includes a conservative taxable sales per square foot assumption representing on-site business-to-business sales activity.
[2] Estimated in Table B-5A.
[3] Represents a discount factor to account for taxable sales transactions that may shift from the City's existing Regional- and Community-serving retail centers to those included in the Project.

APPENDIX C:

General Fund Expenditure Analysis

Table C-1 Expenditure-Estimating Procedures based on San Joaquin County FY 2016–17 Budget..... 18

Table C-2 Estimated Annual General Fund Expenditures..... 19

Table C-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Expenditure-Estimating Procedures Based on San Joaquin County FY 2016-17 Budget (2016$)

San Joaquin County

Item	Estimating Procedure	FY 2016-17 Budgeted Expenditures	Less Offsetting Revenue	FY 2016-17 Net County Expenditures	Population or Persons Served	FY 2016-17 Avg. Cost	Adjustment Factor [1]	Net FY 2016-17 Avg. Cost
General Fund								
General Government								
Legislative & Administrative	Persons Served	$11,737,223	($3,285,766)	$8,451,457	858,433	$9.85	100%	$9.85
Finance	Persons Served	$39,770,455	($7,054,492)	$32,715,963	858,433	$38.11	100%	$38.11
County Counsel	Persons Served	$1,633,741	($147,886)	$1,485,855	858,433	$1.73	100%	$1.73
Human Resources	Persons Served	$2,059,616	($653,357)	$1,406,259	858,433	$1.64	100%	$1.64
Elections	Persons Served	$5,445,605	($2,316,125)	$3,129,480	858,433	$3.65	100%	$3.65
Property Management	Persons Served	$7,664,575	($663,167)	$7,001,408	858,433	$8.16	100%	$8.16
Economic Promotion	[3]	$292,842	($400,000)	($107,158)	N/A	N/A	100%	N/A
Other General	Persons Served	$14,603,902	($8,878,815)	$5,725,087	858,433	$6.67	100%	$6.67
Total General Government		**$83,207,959**	**($23,399,608)**	**$59,808,351**				
Public Protection								
Judicial	Persons Served	$76,254,958	($32,909,216)	$43,345,742	858,433	$50.49	100%	$50.49
Police Protection [2]								
Countywide Police Protection	Persons Served	$24,255,994	($890,280)	$23,365,714	858,433	$27.22	100%	$27.22
Unincorporated County Police Protection	[3]	$50,332,063	($28,356,028)	$21,976,035	N/A	N/A	100%	N/A
Detention and Corrections	Persons Served	$101,610,755	($38,526,904)	$63,083,851	858,433	$73.49	100%	$73.49
Flood Control	Persons Served	$590,000	($590,000)	$0	858,433	-	100%	-
Protective Inspection	Persons Served	$13,691,931	($9,566,135)	$4,125,796	858,433	$4.81	100%	$4.81
Other Protection	Persons Served	$7,413,728	($5,308,369)	$2,105,359	858,433	$2.45	100%	$2.45
Total Public Protection		**$274,149,429**	**($116,146,932)**	**$158,002,497**				
Public Ways and Facilities	[3]	**$69,000**	**($69,000)**	**$0**	N/A	N/A	100%	N/A
Health and Sanitation								
Health Services	Per Capita	$74,074,647	($57,193,730)	$16,880,917	733,383	$23.02	100%	$23.02
Sanitation	Per Capita	$0	$0	$0	733,383	-	100%	-
Total Health and Sanitation		**$74,074,647**	**($57,193,730)**	**$16,880,917**				
Public Assistance								
Administration	Per Capita	$167,649,080	($158,098,972)	$9,550,108	733,383	$13.02	100%	$13.02
Aid Programs	Per Capita	$179,264,545	($178,631,028)	$633,517	733,383	$0.86	100%	$0.86
General Relief	Per Capita	$3,244,844	($13,500)	$3,231,344	733,383	$4.41	100%	$4.41
Other Assistance	Per Capita	$24,871,043	($19,014,229)	$5,856,814	733,383	$7.99	100%	$7.99
Veterans Services	Per Capita	$361,484	($150,000)	$211,484	733,383	$0.29	100%	$0.29
Total Public Assistance		**$375,390,996**	**($355,907,729)**	**$19,483,267**				
Education								
Agriculture Education	Per Capita	$349,415	$0	$349,415	733,383	$0.48	100%	$0.48
Total Education		**$349,415**	**$0**	**$349,415**				
Recreation								
Recreation Services	Per Capita	$5,163,624	($3,088,133)	$2,075,491	733,383	$2.83	100%	$2.83
Cultural Services	Per Capita	$349,965	$0	$349,965	733,383	$0.48	100%	$0.48
Total Recreation		**$5,513,589**	**($3,088,133)**	**$2,425,456**				
Contingency Reserve		**$53,994,173**	**($13,921,761)**	**$40,072,412**	N/A	N/A	100%	N/A
Total General Fund Expenditures		**$866,749,208**	**($569,726,893)**	**$297,022,315**				

exp pro

Source: San Joaquin County Fiscal Year 2016-17 Approved Annual Budget; San Joaquin County Administrator; EPS.

[1] An adjustment factor may be used to reflect the fact that new employees may not increase certain General Fund department expenditures at a 1:1 ratio. This analysis does not assume an adjustment.
[2] A majority of the police protection budget serves the unincorporated County population only. This analysis excludes this portion of the budget and only accounts for countywide cost impacts.
[3] These cost categories serve the unincorporated County population only and have been excluded from the analysis.

Table C-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Estimated Annual General Fund Expenditures (2016$)

San Joaquin County

Expenditure Category	Estimated Annual Expenditure					
	2020	2025	2030	2040	2050	Buildout (2060)
General Fund						
General Government						
Legislative & Administrative	$50,806	$142,514	$219,479	$338,636	$465,413	$542,668
Finance	$196,673	$551,680	$849,614	$1,310,875	$1,801,634	$2,100,693
County Counsel	$8,932	$25,056	$38,587	$59,536	$81,824	$95,407
Human Resources	$8,454	$23,713	$36,520	$56,346	$77,441	$90,296
Elections	$18,813	$52,771	$81,271	$125,393	$172,337	$200,944
Property Management	$42,089	$118,063	$181,822	$280,535	$385,560	$449,561
Other General	$34,417	$96,540	$148,677	$229,395	$315,275	$367,608
Total General Government	**$360,184**	**$1,010,337**	**$1,555,971**	**$2,400,716**	**$3,299,484**	**$3,847,176**
Public Protection						
Judicial	$260,574	$730,926	$1,125,663	$1,736,793	$2,387,004	$2,783,231
Police Protection	$140,464	$394,009	$606,794	$936,226	$1,286,725	$1,500,313
Detention and Corrections	$379,231	$1,063,764	$1,638,250	$2,527,666	$3,473,961	$4,050,615
Protective Inspection	$24,802	$69,572	$107,144	$165,314	$227,203	$264,917
Other Protection	$12,656	$35,502	$54,675	$84,358	$115,940	$135,185
Total Public Protection	**$817,728**	**$2,293,774**	**$3,532,527**	**$5,450,357**	**$7,490,834**	**$8,734,262**
Health and Sanitation						
Health Services	$98,033	$282,659	$403,872	$545,846	$800,907	$947,185
Total Health and Sanitation	**$98,033**	**$282,659**	**$403,872**	**$545,846**	**$800,907**	**$947,185**
Public Assistance						
Administration	$55,461	$159,910	$228,484	$308,804	$453,100	$535,855
Aid Programs	$3,679	$10,608	$15,157	$20,485	$30,057	$35,547
General Relief	$18,765	$54,107	$77,309	$104,486	$153,310	$181,310
Other Assistance	$34,012	$98,068	$140,123	$189,381	$277,874	$328,625
Veterans Services	$1,228	$3,541	$5,060	$6,838	$10,034	$11,866
Total Public Assistance	**$113,146**	**$326,234**	**$466,132**	**$629,993**	**$924,374**	**$1,093,203**
Education						
Agriculture Education	$2,029	$5,851	$8,360	$11,298	$16,578	$19,606
Total Education	**$2,029**	**$5,851**	**$8,360**	**$11,298**	**$16,578**	**$19,606**
Recreation						
Recreation Services	$12,053	$34,753	$49,656	$67,111	$98,471	$116,455
Cultural Services	$2,032	$5,860	$8,373	$11,316	$16,604	$19,636
Total Recreation	**$14,085**	**$40,613**	**$58,028**	**$78,427**	**$115,075**	**$136,092**
Total Annual General Fund Expenditures	**$1,405,206**	**$3,959,468**	**$6,024,890**	**$9,116,637**	**$12,647,251**	**$14,777,524**

exp

Source: San Joaquin County Fiscal Year 2016-17 Approved Annual Budget; EPS.

APPENDIX D:

Supporting Tables for Revenue and Expenditure Analyses

Table D-1 Preliminary Property Tax Allocations for Annexation Area 20

Table D-2 Cumulative Assessed Valuation (2 pages) 21

Table D-3 Estimated Average Annual Household Income 23

Table D-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Preliminary Property Tax Allocations for Annexation Area

San Joaquin County

Tax Code	Entity	Existing Tax Rate Area (TRA) Post-ERAF Distribution [1]					Gross Revenue (FY 2016-17) [1]						Property Tax-Sharing Agreement [2]	Post Annexation Average	
		TRA 102-135	TRA 102-032	TRA 102-136	TRA 102-001	TRA 102-004	TRA 102-135	TRA 102-032	TRA 102-136	TRA 102-001	TRA 102-004	Total		Base Revenue	Post-ERAF Distribution
Formula		*a*	*b*	*c*	*d*		*e*	*f*				*g = e + f*	*h*	*e = d * $716,868*	*f = e / $2,129,671*
Subject to Detachment															
10001	County General	22.29650%	22.30610%	20.32600%	20.29360%	21.47880%	$172,291	($796)	$228,594	$14,804	$34,996	$449,889	80%	$573,494	26.92877%
10527	Road District 1	4.26040%	4.26030%	3.97920%	3.97840%	0.00000%	$32,921	($152)	$44,751	$2,902	-	$80,422	-	-	0.00000%
10527	Road District 5	0.00000%	0.00000%	0.00000%	0.00000%	4.20920%	-	-	-	-	$6,858	$6,858	-	-	0.00000%
14901	Lathrop-Manteca Rural Fire	0.00000%	0.00000%	8.83690%	8.84610%	0.00000%	-	-	$99,384	$6,453	-	$105,837	-	-	0.00000%
14401	French Camp-Mc Kinley Rural Fire	9.60300%	9.60300%	0.00000%	0.00000%	0.00000%	$74,205	($343)	-	-	-	$73,862	-	-	0.00000%
	City General Fund	0.00000%	0.00000%	0.00000%	0.00000%	0.00000%	-	-	-	-	-	-	20%	$143,374	6.73219%
	Subtotal	**36.15990%**	**36.16940%**	**33.14210%**	**33.11810%**	**25.68800%**	**$279,417**	**($1,291)**	**$372,728**	**$24,160**	**$41,854**	**$716,868**	**100%**	**$716,868**	**33.66097%**
Not Subject to Detachment															
10618	County Library	1.80010%	1.80010%	1.63940%	1.63910%	1.73420%	$13,910	($64)	$18,437	$1,196	$2,826	$36,304	-	$36,304	1.70470%
12601	Manteca Unified Schools	29.58380%	29.58380%	26.94230%	26.93720%	28.50000%	$228,602	($1,056)	$303,000	$19,651	$46,435	$596,632	-	$596,632	28.01521%
13001	S.J. Delta Comm College	4.00510%	4.00510%	3.64750%	3.64670%	3.85840%	$30,949	($143)	$41,021	$2,660	$6,287	$80,773	-	$80,773	3.79276%
13201	County Office Of Education	1.43850%	1.42890%	1.28960%	1.31780%	1.38660%	$11,116	($51)	$14,501	$961	$2,259	$28,786	-	$28,786	1.35169%
16001	Sjc Flood Control	0.17560%	0.17570%	0.16000%	0.15990%	0.16920%	$1,357	($6)	$1,799	$117	$276	$3,542	-	$3,542	0.16633%
21901	Sjc Mosquito Abatement	0.78840%	0.78840%	0.71800%	0.71790%	0.75950%	$6,092	($28)	$8,075	$524	$1,237	$15,900	-	$15,900	0.74658%
24601	South San Joaquin Irrigation	0.00000%	0.00000%	5.41160%	5.41660%	0.00000%	-	-	$60,861	$3,951	-	$64,813	-	$64,813	3.04333%
14901	Lathrop Manteca Fire District	0.00000%	0.00000%	0.00000%	0.00000%	9.35930%	-	-	-	-	$15,249	$15,249	-	$15,249	0.71603%
22001	Reclamation District #17	0.00000%	0.00000%	0.00000%	0.00000%	0.92480%	-	-	-	-	$1,507	$1,507	-	$1,507	0.07075%
41100	ERAF - Educational Revenue Augmentation Fund	26.04860%	26.04860%	27.04950%	27.04670%	27.62000%	$201,285	($930)	$304,205	$19,731	$45,005	$569,296	-	$569,296	26.73165%
	Subtotal	**63.84010%**	**63.83060%**	**66.85790%**	**66.88190%**	**74.31200%**	**$493,311**	**($2,279)**	**$751,899**	**$48,791**	**$121,081**	**$1,412,803**	-	**$1,412,803**	**66.33903%**
Total		**100.00000%**	**100.00000%**	**100.00000%**	**100.00000%**	**100.00000%**	**$772,729**	**($3,570)**	**$1,124,627**	**$72,951**	**$162,934**	**$2,129,671**	**100%**	**$2,129,671**	**100.00000%**

TRA

Source: San Joaquin County Auditor-Controller; EPS.

[1] Provided by the San Joaquin County Auditor-Controller.
[2] Based on the most recent tax-sharing agreements between San Joaquin County and the Cities of Stockton, Lathrop, and Manteca related to annexed areas to the City.

Table D-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Cumulative Assessed Valuation (2016$)

San Joaquin County

Item	Rounded Value per Unit/Sq. Ft. [1]	Total Assessed Value (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Development Projections in Current City Limits							
Residential Land Uses							
Owner-Occupied Residential	*per Unit*						
Low Density Residential	$440,000	$185,240,000	$631,382,400	$857,542,400	$1,353,422,400	$1,921,462,400	$2,067,542,400
Medium Density Residential	$425,000	$11,475,000	$52,700,000	$93,925,000	$117,725,000	$123,462,500	$129,200,000
Variable Density Residential	$425,000	$255,000,000	$563,550,000	$949,875,000	$949,875,000	$1,508,537,500	$2,067,200,000
Subtotal Owner-Occupied Residential		**$451,715,000**	**$1,247,632,400**	**$1,901,342,400**	**$2,421,022,400**	**$3,553,462,400**	**$4,263,942,400**
Renter-Occupied Residential							
Residential/Mixed Use	$180,000	-	-	-	-	$58,590,000	$117,180,000
Variable Density Residential Flex	$180,000	-	-	-	-	$38,520,000	$77,040,000
High Density Residential	$180,000	$54,180,000	$248,760,000	$304,020,000	$395,820,000	$405,540,000	$415,260,000
Subtotal Renter-Occupied Residential		**$54,180,000**	**$248,760,000**	**$304,020,000**	**$395,820,000**	**$502,650,000**	**$609,480,000**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	$13,329,360	$125,902,840	$321,370,198	$571,867,136	$638,690,659	$668,080,591
Service Commercial	$200	$53,317,440	$163,611,360	$645,480,792	$901,796,544	$993,677,652	$1,085,558,760
Office	$150	$18,621,900	$37,733,850	$91,565,843	$253,453,860	$313,435,980	$373,418,100
Industrial	$85	$27,769,500	$64,039,000	$141,513,355	$474,747,355	$474,747,355	$474,747,355
Light Industrial/R&D Flex	$85	-	-	$46,541,682	$186,166,728	$186,166,728	$186,166,728
Subtotal Nonresidential		**$113,038,200**	**$391,287,050**	**$1,246,471,870**	**$2,388,031,623**	**$2,606,718,374**	**$2,787,971,534**
Total All Land Uses		**$618,933,200**	**$1,887,679,450**	**$3,451,834,270**	**$5,204,874,023**	**$6,662,830,774**	**$7,661,393,934**
Development Projections in Annexation Areas							
Residential Land Uses							
Owner-Occupied Residential	*per Unit*						
Low Density Residential	$440,000	$61,600,000	$61,600,000	$61,600,000	$272,800,000	$546,040,000	$546,040,000
Medium Density Residential	$425,000	-	-	-	-	-	-
Variable Density Residential	$425,000	-	-	-	-	-	-
Subtotal Owner-Occupied Residential		**$61,600,000**	**$61,600,000**	**$61,600,000**	**$272,800,000**	**$546,040,000**	**$546,040,000**
Renter-Occupied Residential							
Residential/Mixed Use	$180,000	-	-	-	-	-	-
Variable Density Residential Flex	$180,000	-	-	-	-	-	-
High Density Residential	$180,000	-	-	-	-	-	-
Subtotal Renter-Occupied Residential		**-**	**-**	**-**	**-**	**-**	**-**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	-	-	$20,000,000	$70,000,000	$122,299,968	$159,342,480
Commercial	$200	-	-	-	-	$9,199,872	$18,399,744
Office	$150	-	-	-	-	-	-
Industrial	$85	-	-	-	-	-	-
Light Industrial/R&D Flex	$85	$152,150,406	$225,932,652	$225,932,652	$225,932,652	$236,429,523	$246,926,394
Subtotal Nonresidential		**$152,150,406**	**$225,932,652**	**$245,932,652**	**$295,932,652**	**$367,929,363**	**$424,668,618**
Total All Land Uses		**$213,750,406**	**$287,532,652**	**$307,532,652**	**$568,732,652**	**$913,969,363**	**$970,708,618**

Table D-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Cumulative Assessed Valuation (2016$)

San Joaquin County

Item	Rounded Value per Unit/Sq. Ft. [1]	Total Assessed Value (2016$) 2020	2025	2030	2040	2050	Buildout (2060)
Total San Joaquin County Development Projections							
Residential Land Uses							
Owner-Occupied Residential	*per Unit*						
Low Density Residential	$440,000	$246,840,000	$692,982,400	$919,142,400	$1,626,222,400	$2,467,502,400	$2,613,582,400
Medium Density Residential	$425,000	$11,475,000	$52,700,000	$93,925,000	$117,725,000	$123,462,500	$129,200,000
Variable Density Residential	$425,000	$255,000,000	$563,550,000	$949,875,000	$949,875,000	$1,508,537,500	$2,067,200,000
Subtotal Owner-Occupied Residential		**$513,315,000**	**$1,309,232,400**	**$1,962,942,400**	**$2,693,822,400**	**$4,099,502,400**	**$4,809,982,400**
Renter-Occupied Residential							
Residential/Mixed Use	$180,000	-	-	-	-	$58,590,000	$117,180,000
Variable Density Residential Flex	$180,000	-	-	-	-	$38,520,000	$77,040,000
High Density Residential	$180,000	$54,180,000	$248,760,000	$304,020,000	$395,820,000	$405,540,000	$415,260,000
Subtotal Renter-Occupied Residential		**$54,180,000**	**$248,760,000**	**$304,020,000**	**$395,820,000**	**$502,650,000**	**$609,480,000**
Nonresidential Land Uses	*per Sq. Ft.*						
Retail	$200	$13,329,360	$125,902,840	$341,370,198	$641,867,136	$760,990,627	$827,423,071
Commercial	$200	$53,317,440	$163,611,360	$645,480,792	$901,796,544	$1,002,877,524	$1,103,958,504
Office	$150	$18,621,900	$37,733,850	$91,565,843	$253,453,860	$313,435,980	$373,418,100
Industrial	$85	$27,769,500	$64,039,000	$141,513,355	$474,747,355	$474,747,355	$474,747,355
Light Industrial/R&D Flex	$85	$152,150,406	$225,932,652	$272,474,334	$412,099,380	$422,596,251	$433,093,122
Subtotal Nonresidential		**$265,188,606**	**$617,219,702**	**$1,492,404,522**	**$2,683,964,275**	**$2,974,647,737**	**$3,212,640,152**
Total All Land Uses		**$832,683,606**	**$2,175,212,102**	**$3,759,366,922**	**$5,773,606,675**	**$7,576,800,137**	**$8,632,102,552**

AV

Source: Costar; CBRE; The Gregory Group; EPS.

[1] Refer to Table A-5 for details.

Table D-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - San Joaquin County
Estimated Average Annual Household Income (2016$)

San Joaquin County

Residential Land Use	Estimated Home Value [1]	Total Annual Mortgage or Rent [2]	Estimated Household Income [3]	Taxable Expenditures as a Percentage of Income [4]	Annual Taxable Expenditures per Household (Rounded)
Owner-Occupied Residential					
Low Density Residential	$440,000	$31,475	$90,000	27%	$24,000
Medium Density Residential	$425,000	$30,402	$87,000	27%	$24,000
Variable Density Residential	$425,000	$30,402	$87,000	27%	$24,000
Renter-Occupied Residential					
Residential/Mixed Use	$180,000	$18,000	$51,000	29%	$15,000
Variable Density Residential Flex	$180,000	$18,000	$51,000	29%	$15,000
High Density Residential	$180,000	$18,000	$51,000	29%	$15,000

income

Source: Costar; The Gregory Group; Bureau of Labor Statistics; EPS.

[1] See Table A-5 for detail on estimated values for owner-occupied units.
[2] Based on a 5%, 30-year fixed-rate mortgage with a 20% down payment, $150 monthly Homeowners' Association dues and 2% annual taxes and insurance.
High density residential based on an average monthly rent assumption of $1,500 based on data on similar multifamily residential obtained from Costar and an average size of 1,000 square feet.
[3] Assumes 35% of income dedicated to housing costs (mortgage, taxes, insurance, and HOA dues) or rent payments. Rounded to the nearest $1,000.
[4] Based on household expenditures data from the Bureau of Labor Statistics, 2015 Consumer Expenditure Survey.

ATTACHMENT C:
NO PROJECT ALTERNATIVE ANALYSES

- RD 17 Area Finance Plan Implementation Fiscal Impact Analysis — No Project Alternative prepared by Economic & Planning Systems, Inc.

Preliminary Draft Discussion Tables

RD 17 Area Finance Plan Implementation

Fiscal Impact Analysis—No Project Alternative

The Economics of Land Use

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Table 1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
No Project Revenues Summary (2016$)

Item	Existing Revenues (FY 2016-17)	No Project Adjusted Revenues	Difference
City of Lathrop			
Annual General Fund Revenues [1]			
Property Tax Revenues	$3,153,952	$3,081,911	($72,041)
Property Tax In Lieu of VLF Revenue	$1,192,169	$1,164,939	($27,231)
Total Annual General Fund Revenues	**$4,346,121**	**$4,246,850**	**($99,271)**
Percentage Change	-	-	*(2.28%)*
City of Manteca			
Annual General Fund Revenues [1]			
Property Tax Revenues	$709,747	$657,406	($52,342)
Property Tax In Lieu of VLF Revenue	$442,910	$410,247	($32,663)
Total Annual General Fund Revenues	**$1,152,657**	**$1,067,652**	**($85,005)**
Percentage Change	-	-	*(7.37%)*
City of Stockton			
Annual General Fund Revenues [1]			
Property Tax Revenues	$1,806,397	$1,795,491	($10,906)
Property Tax In Lieu of VLF Revenue	$1,226,646	$1,219,240	($7,406)
Total Annual General Fund Revenues	**$3,033,043**	**$3,014,731**	**($18,312)**
Percentage Change	-	-	*(0.60%)*
San Joaquin County [2]			
Annual General Fund Revenues [1]			
Property Tax Revenues	$8,666,360	$8,456,008	($210,352)
Property Tax In Lieu of VLF Revenue	$5,270,245	$5,142,158	($128,086)
Total Annual General Fund Revenues	**$13,936,604**	**$13,598,166**	**($338,438)**
Percentage Change	-	-	*(2.43%)*

sum

Source: EPS.

[1] Reflects only the revenue categories that would be impacted by the No Project Alternative.
[2] Includes revenue estimates for the unincorporated portion of the County as well as the sum of all incorporated cities within the project area.

Table 2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Assessed Value Summary (2016$)

Item	Total Existing Assessed Value	No Project Adjusted Total Assessed Value	Difference
City of Lathrop	$2,308,244,724	$2,255,521,288	($52,723,436)
Percentage Change	-	-	*(2.28%)*
City of Manteca	$525,776,893	$487,002,550	($38,774,343)
Percentage Change	-	-	*(7.37%)*
City of Stockton	$1,164,851,051	$1,157,818,242	($7,032,809)
Percentage Change	-	-	*(0.60%)*
San Joaquin County			
Unincorporated County	$510,001,908	$498,950,195	($11,051,714)
Incorporated Cities [1]	$3,998,872,668	$3,900,342,080	($98,530,588)
Total San Joaquin County	**$4,508,874,576**	**$4,399,292,274**	**($109,582,302)**
Percentage Change	-	-	*(2.43%)*

AV sum

Source: EPS.

[1] Represents the sum of assessed values within the Cities of Lathrop, Manteca, and Stockton included in the Project Area.

APPENDICES:

Appendix A: City of Lathrop

Appendix B: City of Manteca

Appendix C: City of Stockton

Appendix D: San Joaquin County

APPENDIX A:

City of Lathrop

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Table A-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
No Project Revenues Summary (2016$) - City of Lathrop

City of Lathrop

Item	Existing Revenues	No Project Adjusted Revenues	Difference
Annual General Fund Revenues [1]			
Property Tax Revenues	$3,153,952	$3,081,911	($72,041)
Property Tax In Lieu of VLF Revenue	$1,192,169	$1,164,939	($27,231)
Total Annual General Fund Revenues	**$4,346,121**	**$4,246,850**	**($99,271)**

sum lath

Source: EPS.

[1] Reflects only the revenue categories that would be impacted by the No Project Alternative.

Table A-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - City of Lathrop

City of Lathrop

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Assessed Value: Total Existing Value	Existing Value per Acre	Adjusted Value per Acre [1]	Percentage of Acres to Lose Value [2]	Total Adjusted Value
Improved Land [3]								
Residential Land Uses	**927**	**$368,118,852**	**$878,593,739**	**$1,246,712,591**				**$1,246,712,591**
Residential	875	$365,942,978	$876,029,761	$1,241,972,739	$1,420,152	[4]	0%	$1,241,972,739
Rural Residential	53	$2,175,874	$2,563,978	$4,739,852	$89,663	[4]	0%	$4,739,852
Nonresidential Land Uses	**1,255**	**$163,532,460**	**$767,676,296**	**$931,208,756**				**$931,208,756**
Commercial	239	$61,672,654	$113,030,060	$174,702,714	$729,899	[4]	0%	$174,702,714
Industrial	1,016	$101,859,806	$654,646,236	$756,506,042	$744,830	[4]	0%	$756,506,042
Vacant Land Uses	**92**	**$9,818,115**	**$3,738,709**	**$13,556,824**				**$13,556,824**
Vacant	0	$66,750	$2,225	$68,975	$186,419	[4]	0%	$68,975
Vacant Commercial	31	$5,968,891	$2,117,142	$8,086,033	$259,951	[4]	0%	$8,086,033
Vacant Industrial	60	$3,597,033	$1,334,174	$4,931,207	$82,831	[4]	0%	$4,931,207
Vacant Residential	1	$185,441	$285,168	$470,609	$468,268	[4]	0%	$470,609
Total Improved Land	**2,274**	**$541,469,427**	**$1,650,008,744**	**$2,191,478,171**				**$2,191,478,171**
Unimproved and Agricultural Land								
Residential Land Uses	**53**	**$2,111,706**	**-**	**$2,111,706**				**$2,111,706**
Residential	33	$1,657,462	-	$1,657,462	$50,152	[4]	0%	$1,657,462
Rural Residential	20	$454,244	-	$454,244	$23,020	[4]	0%	$454,244
Nonresidential Land Uses	**1,510**	**$24,673,117**	**-**	**$24,673,117**				**$24,673,117**
Commercial	1,399	$17,070,138	-	$17,070,138	$12,200	[4]	0%	$17,070,138
Industrial	110	$7,602,979	-	$7,602,979	$68,868	[4]	0%	$7,602,979
Agricultural Land Uses	**1,203**	**$6,739,902**	**$1,669,608**	**$8,409,510**				**$8,052,417**
Agricultural (Delta Plan Area) [5]	0	$0	$0	$0	$0	[4]	0%	$0
Agricultural	1,203	$6,739,902	$1,669,608	$8,409,510	$6,989	$6,000	30%	$8,052,417
Vacant Land Uses	**1,127**	**$81,572,220**	**-**	**$81,572,220**				**$29,205,877**
Vacant	45	$859,752	-	$859,752	$19,042	$6,000	70%	$447,556
Vacant Commercial	327	$34,213,457	-	$34,213,457	$104,611	$6,000	70%	$11,637,664
Vacant Industrial	338	$19,778,780	-	$19,778,780	$58,583	$6,000	70%	$7,351,634
Vacant Residential	417	$26,720,231	-	$26,720,231	$64,020	$6,000	70%	$9,769,023
Total Unimproved Land Uses	**3,892**	**$115,096,945**	**$1,669,608**	**$116,766,553**				**$64,043,117**

Table A-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - City of Lathrop

City of Lathrop

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Assessed Value: Total Existing Value	Existing Value per Acre	Adjusted Value per Acre [1]	Percentage of Acres to Lose Value [2]	Total Adjusted Value
Total All Land Uses								
Residential Land Uses	**980**	**$370,230,558**	**$878,593,739**	**$1,248,824,297**				**$1,248,824,297**
Residential	908	$367,600,440	$876,029,761	$1,243,630,201	$1,370,265	N/A	N/A	$1,243,630,201
Rural Residential	73	$2,630,118	$2,563,978	$5,194,096	$71,548	N/A	N/A	$5,194,096
Nonresidential Land Uses	**2,765**	**$188,205,577**	**$767,676,296**	**$955,881,873**				**$955,881,873**
Commercial	1,639	$78,742,792	$113,030,060	$191,772,852	$117,039	N/A	N/A	$191,772,852
Industrial	1,126	$109,462,785	$654,646,236	$764,109,021	$678,560	N/A	N/A	$764,109,021
Agricultural Land Uses	**1,203**	**$6,739,902**	**$1,669,608**	**$8,409,510**				**$8,052,417**
Agricultural (Delta Plan Area) [5]	0	$0	$0	$0	$0	N/A	N/A	$0
Agricultural	1,203	$6,739,902	$1,669,608	$8,409,510	$6,989	N/A	N/A	$8,052,417
Vacant Land Uses	**1,219**	**$91,390,335**	**$3,738,709**	**$95,129,044**				**$42,762,701**
Vacant	46	$926,502	$2,225	$928,727	$20,403	N/A	N/A	$516,531
Vacant Commercial	358	$40,182,348	$2,117,142	$42,299,490	$118,102	N/A	N/A	$19,723,697
Vacant Industrial	397	$23,375,813	$1,334,174	$24,709,987	$62,218	N/A	N/A	$12,282,841
Vacant Residential	418	$26,905,672	$285,168	$27,190,840	$64,992	N/A	N/A	$10,239,632
Total All Land Uses	**6,167**	**$656,566,372**	**$1,651,678,352**	**$2,308,244,724**				**$2,255,521,288**

AV lath

Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; LWA; EPS.

[1] Adjusted assessed value is estimated as the existing, average land value per acre for all agricultural land within the Project Area.
[2] Represents the portion of vacant acres, including agricultural acres, estimated to lose value without a flood certification in place. This adjustment is based on the percentage of vacant acres required for development anticipated to buildout within the next 15 years (by 2030).
[3] Improved Land includes any nonagricultural parcels with an assessed value associated with a structure or machinery on the property.
[4] These land use categories are not anticipated to be reassessed to a lower value if ULOP certification is not obtained.
[5] Represents land in the Delta Plan, which is precluded from future development and not expected to change in value based on whether ULOP certification is obtained.

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Table A-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Estimated Annual Property Tax Revenues (2016$) - City of Lathrop

City of Lathrop

Item	Assumption/ Source	Formula	Estimated Property Tax Revenues Existing	Estimated Property Tax Revenues Adjusted
Property Tax Revenue				
1-Percent Property Tax				
Total Assessed Value Existing within Project Area [1]	Table A-2	*a*	$2,308,244,724	$2,255,521,288
Property Tax Revenue (1% of Assessed Value)	1.0000%	*b = a * 1.00%*	$23,082,447	$22,555,213
Estimated Property Tax Allocation				
City of Lathrop General Fund [2]	13.6639%	*c = b * 13.66%*	$3,153,952	$3,081,911
Other Agencies/ERAF	86.3361%	*d = b * 86.34%*	$19,928,496	$19,473,302
Property Tax In-Lieu of Motor Vehicle In-Lieu Fee Revenue (VLF)				
Total Citywide Assessed Value [3]		*e*	$2,710,640,574	$2,710,640,574
Total Assessed Value of Project Area		*f*	$2,308,244,724	$2,255,521,288
Project Area Percentage of Citywide AV		*g = f / e*	85.15%	83.21%
Property Tax In-Lieu of VLF [4]	**$1,400,000**	***h = g * $1,400,000***	**$1,192,169**	**$1,164,939**

prop lath

Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; San Joaquin County Auditor-Controller; EPS.

[1] Represents the total assessed value of all land, structures, and improvements located within the Project Area. Refer to Table A-2 for details.
[2] Reflects the average property tax allocation to the City General Fund for all TRAs within the 200-year flood plain that are within the boundaries of the City of Lathrop. TRAs include: 007-000, 007-002, 007-007, 007-008, 007-010, 007-012, 007-013, 007-014, 007-022, 007-029, 007-032, 007-041, 007-043, 007-046, 007-047, 007-048, 007-049, 007-071, and 007-074.
[3] Reflects Assessed Valuation for FY 2016-17. Includes citywide secured, unsecured, homeowner exemption, and public utility roll.
[4] Property tax in-lieu of VLF amount derived from the City of Lathrop FY 2016-17 Annual Budget.

APPENDIX B:

City of Manteca

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Table B-2 Existing Land Use Assessed Value and No Project Alternative Adjustment—City of Manteca (2 pages) 8

Table B-3 Estimated Annual Property Tax Revenues—City of Manteca 10

Table B-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
No Project Revenues Summary (2016$) - City of Manteca

City of Manteca

Item	Existing Revenues	No Project Adjusted Revenues	Difference
Annual General Fund Revenues [1]			
Property Tax Revenues	$709,747	$657,406	($52,342)
Property Tax In Lieu of VLF Revenue	$442,910	$410,247	($32,663)
Total Annual General Fund Revenues	**$1,152,657**	**$1,067,652**	**($85,005)**

sum man

Source: EPS.

[1] Reflects only the revenue categories that would be impacted by the No Project Alternative.

Table B-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - City of Manteca

City of Manteca

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Assessed Value: Total Existing Value	Existing Value per Acre	Adjusted Value per Acre [1]	Percentage of Acres to Lose Value [2]	Total Adjusted Value
Improved Land [3]								
Residential Land Uses	**225**	**$104,992,282**	**$251,689,748**	**$356,682,030**				**$356,682,030**
Residential	193	$103,903,624	$250,251,012	$354,154,636	$1,833,554	[4]	0%	$354,154,636
Rural Residential	32	$1,088,658	$1,438,736	$2,527,394	$80,204	[4]	0%	$2,527,394
Nonresidential Land Uses	**111**	**$29,334,153**	**$82,500,316**	**$111,834,469**				**$111,834,469**
Commercial	63	$25,088,271	$63,335,323	$88,423,594	$1,412,314	[4]	0%	$88,423,594
Industrial	48	$4,245,882	$19,164,993	$23,410,875	$483,996	[4]	0%	$23,410,875
Vacant Land Uses	**97**	**$2,450,959**	**$193,406**	**$2,644,365**				**$2,644,365**
Vacant	-	-	-	-	-	[4]	0%	-
Vacant Commercial	60	$1,121,642	$123,037	$1,244,679	$20,850	[4]	0%	$1,244,679
Vacant Industrial	38	$1,329,317	$70,369	$1,399,686	$37,029	[4]	0%	$1,399,686
Vacant Residential	-	-	-	-	-	[4]	-	-
Total Improved Land	**433**	**$136,777,394**	**$334,383,470**	**$471,160,864**				**$471,160,864**
Unimproved and Agricultural Land								
Residential Land Uses	**32**	**$5,294,153**	**-**	**$5,294,153**				**$5,294,153**
Residential	27	$5,198,214	-	$5,198,214	$194,996	[4]	0%	$5,198,214
Rural Residential	6	$95,939	-	$95,939	$16,802	[4]	0%	$95,939
Nonresidential Land Uses	**406**	**$110,484**	**-**	**$110,484**				**$110,484**
Commercial	406	$110,484	-	$110,484	$272	[4]	0%	$110,484
Industrial	-	-	-	-	-	[4]	-	-
Agricultural Land Uses	**1,057**	**$6,383,314**	**$1,368,597**	**$7,751,911**				**$7,329,409**
Agricultural (Delta Plan Area) [5]	0	$0	$0	$0	$0	[4]	0%	$0
Agricultural	1,057	$6,383,314	$1,368,597	$7,751,911	$7,332	$6,000	30%	$7,329,409
Vacant Land Uses	**518**	**$41,459,481**	**-**	**$41,459,481**				**$3,107,640**
Vacant	-	-	-	-	-	-	-	-
Vacant Commercial	189	$13,053,344	-	$13,053,344	$69,154	$6,000	100%	$1,132,548
Vacant Industrial	146	$19,965,980	-	$19,965,980	$136,800	$6,000	100%	$875,700
Vacant Residential	183	$8,440,157	-	$8,440,157	$46,063	$6,000	100%	$1,099,392
Total Unimproved Land	**2,013**	**$53,247,432**	**$1,368,597**	**$54,616,029**				**$15,841,686**

Table B-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - City of Manteca

City of Manteca

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Assessed Value: Total Existing Value	Existing Value per Acre	Adjusted Value per Acre [1]	Percentage of Acres to Lose Value [2]	Total Adjusted Value
All Land Uses								
Residential Land Uses	**257**	**$110,286,435**	**$251,689,748**	**$361,976,183**				**$361,976,183**
Residential	220	$109,101,838	$250,251,012	$359,352,850	$1,634,834	N/A	N/A	$359,352,850
Rural Residential	37	$1,184,597	$1,438,736	$2,623,333	$70,478	N/A	N/A	$2,623,333
Nonresidential Land Uses	**517**	**$29,444,637**	**$82,500,316**	**$111,944,953**				**$111,944,953**
Commercial	468	$25,198,755	$63,335,323	$88,534,078	$189,024	N/A	N/A	$88,534,078
Industrial	48	$4,245,882	$19,164,993	$23,410,875	$483,996	N/A	N/A	$23,410,875
Agricultural Land Uses	**1,057**	**$6,383,314**	**$1,368,597**	**$7,751,911**				**$7,329,409**
Agricultural (Delta Plan Area) [5]	0	$0	$0	$0	$0	N/A	N/A	$0
Agricultural	1,057	$6,383,314	$1,368,597	$7,751,911	$7,332	N/A	N/A	$7,329,409
Vacant Land Uses	**615**	**$43,910,440**	**$193,406**	**$44,103,846**				**$5,752,005**
Vacant	-	-	-	-	-	N/A	N/A	-
Vacant Commercial	248	$14,174,986	$123,037	$14,298,023	$57,548	N/A	N/A	$2,377,227
Vacant Industrial	184	$21,295,297	$70,369	$21,365,666	$116,276	N/A	N/A	$2,275,386
Vacant Residential	183	$8,440,157	-	$8,440,157	$46,063	N/A	N/A	$1,099,392
Total All Land Uses	**2,446**	**$190,024,826**	**$335,752,067**	**$525,776,893**				**$487,002,550**

AV man

Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; LWA; EPS.

[1] Adjusted assessed value is estimated as the existing, average land value per acre for all agricultural land within the Project Area.
[2] Represents the portion of vacant acres, including agricultural acres, estimated to lose value without a flood certification in place. This adjustment is based on the percentage of vacant acres required for development anticipated to buildout within the next 15 years (by 2030).
[3] Improved Land includes any parcels with an assessed value associated with a structure or machinery on the property.
[4] These land use categories are not anticipated to be reassessed to a lower value if ULOP certification is not obtained.
[5] Represents land in the Delta Plan, which is precluded from future development and not expected to change in value based on whether ULOP certification is obtained.

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Table B-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Estimated Annual Property Tax Revenues (2016$) - City of Manteca

City of Manteca

Item	Assumption/ Source	Formula	Estimated Property Tax Revenues Existing	Adjusted
Property Tax Revenue				
1-Percent Property Tax				
Total Assessed Value Existing within Project Area [1]	Table B-2	*a*	$525,776,893	$487,002,550
Property Tax Revenue (1% of Assessed Value)	1.0000%	*b = a * 1.00%*	$5,257,769	$4,870,026
Estimated Property Tax Allocation				
City of Manteca General Fund [2]	13.4990%	*c = b * 13.50%*	$709,747	$657,406
Other Agencies/ERAF	86.5010%	*d = b * 86.50%*	$4,548,022	$4,212,620
Property Tax In-Lieu of Motor Vehicle In-Lieu Fee Revenue (VLF)				
Total Citywide Assessed Value [3]		*e*	$6,625,186,105	$6,625,186,105
Total Assessed Value of Project Area		*f*	$525,776,893	$487,002,550
Project Area Percentage of Citywide AV		*g = f / e*	7.94%	7.35%
Property Tax In-Lieu of VLF [4]	**$5,581,000**	***h = g * $5,581,000***	**$442,910**	**$410,247**

prop man

Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; San Joaquin County Auditor-Controller; EPS.

[1] Represents the total assessed value of all land, structures, and improvements located within the Project Area. Refer to Table B-2 for details.
[2] Reflects the average property tax allocation to the City's General Fund for all TRAs within the 200-year flood plain that are within the boundaries of the City of Manteca and not included in a redevelopment area. TRAs include: 002-000, 002-060, 002-063, 002-064, 002-087, and 002-088.
[3] Reflects Assessed Valuation for FY 2016-17. Includes citywide secured, unsecured, homeowner exemption, and public utility roll.
[4] Property tax in-lieu of VLF amount derived from the City of Manteca FY 2016-17 Annual Budget.

APPENDIX C:

City of Stockton

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Table C-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
No Project Revenues Summary (2016$) - City of Stockton

City of Stockton

Item	Existing Revenues	No Project Adjusted Revenues	Difference
Annual General Fund Revenues [1]			
Property Tax Revenues	$1,806,397	$1,795,491	($10,906)
Property Tax In Lieu of VLF Revenue	$1,226,646	$1,219,240	($7,406)
Total Annual General Fund Revenues	**$3,033,043**	**$3,014,731**	**($18,312)**

sum stock

Source: EPS.

[1] Reflects only the revenue categories that would be impacted by the No Project Alternative.

Table C-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - City of Stockton

City of Stockton

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Assessed Value: Total Existing Value	Existing Value per Acre	Adjusted Value per Acre [1]	Percentage of Acres to Lose Value [2]	Total Adjusted Value
Improved Land [3]								
Residential Land Uses	**846**	**$313,029,281**	**$813,742,433**	**$1,126,771,714**				**$1,126,771,714**
Residential	845	$313,020,169	$813,641,895	$1,126,662,064	$1,333,213	[4]	0%	$1,126,662,064
Rural Residential	1	$9,112	$100,538	$109,650	$88,570	[4]	0%	$109,650
Nonresidential Land Uses	**27**	**$9,304,992**	**$16,054,558**	**$25,359,550**				**$25,359,550**
Commercial	27	$9,204,506	$15,898,118	$25,102,624	$934,886	[4]	0%	$25,102,624
Industrial	0	$100,486	$156,440	$256,926	$533,041	[4]	0%	$256,926
Vacant Land Uses	**0**	**$81,000**	**$189,000**	**$270,000**				**$270,000**
Vacant	-	-	-	-	-	[4]	-	-
Vacant Commercial	-	-	-	-	-	[4]	-	-
Vacant Industrial	-	-	-	-	-	[4]	-	-
Vacant Residential	0	$81,000	$189,000	$270,000	$1,875,000	[4]	0%	$270,000
Total Improved Land	**873**	**$322,415,273**	**$829,985,991**	**$1,152,401,264**				**$1,152,401,264**
Unimproved and Agricultural Land								
Residential Land Uses	**84**	**$3,889,270**	**-**	**$3,889,270**				**$3,889,270**
Residential	84	$3,889,270	-	$3,889,270	$46,222	[4]	0%	$3,889,270
Rural Residential	-	-	-	-	-	[4]	-	-
Nonresidential Land Uses	**178**	**$902,354**	**-**	**$902,354**				**$902,354**
Commercial	178	$902,354	-	$902,354	$5,083	[4]	0%	$902,354
Industrial	-	-	-	-	-	[4]	-	-
Agricultural Uses	**44**	**$100,007**	**$143,279**	**$243,286**				**$243,286**
Agricultural (Delta Plan Area) [5]	0	$0	$0	$0	$0	[4]	0%	$0
Agricultural	44	$100,007	$143,279	$243,286	$5,572	$5,572	30%	$243,286
Vacant Land Uses	**88**	**$7,414,877**	**-**	**$7,414,877**				**$382,068**
Vacant	34	$58,476	-	$58,476	$1,739	$1,739	100%	$58,476
Vacant Commercial	24	$4,839,068	-	$4,839,068	$204,854	$6,000	100%	$141,732
Vacant Industrial	-	-	-	-	-	-	-	-
Vacant Residential	30	$2,517,333	-	$2,517,333	$83,053	$6,000	100%	$181,860
Total Unimproved Land	**392**	**$12,306,508**	**$143,279**	**$12,449,787**				**$5,416,978**

Table C-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - City of Stockton

City of Stockton

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Assessed Value: Total Existing Value	Existing Value per Acre	Adjusted Value per Acre [1]	Percentage of Acres to Lose Value [2]	Total Adjusted Value
Total All Land Uses								
Residential Land Uses	**930**	**$316,918,551**	**$813,742,433**	**$1,130,660,984**				**$1,130,660,984**
Residential	929	$316,909,439	$813,641,895	$1,130,551,334	$1,216,672	N/A	N/A	$1,130,551,334
Rural Residential	1	$9,112	$100,538	$109,650	$88,570	N/A	N/A	$109,650
Nonresidential Land Uses	**205**	**$10,207,346**	**$16,054,558**	**$26,261,904**				**$26,261,904**
Commercial	204	$10,106,860	$15,898,118	$26,004,978	$127,240	N/A	N/A	$26,004,978
Industrial	0	$100,486	$156,440	$256,926	$533,041	N/A	N/A	$256,926
Agricultural Uses	**44**	**$100,007**	**$143,279**	**$243,286**				**$243,286**
Agricultural (Delta Plan Area) [5]	0	$0	$0	$0	$0	N/A	N/A	$0
Agricultural	44	$100,007	$143,279	$243,286	$5,572	N/A	N/A	$243,286
Vacant Land Uses	**88**	**$7,495,877**	**$189,000**	**$7,684,877**				**$652,068**
Vacant	34	$58,476	-	$58,476	$1,739	N/A	N/A	$58,476
Vacant Commercial	24	$4,839,068	-	$4,839,068	$204,854	N/A	N/A	$141,732
Vacant Industrial	-	-	-	-	-	N/A	N/A	-
Vacant Residential	30	$2,598,333	$189,000	$2,787,333	$91,526	N/A	N/A	$451,860
Total All Land Uses	**1,266**	**$334,721,781**	**$830,129,270**	**$1,164,851,051**				**$1,157,818,242**

AV stock

Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; LWA; EPS.

[1] Adjusted assessed value is estimated as the lesser of the existing total assessed value per acre for each land use or the existing, average land value per acre for all agricultural land within the Project Area.
[2] Represents the portion of vacant acres, including agricultural acres, estimated to lose value without a flood certification in place. This adjustment is based on the percentage of vacant acres required for development anticipated to buildout within the next 15 years (by 2030).
[3] Improved Land includes any parcels with an assessed value associated with a structure or machinery on the property.
[4] These land use categories are not anticipated to be reassessed to a lower value if ULOP certification is not obtained.
[5] Represents land in the Delta Plan, which is precluded from future development and not expected to change in value based on whether ULOP certification is obtained.

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Table C-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Estimated Annual Property Tax Revenues (2016$) - City of Stockton

City of Stockton

Item	Assumption/ Source	Formula	Estimated Property Tax Revenues Existing	Adjusted
Property Tax Revenue				
1-Percent Property Tax				
Total Assessed Value Existing within Project Area [1]	Table C-2	*a*	$1,164,851,051	$1,157,818,242
Property Tax Revenue (1% of Assessed Value)	1.0000%	*b = a * 1.00%*	$11,648,511	$11,578,182
Estimated Property Tax Allocation [2]				
City of Stockton General Fund	15.5075%	*c = b * 15.51%*	$1,806,397	$1,795,491
Other Agencies/ERAF	84.4925%	*d = b * 84.49%*	$9,842,113	$9,782,691
Property Tax In-Lieu of Motor Vehicle In-Lieu Fee Revenue (VLF)				
Total Citywide Assessed Value [3]		*e*	$20,337,129,485	$20,337,129,485
Total Assessed Value of Project Area		*f*	$1,164,851,051	$1,157,818,242
Project Area Percent of Citywide AV		*g = f / e*	5.73%	5.69%
Property Tax In-Lieu of VLF [4]	**$21,416,000**	***h = g * $21,416,000***	**$1,226,646**	**$1,219,240**

prop stock

Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; San Joaquin County Auditor-Controller; EPS.

[1] Represents the total assessed value of all land, structures, and improvements located within the Project Area. Refer to Table C-2 for details.
[2] Reflects the average property tax allocation to the City's General Fund for all TRAs within the 200-year flood plain that are within the boundaries of the City of Stockton. TRAs include: 003-159, 003-206, 003-238, 003,240, 003-289, 003-312, 003-463, and 003-464.
[3] Reflects Assessed Valuation for FY 2016-17. Includes Citywide secured, unsecured, homeowner exemption, and public utility roll.
[4] Property tax in-lieu of VLF amount derived from the City of Stockton FY 2016-17 Annual Budget.

APPENDIX D:

San Joaquin County

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Table D-4 Estimated Annual Property Tax Revenues—San Joaquin County 20

Table D-1
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
No Project Revenues Summary (2016$) - San Joaquin County

San Joaquin County

Item	Existing Revenues	No Project Adjusted Revenues	Difference
Annual General Fund Revenues [1]			
Property Tax Revenues	$8,666,360	$8,456,008	($210,352)
Property Tax In Lieu of VLF Revenue	$5,270,245	$5,142,158	($128,086)
Total Annual General Fund Revenues	**$13,936,604**	**$13,598,166**	**($338,438)**

sum SJ

Source: EPS.

[1] Reflects only the revenue categories that would be impacted by the No Project Alternative.

Table D-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - San Joaquin County (2016$)

San Joaquin County

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Assessed Value: Total Existing Value	Total Assessed Value: Total Adjusted Value [1]
Improved Land [2]					
Residential Land Uses	**3,417**	**$885,432,618**	**$2,134,465,310**	**$3,019,897,928**	**$3,019,897,928**
Residential	2,329	$850,385,101	$2,080,087,981	$2,930,473,082	$2,930,473,082
Rural Residential	1,088	$35,047,517	$54,377,329	$89,424,846	$89,424,846
Nonresidential Land Uses	**2,311**	**$239,820,582**	**$932,599,926**	**$1,172,420,508**	**$1,172,420,508**
Commercial	1,030	$113,298,387	$212,479,807	$325,778,194	$325,778,194
Industrial	1,281	$126,522,195	$720,120,119	$846,642,314	$846,642,314
Vacant Land Uses	**264**	**$16,240,053**	**$4,742,466**	**$20,982,519**	**$20,982,519**
Vacant	0	$66,750	$2,225	$68,975	$68,975
Vacant Commercial	92	$7,212,975	$2,337,857	$9,550,832	$9,550,832
Vacant Industrial	169	$8,586,038	$1,782,594	$10,368,632	$10,368,632
Vacant Residential	3	$374,290	$619,790	$994,080	$994,080
Total Improved Land	**5,992**	**$1,141,493,253**	**$3,071,807,702**	**$4,213,300,955**	**$4,213,300,955**
Unimproved and Agricultural Land					
Residential Land Uses	**418**	**$18,328,469**	**-**	**$18,328,469**	**$18,328,469**
Residential	231	$14,478,477	-	$14,478,477	$14,478,477
Rural Residential	188	$3,849,992	-	$3,849,992	$3,849,992
Nonresidential Land Uses	**3,221**	**$32,407,747**	**-**	**$32,407,747**	**$32,407,747**
Commercial	2,823	$18,735,373	-	$18,735,373	$18,735,373
Industrial	398	$13,672,374	-	$13,672,374	$13,672,374
Agricultural Uses	**9,730**	**$62,789,402**	**$29,239,605**	**$92,029,007**	**$81,928,328**
Agricultural (Delta Plan Area) [3]	508	$2,659,383	-	$2,659,383	$2,659,383
Agricultural	9,730	$62,789,402	$29,239,605	$92,029,007	$81,928,328
Vacant Land Uses	**2,132**	**$150,149,015**	**-**	**$150,149,015**	**$50,667,392**
Vacant	90	$1,041,722	-	$1,041,722	$623,658
Vacant Commercial	648	$57,671,697	-	$57,671,697	$17,986,298
Vacant Industrial	665	$46,838,788	-	$46,838,788	$14,720,799
Vacant Residential	730	$44,596,808	-	$44,596,808	$17,336,638
Total Unimproved Land	**16,009**	**$266,334,016**	**$29,239,605**	**$295,573,621**	**$185,991,319**

Table D-2
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - San Joaquin County (2016$)

San Joaquin County

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Assessed Value: Total Existing Value	Total Assessed Value: Total Adjusted Value [1]
Total All Land Uses					
Residential Land Uses	**3,836**	**$903,761,087**	**$2,134,465,310**	**$3,038,226,397**	**$3,038,226,397**
Residential	2,560	$864,863,578	$2,080,087,981	$2,944,951,559	$2,944,951,559
Rural Residential	1,275	$38,897,509	$54,377,329	$93,274,838	$93,274,838
Nonresidential Land Uses	**5,532**	**$272,228,329**	**$932,599,926**	**$1,204,828,255**	**$1,204,828,255**
Commercial	3,853	$132,033,760	$212,479,807	$344,513,567	$344,513,567
Industrial	1,679	$140,194,569	$720,120,119	$860,314,688	$860,314,688
Agricultural Uses	**9,730**	**$62,789,402**	**$29,239,605**	**$92,029,007**	**$81,928,328**
Agricultural (Delta Plan Area) [3]	508	$2,659,383	-	$2,659,383	$2,659,383
Agricultural	9,730	$62,789,402	$29,239,605	$92,029,007	$81,928,328
Vacant Land Uses	**2,396**	**$166,389,068**	**$4,742,466**	**$171,131,534**	**$71,649,911**
Vacant	90	$1,108,472	$2,225	$1,110,697	$692,633
Vacant Commercial	740	$64,884,672	$2,337,857	$67,222,529	$27,537,130
Vacant Industrial	834	$55,424,826	$1,782,594	$57,207,420	$25,089,431
Vacant Residential	733	$44,971,098	$619,790	$45,590,888	$18,330,718
Total All Land Uses	**22,002**	**$1,407,827,269**	**$3,101,047,307**	**$4,508,874,576**	**$4,399,292,274**

AV

Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; LWA; EPS.

[1] Total adjusted value calculated on a per-jurisdiction basis, refer to Table D-3, Table C-2, Table A-2, and Table B-2 for details.
[2] Improved Land includes any parcels with an assessed value associated with a structure or machinery on the property.
[3] Represents land in the Delta Plan, which is precluded from future development and not expected to change in value based on whether ULOP certification is obtained.

Table D-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - Unincorporated San Joaquin County

Unincorporated San Joaquin County

Land Use	Total Acres	FY 2016/17 Assessed Value						
				Total Assessed Value				
		Existing Land Value	Existing Land Improvement Value	Total Existing Value	Existing Value per Acre	Adjusted Value per Acre [1]	Percentage of Acres to Lose Value [2]	Total Adjusted Value
Improved Land [3]								
Residential Land Uses	**1,419**	**$99,292,203**	**$190,439,390**	**$289,731,593**				**$289,731,593**
Residential	417	$67,518,330	$140,165,313	$207,683,643	$498,497	[4]	0%	$207,683,643
Rural Residential	1,002	$31,773,873	$50,274,077	$82,047,950	$81,866	[4]	0%	$82,047,950
Nonresidential Land Uses	**918**	**$37,648,977**	**$66,368,756**	**$104,017,733**				**$104,017,733**
Commercial	701	$17,332,956	$20,216,306	$37,549,262	$53,549	[4]	0%	$37,549,262
Industrial	217	$20,316,021	$46,152,450	$66,468,471	$306,974	[4]	0%	$66,468,471
Vacant Land Uses	**74**	**$3,889,979**	**$621,351**	**$4,511,330**				**$4,511,330**
Vacant	-	-	-	-	-	[4]	0%	-
Vacant Commercial	1	$122,442	$97,678	$220,120	$268,439	[4]	0%	$220,120
Vacant Industrial	71	$3,659,688	$378,051	$4,037,739	$56,672	[4]	0%	$4,037,739
Vacant Residential	2	$107,849	$145,622	$253,471	$120,528	[4]	0%	$253,471
Total Improved Land	**2,410**	**$140,831,159**	**$257,429,497**	**$398,260,656**				**$398,260,656**
Unimproved and Agricultural Land								
Residential Land Uses	**249**	**$7,033,340**	**-**	**$7,033,340**				**$7,033,340**
Residential	87	$3,733,531	-	$3,733,531	$42,942	[4]	0%	$3,733,531
Rural Residential	162	$3,299,809	-	$3,299,809	$20,346	[4]	0%	$3,299,809
Nonresidential Land Uses	**1,128**	**$6,721,792**	**-**	**$6,721,792**				**$6,721,792**
Commercial	841	$652,397	-	$652,397	$776	[4]	0%	$652,397
Industrial	288	$6,069,395	-	$6,069,395	$21,088	[4]	0%	$6,069,395
Agricultural Uses	**7,934**	**$52,225,562**	**$26,058,121**	**$78,283,683**				**$68,962,599**
Agricultural (Delta Plan Area) [5]	508	$2,659,383	-	$2,659,383	$5,231	[4]	0%	$2,659,383
Agricultural	7,426	$49,566,179	$26,058,121	$75,624,300	$10,184	$6,000	30%	$66,303,216
Vacant Land Uses	**399**	**$19,702,437**	**-**	**$19,702,437**				**$17,971,808**
Vacant	11	$123,494	-	$123,494	$11,431	$6,000	10%	$117,626
Vacant Commercial	109	$5,565,828	-	$5,565,828	$51,291	$6,000	10%	$5,074,354
Vacant Industrial	181	$7,094,028	-	$7,094,028	$39,107	$6,000	10%	$6,493,465
Vacant Residential	99	$6,919,087	-	$6,919,087	$70,145	$6,000	10%	$6,286,362
Total Unimproved Land	**9,710**	**$85,683,131**	**$26,058,121**	**$111,741,252**				**$100,689,539**

Table D-3
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Existing Land Use Assessed Value and No Project Alternative Adjustment (2016$) - Unincorporated San Joaquin County

Unincorporated San Joaquin County

Land Use	Total Acres	FY 2016/17 Assessed Value						
				Total Assessed Value				
		Existing Land Value	Existing Land Improvement Value	Total Existing Value	Existing Value per Acre	Adjusted Value per Acre [1]	Percentage of Acres to Lose Value [2]	Total Adjusted Value
Total All Land Uses								
Residential Land Uses	**1,668**	**$106,325,543**	**$190,439,390**	**$296,764,933**				**$296,764,933**
Residential	504	$71,251,861	$140,165,313	$211,417,174	$419,843	N/A	N/A	$211,417,174
Rural Residential	1,164	$35,073,682	$50,274,077	$85,347,759	$73,298	N/A	N/A	$85,347,759
Nonresidential Land Uses	**2,046**	**$44,370,769**	**$66,368,756**	**$110,739,525**				**$110,739,525**
Commercial	1,542	$17,985,353	$20,216,306	$38,201,659	$24,777	N/A	N/A	$38,201,659
Industrial	504	$26,385,416	$46,152,450	$72,537,866	$143,826	N/A	N/A	$72,537,866
Agricultural Uses	**7,934**	**$52,225,562**	**$26,058,121**	**$78,283,683**				**$68,962,599**
Agricultural (Delta Plan Area) [5]	508	$2,659,383	-	$2,659,383	$5,231	N/A	N/A	$2,659,383
Agricultural	7,426	$49,566,179	$26,058,121	$75,624,300	$10,184	N/A	N/A	$66,303,216
Vacant Land Uses	**474**	**$23,592,416**	**$621,351**	**$24,213,767**				**$22,483,138**
Vacant	11	$123,494	-	$123,494	$11,431	N/A	N/A	$117,626
Vacant Commercial	109	$5,688,270	$97,678	$5,785,948	$52,920	N/A	N/A	$5,294,474
Vacant Industrial	253	$10,753,716	$378,051	$11,131,767	$44,060	N/A	N/A	$10,531,204
Vacant Residential	101	$7,026,936	$145,622	$7,172,558	$71,197	N/A	N/A	$6,539,833
Total All Land Uses	**12,121**	**$226,514,290**	**$283,487,618**	**$510,001,908**				**$498,950,195**

AV SJ

Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; LWA; EPS.

[1] Adjusted assessed value is estimated as the existing, average land value per acre for all agricultural land within the Project Area.
[2] Represents the portion of vacant acres, including agricultural acres, estimated to lose value without a flood certification in place. This adjustment is based on the percentage of vacant acres required for development anticipated to buildout within the next 15 years (by 2030).
[3] Improved Land includes any parcels with an assessed value associated with a structure or machinery on the property.
[4] These land use categories are not anticipated to be reassessed to a lower value if ULOP certification is not obtained.
[5] Represents land in the Delta Plan, which is precluded from future development and not expected to change in value based on whether ULOP certification is obtained.

Table D-4
RD-17 Basin Finance Plan Implementation
Fiscal Impact Analysis - No Project Alternative
Estimated Annual Property Tax Revenues (2016$) - San Joaquin County

San Joaquin County

Item	Assumption/ Source	Formula	Estimated Property Tax Revenues Existing	Adjusted
Property Tax Revenue				
Total Assessed Value Existing within Project Area				
Assessed Value of Unincorporated County [1]	Table D-3	*a*	$510,001,908	$498,950,195
Assessed Value of Incorporated Cities [2]		*b*	$3,998,872,668	$3,900,342,080
Total Countywide Assessed Value within Project Area		***c = a + b***	**$4,508,874,576**	**$4,399,292,274**
Property Tax Revenue (1% of Assessed Value)				
Property Tax Revenue in Unincorporated County	1.0000%	*d = a * 1.00%*	$5,100,019	$4,989,502
Property Tax Revenue in Incorporated Cities	1.0000%	*e = b * 1.00%*	$39,988,727	$39,003,421
Total Property Tax Revenue within Project Area		***f = d + e***	**$45,088,746**	**$43,992,923**
Estimated Property Tax Allocation				
Property Tax Allocation in Unincorporated County				
San Joaquin County General Fund [3]	21.0216%	*g = d * 21.02%*	$1,072,108	$1,048,875
Other Agencies/ERAF	78.9784%	*h = d * 78.98%*	$4,027,911	$3,940,627
Property Tax Allocation in Incorporated Cities				
San Joaquin County General Fund [4]	18.9910%	*i = e * 18.99%*	$7,594,252	$7,407,133
Other Agencies/ERAF	81.0090%	*j = e * 81.01%*	$36,525,950	$35,638,235
Total San Joaquin County General Fund Property Tax Allocation		***k = g + i***	**$8,666,360**	**$8,456,008**
Property Tax In-Lieu of Motor Vehicle In-Lieu Fee Revenue (VLF)				
Total Countywide Assessed Value [5]		*l*	$66,473,297,283	$66,473,297,283
Total Assessed Value of Project Area		*m*	$4,508,874,576	$4,399,292,274
Project Area Percentage of Countywide AV		*n = m / l*	6.78%	6.62%
Property Tax In-Lieu of VLF [6]	**$77,698,000**	***o = n * $77,698,000***	**$5,270,245**	**$5,142,158**

prop SJ

Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; San Joaquin County Auditor-Controller; EPS.

[1] Represents the total assessed value of all land, structures, and improvements located within the Unincorporated San Joaquin County and the Project Area. Refer to Table D-3 for details.
[2] Represents the sum of total assessed value of all land, structures, and improvements located within the Cities of Stockton, Lathrop, and Manteca and the Project Area. Refer to Table C-2, Table A-2, and Table B-2 for details.
[3] Reflects the average property tax allocation to the County General Fund for all TRAs within the 200-year flood plain that are within the boundaries of the Cities of Lathrop, Manteca, and Stockton. TRAs include: 002-000, 002-060, 002-063, 002-064, 002-087, 002-088, 003-159, 003-206, 003-238, 003-240, 003-289, 003-312, 003463, 003-464, 007-000, 007-002, 007-007, 007-008, 007-010, 007-012, 007-013, 007-014, 007-022, 007-029, 007-032, 007-041, 007-043, 007-046, 007-047, 007-048, 007-049, 007-071, and 007-074.
[4] Reflects the average property tax allocation to the County's General Fund for all TRAs within the 200-year flood plain that are not within the City's boundary. TRAs include: 102-001, 102-003, 102-004, 102-032, 102-034, 102-038, 102-041, 102-044, 102-049, 102-058, 102-060, 102-065, 102-066, 102-067, 102-073, 102-099, 102-100, 102-108, 102-121, 102-135, 102-135, 102-136, 102-138, 102-151, 102-154, 102-159, 102-175, 102-177, 102-178.
[5] Reflects Assessed Valuation for FY 2016-17. Includes countywide secured, unsecured, homeowner exemption, and public utility roll.
[6] Property tax in-lieu of VLF amount derived from the San Joaquin County FY 2016-17 Annual Budget.

ATTACHMENT D:
DEVELOPMENT FEASIBILITY ANALYSES

- RD 17 Area Finance Plan Implementation Support Feasibility Analysis prepared by Economic & Planning Systems, Inc.

Preliminary Draft Discussion Tables

RD 17 Area Finance Plan Implementation Support

Feasibility Analysis

Prepared by:

Economic & Planning Systems, Inc. (EPS)

September 5, 2017

EPS #162095

The Economics of Land Use

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Table 1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Summary of Infrastructure Cost Burden and Residual Land Value Analysis: Single-Family Residential [1] [2]

Single-Family Residential

Item	Source	Development Areas Within RD 17			
		Lathrop	Manteca	Stockton	Unincorp. SJC
		Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annexation
Assumed Home Sales Price	[3]	**$450,000**	**$450,000**	**$325,000**	**$325,000**
Infrastructure Burden					
Backbone Improvement Costs	[4]	$32,500	$32,500	$32,500	$32,500
City/County/Agency Development Fees	[4]	$43,800	$52,500	$56,700	$60,200
Estimated Infrastructure & School Facility Bond Debt	[4]	$57,200	-	$3,800	-
Proposed Flood Control Assessment	[4]	TBD	TBD	TBD	TBD
Subtotal Infrastructure Burden		**$133,500**	**$85,000**	**$93,000**	**$92,700**
Infrastructure Burden as a % of Assumed Home Sales Price		**29.7%**	**18.9%**	**28.6%**	**28.5%**
Unit Development Costs					
Vertical Construction	[4]	$162,500	$162,500	$162,500	$162,500
Subdivision Lot Improvement Cost	[4]	$35,000	$35,000	$35,000	$35,000
Builder Profit (10% of Sales Price)	[4]	$45,000	$45,000	$32,500	$32,500
Other Soft Costs	[4]	$83,400	$83,400	$60,200	$60,200
Subtotal Unit Development Costs		**$325,900**	**$325,900**	**$290,200**	**$290,200**
TOTAL COST OF UNIT		**$459,400**	**$410,900**	**$383,200**	**$382,900**
Residual Land Value per Unit		**($9,400)**	**$39,100**	**($58,200)**	**($57,900)**
As a % of Total Development Costs		(2.0%)	9.5%	(15.2%)	(15.1%)
Per Lot Sq. Ft.		($1.34)	$5.59	($8.31)	($8.27)

sfr rlv summ

Source: The Gregory Group; Various City/County/Agency Development Impact Fee Schedules; EPS.

[1] Analysis based on dwelling unit with the following characteristics: 2,500 sq. ft. living area; 450 garage sq. ft.; 5.0 DU/Acre; and 7,000 sq. ft. lot. Prototype based on EPS review of typical new single-family residential units developed in the Central Valley.
[2] All values are rounded to the nearest $100.
[3] Based on a review of single-family residential homes sold in San Joaquin County communities from 2016 Q4 to 2017 Q1, as reported by The Gregory Group, a database that provides specific analysis related to new home projects throughout California and Nevada.
[4] See Table A-1.

Table 2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Summary of Infrastructure Cost Burden and Residual Land Value Analysis: Multifamily Residential [1] [2]

Multifamily Residential

Item	Source	Development Areas Within RD 17			
		Lathrop	Manteca	Stockton	Unincorp. SJC
		Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annexation
Assumed Capitalized Value per Unit	[3]	**$180,000**	**$180,000**	**$180,000**	**$180,000**
Infrastructure Burden					
Backbone Improvement Costs	[4]	$11,000	$11,000	$11,000	$11,000
City/County/Agency Development Fees	[4]	$22,400	$28,000	$31,100	$32,000
Estimated Infrastructure & School Facility Bond Debt	[4]	$17,200	-	$1,700	-
Proposed Flood Control Assessment	[4]	TBD	TBD	TBD	TBD
Subtotal Infrastructure Burden		**$50,600**	**$39,000**	**$43,800**	**$43,000**
Infrastructure Burden as a % of Assumed Cap. Value per Unit		**28.1%**	**21.7%**	**24.3%**	**23.9%**
Unit Development Costs					
Vertical Construction	[4]	$137,500	$137,500	$137,500	$137,500
Subdivision Lot Improvement Cost	[4]	$11,000	$11,000	$11,000	$11,000
Builder Profit (10% of Sales Price)	[4]	$18,000	$18,000	$18,000	$18,000
Other Soft Costs	[4]	$31,500	$31,500	$31,500	$31,500
Subtotal Unit Development Costs		**$198,000**	**$198,000**	**$198,000**	**$198,000**
TOTAL COST OF UNIT		**$248,600**	**$237,000**	**$241,800**	**$241,000**
Residual Land Value per Unit		**($68,600)**	**($57,000)**	**($61,800)**	**($61,000)**
As a % of Total Development Costs		(27.6%)	(24.1%)	(25.6%)	(25.3%)
Per Acre		($3,430)	($2,850)	($3,090)	($3,050)

mfr rlv summ

Source: CoStar; Loopnet; CBRE; The Gregory Group; Various City/County/Agency Development Impact Fee Schedules; EPS.

[1] Analysis based on apartment development project with the following characteristics: 10 acres; 200 total units; 20.0 DU/Acre; 250,000 gross building sq. ft.; 200,000 net leasable building sq. ft.; and average unit size of 1,000 sq. ft. Project characteristics based on EPS review of suburban apartment complexes in the Central Valley.
[2] All values are rounded to the nearest $100.
[3] Based on a review of multifamily residential property sales in the Central Valley, as reported by CoStar and Loopnet. Research conducted in May, 2017.
[4] See Table A-2.

Table 3
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Summary of Infrastructure Cost Burden and Residual Land Value Analysis: Industrial Development [1] [2]

Industrial

Item	Source	Development Areas Within RD 17			
		Lathrop East Lathrop	Manteca Trails of Manteca	Stockton Weston Ranch	Unincorp. SJC Stockton Annexation
Assumed Value per Building	[3]	**$21,250,000**	**$21,250,000**	**$21,250,000**	**$21,250,000**
Infrastructure Burden					
Backbone Improvement Costs	[4]	$1,365,000	$1,365,000	$1,365,000	$1,365,000
City/County/Agency Development Fees	[4]	$1,675,000	$2,267,000	$1,340,000	$1,540,000
Estimated Infrastructure & School Facility Bond Debt	[4]	-	-	-	-
Proposed Flood Control Assessment	[4]	TBD	TBD	TBD	TBD
Subtotal Infrastructure Burden		**$3,040,000**	**$3,632,000**	**$2,705,000**	**$2,905,000**
Infrastructure Cost Burden as a % of Assumed Building Value		**14.3%**	**17.1%**	**12.7%**	**13.7%**
Unit Development Costs					
Vertical Construction	[4]	$10,500,000	$10,500,000	$10,500,000	$10,500,000
Builder Profit (10% of Sales Price)	[4]	$2,125,000	$2,125,000	$2,125,000	$2,125,000
Other Soft Costs	[4]	$3,720,000	$3,720,000	$3,720,000	$3,720,000
Subtotal Unit Development Costs		**$16,345,000**	**$16,345,000**	**$16,345,000**	**$16,345,000**
TOTAL COST OF BUILDING		**$19,385,000**	**$19,977,000**	**$19,050,000**	**$19,250,000**
Residual Land Value per Building		**$1,865,000**	**$1,273,000**	**$2,200,000**	**$2,000,000**
As a % of Total Development Costs		9.6%	6.4%	11.5%	10.4%
Per Acre		$162,000	$111,000	$191,000	$174,000

ind rlv summ

Source: CoStar; Loopnet; CBRE; The Gregory Group; Various City/County/Agency Development Impact Fee Schedules; EPS.

[1] Analysis based on industrial development project with the following characteristics: 11.5 acres; 0.50 FAR; 250,000 gross bldg. sq. ft.; and 237,500 net leasable bldg. sq. ft.
Project characteristics based on EPS review of warehouse/distribution developments in the Central Valley.
[2] All values are rounded to the nearest $1000.
[3] Based on a review of industrial property sales in the Central Valley, as reported by CoStar, Loopnet, and CBRE transaction reports. Research conducted in May, 2017.
[4] See Table A-3.

APPENDICES:

Appendix A: Detailed Residual Land Value Analysis

Appendix B: Single-Family Residential Infrastructure Cost Burden Analysis

Appendix C: Multifamily Residential Infrastructure Cost Burden Analysis

Appendix D: Industrial Development Infrastructure Cost Burden Analysis

Appendix E: Retail Development Infrastructure Cost Burden Analysis

Appendix F: Assessed Value Assumptions by Land Use

Appendix G: Stanford Crossing CFF Credit Analysis

APPENDIX A:

Detailed Residual Land Value Analysis

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Table A-2 Land Residual Value Calculation: Multifamily Residential (2 pages) 6

Table A-3 Land Residual Value Calculation: Industrial (2 pages) 8

Table A-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Land Residual Value Calculation: Single-Family Residential [1]

Single-Family Residential

Item	Source	Assumption	Development Areas Within RD 17: Lathrop Stanford Crossing	Manteca Trails of Manteca	Stockton Weston Ranch	Unincorp. SJC Stockton Annex
Development Assumptions						
Unit Sq. Ft.	[2]	2,500				
Garage Sq. Ft.	[2]	450				
Density (DU/Acre)	[2]	5.0				
Lot Sq. Ft.	[2]	7,000				
Sales Price per Unit	[3]		**$450,000**	**$450,000**	**$325,000**	**$325,000**
Per Unit Sq. Ft.			$180	$180	$130	$130
Development Costs per Unit						
Direct Costs						
Backbone Improvement Cost	[4]	20.0% of vertical cost	$32,500	$32,500	$32,500	$32,500
Subdivision Lot Improvement Cost	[5]	$35,000 per lot	$35,000	$35,000	$35,000	$35,000
Vertical Construction Cost	[6]	$65 per unit sq. ft.	$162,500	$162,500	$162,500	$162,500
City/County/Agency Development Fees	[7]	-	$43,800	$52,500	$56,700	$60,200
Est. Infrastructure & School Facility Bond Debt	[7]	-	$57,200	-	$3,800	-
Proposed Flood Control Assessment	[8]	-	TBD	TBD	TBD	TBD
Closing Cost	[4]	0.5% of sales price	$2,300	$2,300	$1,600	$1,600
Total Direct Costs			**$333,300**	**$284,800**	**$292,100**	**$291,800**
Indirect Costs						
Builder Overhead (General & Admin.) Costs	[9]	3.0% of sales price	$13,500	$13,500	$9,800	$9,800
Builder Indirect Costs	[9]	4.0% of sales price	$18,000	$18,000	$13,000	$13,000
Construction Financing Costs	[9]	5.0% of sales price	$22,500	$22,500	$16,300	$16,300
Sales and Marketing Costs	[9]	4.0% of sales price	$18,000	$18,000	$13,000	$13,000
Real Estate Taxes	[9]	1.5% of sales price	$6,800	$6,800	$4,900	$4,900
New Home Warranty Costs	[9]	0.5% of sales price	$2,300	$2,300	$1,600	$1,600
Total Indirect Costs			**$81,100**	**$81,100**	**$58,600**	**$58,600**
Builder Developer Profit	[4]	10.0% of sales price	$45,000	$45,000	$32,500	$32,500
Total Development Costs per Unit			**$459,400**	**$410,900**	**$383,200**	**$382,900**
Per Unit Sq. Ft.			$184	$164	$153	$153
Land Residual Value per Unit			**($9,400)**	**$39,100**	**($58,200)**	**($57,900)**
As a % of Total Development Costs			(2.0%)	9.5%	(15.2%)	(15.1%)
Per Lot Sq. Ft.			($1.34)	$5.59	($8.31)	($8.27)

sfr rlv

Source: The Gregory Group; Various City/County/Agency Development Impact Fee Schedules; EPS.

Table A-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Land Residual Value Calculation: Single-Family Residential [1]

Single-Family Residential

[1] All values are rounded to the nearest $100.
[2] Analysis based on dwelling unit with the following characteristics: 2,500 sq. ft. living area; 450 garage sq. ft.; 5.0 DU/Acre; and 7,000 sq. ft. lot. Prototype based on EPS review of typical new single-family residential units developed in the Central Valley.
[3] Based on a review of single-family residential homes sold in San Joaquin County communities from 2016 Q4 to 2017 Q1, as reported by The Gregory Group, a database that provides specific analysis related to new home projects throughout California and Nevada.
[4] Based on recent analyses prepared by EPS that evaluated the direct development costs of master plan development in the Central Valley.
[5] Based on 2017 information from developers related to single-family residential developments in the Central Valley.
[6] Based on information from developers related to recent (2016 and 2017) single-family residential developments in the Sacramento Valley.
[7] See Table B-1.
[8] Table TBD.
[9] Based on numerous land residual analyses prepared by EPS and reviewed by real estate developers.

Table A-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Land Residual Value Calculation: Multifamily Residential [1]

Multifamily Residential

Item	Source	Assumption	Development Areas Within RD 17			
			Lathrop	Manteca	Stockton	Unincorp. SJC
			Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex
Development Assumptions						
Acres	[2]	10				
Total No. of Units	[2]	200				
Density (DU/Ac. or FAR)	[2]	20				
Gross Building Square Feet	[2]	250,000				
Net Building Square Feet (80% net-to-gross)	[2]	200,000				
Avg. Unit Sq. Ft.	[2]	1,000				
Capitalized Value per Unit	[3]	**$180,000**				
Per Unit Sq. Ft.		$180.00				
Development Costs per Unit						
Direct Costs						
Backbone Improvement Cost	[4]	8.0% of vertical cost	$11,000	$11,000	$11,000	$11,000
Subdivision Lot Improvement Cost	[4]	8.0% of vertical cost	$11,000	$11,000	$11,000	$11,000
Vertical Construction Cost	[5]	$110 per gross bldg. sq. ft.	$137,500	$137,500	$137,500	$137,500
City/County/Agency Development Fees	[6]	-	$22,400	$28,000	$31,100	$32,000
Est. Infrastructure & School Facility Bond Debt	[6]	-	$17,200	$0	$1,700	$0
Proposed Flood Control Assessment	[7]	-	TBD	TBD	TBD	TBD
Total Direct Costs			**$199,100**	**$187,500**	**$192,300**	**$191,500**
Indirect Costs						
Builder Overhead (General & Admin.) Costs	[5]	3.0% of cap. value	$5,400	$5,400	$5,400	$5,400
Builder Indirect Costs	[5]	4.0% of cap. value	$7,200	$7,200	$7,200	$7,200
Construction Financing Costs	[5]	5.0% of cap. value	$9,000	$9,000	$9,000	$9,000
Sales and Marketing Costs	[5]	4.0% of cap. value	$7,200	$7,200	$7,200	$7,200
Real Estate Taxes	[5]	1.5% of cap. value	$2,700	$2,700	$2,700	$2,700
Total Indirect Costs			**$31,500**	**$31,500**	**$31,500**	**$31,500**
Builder Developer Profit	[5]	10.0% of cap. value	$18,000	$18,000	$18,000	$18,000
Total Development Costs per Unit			**$248,600**	**$237,000**	**$241,800**	**$241,000**
Per Unit Sq. Ft.			$248.60	$237.00	$241.80	$241.00
Land Residual Value per Unit			**($68,600)**	**($57,000)**	**($61,800)**	**($61,000)**
As a % of Total Development Costs			(27.6%)	(24.1%)	(25.6%)	(25.3%)
Per Acre			($1,372,000)	($1,140,000)	($1,236,000)	($1,220,000)

mfr rlv

Source: CoStar; Loopnet; Various City/County/Agency Development Impact Fee Schedules; EPS.

Table A-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Land Residual Value Calculation: Multifamily Residential [1]

Multifamily Residential

[1] All values are rounded to the nearest $100.
[2] Project characteristics (i.e., unit size, density, project size) based on review of suburban apartment complexes in the Central Valley.
[3] Based on a review of multifamily residential property sales in the Central Valley, as reported by CoStar and Loopnet. Research conducted in May, 2017. See Table F-1 for detail.
[4] Based on recent analyses prepared by EPS that evaluated the direct development costs of master plan development in the Central Valley.
[5] Based on numerous land residual analyses prepared by EPS and review by real estate developers.
[6] See Table C-1.
[7] Table TBD.

Table A-3
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Land Residual Value Calculation: Industrial [1]

Industrial

Item	Source	Assumption	Development Areas Within RD 17: Lathrop East Lathrop	Manteca Trails of Manteca	Stockton Weston Ranch	Unincorp. SJC Stockton Annex
Development Assumptions						
Acres	[2]	11.5				
Density (FAR)	[2]	0.50				
Gross Building Square Feet	[2]	250,000				
Net Building Square Feet (95% net-to-gross)	[2]	237,500				
Capitalized Value	[3]	**$21,250,000**				
Per Bldg. Sq. Ft.		$85.00				
Development Costs per Building						
Direct Costs						
Backbone Improvement Cost	[4]	13.0% of vertical cost	$1,365,000	$1,365,000	$1,365,000	$1,365,000
Vertical Construction Cost	[4]	$42 per gross bldg. sq. ft.	$10,500,000	$10,500,000	$10,500,000	$10,500,000
City/County/Agency Development Fees	[5]	-	$1,675,000	$2,267,000	$1,340,000	$1,540,000
Est. Infrastructure & School Facility Bond Debt	[5]	-	$0	$0	$0	$0
Proposed Flood Control Assessment	[6]	-	TBD	TBD	TBD	TBD
Total Direct Costs			**$11,865,000**	**$11,865,000**	**$11,865,000**	**$11,865,000**
Indirect Costs						
Builder Overhead (General & Admin.) Costs	[7]	3.0% of cap. value	$638,000	$638,000	$638,000	$638,000
Builder Indirect Costs	[7]	4.0% of cap. value	$850,000	$850,000	$850,000	$850,000
Construction Financing Costs	[7]	5.0% of cap. value	$1,063,000	$1,063,000	$1,063,000	$1,063,000
Sales and Marketing Costs	[7]	4.0% of cap. value	$850,000	$850,000	$850,000	$850,000
Real Estate Taxes	[7]	1.5% of cap. value	$319,000	$319,000	$319,000	$319,000
Total Indirect Costs			**$3,720,000**	**$3,720,000**	**$3,720,000**	**$3,720,000**
Builder Developer Profit	[7]	10.0% of cap. value	$2,125,000	$2,125,000	$2,125,000	$2,125,000
Total Development Costs			**$19,385,000**	**$19,977,000**	**$19,050,000**	**$19,250,000**
Per Bldg. Sq. Ft.			$77.54	$79.91	$76.20	$77.00
Land Residual Value			**$1,865,000**	**$1,273,000**	**$2,200,000**	**$2,000,000**
As a % of Total Development Costs			9.6%	6.4%	11.5%	10.4%
Per Acre			$162,000	$111,000	$191,000	$174,000

ind rlv

Source: CoStar; Loopnet; CBRE; Various City/County/Agency Development Impact Fee Schedules; EPS.

Table A-3
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Land Residual Value Calculation: Industrial [1]

Industrial

[1] All values are rounded to the nearest $1000.
[2] Project characteristics (i.e., density, project size) based on review of light industrial developments in the Central Valley.
[3] Based on a review of industrial property sales in the Central Valley, as reported by CoStar, Loopnet, and CBRE transaction reports. Research conducted in May, 2017. See Table F-3 for detail.
[4] Backbone Improvement Cost reflects the on- and off-site improvement costs as a percentage of shell and tenant improvement costs of a recent industrial development in the Central Valley.
[5] See Table D-1.
[6] Table TBD.
[7] Based on numerous land residual analyses prepared by EPS and review by real estate developers.

APPENDIX B:

Single-Family Residential Infrastructure Cost Burden Analysis

Table B-1 Summary of Infrastructure Cost Burden per Unit (2 pages) 10

Table B-2 City/County/Other Agency Development Impact Fees per Unit (2 pages) 12

Table B-3 Estimated School Mitigation per Unit 14

Table B-4 Special Taxes and Assessments per Unit 15

Table B-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Single-Family Residential - 2,500 Sq. Ft. Home, 450 Sq. Ft. Garage, 5.0 DU/Acre
Summary of Infrastructure Cost Burden per Unit

Single-Family Residential: Summary of Infrastructure Cost Burden Analysis

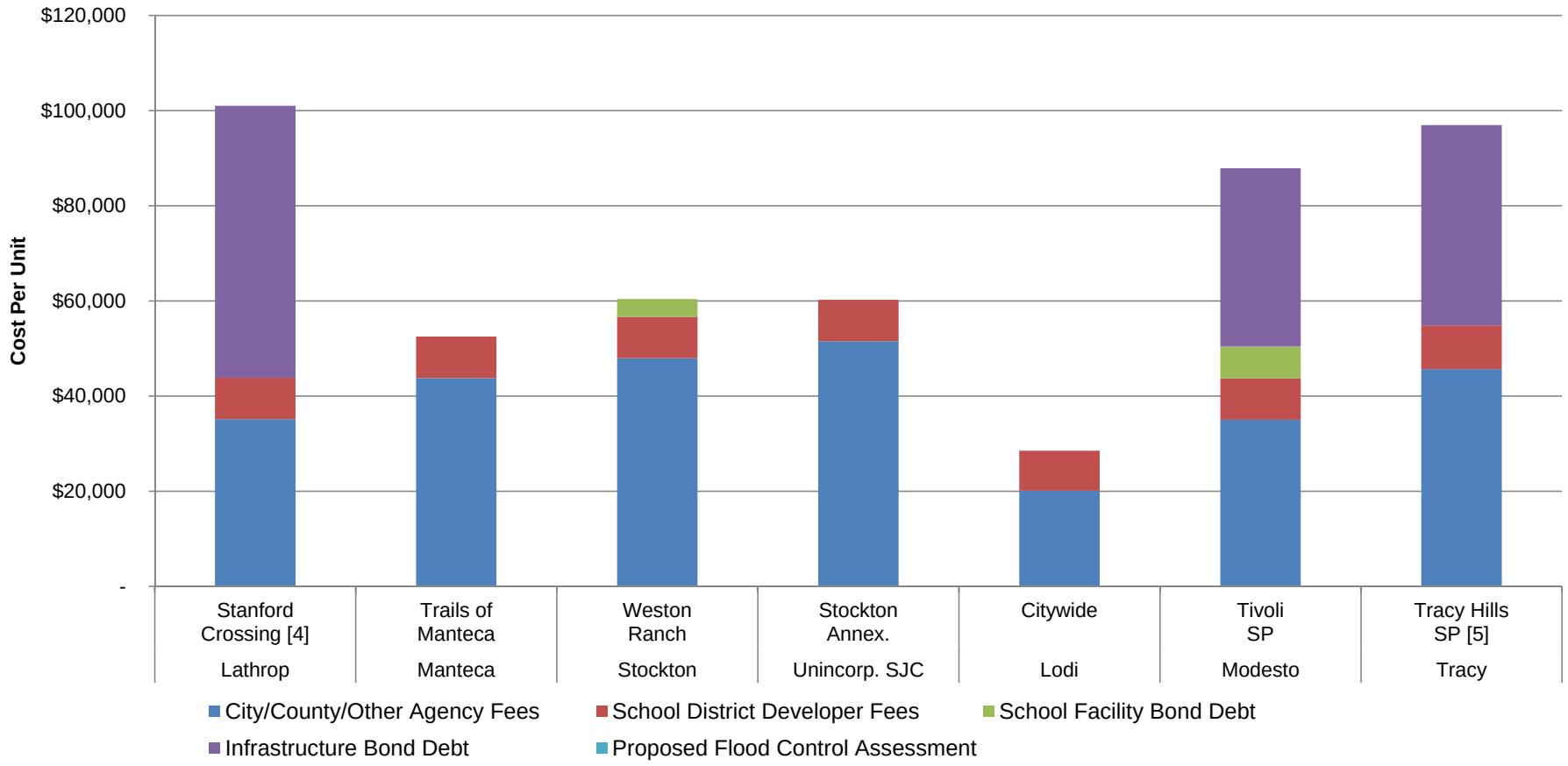
	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Summary of Development Impact Fees per Unit	Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex.	Citywide	Tivoli SP	Tracy Hills SP
Current as of	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*
Development Impact Fees per Unit							
Total City/County/Other Agency Development Impact Fees (Table B-2) [1]	$35,142	$43,793	$47,964	$51,526	$20,107	$35,021	$45,656
School District Developer Fees (Table B-3) [2]	$8,700	$8,700	$8,700	$8,700	$8,400	$8,700	$9,200
Subtotal Development Impact Fees	**$43,842**	**$52,493**	**$56,664**	**$60,226**	**$28,507**	**$43,721**	**$54,856**
Estimated Bond Debt per Unit							
Bond Debt for School Facilities (Table B-3) [3]	TBD	-	$3,753	-	-	$6,700	-
Bond Debt for Infrastructure (Table B-4)	$57,168	-	-	-	-	$37,463	$42,087
Bond Debt for Proposed Flood Control Assessment	TBD	TBD	TBD	TBD	-	-	-
Subtotal Estimated Bond Debt per Unit	**$57,168**	**-**	**$3,753**	**-**	**-**	**$44,163**	**$42,087**
Total Estimated Infrastructure Burden per Unit	**$101,010**	**$52,493**	**$60,418**	**$60,226**	**$28,507**	**$87,884**	**$96,942**

sfr summ

[1] No development areas evaluated in this analysis are subject to specific plan area fees.
[2] Tracy Hills SP: Per Jefferson USD Chief Business Officer, the school district is undergoing a mitigation agreement with Tracy Hills Specific Plan, which is not yet finalized. However, Jefferson USD currently charges $3.68 per residential square foot for projects without a mitigation agreement. This analysis assumes a fee of $3.68 per square foot, but is subject to change.
[3] Stanford Crossing: The project developer will soon enter into negotiations with the Manteca USD to establish a school infrastructure CFD.

Table B-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Single-Family Residential - 2,500 Sq. Ft. Home, 450 Sq. Ft. Garage, 5.0 DU/Acre
Summary of Infrastructure Cost Burden per Unit

Single-Family Residential:
Summary of Infrastructure
Cost Burden Analysis



[4] Stanford Crossing: The project developer will soon enter into negotiations with the Manteca USD to establish a school infrastructure CFD.
[5] Tracy Hills SP: Jefferson USD is undergoing a mitigation agreement with Tracy Hills Specific Plan developer. The school district currently charges $3.68 per residential square foot for projects without a mitigation agreement. This analysis assumes a fee of $3.68 per square foot, but is subject to change.

Table B-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Single-Family Residential - 2,500 Sq. Ft. Home, 450 Sq. Ft. Garage, 5.0 DU/Acre
City/County/Other Agency Development Impact Fees per Unit

Single-Family Residential:
City/County/Other Agency
Development Impact Fees

City/County/Other Agency Development Impact Fees per Unit: These are fees charged by the City, County, or Other Agency (e.g., Sewer District) and do not include fees for a special plan area.	**Development Areas Within RD 17**				**Development Areas Outside RD 17**		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
	Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex. [1]	Citywide	Tivoli SP	Tracy Hills SP
Current as of	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*
CITY/COUNTY/OTHER AGENCY FEES PER UNIT							
Processing Fees per Unit [2] [3]							
Building Permit	$2,054	$1,392	$2,574	$2,574	$3,678	$1,981	$2,796
Plan Check	$1,438	$1,113	$541	$541	$2,207	$211	$1,817
Fire Review Fee	$2,097	$647	$528	$528	$1,471	$538	$108
Energy Fee	$514	-	-	-	$368	-	$370
Technology Surcharge	-	$70	$240	$240	-	-	-
Seismic/Strong Motion	$42	$42	$42	$42	$42	$42	$47
CBSC Fee	$13	$13	$13	$13	$13	$13	$14
General Plan/Long Range Planning	-	-	$481	$481	-	$84	-
Other Building Permit or Processing Fees	$308	$258	$555	$555	$368	-	-
Subtotal Processing Fees per Unit	**$6,467**	**$3,535**	**$4,973**	**$4,973**	**$8,147**	**$2,869**	**$5,153**
Development Impact Fees per Unit							
Sewer [4]	-	$6,309	$2,950	$2,950	$1,720	$2,643	$8,337
Water [4] [5] [6] [7]	$6,687	$7,860	$12,042	$12,042	$1,263	$7,085	$6,355
Drainage [8]	-	$1,000	-	-	-	-	-
Traffic	$3,589	$2,665	$13,803	$13,803	$289	-	$5,186
Transit	-	-	-	-	-	-	-
Regional Traffic Fees	$3,223	$3,223	$3,336	$3,336	$3,223	$4,379	$3,223
Parks - Neighborhood	-	-	-	-	$1,016	-	-
Parks - Citywide	$9,034	$3,740	$2,896	$2,896	$1,584	-	$7,557
Library	-	-	$934	$934	-	-	-
Fire	$775	$700	$808	$808	$157	-	-
Police	-	-	$612	$612	$307	-	$1,349
Flood Protection	-	-	-	-	-	-	-
Habitat/Greenbelt Preservation [9]	-	$3,562	-	$3,562	$1,781	-	$3,562
Agriculture Mitigation	$651	$425	$2,387	$2,387	-	-	-
Affordable Housing	-	-	-	-	-	-	-
Public/Capital Facilities	$3,623	$4,607	$981	$981	$251	$14,793	$2,953
Fee Administration	$708	-	-	-	-	-	-
Other General Fees/One-Time Taxes	-	$1,250	$194	$194	$369	-	-
RD 17 Interim ULOP Fee [10]	$2,936	$2,936	-	-	-	-	-
Countywide Fees	$1,981	$1,981	$2,050	$2,050	-	$3,252	$1,981
City of Lathrop CFF Creditable Costs [11]	($4,532)	-	-	-	-	-	-
Total Development Impact Fees per Unit	**$28,675**	**$40,258**	**$42,992**	**$46,553**	**$11,960**	**$32,152**	**$40,503**
TOTAL CITY/COUNTY/OTHER AGENCY FEES PER UNIT	**$35,142**	**$43,793**	**$47,964**	**$51,526**	**$20,107**	**$35,021**	**$45,656**

sfr impact

Table B-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Single-Family Residential - 2,500 Sq. Ft. Home, 450 Sq. Ft. Garage, 5.0 DU/Acre
City/County/Other Agency Development Impact Fees per Unit

Single-Family Residential:
City/County/Other Agency
Development Impact Fees

[1] Assumes estimated fees as if the project is processed by the City of Stockton.
[2] Processing fees exclude mechanical, electrical, plumbing and other similar review fees.
[3] Building permit and other processing fees are often based on building valuation. Unless otherwise noted, building valuation for this analysis is based on ICC February 2017 Group R-3 Type VA for living square footage, and Group U Type VA for garage.
Stockton: City of Stockton utilizes Fall 2015 ICC for building valuation.
[4] Stockton: Fees are based on the Municipal Utilities Department Fee Estimator Calculators for a single-family residential address located in Weston Ranch.
[5] Assumes 3/4" water meter, unless otherwise noted.
Modesto: Assumes 1" water meter.
[6] Modesto: In addition to fees shown, the City of Modesto charges $26 per linear foot for water main installation. This cost is not included in this calculation.
[7] Tracy: Water distribution not included in analysis as this component is to be developer funded. In addition, Tracy Hills SP recycled water component is 47 percent of the City's Recycled Water Fees, per the Tracy Hills SP Development Agreement.
[8] Lodi: Drainage upgrades for the City's new growth areas are to be developer funded. Costs for such improvements varies by project basis.
Tracy: Drainage improvements in the Tracy Hills SP are to be developer funded.
[9] All San Joaquin County Projects: All SJC projects are subject to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) Development Fee. Per San Joaquin Council of Governments staff, this fee is due at grading permit. Details regarding each development area are provided below.
Lathrop-Stanford Crossing: The SJMSCP Development Fee has been paid for residential and commercial development areas in the specific plan area.
Manteca, Unincorporated San Joaquin County: Agriculture
Stockton-Weston Ranch: Exempt through development agreement.
Lodi: Open Spaces.
Tracy: Natural.
[10] As of 06-14-2017, the Cities of Lathrop and Manteca have passed ordinances to authorize the imposition of the RD 17 Interim ULOP Fee.
[11] Reflects the allocation of City of Lathrop CFF creditable costs for facility improvements by land use, per the CLSP Development Agreement, dated December 6, 2016. See Table G-1 through Table G-6 for details.

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Table B-3
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Single-Family Residential - 2,500 Sq. Ft. Home, 450 Sq. Ft. Garage, 5.0 DU/Acre
Estimated School Mitigation per Unit

Single-Family Residential: School Mitigation

	Development Areas Within RD 17				Development Areas Outside RD 17		
Estimated School Mitigation per Unit	Lathrop Stanford Crossing [1]	Manteca Trails of Manteca [2]	Stockton Weston Ranch	Unincorp. SJC Stockton Annex. [2]	Lodi Citywide	Modesto Tivoli SP [3]	Tracy Tracy Hills SP [4]
Current as of	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*
School District	*Manteca USD*	*Manteca USD*	*Manteca USD*	*Manteca USD*	*Lodi USD*	*[5]*	*Jefferson USD*
A. Annual School Mello-Roos CFD Taxes [1] [2] [3]	TBD	-	$666	-	-	$448	-
B. Present Value of School CFD Tax	TBD	-	$3,753	-	-	$6,700	-
C. School Fee per Sq. Ft.:							
Level 1 Fees	-	-	-	-	-	-	-
Level 2 (or 3) SB50 Fee [4]	$3.48	$3.48	$3.48	$3.48	$3.36	$3.48	$3.68
Mitigation Agreement	-	-	-	-	-	-	-
D. Total School Fee:							
Stirling Fee	-	-	-	-	-	-	-
Level 2 (or 3) SB50 Fee	$8,700	$8,700	$8,700	$8,700	$8,400	$8,700	$9,200
Mitigation Agreement	-	-	-	-	-	-	-
E. Total School Mitigation (B+D)	**$8,700**	**$8,700**	**$12,453**	**$8,700**	**$8,400**	**$15,400**	**$9,200**

sfr school

[1] Stanford Crossing: The project developer will soon enter into negotiations with the Manteca USD to establish a school infrastructure CFD.
[2] Manteca and Unincorp. SJC: New development areas in the Manteca USD are typically subject to a school infrastructure CFD. These development areas are not yet annexed into an existing school district CFD, nor has a school infrastructure CFD been formed yet for these areas.
[3] Modesto: Estimate based on the Tivoli Specific Plan Infrastructure Finance Plan produced in 2008, which assumes the development area would annex into SIFA CFD No. 1998-1.
[4] Tracy Hills SP: Per Jefferson USD Chief Business Officer, the school district is undergoing a mitigation agreement with Tracy Hills Specific Plan, which is not yet finalized. However, Jefferson USD currently charges $3.68 per residential square foot for projects without a mitigation agreement. This analysis assumes a fee of $3.68 per square foot, but is subject to change.
[5] Modesto: Fees are due to the Sylvan School District (K-8) and Modesto City Schools (9-12). Mello-Roos taxes are administered by the Schools Infrastructure Financing Agency (SIFA), which administers special taxes for schools in the Modesto area.

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Table B-4
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Single-Family Residential - 2,500 Sq. Ft. Home, 450 Sq. Ft. Garage, 5.0 DU/Acre
Special Taxes and Assessments per Unit

Single-Family Residential:
Special Taxes
and Assessments

	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Special Taxes and Assessments per Unit for Infrastructure [1]	Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex.	Citywide	Tivoli SP [2]	Tracy Hills SP
Current as of	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*
Annual Special Taxes and Assessments per Unit							
Infrastructure CFD [2]	$4,876	-	-	-	-	$2,578	$2,896
Infrastructure Assessment District	-	-	-	-	-	-	-
Total Annual Taxes and Assessments	**$4,876**	**-**	**-**	**-**	**-**	**$2,578**	**$2,896**
Estimated Bond Debt of Special Taxes and Assessments							
Infrastructure CFD	$57,168	-	-	-	-	$37,463	$42,087
Infrastructure Assessment District	-	-	-	-	-	-	-
Total Estimated Bond Debt	**$57,168**	**-**	**-**	**-**	**-**	**$37,463**	**$42,087**

sfr tax

[1] Taxes and Assessments for schools can be found in Table B-3.
[2] Modesto: The Infrastructure CFD for Tivoli Specific Plan has not yet been formed. The amount shown is an estimate based on the Tivoli Specific Plan Infrastructure Finance Plan, produced in 2008.

APPENDIX C:

Multifamily Residential Infrastructure Cost Burden Analysis

Table C-1	Summary of Infrastructure Cost Burden per Unit (2 pages)	16
Table C-2	City/County/Other Agency Development Impact Fees per Unit (2 pages)	18
Table C-3	Estimated School Mitigation per Unit	20
Table C-4	Special Taxes and Assessments per Unit	21

Table C-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Multifamily Residential Project - 1,000 Sq. Ft. Units, 200 Total Units, 20 DU/Acre
Summary of Infrastructure Cost Burden per Unit

Multifamily Residential: Summary of Infrastructure Cost Burden Analysis

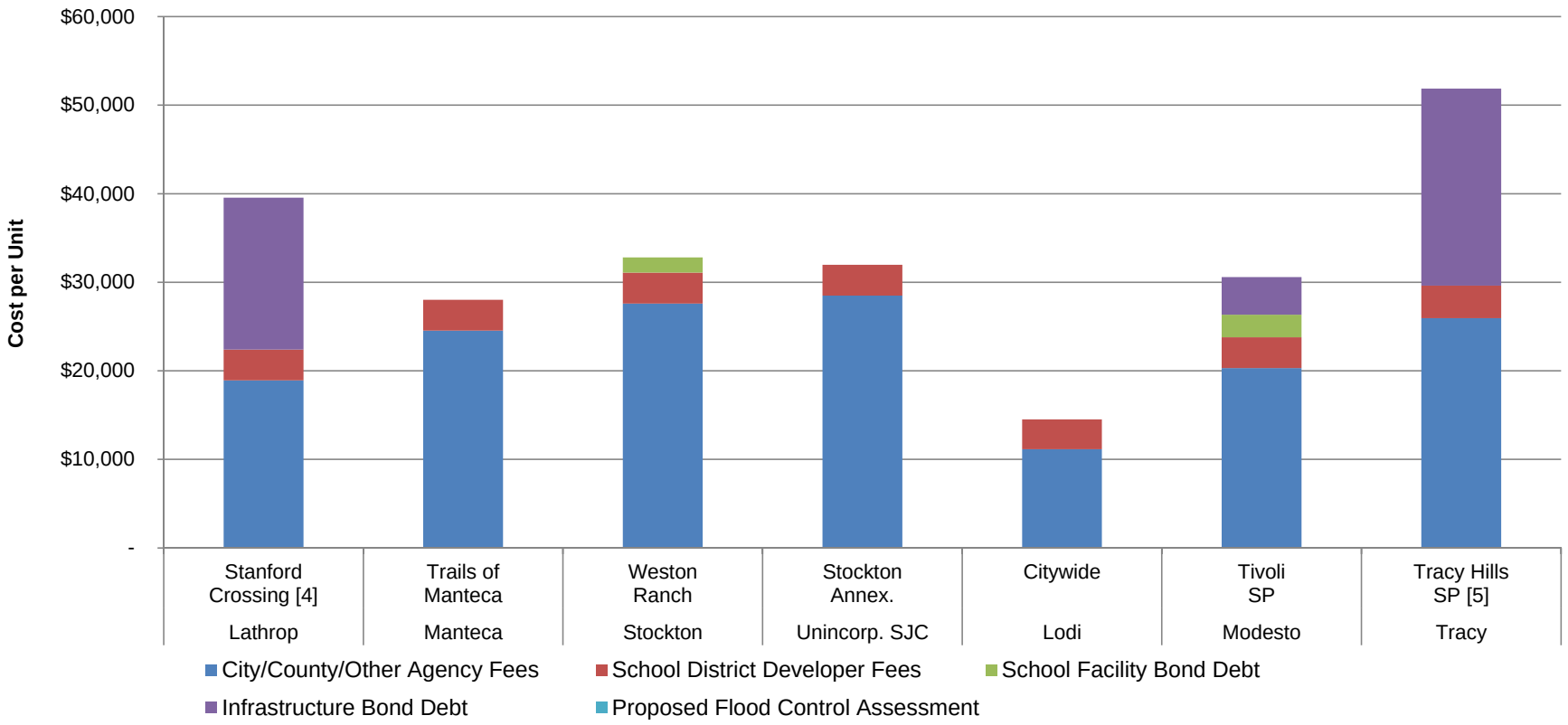
	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Summary of Development Impact Fees per Unit	Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex.	Citywide	Tivoli SP	Tracy Hills SP
Current as of	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*
Development Impact Fees per Unit							
Total City/County/Other Agency Development Impact Fees (Table C-2) [1]	$18,920	$24,536	$27,604	$28,494	$11,158	$20,312	$25,948
School District Developer Fees (Table C-3) [2]	$3,480	$3,480	$3,480	$3,480	$3,360	$3,480	$3,680
Subtotal Development Impact Fees	**$22,400**	**$28,016**	**$31,084**	**$31,974**	**$14,518**	**$23,792**	**$29,628**
Estimated Bond Debt per Unit							
Bond Debt for School Facilities (Table C-3) [3]	TBD	-	$1,727	-	-	$2,541	-
Bond Debt for Infrastructure (Table C-4)	$17,150	-	-	-	-	$4,257	$22,237
Bond Debt for Proposed Flood Control Assessment	TBD	TBD	TBD	TBD	-	-	-
Subtotal Estimated Bond Debt per Unit	**$17,150**	**-**	**$1,727**	**-**	**-**	**$6,798**	**$22,237**
Total Estimated Infrastructure Burden per Unit	**$39,550**	**$28,016**	**$32,810**	**$31,974**	**$14,518**	**$30,590**	**$51,865**

mfr summ

[1] No development areas evaluated in this analysis are subject to specific plan area fees.
[2] Tracy Hills SP: Per Jefferson USD Chief Business Officer, the school district is undergoing a mitigation agreement with Tracy Hills Specific Plan, which is not yet finalized. However, Jefferson USD currently charges $3.68 per residential square foot for projects without a mitigation agreement. This analysis assumes a fee of $3.68 per square foot, but is subject to change.
[3] Stanford Crossing: The project developer will soon enter into negotiations with the Manteca USD to establish a school infrastructure CFD.

Table C-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Multifamily Residential Project - 1,000 Sq. Ft. Units, 200 Total Units, 20 DU/Acre
Summary of Infrastructure Cost Burden per Unit

Multifamily Residential:
Summary of Infrastructure
Cost Burden Analysis



[4] Stanford Crossing: The project developer will soon enter into negotiations with the Manteca USD to establish a school infrastructure CFD.
[5] Tracy Hills SP: Jefferson USD is undergoing a mitigation agreement with Tracy Hills Specific Plan developer. The school district currently charges $3.68 per residential square foot for projects without a mitigation agreement. This analysis assumes a fee of $3.68 per square foot, but is subject to change.

Table C-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Multifamily Residential Project - 1,000 Sq. Ft. Units, 200 Total Units, 20 DU/Acre
City/County/Other Agency Development Impact Fees per Unit

Multifamily Residential: City/County/Other Agency Development Impact Fees

City/County/Other Agency Development Impact Fees per Unit: These are fees charged by the City, County, or Other Agency (e.g., Sewer District) and do not include fees for a special plan area.	**Development Areas Within RD 17**				**Development Areas Outside RD 17**		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
	Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex. [1]	Citywide	Tivoli SP	Tracy Hills SP
Current as of	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*
CITY/COUNTY/OTHER AGENCY FEES PER UNIT							
Processing Fees per Unit [2] [3] [4]							
Building Permit	$553	$467	$781	$781	$910	$609	$771
Plan Check	$387	$374	$637	$637	$546	$106	$501
Fire Review Fee	$553	$217	$95	$95	$364	$215	$113
Energy Fee	$138	-	-	-	$91	-	$46
Technology Surcharge	-	$23	$81	$81	-	-	-
Seismic/Strong Motion	$30	$30	$30	$30	$30	$30	$34
CBSC Fee	$4	$4	$4	$4	$4	$4	$5
General Plan/Long Range Planning	-	-	$162	$162	-	$28	-
Other Building Permit or Processing Fees	$83	-	$182	$182	$91	-	-
Subtotal Processing Fees per Unit	**$1,750**	**$1,117**	**$1,972**	**$1,972**	**$2,038**	**$992**	**$1,470**
Development Impact Fees per Unit							
Sewer [5]	-	$5,355	$2,175	$2,175	$3,584	$1,844	$5,558
Water [5] [6] [7] [8]	$2,786	$3,277	$4,260	$4,260	$526	$2,561	$3,328
Drainage [9]	-	$217	-	-	-	-	-
Traffic	$2,387	$1,597	$10,063	$10,063	$157	-	$3,164
Transit	-	-	-	-	-	-	-
Regional Traffic Fees	$1,934	$1,934	$2,001	$2,001	$1,934	$2,684	$1,934
Parks - Neighborhood	-	-	-	-	$713	-	-
Parks - Citywide	$6,452	$2,612	$1,772	$1,772	$1,111	-	$5,038
Library	-	-	$788	$788	-	-	-
Fire	$310	$340	$681	$681	$110	-	-
Police	-	-	$514	$514	$215	-	$899
Flood Protection	-	-	-	-	-	-	-
Habitat/Greenbelt Preservation [10]	-	$890	-	$890	$445	-	$890
Agriculture Mitigation	$203	$132	$665	$665	-	-	-
Affordable Housing	-	-	-	-	-	-	-
Public/Capital Facilities	$2,587	$3,458	$824	$824	$176	$9,966	$1,969
Fee Administration	$432	-	-	-	-	-	-
Other General Fees/One-Time Taxes	-	$975	$131	$131	$149	-	-
RD 17 Interim ULOP Fee [11]	$933	$933	-	-	-	-	-
Countywide Fees	$1,698	$1,698	$1,757	$1,757	-	$2,265	$1,698
City of Lathrop CFF Creditable Costs [12]	($2,552)	-	-	-	-	-	-
Total Development Impact Fees per Unit	**$17,170**	**$23,419**	**$25,632**	**$26,523**	**$9,120**	**$19,320**	**$24,479**
TOTAL CITY/COUNTY/OTHER AGENCY FEES PER UNIT	**$18,920**	**$24,536**	**$27,604**	**$28,494**	**$11,158**	**$20,312**	**$25,948**

mfr impact

Table C-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Multifamily Residential Project - 1,000 Sq. Ft. Units, 200 Total Units, 20 DU/Acre
City/County/Other Agency Development Impact Fees per Unit

Multifamily Residential:
City/County/Other Agency
Development Impact Fees

[1] Assumes estimated fees as if the project is processed by the City of Stockton.
[2] Processing fees exclude mechanical, electrical, plumbing and other similar review fees.
[3] Building permit and other processing fees are often based on building valuation. Unless otherwise noted, building valuation for this analysis is based on ICC February 2017 Group R-2 Type VA for living square footage.
Stockton: City of Stockton utilizes Fall 2015 ICC for building valuation.
[4] Processing fees based on valuation reflect a single unit's proportional share of the total processing costs assuming an average apartment building of 8 units.
[5] Stockton: Fees are based on the Municipal Utilities Department Fee Estimator Calculators for a single-family residential address located in Weston Ranch.
[6] Assumes a single 1.5-inch water meter per 8 unit building, unless otherwise noted.
[7] Modesto: In addition to fees shown, the City of Modesto charges $26 per linear foot for water main installation. This cost is not included in this calculation.
[8] Tracy: Water distribution not included in analysis as this component is to be developer funded. In addition, Tracy Hills SP recycled water component is 47 percent of the City's Recycled Water Fees, per the Tracy Hills SP Development Agreement.
[9] Lodi: Drainage upgrades for the City's new growth areas are to be developer funded. Costs for such improvements varies by project basis.
Tracy: Drainage improvements in the Tracy Hills SP are to be developer funded.
[10] All San Joaquin County Projects: All SJC projects are subject to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) Development Fee. Per San Joaquin Council of Governments staff, this fee is due at grading permit. Details regarding each development area are provided below.
Lathrop-Stanford Crossing: The SJMSCP Development Fee has been paid for residential and commercial development areas in the specific plan area.
Manteca, Unincorporated San Joaquin County: Agriculture
Stockton-Weston Ranch: Exempt through development agreement.
Lodi: Open Spaces.
Tracy: Natural.
[11] As of 06-14-2017, the Cities of Lathrop and Manteca have passed ordinances to authorize the imposition of the RD 17 Interim ULOP Fee.
[12] Reflects the allocation of City of Lathrop CFF creditable costs for facility improvements by land use, per the CLSP Development Agreement, dated December 6, 2016. See Table G-1 through Table G-6 for details.

Table C-3
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Multifamily Residential Project - 1,000 Sq. Ft. Units, 200 Total Units, 20 DU/Acre
Estimated School Mitigation per Unit

Multifamily Residential: School Mitigation

	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Estimated School Mitigation per Unit	Stanford Crossing [1]	Trails of Manteca [2]	Weston Ranch	Stockton Annex. [2]	Citywide	Tivoli SP [3]	Tracy Hills SP [4]
Current as of	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*
School District	*Manteca USD*	*Manteca USD*	*Manteca USD*	*Manteca USD*	*Lodi USD*	*[5]*	*Jefferson USD*
A. Annual School Mello-Roos CFD Taxes [1] [2] [3]	TBD	-	$307	-	-	$170	-
B. Present Value of School CFD Tax [1] [2] [3]	TBD	-	$1,727	-	-	$2,541	-
C. School Fee per Sq. Ft.:							
Level 1 Fees	-	-	-	-	-	-	-
Level 2 (or 3) SB50 Fee [4]	$3.48	$3.48	$3.48	$3.48	$3.36	$3.48	$3.68
Mitigation Agreement	-	-	-	-	-	-	-
D. Total School Fee:							
Stirling Fee	-	-	-	-	-	-	-
Level 2 (or 3) SB50 Fee	$3,480	$3,480	$3,480	$3,480	$3,360	$3,480	$3,680
Mitigation Agreement	-	-	-	-	-	-	-
E. Total School Mitigation (B+D)	**$3,480**	**$3,480**	**$5,207**	**$3,480**	**$3,360**	**$6,021**	**$3,680**

mfr school

[1] Stanford Crossing: The project developer will soon enter into negotiations with the Manteca USD to establish a school infrastructure CFD.
[2] Manteca and Unincorp. SJC: New development areas in the Manteca USD are typically subject to a school infrastructure CFD. These development areas are not yet annexed into an existing school district CFD, nor has a school infrastructure CFD been formed yet for these areas.
[3] Modesto: Estimate based on the Tivoli Specific Plan Infrastructure Finance Plan produced in 2008, which assumes the development area would annex into SIFA CFD No. 1998-1.
[4] Tracy Hills SP: Per Jefferson USD Chief Business Officer, the school district is undergoing a mitigation agreement with Tracy Hills Specific Plan, which is not yet finalized. However, Jefferson USD currently charges $3.68 per residential square foot for projects without a mitigation agreement. This analysis assumes a fee of $3.68 per square foot, but is subject to change.
[5] Modesto: Fees are due to the Sylvan School District (K-8) and Modesto City Schools (9-12). Mello-Roos taxes are administered by the Schools Infrastructure Financing Agency (SIFA), which administers special taxes for schools in the Modesto area.

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Table C-4
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Multifamily Residential Project - 1,000 Sq. Ft. Units, 200 Total Units, 20 DU/Acre
Special Taxes and Assessments per Unit

Multifamily Residential: Special Taxes and Assessments

	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Special Taxes and Assessments per Unit for Infrastructure [1]	Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex.	Citywide	Tivoli SP [2]	Tracy Hills SP
Current as of	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*	*May-17*
Annual Special Taxes and Assessments per Unit							
Infrastructure CFD [2]	$1,463	-	-	-	-	$293	$1,530
Infrastructure Assessment District	-	-	-	-	-	-	-
Total Annual Taxes and Assessments	**$1,463**	**-**	**-**	**-**	**-**	**$293**	**$1,530**
Estimated Bond Debt of Special Taxes and Assessments							
Infrastructure CFD	$17,150	-	-	-	-	$4,257	$22,237
Infrastructure Assessment District	-	-	-	-	-	-	-
Total Estimated Bond Debt	**$17,150**	**-**	**-**	**-**	**-**	**$4,257**	**$22,237**

mfr tax

[1] Taxes and Assessments for schools can be found in Table C-3.
[2] Modesto: The Infrastructure CFD for Tivoli Specific Plan has not yet been formed. The amount shown is an estimate based on the Tivoli Specific Plan Infrastructure Finance Plan, produced in 2008.

APPENDIX D:

Industrial Development
Infrastructure Cost Burden Analysis

Table D-1 Summary of Infrastructure Cost Burden per Building (2 pages) 22

Table D-2 City/County/Other Agency Development Impact Fees per Building (2 pages) 24

Table D-3 Estimated School Mitigation per Building 26

Table D-4 Special Taxes and Assessments per Building 27

Table D-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Industrial Project - 250,000 Building Sq. Ft., 11.5 Acres, 0.5 FAR
Summary of Infrastructure Cost Burden per Building

Industrial:
Summary of Infrastructure
Cost Burden Analysis

	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Summary of Development Impact Fees per Building	East Lathrop	Citywide	Citywide	Stockton Annex.	Citywide	Kiernan BP	Cordes Ranch SP
Current as of							
Development Impact Fees per Building							
Total City/County/Other Agency Development Impact Fees (Table D-2) [1]	$1,540,111	$2,131,563	$1,199,923	$1,404,715	$855,718	$978,132	$2,385,059
School District Developer Fees (Table D-3)	$135,000	$135,000	$140,000	$135,000	$140,000	$140,000	$140,000
Subtotal Development Impact Fees	**$1,675,111**	**$2,266,563**	**$1,339,923**	**$1,539,715**	**$995,718**	**$1,118,132**	**$2,525,059**
Per Acre	*$145,662*	*$197,092*	*$116,515*	*$133,888*	*$86,584*	*$97,229*	*$219,570*
Per Building Sq. Ft.	*$6.70*	*$9.07*	*$5.36*	*$6.16*	*$3.98*	*$4.47*	*$10.10*
Estimated Bond Debt per Building							
Bond Debt for School Facilities (Table D-3)	-	-	-	-	-	-	-
Bond Debt for Infrastructure (Table D-4)	-	-	-	-	-	$3,008,380	-
Bond Debt for Proposed Flood Control Assessment	TBD	TBD	TBD	TBD	-	-	-
Subtotal Estimated Bond Debt per Building	**-**	**-**	**-**	**-**	**-**	**$3,008,380**	**-**
Total Estimated Infrastructure Burden per Building	**$1,675,111**	**$2,266,563**	**$1,339,923**	**$1,539,715**	**$995,718**	**$4,126,512**	**$2,525,059**
Per Acre	*$145,662*	*$197,092*	*$116,515*	*$133,888*	*$86,584*	*$358,827*	*$219,570*
Per Building Sq. Ft.	*$6.70*	*$9.07*	*$5.36*	*$6.16*	*$3.98*	*$16.51*	*$10.10*

ind summ

[1] No development areas evaluated in this analysis are subject to specific plan area fees.

Table D-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Industrial Project - 250,000 Building Sq. Ft., 11.5 Acres, 0.5 FAR
Summary of Infrastructure Cost Burden per Building

Industrial:
Summary of Infrastructure
Cost Burden Analysis

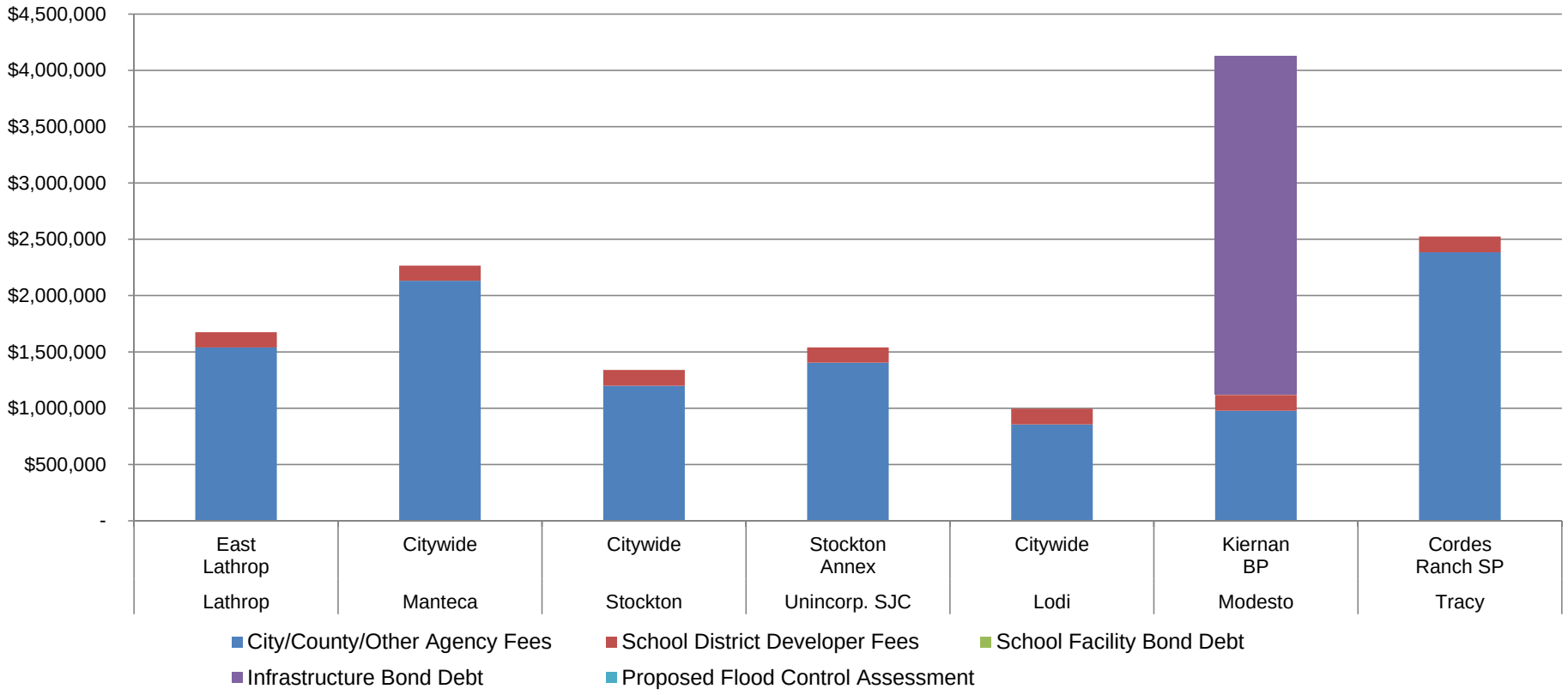


Table D-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Industrial Project - 250,000 Building Sq. Ft., 11.5 Acres, 0.5 FAR
City/County/Other Agency Development Impact Fees per Building

Industrial:
City/County/Other Agency
Development Impact Fees

City/County/Other Agency Development Impact Fees: These are fees charged by the City, County, or Other Agency (e.g., Sewer District) and do not include fees for a special plan area.	**Development Areas Within RD 17**				**Development Areas Outside RD 17**		
	Lathrop East Lathrop	Manteca Citywide	Stockton Citywide	Unincorp. SJC Stockton Annex. [1]	Lodi Citywide	Modesto Kiernan BP	Tracy Cordes Ranch SP
Current as of							
CITY/COUNTY/OTHER AGENCY FEES PER BUILDING							
Processing Fees per Building [2] [3]							
Building Permit	$55,431	$76,648	$96,857	$96,857	$59,380	$15,500	$66,625
Plan Check	$38,802	$61,318	$79,235	$79,235	$35,628	$75	$43,306
Fire Review Fee	$51,224	$35,650	$1,230	$1,230	$23,752	$53,750	$1,480
Energy Fee	$13,858	-	-	-	$2,375	-	$1,480
Technology Surcharge	-	$3,832	$13,369	$13,369	-	-	-
Seismic/Strong Motion	$4,991	$3,832	$4,991	$4,991	$4,991	$4,991	$4,991
CBSC Fee	$713	$713	$713	$713	$713	$713	$713
General Plan/Long Range Planning	-	-	$26,738	$26,738	$5,938	$4,635	-
Other Building Permit or Processing Fees	$8,315	-	$28,093	$28,093	$5,938	-	-
Subtotal Processing Fees per Building	**$173,333**	**$181,993**	**$251,225**	**$251,225**	**$138,714**	**$79,664**	**$118,595**
Development Impact Fees per Building							
Sewer	$328,432	$800,188	$104,299	$104,299	$76,070	$85,000	$383,502
Water [4] [5]	$32,119	$38,132	$135,431	$135,431	$22,521	$20,718	$475,353
Drainage	$52,509	$53,659	-	-	$180,389	-	$273,907
Traffic	-	$281,500	$262,567	$262,567	$110,750	-	$830,795
Transit	-	-	-	-	-	-	-
Regional Traffic Fees	$102,500	$102,500	$106,088	$106,088	$102,500	$261,250	$102,500
Parks - Neighborhood	-	-	-	-	-	-	-
Parks - Citywide	-	-	-	-	$54,250	-	-
Library	-	-	$14,490	$14,490	-	-	-
Fire	-	$22,500	$13,973	$13,973	$45,000	-	-
Police	-	-	$16,043	$16,043	$44,000	-	$34,000
Flood Protection	-	-	-	-	-	-	-
Habitat/Greenbelt Preservation [6]	$204,792	$204,792	-	$204,792	-	-	$102,408
Agriculture Mitigation	$46,575	$30,379	$124,905	$124,905	-	-	-
Affordable Housing	-	-	-	-	-	-	-
Public/Capital Facilities	$357,250	$170,000	$6,598	$6,598	$36,000	$513,000	$6,500
Fee Administration	$11,681	-	-	-	-	-	-
Other General Fees/One-Time Taxes	-	$15,000	$104,794	$104,794	$45,524	-	-
RD 17 Interim ULOP Fee [7]	$173,420	$173,420	-	-	-	-	-
Countywide Fees	$57,500	$57,500	$59,513	$59,513	-	$18,500	$57,500
Total Development Impact Fees per Building	**$1,366,778**	**$1,949,570**	**$948,699**	**$1,153,491**	**$717,004**	**$898,468**	**$2,266,464**
TOTAL CITY/COUNTY/OTHER AGENCY FEES PER BUILDING	**$1,540,111**	**$2,131,563**	**$1,199,923**	**$1,404,715**	**$855,718**	**$978,132**	**$2,385,059**
Per Acre	*$133,923*	*$185,353*	*$104,341*	*$122,149*	*$74,410*	*$85,055*	*$207,396*
Per Building Sq. Ft.	*$6.16*	*$8.53*	*$4.80*	*$5.62*	*$3.42*	*$3.91*	*$9.54*

ind impact

Table D-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Industrial Project - 250,000 Building Sq. Ft., 11.5 Acres, 0.5 FAR
City/County/Other Agency Development Impact Fees per Building

Industrial:
City/County/Other Agency
Development Impact Fees

[1] Assumes estimated fees as if the project is processed by the City of Stockton.
[2] Processing fees exclude mechanical, electrical, plumbing and other similar review fees.
[3] Building permit and other processing fees are often based on building valuation. Unless otherwise noted, building valuation for this analysis is based on ICC February 2017 Group F-2 Type VA.
[4] Assumes a single 2" meter for domestic water per building.
[5] Modesto: In addition to fees shown, the City of Modesto charges $26 per linear foot for water main installation. This cost is not included in this calculation.
[6] All San Joaquin County Projects: All SJC projects are subject to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) Development Fee. Per San Joaquin Council of Governments staff, this fee is due at grading permit. Details regarding each development area are provided below.
Lathrop, Manteca, Unincorporated San Joaquin County: Agriculture
Stockton and Lodi: Exempt.
Tracy: Open Space.
[7] As of 06-14-2017, the Cities of Lathrop and Manteca have passed ordinances to authorize the imposition of the RD 17 Interim ULOP Fee.

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Table D-3
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Industrial Project - 250,000 Building Sq. Ft., 11.5 Acres, 0.5 FAR
Estimated School Mitigation per Building

Industrial:
School Mitigation

	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Estimated School Mitigation	East Lathrop	Citywide	Citywide	Stockton Annex.	Citywide	Kiernan BP	Cordes Ranch SP
Current as of							
School District	*Manteca USD*	*Manteca USD*	*Stockton USD*	*Manteca USD*	*Lodi USD*	*[1]*	*Lammersville USD*
A. Annual School Mello-Roos CFD Taxes	-	-	-	-	-	-	-
B. Present Value of School CFD Tax	-	-	-	-	-	-	-
C. School Fee per Sq. Ft.:							
Level 1 Fees	-	-	-	-	-	-	-
Level 2 (or 3) SB50 Fee	$0.54	$0.54	$0.56	$0.54	$0.56	$0.56	$0.56
Mitigation Agreement	-	-	-	-	-	-	-
D. Total School Fee:							
Stirling Fee	-	-	-	-	-	-	-
Level 2 (or 3) SB50 Fee	$135,000	$135,000	$140,000	$135,000	$140,000	$140,000	$140,000
Mitigation Agreement	-	-	-	-	-	-	-
E. Total School Mitigation (B+D)	**$135,000**	**$135,000**	**$140,000**	**$135,000**	**$140,000**	**$140,000**	**$140,000**

ind school

[1] Modesto: Fees are due to the Stanislaus School District (K-8) and Modesto City Schools (9-12). Mello-Roos taxes are administered by the Schools Infrastructure Financing Agency (SIFA), which administers special taxes for schools in the Modesto area.

Table D-4
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Industrial Project - 250,000 Building Sq. Ft., 11.5 Acres, 0.5 FAR
Special Taxes and Assessments per Building

Industrial:
Special Taxes
and Assessments

	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Special Taxes and Assessments for Infrastructure [1]	East Lathrop	Citywide	Citywide	Stockton Annex.	Citywide	Kiernan BP [2]	Cordes Ranch SP [3]
Current as of							
Annual Special Taxes and Assessments							
Infrastructure CFD [3]	-	-	-	-	-	-	-
Infrastructure Assessment District	-	-	-	-	-	-	-
Total Annual Taxes and Assessments	-	-	-	-	-	-	-
Estimated Bond Debt of Special Taxes and Assessments							
Infrastructure CFD [2] [3]	-					$3,008,380	-
Infrastructure Assessment District	-	-	-	-	-	-	-
Total Estimated Bond Debt	**-**	**-**	**-**	**-**	**-**	**$3,008,380**	**-**

ind tax

[1] Taxes and Assessments for schools can be found in Table D-3.
[2] Modesto: Reflects a one-time special tax that shall be collected prior to a building permit being issued for new construction. One-time special tax rates varies by parcel within CFD No. 2012-1. This analysis assumes the average cost per acre for taxable parcels within the CFD.
[3] Tracy: Cordes Ranch Specific Plan may form a CFD to recover costs for specific plan infrastructure.

APPENDIX E:

Retail Development
Infrastructure Cost Burden Analysis

Table E-1 Summary of Infrastructure Cost Burden per Building (2 pages) 28

Table E-2 City/County/Other Agency Development Impact Fees per Building (2 pages) 30

Table E-3 Estimated School Mitigation per Building 32

Table E-4 Special Taxes and Assessments per Building 33

Table E-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Retail Project - 100,000 Building Sq. Ft., 7.6 Acres, 0.3 FAR
Summary of Infrastructure Cost Burden per Building

Retail:
Summary of Infrastructure Cost Burden Analysis

	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Summary of Development Impact Fees per Unit	Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex	Citywide	Tivoli SP	Cordes Ranch SP
Current as of							
Development Impact Fees per Building							
Total City/County/Other Agency Development Impact Fees (Table E-2) [1]	$1,235,266	$1,775,660	$1,111,928	$1,247,269	$703,203	$1,394,560	$2,445,930
School District Developer Fees (Table E-3)	$54,000	$54,000	$54,000	$54,000	$56,000	$56,000	$56,000
Subtotal Development Impact Fees	**$1,289,266**	**$1,829,660**	**$1,165,928**	**$1,301,269**	**$759,203**	**$1,450,560**	**$2,501,930**
Per Acre	*$169,640*	*$240,745*	*$153,412*	*$171,220*	*$99,895*	*$190,863*	*$329,201*
Per Building Sq. Ft.	*$12.89*	*$18.30*	*$11.66*	*$13.01*	*$7.59*	*$14.51*	*$25.02*
Estimated Bond Debt per Building							
Bond Debt for School Facilities (Table E-3)	-	-	-	-	-	-	-
Bond Debt for Infrastructure (Table E-4)	$1,639,696	-	-	-	-	$538,444	-
Bond Debt for Proposed Flood Control Assessment	TBD	TBD	TBD	TBD	-	-	-
Subtotal Estimated Bond Debt per Building	**$1,639,696**	**-**	**-**	**-**	**-**	**$538,444**	**-**
Total Estimated Infrastructure Burden per Building	**$2,928,962**	**$1,829,660**	**$1,165,928**	**$1,301,269**	**$759,203**	**$1,989,005**	**$2,501,930**
Per Acre	*$385,390*	*$240,745*	*$153,412*	*$171,220*	*$99,895*	*$261,711*	*$329,201*
Per Building Sq. Ft.	*$29.29*	*$18.30*	*$11.66*	*$13.01*	*$7.59*	*$19.89*	*$25.02*

ret summ

[1] No development areas evaluated in this analysis are subject to specific plan area fees.

Table E-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Retail Project - 100,000 Building Sq. Ft., 7.6 Acres, 0.3 FAR
Summary of Infrastructure Cost Burden per Building

Retail:
Summary of Infrastructure
Cost Burden Analysis

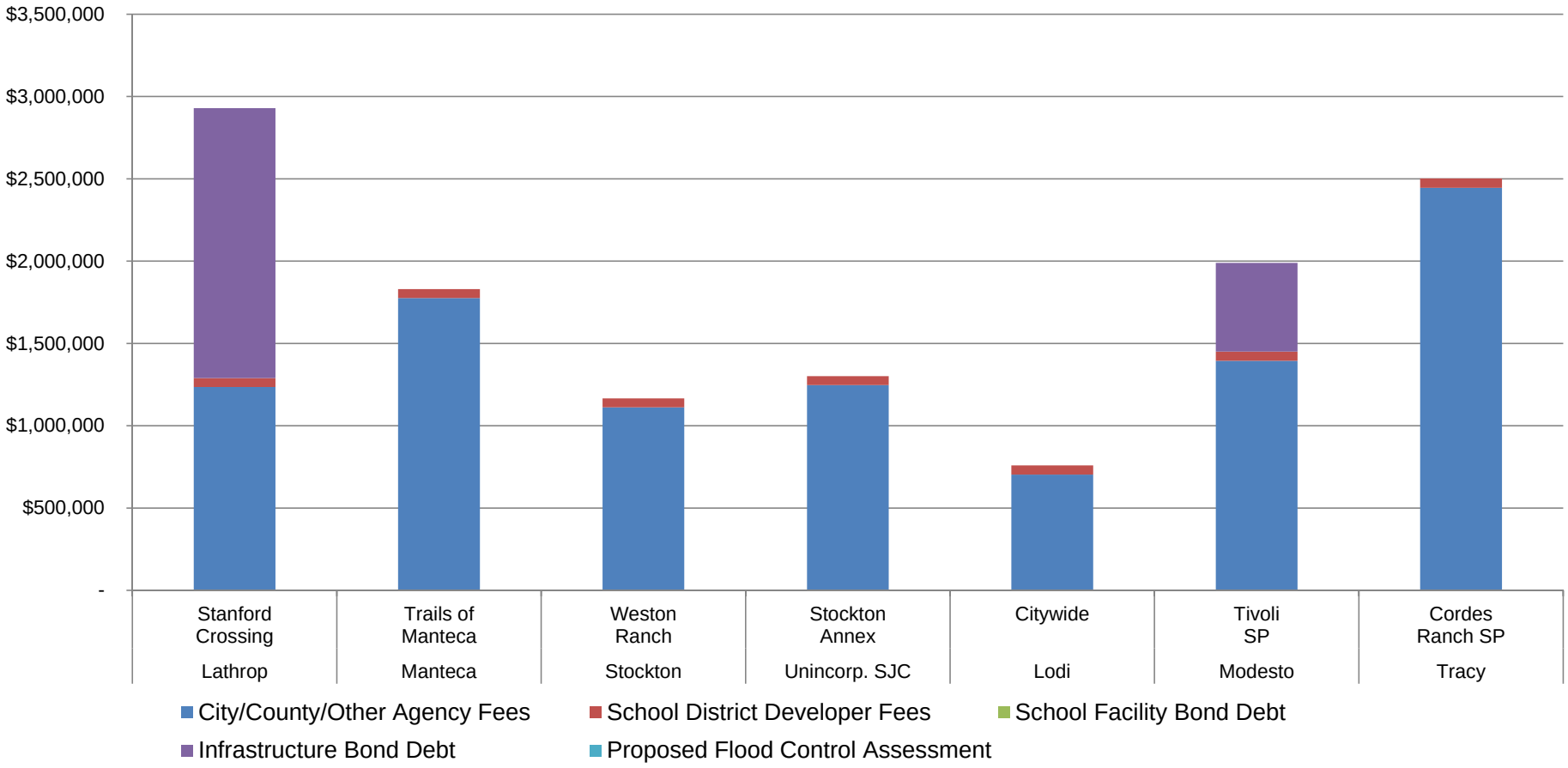


Table E-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Retail Project - 100,000 Building Sq. Ft., 7.6 Acres, 0.3 FAR
City/County/Other Agency Development Impact Fees Per Building

Retail:
City/County/Other Agency
Development Impact Fees

City/County/Other Agency Development Impact Fees: These are fees charged by the City, County, or Other Agency (e.g., Sewer District) and do not include fees for a special plan area.	**Development Areas Within RD 17**				**Development Areas Outside RD 17**		
	Lathrop Stanford Crossing	Manteca Trails of Manteca	Stockton Weston Ranch	Unincorp. SJC Stockton Annex [1]	Lodi Citywide	Modesto Tivoli SP	Tracy Cordes Ranch SP
Current as of							
CITY/COUNTY/OTHER AGENCY FEES PER BUILDING							
Processing Fees per Building [2] [3]							
Building Permit	$40,854	$55,754	$71,915	$71,915	$44,511	$15,500	$49,230
Plan Check	$28,598	$44,603	$58,827	$58,827	$26,707	$75	$31,999
Fire Review Fee	$37,862	$25,932	$1,230	$1,230	$17,804	$21,500	$1,480
Energy Fee	$10,214	-	-	-	$1,780	-	$1,480
Technology Surcharge	-	$2,788	$9,725	$9,725	-	-	-
Seismic/Strong Motion	$3,630	$2,788	$3,630	$3,630	$3,630	$3,630	$3,630
CBSC Fee	$519	$519	$519	$519	$519	$519	$519
General Plan/Long Range Planning	-	-	$19,449	$19,449	$4,451	$3,371	-
Other Building Permit or Processing Fees	$6,128	-	$20,522	$20,522	$4,451	-	-
Subtotal Processing Fees per Building	**$127,804**	**$132,383**	**$185,818**	**$185,818**	**$103,854**	**$44,595**	**$88,338**
Development Impact Fees per Building							
Sewer	-	$255,228	$29,498	$29,498	$78,765	$45,000	$273,600
Water [4] [5]	$35,662	$41,631	$134,764	$134,764	$22,521	$38,965	$408,979
Drainage	-	$45,608	-	-	$111,264	-	$181,017
Traffic	$598,900	$664,200	$397,337	$397,337	$119,900	-	$1,203,718
Transit	-	-	-	-	-	-	-
Regional Traffic Fees	$128,000	$129,000	$133,515	$133,515	$129,000	$299,500	$129,000
Parks - Neighborhood	-	-	-	-	-	-	-
Parks - Citywide	-	-	-	-	$40,600	-	-
Library	-	-	$5,020	$5,020	-	-	-
Fire	$43,000	$21,000	$5,589	$5,589	$33,800	-	-
Police	-	-	$5,589	$5,589	$33,000	-	$40,900
Flood Protection	-	-	-	-	-	-	-
Habitat/Greenbelt Preservation [6]	-	$135,341	-	$135,341	-	-	$67,678
Agriculture Mitigation	$30,780	$20,076	$92,488	$92,488		-	-
Affordable Housing	-	-	-	-	-	-	-
Public/Capital Facilities	$236,000	$130,000	$4,425	$4,425	$27,000	$907,300	$7,700
Fee Administration	$8,150	-	-	-	-	-	-
Other General Fees/One-Time Taxes	-	$10,000	$71,312	$71,312	$3,500	-	-
RD 17 Interim ULOP Fee [7]	$146,194	$146,194	-	-	-	-	-
Countywide Fees	$45,000	$45,000	$46,575	$46,575	-	$59,200	$45,000
City of Lathrop CFF Creditable Costs [8]	($164,223)	-	-	-	-	-	-
Total Development Impact Fees per Building	**$1,107,462**	**$1,643,277**	**$926,111**	**$1,061,451**	**$599,350**	**$1,349,965**	**$2,357,592**
TOTAL CITY/COUNTY/OTHER AGENCY FEES PER BUILDING	**$1,235,266**	**$1,775,660**	**$1,111,928**	**$1,247,269**	**$703,203**	**$1,394,560**	**$2,445,930**
Per Acre	*$162,535*	*$233,640*	*$146,306*	*$164,114*	*$92,527*	*$183,495*	*$321,833*
Per Building Sq. Ft.	*$12.35*	*$17.76*	*$11.12*	*$12.47*	*$7.03*	*$13.95*	*$24.46*

ret impact

Table E-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Retail Project - 100,000 Building Sq. Ft., 7.6 Acres, 0.3 FAR
City/County/Other Agency Development Impact Fees Per Building

Retail:
City/County/Other Agency
Development Impact Fees

[1] Assumes estimated fees as if the project is processed by the City of Stockton.
[2] Processing fees exclude mechanical, electrical, plumbing and other similar review fees.
[3] Building permit and other processing fees are often based on building valuation. Unless otherwise noted, building valuation for this analysis is based on ICC February 2017 Group B Type VA.
[4] Assumes a single 2" meter for domestic water per building.
[5] Modesto: In addition to fees shown, the City of Modesto charges $26 per linear foot for water main installation. This cost is not included in this calculation.
[6] All San Joaquin County Projects: All SJC projects are subject to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) Development Fee. Per San Joaquin Council of Governments staff, this fee is due at grading permit. Details regarding each development area are provided below.
Lathrop-Stanford Crossing: The SJMSCP Development Fee has been paid for residential and commercial development areas in the specific plan area.
Manteca, Unincorporated San Joaquin County: Agriculture
Stockton and Lodi: Exempt.
Tracy: Open Space.
[7] As of 06-14-2017, the Cities of Lathrop and Manteca have passed ordinances to authorize the imposition of the RD 17 Interim ULOP Fee.
[8] Reflects the allocation of City of Lathrop CFF creditable costs for facility improvements by land use, per the CLSP Development Agreement, dated December 6, 2016. See Table G-1 through Table G-6 for details.

Table E-3
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Retail Project - 100,000 Building Sq. Ft., 7.6 Acres, 0.3 FAR
Estimated School Mitigation per Building

Retail:
School Mitigation

	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Estimated School Mitigation	Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex	Citywide	Tivoli SP	Cordes Ranch SP
Current as of							
School District	*Manteca USD*	*Manteca USD*	*Manteca USD*	*Manteca USD*	*Lodi USD*	*[1]*	*Lammersville USD*
A. Annual School Mello-Roos CFD Taxes	-	-	-	-	-	-	-
B. Present Value of School CFD Tax	-	-	-	-	-	-	-
C. School Fee per Sq. Ft.:							
Level 1 Fees	-	-	-	-	-	-	-
Level 2 (or 3) SB50 Fee	$0.54	$0.54	$0.54	$0.54	$0.56	$0.56	$0.56
Mitigation Agreement	-	-	-	-	-	-	-
D. Total School Fee:							
Stirling Fee	-	-	-	-	-	-	-
Level 2 (or 3) SB50 Fee	$54,000	$54,000	$54,000	$54,000	$56,000	$56,000	$56,000
Mitigation Agreement	-	-	-	-	-	-	-
E. Total School Mitigation (B+D)	**$54,000**	**$54,000**	**$54,000**	**$54,000**	**$56,000**	**$56,000**	**$56,000**

ret school

[1] Modesto: Fees are due to the Stanislaus School District (K-8) and Modesto City Schools (9-12). Mello-Roos taxes are administered by the Schools Infrastructure Financing Agency (SIFA), which administers special taxes for schools in the Modesto area.

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Table E-4
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Industrial Project - 100,000 Building Sq. Ft., 7.6 Acres, 0.3 FAR
Special Taxes and Assessments per Building

Retail:
Special Taxes
and Assessments

	Development Areas Within RD 17				Development Areas Outside RD 17		
	Lathrop	Manteca	Stockton	Unincorp. SJC	Lodi	Modesto	Tracy
Estimated School Mitigation	Stanford Crossing	Trails of Manteca	Weston Ranch	Stockton Annex	Citywide	Tivoli SP [2]	Cordes Ranch SP
Current as of							
Annual Special Taxes and Assessments							
Infrastructure CFD	$139,854	-	-	-	-	$37,048	-
Infrastructure Assessment District	-	-	-	-	-	-	-
Total Annual Taxes and Assessments	**$139,854**	**-**	**-**	**-**	**-**	**$37,048**	**-**
Estimated Bond Debt of Special Taxes and Assessments							
Infrastructure CFD	$1,639,696	-	-	-	-	$538,444	-
Infrastructure Assessment District	-	-	-	-	-	-	-
Total Estimated Bond Debt	**$1,639,696**	**-**	**-**	**-**	**-**	**$538,444**	**-**

ret tax

[1] Taxes and Assessments for schools can be found in RD 17 Basin Finance Plan Implementation Support.
[2] Modesto: The Infrastructure CFD for Tivoli Specific Plan has not yet been formed. The amount shown is an estimate based on the Tivoli Specific Plan Infrastructure Finance Plan, produced in 2008.

APPENDIX F:

Assessed Value Assumptions by Land Use

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Table F-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Estimated Value: Multifamily Residential For Rent

Item	Assumption	Per Unit
Revenue Assumptions		
Gross Annual Rent Revenue [1]	$1.60/sq. ft./month	$19,193
Total Gross Revenues		**$19,193**
Expenditure Assumptions		
(Less) Vacancy	5.0%	($960)
(Less) Operating Expenses	25.0%	($4,798)
(Less) Capital Reserves	5.0%	($960)
Total Expenses		**($6,718)**
Net Operating Revenues		**$12,476**
Capitalized Value (Rounded) [2]	7.0%	**$180,000**

cap value

Source: CoStar; CBRE; EPS.

[1] Based on the average rent of apartments in recently-constructed, proximate apartment buildings in Fresno, Madera, San Joaquin, and Stanislaus County, as of May 2017. See Table F-2.
[2] Capitalization rate based on CoStar data for apartment projects and discussion with CBRE, as of May 2017.

Table F-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Multifamily Rent Data [1]

Project Name	Project Location	Year Constructed	Number of Units by Bedroom				Density (DU/Acre)	Average Unit Sq. Ft.	Average Monthly Rent			
			1 Bdrm	2 Bdrm	3 Bdrm	Total			1 Bdrm	2 Bdrm	3 Bdrm	Total
Harbor Pointe	Clovis	2016	0	48	0	48	15	1,214	N/A	$1,545	N/A	-
Brio on Broadway	Fresno	2015	21	20	11	52	186	982	$906	$895	$895	-
Riverbank Central Apartments	Riverbank	2017	0	30	20	50	11	N/A	N/A	N/A	N/A	-
The Lede	Fresno	2016	48	25	0	73	33	963	$969	$1,978	N/A	-
541 @ South Tower	Fresno	2016	12	12	8	32	N/A	855	N/A	N/A	N/A	-
1743 L St	Fresno	2017	142	74	74	290	N/A	875	N/A	N/A	N/A	-
Ingram Apartment/Condo Project	Fresno	2017	2	2	4	8	24	825	N/A	N/A	N/A	-
Marion Villas Apartments	Kingsburg	2015	38	8	0	46	N/A	699	$624	$741	N/A	-
Sierra Gateway II	Fresno	2015	68	0	0	68	38	750	N/A	N/A	N/A	-
The Vista	Turlock	2017	180	0	0	180	N/A	N/A	N/A	N/A	N/A	-
The Palms At Morada	Stockton	2017	75	115	0	190	16	873	$1,325	$602	N/A	-
Boulder Creek Apartments	Fresno	2015	48	80	32	160	16	1,063	$1,245	$1,485	$1,725	-
Overland Court Apartments	Los Banos	2017	56	14	0	70	N/A	731	N/A	N/A	N/A	-
Aspire Apartments	Tracy	2017	16	80	47	143	13	1,160	$1,950	$2,175	$2,654	-
Aspire Apartments Phase II	Tracy	2017	0	0	0	0	0	N/A	N/A	N/A	N/A	-
Dominion Courtyard Villas	Fresno	2017	33	30	0	63	N/A	901	$1,515	N/A	N/A	-
City View	Fresno	2015	30	9	0	39	103	685	$617	$735	N/A	-
404 W Westwood Ave	Manteca	2017	0	24	0	24	30	N/A	N/A	N/A	N/A	-
Villa Faria	Fresno	2015	15	39	11	65	N/A	1,160	$1,538	$1,819	$2,229	-
Average								**916**	**$1,188**	**$1,331**	**$1,876**	**$1,465**
Average Monthly Rent/Sq. Ft.												**$1.60**

mfr rent

Source: CoStar; EPS.

[1] Data obtained from CoStar as of May 2017.

Table F-3
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Industrial Comparable Sales Prices

Item	Community	Average Building Sq. Ft.	Average Density (FAR)	Average Total Acres	Average Price per Sq. Ft.
Industrial (Warehouse/Distribution)					
700 D'arcy Parkway (JC Penney) [1]	Lathrop	436,098	N/A	28.0	$83
701 D'arcy Parkway (JC Penney) [1]	Lathrop	101,695	N/A	23.1	$111
18390 S Harlan Road (LBA Logistics Center) [1]	Lathrop	517,250	N/A	29.0	$85
2 Nestle Way (Crossroads Commerce Center) [1]	Lathrop	747,035	N/A	50.9	$81
3173 Del Este & 819 Mariposa [1]	Modesto	42,320	N/A	N/A	$100
255 Park Center Dr (Amazon Dist. Center) [1]	Patterson	1,016,083	N/A	55.0	$90
13701 Rogers Rd	Stockton	1,500,000	N/A	N/A	$65
2845 Boeing Way	Stockton	257,000	0.4	15.0	$68
4015-4143 Calloway Court [1]	Stockton	4,150	N/A	2.8	$99
3741 Gold River Lane [1]	Stockton	47,986	N/A	3.2	$85
3735 Imperial Way [1]	Stockton	164,540	N/A	10.5	$103
17350 Commerce Way [1]	Tracy	86,000	N/A	5.6	$80
1941 N MacArthur Dr (Part of Multi-Property Sale)	Tracy	12,160	0.4	0.7	$85
1945 N Macarthur Dr (Part of Multi-Property Sale)	Tracy	10,133	0.4	0.6	$85
259 16 S Corporate Court [1]	Tracy	94,687	N/A	N/A	$80
Average		**335,809**	**0.4**	**18.7**	**$87**
Average (Rounded)		**340,000**		**20.0**	**$85**

ind comp

Source: CoStar; CBRE; EPS.

[1] From CBRE transactions as of 5/18/2017.

Table F-4
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Retail Comparable Sales Prices

Address	Business	Community	Sale Date	Average Building Sq. Ft.	Average Assessed Value per Sq. Ft.
Retail					
940 E Whitmore Ave	Dollar General	Ceres	7/2/2014	9,400	$310
3401 SW Fresno Ave	Dollar General	Denair	7/24/2015	9,100	$253
12984 Blossom Ct	Dollar General	Lockeford	12/18/2015	9,100	$245
1638 E Fremont St	WSS Shoes	Stockton	4/22/2016	12,000	$193
2006 E Mariposa Rd	Family Dollar	Stockton	1/22/2015	9,180	$325
501 W Harding Way	Family Dollar	Stockton	11/6/2014	8,320	$280
6618 Pacific Ave	Grocery Outlet	Stockton	10/23/2015	13,969	$344
Average				**10,153**	**$278**
Rounded Average				**10,000**	**$280**

ret comp

Source: CoStar; ParcelQuest; EPS.

APPENDIX G:

Stanford Crossing CFF Credit Analysis

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Table G-1
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Stanford Crossing Specific Plan CFF Credit Summary per Land Use

Summary

Item	Source	Land Use: Residential: Single Family	Land Use: Residential: Multifamily	Land Use: Nonresidential: Retail	Land Use: Nonresidential: Office
CFF Category		*per unit*		*per bldg. sq. ft.*	
West/Central Lathrop Transportation Fee	Table G-2	$604	$371	$0.77	$0.56
Culture & Leisure Fee Credit Allocation	Table G-3	$1,187	$847	$0.00	$0.00
Water Related Fees Credit Allocation	Table G-4	$2,741	$1,333	$0.87	$1.12
Total		**$4,532**	**$2,552**	**$1.64**	**$1.68**

cff credit summ

Source: City of Lathrop; CLSP Development Agreement, dated December 6, 2016; EPS.

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Table G-2
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
West/Central Lathrop Transportation Fee Credit Allocation

West/Central Lathrop Transportation Fee

Item	Developable Acres	Units/ Bldg. Sq. Ft.	West/Central Lathrop Transportation Fee per Unit/ 1k Bldg. Sq. Ft.	DUE per Unit/ 1k Bldg. Sq. Ft.	Total DUE	Percentage Allocation	Credit Distribution [1]	Credit per Unit or Bldg. Sq. Ft.
Formula	*a*	*b*	*c*	*d=c/SFR c*	*e=b*d*	*f=e/total e*	*g=e*total e*	*h=g/b*
Residential Land Uses		*units*	*per unit*	*per unit*				*per unit*
Single-Family (SFR)	407.6	2,266	$3,126	1.00	2,266	40.1%	$1,368,891	$604
Multifamily	13.7	310	$1,920	0.61	190	3.4%	$115,023	$371
Subtotal Residential Land Uses	**421.3**	**2,576**			**2,456**	**43.5%**	**$1,483,914**	
Nonresidential Land Uses		*bldg. sq. ft.*	*per 1k bldg. sq. ft.*	*per 1k bldg. sq. ft.*				*per bldg. sq. ft.*
Retail	111.1	1,452,247	$3,982	1.27	1,850	32.8%	$1,117,537	$0.77
Office	110.2	1,439,702	$2,909	0.93	1,340	23.7%	$809,350	$0.56
Subtotal Nonresidential Land Uses	**221.3**	**2,891,949**			**3,190**	**56.5%**	**$1,926,886**	
Total	**642.6**				**5,646**	**100.0%**	**$3,410,800**	

transportation credit

Source: City of Lathrop; CLSP Development Agreement, dated December 6, 2016; EPS.

[1] See Table G-5 for total credit.

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Table G-3
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Culture & Leisure Fee Credit Allocation

Culture and Leisure Fee

Item	Developable Acres	Units/ Bldg. Sq. Ft.	Culture & Leisure Fee per Unit/ 1k Bldg. Sq. Ft. [1]	DUE per Unit/ 1k Bldg. Sq. Ft.	Total DUE	Percentage Allocation	Credit Distribution [2]	Credit per Unit or Bldg. Sq. Ft.
Formula	*a*	*b*	*c*	*d=c/SFR c*	*e=b*d*	*f=e/total e*	*g=e*total e*	*h=g/b*
Residential Land Uses		*units*	*per unit*	*per unit*				*per unit*
Single-Family (SFR)	407.6	2,266	$9,034	1.00	2,266	91.1%	$2,688,907	$1,187
Multifamily	13.7	310	$6,452	0.71	221	8.9%	$262,719	$847
Subtotal Residential Land Uses	**421.3**	**2,576**			**2,487**	**100.0%**	**$2,951,626**	
Nonresidential Land Uses		*bldg. sq. ft.*	*per 1k bldg. sq. ft.*	*per 1k bldg. sq. ft.*				*per bldg. sq. ft.*
Retail	111.1	1,452,247	$0	0.00	0	0.0%	$0	$0.00
Office	110.2	1,439,702	$0	0.00	0	0.0%	$0	$0.00
Subtotal Nonresidential Land Uses	**221.3**	**2,891,949**			**0**	**0.0%**	**$0**	
Total	**642.6**				**2,487**	**100.0%**	**$2,951,626**	

cl credit

Source: City of Lathrop; CLSP Development Agreement, dated December 6, 2016; EPS.

[1] Includes Parks and Facilities fee components.
[1] See Table G-5 for total credit.

Table G-4
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Water Related Fees Credit Allocation

Water Related Fees

Item	Developable Acres	Units/ Bldg. Sq. Ft.	Water Demand [1]	Total Demand	Distribution of Demand	Credit Distribution [2]	Credit per Unit or Bldg. Sq. Ft.
Formula	*a*	*b*	*c*	*d=c*a or b*	*e=d/total d*	*f=e*total f*	*g=f/a*
Residential Land Uses		*units*	*per unit*				*per unit*
Single-Family (SFR)	407.6	2,266	0.37	838	65.4%	$6,210,641	$2,741
Multifamily	13.7	310	0.18	56	4.4%	$413,341	$1,333
Subtotal Residential Land Uses	**421.3**	**2,576**		**894**	**69.7%**	**$6,623,983**	
Nonresidential Land Uses		*bldg. sq. ft.*	*per acre*				*per bldg. sq. ft.*
Retail	111.1	1,452,247	1.54	171	13.3%	$1,267,388	$0.87
Office	110.2	1,439,702	1.97	217	16.9%	$1,608,135	$1.12
Subtotal Nonresidential Land Uses	**221.3**	**2,891,949**		**388**	**30.3%**	**$2,875,523**	
Total	**642.6**			**1,282**	**100.0%**	**$9,499,506**	

water credit

Source: City of Lathrop; CLSP Development Agreement, dated December 6, 2016; EPS.

[1] Because the City of Lathrop water related fees are based on water meter size instead of land use designation, water demand factors reflect land use factors used in the Folsom Plan Area Specific Plan Infrastructure Fee Nexus Study, dated August 28, 2015, prepared by EPS.
[2] See Table G-5 for total credit. Includes credits for Surface Water Fee and other water related fees.

Table G-5
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Creditable Costs: Stanford Crossing Specific Plan (Lathrop)

Creditable Improvements	Existing Capital Facility Fee Program	Amount
Roadway Improvements		
Golden Valley Parkway	West/Central Lathrop Transportation Fee	$2,979,200
Lathrop Road	West/Central Lathrop Transportation Fee	$431,600
Total Roadway Improvements		**$3,410,800**
Recreation Improvements		
Generations Center Land/Land Improvements	Culture and Leisure Fee	$2,951,626
Water Improvements		
Surface Water Improvements [1]	Surface Water Supply Full-Cost	$5,099,875
Pump Station and Force Main	Water System Well Improvement	$2,074,254
Oversized Mains	Water System Well Improvement	$1,114,552
Recycled Water - Mains	Recycled Water Outfall	$1,210,825
Total Water Related Fees		**$9,499,506**

cff credit

Source: CLSP Development Agreement, dated December 6, 2016; EPS.

[1] Reflects the Saybrook Surface Water Credit for FY 2016-2017.

Table G-6
RD 17 Basin Finance Plan Implementation Support
Feasibility Analysis
Stanford Crossing Land Use Summary

Developable Land Use	Acreage	Dwelling Units	Bldg. Sq. Ft.	Avg. Density DU/Acre or FAR
Residential Land Uses				*DU/Ac.*
Single-Family	407.6	2,266	0	5.6
Multifamily	13.7	310	0	22.6
Subtotal Residential Land Uses	**421.3**	**2,576**	**0**	
Nonresidential Land Uses				*FAR*
Retail	111.1	0	1,452,247	0.30
Office	110.2	0	1,439,702	0.30
Subtotal Nonresidential Land Uses	**221.3**	**0**	**2,891,949**	
Total Residential and Nonresidential Land Uses	**642.6**	**2,576**	**2,891,949**	

clsp lu

Source: Saybrook CLSP; MacKay & Somps; EPS.

ATTACHMENT E:
DEVELOPMENT FEE COMPARISON

Table 1 Comparable Flood Control Fee Analysis
(Prototype Rate Comparisons by Flood Control Fee Study) E1

Table 2 Comparison Fee Study Rates E2

Table 1
RD 17 Basin Financing Plan Implementation
Comparable Flood Control Fee Analysis (Prototype Rate Comparisons by Flood Control Fee Study)

DRAFT

	Development Type			
	Single-Family Residential	**Multi-Family Residential**	**Retail**	**Industrial**
Prototype Assumptions				
Unit / Bldg Sq. Ft.	2,000	1,000	100,000	250,000
Total Units	-	200	-	-
Garage SF	450	-	-	-
Density	5.00	20.00	0.30	0.50
Lot SF	7,000	435,600	333,000	500,000
Acres	0.16	10.00	7.64	11.48

Comparable Fee Analysis *(See Table 2 for Base Fee Rates)*		*Rank*		*Rank*		*Rank*		*Rank*
RD 17 Area Interim Fee (Lathrop/Manteca)	$3,411	4	$186,670	5	$147,052	5	$173,095	5
TRLIA Levee Fee [1]	$17,793	1	$408,476	2	$341,205	1	$433,528	3
SAFCA DIF [2]	$4,020	3	$246,000	4	$315,000	3	$522,500	2
RD 1000 & SAFCA DIF's [3]	$4,181	2	$260,010	3	$328,768	2	$542,025	1
WSAFCA In-Lieu Fee [4]	$1,815	6	$158,000	6	$225,000	4	$382,500	4
Yuba City & Sutter County Fees [5]	$2,931	5	$420,240	1	$46,920	6	$58,650	7
Wheatland Levee Fee	$1,145	7	$101,760	7	$42,081	7	$87,410	6
Average Comparable Fee Rate [6]	$5,314		$265,748		$216,496		$337,769	

[1] Reflects current fee rate for Plumas Lake Zone.
[2] Reflects fee for all areas in SAFCA outside of Natomas. See Note [3]
[3] Reflects the combination of the SAFCA DIF and RD 1000 DIF for flood control facilities in the Natomas Basin
[4] Reflects the WSAFCA Levee Fee Zone 2 Rate
[5] Reflects the Levee Fee Component of the Capital Faclities Fee collected within the City of Yuba City and the Yuba City SOI within Sutter County.
[6] Reflects tha average fee rate of the comparable jurisdictions, not RD 17 Area Interim Fee rate.

Table 2
RD 17 Basin Financing Plan Implementation
Comparison Fee Study Rates

DRAFT

Fee Study	RD 17 Area: Interim ULOP Levee Impact Fee	Three Rivers Levee Fee	SAFCA DIF	RD 1000 (Natomas) DIF [3]	WSAFCA 200-Year Flood Protection In-Lieu Fee [4]	Yuba City/ Sutter County	City of Wheatland Bear River North Levee Project Impact Fee
Rate Bases	Gross Developable Acre	Gross Developable Acre [1]	Damageable Sq. Ft. [2]	Acre	Dwelling Unit (SF Res) / Building Footprint Sq. Ft. (All Other)	Dwelling Unit (Res) or Building KSF (Non-Res) [5]	Dwelling Unit (Res) Building KSF (Non-Res) [6]
Base Fee Rates (per Study)							
SF Residential	$17,054	$88,966	$2.01	$1,001	$1,815	$2,931.48	$1,145.32
MF Residential	$18,667	$88,966	$1.23	$1,401	$1.58	$2,101.20	$508.80
Commercial (Office)	$19,236	$148,629	$3.15	$1,801	$2.25	$670.14	$349.64
Commercial (Retail)	$19,236	$148,629	$3.15	$1,801	$2.25	$469.20	$420.81
Industrial	$15,080	$75,538	$2.09	$1,701	$1.53	$234.60	$349.64

Notes
[1] For non-residential development, the GDA is calculated based on building footprint.
[2] Damageable Square Feet is the 1st two stories of residential development and building footprint of all non-residential development.
[3] Within Natomas, the RD 1000 fee applies in addition to the SAFCA fee.
[4] In-Leiu Fee (Draft 2013 Update), Zone 2.
[5] Includes a 2% Administration Fee
[6] Assumes Retail is Commercial and Office / Industrial are "Employment Projects"

ATTACHMENT F:
OVERLAY ASSESSMENT ANALYSIS

- Updated Technical Memorandum - RD 17 Area: Overlay Assessment Rate Analysis prepared by Larsen Wurzel & Associates, Inc.

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Updated Draft Technical Memorandum

RD 17 Area: Overlay Assessment Rate Analysis

August 18, 2017

Prepared for: RD 17 Area Agencies – San Joaquin County and Cities of Stockton, Lathrop, Manteca and Reclamation District No. 17

Prepared by: Megan Jonsson

Reviewed by: Seth Wurzel, CGFM

Summary

As part of Larsen Wurzel & Associates, Inc.'s (LWA) financial analyses in support of a new Governance Entity, LWA conducted an analysis of a proposed Overlay Assessment (OA). This analysis was prepared by reviewing the current Reclamation District No. 17 (RD 17) Mossdale Tract benefit assessment and apportionment methodology as described in the **Reclamation District No. 17 Mossdale Tract Assessment Engineer's Report** (RD 17 ER) prepared by Kjeldsen, Sinnock & Neudeck, Inc. (KSN) dated May 15, 2008 and by making adjustments to the methodology to account for the following:

- All properties within the 200-Year Floodplain Basin within San Joaquin County (SJC 200-YFP Basin).
- An adjustment to benefit apportionment methodology to consider a greater amount of benefit to properties designated for development.
- And an analysis of the marginal effect to the net OA revenues as these properties developed based on the **RD 17 Basin Financing Plan Implementation Updated Development Absorption Projections Final Updated Technical Memorandum** (DAP) prepared by LWA dated May 17, 2017.

This analysis is intended to be used to inform an updated financing plan as described with the RD 17 Area ULOP Adequate Progress Report. This analysis also identifies apportionment and benefit assessment considerations that will need to be addressed in the future as the RD 17 Area Agencies move forward with implementation of the proposed OA.

Methodology

LWA prepared Development Absorption Projections based on meetings with and information provided by representative staff from the Cities of Lathrop, Manteca, Stockton, and San Joaquin County and their follow-on review. The methodology behind the DAP is covered in greater detail in the **RD 17 Basin Financing Plan Implementation Updated Development Absorption Projections Final Updated Technical Memorandum** (DAP) prepared by LWA dated May 17, 2017. After the release of the DAP, further refinements were requested by the City of Lathrop, specifically, to adjust the amount of commercial development that was deemed retail versus non-retail. In conjunction with the DAP, LWA prepared an analysis of an Overlay Assessment (OA) to be levied in

addition to the current RD 17 Mossdale Tract Assessment. The OA rates were based on the methodology outlined in the **Reclamation District No. 17 Mossdale Tract Assessment Engineer's Report** (RD 17 ER) prepared by Kjeldsen, Sinnock & Neudeck, Inc. dated May 15, 2008. Using parcel data from the current RD 17 assessment roll, provided by NBS (RD 17's assessment administrator), and parcel data from the San Joaquin County 200-Year Floodplain GIS mapping, provided by KSN, LWA created a database of all parcels benefitting from the Levee Project (OA Database).

Table 1 provides a summary of the current RD 17 Mossdale Tract Assessment for FY 2016-17 by acre and by parcel.

The DAP provided data in terms of units for residential development and thousands of square feet for non-residential development. For the purpose of the OA Analysis, the DAP was converted to acres based either on direct acreage data provided by the agencies or based on assumptions from supporting documents (such as specific plans, land use summaries, and tentative subdivision maps) providing residential densities or commercial and industrial floor area ratios (FAR). DAP data for Parks, School, and other public land uses was excluded from the OA Analysis. The total provided or assumed acreages and the associated density or FAR, where applicable, are summarized in **Appendix A, Table A-3**. This data was used to calculate the DAP by acres presented in **Appendix A, Table A-2**.

In the RD 17 ER, the county land use codes were grouped into eleven categories: Agricultural, Commercial, Easements, Industrial, Parks, Residential, Rural Residential, Vacant, Vacant Commercial, Vacant Industrial, and Vacant Residential. These same land use code groupings were applied to the OA Database. The total acreages for Vacant Commercial, Vacant Industrial, and Vacant Residential were compared to the total projected development in these categories from the DAP by acres and an adjustment was made to accommodate additional projected acreage in each category. The total additional acreage was assumed to be currently classified as Agricultural lands, and therefore, was subtracted from this land use category to balance the total acreage in the OA Database. These adjustments are summarized in **Appendix A, Table A-1**.

The Average 2016-17 Assessment Per Acre rates from **Table 1** were applied to the Overlay Assessment Acreage and the Proportional Total Overlay Assessment was calculated for each of the eleven land use categories as shown in **Table 2**. To adjust the assessment rates to reflect additional benefit received by vacant properties with the potential development acreage, LWA doubled the effective equivalency factor as determined by the rates utilized in the RD 17 ER for all Vacant Commercial, Industrial, and Residential land. This increased assessment is assumed to approximate the increased benefit received by properties that have a potential to develop directly as result of the implementation of the RD 17 Area 200-Year ULOP Project. The resulting per acre assessment rates for the OA are shown on **Table 3**. These resulting rates are based upon an assumed total assessment budget of $5.5 million per year (the total OA budget assumed within the ULOP APR financing plan).

Overlay Assessment Cash Flow

One important factor to consider as a result of employing an assessment methodology that would apportion greater benefit to properties with the potential for development is that the assessment district will likely generate

less revenue overtime as properties develop and their land use category changes to a land use type with a lower assessment rate.

The goal of modeling the OA is to provide a cash flow of potential assessment revenues over time. To do this, the marginal change in assessment revenues was calculated as developable vacant properties are developed. **Table** B-3 provides the calculation of the marginal change in assessment rates per acre for Vacant Commercial, Vacant Industrial, and Vacant Residential lands as they are developed. These rates were then applied to the acreages in **Appendix A, Table A-2** to demonstrate the marginal change in assessment over time by Land Use Jurisdiction by Land Use Category in **Appendix B, Table B-2**. **Table B-1** models the OA cash flow in conjunction with the development projections as defined by the DAP absorption schedule. **Table 4** summarizes of the annual OA revenues by year. The OA revenues are effectively reduced by approximately $729,000 over the 43-year modeling period.

Implementation Concerns

LWA believes that it is possible to develop a defensible assessment methodology that justifies the assessment and apportionment of greater benefit to those properties that have the potential to develop as a result of the RD 17 200-Year ULOP Project. However there are several issues that will need to be addressed at either a policy level or an administrative level in order to implement and administer the proposed assessment over time. The following summarizes some of the immediately identified issues;

- Land Use Categorization Trigger – What would the threshold trigger be for property that is designated for development thus determining that it receives greater benefit than its current use (which could be the same use as a similar property). Zoning, General Plan, Entitlement Application, Approved Entitlement, etc.?
- Land Use Categorization Administration – How would the assessment be administered, would categorization be totally based upon assessor's use code? Or some other database?
- Assessment Appeals (no plans for development) – How would the Agency implementing the assessment ultimately determine that a property receives greater benefit if a property owner appeals and indicates that they have no plans or desire to develop in the future?
- Un-intended consequences – This type of assessment methodology may have the unintended consequence of delaying development that is needed to help finance the levee program as a result of properties delaying the entitlement application process because there is no way to defer the funding obligation (versus a fee that can be deferred collection until development occurs).

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Table 1

RD 17 Area: Overlay Asssessment Rate Analysis

Current RD 17 Mossdale Tract 2016-17 Assessment Summary by Acre & by Parcel

Current Assessment

Land Use	2016-17 Acreage A	2016-17 Parcel Count B	Total 2016-17 Assessment C	Average 2016-17 Assessment Per Acre D = C / A	Average 2016-17 Assessment Per Parcel E = C / B
Agricultural	7,037	182	$137,227	$19.50	$754.00
Commercial	1,680	376	$687,966	$409.50	$1,829.70
Easements	651	131	$253,774	$390.00	$1,937.21
Industrial	1,656	231	$645,856	$390.00	$2,795.91
Parks	311	32	$6,068	$19.50	$189.61
Residential	2,037	11,868	$794,447	$390.00	$66.94
Rural Residential	896	295	$44,799	$49.99	$151.86
Vacant [1]	66	47	$1,293	$19.50	$27.50
Vacant Commercial	436	167	$133,980	$307.13	$802.28
Vacant Industrial	371	56	$108,492	$292.50	$1,937.36
Vacant Residential	543	472	$158,972	$292.50	$336.81
Total	**15,685**	**13,857**	**$2,972,874**	**$189.53**	**$214.54**

[1] Aerial photographs of those parcels classified as Vacant under the Engineer's Report for the current RD 17 Mossdale Tract Assessment were analyzed and it was determined that these parcels are undevelopable and therefore not grouped with those land uses that are considered to be vacant and developable as a designated land use.

Table 2
RD 17 Area: Overlay Asssessment Rate Analysis
Proportional Overlay Assessment Calculations

Overaly Asessment with Vacant Multiplier: 2x

Land Use	Overlay Assessment Acreage [1] A (Table A-1)	2016-17 Average Assessment Per Acre B (Table 1)	Equivalency Factor [2] C = B / $19.50	Multiplier [3] D	Adjusted Acreage E = A * C * D	Proportionate Total Overlay Assessment F = E * Assessment Rate Per Adjusted Acre [4]
Agricultural	8,340	$19.50	1.0	1.0	8,340	$149,201
Commercial	3,656	$409.50	21.0	1.0	76,781	$1,373,575
Easements	651	$390.00	20.0	1.0	13,014	$232,815
Industrial	1,767	$390.00	20.0	1.0	35,347	$632,334
Parks	319	$19.50	1.0	1.0	319	$5,707
Residential	2,360	$390.00	20.0	1.0	47,200	$844,384
Rural Residential	1,057	$49.99	2.6	1.0	2,711	$48,491
Vacant	66	$19.50	1.0	1.0	66	$1,175
Vacant Commercial	1,002	$307.13	15.75	2.0	31,555	$564,509
Vacant Industrial	817	$292.50	15.0	2.0	24,519	$438,633
Vacant Residential	2,253	$292.50	15.0	2.0	67,591	$1,209,176
Total	**22,289**	**$189.53**			**307,443**	**$5,500,000**

[1] Acreage was added to the Vacant Commercial, Vacant Industrial, and Vacant Resiential in order to match the Development Absoprtion Projections totals. The total additional acreage was subtracted from the Agricultural category. See Table A-1, Appendix A for detailed calculations.

[2] The the per acres assessment for Agricultural is used as the base to calculate the Equivalency Factor as per the RD 17 Mossdale Tract Assessment Engineer's Report prepared by Kjeldsen, Sinnock & Neudeck, Inc. dated May 15, 2008.
[3] For this analysis a multiplier is used as a proxy for apportioning more benefit to Vacant lands that are developable versus currently developed properties due to the fact that the Levee Project will allow these lands to be developed.
[4] Assessment Rate Per Adjusted Acre ($17.89) is calculated as the total Adjusted Acreage (307,443) divided by the Target Assessment Rate ($5,500,000).

Table 3
RD 17 Area: Overlay Asssessment Rate Analysis
Overlay Assessment Summary

Overaly Asessment with Vacant Multiplier: 2x

Land Use	Overlay Assessment Acreage A (Table 2)	Overlay Parcel Count B	Proportionate Overlay Assessment C (Table 2)	Average Overlay Assessment Per Acre D = C / A	Equivalency Factor E = D / $17.89	Average Overlay Assessment Per Parcel F = C / B	Pct. of Total Overlay Assessment G = C / $5,500,000	Aggregate Pct. of Overlay Assessment H = SUM(G)
Agricultural	8,340	257	$149,201	$17.89	1.0	$580.55	2.7%	
Commercial	3,656	515	$1,373,575	$375.68	21.0	$2,667.14	25.0%	
Easements	651	131	$232,815	$357.79	20.0	$1,777.21	4.2%	
Industrial	1,767	257	$632,334	$357.79	20.0	$2,460.44	11.5%	59.8%
Parks	319	35	$5,707	$17.89	1.0	$163.07	0.1%	
Residential	2,360	12,478	$844,384	$357.79	20.0	$67.67	15.4%	
Rural Residential	1,057	526	$48,491	$45.86	2.6	$92.19	0.9%	
Vacant	66	107	$1,175	$17.89	1.0	$10.98	0.0%	
Vacant Commercial	1,002	187	$564,509	$563.53	31.50	$3,018.77	10.3%	
Vacant Industrial	817	90	$438,633	$536.69	30.0	$4,873.70	8.0%	40.2%
Vacant Residential	2,253	547	$1,209,176	$536.69	30.0	$2,210.56	22.0%	
Total	**22,289**	**15,130**	**$5,500,000**	**$246.76**		**$363.52**	**100.0%**	

[1] The the per acres assessment for Agricultural is used as the base to calculate the Equivalency Factor as per the RD 17 Mossdale Tract Assessment Engineer's Report prepared by Kjeldsen, Sinnock & Neudeck, Inc. dated May 15, 2008.

Table 4
RD 17 Area: Overlay Asssessment Rate Analysis
Overlay Assessment Revenues By Year

Year	Annual Assessment Amount	Year	Annual Assessment Amount
2018	$5,500,000	2040	$5,009,863
2019	$5,475,493	2041	$4,981,617
2020	$5,451,642	2042	$4,961,855
2021	$5,425,588	2043	$4,942,730
2022	$5,407,899	2044	$4,923,605
2023	$5,381,462	2045	$4,907,095
2024	$5,360,816	2046	$4,892,467
2025	$5,338,937	2047	$4,877,839
2026	$5,320,586	2048	$4,863,211
2027	$5,295,837	2049	$4,849,432
2028	$5,270,668	2050	$4,840,176
2029	$5,246,839	2051	$4,833,003
2030	$5,223,010	2052	$4,825,830
2031	$5,196,086	2053	$4,818,657
2032	$5,182,929	2054	$4,811,484
2033	$5,168,338	2055	$4,804,311
2034	$5,153,948	2056	$4,797,138
2035	$5,142,560	2057	$4,789,965
2036	$5,124,150	2058	$4,782,814
2037	$5,095,411	2059	$4,776,061
2038	$5,066,497	2060	$4,769,308
2039	$5,038,108		

[1] See Table B-1, Appendix B for detailed calcualtion of the Annual Assessment Amounts.

Table A-1
RD 17 Area: Overlay Asssessment Rate Analysis
Calculation of Overlay Assessment Acreage

Overlay Assessment Land Use Category	ER Overlay Assessment Acreage [1] A	Total Acreage from DAP [2] B	Adjustment to ER Overlay Assessment Acreage [1] C = B - A	Overlay Assessment Acreage D = A + C
Agricultural	10,162	N/A	-1,822	8,340
Commercial	3,656	N/A	0	3,656
Easements	651	N/A	0	651
Industrial	1,767	N/A	0	1,767
Parks	319	N/A	0	319
Residential	2,360	N/A	0	2,360
Rural Residential	1,057	N/A	0	1,057
Vacant	66	N/A	0	66
Vacant Commercial	692	1,002	310	1,002
Vacant Industrial	727	817	90	817
Vacant Residential	830	2,253	1,423	2,253
Total	**22,289**	**4,072**	**0**	**22,289**

[1] Based on the County Land Use classifcations from the RD 17 Mossdale Tract Assessment Engineer's Report prepared by Kjeldsen, Sinnock & Neudeck, Inc. dated May 15, 2008.
[2] Summarized from Table A-2, Appendix A.

A1

Table A-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projection in Acres by Land Use Jurisdiction by Land Use Category

Development Area / Project	OA Rate Land Use Category	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
City of Lathrop																							
Central Lathrop																							
High Density Residential	Residential	-	-	-	3.4	3.4	3.4	3.4	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variable Density Residential	Residential	25.0	25.0	25.0	18.2	18.2	18.2	18.2	18.2	22.7	22.7	22.7	22.7	22.7	-	-	-	-	-	-	-	-	-
Residential/Mixed Use	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variable Density Residential Flex	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office	Commercial	3.2	3.2	3.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	3.9	3.9	3.9	3.9
Office Commercial (25% Retail / 75%Non-Retail)	Commercial	3.2	3.2	3.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	3.9	3.9	3.9	3.9
Neighborhood Commercial (50% Retail / 50% Non-Retail)	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P-SP, Neighborhood Commercial (0% Retail / 100% Non-Retail)	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Specialty Commercial (100% Retail / 0% Non-Retail)	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Central Lathrop Acres		***31.3***	***31.3***	***31.3***	***25.5***	***25.5***	***25.5***	***25.5***	***25.5***	***26.7***	***26.7***	***26.7***	***26.7***	***26.7***	***4.3***	***4.3***	***4.3***	***4.3***	***4.3***	***7.8***	***7.8***	***7.8***	***7.8***
Mossdale Landing																							
Low Density Residential	Residential	-	-	-	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	-	-	-	-	-	-	-	-	-
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Density Residential	Residential	1.3	1.3	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-	-	-	-	-	-	-	-	-
Community Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neighborhood Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing Acres		***1.3***	***1.3***	***1.3***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***2.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Mossdale Landing East																							
Low Density Residential	Residential	2.3	2.3	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Density Residential	Residential	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	0.3	0.3	0.3	4.0	4.0	4.0	4.0	4.0	22.0	22.0	22.0	22.0	22.0	-	-	-	-	-	-	-	-	-
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing East Acres		***3.8***	***3.8***	***3.8***	***5.1***	***5.1***	***5.1***	***5.1***	***5.1***	***22.0***	***22.0***	***22.0***	***22.0***	***22.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Mossdale Landing South																							
Medium Density Residential	Residential	-	-	-	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	-	-	-	-	-	-	-	-	-
High Density Residential	Residential	2.0	2.0	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	1.0	1.0	1.0	1.0	1.0	14.0	14.0	14.0	14.0	14.0	-	-	-	-	-	-	-	-	-
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing South Acres		***2.0***	***2.0***	***2.0***	***2.9***	***2.9***	***2.9***	***2.9***	***2.9***	***15.9***	***15.9***	***15.9***	***15.9***	***15.9***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Mossdale Landing Other																							
Low Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing Other Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
South Lathrop																							
Light Industrial / R&D Flex	Industrial	45.7	45.7	45.7	13.3	13.3	13.3	13.3	13.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office Commercial (25% Retail / 75% Non-Retail)	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal South Lathrop Acres		***45.7***	***45.7***	***45.7***	***13.3***	***13.3***	***13.3***	***13.3***	***13.3***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Lathrop Gateway																							
Light Industrial / R&D Flex	Industrial	-	-	-	-	-	-	-	-	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	16.8	16.8	16.8	16.8
Office	Commercial	-	-	-	-	-	-	-	-	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	7.0	7.0	7.0	7.0
Office Commercial (25% Retail / 75% Non-Retail)	Commercial	-	-	-	-	-	-	-	-	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	7.0	7.0	7.0	7.0
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Lathrop Gateway Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***15.4***	***15.4***	***15.4***	***15.4***	***15.4***	***15.4***	***15.4***	***15.4***	***15.4***	***15.4***	***30.7***	***30.7***	***30.7***	***30.7***

Table A-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projection in Acres by Land Use Jurisdiction by Land Use Category

Development Area / Project	OA Rate Land Use Category	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
Cross Roads																							
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Cross Roads Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Historic/East Lathrop																							
Low Density Residential	Residential	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Medium Density Residential	Residential	0.9	0.9	0.9	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
High Density Residential	Residential	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Commercial	Commercial	5.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Industrial	Industrial	8.3	8.3	8.3	5.0	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0	20.0	20.0	20.0	20.0	20.0	40.0	40.0	40.0	40.0
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Historic/East Lathrop Acres		***14.6***	***14.6***	***14.6***	***8.9***	***8.9***	***8.9***	***8.9***	***8.9***	***14.9***	***14.9***	***14.9***	***14.9***	***14.9***	***24.9***	***24.9***	***24.9***	***24.9***	***24.9***	***44.9***	***44.9***	***44.9***	***44.9***
Subtotal City of Lathrop Acres		**98.7**	**98.7**	**98.7**	**57.7**	**57.7**	**57.7**	**57.7**	**57.7**	**96.9**	**96.9**	**96.9**	**96.9**	**96.9**	**44.5**	**44.5**	**44.5**	**44.5**	**44.5**	**83.4**	**83.4**	**83.4**	**83.4**
City of Manteca																							
Terra Ranch																							
Single-Family	Residential	23.0	23.0	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multifamily	Residential	-	-	1.4	4.0	4.0	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Terra Ranch Acres		***23.0***	***23.0***	***16.4***	***4.0***	***4.0***	***0.6***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Cerri																							
Single-Family	Residential	-	-	-	-	4.9	19.5	19.5	19.5	19.5	19.5	19.5	19.5	18.3	-	-	-	-	-	-	-	-	-
Subtotal Cerri Acres		***0.0***	***0.0***	***0.0***	***0.0***	***4.9***	***19.5***	***19.5***	***19.5***	***19.5***	***19.5***	***19.5***	***19.5***	***18.3***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Future Development																							
Multifamily	Residential	-	-	-	-	4.0	4.0	3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	4.8	-	-
Industrial	Industrial	-	-	-	-	-	-	3.8	3.8	3.8	3.8	3.8	3.8	4.4	-	-	-	-	-	-	-	-	-
Subtotal Future Development Acres		***0.0***	***0.0***	***0.0***	***0.0***	***4.0***	***4.0***	***11.3***	***7.7***	***7.7***	***7.7***	***7.7***	***7.7***	***8.3***	***3.8***	***3.8***	***3.8***	***3.8***	***3.8***	***3.8***	***4.8***	***0.0***	***0.0***
Denali																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	17.9	17.9	17.9	16.8	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8	3.8	3.8	1.5	-	-	-	-
Subtotal Denali Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***17.9***	***17.9***	***21.7***	***20.6***	***3.8***	***1.5***	***0.0***	***0.0***	***0.0***	***0.0***
The Trails of Manteca																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.7	21.7	21.7	21.7	21.7
Subtotal The Trails of Manteca Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***21.7***	***21.7***	***21.7***	***21.7***	***21.7***
Oakwood Trails																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.9	19.9	19.9	19.9
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.0	5.0
Subtotal Oakwood Trails Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***19.9***	***19.9***	***24.9***	***24.9***
Oleande																							
Single-Family	Residential	-	-	18.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Oleande Acres		***0.0***	***0.0***	***18.1***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Sundance																							
Single-Family	Residential	-	-	-	17.1	17.1	17.1	17.1	5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Sundance Acres		***0.0***	***0.0***	***0.0***	***17.1***	***17.1***	***17.1***	***17.1***	***5.8***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Subtotal City of Manteca Acres		***23.0***	***23.0***	***34.5***	***21.1***	***30.0***	***41.2***	***47.9***	***33.0***	***27.2***	***27.2***	***27.2***	***27.2***	***44.5***	***21.7***	***25.6***	***24.4***	***7.7***	***27.0***	***45.4***	***46.3***	***46.6***	***46.6***

Table A-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projection in Acres by Land Use Jurisdiction by Land Use Category

Development Area / Project	OA Rate Land Use Category	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
City of Stockton																							
Weston Ranch																							
Single-Family	Residential	-	-	11.9	11.9	11.9	11.9	11.9	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multifamily	Residential	-	-	-	7.6	7.6	-	-	-	7.5	7.5	-	-	-	-	4.0	4.0	4.0	4.0	4.0	4.0	0.8	-
Commercial	Commercial	-	-	-	-	38.1	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Subtotal City of Stockton Acres		***0.0***	***0.0***	***11.9***	***19.5***	***57.6***	***15.7***	***15.7***	***10.9***	***11.3***	***11.3***	***3.8***	***3.8***	***3.8***	***3.8***	***7.8***	***7.8***	***7.8***	***7.8***	***7.8***	***7.8***	***4.6***	***3.8***
San Joaquin County																							
Future Stockton Annex																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Future Stockton Annex Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***
Future Manteca Annex																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.0	20.0	20.0	20.0	20.0
Subtotal Future Manteca Annex Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***20.0***	***20.0***	***20.0***	***20.0***	***20.0***
Oakwood Shores																							
Single-Family	Residential	14.7	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Oakwood Shores Acres		***14.7***	***11.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Subtotal San Joaquin County Acres		***14.7***	***11.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***22.2***	***22.2***	***22.2***	***22.2***	***22.2***
Total RD 17 Area Acres		**136.4**	**132.7**	**145.1**	**98.3**	**145.2**	**114.6**	**121.3**	**101.6**	**135.4**	**137.6**	**130.1**	**130.1**	**147.4**	**72.3**	**80.1**	**79.0**	**62.2**	**101.6**	**158.9**	**159.8**	**156.8**	**156.0**

Table A-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projection in Acres by Land Use Jurisdiction by Land Use Categor

Development Area / Project	OA Rate Land Use Category	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Total
City of Lathrop																							
Central Lathrop																							
High Density Residential	Residential	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	**23.4**
Variable Density Residential	Residential	-	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	16.4	**608.0**
Residential/Mixed Use	Residential	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	**40.7**
Variable Density Residential Flex	Residential	-	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	**53.5**
Office	Commercial	3.9	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	**120.7**
Office Commercial (25% Retail / 75%Non-Retail)	Commercial	3.9	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	**120.7**
Neighborhood Commercial (50% Retail / 50% Non-Retail)	Commercial	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	**12.6**
P-SP, Neighborhood Commercial (0% Retail / 100% Non-Retail)	Commercial	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	**11.1**
Specialty Commercial (100% Retail / 0% Non-Retail)	Commercial	-	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**7.9**
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Subtotal Central Lathrop Acres		***7.8***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***29.2***	***998.6***
Mossdale Landing																							
Low Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**14.3**
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
High Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3.9**
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**6.0**
Community Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Neighborhood Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Subtotal Mossdale Landing Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***24.2***
Mossdale Landing East																							
Low Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**6.9**
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
High Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9.0**
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**131.0**
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Subtotal Mossdale Landing East Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***146.9***
Mossdale Landing South																							
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**18.9**
High Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**6.0**
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**75.0**
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Subtotal Mossdale Landing South Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***100.0***
Mossdale Landing Other																							
Low Density Residential	Residential	-	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	**131.6**
Subtotal Mossdale Landing Other Acres		***0.0***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***6.6***	***131.6***
South Lathrop																							
Light Industrial / R&D Flex	Industrial	-	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	**222.3**
Office	Commercial	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	**4.4**
Office Commercial (25% Retail / 75% Non-Retail)	Commercial	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	**4.4**
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Subtotal South Lathrop Acres		***0.0***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***1.4***	***231.1***
Lathrop Gateway																							
Light Industrial / R&D Flex	Industrial	16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**167.6**
Office	Commercial	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**69.9**
Office Commercial (25% Retail / 75% Non-Retail)	Commercial	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**69.9**
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Subtotal Lathrop Gateway Acres		***30.7***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***307.3***

Table A-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projection in Acres by Land Use Jurisdiction by Land Use Categor

Development Area / Project	OA Rate Land Use Category	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Total
Cross Roads																							
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Subtotal Cross Roads Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***
Historic/East Lathrop																							
Low Density Residential	Residential	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	**6.8**
Medium Density Residential	Residential	0.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	**16.4**
High Density Residential	Residential	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.6**
Commercial	Commercial	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**90.0**
Industrial	Industrial	40.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**400.0**
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Subtotal Historic/East Lathrop Acres		***44.9***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***0.2***	***515.8***
Subtotal City of Lathrop Acres		**83.4**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**37.3**	**2,455.5**
																							0.0
City of Manteca																							
Terra Ranch																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**61.0**
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**10.0**
Subtotal Terra Ranch Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***71.0***
Cerri																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**160.0**
Subtotal Cerri Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***160.0***
Future Development																							
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**11.6**
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**54.5**
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**27.4**
Subtotal Future Development Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***93.5***
Denali																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**70.5**
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**13.0**
Subtotal Denali Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***83.5***
The Trails of Manteca																							
Single-Family	Residential	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	11.6	-	-	-	-	-	-	-	-	-	-	-	315.0
Subtotal The Trails of Manteca Acres		***21.7***	***21.7***	***21.7***	***21.7***	***21.7***	***21.7***	***21.7***	***21.7***	***21.7***	***11.6***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***315.0***
Oakwood Trails																							
Single-Family	Residential	19.9	19.9	19.9	19.9	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168.0**
Commercial	Commercial	5.0	5.0	5.0	5.0	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**31.5**
Subtotal Oakwood Trails Acres		***24.9***	***24.9***	***24.9***	***24.9***	***10.4***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***199.5***
Oleande																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**18.1**
Subtotal Oleande Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***18.1***
Sundance																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74.3
Subtotal Sundance Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***74.3***
Subtotal City of Manteca Acres		***46.6***	***46.6***	***46.6***	***46.6***	***32.1***	***21.7***	***21.7***	***21.7***	***21.7***	***11.6***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***1,014.9***

Table A-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projection in Acres by Land Use Jurisdiction by Land Use Categor

Development Area / Project	OA Rate Land Use Category	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Total
City of Stockton																							
Weston Ranch																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**66.4**
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**55.0**
Commercial	Commercial	3.8	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**110.0**
Subtotal City of Stockton Acres		***3.8***	***3.4***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***231.4***
San Joaquin County																							
Future Stockton Annex																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Commercial	Commercial	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	-	-	-	**69.2**
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0**
Subtotal Future Stockton Annex Acres		***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.1***	***0.0***	***0.0***	***0.0***	***69.2***
Future Manteca Annex																							
Single-Family	Residential	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	15.3	-	-	-	-	-	-	-	-	-	-	-	-	**275.3**
Subtotal Future Manteca Annex Acres		***20.0***	***20.0***	***20.0***	***20.0***	***20.0***	***20.0***	***20.0***	***20.0***	***15.3***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***275.3***
Oakwood Shores																							
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.7
Subtotal Oakwood Shores Acres		***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***0.0***	***25.7***
Subtotal San Joaquin County Acres		***22.2***	***22.2***	***22.2***	***22.2***	***22.2***	***22.2***	***22.2***	***22.2***	***17.5***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.2***	***2.1***	***0.0***	***0.0***	***0.0***	***370.2***
Total RD 17 Area Acres		**156.0**	**109.5**	**106.1**	**106.1**	**91.7**	**81.2**	**81.2**	**81.2**	**76.5**	**51.2**	**39.6**	**39.6**	**39.6**	**39.6**	**39.6**	**39.6**	**39.6**	**39.5**	**37.3**	**37.3**	**37.3**	**4,072.1**

Table A-3
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projection Acreage Assumptions

Development Area / Project	DAP Units Type	DAP Units Total	ACREAGE Provided	ACREAGE Assumed	Desnsity/FAR Assumption
		A (DAP)	B	C = A / D	D
City of Lathrop					
Central Lathrop					
High Density Residential	du	375.0		23.4	16.0
Variable Density Residential	du	4,864.0		608.0	8.0
Residential/Mixed Use	du	651.0		40.7	16.0
Variable Density Residential Flex	du	428.0		53.5	8.0
Office	ksf	1,576.7	120.7		
Office Commercial	ksf	1,576.7	120.7		
Neighborhood Commercial	ksf	164.7	12.6		
P-SP, Neighborhood Commercial	ksf	145.1	11.1		
Specialty Commercial	ksf	103.2	7.9		
Subtotal Acreage Central Lathrop				***998.6***	
Mossdale Landing					
Low Density Residential	du	66.0		14.3	4.6
Medium Density Residential	du	0.0		0.0	8.4
High Density Residential	du	62.0		3.9	16.0
Commercial	ksf	78.4	6.0		
Subtotal Acreage Mossdale Landing				***24.2***	
Mossdale Landing East					
Low Density Residential	du	38.0		6.9	5.5
Medium Density Residential	du	0.0		0.0	10.0
High Density Residential	du	144.0		9.0	16.0
Commercial	ksf	1,711.9	131.0		
Subtotal Acreage Mossdale Landing East				***146.9***	
Mossdale Landing South					
Medium Density Residential	du	140.0		18.9	7.4
High Density Residential	du	150.0		6.0	24.8
Commercial	ksf	980.1	75.0		
Subtotal Acreage Mossdale Landing South				***100.0***	
Mossdale Landing Other					
Low Density Residential	du	658.0		131.6	5.0
Subtotal Acreage Mossdale Landing Other				***131.6***	
South Lathrop					
Light Industrial / R&D Flex	ksf	2,905.0	222.3		
Office	ksf	57.5	4.4		
Office Commercial	ksf	57.5	4.4		
Subtotal Acreage South Lathrop				***231.1***	

Table A-3
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projection Acreage Assumptions

Development Area / Project	DAP Units Type	DAP Units Total A (DAP)	ACREAGE Provided B	ACREAGE Assumed C = A / D	Desnsity/FAR Assumption D
Lathrop Gateway					
Light Industrial / R&D Flex	ksf	2,190.2	167.6		
Office	ksf	912.8	69.9		
Office Commercial	ksf	912.8	69.9		
Subtotal Acreage Lathrop Gateway				***307.3***	
Cross Roads					
Industrial	ksf	0.0	0.0		
Commercial	ksf	0.0	0.0		
Subtotal Acreage Cross Roads				***0.0***	
Historic/East Lathrop					
Low Density Residential	du	34.0		6.8	5.0
Medium Density Residential	du	164.0		16.4	10.0
High Density Residential	du	42.0		2.6	16.0
Commercial	ksf	1,176.1	90.0		
Industrial	ksf	5,227.2	400.0		
Subtotal Acreage Historic/East Lathrop				***515.8***	
Subtotal Acreage City of Lathrop				**2,455.5**	
City of Manteca					
Terra Ranch					
Single-Family	du	212.0	61.0		
Multifamily	du	200.0	10.0		
Subtotal Acreage Terra Ranch				***71.0***	
Cerri					
Single-Family	du	655.0	160.0		
Subtotal Acreage Cerri				***160.0***	
Future Development					
Multifamily	du	233.0	11.6		
Commercial	ksf	712.2	54.5		
Industrial	ksf	358.1	27.4		
Subtotal Acreage Future Development				***93.5***	
Denali					
Single-Family	du	315.0	70.5		
Commercial	ksf	169.9	13.0		
Subtotal Acreage Denali				***83.5***	
The Trails of Manteca					
Single-Family	du	1,163.0	315.0		
Subtotal Acreage The Trails of Manteca				***315.0***	

Table A-3
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projection Acreage Assumptions

Development Area / Project	DAP Units Type	DAP Units Total	ACREAGE Provided	ACREAGE Assumed	Desnsity/FAR Assumption
		A (DAP)	B	C = A / D	D
Oakwood Trails					
Single-Family	du	676.0	168.0		
Commercial	ksf	314.9	31.5		
Subtotal Acreage Oakwood Trails				***199.5***	
Oleander					
Single-Family	du	87.0		18.1	4.8
Subtotal Acreage Oleander				***18.1***	
Sundance					
Single-Family	du	347.0		74.3	4.7
Subtotal Acreage Sundance				***74.3***	
Subtotal Acreage City of Manteca				***1,014.9***	
City of Stockton					
Weston Ranch					
Single-Family	du	448.0	66.4		
Multifamily	du	1,101.0	55.0		
Commercial	ksf	722.2	110.0		
Subtotal Acreage City of Stockton				***231.4***	
San Joaquin County					
Future Stockton Annex					
Single-Family	du	0.0	0.0		
Multifamily	du	0.0	0.0		
Commercial	ksf	773.7	69.2		
Industrial	ksf	0.0	0.0		
Subtotal Acreage Future Stockton Annex				***69.2***	
Future Manteca Annex					
Single-Family	du	1,101.0	275.3		
Subtotal Acreage Future Manteca Annex				***275.3***	
Oakwood Shores					
Single-Family	du	140.0	25.7		
Subtotal Acreage Oakwood Shores				***25.7***	
Subtotal Acreage San Joaquin County				***370.2***	
Total SJC 200-YFP Basin Acreage				**4,072.1**	

Table B-1
RD 17 Area: Overlay Asssessment Rate Analysis
Cash Flow Modeling of Overlay Assessment in
Conjunction with Development Projections

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Annual Assessment Revenue [1]	**$5,500,000**	**$5,475,493**	**$5,451,642**	**$5,425,588**	**$5,407,899**	**$5,381,462**	**$5,360,816**	**$5,338,937**	**$5,320,586**	**$5,295,837**	**$5,270,668**	**$5,246,839**
Planned Development Acres [2]												
Commercial	12	12	12	13	51	16	20	20	59	61	61	61
Industrial	54	54	54	18	18	18	22	22	22	22	22	22
Residential	71	67	79	67	76	80	79	59	54	54	46	46
Subtotal Planned Development Acres	***136***	***133***	***145***	***98***	***145***	***115***	***121***	***102***	***135***	***138***	***130***	***130***
Marignal Change in Assessement Revenue [3]												
Commercial	-$2,192.06	-$2,192.06	-$2,192.06	-$2,348.42	-$9,501.06	-$3,063.68	-$3,782.42	-$3,782.42	-$11,124.50	-$11,544.53	-$11,544.53	-$11,544.53
Industrial	-$9,658.91	-$9,658.91	-$9,658.91	-$3,271.05	-$3,271.05	-$3,271.05	-$3,955.53	-$3,955.53	-$3,972.57	-$3,972.57	-$3,972.57	-$3,972.57
Residential	-$12,656.32	-$11,999.78	-$14,203.16	-$12,069.35	-$13,664.79	-$14,311.21	-$14,141.53	-$10,612.66	-$9,652.17	-$9,652.17	-$8,311.67	-$8,311.67
Subtotal Marignal Change in Assessement Revenue	***-$24,507.30***	***-$23,850.76***	***-$26,054.13***	***-$17,688.82***	***-$26,436.90***	***-$20,645.95***	***-$21,879.48***	***-$18,350.60***	***-$24,749.24***	***-$25,169.26***	***-$23,828.77***	***-$23,828.77***
Net Change in Assessment Revenue [4]	***$5,475,493***	***$5,451,642***	***$5,425,588***	***$5,407,899***	***$5,381,462***	***$5,360,816***	***$5,338,937***	***$5,320,586***	***$5,295,837***	***$5,270,668***	***$5,246,839***	***$5,223,010***

Notes
[1] Annual Assessment Revnue calculated by subtracting the marginal change in assessment revenue from the previous year's development.
[2] Development assumed to ocur during the year affecting the following year's assessment roll. Summarized from Table A-2, Appendix A.
[3] Calculated by multiplying the Planned Development Acres by the appropriate rate from Table 4.
[4] Assessment revenues assumed to result from development during the year.

Table B-1
RD 17 Area: Overlay Asssessment Rate Analysis
Cash Flow Modeling of Overlay Assessment in
Conjunction with Development Projections

	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Annual Assessment Revenue [1]	**$5,223,010**	**$5,196,086**	**$5,182,929**	**$5,168,338**	**$5,153,948**	**$5,142,560**	**$5,124,150**	**$5,095,411**	**$5,066,497**	**$5,038,108**	**$5,009,863**	**$4,981,617**
Planned Development Acres [2]												
Commercial	61	25	29	29	29	27	36	37	37	37	37	19
Industrial	23	28	28	28	28	28	57	57	57	57	57	1
Residential	63	19	23	22	5	47	66	66	63	62	62	90
Subtotal Planned Development Acres	***147***	***72***	***80***	***79***	***62***	***102***	***159***	***160***	***157***	***156***	***156***	***110***
Marignal Change in Assessement Revenue [3]												
Commercial	-$11,544.53	-$4,721.87	-$5,440.61	-$5,440.61	-$5,440.61	-$5,007.70	-$6,695.50	-$6,870.96	-$6,917.39	-$6,917.39	-$6,917.39	-$3,526.20
Industrial	-$4,082.95	-$5,077.04	-$5,077.04	-$5,077.04	-$5,077.04	-$5,077.04	-$10,154.08	-$10,154.08	-$10,154.08	-$10,154.08	-$10,154.08	-$169.06
Residential	-$11,296.25	-$3,358.26	-$4,073.20	-$3,873.00	-$870.12	-$8,325.25	-$11,889.13	-$11,889.13	-$11,317.19	-$11,174.20	-$11,174.20	-$16,066.20
Subtotal Marignal Change in Assessement Revenue	***-$26,923.72***	***-$13,157.18***	***-$14,590.85***	***-$14,390.66***	***-$11,387.77***	***-$18,409.99***	***-$28,738.72***	***-$28,914.18***	***-$28,388.66***	***-$28,245.67***	***-$28,245.67***	***-$19,761.46***
Net Change in Assessment Revenue [4]	***$5,196,086***	***$5,182,929***	***$5,168,338***	***$5,153,948***	***$5,142,560***	***$5,124,150***	***$5,095,411***	***$5,066,497***	***$5,038,108***	***$5,009,863***	***$4,981,617***	***$4,961,855***

Notes
[1] Annual Assessment Revnue calculated by subtracting the marginal change in assessment revenue from the previous year's development.
[2] Development assumed to ocur during the year affecting the following year's assessment roll. Summarized from Table A-2, Appendix A.
[3] Calculated by multiplying the Planned Development Acres by the appropriate rate from Table 4.
[4] Assessment revenues assumed to result from development during the year.

Table B-1
RD 17 Area: Overlay Asssessment Rate Analysis
Cash Flow Modeling of Overlay Assessment in
Conjunction with Development Projections

	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053
Annual Assessment Revenue [1]	**$4,961,855**	**$4,942,730**	**$4,923,605**	**$4,907,095**	**$4,892,467**	**$4,877,839**	**$4,863,211**	**$4,849,432**	**$4,840,176**	**$4,833,003**	**$4,825,830**	**$4,818,657**
Planned Development Acres [2]												
Commercial	15	15	12	10	10	10	10	10	10	10	10	10
Industrial	1	1	1	1	1	1	1	1	1	1	1	1
Residential	90	90	79	70	70	70	65	40	28	28	28	28
Subtotal Planned Development Acres	***106***	***106***	***92***	***81***	***81***	***81***	***76***	***51***	***40***	***40***	***40***	***40***
Marignal Change in Assessement Revenue [3]												
Commercial	-$2,890.21	-$2,890.21	-$2,230.63	-$1,949.59	-$1,949.59	-$1,949.59	-$1,949.59	-$1,949.59	-$1,949.59	-$1,949.59	-$1,949.59	-$1,949.59
Industrial	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06
Residential	-$16,066.20	-$16,066.20	-$14,110.00	-$12,509.47	-$12,509.47	-$12,509.47	-$11,659.50	-$7,137.86	-$5,054.34	-$5,054.34	-$5,054.34	-$5,054.34
Subtotal Marignal Change in Assessement Revenue	***-$19,125.47***	***-$19,125.47***	***-$16,509.68***	***-$14,628.12***	***-$14,628.12***	***-$14,628.12***	***-$13,778.15***	***-$9,256.51***	***-$7,172.99***	***-$7,172.99***	***-$7,172.99***	***-$7,172.99***
Net Change in Assessment Revenue [4]	***$4,942,730***	***$4,923,605***	***$4,907,095***	***$4,892,467***	***$4,877,839***	***$4,863,211***	***$4,849,432***	***$4,840,176***	***$4,833,003***	***$4,825,830***	***$4,818,657***	***$4,811,484***

Notes
[1] Annual Assessment Revnue calculated by subtracting the marginal change in assessment revenue from the previous year's development.
[2] Development assumed to ocur during the year affecting the following year's assessment roll. Summarized from Table A-2, Appendix A.
[3] Calculated by multiplying the Planned Development Acres by the appropriate rate from Table 4.
[4] Assessment revenues assumed to result from development during the year.

Table B-1
RD 17 Area: Overlay Asssessment Rate Analysis
Cash Flow Modeling of Overlay Assessment in
Conjunction with Development Projections

	2054	2055	2056	2057	2058	2059	2060
Annual Assessment Revenue [1]	**$4,811,484**	**$4,804,311**	**$4,797,138**	**$4,789,965**	**$4,782,814**	**$4,776,061**	**$4,769,308**
Planned Development Acres [2]							
Commercial	10	10	10	10	8	8	8
Industrial	1	1	1	1	1	1	1
Residential	28	28	28	28	28	28	28
Subtotal Planned Development Acres	***40***	***40***	***40***	***39***	***37***	***37***	***37***
Marignal Change in Assessement Revenue [3]							
Commercial	-$1,949.59	-$1,949.59	-$1,949.59	-$1,927.96	-$1,529.57	-$1,529.57	-$1,529.57
Industrial	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06	-$169.06
Residential	-$5,054.34	-$5,054.34	-$5,054.34	-$5,054.34	-$5,054.34	-$5,054.34	-$5,054.34
Subtotal Marignal Change in Assessement Revenue	***-$7,172.99***	***-$7,172.99***	***-$7,172.99***	***-$7,151.36***	***-$6,752.97***	***-$6,752.97***	***-$6,752.97***
Net Change in Assessment Revenue [4]	***$4,804,311***	***$4,797,138***	***$4,789,965***	***$4,782,814***	***$4,776,061***	***$4,769,308***	***$4,762,555***

Notes
[1] Annual Assessment Revnue calculated by subtracting the marginal change in assessment revenue from the previou
[2] Development assumed to ocur during the year affecting the following year's assessment roll. Summarized from Ta
[3] Calculated by multiplying the Planned Development Acres by the appropriate rate from Table 4.
[4] Assessment revenues assumed to result from development during the year.

Table B-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projections Marginal Change in Assessment by Land Use Jurisdiction by Land Use Category

Development Area / Project	Overlay Assessment Rate Land Use Category	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
City of Lathrop																
Central Lathrop																
High Density Residential	Residential	-	-	-	-612.72	-612.72	-612.72	-612.72	-612.72	-	-	-	-	-	-	-
Variable Density Residential	Residential	-4,472.38	-4,472.38	-4,472.38	-3,246.95	-3,246.95	-3,246.95	-3,246.95	-3,246.95	-4,065.39	-4,065.39	-4,065.39	-4,065.39	-4,065.39	-	-
Residential/Mixed Use	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variable Density Residential Flex	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Central Lathrop Marginal Change in Assessment		***($4,472.38)***	***($4,472.38)***	***($4,472.38)***	***($3,859.66)***	***($3,859.66)***	***($3,859.66)***	***($3,859.66)***	***($3,859.66)***	***($4,065.39)***	***($4,065.39)***	***($4,065.39)***	***($4,065.39)***	***($4,065.39)***	***$0.00***	***$0.00***
Mossdale Landing																
Low Density Residential	Residential	-	-	-	-256.68	-256.68	-256.68	-256.68	-256.68	-256.68	-256.68	-256.68	-256.68	-256.68	-	-
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Density Residential	Residential	-231.07	-231.07	-231.07	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-112.71	-112.71	-112.71	-112.71	-112.71	-112.71	-112.71	-112.71	-112.71	-112.71	-	-
Community Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neighborhood Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing Marginal Change in Assessme		***($231.07)***	***($231.07)***	***($231.07)***	***($369.38)***	***($369.38)***	***($369.38)***	***($369.38)***	***($369.38)***	***($369.38)***	***($369.38)***	***($369.38)***	***($369.38)***	***($369.38)***	***$0.00***	***$0.00***
Mossdale Landing East																
Low Density Residential	Residential	-412.00	-412.00	-412.00	-	-	-	-	-	-	-	-	-	-	-	-
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Density Residential	Residential	-201.26	-201.26	-201.26	-201.26	-201.26	-201.26	-201.26	-201.26	-	-	-	-	-	-	-
Commercial	Commercial	-62.62	-62.62	-62.62	-751.40	-751.40	-751.40	-751.40	-751.40	-4,132.68	-4,132.68	-4,132.68	-4,132.68	-4,132.68	-	-
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing East Marginal Change in Asse		***($675.87)***	***($675.87)***	***($675.87)***	***($952.65)***	***($952.65)***	***($952.65)***	***($952.65)***	***($952.65)***	***($4,132.68)***	***($4,132.68)***	***($4,132.68)***	***($4,132.68)***	***($4,132.68)***	***$0.00***	***$0.00***
Mossdale Landing South																
Medium Density Residential	Residential	-	-	-	-338.45	-338.45	-338.45	-338.45	-338.45	-338.45	-338.45	-338.45	-338.45	-338.45	-	-
High Density Residential	Residential	-360.68	-360.68	-360.68	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-187.85	-187.85	-187.85	-187.85	-187.85	-2,629.89	-2,629.89	-2,629.89	-2,629.89	-2,629.89	-	-
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing South Marginal Change in Ass		***($360.68)***	***($360.68)***	***($360.68)***	***($526.30)***	***($526.30)***	***($526.30)***	***($526.30)***	***($526.30)***	***($2,968.34)***	***($2,968.34)***	***($2,968.34)***	***($2,968.34)***	***($2,968.34)***	***$0.00***	***$0.00***
Mossdale Landing Other																
Low Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing Other Marginal Change in Ass		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
South Lathrop																
Light Industrial / R&D Flex	Industrial	-8,168.12	-8,168.12	-8,168.12	-2,376.58	-2,376.58	-2,376.58	-2,376.58	-2,376.58	-	-	-	-	-	-	-
Office Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal South Lathrop Marginal Change in Assessment		***($8,168.12)***	***($8,168.12)***	***($8,168.12)***	***($2,376.58)***	***($2,376.58)***	***($2,376.58)***	***($2,376.58)***	***($2,376.58)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***

Table B-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projections Marginal Change in Assessment by Land Use Jurisdiction by Land Use Category

Development Area / Project	Overlay Assessment Rate Land Use Category	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Lathrop Gateway																
Light Industrial / R&D Flex	Industrial	-	-	-	-	-	-	-	-	-1,499.14	-1,499.14	-1,499.14	-1,499.14	-1,499.14	-1,499.14	-1,499.14
Office Commercial	Commercial	-	-	-	-	-	-	-	-	-656.06	-656.06	-656.06	-656.06	-656.06	-656.06	-656.06
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Lathrop Gateway Marginal Change in Assessmen		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($2,155.20)***	***($2,155.20)***	***($2,155.20)***	***($2,155.20)***	***($2,155.20)***	***($2,155.20)***	***($2,155.20)***
Cross Roads																
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Cross Roads Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Historic/East Lathrop																
Low Density Residential	Residential	-47.71	-47.71	-47.71	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93
Medium Density Residential	Residential	-161.01	-161.01	-161.01	-96.60	-96.60	-96.60	-96.60	-96.60	-96.60	-96.60	-96.60	-96.60	-96.60	-96.60	-96.60
High Density Residential	Residential	-26.09	-26.09	-26.09	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65
Commercial	Commercial	-939.24	-939.24	-939.24	-563.55	-563.55	-563.55	-563.55	-563.55	-751.40	-751.40	-751.40	-751.40	-751.40	-751.40	-751.40
Industrial	Industrial	-1,490.79	-1,490.79	-1,490.79	-894.48	-894.48	-894.48	-894.48	-894.48	-1,788.95	-1,788.95	-1,788.95	-1,788.95	-1,788.95	-3,577.90	-3,577.90
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Historic/East Lathrop Marginal Change in Assess		***($2,664.84)***	***($2,664.84)***	***($2,664.84)***	***($1,613.21)***	***($1,613.21)***	***($1,613.21)***	***($1,613.21)***	***($1,613.21)***	***($2,695.54)***	***($2,695.54)***	***($2,695.54)***	***($2,695.54)***	***($2,695.54)***	***($4,484.49)***	***($4,484.49)***
Subtotal City of Lathrop Marginal Change in Assessment		***($16,572.96)***	***($16,572.96)***	***($16,572.96)***	***($9,697.79)***	***($9,697.79)***	***($9,697.79)***	***($9,697.79)***	***($9,697.79)***	***($16,386.53)***	***($16,386.53)***	***($16,386.53)***	***($16,386.53)***	***($16,386.53)***	***($6,639.69)***	***($6,639.69)***
City of Manteca																
Terra Ranch																
Single-Family	Residential	-4,117.96	-4,117.96	-2,676.68	-	-	-	-	-	-	-	-	-	-	-	-
Multifamily	Residential	-	-	-250.45	-715.58	-715.58	-107.34	-	-	-	-	-	-	-	-	-
Subtotal Terra Ranch Marginal Change in Assessment		***($4,117.96)***	***($4,117.96)***	***($2,927.13)***	***($715.58)***	***($715.58)***	***($107.34)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Cerri																
Single-Family	Residential	-	-	-	-	-873.99	-3,495.96	-3,495.96	-3,495.96	-3,495.96	-3,495.96	-3,495.96	-3,495.96	-3,277.47	-	-
Subtotal Cerri Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($873.99)***	***($3,495.96)***	***($3,495.96)***	***($3,495.96)***	***($3,495.96)***	***($3,495.96)***	***($3,495.96)***	***($3,495.96)***	***($3,277.47)***	***$0.00***	***$0.00***
Future Development																
Multifamily	Residential	-	-	-	-	-712.51	-712.51	-650.16	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-718.74	-718.74	-718.74	-718.74	-718.74	-718.74	-718.74	-718.74	-718.74
Industrial	Industrial	-	-	-	-	-	-	-684.48	-684.48	-684.48	-684.48	-684.48	-684.48	-794.86	-	-
Subtotal Future Development Marginal Change in Assessn		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($712.51)***	***($712.51)***	***($2,053.38)***	***($1,403.21)***	***($1,403.21)***	***($1,403.21)***	***($1,403.21)***	***($1,403.21)***	***($1,513.59)***	***($718.74)***	***($718.74)***
Denali																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-3,203.07	-3,203.07	-3,203.07
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-718.74
Subtotal Denali Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($3,203.07)***	***($3,203.07)***	***($3,921.81)***
The Trails of Manteca																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal The Trails of Manteca Marginal Change in Assess		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Oakwood Trails																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Oakwood Trails Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***

Table B-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projections Marginal Change in Assessment by Land Use Jurisdiction by Land Use Category

Development Area / Project	Overlay Assessment Rate Land Use Category	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Oleander																
Single-Family	Residential	-	-	-3,242.47	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Oleander Marginal Change in Assessment		***$0.00***	***$0.00***	***($3,242.47)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Sundance																
Single-Family	Residential	-	-	-	-3,062.79	-3,062.79	-3,062.79	-3,062.79	-1,033.69	-	-	-	-	-	-	-
Subtotal Sundance Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***($3,062.79)***	***($3,062.79)***	***($3,062.79)***	***($3,062.79)***	***($1,033.69)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Subtotal City of Manteca Marginal Change in Assessment		***($4,117.96)***	***($4,117.96)***	***($6,169.60)***	***($3,778.37)***	***($5,364.88)***	***($7,378.61)***	***($8,612.14)***	***($5,932.87)***	***($4,899.18)***	***($4,899.18)***	***($4,899.18)***	***($4,899.18)***	***($7,994.13)***	***($3,921.81)***	***($4,640.55)***
City of Stockton																
Weston Ranch																
Single-Family	Residential	-	-	-2,121.37	-2,121.37	-2,121.37	-2,121.37	-2,121.37	-1,271.76	-	-	-	-	-	-	-
Multifamily	Residential	-	-	-	-1,358.37	-1,367.30	-	-	-	-1,340.49	-1,340.49	-	-	-	-	-714.93
Commercial	Commercial	-	-	-	-	-7,152.64	-715.26	-715.26	-715.26	-715.26	-715.26	-715.26	-715.26	-715.26	-715.26	-715.26
Subtotal City of Stockton Marginal Change in Assessment		***$0.00***	***$0.00***	***($2,121.37)***	***($3,479.74)***	***($10,641.32)***	***($2,836.64)***	***($2,836.64)***	***($1,987.03)***	***($2,055.76)***	***($2,055.76)***	***($715.26)***	***($715.26)***	***($715.26)***	***($715.26)***	***($1,430.19)***
San Joaquin County																
Future Stockton Annex																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Future Stockton Annex Marginal Change in Asses		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***
Future Manteca Annex																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Future Manteca Annex Marginal Change in Asses		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Oakwood Shores																
Single-Family	Residential	-2,626.18	-1,969.63	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Oakwood Shores Marginal Change in Assessmen		***($2,626.18)***	***($1,969.63)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Subtotal San Joaquin County Marginal Change in Assessment		***($2,626.18)***	***($1,969.63)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***
Total RD 17 Area: Marginal Change in Assessment		**($23,317.10)**	**($22,660.55)**	**($24,863.93)**	**($16,955.91)**	**($25,703.99)**	**($19,913.03)**	**($21,146.57)**	**($17,617.69)**	**($23,341.47)**	**($23,761.49)**	**($22,421.00)**	**($22,421.00)**	**($25,515.95)**	**($11,696.79)**	**($13,130.46)**

Source: City of Lathrop, City of Manteca, City of Stockton, San Joaquin County, ParcelQuest, LWA

Indicates an update from the May 5, 2017 version.

Table B-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projections Marginal Change in Assessm

Development Area / Project	Overlay Assessment Rate Land Use Category	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
City of Lathrop																
Central Lathrop																
High Density Residential	Residential	-	-	-	-	-	-	-	-	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46
Variable Density Residential	Residential	-	-	-	-	-	-	-	-	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47
Residential/Mixed Use	Residential	-	-	-	-	-	-	-	-	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94
Variable Density Residential Flex	Residential	-	-	-	-	-	-	-	-	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54
Commercial	Commercial	-	-	-	-	-	-	-	-	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Central Lathrop Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***
Mossdale Landing																
Low Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Neighborhood Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing Marginal Change in Assessme		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Mossdale Landing East																
Low Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing East Marginal Change in Asse		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Mossdale Landing South																
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Mossdale Landing South Marginal Change in Ass		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Mossdale Landing Other																
Low Density Residential	Residential	-	-	-	-	-	-	-	-	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13
Subtotal Mossdale Landing Other Marginal Change in Ass		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***
South Lathrop																
Light Industrial / R&D Flex	Industrial	-	-	-	-	-	-	-	-	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06
Office Commercial	Commercial	-	-	-	-	-	-	-	-	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal South Lathrop Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***

Table B-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projections Marginal Change in Assessm

Development Area / Project	Overlay Assessment Rate Land Use Category	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Lathrop Gateway																
Light Industrial / R&D Flex	Industrial	-1,499.14	-1,499.14	-1,499.14	-2,998.28	-2,998.28	-2,998.28	-2,998.28	-2,998.28	-	-	-	-	-	-	-
Office Commercial	Commercial	-656.06	-656.06	-656.06	-1,312.13	-1,312.13	-1,312.13	-1,312.13	-1,312.13	-	-	-	-	-	-	-
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Lathrop Gateway Marginal Change in Assessmen		***($2,155.20)***	***($2,155.20)***	***($2,155.20)***	***($4,310.41)***	***($4,310.41)***	***($4,310.41)***	***($4,310.41)***	***($4,310.41)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Cross Roads																
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Cross Roads Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Historic/East Lathrop																
Low Density Residential	Residential	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93	-42.93	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73
Medium Density Residential	Residential	-96.60	-96.60	-96.60	-103.76	-103.76	-103.76	-103.76	-103.76	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15
High Density Residential	Residential	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65	-15.65	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91
Commercial	Commercial	-751.40	-751.40	-751.40	-751.40	-751.40	-751.40	-751.40	-751.40	-	-	-	-	-	-	-
Industrial	Industrial	-3,577.90	-3,577.90	-3,577.90	-7,155.80	-7,155.80	-7,155.80	-7,155.80	-7,155.80	-	-	-	-	-	-	-
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Historic/East Lathrop Marginal Change in Assessi		***($4,484.49)***	***($4,484.49)***	***($4,484.49)***	***($8,069.55)***	***($8,069.55)***	***($8,069.55)***	***($8,069.55)***	***($8,069.55)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***
Subtotal City of Lathrop Marginal Change in Assessment		***($6,639.69)***	***($6,639.69)***	***($6,639.69)***	***($12,379.95)***	***($12,379.95)***	***($12,379.95)***	***($12,379.95)***	***($12,379.95)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***
City of Manteca																
Terra Ranch																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Terra Ranch Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Cerri																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Cerri Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Future Development																
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-718.74	-718.74	-718.74	-718.74	-894.19	-	-	-	-	-	-	-	-	-	-
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Future Development Marginal Change in Assessn		***($718.74)***	***($718.74)***	***($718.74)***	***($718.74)***	***($894.19)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Denali																
Single-Family	Residential	-3,002.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-718.74	-718.74	-285.83	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Denali Marginal Change in Assessment		***($3,721.62)***	***($718.74)***	***($285.83)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
The Trails of Manteca																
Single-Family	Residential	-	-	-3,876.32	-3,876.32	-3,876.32	-3,876.32	-3,876.32	-3,876.32	-3,876.32	-3,876.32	-3,876.32	-3,876.32	-3,876.32	-3,876.32	-3,876.32
Subtotal The Trails of Manteca Marginal Change in Assess		***$0.00***	***$0.00***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***
Oakwood Trails																
Single-Family	Residential	-	-	-	-3,556.73	-3,556.73	-3,556.73	-3,556.73	-3,556.73	-3,556.73	-3,556.73	-3,556.73	-1,600.53	-	-	-
Commercial	Commercial	-	-	-	-	-	-940.62	-940.62	-940.62	-940.62	-940.62	-940.62	-281.03	-	-	-
Subtotal Oakwood Trails Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***($3,556.73)***	***($3,556.73)***	***($4,497.35)***	***($4,497.35)***	***($4,497.35)***	***($4,497.35)***	***($4,497.35)***	***($4,497.35)***	***($1,881.56)***	***$0.00***	***$0.00***	***$0.00***

Table B-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projections Marginal Change in Assessm

Development Area / Project	Overlay Assessment Rate Land Use Category	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Oleander																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Oleander Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Sundance																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Sundance Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Subtotal City of Manteca Marginal Change in Assessment		***($4,440.35)***	***($1,437.47)***	***($4,880.88)***	***($8,151.78)***	***($8,327.24)***	***($8,373.67)***	***($8,373.67)***	***($8,373.67)***	***($8,373.67)***	***($8,373.67)***	***($8,373.67)***	***($5,757.88)***	***($3,876.32)***	***($3,876.32)***	***($3,876.32)***
City of Stockton																
Weston Ranch																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multifamily	Residential	-714.93	-714.93	-714.93	-714.93	-714.93	-142.99	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-715.26	-715.26	-715.26	-715.26	-715.26	-715.26	-715.26	-715.26	-635.99	-	-	-	-	-	-
Subtotal City of Stockton Marginal Change in Assessment		***($1,430.19)***	***($1,430.19)***	***($1,430.19)***	***($1,430.19)***	***($1,430.19)***	***($858.25)***	***($715.26)***	***($715.26)***	***($635.99)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
San Joaquin County																
Future Stockton Annex																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commercial	Commercial	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Future Stockton Annex Marginal Change in Asses		***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***	***($420.03)***
Future Manteca Annex																
Single-Family	Residential	-	-	-3,578.81	-3,578.81	-3,578.81	-3,578.81	-3,578.81	-3,578.81	-3,578.81	-3,578.81	-3,578.81	-3,578.81	-3,578.81	-3,578.81	-3,578.81
Subtotal Future Manteca Annex Marginal Change in Asses		***$0.00***	***$0.00***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***	***($3,578.81)***
Oakwood Shores																
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Oakwood Shores Marginal Change in Assessmen		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Subtotal San Joaquin County Marginal Change in Assessment		***($420.03)***	***($420.03)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***	***($3,998.84)***
Total RD 17 Area: Marginal Change in Assessment		**($12,930.27)**	**($9,927.38)**	**($16,949.60)**	**($25,960.76)**	**($26,136.22)**	**($25,610.70)**	**($25,467.72)**	**($25,467.72)**	**($18,347.42)**	**($17,711.43)**	**($17,711.43)**	**($15,095.64)**	**($13,214.08)**	**($13,214.08)**	**($13,214.08)**

Source: City of Lathrop, City of Manteca, City of Stockton, San Joaquin County, ParcelQuest, LWA

Table B-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projections Marginal Change in Assessm

Development Area / Project	Overlay Assessment Rate Land Use Category	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Total
City of Lathrop															
Central Lathrop															
High Density Residential	Residential	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46	-56.46	($4,192.85)
Variable Density Residential	Residential	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	-2,939.47	($108,768.19)
Residential/Mixed Use	Residential	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94	-363.94	($7,278.79)
Variable Density Residential Flex	Residential	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54	-478.54	($9,570.89)
Commercial	Commercial	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20	-74.20	($1,484.01)
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Subtotal Central Lathrop Marginal Change in Assessment		***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($3,912.62)***	***($131,294.73)***
Mossdale Landing															
Low Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($2,566.76)
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
High Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($693.22)
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	($1,127.09)
Community Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Neighborhood Park	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Subtotal Mossdale Landing Marginal Change in Assessme		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($4,387.07)***
Mossdale Landing East															
Low Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($1,236.00)
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
High Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($1,610.06)
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	($24,608.22)
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Subtotal Mossdale Landing East Marginal Change in Asses		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($27,454.27)***
Mossdale Landing South															
Medium Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($3,384.50)
High Density Residential	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($1,082.03)
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	($14,088.67)
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Subtotal Mossdale Landing South Marginal Change in Ass		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($18,555.20)***
Mossdale Landing Other															
Low Density Residential	Residential	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	-1,177.13	($23,542.59)
Subtotal Mossdale Landing Other Marginal Change in Ass		***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($1,177.13)***	***($23,542.59)***
South Lathrop															
Light Industrial / R&D Flex	Industrial	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06	-169.06	($39,768.37)
Office Commercial	Commercial	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33	-41.33	($826.54)
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Subtotal South Lathrop Marginal Change in Assessment		***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($210.38)***	***($40,594.91)***

Table B-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projections Marginal Change in Assessm

Development Area / Project	Overlay Assessment Rate Land Use Category	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Total
Lathrop Gateway															
Light Industrial / R&D Flex	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	($29,982.81)
Office Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	($13,121.25)
Open Space	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Public Landscaping	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Subtotal Lathrop Gateway Marginal Change in Assessmen		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($43,104.06)***
Cross Roads															
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Subtotal Cross Roads Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***
Historic/East Lathrop															
Low Density Residential	Residential	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73	-10.73	($1,216.49)
Medium Density Residential	Residential	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15	-24.15	($2,933.88)
High Density Residential	Residential	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91	-3.91	($469.60)
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	($16,906.41)
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	($71,558.02)
Parks	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Schools	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Subtotal Historic/East Lathrop Marginal Change in Assessi		***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($38.80)***	***($93,084.40)***
Subtotal City of Lathrop Marginal Change in Assessment		***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($5,338.93)***	***($382,017.23)***
City of Manteca															
Terra Ranch															
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($10,912.60)
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($1,788.95)
Subtotal Terra Ranch Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($12,701.55)***
Cerri															
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($28,623.21)
Subtotal Cerri Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($28,623.21)***
Future Development															
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($2,075.18)
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	($10,237.77)
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	($4,901.72)
Subtotal Future Development Marginal Change in Assessn		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($17,214.68)***
Denali															
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($12,612.10)
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	($2,442.04)
Subtotal Denali Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($15,054.14)***
The Trails of Manteca															
Single-Family	Residential	-3,876.32	-2,083.52	-	-	-	-	-	-	-	-	-	-	-	($56,351.94)
Subtotal The Trails of Manteca Marginal Change in Assess		***($3,876.32)***	***($2,083.52)***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($56,351.94)***
Oakwood Trails															
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($30,054.37)
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	($5,924.76)
Subtotal Oakwood Trails Marginal Change in Assessment		***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***($35,979.13)***

Table B-2
RD 17 Area: Overlay Asssessment Rate Analysis
Development Absorption Projections Marginal Change in Assessm

Development Area / Project	Overlay Assessment Rate Land Use Category	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	Total
Oleander															
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($3,242.47)
Subtotal Oleander Marginal Change in Assessment		*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*($3,242.47)*
Sundance															
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($13,284.87)
Subtotal Sundance Marginal Change in Assessment		*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*($13,284.87)*
Subtotal City of Manteca Marginal Change in Assessment		*($3,876.32)*	*($2,083.52)*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*($182,451.99)*
City of Stockton															
Weston Ranch															
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($11,878.63)
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($9,839.23)
Commercial	Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	($20,663.39)
Subtotal City of Stockton Marginal Change in Assessment		*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*($42,381.25)*
San Joaquin County															
Future Stockton Annex															
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Multifamily	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Commercial	Commercial	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-420.03	-398.40	-	-	-	($12,999.15)
Industrial	Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	$0.00
Subtotal Future Stockton Annex Marginal Change in Asses		*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($398.40)*	*$0.00*	*$0.00*	*$0.00*	*($12,999.15)*
Future Manteca Annex															
Single-Family	Residential	-2,728.84	-	-	-	-	-	-	-	-	-	-	-	-	($49,253.39)
Subtotal Future Manteca Annex Marginal Change in Asses		*($2,728.84)*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*($49,253.39)*
Oakwood Shores															
Single-Family	Residential	-	-	-	-	-	-	-	-	-	-	-	-	-	($4,595.81)
Subtotal Oakwood Shores Marginal Change in Assessmen		*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*($4,595.81)*
Subtotal San Joaquin County Marginal Change in Assessment		*($3,148.87)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($420.03)*	*($398.40)*	*$0.00*	*$0.00*	*$0.00*	*($66,848.35)*
Total RD 17 Area: Marginal Change in Assessment		**($12,364.11)**	**($7,842.47)**	**($5,758.95)**	**($5,758.95)**	**($5,758.95)**	**($5,758.95)**	**($5,758.95)**	**($5,758.95)**	**($5,758.95)**	**($5,737.32)**	**($5,338.93)**	**($5,338.93)**	**($5,338.93)**	**($673,698.81)**

Indicates an update from the May 5, 2017 version.

Table B-3
RD 17 Area: Overlay Asssessment Rate Analysis
Marginal Change in Overlay Assessment Per Acre of Development

Overlay Assessment Land Use Category	Assessment Rate Per Developable Acre B (Table 3)	Assessment Rate Per Developed Acre C (Table 3)	Marginal Assessment Rate Change Per Acre D = C - B
Vacant Commercial	$563.53	$375.68	($187.85)
Vacant Industrial	$536.69	$357.79	($178.90)
Vacant Residential	$536.69	$357.79	($178.90)
Total	**$1,636.90**	**$1,091.26**	**($545.64)**

ATTACHMENT G:
EIFD REVENUE ANALYSIS

- RD 17 Area Finance Plan Implementation EIFD Revenue Analysis prepared by Economic & Planning Systems, Inc.

DRAFT Discussion Tables

RD 17 Area Finance Plan Implementation

EIFD Revenue Analysis

The Economics of Land Use

Prepared by:

Economic & Planning Systems, Inc. (EPS)

September 21, 2017

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Table 1
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Property Tax Summary for Fiscal Years 2017-18 through 2060-61 (Real $)

Item	Cumulative Revenue (Fiscal Years 2017-18 through 2060-61)				
	Lathrop	Manteca [1]	Stockton	Unincorporated San Joaquin County	**Total**
EIFD Revenue	**$383,064,173**	**$166,793,790**	**$105,771,135**	**$14,025,284**	**$669,654,382**
EIFD Revenue from City	$160,348,861	$66,231,381	$45,657,407	$0	$272,237,650
Percentage of Gross Property Tax Revenue	23%	24%	18%	NA	28%
EIFD Revenue from County	$222,715,312	$100,562,409	$60,113,727	$14,025,284	$397,416,732
Percentage of Gross Property Tax Revenue	23%	25%	19%	14%	28%
Net Property Tax Revenue [2]	**$5,229,497,822**	**$1,886,070,811**	**$1,481,755,300**	**$465,955,634**	**$9,063,279,567**
Property Tax Revenue to City [2]	$550,800,879	$204,183,069	$207,280,529	$0	**$962,264,478**
Property Tax Revenue to County [2]	$757,410,913	$305,207,948	$264,040,711	$85,051,947	**$1,411,711,518**

summ

Source: EPS.

[1] Represents non-redevelopment area parcels only.
[2] Estimated property tax revenue to jurisdictions are net of an assumed contribution to an EIFD.

Table 2
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
EIFD Revenue Summary for Fiscal Years 2017-18 through 2060-61 (Real $)

Fiscal Year Ending	Annual EIFD Revenue (Fiscal Years 2017-18 through 2060-61)				
	Lathrop [1]	Manteca [1]	Stockton [1]	Unincorporated San Joaquin County	**Total**
2017	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0
2019	$287,842	$103,755	$45,694	$11,393	$448,683
2020	$590,709	$201,812	$92,758	$23,128	$908,407
2021	$909,245	$315,027	$178,383	$35,215	$1,437,870
2022	$1,176,803	$411,156	$307,957	$47,664	$1,943,580
2023	$1,457,351	$544,637	$519,838	$60,487	$2,582,312
2024	$1,751,427	$706,262	$629,527	$73,695	$3,160,910
2025	$2,059,593	$892,453	$743,958	$87,299	$3,783,302
2026	$2,382,427	$1,032,591	$846,070	$101,310	$4,362,399
2027	$2,362,189	$955,966	$800,257	$95,318	$4,213,729
2028	$2,782,776	$1,066,667	$915,211	$107,560	$4,872,213
2029	$3,224,624	$1,182,684	$994,968	$120,125	$5,522,401
2030	$3,688,630	$1,304,236	$1,077,557	$133,068	$6,203,491
2031	$4,175,725	$1,481,341	$1,163,078	$146,399	$6,966,543
2032	$4,457,943	$1,609,819	$1,251,631	$160,130	$7,479,523
2033	$4,751,487	$1,759,547	$1,367,480	$174,273	$8,052,787
2034	$5,056,783	$1,912,788	$1,488,025	$188,840	$8,646,435
2035	$5,374,272	$2,018,250	$1,613,442	$203,844	$9,209,808
2036	$5,704,410	$2,211,506	$1,743,917	$219,298	$9,879,131
2037	$6,134,608	$2,468,360	$1,879,638	$234,961	$10,717,568
2038	$6,583,636	$2,741,509	$2,020,805	$251,094	$11,597,043
2039	$7,052,235	$3,022,885	$2,144,544	$267,710	$12,487,375
2040	$7,541,177	$3,317,209	$2,266,818	$284,825	$13,410,029
2041	$8,051,260	$3,625,003	$2,393,370	$302,453	$14,372,085
2042	$8,538,950	$3,946,811	$2,523,132	$320,611	$15,329,503
2043	$9,046,806	$4,283,198	$2,647,373	$339,313	$16,316,690
2044	$9,575,601	$4,634,747	$2,775,669	$358,576	$17,344,593
2045	$10,126,133	$4,943,426	$2,908,152	$378,416	$18,356,126
2046	$10,699,229	$5,221,762	$3,044,956	$398,853	$19,364,800
2047	$11,295,750	$5,510,881	$3,186,222	$419,902	$20,412,755
2048	$11,916,584	$5,811,179	$3,332,095	$441,583	$21,501,442
2049	$12,562,654	$6,115,134	$3,482,724	$463,914	$22,624,426
2050	$13,234,914	$6,363,179	$3,638,263	$486,915	$23,723,271
2051	$13,934,355	$6,569,605	$3,798,871	$510,606	$24,813,436
2052	$14,662,002	$6,782,223	$3,964,712	$535,008	$25,943,945
2053	$15,418,919	$7,001,220	$4,135,955	$560,142	$27,116,236
2054	$16,206,207	$7,226,787	$4,312,776	$586,029	$28,331,799
2055	$17,025,006	$7,459,121	$4,495,355	$612,694	$29,592,176
2056	$17,876,499	$7,698,425	$4,683,878	$640,159	$30,898,961
2057	$18,761,910	$7,944,908	$4,878,538	$668,447	$32,253,804
2058	$19,682,509	$8,198,786	$5,078,658	$697,584	$33,657,537
2059	$20,639,610	$8,460,280	$5,268,647	$727,595	$35,096,132
2060	$21,634,574	$8,729,619	$5,464,337	$758,507	$36,587,036
2061	$22,668,811	$9,007,037	$5,665,897	$790,346	$38,132,091
Total	**$383,064,173**	**$166,793,790**	**$105,771,135**	**$14,025,284**	**$669,654,382**

EIFD rev

Source: EPS.

[1] Includes both City and County EIFD revenue resulting from the tax increment of each jurisdiction.

Table 3
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Net Fiscal Impact After EIFD Contribution (Real and Current 2016 $)

Jurisdiction / Item	Formula	2020	2025	2030	2040	2050	Buildout (2060)
EIFD Allocation [1]		*34%*	*34%*	*28%*	*28%*	*28%*	*28%*
Lathrop							
EIFD Allocation							
Estimated EIFD Allocation (Real $)	*a*	$230,685	$827,986	$1,523,850	$3,153,511	$5,555,910	$9,100,226
Discount Factor	*b*	1.13	1.30	1.51	2.03	2.73	3.67
Estimated EIFD Allocation (Current 2016$)	*c = a / b*	$204,960	$634,582	$1,007,445	$1,551,318	$2,033,713	$2,478,645
Net Fiscal Impact							
Net Fiscal Surplus/(Deficit) (2016$)	*d*	($119,000)	($367,000)	$333,000	$1,499,000	$591,000	($316,000)
Net Fiscal Surplus/(Deficit) (after EIFD Contribution) [2]	***e = d - c***	**($323,960)**	**($1,001,582)**	**($674,445)**	**($52,318)**	**($1,442,713)**	**($2,794,645)**
Manteca							
EIFD Allocation							
Estimated EIFD Allocation (Real $)	*f*	$68,851	$356,260	$529,964	$1,330,002	$2,512,161	$3,450,877
Discount Factor	*g*	1.13	1.30	1.51	2.03	2.73	3.67
Estimated EIFD Allocation (Current 2016$)	*h = f / g*	$61,173	$273,044	$350,369	$654,273	$919,564	$939,921
Net Fiscal Impact							
Net Fiscal Surplus/(Deficit) (2016$)	*i*	($91,000)	($254,000)	$153,000	$1,209,000	$1,114,000	$1,114,000
Net Fiscal Surplus/(Deficit) (after EIFD Contribution) [2]	***j - i - h***	**($152,173)**	**($527,044)**	**($197,369)**	**$554,727**	**$194,436**	**$174,079**
Stockton							
EIFD Allocation							
Estimated EIFD Allocation (Real $)	*k*	$41,822	$335,429	$480,244	$989,458	$1,562,911	$2,323,606
Discount Factor	*l*	1.13	1.30	1.51	2.03	2.73	3.67
Estimated EIFD Allocation (Current 2016$)	*m = k / l*	$37,158	$257,078	$317,498	$486,748	$572,095	$632,885
Net Fiscal Impact							
Net Fiscal Surplus/(Deficit) (2016$)	*n*	($7,000)	$580,000	$984,000	$1,932,000	$2,517,000	$2,889,000
Net Fiscal Surplus/(Deficit) (after EIFD Contribution) [2]	***o - n - m***	**($44,158)**	**$322,922**	**$666,502**	**$1,445,252**	**$1,944,905**	**$2,256,115**
San Joaquin County							
EIFD Allocation							
Estimated EIFD Allocation (Real $)	*p*	$567,049	$2,263,627	$3,669,433	$7,937,059	$14,092,288	$21,712,327
Discount Factor	*q*	1.13	1.30	1.51	2.03	2.73	3.67
Estimated EIFD Allocation (Current 2016$)	*r = p / q*	$503,816	$1,734,882	$2,425,927	$3,904,507	$5,158,410	$5,913,825
Net Fiscal Impact							
Net Fiscal Surplus/(Deficit) (2016$)	*s*	$1,124,000	$3,313,000	$7,176,000	$11,520,000	$13,944,000	$15,452,000
Net Fiscal Surplus/(Deficit) (after EIFD Contribution) [2]	***t = s - r***	**$620,184**	**$1,578,118**	**$4,750,073**	**$7,615,493**	**$8,785,590**	**$9,538,175**

fiscal

Source: EPS.

[1] Assumed percentage of tax increment allocated to EIFD.

[2] The EIFD contribution is estimated based on the incremental growth of existing and new development, while the fiscal impact analysis evaluates the incremental impacts from new development only. Thus, netting out the EIFD contribution from the net fiscal impacts to each jurisdiction overestimates the reduction in property tax revenues related to new development. However, for Lathrop and Manteca and the County, the EIFD contribution predominantly comprises revenue from the incremental growth of new development; in Stockton, about 50 percent of the EIFD contribution comprises revenue from the incremental growth of new development. This table is intended to illustrate general impacts. Further analyses will be required to determine the exact net fiscal impacts less the EIFD contribution related to new development only.

Table 4
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Analysis Assumptions

Item	Jurisdiction						
	Lathrop		Manteca		Stockton		Unincorporated
	Existing City	Annexation Areas	Existing City	Annexation Areas	Existing City	Annexation Areas	San Joaquin County
Tax Increment [1]							
City General Fund Allocation [2]	13.20%	5.14%	14.33%	6.63%	16.83%	7.23%	NA
Initial Percentage Of City Tax Increment to EIFD	34.00%	34.00%	34.00%	34.00%	34.00%	34.00%	NA
Percentage of City Tax Increment to EIFD beginning FY ending 2026	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	NA
County General Fund Allocation [2]	17.65%	20.55%	19.81%	26.51%	20.50%	28.93%	21.26%
Initial Percentage Of County Tax Increment to EIFD	34.00%	34.00%	34.00%	34.00%	34.00%	34.00%	34.00%
Percentage of County Tax Increment to EIFD beginning FY ending 2026	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%	28.00%
Assessed Value per Dwelling Unit (2016$)							
Owner-Occupied Residential							
Low Density Residential	$450,000	$450,000	$450,000	$450,000	$325,000	$325,000	NA
Medium Density Residential	$425,000	$425,000	NA	NA	NA	NA	NA
Variable Density Residential	$425,000	$425,000	NA	NA	NA	NA	NA
Renter Occupied Residential							
Variable Density Residential Flex	$180,000	$180,000	N/A	N/A	N/A	N/A	NA
High Density Residential	$180,000	$180,000	$180,000	$180,000	$180,000	$180,000	NA
Residential/Mixed Use	$180,000	$180,000	N/A	N/A	N/A	N/A	NA
Assessed Value per Nonresidential Building Sq. Ft. (2016$)							
Retail	$200	$200	$200	$200	200	200	NA
Service Commercial	$200	$200	NA	NA	NA	NA	NA
Office	$150	$150	NA	NA	NA	NA	NA
Industrial	$85	$85	$85	$85	NA	NA	NA
Light Industrial/R&D Flex	$85	$85	NA	NA	NA	NA	NA
AV Annual Growth							
Existing AV Growth [3]	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
New Development Annual Sales Price Increase	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	0.00%

assumps

Source: The Gregory Group; San Joaquin County; Costar; Colliers, International; CBRE; San Joaquin County Auditor-Controller; LWA; EPS.

[1] This Analysis assumed an EIFD will be formed in fiscal year 2018-19.
[2] Refer to Table E-2 for details pertaining to property tax allocations for existing City and unincorporated areas.
Refer to Table E-4, Table E-5, and Table E-3 for additional details pertaining to the calculation of property tax allocations for annexation areas.
[3] Assumes 2 percent annual growth plus an additional 1 percent to account for annual turnover)

Table 5
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue Summary - Lathrop (Real $)

Lathrop

Fiscal Year Ending	Net City Property Tax Revenue [1]			Net County Property Tax Revenue [1]			EIFD Revenue		
	Existing City Boundaries	Annexation Areas	Total	Existing City Boundaries	Annexation Areas	Total	City EIFD Revenue	County EIFD Revenue	Total
	Table 6	*Table 7*		*Table 6*	*Table 7*				
2017	$3,047,137	$0	$3,047,137	$4,074,625	$0	$4,074,625	$0	$0	$0
2018	$3,138,551	$0	$3,138,551	$4,196,864	$0	$4,196,864	$0	$0	$0
2019	$3,338,590	$18,244	$3,356,834	$4,464,356	$72,976	$4,537,332	$112,449	$175,393	$287,842
2020	$3,548,767	$37,583	$3,586,350	$4,745,405	$150,331	$4,895,736	$230,685	$360,025	$590,709
2021	$3,769,511	$58,065	$3,827,576	$5,040,583	$232,261	$5,272,844	$354,953	$554,293	$909,245
2022	$3,975,597	$65,608	$4,041,205	$5,316,161	$262,431	$5,578,592	$465,004	$711,799	$1,176,803
2023	$4,191,616	$73,550	$4,265,167	$5,605,021	$294,201	$5,899,223	$580,378	$876,973	$1,457,351
2024	$4,417,979	$81,911	$4,499,889	$5,907,713	$327,642	$6,235,355	$701,296	$1,050,132	$1,751,427
2025	$4,655,111	$90,706	$4,745,817	$6,224,805	$362,825	$6,587,630	$827,986	$1,231,607	$2,059,593
2026	$4,903,455	$99,956	$5,003,411	$6,556,891	$399,823	$6,956,714	$960,686	$1,421,741	$2,382,427
2027	$5,497,199	$112,314	$5,609,513	$7,350,845	$449,256	$7,800,101	$960,930	$1,401,259	$2,362,189
2028	$5,952,729	$115,683	$6,068,412	$7,959,978	$462,734	$8,422,712	$1,139,391	$1,643,385	$2,782,776
2029	$6,431,434	$119,154	$6,550,588	$8,600,101	$476,616	$9,076,717	$1,326,903	$1,897,720	$3,224,624
2030	$6,934,294	$122,729	$7,057,023	$9,272,525	$490,914	$9,763,439	$1,523,850	$2,164,779	$3,688,630
2031	$7,462,329	$126,410	$7,588,739	$9,978,612	$505,642	$10,484,254	$1,730,629	$2,445,096	$4,175,725
2032	$7,764,717	$130,203	$7,894,920	$10,382,965	$520,811	$10,903,776	$1,849,699	$2,608,244	$4,457,943
2033	$8,079,323	$134,109	$8,213,432	$10,803,656	$536,435	$11,340,091	$1,973,565	$2,777,922	$4,751,487
2034	$8,406,609	$138,132	$8,544,741	$11,241,301	$552,528	$11,793,830	$2,102,407	$2,954,375	$5,056,783
2035	$8,747,051	$142,276	$8,889,327	$11,696,539	$569,104	$12,265,644	$2,236,413	$3,137,859	$5,374,272
2036	$9,101,144	$146,544	$9,247,688	$12,170,033	$586,177	$12,756,210	$2,375,776	$3,328,635	$5,704,410
2037	$9,565,051	$150,941	$9,715,991	$12,790,368	$603,763	$13,394,130	$2,557,894	$3,576,715	$6,134,608
2038	$10,049,392	$155,469	$10,204,861	$13,438,028	$621,876	$14,059,903	$2,748,009	$3,835,626	$6,583,636
2039	$10,554,976	$160,133	$10,715,109	$14,114,094	$640,532	$14,754,625	$2,946,439	$4,105,796	$7,052,235
2040	$11,082,641	$164,937	$11,247,578	$14,819,687	$659,748	$15,479,434	$3,153,511	$4,387,666	$7,541,177
2041	$11,633,258	$169,885	$11,803,143	$15,555,970	$679,540	$16,235,511	$3,369,564	$4,681,696	$8,051,260
2042	$12,155,276	$176,685	$12,331,961	$16,254,012	$706,741	$16,960,753	$3,575,215	$4,963,734	$8,538,950
2043	$12,698,936	$183,740	$12,882,676	$16,980,993	$734,962	$17,715,955	$3,789,382	$5,257,424	$9,046,806
2044	$13,265,066	$191,060	$13,456,127	$17,738,022	$764,240	$18,502,262	$4,012,391	$5,563,210	$9,575,601
2045	$13,854,527	$198,653	$14,053,180	$18,526,247	$794,614	$19,320,861	$4,244,578	$5,881,554	$10,126,133
2046	$14,468,207	$206,530	$14,674,738	$19,346,859	$826,122	$20,172,981	$4,486,295	$6,212,935	$10,699,229
2047	$15,107,030	$214,701	$15,321,732	$20,201,092	$858,805	$21,059,898	$4,737,904	$6,557,846	$11,295,750
2048	$15,771,952	$223,177	$15,995,129	$21,090,225	$892,706	$21,982,931	$4,999,780	$6,916,804	$11,916,584
2049	$16,463,964	$231,967	$16,695,931	$22,015,582	$927,869	$22,943,450	$5,272,315	$7,290,339	$12,562,654
2050	$17,184,093	$241,084	$17,425,177	$22,978,537	$964,337	$23,942,874	$5,555,910	$7,679,004	$13,234,914
2051	$17,933,403	$250,540	$18,183,942	$23,980,512	$1,002,158	$24,982,671	$5,850,986	$8,083,369	$13,934,355
2052	$18,712,997	$260,345	$18,973,342	$25,022,983	$1,041,381	$26,064,365	$6,157,974	$8,504,028	$14,662,002
2053	$19,524,017	$270,514	$19,794,531	$26,107,478	$1,082,055	$27,189,533	$6,477,325	$8,941,594	$15,418,919
2054	$20,367,647	$281,058	$20,648,705	$27,235,579	$1,124,233	$28,359,812	$6,809,505	$9,396,702	$16,206,207
2055	$21,245,115	$291,992	$21,537,107	$28,408,927	$1,167,967	$29,576,894	$7,154,994	$9,870,012	$17,025,006
2056	$22,157,691	$303,328	$22,461,019	$29,629,222	$1,213,314	$30,842,535	$7,514,293	$10,362,206	$17,876,499
2057	$23,106,691	$315,082	$23,421,774	$30,898,224	$1,260,330	$32,158,553	$7,887,920	$10,873,990	$18,761,910
2058	$24,093,481	$327,269	$24,420,750	$32,217,757	$1,309,075	$33,526,832	$8,276,411	$11,406,099	$19,682,509
2059	$25,119,473	$339,903	$25,459,376	$33,589,711	$1,359,610	$34,949,322	$8,680,321	$11,959,289	$20,639,610
2060	$26,186,131	$353,000	$26,539,131	$35,016,045	$1,412,000	$36,428,045	$9,100,226	$12,534,348	$21,634,574
2061	$27,294,972	$366,577	$27,661,550	$36,498,785	$1,466,309	$37,965,094	$9,536,722	$13,132,089	$22,668,811
TOTAL	**$542,959,131**	**$7,841,749**	**$550,800,879**	**$726,043,918**	**$31,366,995**	**$757,410,913**	**$160,348,861**	**$222,715,312**	**$383,064,173**

proj lath

Source: EPS.

[1] Includes property tax revenue from parcels within the RD 17 boundary only.

Table 6
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue - Lathrop Existing City Boundaries (Real $)

Lathrop
Existing City

Fiscal Year Ending	Beginning Assessed Value [1]	Gross Property Tax Revenue	Net City and County Property Tax Revenue						
			City	City EIFD Amount [2]	**Net City**	County	County EIFD Amount [2]	**Net County**	**Total EIFD**
Formula	*a*	*b=a*1.0%*	*c=b*13.20%*	*d*	*e=c-d*	*f=b*17.65%*	*g*	*h=f-g*	*i=d+g*
2017	$2,308,244,724	$23,082,447	$3,047,137	$0	**$3,047,137**	$4,074,625	$0	**$4,074,625**	**$0**
2018	$2,377,492,066	$23,774,921	$3,138,551	$0	**$3,138,551**	$4,196,864	$0	**$4,196,864**	**$0**
2019	$2,607,086,558	$26,070,866	$3,441,641	$103,051	**$3,338,590**	$4,602,155	$137,799	**$4,464,356**	**$240,850**
2020	$2,848,316,976	$28,483,170	$3,760,091	$211,324	**$3,548,767**	$5,027,987	$282,582	**$4,745,405**	**$493,906**
2021	$3,101,674,842	$31,016,748	$4,094,552	$325,040	**$3,769,511**	$5,475,226	$434,643	**$5,040,583**	**$759,684**
2022	$3,338,209,332	$33,382,093	$4,406,803	$431,206	**$3,975,597**	$5,892,769	$576,608	**$5,316,161**	**$1,007,813**
2023	$3,586,144,384	$35,861,444	$4,734,105	$542,488	**$4,191,616**	$6,330,436	$725,414	**$5,605,021**	**$1,267,903**
2024	$3,845,951,151	$38,459,512	$5,077,078	$659,099	**$4,417,979**	$6,789,059	$881,346	**$5,907,713**	**$1,540,446**
2025	$4,118,118,794	$41,181,188	$5,436,369	$781,258	**$4,655,111**	$7,269,503	$1,044,697	**$6,224,805**	**$1,825,955**
2026	$4,403,155,139	$44,031,551	$5,812,648	$909,193	**$4,903,455**	$7,772,662	$1,215,771	**$6,556,891**	**$2,124,965**
2027	$4,859,028,672	$48,590,287	$6,414,452	$917,252	**$5,497,199**	$8,577,393	$1,226,548	**$7,350,845**	**$2,143,800**
2028	$5,338,291,776	$53,382,918	$7,047,132	$1,094,403	**$5,952,729**	$9,423,411	$1,463,433	**$7,959,978**	**$2,557,836**
2029	$5,841,937,541	$58,419,375	$7,711,999	$1,280,566	**$6,431,434**	$10,312,471	$1,712,370	**$8,600,101**	**$2,992,936**
2030	$6,370,997,589	$63,709,976	$8,410,417	$1,476,122	**$6,934,294**	$11,246,393	$1,973,868	**$9,272,525**	**$3,449,991**
2031	$6,926,543,497	$69,265,435	$9,143,798	$1,681,469	**$7,462,329**	$12,227,070	$2,248,458	**$9,978,612**	**$3,929,927**
2032	$7,244,686,373	$72,446,864	$9,563,782	$1,799,065	**$7,764,717**	$12,788,671	$2,405,706	**$10,382,965**	**$4,204,771**
2033	$7,575,683,932	$75,756,839	$10,000,735	$1,921,412	**$8,079,323**	$13,372,964	$2,569,308	**$10,803,656**	**$4,490,720**
2034	$7,920,021,127	$79,200,211	$10,455,298	$2,048,689	**$8,406,609**	$13,980,804	$2,739,503	**$11,241,301**	**$4,788,193**
2035	$8,278,200,438	$82,782,004	$10,928,134	$2,181,083	**$8,747,051**	$14,613,080	$2,916,540	**$11,696,539**	**$5,097,624**
2036	$8,650,742,489	$86,507,425	$11,419,930	$2,318,786	**$9,101,144**	$15,270,709	$3,100,677	**$12,170,033**	**$5,419,463**
2037	$9,138,819,265	$91,388,193	$12,064,245	$2,499,194	**$9,565,051**	$16,132,286	$3,341,918	**$12,790,368**	**$5,841,113**
2038	$9,648,394,979	$96,483,950	$12,736,941	$2,687,549	**$10,049,392**	$17,031,814	$3,593,786	**$13,438,028**	**$6,281,335**
2039	$10,180,320,299	$101,803,203	$13,439,141	$2,884,165	**$10,554,976**	$17,970,794	$3,856,700	**$14,114,094**	**$6,740,866**
2040	$10,735,477,582	$107,354,776	$14,172,010	$3,089,369	**$11,082,641**	$18,950,784	$4,131,098	**$14,819,687**	**$7,220,466**
2041	$11,314,782,014	$113,147,820	$14,936,755	$3,303,497	**$11,633,258**	$19,973,401	$4,417,430	**$15,555,970**	**$7,720,928**
2042	$11,863,997,559	$118,639,976	$15,661,780	$3,506,504	**$12,155,276**	$20,942,903	$4,688,891	**$16,254,012**	**$8,195,395**
2043	$12,435,982,733	$124,359,827	$16,416,863	$3,717,928	**$12,698,936**	$21,952,598	$4,971,606	**$16,980,993**	**$8,689,533**
2044	$13,031,609,420	$130,316,094	$17,203,156	$3,938,089	**$13,265,066**	$23,004,027	$5,266,006	**$17,738,022**	**$9,204,095**
2045	$13,651,781,324	$136,517,813	$18,021,851	$4,167,324	**$13,854,527**	$24,098,785	$5,572,538	**$18,526,247**	**$9,739,862**
2046	$14,297,435,093	$142,974,351	$18,874,185	$4,405,978	**$14,468,207**	$25,238,524	$5,891,665	**$19,346,859**	**$10,297,642**
2047	$14,969,541,485	$149,695,415	$19,761,439	$4,654,409	**$15,107,030**	$26,424,959	$6,223,867	**$20,201,092**	**$10,878,275**
2048	$15,669,106,570	$156,691,066	$20,684,942	$4,912,990	**$15,771,952**	$27,659,865	$6,569,640	**$21,090,225**	**$11,482,630**
2049	$16,397,172,972	$163,971,730	$21,646,070	$5,182,105	**$16,463,964**	$28,945,083	$6,929,501	**$22,015,582**	**$12,111,607**
2050	$17,154,821,162	$171,548,212	$22,646,248	$5,462,155	**$17,184,093**	$30,282,520	$7,303,984	**$22,978,537**	**$12,766,139**
2051	$17,943,170,788	$179,431,708	$23,686,956	$5,753,554	**$17,933,403**	$31,674,153	$7,693,641	**$23,980,512**	**$13,447,195**
2052	$18,763,382,052	$187,633,821	$24,769,725	$6,056,729	**$18,712,997**	$33,122,030	$8,099,046	**$25,022,983**	**$14,155,775**
2053	$19,616,657,138	$196,166,571	$25,896,142	$6,372,126	**$19,524,017**	$34,628,272	$8,520,794	**$26,107,478**	**$14,892,920**
2054	$20,504,241,686	$205,042,417	$27,067,851	$6,700,204	**$20,367,647**	$36,195,079	$8,959,500	**$27,235,579**	**$15,659,705**
2055	$21,427,426,316	$214,274,263	$28,286,557	$7,041,442	**$21,245,115**	$37,824,730	$9,415,802	**$28,408,927**	**$16,457,244**
2056	$22,387,548,205	$223,875,482	$29,554,023	$7,396,332	**$22,157,691**	$39,519,583	$9,890,361	**$29,629,222**	**$17,286,694**
2057	$23,385,992,725	$233,859,927	$30,872,079	$7,765,388	**$23,106,691**	$41,282,086	$10,383,862	**$30,898,224**	**$18,149,250**
2058	$24,424,195,122	$244,241,951	$32,242,621	$8,149,140	**$24,093,481**	$43,114,771	$10,897,014	**$32,217,757**	**$19,046,153**
2059	$25,503,642,269	$255,036,423	$33,667,609	$8,548,136	**$25,119,473**	$45,020,263	$11,430,552	**$33,589,711**	**$19,978,688**
2060	$26,625,874,470	$266,258,745	$35,149,079	$8,962,948	**$26,186,131**	$47,001,282	$11,985,237	**$35,016,045**	**$20,948,185**
2061	$27,792,487,324	$277,924,873	$36,689,136	$9,394,164	**$27,294,972**	$49,060,643	$12,561,858	**$36,498,785**	**$21,956,022**

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Source: San Joaquin County; City of Lathrop; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.
[2] Refer to Table A-2 for details.

Table 7
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue - Lathrop Annexation Area (Real $)

Lathrop Annexation Area

Fiscal Year Ending	Beginning Assessed Value [1]	Gross Property Tax Revenue	Net City and County Property Tax Revenue						
			City	City EIFD Amount [2]	Net City	County	County EIFD Amount [2]	Net County	Total EIFD
Formula	*a*	*b=a*1.0%*	*c=b*5.14%*	*d*	*e=c-d*	*f=b*20.55%*	*g*	*h=f-g*	*d+g*
2017	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2018	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2019	$53,805,455	$538,055	$27,642	$9,398	**$18,244**	$110,570	$37,594	**$72,976**	**$46,992**
2020	$110,839,238	$1,108,392	$56,943	$19,361	**$37,583**	$227,774	$77,443	**$150,331**	**$96,804**
2021	$171,246,622	$1,712,466	$87,978	$29,912	**$58,065**	$351,911	$119,650	**$232,261**	**$149,562**
2022	$193,490,790	$1,934,908	$99,406	$33,798	**$65,608**	$397,622	$135,192	**$262,431**	**$168,989**
2023	$216,915,486	$2,169,155	$111,440	$37,890	**$73,550**	$445,760	$151,558	**$294,201**	**$189,448**
2024	$241,571,521	$2,415,715	$124,107	$42,196	**$81,911**	$496,428	$168,785	**$327,642**	**$210,982**
2025	$267,511,696	$2,675,117	$137,434	$46,727	**$90,706**	$549,735	$186,910	**$362,825**	**$233,637**
2026	$294,790,866	$2,947,909	$151,448	$51,492	**$99,956**	$605,793	$205,970	**$399,823**	**$257,462**
2027	$303,634,592	$3,036,346	$155,992	$43,678	**$112,314**	$623,967	$174,711	**$449,256**	**$218,388**
2028	$312,743,629	$3,127,436	$160,671	$44,988	**$115,683**	$642,686	$179,952	**$462,734**	**$224,940**
2029	$322,125,938	$3,221,259	$165,492	$46,338	**$119,154**	$661,966	$185,351	**$476,616**	**$231,688**
2030	$331,789,716	$3,317,897	$170,456	$47,728	**$122,729**	$681,825	$190,911	**$490,914**	**$238,639**
2031	$341,743,408	$3,417,434	$175,570	$49,160	**$126,410**	$702,280	$196,638	**$505,642**	**$245,798**
2032	$351,995,710	$3,519,957	$180,837	$50,634	**$130,203**	$723,349	$202,538	**$520,811**	**$253,172**
2033	$362,555,581	$3,625,556	$186,262	$52,153	**$134,109**	$745,049	$208,614	**$536,435**	**$260,767**
2034	$373,432,249	$3,734,322	$191,850	$53,718	**$138,132**	$767,401	$214,872	**$552,528**	**$268,590**
2035	$384,635,216	$3,846,352	$197,606	$55,330	**$142,276**	$790,423	$221,318	**$569,104**	**$276,648**
2036	$396,174,273	$3,961,743	$203,534	$56,989	**$146,544**	$814,135	$227,958	**$586,177**	**$284,947**
2037	$408,059,501	$4,080,595	$209,640	$58,699	**$150,941**	$838,559	$234,797	**$603,763**	**$293,496**
2038	$420,301,286	$4,203,013	$215,929	$60,460	**$155,469**	$863,716	$241,840	**$621,876**	**$302,301**
2039	$432,910,325	$4,329,103	$222,407	$62,274	**$160,133**	$889,628	$249,096	**$640,532**	**$311,370**
2040	$445,897,634	$4,458,976	$229,079	$64,142	**$164,937**	$916,316	$256,569	**$659,748**	**$320,711**
2041	$459,274,563	$4,592,746	$235,951	$66,066	**$169,885**	$943,806	$264,266	**$679,540**	**$330,332**
2042	$477,658,423	$4,776,584	$245,396	$68,711	**$176,685**	$981,585	$274,844	**$706,741**	**$343,555**
2043	$496,731,967	$4,967,320	$255,195	$71,455	**$183,740**	$1,020,781	$285,819	**$734,962**	**$357,273**
2044	$516,520,032	$5,165,200	$265,361	$74,301	**$191,060**	$1,061,445	$297,205	**$764,240**	**$371,506**
2045	$537,048,321	$5,370,483	$275,908	$77,254	**$198,653**	$1,103,630	$309,016	**$794,614**	**$386,271**
2046	$558,343,440	$5,583,434	$286,848	$80,317	**$206,530**	$1,147,392	$321,270	**$826,122**	**$401,587**
2047	$580,432,922	$5,804,329	$298,196	$83,495	**$214,701**	$1,192,785	$333,980	**$858,805**	**$417,475**
2048	$603,345,264	$6,033,453	$309,968	$86,791	**$223,177**	$1,239,870	$347,164	**$892,706**	**$433,955**
2049	$627,109,957	$6,271,100	$322,177	$90,209	**$231,967**	$1,288,706	$360,838	**$927,869**	**$451,047**
2050	$651,757,521	$6,517,575	$334,839	$93,755	**$241,084**	$1,339,357	$375,020	**$964,337**	**$468,775**
2051	$677,319,540	$6,773,195	$347,972	$97,432	**$250,540**	$1,391,887	$389,728	**$1,002,158**	**$487,160**
2052	$703,828,698	$7,038,287	$361,591	$101,245	**$260,345**	$1,446,363	$404,982	**$1,041,381**	**$506,227**
2053	$731,318,818	$7,313,188	$375,714	$105,200	**$270,514**	$1,502,855	$420,799	**$1,082,055**	**$525,999**
2054	$759,824,899	$7,598,249	$390,359	$109,300	**$281,058**	$1,561,435	$437,202	**$1,124,233**	**$546,502**
2055	$789,383,159	$7,893,832	$405,544	$113,552	**$291,992**	$1,622,177	$454,209	**$1,167,967**	**$567,762**
2056	$820,031,071	$8,200,311	$421,289	$117,961	**$303,328**	$1,685,158	$471,844	**$1,213,314**	**$589,805**
2057	$851,807,413	$8,518,074	$437,614	$122,532	**$315,082**	$1,750,458	$490,128	**$1,260,330**	**$612,660**
2058	$884,752,308	$8,847,523	$454,540	$127,271	**$327,269**	$1,818,159	$509,085	**$1,309,075**	**$636,356**
2059	$918,907,270	$9,189,073	$472,087	$132,184	**$339,903**	$1,888,348	$528,737	**$1,359,610**	**$660,922**
2060	$954,315,253	$9,543,153	$490,278	$137,278	**$353,000**	$1,961,111	$549,111	**$1,412,000**	**$686,389**
2061	$991,020,698	$9,910,207	$509,135	$142,558	**$366,577**	$2,036,540	$570,231	**$1,466,309**	**$712,789**

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Source: San Joaquin County; City of Lathrop; LWA; EPS.

[1] Prior to annexation of the annexation area to the City, the City receives no property tax revenue for these TRAs.
[2] Refer to Table A-3 for details.

Table 8
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue Summary - Manteca (Real $)

Manteca

Fiscal Year Ending	Net City Property Tax Revenue [1]			Net County Property Tax Revenue [1]			EIFD Revenue		
	Existing City Boundaries	Annexation Areas	Total	Existing City Boundaries	Annexation Areas	Total	City EIFD Revenue	County EIFD Revenue	Total
	Table 9	*Table 10*		*Table 9*	*Table 10*				
2017	$753,559	$0	$753,559	$1,041,446	$0	$1,041,446	$0	$0	$0
2018	$776,165	$0	$776,165	$1,072,689	$0	$1,072,689	$0	$0	$0
2019	$827,661	$15,749	$843,409	$1,143,858	$62,994	$1,206,852	$34,641	$69,114	$103,755
2020	$881,785	$28,032	$909,817	$1,218,659	$112,130	$1,330,789	$68,851	$132,961	$201,812
2021	$972,281	$28,873	$1,001,155	$1,343,729	$115,494	$1,459,223	$115,904	$199,123	$315,027
2022	$1,048,801	$29,740	$1,078,541	$1,449,482	$118,958	$1,568,441	$155,769	$255,387	$411,156
2023	$1,155,705	$30,632	$1,186,337	$1,597,227	$122,527	$1,719,754	$211,300	$333,337	$544,637
2024	$1,285,488	$31,551	$1,317,038	$1,776,592	$126,203	$1,902,795	$278,632	$427,630	$706,262
2025	$1,435,232	$32,497	$1,467,729	$1,983,544	$129,989	$2,113,533	$356,260	$536,192	$892,453
2026	$1,547,388	$33,472	$1,580,860	$2,138,548	$133,889	$2,272,436	$414,540	$618,052	$1,032,591
2027	$1,729,192	$37,611	$1,766,803	$2,389,808	$150,442	$2,540,250	$385,248	$570,718	$955,966
2028	$1,846,326	$38,739	$1,885,065	$2,551,692	$154,955	$2,706,647	$431,239	$635,428	$1,066,667
2029	$1,969,128	$39,901	$2,009,029	$2,721,408	$159,604	$2,881,012	$479,447	$703,237	$1,182,684
2030	$2,097,832	$41,098	$2,138,930	$2,899,282	$164,392	$3,063,674	$529,964	$774,272	$1,304,236
2031	$2,286,431	$42,331	$2,328,762	$3,159,932	$169,324	$3,329,256	$603,787	$877,554	$1,481,341
2032	$2,422,458	$43,601	$2,466,059	$3,347,927	$174,404	$3,522,331	$657,181	$952,638	$1,609,819
2033	$2,581,344	$44,909	$2,626,253	$3,567,514	$179,636	$3,747,150	$719,479	$1,040,068	$1,759,547
2034	$2,743,942	$46,256	$2,790,198	$3,792,230	$185,025	$3,977,255	$783,235	$1,129,553	$1,912,788
2035	$2,854,876	$47,644	$2,902,520	$3,945,545	$190,576	$4,136,120	$826,916	$1,191,334	$2,018,250
2036	$3,024,435	$66,253	$3,090,688	$4,179,881	$265,014	$4,444,895	$900,092	$1,311,413	$2,211,506
2037	$3,261,477	$85,421	$3,346,898	$4,507,483	$341,685	$4,849,168	$999,730	$1,468,631	$2,468,360
2038	$3,514,902	$105,164	$3,620,066	$4,857,725	$420,657	$5,278,382	$1,105,962	$1,635,547	$2,741,509
2039	$3,775,966	$125,499	$3,901,465	$5,218,525	$501,997	$5,720,523	$1,215,394	$1,807,491	$3,022,885
2040	$4,049,726	$146,445	$4,196,170	$5,596,872	$585,778	$6,182,650	$1,330,002	$1,987,207	$3,317,209
2041	$4,336,708	$168,018	$4,504,726	$5,993,492	$672,073	$6,665,565	$1,449,996	$2,175,007	$3,625,003
2042	$4,637,461	$190,239	$4,827,700	$6,409,143	$760,956	$7,170,099	$1,575,597	$2,371,215	$3,946,811
2043	$4,952,551	$213,126	$5,165,677	$6,844,609	$852,505	$7,697,115	$1,707,032	$2,576,165	$4,283,198
2044	$5,282,568	$236,700	$5,519,268	$7,300,706	$946,801	$8,247,507	$1,844,540	$2,790,207	$4,634,747
2045	$5,564,822	$260,982	$5,825,804	$7,690,791	$1,043,926	$8,734,717	$1,963,748	$2,979,678	$4,943,426
2046	$5,812,792	$285,991	$6,098,783	$8,033,494	$1,143,965	$9,177,459	$2,069,907	$3,151,855	$5,221,762
2047	$6,070,827	$311,751	$6,382,578	$8,390,108	$1,247,005	$9,637,113	$2,180,272	$3,330,609	$5,510,881
2048	$6,339,308	$338,284	$6,677,592	$8,761,159	$1,353,136	$10,114,295	$2,294,999	$3,516,180	$5,811,179
2049	$6,618,630	$361,532	$6,980,162	$9,147,193	$1,446,130	$10,593,322	$2,412,665	$3,702,468	$6,115,134
2050	$6,863,630	$372,378	$7,236,008	$9,485,792	$1,489,514	$10,975,306	$2,512,161	$3,851,018	$6,363,179
2051	$7,063,019	$383,550	$7,446,569	$9,761,355	$1,534,199	$11,295,554	$2,594,046	$3,975,559	$6,569,605
2052	$7,268,390	$395,056	$7,663,446	$10,045,185	$1,580,225	$11,625,410	$2,678,387	$4,103,836	$6,782,223
2053	$7,479,922	$406,908	$7,886,830	$10,337,530	$1,627,632	$11,965,162	$2,765,258	$4,235,962	$7,001,220
2054	$7,697,800	$419,115	$8,116,915	$10,638,646	$1,676,461	$12,315,106	$2,854,736	$4,372,051	$7,226,787
2055	$7,922,214	$431,689	$8,353,903	$10,948,794	$1,726,755	$12,675,549	$2,946,898	$4,512,223	$7,459,121
2056	$8,153,361	$444,639	$8,598,000	$11,268,248	$1,778,557	$13,046,805	$3,041,825	$4,656,601	$7,698,425
2057	$8,391,442	$457,979	$8,849,420	$11,597,284	$1,831,914	$13,429,199	$3,139,599	$4,805,309	$7,944,908
2058	$8,636,665	$471,718	$9,108,383	$11,936,192	$1,886,872	$13,823,064	$3,240,307	$4,958,479	$8,198,786
2059	$8,889,245	$485,869	$9,375,115	$12,285,267	$1,943,478	$14,228,745	$3,344,036	$5,116,244	$8,460,280
2060	$9,149,403	$500,446	$9,649,848	$12,644,815	$2,001,782	$14,646,597	$3,450,877	$5,278,742	$8,729,619
2061	$9,417,365	$515,459	$9,932,824	$13,015,149	$2,061,836	$15,076,984	$3,560,923	$5,446,115	$9,007,037
TOTAL	**$195,390,220**	**$8,792,849**	**$204,183,069**	**$270,036,552**	**$35,171,396**	**$305,207,948**	**$66,231,381**	**$100,562,409**	**$166,793,790**

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Source: EPS.

[1] Includes property tax revenue from parcels within the RD 17 boundary only.

Table 9
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue - Manteca Existing City Boundaries (Real $)

Manteca
Existing City

Fiscal Year Ending	Beginning Assessed Value [1]	Gross Property Tax Revenue	Net City and County Property Tax Revenue						
			City	City EIFD Amount [2]	Net City	County	County EIFD Amount [2]	Net County	Total EIFD
Formula	*a*	*b=a*1.0%*	*c=b*14.33%*	*d*	*e=c-d*	*f=b*19.81%*	*g*	*h=f-g*	*d+g*
2017	$525,776,893	$5,257,769	$753,559	$0	**$753,559**	$1,041,446	$0	**$1,041,446**	**$0**
2018	$541,550,200	$5,415,502	$776,165	$0	**$776,165**	$1,072,689	$0	**$1,072,689**	**$0**
2019	$595,989,106	$5,959,891	$854,189	$26,528	**$827,661**	$1,180,521	$36,663	**$1,143,858**	**$63,191**
2020	$653,206,951	$6,532,070	$936,195	$54,410	**$881,785**	$1,293,856	$75,197	**$1,218,659**	**$129,607**
2021	$748,876,300	$7,488,763	$1,073,311	$101,030	**$972,281**	$1,483,356	$139,627	**$1,343,729**	**$240,656**
2022	$829,770,002	$8,297,700	$1,189,250	$140,449	**$1,048,801**	$1,643,588	$194,106	**$1,449,482**	**$334,554**
2023	$942,784,162	$9,427,842	$1,351,225	$195,520	**$1,155,705**	$1,867,444	$270,216	**$1,597,227**	**$465,737**
2024	$1,079,985,316	$10,799,853	$1,547,866	$262,378	**$1,285,488**	$2,139,208	$362,616	**$1,776,592**	**$624,995**
2025	$1,238,289,154	$12,382,892	$1,774,752	$339,519	**$1,435,232**	$2,452,773	$469,228	**$1,983,544**	**$808,748**
2026	$1,356,855,675	$13,568,557	$1,944,685	$397,297	**$1,547,388**	$2,687,626	$549,079	**$2,138,548**	**$946,375**
2027	$1,465,093,144	$14,650,931	$2,099,814	$370,622	**$1,729,192**	$2,902,020	$512,213	**$2,389,808**	**$882,834**
2028	$1,578,603,690	$15,786,037	$2,262,500	$416,174	**$1,846,326**	$3,126,859	$575,168	**$2,551,692**	**$991,341**
2029	$1,697,606,285	$16,976,063	$2,433,058	$463,930	**$1,969,128**	$3,362,577	$641,168	**$2,721,408**	**$1,105,098**
2030	$1,822,328,293	$18,223,283	$2,611,813	$513,981	**$2,097,832**	$3,609,623	$710,341	**$2,899,282**	**$1,224,323**
2031	$2,005,092,340	$20,050,923	$2,873,756	$587,325	**$2,286,431**	$3,971,638	$811,706	**$3,159,932**	**$1,399,031**
2032	$2,136,911,611	$21,369,116	$3,062,683	$640,225	**$2,422,458**	$4,232,742	$884,815	**$3,347,927**	**$1,525,040**
2033	$2,290,882,520	$22,908,825	$3,283,359	$702,014	**$2,581,344**	$4,537,724	$970,210	**$3,567,514**	**$1,672,224**
2034	$2,448,449,556	$24,484,496	$3,509,188	$765,246	**$2,743,942**	$4,849,829	$1,057,599	**$3,792,230**	**$1,822,845**
2035	$2,555,951,704	$25,559,517	$3,663,263	$808,387	**$2,854,876**	$5,062,766	$1,117,222	**$3,945,545**	**$1,925,609**
2036	$2,720,264,876	$27,202,649	$3,898,762	$874,327	**$3,024,435**	$5,388,234	$1,208,352	**$4,179,881**	**$2,082,679**
2037	$2,949,973,944	$29,499,739	$4,227,987	$966,510	**$3,261,477**	$5,843,236	$1,335,753	**$4,507,483**	**$2,302,263**
2038	$3,195,558,668	$31,955,587	$4,579,966	$1,065,064	**$3,514,902**	$6,329,684	$1,471,959	**$4,857,725**	**$2,537,023**
2039	$3,448,545,907	$34,485,459	$4,942,555	$1,166,589	**$3,775,966**	$6,830,795	$1,612,270	**$5,218,525**	**$2,778,859**
2040	$3,713,836,378	$37,138,364	$5,322,777	$1,273,051	**$4,049,726**	$7,356,276	$1,759,404	**$5,596,872**	**$3,032,455**
2041	$3,991,940,587	$39,919,406	$5,721,364	$1,384,656	**$4,336,708**	$7,907,138	$1,913,646	**$5,993,492**	**$3,298,301**
2042	$4,283,388,594	$42,833,886	$6,139,076	$1,501,615	**$4,637,461**	$8,484,431	$2,075,288	**$6,409,143**	**$3,576,902**
2043	$4,588,730,736	$45,887,307	$6,576,701	$1,624,150	**$4,952,551**	$9,089,245	$2,244,636	**$6,844,609**	**$3,868,785**
2044	$4,908,538,357	$49,085,384	$7,035,058	$1,752,490	**$5,282,568**	$9,722,712	$2,422,006	**$7,300,706**	**$4,174,496**
2045	$5,182,060,111	$51,820,601	$7,427,077	$1,862,255	**$5,564,822**	$10,264,497	$2,573,706	**$7,690,791**	**$4,435,962**
2046	$5,422,358,272	$54,223,583	$7,771,480	$1,958,688	**$5,812,792**	$10,740,474	$2,706,980	**$8,033,494**	**$4,665,668**
2047	$5,672,410,470	$56,724,105	$8,129,862	$2,059,035	**$6,070,827**	$11,235,771	$2,845,663	**$8,390,108**	**$4,904,698**
2048	$5,932,585,676	$59,325,857	$8,502,752	$2,163,444	**$6,339,308**	$11,751,120	$2,989,961	**$8,761,159**	**$5,153,405**
2049	$6,203,266,226	$62,032,662	$8,890,699	$2,272,070	**$6,618,630**	$12,287,277	$3,140,085	**$9,147,193**	**$5,412,154**
2050	$6,440,686,899	$64,406,869	$9,230,977	$2,367,347	**$6,863,630**	$12,757,554	$3,271,762	**$9,485,792**	**$5,639,110**
2051	$6,633,907,506	$66,339,075	$9,507,907	$2,444,888	**$7,063,019**	$13,140,281	$3,378,926	**$9,761,355**	**$5,823,813**
2052	$6,832,924,731	$68,329,247	$9,793,144	$2,524,754	**$7,268,390**	$13,534,489	$3,489,304	**$10,045,185**	**$6,014,058**
2053	$7,037,912,473	$70,379,125	$10,086,938	$2,607,016	**$7,479,922**	$13,940,524	$3,602,994	**$10,337,530**	**$6,210,010**
2054	$7,249,049,848	$72,490,498	$10,389,546	$2,691,747	**$7,697,800**	$14,358,740	$3,720,094	**$10,638,646**	**$6,411,841**
2055	$7,466,521,343	$74,665,213	$10,701,233	$2,779,019	**$7,922,214**	$14,789,502	$3,840,707	**$10,948,794**	**$6,619,726**
2056	$7,690,516,983	$76,905,170	$11,022,270	$2,868,909	**$8,153,361**	$15,233,187	$3,964,939	**$11,268,248**	**$6,833,849**
2057	$7,921,232,493	$79,212,325	$11,352,938	$2,961,496	**$8,391,442**	$15,690,182	$4,092,898	**$11,597,284**	**$7,054,394**
2058	$8,158,869,467	$81,588,695	$11,693,526	$3,056,861	**$8,636,665**	$16,160,888	$4,224,696	**$11,936,192**	**$7,281,557**
2059	$8,403,635,552	$84,036,356	$12,044,332	$3,155,087	**$8,889,245**	$16,645,715	$4,360,447	**$12,285,267**	**$7,515,534**
2060	$8,655,744,618	$86,557,446	$12,405,662	$3,256,259	**$9,149,403**	$17,145,086	$4,500,271	**$12,644,815**	**$7,756,530**
2061	$8,915,416,957	$89,154,170	$12,777,832	$3,360,467	**$9,417,365**	$17,659,439	$4,644,290	**$13,015,149**	**$8,004,756**

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Source: San Joaquin County; City of Manteca; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.
[2] Refer to Table B-2 for details.

Table 10
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue - Manteca Annexation Area (Real $)

Manteca Annexation Area

Fiscal Year Ending	Beginning Assessed Value [1]	Gross Property Tax Revenue	Net City and County Property Tax Revenue						
			City	City EIFD Amount [2]	**Net City**	County	County EIFD Amount [2]	**Net County**	**Total EIFD**
Formula	*a*	*b=a*1.0%*	*c=b*6.63%*	*d*	*e=c-d*	*f=b*26.51%*	*g*	*h=f-g*	*d+g*
2017	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2018	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2019	$36,000,000	$360,000	$23,861	$8,113	**$15,749**	$95,446	$32,452	**$62,994**	**$40,564**
2020	$64,080,000	$640,800	$42,473	$14,441	**$28,032**	$169,893	$57,764	**$112,130**	**$72,205**
2021	$66,002,400	$660,024	$43,748	$14,874	**$28,873**	$174,990	$59,497	**$115,494**	**$74,371**
2022	$67,982,472	$679,825	$45,060	$15,320	**$29,740**	$180,240	$61,282	**$118,958**	**$76,602**
2023	$70,021,946	$700,219	$46,412	$15,780	**$30,632**	$185,647	$63,120	**$122,527**	**$78,900**
2024	$72,122,605	$721,226	$47,804	$16,253	**$31,551**	$191,217	$65,014	**$126,203**	**$81,267**
2025	$74,286,283	$742,863	$49,238	$16,741	**$32,497**	$196,953	$66,964	**$129,989**	**$83,705**
2026	$76,514,871	$765,149	$50,715	$17,243	**$33,472**	$202,862	$68,973	**$133,889**	**$86,216**
2027	$78,810,317	$788,103	$52,237	$14,626	**$37,611**	$208,948	$58,505	**$150,442**	**$73,132**
2028	$81,174,627	$811,746	$53,804	$15,065	**$38,739**	$215,216	$60,260	**$154,955**	**$75,326**
2029	$83,609,866	$836,099	$55,418	$15,517	**$39,901**	$221,672	$62,068	**$159,604**	**$77,585**
2030	$86,118,162	$861,182	$57,081	$15,983	**$41,098**	$228,323	$63,930	**$164,392**	**$79,913**
2031	$88,701,706	$887,017	$58,793	$16,462	**$42,331**	$235,172	$65,848	**$169,324**	**$82,310**
2032	$91,362,758	$913,628	$60,557	$16,956	**$43,601**	$242,227	$67,824	**$174,404**	**$84,780**
2033	$94,103,640	$941,036	$62,374	$17,465	**$44,909**	$249,494	$69,858	**$179,636**	**$87,323**
2034	$96,926,750	$969,267	$64,245	$17,989	**$46,256**	$256,979	$71,954	**$185,025**	**$89,943**
2035	$99,834,552	$998,346	$66,172	$18,528	**$47,644**	$264,688	$74,113	**$190,576**	**$92,641**
2036	$138,829,589	$1,388,296	$92,019	$25,765	**$66,253**	$368,075	$103,061	**$265,014**	**$128,826**
2037	$178,994,476	$1,789,945	$118,641	$33,219	**$85,421**	$474,563	$132,878	**$341,685**	**$166,097**
2038	$220,364,311	$2,203,643	$146,061	$40,897	**$105,164**	$584,246	$163,589	**$420,657**	**$204,486**
2039	$262,975,240	$2,629,752	$174,305	$48,805	**$125,499**	$697,219	$195,221	**$501,997**	**$244,027**
2040	$306,864,497	$3,068,645	$203,395	$56,951	**$146,445**	$813,581	$227,803	**$585,778**	**$284,753**
2041	$352,070,432	$3,520,704	$233,359	$65,340	**$168,018**	$933,434	$261,362	**$672,073**	**$326,702**
2042	$398,632,545	$3,986,325	$264,221	$73,982	**$190,239**	$1,056,883	$295,927	**$760,956**	**$369,909**
2043	$446,591,521	$4,465,915	$296,009	$82,882	**$213,126**	$1,184,035	$331,530	**$852,505**	**$414,412**
2044	$495,989,267	$4,959,893	$328,750	$92,050	**$236,700**	$1,315,002	$368,201	**$946,801**	**$460,251**
2045	$546,868,945	$5,468,689	$362,474	$101,493	**$260,982**	$1,449,898	$405,971	**$1,043,926**	**$507,464**
2046	$599,275,013	$5,992,750	$397,210	$111,219	**$285,991**	$1,588,840	$444,875	**$1,143,965**	**$556,094**
2047	$653,253,264	$6,532,533	$432,988	$121,237	**$311,751**	$1,731,951	$484,946	**$1,247,005**	**$606,183**
2048	$708,850,862	$7,088,509	$469,839	$131,555	**$338,284**	$1,879,356	$526,220	**$1,353,136**	**$657,775**
2049	$757,566,387	$7,575,664	$502,128	$140,596	**$361,532**	$2,008,514	$562,384	**$1,446,130**	**$702,980**
2050	$780,293,379	$7,802,934	$517,192	$144,814	**$372,378**	$2,068,769	$579,255	**$1,489,514**	**$724,069**
2051	$803,702,180	$8,037,022	$532,708	$149,158	**$383,550**	$2,130,832	$596,633	**$1,534,199**	**$745,791**
2052	$827,813,246	$8,278,132	$548,689	$153,633	**$395,056**	$2,194,757	$614,532	**$1,580,225**	**$768,165**
2053	$852,647,643	$8,526,476	$565,150	$158,242	**$406,908**	$2,260,600	$632,968	**$1,627,632**	**$791,210**
2054	$878,227,073	$8,782,271	$582,104	$162,989	**$419,115**	$2,328,418	$651,957	**$1,676,461**	**$814,946**
2055	$904,573,885	$9,045,739	$599,568	$167,879	**$431,689**	$2,398,271	$671,516	**$1,726,755**	**$839,395**
2056	$931,711,101	$9,317,111	$617,555	$172,915	**$444,639**	$2,470,219	$691,661	**$1,778,557**	**$864,577**
2057	$959,662,434	$9,596,624	$636,081	$178,103	**$457,979**	$2,544,325	$712,411	**$1,831,914**	**$890,514**
2058	$988,452,307	$9,884,523	$655,164	$183,446	**$471,718**	$2,620,655	$733,783	**$1,886,872**	**$917,229**
2059	$1,018,105,877	$10,181,059	$674,819	$188,949	**$485,869**	$2,699,275	$755,797	**$1,943,478**	**$944,746**
2060	$1,048,649,053	$10,486,491	$695,063	$194,618	**$500,446**	$2,780,253	$778,471	**$2,001,782**	**$973,088**
2061	$1,080,108,524	$10,801,085	$715,915	$200,456	**$515,459**	$2,863,660	$801,825	**$2,061,836**	**$1,002,281**

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Source: San Joaquin County; City of Manteca; LWA; EPS.

[1] Prior to annexation of the annexation area to the City, the City recieves no property tax revenue for these TRAs.
[2] Refer to Table B-3 for details.

Table 11
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue Summary - Stockton (Real $)

Stockton

Fiscal Year Ending	Net City Property Tax Revenue [1]			Net County Property Tax Revenue [1]			EIFD Revenue		
	Existing City Boundaries	Annexation Areas	Total	Existing City Boundaries	Annexation Areas	Total	City EIFD Revenue	County EIFD Revenue	Total
	Table 12	*Table 13*		*Table 12*	*Table 13*				
2017	$1,960,962	$0	$1,960,962	$2,388,317	$0	$2,388,317	$0	$0	$0
2018	$2,019,790	$0	$2,019,790	$2,459,967	$0	$2,459,967	$0	$0	$0
2019	$2,059,782	$0	$2,059,782	$2,508,674	$0	$2,508,674	$20,602	$25,092	$45,694
2020	$2,100,974	$0	$2,100,974	$2,558,843	$0	$2,558,843	$41,822	$50,936	$92,758
2021	$2,175,915	$0	$2,175,915	$2,650,116	$0	$2,650,116	$80,428	$97,955	$178,383
2022	$2,289,320	$0	$2,289,320	$2,788,236	$0	$2,788,236	$138,849	$169,108	$307,957
2023	$2,474,762	$0	$2,474,762	$3,014,092	$0	$3,014,092	$234,379	$285,458	$519,838
2024	$2,570,764	$0	$2,570,764	$3,131,015	$0	$3,131,015	$283,835	$345,692	$629,527
2025	$2,670,917	$0	$2,670,917	$3,252,995	$0	$3,252,995	$335,429	$408,529	$743,958
2026	$2,760,287	$0	$2,760,287	$3,361,842	$0	$3,361,842	$381,468	$464,602	$846,070
2027	$2,947,593	$0	$2,947,593	$3,589,967	$0	$3,589,967	$360,812	$439,445	$800,257
2028	$3,072,744	$3,604	$3,076,348	$3,742,393	$14,415	$3,756,809	$410,884	$504,327	$915,211
2029	$3,156,601	$7,424	$3,164,025	$3,844,525	$29,696	$3,874,221	$444,980	$549,988	$994,968
2030	$3,243,233	$11,470	$3,254,703	$3,950,036	$45,880	$3,995,916	$480,244	$597,314	$1,077,557
2031	$3,332,731	$15,752	$3,348,483	$4,059,038	$63,009	$4,122,047	$516,714	$646,364	$1,163,078
2032	$3,425,188	$20,281	$3,445,469	$4,171,645	$81,124	$4,252,769	$554,431	$697,201	$1,251,631
2033	$3,548,711	$25,067	$3,573,778	$4,322,088	$100,269	$4,422,357	$604,329	$763,152	$1,367,480
2034	$3,677,072	$30,122	$3,707,194	$4,478,423	$120,490	$4,598,912	$656,213	$831,812	$1,488,025
2035	$3,810,449	$35,458	$3,845,908	$4,640,867	$141,833	$4,782,701	$710,157	$903,285	$1,613,442
2036	$3,949,029	$41,087	$3,990,117	$4,809,648	$164,349	$4,973,998	$766,238	$977,679	$1,743,917
2037	$4,093,003	$47,022	$4,140,026	$4,984,999	$188,089	$5,173,088	$824,536	$1,055,103	$1,879,638
2038	$4,242,571	$53,276	$4,295,847	$5,167,162	$213,105	$5,380,267	$885,133	$1,135,672	$2,020,805
2039	$4,371,183	$59,863	$4,431,046	$5,323,802	$239,452	$5,563,255	$937,710	$1,206,834	$2,144,544
2040	$4,497,313	$66,797	$4,564,110	$5,477,420	$267,189	$5,744,609	$989,458	$1,277,361	$2,266,818
2041	$4,627,585	$74,093	$4,701,679	$5,636,083	$296,374	$5,932,457	$1,042,957	$1,350,413	$2,393,370
2042	$4,760,729	$81,767	$4,842,497	$5,798,244	$327,070	$6,125,314	$1,097,719	$1,425,413	$2,523,132
2043	$4,886,585	$89,835	$4,976,420	$5,951,527	$359,341	$6,310,868	$1,149,800	$1,497,573	$2,647,373
2044	$5,016,216	$98,313	$5,114,530	$6,109,409	$393,253	$6,502,663	$1,203,510	$1,572,160	$2,775,669
2045	$5,149,737	$107,219	$5,256,956	$6,272,028	$428,878	$6,700,906	$1,258,898	$1,649,254	$2,908,152
2046	$5,287,263	$116,571	$5,403,834	$6,439,525	$466,285	$6,905,810	$1,316,017	$1,728,939	$3,044,956
2047	$5,428,914	$126,388	$5,555,302	$6,612,047	$505,551	$7,117,599	$1,374,921	$1,811,301	$3,186,222
2048	$5,574,815	$136,688	$5,711,504	$6,789,745	$546,754	$7,336,499	$1,435,666	$1,896,429	$3,332,095
2049	$5,725,094	$147,493	$5,872,587	$6,972,773	$589,973	$7,562,747	$1,498,310	$1,984,414	$3,482,724
2050	$5,879,880	$158,824	$6,038,704	$7,161,293	$635,294	$7,796,587	$1,562,911	$2,075,352	$3,638,263
2051	$6,039,310	$170,701	$6,210,011	$7,355,468	$682,803	$8,038,271	$1,629,530	$2,169,340	$3,798,871
2052	$6,203,523	$183,148	$6,386,671	$7,555,468	$732,591	$8,288,059	$1,698,231	$2,266,480	$3,964,712
2053	$6,372,663	$196,188	$6,568,851	$7,761,469	$784,751	$8,546,220	$1,769,079	$2,366,876	$4,135,955
2054	$6,546,876	$209,845	$6,756,722	$7,973,649	$839,382	$8,813,031	$1,842,140	$2,470,636	$4,312,776
2055	$6,726,317	$224,146	$6,950,463	$8,192,195	$896,584	$9,088,779	$1,917,484	$2,577,871	$4,495,355
2056	$6,911,140	$239,116	$7,150,256	$8,417,297	$956,463	$9,373,760	$1,995,181	$2,688,697	$4,683,878
2057	$7,101,508	$254,782	$7,356,290	$8,649,152	$1,019,128	$9,668,280	$2,075,305	$2,803,233	$4,878,538
2058	$7,297,587	$270,723	$7,568,309	$8,887,963	$1,082,890	$9,970,853	$2,157,757	$2,920,900	$5,078,658
2059	$7,499,548	$278,844	$7,778,392	$9,133,938	$1,115,377	$10,249,315	$2,239,456	$3,029,191	$5,268,647
2060	$7,707,568	$287,210	$7,994,778	$9,387,292	$1,148,838	$10,536,131	$2,323,606	$3,140,730	$5,464,337
2061	$7,921,829	$295,826	$8,217,655	$9,648,248	$1,183,304	$10,831,551	$2,410,281	$3,255,616	$5,665,897
TOTAL	**$203,115,583**	**$4,164,946**	**$207,280,529**	**$247,380,927**	**$16,659,784**	**$264,040,711**	**$45,657,407**	**$60,113,727**	**$105,771,135**

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Source: EPS.

[1] Includes property tax revenue from parcels within the RD 17 boundary only.

Table 12
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue - Stockton Existing City Boundaries (Real $)

Stockton Existing City

Fiscal Year Ending	Beginning Assessed Value [1]	Gross Property Tax Revenue	Net City and County Property Tax Revenue						
			City	City EIFD Amount [2]	**Net City**	County	County EIFD Amount [2]	**Net County**	**Total EIFD**
Formula	*a*	*b=a*1.0%*	*c=b*16.83%*	*d*	*e=c-d*	*f=b*20.50%*	*g*	*h=f-g*	*d+g*
2017	$1,164,851,051	$11,648,511	$1,960,962	$0	**$1,960,962**	$2,388,317	$0	**$2,388,317**	**$0**
2018	$1,199,796,583	$11,997,966	$2,019,790	$0	**$2,019,790**	$2,459,967	$0	**$2,459,967**	**$0**
2019	$1,235,790,480	$12,357,905	$2,080,384	$20,602	**$2,059,782**	$2,533,766	$25,092	**$2,508,674**	**$45,694**
2020	$1,272,864,194	$12,728,642	$2,142,796	$41,822	**$2,100,974**	$2,609,779	$50,936	**$2,558,843**	**$92,758**
2021	$1,340,313,349	$13,403,133	$2,256,343	$80,428	**$2,175,915**	$2,748,071	$97,955	**$2,650,116**	**$178,383**
2022	$1,442,381,614	$14,423,816	$2,428,169	$138,849	**$2,289,320**	$2,957,344	$169,108	**$2,788,236**	**$307,957**
2023	$1,609,285,238	$16,092,852	$2,709,142	$234,379	**$2,474,762**	$3,299,550	$285,458	**$3,014,092**	**$519,838**
2024	$1,695,689,885	$16,956,899	$2,854,599	$283,835	**$2,570,764**	$3,476,707	$345,692	**$3,131,015**	**$629,527**
2025	$1,785,830,454	$17,858,305	$3,006,346	$335,429	**$2,670,917**	$3,661,524	$408,529	**$3,252,995**	**$743,958**
2026	$1,866,266,733	$18,662,667	$3,141,756	$381,468	**$2,760,287**	$3,826,444	$464,602	**$3,361,842**	**$846,070**
2027	$1,965,260,059	$19,652,601	$3,308,405	$360,812	**$2,947,593**	$4,029,412	$439,445	**$3,589,967**	**$800,257**
2028	$2,068,513,345	$20,685,133	$3,482,227	$409,482	**$3,072,744**	$4,241,114	$498,721	**$3,742,393**	**$908,203**
2029	$2,137,697,549	$21,376,975	$3,598,694	$442,093	**$3,156,601**	$4,382,964	$538,439	**$3,844,525**	**$980,532**
2030	$2,209,171,144	$22,091,711	$3,719,016	$475,783	**$3,243,233**	$4,529,508	$579,471	**$3,950,036**	**$1,055,255**
2031	$2,283,009,227	$22,830,092	$3,843,318	$510,588	**$3,332,731**	$4,680,900	$621,861	**$4,059,038**	**$1,132,449**
2032	$2,359,289,341	$23,592,893	$3,971,732	$546,544	**$3,425,188**	$4,837,298	$665,653	**$4,171,645**	**$1,212,196**
2033	$2,461,199,326	$24,611,993	$4,143,291	$594,580	**$3,548,711**	$5,046,246	$724,158	**$4,322,088**	**$1,318,738**
2034	$2,567,100,550	$25,671,006	$4,321,570	$644,498	**$3,677,072**	$5,263,378	$784,955	**$4,478,423**	**$1,429,453**
2035	$2,677,140,768	$26,771,408	$4,506,817	$696,367	**$3,810,449**	$5,488,995	$848,128	**$4,640,867**	**$1,544,495**
2036	$2,791,473,009	$27,914,730	$4,699,289	$750,260	**$3,949,029**	$5,723,413	$913,765	**$4,809,648**	**$1,664,024**
2037	$2,910,255,757	$29,102,558	$4,899,253	$806,249	**$4,093,003**	$5,966,956	$981,957	**$4,984,999**	**$1,788,206**
2038	$3,033,653,144	$30,336,531	$5,106,985	$864,415	**$4,242,571**	$6,219,960	$1,052,798	**$5,167,162**	**$1,917,213**
2039	$3,139,761,633	$31,397,616	$5,285,613	$914,430	**$4,371,183**	$6,437,516	$1,113,714	**$5,323,802**	**$2,028,144**
2040	$3,243,822,415	$32,438,224	$5,460,794	$963,481	**$4,497,313**	$6,650,874	$1,173,454	**$5,477,420**	**$2,136,935**
2041	$3,351,301,058	$33,513,011	$5,641,728	$1,014,142	**$4,627,585**	$6,871,240	$1,235,156	**$5,636,083**	**$2,249,299**
2042	$3,461,148,673	$34,611,487	$5,826,650	$1,065,921	**$4,760,729**	$7,096,463	$1,298,219	**$5,798,244**	**$2,364,139**
2043	$3,564,983,133	$35,649,831	$6,001,450	$1,114,865	**$4,886,585**	$7,309,356	$1,357,829	**$5,951,527**	**$2,472,694**
2044	$3,671,932,627	$36,719,326	$6,181,493	$1,165,277	**$5,016,216**	$7,528,637	$1,419,228	**$6,109,409**	**$2,584,504**
2045	$3,782,090,606	$37,820,906	$6,366,938	$1,217,201	**$5,149,737**	$7,754,496	$1,482,468	**$6,272,028**	**$2,699,669**
2046	$3,895,553,324	$38,955,533	$6,557,946	$1,270,684	**$5,287,263**	$7,987,131	$1,547,606	**$6,439,525**	**$2,818,290**
2047	$4,012,419,924	$40,124,199	$6,754,685	$1,325,770	**$5,428,914**	$8,226,745	$1,614,698	**$6,612,047**	**$2,940,468**
2048	$4,132,792,521	$41,327,925	$6,957,325	$1,382,510	**$5,574,815**	$8,473,547	$1,683,803	**$6,789,745**	**$3,066,312**
2049	$4,256,776,297	$42,567,763	$7,166,045	$1,440,951	**$5,725,094**	$8,727,754	$1,754,980	**$6,972,773**	**$3,195,932**
2050	$4,384,479,586	$43,844,796	$7,381,026	$1,501,146	**$5,879,880**	$8,989,586	$1,828,293	**$7,161,293**	**$3,329,439**
2051	$4,516,013,974	$45,160,140	$7,602,457	$1,563,147	**$6,039,310**	$9,259,274	$1,903,806	**$7,355,468**	**$3,466,953**
2052	$4,651,494,393	$46,514,944	$7,830,531	$1,627,007	**$6,203,523**	$9,537,052	$1,981,584	**$7,555,468**	**$3,608,591**
2053	$4,791,039,225	$47,910,392	$8,065,447	$1,692,784	**$6,372,663**	$9,823,164	$2,061,695	**$7,761,469**	**$3,754,479**
2054	$4,934,770,401	$49,347,704	$8,307,410	$1,760,533	**$6,546,876**	$10,117,859	$2,144,210	**$7,973,649**	**$3,904,743**
2055	$5,082,813,513	$50,828,135	$8,556,632	$1,830,316	**$6,726,317**	$10,421,394	$2,229,200	**$8,192,195**	**$4,059,515**
2056	$5,235,297,919	$52,352,979	$8,813,331	$1,902,191	**$6,911,140**	$10,734,036	$2,316,739	**$8,417,297**	**$4,218,931**
2057	$5,392,356,856	$53,923,569	$9,077,731	$1,976,223	**$7,101,508**	$11,056,057	$2,406,905	**$8,649,152**	**$4,383,129**
2058	$5,554,127,562	$55,541,276	$9,350,063	$2,052,476	**$7,297,587**	$11,387,739	$2,499,776	**$8,887,963**	**$4,552,253**
2059	$5,720,751,389	$57,207,514	$9,630,565	$2,131,017	**$7,499,548**	$11,729,371	$2,595,433	**$9,133,938**	**$4,726,450**
2060	$5,892,373,931	$58,923,739	$9,919,482	$2,211,914	**$7,707,568**	$12,081,252	$2,693,960	**$9,387,292**	**$4,905,874**
2061	$6,069,145,148	$60,691,451	$10,217,066	$2,295,237	**$7,921,829**	$12,443,690	$2,795,442	**$9,648,248**	**$5,090,680**

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Source: San Joaquin County; City of Stockton; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.
[2] Refer to Table C-2 for details.

Table 13
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue - Stockton Annexation Area (Real $)

Stockton Annexation Area

Fiscal Year Ending	Beginning Assessed Value [1]	Gross Property Tax Revenue	Net City and County Property Tax Revenue						
			City	City EIFD Amount [2]	**Net City**	County	County EIFD Amount [2]	**Net County**	**Total EIFD**
Formula	*a*	*b=a*1.0%*	*c=b*7.23%*	*d*	*e=c-d*	*f=b*28.93%*	*g*	*h=f-g*	*e+h*
2017	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2018	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2019	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2020	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2021	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2022	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2023	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2024	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2025	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2026	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2027	$0	$0	$0	$0	**$0**	$0	$0	**$0**	**$0**
2028	$6,921,169	$69,212	$5,005	$1,402	**$3,604**	$20,021	$5,606	**$14,415**	**$7,008**
2029	$14,257,609	$142,576	$10,311	$2,887	**$7,424**	$41,244	$11,548	**$29,696**	**$14,435**
2030	$22,028,006	$220,280	$15,931	$4,461	**$11,470**	$63,722	$17,842	**$45,880**	**$22,303**
2031	$30,251,794	$302,518	$21,878	$6,126	**$15,752**	$87,512	$24,503	**$63,009**	**$30,629**
2032	$38,949,185	$389,492	$28,168	$7,887	**$20,281**	$112,672	$31,548	**$81,124**	**$39,435**
2033	$48,141,193	$481,412	$34,816	$9,748	**$25,067**	$139,262	$38,993	**$100,269**	**$48,742**
2034	$57,849,667	$578,497	$41,837	$11,714	**$30,122**	$167,347	$46,857	**$120,490**	**$58,571**
2035	$68,097,322	$680,973	$49,248	$13,789	**$35,458**	$196,991	$55,157	**$141,833**	**$68,947**
2036	$78,907,772	$789,078	$57,066	$15,978	**$41,087**	$228,263	$63,914	**$164,349**	**$79,892**
2037	$90,305,562	$903,056	$65,309	$18,286	**$47,022**	$261,235	$73,146	**$188,089**	**$91,432**
2038	$102,316,201	$1,023,162	$73,995	$20,719	**$53,276**	$295,979	$82,874	**$213,105**	**$103,593**
2039	$114,966,205	$1,149,662	$83,143	$23,280	**$59,863**	$332,572	$93,120	**$239,452**	**$116,400**
2040	$128,283,123	$1,282,831	$92,774	$25,977	**$66,797**	$371,095	$103,907	**$267,189**	**$129,883**
2041	$142,295,587	$1,422,956	$102,908	$28,814	**$74,093**	$411,630	$115,257	**$296,374**	**$144,071**
2042	$157,033,345	$1,570,333	$113,566	$31,798	**$81,767**	$454,264	$127,194	**$327,070**	**$158,992**
2043	$172,527,301	$1,725,273	$124,771	$34,936	**$89,835**	$499,084	$139,744	**$359,341**	**$174,679**
2044	$188,809,565	$1,888,096	$136,546	$38,233	**$98,313**	$546,185	$152,932	**$393,253**	**$191,165**
2045	$205,913,491	$2,059,135	$148,916	$41,696	**$107,219**	$595,663	$166,786	**$428,878**	**$208,482**
2046	$223,873,723	$2,238,737	$161,905	$45,333	**$116,571**	$647,618	$181,333	**$466,285**	**$226,666**
2047	$242,726,247	$2,427,262	$175,539	$49,151	**$126,388**	$702,155	$196,603	**$505,551**	**$245,754**
2048	$262,508,436	$2,625,084	$189,845	$53,157	**$136,688**	$759,380	$212,626	**$546,754**	**$265,783**
2049	$283,259,103	$2,832,591	$204,852	$57,359	**$147,493**	$819,407	$229,434	**$589,973**	**$286,793**
2050	$305,018,552	$3,050,186	$220,588	$61,765	**$158,824**	$882,353	$247,059	**$635,294**	**$308,823**
2051	$327,828,635	$3,278,286	$237,084	$66,384	**$170,701**	$948,337	$265,534	**$682,803**	**$331,918**
2052	$351,732,807	$3,517,328	$254,372	$71,224	**$183,148**	$1,017,487	$284,896	**$732,591**	**$356,120**
2053	$376,776,183	$3,767,762	$272,483	$76,295	**$196,188**	$1,089,932	$305,181	**$784,751**	**$381,476**
2054	$403,005,602	$4,030,056	$291,452	$81,607	**$209,845**	$1,165,808	$326,426	**$839,382**	**$408,033**
2055	$430,469,687	$4,304,697	$311,314	$87,168	**$224,146**	$1,245,256	$348,672	**$896,584**	**$435,840**
2056	$459,218,912	$4,592,189	$332,105	$92,989	**$239,116**	$1,328,421	$371,958	**$956,463**	**$464,947**
2057	$489,305,669	$4,893,057	$353,864	$99,082	**$254,782**	$1,415,456	$396,328	**$1,019,128**	**$495,409**
2058	$519,919,307	$5,199,193	$376,004	$105,281	**$270,723**	$1,504,014	$421,124	**$1,082,890**	**$526,405**
2059	$535,516,887	$5,355,169	$387,284	$108,439	**$278,844**	$1,549,135	$433,758	**$1,115,377**	**$542,197**
2060	$551,582,393	$5,515,824	$398,902	$111,693	**$287,210**	$1,595,609	$446,770	**$1,148,838**	**$558,463**
2061	$568,129,865	$5,681,299	$410,869	$115,043	**$295,826**	$1,643,477	$460,174	**$1,183,304**	**$575,217**

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Source: San Joaquin County; City of Stockton; LWA; EPS.

[1] Prior to annexation of the annexation area to the City, the City receives no property tax revenue for these TRAs.
[2] Refer to Table C-3 for details.

Table 14
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue Summary - Unincorporated San Joaquin County (Real $)

Unincorporated San Joaquin County

Fiscal Year Ending	Net County Property Tax Revenue	EIFD Revenue
	Table 15	*Table 15*
2017	$1,084,429	$0
2018	$1,116,962	$0
2019	$1,139,078	$11,393
2020	$1,161,857	$23,128
2021	$1,185,320	$35,215
2022	$1,209,486	$47,664
2023	$1,234,378	$60,487
2024	$1,260,016	$73,695
2025	$1,286,424	$87,299
2026	$1,313,623	$101,310
2027	$1,362,064	$95,318
2028	$1,388,362	$107,560
2029	$1,420,674	$120,125
2030	$1,453,955	$133,068
2031	$1,488,235	$146,399
2032	$1,523,543	$160,130
2033	$1,559,910	$174,273
2034	$1,597,369	$188,840
2035	$1,635,951	$203,844
2036	$1,645,298	$219,298
2037	$1,685,573	$234,961
2038	$1,727,056	$251,094
2039	$1,769,784	$267,710
2040	$1,813,794	$284,825
2041	$1,859,124	$302,453
2042	$1,905,815	$320,611
2043	$1,953,905	$339,313
2044	$2,003,439	$358,576
2045	$2,054,458	$378,416
2046	$2,107,008	$398,853
2047	$2,161,135	$419,902
2048	$2,216,885	$441,583
2049	$2,274,308	$463,914
2050	$2,333,454	$486,915
2051	$2,394,374	$510,606
2052	$2,457,121	$535,008
2053	$2,521,751	$560,142
2054	$2,588,320	$586,029
2055	$2,656,886	$612,694
2056	$2,727,509	$640,159
2057	$2,800,251	$668,447
2058	$2,875,175	$697,584
2059	$2,952,346	$727,595
2060	$3,031,833	$758,507
2061	$3,113,704	$790,346
TOTAL	**$85,051,947**	**$14,025,284**

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Source: EPS.

Table 15
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Net Property Tax and EIFD Revenue - Unincorporated San Joaquin County (Real $)

Unincorporated San Joaquin County

Fiscal Year Ending	Beginning Assessed Value [1]	Gross Property Tax Revenue	Net City and County Property Tax Revenue						
			City	City EIFD Amount	Net City	County	County EIFD Amount [2]	Net County	Total EIFD
Formula	*a*	*b=a*1.0%*	*c=b*0.00%*	*d*	*e=c-d*	*f=b*21.26%*	*g*	*h=f-g*	*d+g*
2017	$510,001,908	$5,100,019	$0	$0	**$0**	$1,084,429	$0	**$1,084,429**	**$0**
2018	$525,301,965	$5,253,020	$0	$0	**$0**	$1,116,962	$0	**$1,116,962**	**$0**
2019	$541,061,024	$5,410,610	$0	$0	**$0**	$1,150,471	$11,393	**$1,139,078**	**$11,393**
2020	$557,292,855	$5,572,929	$0	$0	**$0**	$1,184,985	$23,128	**$1,161,857**	**$23,128**
2021	$574,011,641	$5,740,116	$0	$0	**$0**	$1,220,534	$35,215	**$1,185,320**	**$35,215**
2022	$591,231,990	$5,912,320	$0	$0	**$0**	$1,257,150	$47,664	**$1,209,486**	**$47,664**
2023	$608,968,949	$6,089,689	$0	$0	**$0**	$1,294,865	$60,487	**$1,234,378**	**$60,487**
2024	$627,238,018	$6,272,380	$0	$0	**$0**	$1,333,711	$73,695	**$1,260,016**	**$73,695**
2025	$646,055,159	$6,460,552	$0	$0	**$0**	$1,373,722	$87,299	**$1,286,424**	**$87,299**
2026	$665,436,813	$6,654,368	$0	$0	**$0**	$1,414,934	$101,310	**$1,313,623**	**$101,310**
2027	$685,399,918	$6,853,999	$0	$0	**$0**	$1,457,382	$95,318	**$1,362,064**	**$95,318**
2028	$703,525,096	$7,035,251	$0	$0	**$0**	$1,495,922	$107,560	**$1,388,362**	**$107,560**
2029	$724,630,849	$7,246,308	$0	$0	**$0**	$1,540,799	$120,125	**$1,420,674**	**$120,125**
2030	$746,369,775	$7,463,698	$0	$0	**$0**	$1,587,023	$133,068	**$1,453,955**	**$133,068**
2031	$768,760,868	$7,687,609	$0	$0	**$0**	$1,634,634	$146,399	**$1,488,235**	**$146,399**
2032	$791,823,694	$7,918,237	$0	$0	**$0**	$1,683,673	$160,130	**$1,523,543**	**$160,130**
2033	$815,578,405	$8,155,784	$0	$0	**$0**	$1,734,183	$174,273	**$1,559,910**	**$174,273**
2034	$840,045,757	$8,400,458	$0	$0	**$0**	$1,786,209	$188,840	**$1,597,369**	**$188,840**
2035	$865,247,130	$8,652,471	$0	$0	**$0**	$1,839,795	$203,844	**$1,635,951**	**$203,844**
2036	$876,910,865	$8,769,109	$0	$0	**$0**	$1,864,596	$219,298	**$1,645,298**	**$219,298**
2037	$903,218,191	$9,032,182	$0	$0	**$0**	$1,920,534	$234,961	**$1,685,573**	**$234,961**
2038	$930,314,737	$9,303,147	$0	$0	**$0**	$1,978,150	$251,094	**$1,727,056**	**$251,094**
2039	$958,224,179	$9,582,242	$0	$0	**$0**	$2,037,494	$267,710	**$1,769,784**	**$267,710**
2040	$986,970,904	$9,869,709	$0	$0	**$0**	$2,098,619	$284,825	**$1,813,794**	**$284,825**
2041	$1,016,580,031	$10,165,800	$0	$0	**$0**	$2,161,578	$302,453	**$1,859,124**	**$302,453**
2042	$1,047,077,432	$10,470,774	$0	$0	**$0**	$2,226,425	$320,611	**$1,905,815**	**$320,611**
2043	$1,078,489,755	$10,784,898	$0	$0	**$0**	$2,293,218	$339,313	**$1,953,905**	**$339,313**
2044	$1,110,844,448	$11,108,444	$0	$0	**$0**	$2,362,014	$358,576	**$2,003,439**	**$358,576**
2045	$1,144,169,781	$11,441,698	$0	$0	**$0**	$2,432,875	$378,416	**$2,054,458**	**$378,416**
2046	$1,178,494,875	$11,784,949	$0	$0	**$0**	$2,505,861	$398,853	**$2,107,008**	**$398,853**
2047	$1,213,849,721	$12,138,497	$0	$0	**$0**	$2,581,037	$419,902	**$2,161,135**	**$419,902**
2048	$1,250,265,212	$12,502,652	$0	$0	**$0**	$2,658,468	$441,583	**$2,216,885**	**$441,583**
2049	$1,287,773,169	$12,877,732	$0	$0	**$0**	$2,738,222	$463,914	**$2,274,308**	**$463,914**
2050	$1,326,406,364	$13,264,064	$0	$0	**$0**	$2,820,369	$486,915	**$2,333,454**	**$486,915**
2051	$1,366,198,555	$13,661,986	$0	$0	**$0**	$2,904,980	$510,606	**$2,394,374**	**$510,606**
2052	$1,407,184,511	$14,071,845	$0	$0	**$0**	$2,992,129	$535,008	**$2,457,121**	**$535,008**
2053	$1,449,400,047	$14,494,000	$0	$0	**$0**	$3,081,893	$560,142	**$2,521,751**	**$560,142**
2054	$1,492,882,048	$14,928,820	$0	$0	**$0**	$3,174,350	$586,029	**$2,588,320**	**$586,029**
2055	$1,537,668,510	$15,376,685	$0	$0	**$0**	$3,269,580	$612,694	**$2,656,886**	**$612,694**
2056	$1,583,798,565	$15,837,986	$0	$0	**$0**	$3,367,668	$640,159	**$2,727,509**	**$640,159**
2057	$1,631,312,522	$16,313,125	$0	$0	**$0**	$3,468,698	$668,447	**$2,800,251**	**$668,447**
2058	$1,680,251,897	$16,802,519	$0	$0	**$0**	$3,572,759	$697,584	**$2,875,175**	**$697,584**
2059	$1,730,659,454	$17,306,595	$0	$0	**$0**	$3,679,941	$727,595	**$2,952,346**	**$727,595**
2060	$1,782,579,238	$17,825,792	$0	$0	**$0**	$3,790,340	$758,507	**$3,031,833**	**$758,507**
2061	$1,836,056,615	$18,360,566	$0	$0	**$0**	$3,904,050	$790,346	**$3,113,704**	**$790,346**

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Source: San Joaquin County; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.

APPENDICES:

Appendix A: City of Lathrop

Appendix B: City of Manteca

Appendix C: City of Stockton

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City of Lathrop

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Table A-1
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Lathrop (Real $)

Lathrop

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	New AV Added to Roll [2]	Ending AV	Cumulative Growth in AV *starting in 2018*	Gross Tax Increment	Net Tax Increment				
							City [1]	City EIFD	County [1]	County EIFD	Total EIFD
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*[3]*	*h=g*34%*	*[3]*	*j=i*34%*	*h+j*
2017	$2,308,244,724	$69,247,342	$0	$2,377,492,066	$0	$0	$0	$0	$0	$0	**$0**
2018	$2,377,492,066	$71,324,762	$212,075,185	$2,660,892,013	$283,399,947	$2,833,999	$330,732	$112,449	$515,861	$175,393	**$287,842**
2019	$2,660,892,013	$79,826,760	$218,437,441	$2,959,156,214	$581,664,148	$5,816,641	$678,484	$230,685	$1,058,897	$360,025	**$590,709**
2020	$2,959,156,214	$88,774,686	$224,990,564	$3,272,921,464	$895,429,398	$8,954,294	$1,043,978	$354,953	$1,630,273	$554,293	**$909,245**
2021	$3,272,921,464	$98,187,644	$160,591,014	$3,531,700,122	$1,154,208,056	$11,542,081	$1,367,658	$465,004	$2,093,527	$711,799	**$1,176,803**
2022	$3,531,700,122	$105,951,004	$165,408,744	$3,803,059,870	$1,425,567,804	$14,255,678	$1,706,994	$580,378	$2,579,331	$876,973	**$1,457,351**
2023	$3,803,059,870	$114,091,796	$170,371,007	$4,087,522,673	$1,710,030,607	$17,100,306	$2,062,634	$701,296	$3,088,623	$1,050,132	**$1,751,427**
2024	$4,087,522,673	$122,625,680	$175,482,137	$4,385,630,490	$2,008,138,424	$20,081,384	$2,435,252	$827,986	$3,622,373	$1,231,607	**$2,059,593**
2025	$4,385,630,490	$131,568,915	$180,746,601	$4,697,946,005	$2,320,453,939	$23,204,539	$2,825,546	$960,686	$4,181,592	$1,421,741	**$2,382,427**
2026	$4,697,946,005	$140,938,380	$323,778,878	$5,162,663,263	$2,785,171,198	$27,851,712	$3,431,893	$960,930	$5,004,495	$1,401,259	**$2,362,189**
2027	$5,162,663,263	$154,879,898	$333,492,244	$5,651,035,406	$3,273,543,340	$32,735,433	$4,069,252	$1,139,391	$5,869,233	$1,643,385	**$2,782,776**
2028	$5,651,035,406	$169,531,062	$343,497,012	$6,164,063,479	$3,786,571,414	$37,865,714	$4,738,940	$1,326,903	$6,777,573	$1,897,720	**$3,224,624**
2029	$6,164,063,479	$184,921,904	$353,801,922	$6,702,787,306	$4,325,295,240	$43,252,952	$5,442,322	$1,523,850	$7,731,355	$2,164,779	**$3,688,630**
2030	$6,702,787,306	$201,083,619	$364,415,980	$7,268,286,905	$4,890,794,839	$48,907,948	$6,180,818	$1,730,629	$8,732,486	$2,445,096	**$4,175,725**
2031	$7,268,286,905	$218,048,607	$110,346,571	$7,596,682,083	$5,219,190,017	$52,191,900	$6,606,068	$1,849,699	$9,315,155	$2,608,244	**$4,457,943**
2032	$7,596,682,083	$227,900,462	$113,656,968	$7,938,239,513	$5,560,747,448	$55,607,474	$7,048,447	$1,973,565	$9,921,149	$2,777,922	**$4,751,487**
2033	$7,938,239,513	$238,147,185	$117,066,677	$8,293,453,376	$5,915,961,310	$59,159,613	$7,508,597	$2,102,407	$10,551,341	$2,954,375	**$5,056,783**
2034	$8,293,453,376	$248,803,601	$120,578,677	$8,662,835,654	$6,285,343,589	$62,853,436	$7,987,189	$2,236,413	$11,206,638	$3,137,859	**$5,374,272**
2035	$8,662,835,654	$259,885,070	$124,196,038	$9,046,916,762	$6,669,424,696	$66,694,247	$8,484,913	$2,375,776	$11,887,980	$3,328,635	**$5,704,410**
2036	$9,046,916,762	$271,407,503	$228,554,501	$9,546,878,766	$7,169,386,700	$71,693,867	$9,135,334	$2,557,894	$12,773,981	$3,576,715	**$6,134,608**
2037	$9,546,878,766	$286,406,363	$235,411,136	$10,068,696,265	$7,691,204,199	$76,912,042	$9,814,320	$2,748,009	$13,698,666	$3,835,626	**$6,583,636**
2038	$10,068,696,265	$302,060,888	$242,473,470	$10,613,230,623	$8,235,738,558	$82,357,386	$10,522,997	$2,946,439	$14,663,557	$4,105,796	**$7,052,235**
2039	$10,613,230,623	$318,396,919	$249,747,674	$11,181,375,216	$8,803,883,151	$88,038,832	$11,262,538	$3,153,511	$15,670,237	$4,387,666	**$7,541,177**
2040	$11,181,375,216	$335,441,256	$257,240,105	$11,774,056,577	$9,396,564,512	$93,965,645	$12,034,156	$3,369,564	$16,720,342	$4,681,696	**$8,051,260**
2041	$11,774,056,577	$353,221,697	$214,377,708	$12,341,655,982	$9,964,163,917	$99,641,639	$12,768,625	$3,575,215	$17,727,623	$4,963,734	**$8,538,950**
2042	$12,341,655,982	$370,249,679	$220,809,039	$12,932,714,701	$10,555,222,635	$105,552,226	$13,533,508	$3,789,382	$18,776,515	$5,257,424	**$9,046,806**
2043	$12,932,714,701	$387,981,441	$227,433,310	$13,548,129,452	$11,170,637,386	$111,706,374	$14,329,966	$4,012,391	$19,868,608	$5,563,210	**$9,575,601**
2044	$13,548,129,452	$406,443,884	$234,256,309	$14,188,829,645	$11,811,337,579	$118,113,376	$15,159,208	$4,244,578	$21,005,551	$5,881,554	**$10,126,133**
2045	$14,188,829,645	$425,664,889	$241,283,999	$14,855,778,533	$12,478,286,467	$124,782,865	$16,022,482	$4,486,295	$22,189,052	$6,212,935	**$10,699,229**
2046	$14,855,778,533	$445,673,356	$248,522,519	$15,549,974,407	$13,172,482,342	$131,724,823	$16,921,085	$4,737,904	$23,420,880	$6,557,846	**$11,295,750**
2047	$15,549,974,407	$466,499,232	$255,978,194	$16,272,451,834	$13,894,959,768	$138,949,598	$17,856,359	$4,999,780	$24,702,871	$6,916,804	**$11,916,584**
2048	$16,272,451,834	$488,173,555	$263,657,540	$17,024,282,929	$14,646,790,863	$146,467,909	$18,829,695	$5,272,315	$26,036,925	$7,290,339	**$12,562,654**
2049	$17,024,282,929	$510,728,488	$271,567,266	$17,806,578,683	$15,429,086,617	$154,290,866	$19,842,537	$5,555,910	$27,425,013	$7,679,004	**$13,234,914**
2050	$17,806,578,683	$534,197,360	$279,714,284	$18,620,490,327	$16,242,998,262	$162,429,983	$20,896,377	$5,850,986	$28,869,176	$8,083,369	**$13,934,355**
2051	$18,620,490,327	$558,614,710	$288,105,713	$19,467,210,750	$17,089,718,684	$170,897,187	$21,992,765	$6,157,974	$30,371,529	$8,504,028	**$14,662,002**
2052	$19,467,210,750	$584,016,322	$296,748,884	$20,347,975,956	$17,970,483,891	$179,704,839	$23,133,305	$6,477,325	$31,934,263	$8,941,594	**$15,418,919**
2053	$20,347,975,956	$610,439,279	$305,651,351	$21,264,066,586	$18,886,574,520	$188,865,745	$24,319,659	$6,809,505	$33,559,650	$9,396,702	**$16,206,207**
2054	$21,264,066,586	$637,921,998	$314,820,891	$22,216,809,474	$19,839,317,409	$198,393,174	$25,553,550	$7,154,994	$35,250,042	$9,870,012	**$17,025,006**
2055	$22,216,809,474	$666,504,284	$324,265,518	$23,207,579,276	$20,830,087,211	$208,300,872	$26,836,762	$7,514,293	$37,007,877	$10,362,206	**$17,876,499**
2056	$23,207,579,276	$696,227,378	$333,993,483	$24,237,800,138	$21,860,308,072	$218,603,081	$28,171,143	$7,887,920	$38,835,680	$10,873,990	**$18,761,910**
2057	$24,237,800,138	$727,134,004	$344,013,288	$25,308,947,430	$22,931,455,364	$229,314,554	$29,558,610	$8,276,411	$40,736,066	$11,406,099	**$19,682,509**
2058	$25,308,947,430	$759,268,423	$354,333,687	$26,422,549,539	$24,045,057,474	$240,450,575	$31,001,146	$8,680,321	$42,711,747	$11,959,289	**$20,639,610**
2059	$26,422,549,539	$792,676,486	$364,963,697	$27,580,189,723	$25,202,697,657	$252,026,977	$32,500,806	$9,100,226	$44,765,529	$12,534,348	**$21,634,574**
2060	$27,580,189,723	$827,405,692	$375,912,608	$28,783,508,022	$26,406,015,957	$264,060,160	$34,059,721	$9,536,722	$46,900,319	$13,132,089	**$22,668,811**
2061	$28,783,508,022	$863,505,241	$0	$29,647,013,263	$27,269,521,197	$272,695,212	$35,175,669	$9,849,187	$48,433,235	$13,561,306	**$23,410,493**

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Source: San Joaquin County; City of Lathrop; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.
[2] See Table A-4 for new AV added to roll from 2017-18 on. It is assumed that new AV is added to roll in year after development occurs.
In 2016-17 and 2017-18 prior to the start of the EIFD, it is assumed that the growth in new assessed value will be 3% of the existing assessed value.
[3] The City and County tax allocation rates vary between TRAs within the existing City boundaries and the annexation area. See Table A-2 and Table A-3 for more details.

Table A-2
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Lathrop Existing City Boundaries (Real $)

Lathrop
Existing City

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	New AV Added to Roll [2]	Ending AV	Cumulative Growth in AV *starting in 2018*	Gross Tax Increment	Net Tax Increment						
							City [1]	City EIFD Allocation	City EIFD	County [1]	County EIFD Allocation	County EIFD	Total EIFD
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*g=f*13.20%*	*h*	*i=g*h*	*j=f*17.65%*	*k*	*l=j*k*	*m=i+l*
2017	$2,308,244,724	$69,247,342	$0	$2,377,492,066	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2018	$2,377,492,066	$71,324,762	$158,269,730	$2,607,086,558	$229,594,492	$2,295,945	$303,090	34%	$103,051	$405,291	34%	$137,799	**$240,850**
2019	$2,607,086,558	$78,212,597	$163,017,822	$2,848,316,976	$470,824,911	$4,708,249	$621,541	34%	$211,324	$831,123	34%	$282,582	**$493,906**
2020	$2,848,316,976	$85,449,509	$167,908,357	$3,101,674,842	$724,182,776	$7,241,828	$956,001	34%	$325,040	$1,278,362	34%	$434,643	**$759,684**
2021	$3,101,674,842	$93,050,245	$143,484,245	$3,338,209,332	$960,717,266	$9,607,173	$1,268,252	34%	$431,206	$1,695,905	34%	$576,608	**$1,007,813**
2022	$3,338,209,332	$100,146,280	$147,788,772	$3,586,144,384	$1,208,652,319	$12,086,523	$1,595,554	34%	$542,488	$2,133,572	34%	$725,414	**$1,267,903**
2023	$3,586,144,384	$107,584,332	$152,222,435	$3,845,951,151	$1,468,459,085	$14,684,591	$1,938,527	34%	$659,099	$2,592,195	34%	$881,346	**$1,540,446**
2024	$3,845,951,151	$115,378,535	$156,789,108	$4,118,118,794	$1,740,626,728	$17,406,267	$2,297,818	34%	$781,258	$3,072,639	34%	$1,044,697	**$1,825,955**
2025	$4,118,118,794	$123,543,564	$161,492,782	$4,403,155,139	$2,025,663,074	$20,256,631	$2,674,098	34%	$909,193	$3,575,798	34%	$1,215,771	**$2,124,965**
2026	$4,403,155,139	$132,094,654	$323,778,878	$4,859,028,672	$2,481,536,606	$24,815,366	$3,275,901	28%	$917,252	$4,380,528	28%	$1,226,548	**$2,143,800**
2027	$4,859,028,672	$145,770,860	$333,492,244	$5,338,291,776	$2,960,799,710	$29,607,997	$3,908,581	28%	$1,094,403	$5,226,547	28%	$1,463,433	**$2,557,836**
2028	$5,338,291,776	$160,148,753	$343,497,012	$5,841,937,541	$3,464,445,475	$34,644,455	$4,573,449	28%	$1,280,566	$6,115,607	28%	$1,712,370	**$2,992,936**
2029	$5,841,937,541	$175,258,126	$353,801,922	$6,370,997,589	$3,993,505,524	$39,935,055	$5,271,866	28%	$1,476,122	$7,049,529	28%	$1,973,868	**$3,449,991**
2030	$6,370,997,589	$191,129,928	$364,415,980	$6,926,543,497	$4,549,051,431	$45,490,514	$6,005,248	28%	$1,681,469	$8,030,206	28%	$2,248,458	**$3,929,927**
2031	$6,926,543,497	$207,796,305	$110,346,571	$7,244,686,373	$4,867,194,307	$48,671,943	$6,425,231	28%	$1,799,065	$8,591,807	28%	$2,405,706	**$4,204,771**
2032	$7,244,686,373	$217,340,591	$113,656,968	$7,575,683,932	$5,198,191,866	$51,981,919	$6,862,184	28%	$1,921,412	$9,176,100	28%	$2,569,308	**$4,490,720**
2033	$7,575,683,932	$227,270,518	$117,066,677	$7,920,021,127	$5,542,529,061	$55,425,291	$7,316,747	28%	$2,048,689	$9,783,940	28%	$2,739,503	**$4,788,193**
2034	$7,920,021,127	$237,600,634	$120,578,677	$8,278,200,438	$5,900,708,372	$59,007,084	$7,789,583	28%	$2,181,083	$10,416,216	28%	$2,916,540	**$5,097,624**
2035	$8,278,200,438	$248,346,013	$124,196,038	$8,650,742,489	$6,273,250,423	$62,732,504	$8,281,380	28%	$2,318,786	$11,073,845	28%	$3,100,677	**$5,419,463**
2036	$8,650,742,489	$259,522,275	$228,554,501	$9,138,819,265	$6,761,327,199	$67,613,272	$8,925,695	28%	$2,499,194	$11,935,422	28%	$3,341,918	**$5,841,113**
2037	$9,138,819,265	$274,164,578	$235,411,136	$9,648,394,979	$7,270,902,913	$72,709,029	$9,598,391	28%	$2,687,549	$12,834,950	28%	$3,593,786	**$6,281,335**
2038	$9,648,394,979	$289,451,849	$242,473,470	$10,180,320,299	$7,802,828,233	$78,028,282	$10,300,590	28%	$2,884,165	$13,773,930	28%	$3,856,700	**$6,740,866**
2039	$10,180,320,299	$305,409,609	$249,747,674	$10,735,477,582	$8,357,985,516	$83,579,855	$11,033,459	28%	$3,089,369	$14,753,920	28%	$4,131,098	**$7,220,466**
2040	$10,735,477,582	$322,064,327	$257,240,105	$11,314,782,014	$8,937,289,948	$89,372,899	$11,798,204	28%	$3,303,497	$15,776,537	28%	$4,417,430	**$7,720,928**
2041	$11,314,782,014	$339,443,460	$209,772,085	$11,863,997,559	$9,486,505,494	$94,865,055	$12,523,229	28%	$3,506,504	$16,746,038	28%	$4,688,891	**$8,195,395**
2042	$11,863,997,559	$355,919,927	$216,065,247	$12,435,982,733	$10,058,490,668	$100,584,907	$13,278,313	28%	$3,717,928	$17,755,734	28%	$4,971,606	**$8,689,533**
2043	$12,435,982,733	$373,079,482	$222,547,205	$13,031,609,420	$10,654,117,355	$106,541,174	$14,064,605	28%	$3,938,089	$18,807,163	28%	$5,266,006	**$9,204,095**
2044	$13,031,609,420	$390,948,283	$229,223,621	$13,651,781,324	$11,274,289,258	$112,742,893	$14,883,300	28%	$4,167,324	$19,901,921	28%	$5,572,538	**$9,739,862**
2045	$13,651,781,324	$409,553,440	$236,100,330	$14,297,435,093	$11,919,943,027	$119,199,430	$15,735,634	28%	$4,405,978	$21,041,660	28%	$5,891,665	**$10,297,642**
2046	$14,297,435,093	$428,923,053	$243,183,339	$14,969,541,485	$12,592,049,420	$125,920,494	$16,622,888	28%	$4,654,409	$22,228,095	28%	$6,223,867	**$10,878,275**
2047	$14,969,541,485	$449,086,245	$250,478,840	$15,669,106,570	$13,291,614,504	$132,916,145	$17,546,391	28%	$4,912,990	$23,463,001	28%	$6,569,640	**$11,482,630**
2048	$15,669,106,570	$470,073,197	$257,993,205	$16,397,172,972	$14,019,680,906	$140,196,809	$18,507,519	28%	$5,182,105	$24,748,219	28%	$6,929,501	**$12,111,607**
2049	$16,397,172,972	$491,915,189	$265,733,001	$17,154,821,162	$14,777,329,096	$147,773,291	$19,507,698	28%	$5,462,155	$26,085,656	28%	$7,303,984	**$12,766,139**
2050	$17,154,821,162	$514,644,635	$273,704,991	$17,943,170,788	$15,565,678,722	$155,656,787	$20,548,406	28%	$5,753,554	$27,477,289	28%	$7,693,641	**$13,447,195**
2051	$17,943,170,788	$538,295,124	$281,916,141	$18,763,382,052	$16,385,889,986	$163,858,900	$21,631,175	28%	$6,056,729	$28,925,166	28%	$8,099,046	**$14,155,775**
2052	$18,763,382,052	$562,901,462	$290,373,625	$19,616,657,138	$17,239,165,073	$172,391,651	$22,757,592	28%	$6,372,126	$30,431,408	28%	$8,520,794	**$14,892,920**
2053	$19,616,657,138	$588,499,714	$299,084,834	$20,504,241,686	$18,126,749,621	$181,267,496	$23,929,301	28%	$6,700,204	$31,998,215	28%	$8,959,500	**$15,659,705**
2054	$20,504,241,686	$615,127,251	$308,057,379	$21,427,426,316	$19,049,934,250	$190,499,342	$25,148,006	28%	$7,041,442	$33,627,866	28%	$9,415,802	**$16,457,244**
2055	$21,427,426,316	$642,822,789	$317,299,100	$22,387,548,205	$20,010,056,140	$200,100,561	$26,415,472	28%	$7,396,332	$35,322,719	28%	$9,890,361	**$17,286,694**
2056	$22,387,548,205	$671,626,446	$326,818,073	$23,385,992,725	$21,008,500,659	$210,085,007	$27,733,529	28%	$7,765,388	$37,085,222	28%	$10,383,862	**$18,149,250**
2057	$23,385,992,725	$701,579,782	$336,622,615	$24,424,195,122	$22,046,703,056	$220,467,031	$29,104,070	28%	$8,149,140	$38,917,907	28%	$10,897,014	**$19,046,153**
2058	$24,424,195,122	$732,725,854	$346,721,294	$25,503,642,269	$23,126,150,203	$231,261,502	$30,529,059	28%	$8,548,136	$40,823,399	28%	$11,430,552	**$19,978,688**
2059	$25,503,642,269	$765,109,268	$357,122,933	$26,625,874,470	$24,248,382,404	$242,483,824	$32,010,528	28%	$8,962,948	$42,804,418	28%	$11,985,237	**$20,948,185**
2060	$26,625,874,470	$798,776,234	$367,836,621	$27,792,487,324	$25,414,995,259	$254,149,953	$33,550,586	28%	$9,394,164	$44,863,779	28%	$12,561,858	**$21,956,022**
2061	$27,792,487,324	$833,774,620	$0	$28,626,261,944	$26,248,769,878	$262,487,699	$34,651,260	28%	$9,702,353	$46,335,599	28%	$12,973,968	**$22,676,320**

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Source: San Joaquin County; City of Lathrop; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.
[2] See Table A-4 for new AV added to roll from 2017-18 on. It is assumed that new AV is added to roll in year after development occurs.
In 2016-17 and 2017-18 prior to the start of the EIFD, it is assumed that the growth in new assessed value will be 3% of the existing assessed value.

Table A-3
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Lathrop Annexation Area (Real $)

Lathrop
Annexation Area

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	New AV Added to Roll [2]	Ending AV	Cumulative Growth in AV *starting in 2018*	Gross Tax Increment	Net Tax Increment						
							City [1]	City EIFD Allocation	City EIFD	County [1]	County EIFD Allocation	County EIFD	**Total EIFD**
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*g=f*5.14%*	*h*	*i=g*h*	*j=f*20.55%*	*k*	*l=j*k*	*m=i+l*
2017	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2018	$0	$0	$53,805,455	$53,805,455	$53,805,455	$538,055	$27,642	34%	$9,398	$110,570	34%	$37,594	**$46,992**
2019	$53,805,455	$1,614,164	$55,419,619	$110,839,238	$110,839,238	$1,108,392	$56,943	34%	$19,361	$227,774	34%	$77,443	**$96,804**
2020	$110,839,238	$3,325,177	$57,082,207	$171,246,622	$171,246,622	$1,712,466	$87,978	34%	$29,912	$351,911	34%	$119,650	**$149,562**
2021	$171,246,622	$5,137,399	$17,106,769	$193,490,790	$193,490,790	$1,934,908	$99,406	34%	$33,798	$397,622	34%	$135,192	**$168,989**
2022	$193,490,790	$5,804,724	$17,619,972	$216,915,486	$216,915,486	$2,169,155	$111,440	34%	$37,890	$445,760	34%	$151,558	**$189,448**
2023	$216,915,486	$6,507,465	$18,148,571	$241,571,521	$241,571,521	$2,415,715	$124,107	34%	$42,196	$496,428	34%	$168,785	**$210,982**
2024	$241,571,521	$7,247,146	$18,693,028	$267,511,696	$267,511,696	$2,675,117	$137,434	34%	$46,727	$549,735	34%	$186,910	**$233,637**
2025	$267,511,696	$8,025,351	$19,253,819	$294,790,866	$294,790,866	$2,947,909	$151,448	34%	$51,492	$605,793	34%	$205,970	**$257,462**
2026	$294,790,866	$8,843,726	$0	$303,634,592	$303,634,592	$3,036,346	$155,992	28%	$43,678	$623,967	28%	$174,711	**$218,388**
2027	$303,634,592	$9,109,038	$0	$312,743,629	$312,743,629	$3,127,436	$160,671	28%	$44,988	$642,686	28%	$179,952	**$224,940**
2028	$312,743,629	$9,382,309	$0	$322,125,938	$322,125,938	$3,221,259	$165,492	28%	$46,338	$661,966	28%	$185,351	**$231,688**
2029	$322,125,938	$9,663,778	$0	$331,789,716	$331,789,716	$3,317,897	$170,456	28%	$47,728	$681,825	28%	$190,911	**$238,639**
2030	$331,789,716	$9,953,691	$0	$341,743,408	$341,743,408	$3,417,434	$175,570	28%	$49,160	$702,280	28%	$196,638	**$245,798**
2031	$341,743,408	$10,252,302	$0	$351,995,710	$351,995,710	$3,519,957	$180,837	28%	$50,634	$723,349	28%	$202,538	**$253,172**
2032	$351,995,710	$10,559,871	$0	$362,555,581	$362,555,581	$3,625,556	$186,262	28%	$52,153	$745,049	28%	$208,614	**$260,767**
2033	$362,555,581	$10,876,667	$0	$373,432,249	$373,432,249	$3,734,322	$191,850	28%	$53,718	$767,401	28%	$214,872	**$268,590**
2034	$373,432,249	$11,202,967	$0	$384,635,216	$384,635,216	$3,846,352	$197,606	28%	$55,330	$790,423	28%	$221,318	**$276,648**
2035	$384,635,216	$11,539,056	$0	$396,174,273	$396,174,273	$3,961,743	$203,534	28%	$56,989	$814,135	28%	$227,958	**$284,947**
2036	$396,174,273	$11,885,228	$0	$408,059,501	$408,059,501	$4,080,595	$209,640	28%	$58,699	$838,559	28%	$234,797	**$293,496**
2037	$408,059,501	$12,241,785	$0	$420,301,286	$420,301,286	$4,203,013	$215,929	28%	$60,460	$863,716	28%	$241,840	**$302,301**
2038	$420,301,286	$12,609,039	$0	$432,910,325	$432,910,325	$4,329,103	$222,407	28%	$62,274	$889,628	28%	$249,096	**$311,370**
2039	$432,910,325	$12,987,310	$0	$445,897,634	$445,897,634	$4,458,976	$229,079	28%	$64,142	$916,316	28%	$256,569	**$320,711**
2040	$445,897,634	$13,376,929	$0	$459,274,563	$459,274,563	$4,592,746	$235,951	28%	$66,066	$943,806	28%	$264,266	**$330,332**
2041	$459,274,563	$13,778,237	$4,605,623	$477,658,423	$477,658,423	$4,776,584	$245,396	28%	$68,711	$981,585	28%	$274,844	**$343,555**
2042	$477,658,423	$14,329,753	$4,743,791	$496,731,967	$496,731,967	$4,967,320	$255,195	28%	$71,455	$1,020,781	28%	$285,819	**$357,273**
2043	$496,731,967	$14,901,959	$4,886,105	$516,520,032	$516,520,032	$5,165,200	$265,361	28%	$74,301	$1,061,445	28%	$297,205	**$371,506**
2044	$516,520,032	$15,495,601	$5,032,688	$537,048,321	$537,048,321	$5,370,483	$275,908	28%	$77,254	$1,103,630	28%	$309,016	**$386,271**
2045	$537,048,321	$16,111,450	$5,183,669	$558,343,440	$558,343,440	$5,583,434	$286,848	28%	$80,317	$1,147,392	28%	$321,270	**$401,587**
2046	$558,343,440	$16,750,303	$5,339,179	$580,432,922	$580,432,922	$5,804,329	$298,196	28%	$83,495	$1,192,785	28%	$333,980	**$417,475**
2047	$580,432,922	$17,412,988	$5,499,354	$603,345,264	$603,345,264	$6,033,453	$309,968	28%	$86,791	$1,239,870	28%	$347,164	**$433,955**
2048	$603,345,264	$18,100,358	$5,664,335	$627,109,957	$627,109,957	$6,271,100	$322,177	28%	$90,209	$1,288,706	28%	$360,838	**$451,047**
2049	$627,109,957	$18,813,299	$5,834,265	$651,757,521	$651,757,521	$6,517,575	$334,839	28%	$93,755	$1,339,357	28%	$375,020	**$468,775**
2050	$651,757,521	$19,552,726	$6,009,293	$677,319,540	$677,319,540	$6,773,195	$347,972	28%	$97,432	$1,391,887	28%	$389,728	**$487,160**
2051	$677,319,540	$20,319,586	$6,189,572	$703,828,698	$703,828,698	$7,038,287	$361,591	28%	$101,245	$1,446,363	28%	$404,982	**$506,227**
2052	$703,828,698	$21,114,861	$6,375,259	$731,318,818	$731,318,818	$7,313,188	$375,714	28%	$105,200	$1,502,855	28%	$420,799	**$525,999**
2053	$731,318,818	$21,939,565	$6,566,517	$759,824,899	$759,824,899	$7,598,249	$390,359	28%	$109,300	$1,561,435	28%	$437,202	**$546,502**
2054	$759,824,899	$22,794,747	$6,763,512	$789,383,159	$789,383,159	$7,893,832	$405,544	28%	$113,552	$1,622,177	28%	$454,209	**$567,762**
2055	$789,383,159	$23,681,495	$6,966,418	$820,031,071	$820,031,071	$8,200,311	$421,289	28%	$117,961	$1,685,158	28%	$471,844	**$589,805**
2056	$820,031,071	$24,600,932	$7,175,410	$851,807,413	$851,807,413	$8,518,074	$437,614	28%	$122,532	$1,750,458	28%	$490,128	**$612,660**
2057	$851,807,413	$25,554,222	$7,390,673	$884,752,308	$884,752,308	$8,847,523	$454,540	28%	$127,271	$1,818,159	28%	$509,085	**$636,356**
2058	$884,752,308	$26,542,569	$7,612,393	$918,907,270	$918,907,270	$9,189,073	$472,087	28%	$132,184	$1,888,348	28%	$528,737	**$660,922**
2059	$918,907,270	$27,567,218	$7,840,765	$954,315,253	$954,315,253	$9,543,153	$490,278	28%	$137,278	$1,961,111	28%	$549,111	**$686,389**
2060	$954,315,253	$28,629,458	$8,075,987	$991,020,698	$991,020,698	$9,910,207	$509,135	28%	$142,558	$2,036,540	28%	$570,231	**$712,789**
2061	$991,020,698	$29,730,621	$0	$1,020,751,319	$1,020,751,319	$10,207,513	$524,409	28%	$146,835	$2,097,636	28%	$587,338	**$734,173**

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Source: San Joaquin County; City of Lathrop; LWA; EPS.

[1] Prior to annexation of the annexation area to the City, the City receives no property tax revenue for these TRAs.
[2] See Table A-5 for new AV added to roll from 2017-18 on. It is assumed that new AV is added to roll in year after development occurs.
In 2016-17 and 2017-18 prior to the start of the EIFD, it is assumed that the growth in new assessed value will be 3% of the existing assessed value.

Table A-4
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Assessed Value of New Development - Lathrop Existing City (2016 and Real $)

Lathrop
Existing City

	Assessed Value of New Development [1]															
Fiscal Year Ending	Low Density Residential	Medium Density Residential	Variable Density Residential	Variable Density Residential Flex	High Density Residential	Residential / Mixed Use	**Subtotal Residential**	Retail	Service Commercial	Office	Industrial	Light Industrial / R&D Flex	**Subtotal Nonres.**	**Total (2016$)**	Escalation Factor [2]	**Total with Annual Sales Price Increase**
	AV per Dwelling Unit							*AV per Bldg. Sq. Ft.*								
Assumption	*$450,000*	*$425,000*	*$425,000*	*$180,000*	*$180,000*	*$180,000*		*$200*	*$200*	*$150*	*$85*	*$85*				
2018	$6,300,000	$3,825,000	$85,000,000	$0	$16,380,000	$0	**$111,505,000**	$4,443,120	$17,772,480	$6,207,300	$9,256,500	$0	**$37,679,400**	**$149,184,400**	1.061	**$158,269,730**
2019	$6,300,000	$3,825,000	$85,000,000	$0	$16,380,000	$0	**$111,505,000**	$4,443,120	$17,772,480	$6,207,300	$9,256,500	$0	**$37,679,400**	**$149,184,400**	1.093	**$163,017,822**
2020	$6,300,000	$3,825,000	$85,000,000	$0	$16,380,000	$0	**$111,505,000**	$4,443,120	$17,772,480	$6,207,300	$9,256,500	$0	**$37,679,400**	**$149,184,400**	1.126	**$167,908,357**
2021	$3,510,000	$8,245,000	$61,710,000	$0	$13,356,000	$0	**$86,821,000**	$5,514,696	$22,058,784	$3,822,390	$5,553,900	$0	**$36,949,770**	**$123,770,770**	1.159	**$143,484,245**
2022	$3,510,000	$8,245,000	$61,710,000	$0	$13,356,000	$0	**$86,821,000**	$5,514,696	$22,058,784	$3,822,390	$5,553,900	$0	**$36,949,770**	**$123,770,770**	1.194	**$147,788,772**
2023	$3,510,000	$8,245,000	$61,710,000	$0	$13,356,000	$0	**$86,821,000**	$5,514,696	$22,058,784	$3,822,390	$5,553,900	$0	**$36,949,770**	**$123,770,770**	1.230	**$152,222,435**
2024	$3,510,000	$8,245,000	$61,710,000	$0	$13,356,000	$0	**$86,821,000**	$5,514,696	$22,058,784	$3,822,390	$5,553,900	$0	**$36,949,770**	**$123,770,770**	1.267	**$156,789,108**
2025	$3,510,000	$8,245,000	$61,710,000	$0	$13,356,000	$0	**$86,821,000**	$5,514,696	$22,058,784	$3,822,390	$5,553,900	$0	**$36,949,770**	**$123,770,770**	1.305	**$161,492,782**
2026	$3,510,000	$8,245,000	$77,265,000	$0	$252,000	$0	**$89,272,000**	$24,093,472	$96,373,886	$10,766,399	$11,107,800	$9,308,336	**$151,649,893**	**$240,921,893**	1.344	**$323,778,878**
2027	$3,510,000	$8,245,000	$77,265,000	$0	$252,000	$0	**$89,272,000**	$24,093,472	$96,373,886	$10,766,399	$11,107,800	$9,308,336	**$151,649,893**	**$240,921,893**	1.384	**$333,492,244**
2028	$3,510,000	$8,245,000	$77,265,000	$0	$252,000	$0	**$89,272,000**	$24,093,472	$96,373,886	$10,766,399	$11,107,800	$9,308,336	**$151,649,893**	**$240,921,893**	1.426	**$343,497,012**
2029	$3,510,000	$8,245,000	$77,265,000	$0	$252,000	$0	**$89,272,000**	$24,093,472	$96,373,886	$10,766,399	$11,107,800	$9,308,336	**$151,649,893**	**$240,921,893**	1.469	**$353,801,922**
2030	$3,510,000	$8,245,000	$77,265,000	$0	$252,000	$0	**$89,272,000**	$24,093,472	$96,373,886	$10,766,399	$11,107,800	$9,308,336	**$151,649,893**	**$240,921,893**	1.513	**$364,415,980**
2031	$540,000	$2,295,000	$0	$0	$252,000	$0	**$3,087,000**	$5,035,100	$20,140,402	$11,040,827	$22,215,600	$9,308,336	**$67,740,265**	**$70,827,265**	1.558	**$110,346,571**
2032	$540,000	$2,295,000	$0	$0	$252,000	$0	**$3,087,000**	$5,035,100	$20,140,402	$11,040,827	$22,215,600	$9,308,336	**$67,740,265**	**$70,827,265**	1.605	**$113,656,968**
2033	$540,000	$2,295,000	$0	$0	$252,000	$0	**$3,087,000**	$5,035,100	$20,140,402	$11,040,827	$22,215,600	$9,308,336	**$67,740,265**	**$70,827,265**	1.653	**$117,066,677**
2034	$540,000	$2,295,000	$0	$0	$252,000	$0	**$3,087,000**	$5,035,100	$20,140,402	$11,040,827	$22,215,600	$9,308,336	**$67,740,265**	**$70,827,265**	1.702	**$120,578,677**
2035	$540,000	$2,295,000	$0	$0	$252,000	$0	**$3,087,000**	$5,035,100	$20,140,402	$11,040,827	$22,215,600	$9,308,336	**$67,740,265**	**$70,827,265**	1.754	**$124,196,038**
2036	$540,000	$2,465,000	$0	$0	$252,000	$0	**$3,257,000**	$7,780,687	$31,122,749	$21,336,777	$44,431,200	$18,616,673	**$123,288,086**	**$126,545,086**	1.806	**$228,554,501**
2037	$540,000	$2,465,000	$0	$0	$252,000	$0	**$3,257,000**	$7,780,687	$31,122,749	$21,336,777	$44,431,200	$18,616,673	**$123,288,086**	**$126,545,086**	1.860	**$235,411,136**
2038	$540,000	$2,465,000	$0	$0	$252,000	$0	**$3,257,000**	$7,780,687	$31,122,749	$21,336,777	$44,431,200	$18,616,673	**$123,288,086**	**$126,545,086**	1.916	**$242,473,470**
2039	$540,000	$2,465,000	$0	$0	$252,000	$0	**$3,257,000**	$7,780,687	$31,122,749	$21,336,777	$44,431,200	$18,616,673	**$123,288,086**	**$126,545,086**	1.974	**$249,747,674**
2040	$540,000	$2,465,000	$0	$0	$252,000	$0	**$3,257,000**	$7,780,687	$31,122,749	$21,336,777	$44,431,200	$18,616,673	**$123,288,086**	**$126,545,086**	2.033	**$257,240,105**
2041	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.094	**$209,772,085**
2042	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.157	**$216,065,247**
2043	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.221	**$222,547,205**
2044	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.288	**$229,223,621**
2045	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.357	**$236,100,330**
2046	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.427	**$243,183,339**
2047	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.500	**$250,478,840**
2048	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.575	**$257,993,205**
2049	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.652	**$265,733,001**
2050	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.732	**$273,704,991**
2051	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.814	**$281,916,141**
2052	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.898	**$290,373,625**
2053	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	2.985	**$299,084,834**
2054	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	3.075	**$308,057,379**
2055	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	3.167	**$317,299,100**
2056	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	3.262	**$326,818,073**
2057	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	3.360	**$336,622,615**
2058	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	3.461	**$346,721,294**
2059	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	3.565	**$357,122,933**
2060	$14,940,000	$573,750	$55,866,250	$3,852,000	$972,000	$5,859,000	**$82,063,000**	$2,938,993	$9,188,111	$5,998,212	$0	$0	**$18,125,316**	**$100,188,316**	3.671	**$367,836,621**

av lath ex

Source: San Joaquin County; City of Lathrop; LWA; EPS.

[1] Calculated as annual projected dwelling units/bldg. sq. ft. multiplied by AV per dwelling unit/bldg. sq. ft. See Table A-6 for development projections.

Table A-5
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Assessed Value of New Development - Lathrop Annexation Areas (2016 and Real $)

Lathrop Annexation Area

Fiscal Year Ending	Assessed Value of New Development [1]															
	Low Density Residential	Medium Density Residential	Variable Density Residential	Variable Density Residential Flex	High Density Residential	Residential / Mixed Use	**Subtotal Residential**	Retail	Service Commercial	Office	Industrial	Light Industrial / R&D Flex	**Subtotal Nonres.**	**Total (2016$)**	Escalation Factor [2]	**Total with Annual Sales Price Increase**
	AV per Dwelling Unit							*AV per Bldg. Sq. Ft.*								
Assumption	*$ 450,000*	*$ 425,000*	*$ 425,000*	*$ 180,000*	*$ 180,000*	*$ 180,000*		*$ 200*	*$ 200*	*$ 150*	*$ 85*	*$ 85*				
2018	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$50,716,802	**$50,716,802**	**$50,716,802**	1.061	**$53,805,455**
2019	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$50,716,802	**$50,716,802**	**$50,716,802**	1.093	**$55,419,619**
2020	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$50,716,802	**$50,716,802**	**$50,716,802**	1.126	**$57,082,207**
2021	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$14,756,449	**$14,756,449**	**$14,756,449**	1.159	**$17,106,769**
2022	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$14,756,449	**$14,756,449**	**$14,756,449**	1.194	**$17,619,972**
2023	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$14,756,449	**$14,756,449**	**$14,756,449**	1.230	**$18,148,571**
2024	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$14,756,449	**$14,756,449**	**$14,756,449**	1.267	**$18,693,028**
2025	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$14,756,449	**$14,756,449**	**$14,756,449**	1.305	**$19,253,819**
2026	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.344	**$0**
2027	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.384	**$0**
2028	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.426	**$0**
2029	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.469	**$0**
2030	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.513	**$0**
2031	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.558	**$0**
2032	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.605	**$0**
2033	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.653	**$0**
2034	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.702	**$0**
2035	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.754	**$0**
2036	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.806	**$0**
2037	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.860	**$0**
2038	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.916	**$0**
2039	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	1.974	**$0**
2040	$0	$0	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	$0	**$0**	**$0**	2.033	**$0**
2041	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.094	**$4,605,623**
2042	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.157	**$4,743,791**
2043	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.221	**$4,886,105**
2044	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.288	**$5,032,688**
2045	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.357	**$5,183,669**
2046	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.427	**$5,339,179**
2047	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.500	**$5,499,354**
2048	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.575	**$5,664,335**
2049	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.652	**$5,834,265**
2050	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.732	**$6,009,293**
2051	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.814	**$6,189,572**
2052	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.898	**$6,375,259**
2053	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	2.985	**$6,566,517**
2054	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	3.075	**$6,763,512**
2055	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	3.167	**$6,966,418**
2056	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	3.262	**$7,175,410**
2057	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	3.360	**$7,390,673**
2058	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	3.461	**$7,612,393**
2059	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	3.565	**$7,840,765**
2060	$0	$0	$0	$0	$0	$0	**$0**	$229,997	$919,987	$0	$0	$1,049,687	**$2,199,671**	**$2,199,671**	3.671	**$8,075,987**

av lath ann

Source: San Joaquin County; City of Lathrop; LWA; EPS.

[1] Calculated as annual projected dwelling units/bldg. sq. ft. multiplied by AV per dwelling unit/bldg. sq. ft. See Table A-6 for development projections.
[2] Based on a 3 percent annual growth factor.

Table A-6
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Incremental Development Projections - Lathrop

Lathrop

	Existing City												
	Dwelling Units							Building Square Feet					
Fiscal Year Ending	Low Density Residential	Medium Density Residential	Variable Density Residential	Variable Density Residential Flex	High Density Residential	Residential / Mixed Use	**TOTAL**	Retail	Service Commercial	Office	Industrial	Light Industrial / R&D Flex	**Total**
2018	14	9	200	-	91	-	**314**	22,216	88,862	41,382	108,900	-	**261,360**
2019	14	9	200	-	91	-	**314**	22,216	88,862	41,382	108,900	-	**261,360**
2020	14	9	200	-	91	-	**314**	22,216	88,862	41,382	108,900	-	**261,360**
2021	8	19	145	-	74	-	**247**	27,573	110,294	25,483	65,340	-	**228,690**
2022	8	19	145	-	74	-	**247**	27,573	110,294	25,483	65,340	-	**228,690**
2023	8	19	145	-	74	-	**247**	27,573	110,294	25,483	65,340	-	**228,690**
2024	8	19	145	-	74	-	**247**	27,573	110,294	25,483	65,340	-	**228,690**
2025	8	19	145	-	74	-	**247**	27,573	110,294	25,483	65,340	-	**228,690**
2026	8	19	182	-	1	-	**210**	120,467	481,869	71,776	130,680	109,510	**914,303**
2027	8	19	182	-	1	-	**210**	120,467	481,869	71,776	130,680	109,510	**914,303**
2028	8	19	182	-	1	-	**210**	120,467	481,869	71,776	130,680	109,510	**914,303**
2029	8	19	182	-	1	-	**210**	120,467	481,869	71,776	130,680	109,510	**914,303**
2030	8	19	182	-	1	-	**210**	120,467	481,869	71,776	130,680	109,510	**914,303**
2031	1	5	-	-	1	-	**8**	25,176	100,702	73,606	261,360	109,510	**570,353**
2032	1	5	-	-	1	-	**8**	25,176	100,702	73,606	261,360	109,510	**570,353**
2033	1	5	-	-	1	-	**8**	25,176	100,702	73,606	261,360	109,510	**570,353**
2034	1	5	-	-	1	-	**8**	25,176	100,702	73,606	261,360	109,510	**570,353**
2035	1	5	-	-	1	-	**8**	25,176	100,702	73,606	261,360	109,510	**570,353**
2036	1	6	-	-	1	-	**8**	38,903	155,614	142,245	522,720	219,020	**1,078,502**
2037	1	6	-	-	1	-	**8**	38,903	155,614	142,245	522,720	219,020	**1,078,502**
2038	1	6	-	-	1	-	**8**	38,903	155,614	142,245	522,720	219,020	**1,078,502**
2039	1	6	-	-	1	-	**8**	38,903	155,614	142,245	522,720	219,020	**1,078,502**
2040	1	6	-	-	1	-	**8**	38,903	155,614	142,245	522,720	219,020	**1,078,502**
2041	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2042	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2043	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2044	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2045	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2046	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2047	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2048	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2049	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2050	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2051	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2052	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2053	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2054	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2055	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2056	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2057	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2058	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2059	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
2060	33	1	131	21	5	33	**225**	14,695	45,941	39,988	-	-	**100,624**
Total	**796**	**304**	**4,864**	**428**	**773**	**651**	**7,816**	**1,421,145**	**5,427,794**	**2,489,454**	**5,227,200**	**2,190,197**	**16,755,790**

Source: San Joaquin County; City of Lathrop; LWA; EPS.

Table A-6
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Incremental Development Projections - Lathrop

Lathrop

	Annexation Area												
	Dwelling Units							Building Square Feet					
Fiscal Year Ending	Low Density Residential	Medium Density Residential	Variable Density Residential	Variable Density Residential Flex	High Density Residential	Residential / Mixed Use	**TOTAL**	Retail	Service Commercial	Office	Industrial	Light Industrial / R&D Flex	**Total**
2018	-	-	-	-	-	-	**-**	-	-	-	-	596,668	**596,668**
2019	-	-	-	-	-	-	**-**	-	-	-	-	596,668	**596,668**
2020	-	-	-	-	-	-	**-**	-	-	-	-	596,668	**596,668**
2021	-	-	-	-	-	-	**-**	-	-	-	-	173,605	**173,605**
2022	-	-	-	-	-	-	**-**	-	-	-	-	173,605	**173,605**
2023	-	-	-	-	-	-	**-**	-	-	-	-	173,605	**173,605**
2024	-	-	-	-	-	-	**-**	-	-	-	-	173,605	**173,605**
2025	-	-	-	-	-	-	**-**	-	-	-	-	173,605	**173,605**
2026	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2027	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2028	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2029	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2030	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2031	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2032	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2033	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2034	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2035	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2036	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2037	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2038	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2039	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2040	-	-	-	-	-	-	**-**	-	-	-	-	-	**-**
2041	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2042	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2043	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2044	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2045	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2046	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2047	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2048	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2049	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2050	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2051	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2052	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2053	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2054	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2055	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2056	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2057	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2058	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2059	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
2060	-	-	-	-	-	-	**-**	1,150	4,600	-	-	12,349	**18,099**
Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**23,000**	**91,999**	**-**	**-**	**2,905,016**	**3,020,015**

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Source: San Joaquin County; City of Lathrop; LWA; EPS.

APPENDIX B:

City of Manteca

Table B-1 Projected Tax Increment to EIFD—Manteca 23

Table B-2 Projected Tax Increment to EIFD—
Manteca Existing City Boundaries 24

Table B-3 Projected Tax Increment to EIFD—
Manteca Annexation Area 25

Table B-4 Assessed Value of New Development—
Manteca Existing City 26

Table B-5 Assessed Value of New Development—
Manteca Annexation Areas 27

Table B-6 Incremental Development Projections—Manteca 28

Table B-1
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Manteca (Real $)

Manteca

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	New AV Added to Roll [2]	Ending AV	Cumulative Growth in AV starting in 2018	Gross Tax Increment	Net Tax Increment				
							City [1]	City EIFD	County [1]	County EIFD	Total EIFD
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*[3]*	*h=g*34%*	*[3]*	*j=i*34%*	*h+j*
2017	$525,776,893	$15,773,307	$0	$541,550,200	$0	$0	$0	$0	$0	$0	**$0**
2018	$541,550,200	$16,246,506	$74,192,400	$631,989,106	$90,438,906	$904,389	$101,885	$34,641	$203,277	$69,114	**$103,755**
2019	$631,989,106	$18,959,673	$66,338,172	$717,286,951	$175,736,751	$1,757,368	$202,503	$68,851	$391,060	$132,961	**$201,812**
2020	$717,286,951	$21,518,609	$76,073,140	$814,878,700	$273,328,500	$2,733,285	$340,893	$115,904	$585,657	$199,123	**$315,027**
2021	$814,878,700	$24,446,361	$58,427,413	$897,752,474	$356,202,275	$3,562,023	$458,145	$155,769	$751,139	$255,387	**$411,156**
2022	$897,752,474	$26,932,574	$88,121,059	$1,012,806,108	$471,255,908	$4,712,559	$621,472	$211,300	$980,402	$333,337	**$544,637**
2023	$1,012,806,108	$30,384,183	$108,917,630	$1,152,107,921	$610,557,721	$6,105,577	$819,505	$278,632	$1,257,736	$427,630	**$706,262**
2024	$1,152,107,921	$34,563,238	$125,904,278	$1,312,575,437	$771,025,237	$7,710,252	$1,047,825	$356,260	$1,577,036	$536,192	**$892,453**
2025	$1,312,575,437	$39,377,263	$81,417,847	$1,433,370,547	$891,820,347	$8,918,203	$1,219,235	$414,540	$1,817,799	$618,052	**$1,032,591**
2026	$1,433,370,547	$43,001,116	$67,531,798	$1,543,903,461	$1,002,353,261	$10,023,533	$1,375,885	$385,248	$2,038,279	$570,718	**$955,966**
2027	$1,543,903,461	$46,317,104	$69,557,752	$1,659,778,317	$1,118,228,117	$11,182,281	$1,540,139	$431,239	$2,269,386	$635,428	**$1,066,667**
2028	$1,659,778,317	$49,793,350	$71,644,485	$1,781,216,151	$1,239,665,951	$12,396,660	$1,712,311	$479,447	$2,511,560	$703,237	**$1,182,684**
2029	$1,781,216,151	$53,436,485	$73,793,819	$1,908,446,455	$1,366,896,255	$13,668,963	$1,892,729	$529,964	$2,765,256	$774,272	**$1,304,236**
2030	$1,908,446,455	$57,253,394	$128,094,198	$2,093,794,046	$1,552,243,846	$15,522,438	$2,156,384	$603,787	$3,134,121	$877,554	**$1,481,341**
2031	$2,093,794,046	$62,813,821	$71,666,501	$2,228,274,369	$1,686,724,169	$16,867,242	$2,347,075	$657,181	$3,402,280	$952,638	**$1,609,819**
2032	$2,228,274,369	$66,848,231	$89,863,561	$2,384,986,160	$1,843,435,960	$18,434,360	$2,569,567	$719,479	$3,714,529	$1,040,068	**$1,759,547**
2033	$2,384,986,160	$71,549,585	$88,840,560	$2,545,376,305	$2,003,826,105	$20,038,261	$2,797,268	$783,235	$4,034,118	$1,129,553	**$1,912,788**
2034	$2,545,376,305	$76,361,289	$34,048,661	$2,655,786,256	$2,114,236,056	$21,142,361	$2,953,270	$826,916	$4,254,765	$1,191,334	**$2,018,250**
2035	$2,655,786,256	$79,673,588	$123,634,621	$2,859,094,465	$2,317,544,265	$23,175,443	$3,214,615	$900,092	$4,683,619	$1,311,413	**$2,211,506**
2036	$2,859,094,465	$85,772,834	$184,101,121	$3,128,968,420	$2,587,418,220	$25,874,182	$3,570,463	$999,730	$5,245,109	$1,468,631	**$2,468,360**
2037	$3,128,968,420	$93,869,053	$193,085,506	$3,415,922,978	$2,874,372,779	$28,743,728	$3,949,863	$1,105,962	$5,841,240	$1,635,547	**$2,741,509**
2038	$3,415,922,978	$102,477,689	$193,120,480	$3,711,521,147	$3,169,970,947	$31,699,709	$4,340,694	$1,215,394	$6,455,324	$1,807,491	**$3,022,885**
2039	$3,711,521,147	$111,345,634	$197,834,094	$4,020,700,876	$3,479,150,676	$34,791,507	$4,750,007	$1,330,002	$7,097,167	$1,987,207	**$3,317,209**
2040	$4,020,700,876	$120,621,026	$202,689,117	$4,344,011,019	$3,802,460,819	$38,024,608	$5,178,557	$1,449,996	$7,767,883	$2,175,007	**$3,625,003**
2041	$4,344,011,019	$130,320,331	$207,689,790	$4,682,021,139	$4,140,470,940	$41,404,709	$5,627,131	$1,575,597	$8,468,624	$2,371,215	**$3,946,811**
2042	$4,682,021,139	$140,460,634	$212,840,484	$5,035,322,257	$4,493,772,058	$44,937,721	$6,096,544	$1,707,032	$9,200,591	$2,576,165	**$4,283,198**
2043	$5,035,322,257	$151,059,668	$218,145,698	$5,404,527,624	$4,862,977,424	$48,629,774	$6,587,643	$1,844,540	$9,965,025	$2,790,207	**$4,634,747**
2044	$5,404,527,624	$162,135,829	$162,265,603	$5,728,929,056	$5,187,378,856	$51,873,789	$7,013,386	$1,963,748	$10,641,706	$2,979,678	**$4,943,426**
2045	$5,728,929,056	$171,867,872	$120,836,358	$6,021,633,286	$5,480,083,086	$54,800,831	$7,392,524	$2,069,907	$11,256,625	$3,151,855	**$5,221,762**
2046	$6,021,633,286	$180,648,999	$123,381,449	$6,325,663,733	$5,784,113,533	$57,841,135	$7,786,684	$2,180,272	$11,895,033	$3,330,609	**$5,510,881**
2047	$6,325,663,733	$189,769,912	$126,002,892	$6,641,436,538	$6,099,886,338	$60,998,863	$8,196,426	$2,294,999	$12,557,786	$3,516,180	**$5,811,179**
2048	$6,641,436,538	$199,243,096	$120,152,979	$6,960,832,613	$6,419,282,413	$64,192,824	$8,616,662	$2,412,665	$13,223,102	$3,702,468	**$6,115,134**
2049	$6,960,832,613	$208,824,978	$51,322,687	$7,220,980,278	$6,679,430,078	$66,794,301	$8,972,004	$2,512,161	$13,753,634	$3,851,018	**$6,363,179**
2050	$7,220,980,278	$216,629,408	$0	$7,437,609,687	$6,896,059,487	$68,960,595	$9,264,450	$2,594,046	$14,198,424	$3,975,559	**$6,569,605**
2051	$7,437,609,687	$223,128,291	$0	$7,660,737,977	$7,119,187,777	$71,191,878	$9,565,668	$2,678,387	$14,656,557	$4,103,836	**$6,782,223**
2052	$7,660,737,977	$229,822,139	$0	$7,890,560,117	$7,349,009,917	$73,490,099	$9,875,923	$2,765,258	$15,128,435	$4,235,962	**$7,001,220**
2053	$7,890,560,117	$236,716,803	$0	$8,127,276,920	$7,585,726,720	$75,857,267	$10,195,486	$2,854,736	$15,614,468	$4,372,051	**$7,226,787**
2054	$8,127,276,920	$243,818,308	$0	$8,371,095,228	$7,829,545,028	$78,295,450	$10,524,635	$2,946,898	$16,115,083	$4,512,223	**$7,459,121**
2055	$8,371,095,228	$251,132,857	$0	$8,622,228,084	$8,080,677,885	$80,806,779	$10,863,659	$3,041,825	$16,630,716	$4,656,601	**$7,698,425**
2056	$8,622,228,084	$258,666,843	$0	$8,880,894,927	$8,339,344,727	$83,393,447	$11,212,854	$3,139,599	$17,161,818	$4,805,309	**$7,944,908**
2057	$8,880,894,927	$266,426,848	$0	$9,147,321,775	$8,605,771,575	$86,057,716	$11,572,524	$3,240,307	$17,708,854	$4,958,479	**$8,198,786**
2058	$9,147,321,775	$274,419,653	$0	$9,421,741,428	$8,880,191,228	$88,801,912	$11,942,985	$3,344,036	$18,272,300	$5,116,244	**$8,460,280**
2059	$9,421,741,428	$282,652,243	$0	$9,704,393,671	$9,162,843,471	$91,628,435	$12,324,560	$3,450,877	$18,852,650	$5,278,742	**$8,729,619**
2060	$9,704,393,671	$291,131,810	$0	$9,995,525,481	$9,453,975,281	$94,539,753	$12,717,581	$3,560,923	$19,450,410	$5,446,115	**$9,007,037**
2061	$9,995,525,481	$299,865,764	$0	$10,295,391,245	$9,753,841,046	$97,538,410	$13,122,394	$3,674,270	$20,066,103	$5,618,509	**$9,292,779**

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Source: San Joaquin County; City of Manteca; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.
[2] See Table B-4 for new AV added to roll from 2017-18 on. It is assumed that new AV is added to roll in year after development occurs.
In 2016-17 and 2017-18 prior to the start of the EIFD, it is assumed that the growth in new assessed value will be 3% of the existing assessed value.
[3] The City and County tax allocation rates vary between TRAs within the existing City boundaries and the annexation area. See Table B-2 and Table B-3 for more details.

Table B-2
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Manteca Existing City Boundaries (Real $)

Manteca
Existing City

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	New AV Added to Roll [2]	Ending AV	Cumulative Growth in AV *starting in 2018*	Gross Tax Increment	Net Tax Increment						
							City [1]	City EIFD Allocation	City EIFD	County [1]	County EIFD Allocation	County EIFD	Total EIFD
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*g=f*14.33%*	*h*	*i=g*h*	*j=f*19.81%*	*k*	*l=j*k*	*m=i+l*
2017	$525,776,893	$15,773,307	$0	$541,550,200	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2018	$541,550,200	$16,246,506	$38,192,400	$595,989,106	$54,438,906	$544,389	$78,023	34%	$26,528	$107,831	34%	$36,663	**$63,191**
2019	$595,989,106	$17,879,673	$39,338,172	$653,206,951	$111,656,751	$1,116,568	$160,030	34%	$54,410	$221,167	34%	$75,197	**$129,607**
2020	$653,206,951	$19,596,209	$76,073,140	$748,876,300	$207,326,100	$2,073,261	$297,146	34%	$101,030	$410,666	34%	$139,627	**$240,656**
2021	$748,876,300	$22,466,289	$58,427,413	$829,770,002	$288,219,803	$2,882,198	$413,085	34%	$140,449	$570,899	34%	$194,106	**$334,554**
2022	$829,770,002	$24,893,100	$88,121,059	$942,784,162	$401,233,962	$4,012,340	$575,060	34%	$195,520	$794,754	34%	$270,216	**$465,737**
2023	$942,784,162	$28,283,525	$108,917,630	$1,079,985,316	$538,435,116	$5,384,351	$771,701	34%	$262,378	$1,066,519	34%	$362,616	**$624,995**
2024	$1,079,985,316	$32,399,559	$125,904,278	$1,238,289,154	$696,738,954	$6,967,390	$998,586	34%	$339,519	$1,380,083	34%	$469,228	**$808,748**
2025	$1,238,289,154	$37,148,675	$81,417,847	$1,356,855,675	$815,305,476	$8,153,055	$1,168,519	34%	$397,297	$1,614,937	34%	$549,079	**$946,375**
2026	$1,356,855,675	$40,705,670	$67,531,798	$1,465,093,144	$923,542,944	$9,235,429	$1,323,648	28%	$370,622	$1,829,331	28%	$512,213	**$882,834**
2027	$1,465,093,144	$43,952,794	$69,557,752	$1,578,603,690	$1,037,053,490	$10,370,535	$1,486,335	28%	$416,174	$2,054,170	28%	$575,168	**$991,341**
2028	$1,578,603,690	$47,358,111	$71,644,485	$1,697,606,285	$1,156,056,086	$11,560,561	$1,656,893	28%	$463,930	$2,289,887	28%	$641,168	**$1,105,098**
2029	$1,697,606,285	$50,928,189	$73,793,819	$1,822,328,293	$1,280,778,093	$12,807,781	$1,835,648	28%	$513,981	$2,536,934	28%	$710,341	**$1,224,323**
2030	$1,822,328,293	$54,669,849	$128,094,198	$2,005,092,340	$1,463,542,140	$14,635,421	$2,097,591	28%	$587,325	$2,898,948	28%	$811,706	**$1,399,031**
2031	$2,005,092,340	$60,152,770	$71,666,501	$2,136,911,611	$1,595,361,411	$15,953,614	$2,286,518	28%	$640,225	$3,160,053	28%	$884,815	**$1,525,040**
2032	$2,136,911,611	$64,107,348	$89,863,561	$2,290,882,520	$1,749,332,320	$17,493,323	$2,507,193	28%	$702,014	$3,465,034	28%	$970,210	**$1,672,224**
2033	$2,290,882,520	$68,726,476	$88,840,560	$2,448,449,556	$1,906,899,356	$19,068,994	$2,733,023	28%	$765,246	$3,777,139	28%	$1,057,599	**$1,822,845**
2034	$2,448,449,556	$73,453,487	$34,048,661	$2,555,951,704	$2,014,401,504	$20,144,015	$2,887,098	28%	$808,387	$3,990,077	28%	$1,117,222	**$1,925,609**
2035	$2,555,951,704	$76,678,551	$87,634,621	$2,720,264,876	$2,178,714,676	$21,787,147	$3,122,596	28%	$874,327	$4,315,544	28%	$1,208,352	**$2,082,679**
2036	$2,720,264,876	$81,607,946	$148,101,121	$2,949,973,944	$2,408,423,744	$24,084,237	$3,451,822	28%	$966,510	$4,770,546	28%	$1,335,753	**$2,302,263**
2037	$2,949,973,944	$88,499,218	$157,085,506	$3,195,558,668	$2,654,008,468	$26,540,085	$3,803,801	28%	$1,065,064	$5,256,995	28%	$1,471,959	**$2,537,023**
2038	$3,195,558,668	$95,866,760	$157,120,480	$3,448,545,907	$2,906,995,708	$29,069,957	$4,166,390	28%	$1,166,589	$5,758,106	28%	$1,612,270	**$2,778,859**
2039	$3,448,545,907	$103,456,377	$161,834,094	$3,713,836,378	$3,172,286,179	$31,722,862	$4,546,612	28%	$1,273,051	$6,283,586	28%	$1,759,404	**$3,032,455**
2040	$3,713,836,378	$111,415,091	$166,689,117	$3,991,940,587	$3,450,390,387	$34,503,904	$4,945,199	28%	$1,384,656	$6,834,448	28%	$1,913,646	**$3,298,301**
2041	$3,991,940,587	$119,758,218	$171,689,790	$4,283,388,594	$3,741,838,395	$37,418,384	$5,362,910	28%	$1,501,615	$7,411,741	28%	$2,075,288	**$3,576,902**
2042	$4,283,388,594	$128,501,658	$176,840,484	$4,588,730,736	$4,047,180,536	$40,471,805	$5,800,535	28%	$1,624,150	$8,016,556	28%	$2,244,636	**$3,868,785**
2043	$4,588,730,736	$137,661,922	$182,145,698	$4,908,538,357	$4,366,988,157	$43,669,882	$6,258,893	28%	$1,752,490	$8,650,023	28%	$2,422,006	**$4,174,496**
2044	$4,908,538,357	$147,256,151	$126,265,603	$5,182,060,111	$4,640,509,911	$46,405,099	$6,650,912	28%	$1,862,255	$9,191,808	28%	$2,573,706	**$4,435,962**
2045	$5,182,060,111	$155,461,803	$84,836,358	$5,422,358,272	$4,880,808,073	$48,808,081	$6,995,314	28%	$1,958,688	$9,667,785	28%	$2,706,980	**$4,665,668**
2046	$5,422,358,272	$162,670,748	$87,381,449	$5,672,410,470	$5,130,860,270	$51,308,603	$7,353,696	28%	$2,059,035	$10,163,082	28%	$2,845,663	**$4,904,698**
2047	$5,672,410,470	$170,172,314	$90,002,892	$5,932,585,676	$5,391,035,476	$53,910,355	$7,726,587	28%	$2,163,444	$10,678,430	28%	$2,989,961	**$5,153,405**
2048	$5,932,585,676	$177,977,570	$92,702,979	$6,203,266,226	$5,661,716,026	$56,617,160	$8,114,534	28%	$2,272,070	$11,214,588	28%	$3,140,085	**$5,412,154**
2049	$6,203,266,226	$186,097,987	$51,322,687	$6,440,686,899	$5,899,136,699	$58,991,367	$8,454,812	28%	$2,367,347	$11,684,865	28%	$3,271,762	**$5,639,110**
2050	$6,440,686,899	$193,220,607	$0	$6,633,907,506	$6,092,357,306	$60,923,573	$8,731,741	28%	$2,444,888	$12,067,591	28%	$3,378,926	**$5,823,813**
2051	$6,633,907,506	$199,017,225	$0	$6,832,924,731	$6,291,374,532	$62,913,745	$9,016,979	28%	$2,524,754	$12,461,800	28%	$3,489,304	**$6,014,058**
2052	$6,832,924,731	$204,987,742	$0	$7,037,912,473	$6,496,362,274	$64,963,623	$9,310,773	28%	$2,607,016	$12,867,835	28%	$3,602,994	**$6,210,010**
2053	$7,037,912,473	$211,137,374	$0	$7,249,049,848	$6,707,499,648	$67,074,996	$9,613,381	28%	$2,691,747	$13,286,050	28%	$3,720,094	**$6,411,841**
2054	$7,249,049,848	$217,471,495	$0	$7,466,521,343	$6,924,971,143	$69,249,711	$9,925,067	28%	$2,779,019	$13,716,812	28%	$3,840,707	**$6,619,726**
2055	$7,466,521,343	$223,995,640	$0	$7,690,516,983	$7,148,966,783	$71,489,668	$10,246,104	28%	$2,868,909	$14,160,498	28%	$3,964,939	**$6,833,849**
2056	$7,690,516,983	$230,715,509	$0	$7,921,232,493	$7,379,682,293	$73,796,823	$10,576,773	28%	$2,961,496	$14,617,493	28%	$4,092,898	**$7,054,394**
2057	$7,921,232,493	$237,636,975	$0	$8,158,869,467	$7,617,319,268	$76,173,193	$10,917,361	28%	$3,056,861	$15,088,199	28%	$4,224,696	**$7,281,557**
2058	$8,158,869,467	$244,766,084	$0	$8,403,635,552	$7,862,085,352	$78,620,854	$11,268,166	28%	$3,155,087	$15,573,025	28%	$4,360,447	**$7,515,534**
2059	$8,403,635,552	$252,109,067	$0	$8,655,744,618	$8,114,194,418	$81,141,944	$11,629,496	28%	$3,256,259	$16,072,397	28%	$4,500,271	**$7,756,530**
2060	$8,655,744,618	$259,672,339	$0	$8,915,416,957	$8,373,866,757	$83,738,668	$12,001,666	28%	$3,360,467	$16,586,749	28%	$4,644,290	**$8,004,756**
2061	$8,915,416,957	$267,462,509	$0	$9,182,879,465	$8,641,329,266	$86,413,293	$12,385,001	28%	$3,467,800	$17,116,532	28%	$4,792,629	**$8,260,429**

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Source: San Joaquin County; City of Manteca; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.
[2] See Table B-4 for new AV added to roll from 2017-18 on. It is assumed that new AV is added to roll in year after development occurs.
In 2016-17 and 2017-18 prior to the start of the EIFD, it is assumed that the growth in new assessed value will be 3% of the existing assessed value.

Table B-3
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Manteca Annexation Area (Real $)

Manteca
Annexation Area

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	New AV Added to Roll [2]	Ending AV	Cumulative Growth in AV *starting in 2018*	Gross Tax Increment	Net Tax Increment						
							City [1]	City EIFD Allocation	City EIFD	County [1]	County EIFD Allocation	County EIFD	**Total EIFD**
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*g=f*6.63%*	*h*	*i=g*h*	*j=f*26.51%*	*k*	*l=j*k*	*m=i+l*
2017	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2018	$0	$0	$36,000,000	$36,000,000	$36,000,000	$360,000	$23,861	34%	$8,113	$95,446	34%	$32,452	**$40,564**
2019	$36,000,000	$1,080,000	$27,000,000	$64,080,000	$64,080,000	$640,800	$42,473	34%	$14,441	$169,893	34%	$57,764	**$72,205**
2020	$64,080,000	$1,922,400	$0	$66,002,400	$66,002,400	$660,024	$43,748	34%	$14,874	$174,990	34%	$59,497	**$74,371**
2021	$66,002,400	$1,980,072	$0	$67,982,472	$67,982,472	$679,825	$45,060	34%	$15,320	$180,240	34%	$61,282	**$76,602**
2022	$67,982,472	$2,039,474	$0	$70,021,946	$70,021,946	$700,219	$46,412	34%	$15,780	$185,647	34%	$63,120	**$78,900**
2023	$70,021,946	$2,100,658	$0	$72,122,605	$72,122,605	$721,226	$47,804	34%	$16,253	$191,217	34%	$65,014	**$81,267**
2024	$72,122,605	$2,163,678	$0	$74,286,283	$74,286,283	$742,863	$49,238	34%	$16,741	$196,953	34%	$66,964	**$83,705**
2025	$74,286,283	$2,228,588	$0	$76,514,871	$76,514,871	$765,149	$50,715	34%	$17,243	$202,862	34%	$68,973	**$86,216**
2026	$76,514,871	$2,295,446	$0	$78,810,317	$78,810,317	$788,103	$52,237	28%	$14,626	$208,948	28%	$58,505	**$73,132**
2027	$78,810,317	$2,364,310	$0	$81,174,627	$81,174,627	$811,746	$53,804	28%	$15,065	$215,216	28%	$60,260	**$75,326**
2028	$81,174,627	$2,435,239	$0	$83,609,866	$83,609,866	$836,099	$55,418	28%	$15,517	$221,672	28%	$62,068	**$77,585**
2029	$83,609,866	$2,508,296	$0	$86,118,162	$86,118,162	$861,182	$57,081	28%	$15,983	$228,323	28%	$63,930	**$79,913**
2030	$86,118,162	$2,583,545	$0	$88,701,706	$88,701,706	$887,017	$58,793	28%	$16,462	$235,172	28%	$65,848	**$82,310**
2031	$88,701,706	$2,661,051	$0	$91,362,758	$91,362,758	$913,628	$60,557	28%	$16,956	$242,227	28%	$67,824	**$84,780**
2032	$91,362,758	$2,740,883	$0	$94,103,640	$94,103,640	$941,036	$62,374	28%	$17,465	$249,494	28%	$69,858	**$87,323**
2033	$94,103,640	$2,823,109	$0	$96,926,750	$96,926,750	$969,267	$64,245	28%	$17,989	$256,979	28%	$71,954	**$89,943**
2034	$96,926,750	$2,907,802	$0	$99,834,552	$99,834,552	$998,346	$66,172	28%	$18,528	$264,688	28%	$74,113	**$92,641**
2035	$99,834,552	$2,995,037	$36,000,000	$138,829,589	$138,829,589	$1,388,296	$92,019	28%	$25,765	$368,075	28%	$103,061	**$128,826**
2036	$138,829,589	$4,164,888	$36,000,000	$178,994,476	$178,994,476	$1,789,945	$118,641	28%	$33,219	$474,563	28%	$132,878	**$166,097**
2037	$178,994,476	$5,369,834	$36,000,000	$220,364,311	$220,364,311	$2,203,643	$146,061	28%	$40,897	$584,246	28%	$163,589	**$204,486**
2038	$220,364,311	$6,610,929	$36,000,000	$262,975,240	$262,975,240	$2,629,752	$174,305	28%	$48,805	$697,219	28%	$195,221	**$244,027**
2039	$262,975,240	$7,889,257	$36,000,000	$306,864,497	$306,864,497	$3,068,645	$203,395	28%	$56,951	$813,581	28%	$227,803	**$284,753**
2040	$306,864,497	$9,205,935	$36,000,000	$352,070,432	$352,070,432	$3,520,704	$233,359	28%	$65,340	$933,434	28%	$261,362	**$326,702**
2041	$352,070,432	$10,562,113	$36,000,000	$398,632,545	$398,632,545	$3,986,325	$264,221	28%	$73,982	$1,056,883	28%	$295,927	**$369,909**
2042	$398,632,545	$11,958,976	$36,000,000	$446,591,521	$446,591,521	$4,465,915	$296,009	28%	$82,882	$1,184,035	28%	$331,530	**$414,412**
2043	$446,591,521	$13,397,746	$36,000,000	$495,989,267	$495,989,267	$4,959,893	$328,750	28%	$92,050	$1,315,002	28%	$368,201	**$460,251**
2044	$495,989,267	$14,879,678	$36,000,000	$546,868,945	$546,868,945	$5,468,689	$362,474	28%	$101,493	$1,449,898	28%	$405,971	**$507,464**
2045	$546,868,945	$16,406,068	$36,000,000	$599,275,013	$599,275,013	$5,992,750	$397,210	28%	$111,219	$1,588,840	28%	$444,875	**$556,094**
2046	$599,275,013	$17,978,250	$36,000,000	$653,253,264	$653,253,264	$6,532,533	$432,988	28%	$121,237	$1,731,951	28%	$484,946	**$606,183**
2047	$653,253,264	$19,597,598	$36,000,000	$708,850,862	$708,850,862	$7,088,509	$469,839	28%	$131,555	$1,879,356	28%	$526,220	**$657,775**
2048	$708,850,862	$21,265,526	$27,450,000	$757,566,387	$757,566,387	$7,575,664	$502,128	28%	$140,596	$2,008,514	28%	$562,384	**$702,980**
2049	$757,566,387	$22,726,992	$0	$780,293,379	$780,293,379	$7,802,934	$517,192	28%	$144,814	$2,068,769	28%	$579,255	**$724,069**
2050	$780,293,379	$23,408,801	$0	$803,702,180	$803,702,180	$8,037,022	$532,708	28%	$149,158	$2,130,832	28%	$596,633	**$745,791**
2051	$803,702,180	$24,111,065	$0	$827,813,246	$827,813,246	$8,278,132	$548,689	28%	$153,633	$2,194,757	28%	$614,532	**$768,165**
2052	$827,813,246	$24,834,397	$0	$852,647,643	$852,647,643	$8,526,476	$565,150	28%	$158,242	$2,260,600	28%	$632,968	**$791,210**
2053	$852,647,643	$25,579,429	$0	$878,227,073	$878,227,073	$8,782,271	$582,104	28%	$162,989	$2,328,418	28%	$651,957	**$814,946**
2054	$878,227,073	$26,346,812	$0	$904,573,885	$904,573,885	$9,045,739	$599,568	28%	$167,879	$2,398,271	28%	$671,516	**$839,395**
2055	$904,573,885	$27,137,217	$0	$931,711,101	$931,711,101	$9,317,111	$617,555	28%	$172,915	$2,470,219	28%	$691,661	**$864,577**
2056	$931,711,101	$27,951,333	$0	$959,662,434	$959,662,434	$9,596,624	$636,081	28%	$178,103	$2,544,325	28%	$712,411	**$890,514**
2057	$959,662,434	$28,789,873	$0	$988,452,307	$988,452,307	$9,884,523	$655,164	28%	$183,446	$2,620,655	28%	$733,783	**$917,229**
2058	$988,452,307	$29,653,569	$0	$1,018,105,877	$1,018,105,877	$10,181,059	$674,819	28%	$188,949	$2,699,275	28%	$755,797	**$944,746**
2059	$1,018,105,877	$30,543,176	$0	$1,048,649,053	$1,048,649,053	$10,486,491	$695,063	28%	$194,618	$2,780,253	28%	$778,471	**$973,088**
2060	$1,048,649,053	$31,459,472	$0	$1,080,108,524	$1,080,108,524	$10,801,085	$715,915	28%	$200,456	$2,863,660	28%	$801,825	**$1,002,281**
2061	$1,080,108,524	$32,403,256	$0	$1,112,511,780	$1,112,511,780	$11,125,118	$737,393	28%	$206,470	$2,949,570	28%	$825,880	**$1,032,350**

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Source: San Joaquin County; City of Manteca; LWA; EPS.

[1] Prior to annexation of the annexation area to the City, the City receives no property tax revenue for these TRAs.
[2] See Table B-5 for new AV added to roll from 2017-18 on. It is assumed that new AV is added to roll in year after development occurs.
In 2016-17 and 2017-18 prior to the start of the EIFD, it is assumed that the growth in new assessed value will be 3% of the existing assessed value.

Table B-4
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Assessed Value of New Development - Manteca Existing City (2016 and Real $)

Manteca
Existing City

Fiscal Year Ending	Assessed Value of New Development [1]								
	Single Family Low Density	Multifamily	**Subtotal Residential**	Retail	Industrial	**Subtotal Nonres.**	**Total (2016$)**	Escalation Factor [2]	**Total with Annual Sales Price Increase**
	AV per Dwelling Unit			*AV per Bldg. Sq. Ft.*					
Assumption	*$ 450,000*	*$ 180,000*		*$ 200*	*$ 85*				
2018	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	1.061	**$38,192,400**
2019	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	1.093	**$39,338,172**
2020	$62,550,000	$5,040,000	**$67,590,000**	$0	$0	**$0**	**$67,590,000**	1.126	**$76,073,140**
2021	$36,000,000	$14,400,000	**$50,400,000**	$0	$0	**$0**	**$50,400,000**	1.159	**$58,427,413**
2022	$45,000,000	$28,800,000	**$73,800,000**	$0	$0	**$0**	**$73,800,000**	1.194	**$88,121,059**
2023	$72,000,000	$16,560,000	**$88,560,000**	$0	$0	**$0**	**$88,560,000**	1.230	**$108,917,630**
2024	$72,000,000	$13,140,000	**$85,140,000**	$10,000,000	$4,250,000	**$14,250,000**	**$99,390,000**	1.267	**$125,904,278**
2025	$48,150,000	$0	**$48,150,000**	$10,000,000	$4,250,000	**$14,250,000**	**$62,400,000**	1.305	**$81,417,847**
2026	$36,000,000	$0	**$36,000,000**	$10,000,000	$4,250,000	**$14,250,000**	**$50,250,000**	1.344	**$67,531,798**
2027	$36,000,000	$0	**$36,000,000**	$10,000,000	$4,250,000	**$14,250,000**	**$50,250,000**	1.384	**$69,557,752**
2028	$36,000,000	$0	**$36,000,000**	$10,000,000	$4,250,000	**$14,250,000**	**$50,250,000**	1.426	**$71,644,485**
2029	$36,000,000	$0	**$36,000,000**	$10,000,000	$4,250,000	**$14,250,000**	**$50,250,000**	1.469	**$73,793,819**
2030	$69,750,000	$0	**$69,750,000**	$10,000,000	$4,935,355	**$14,935,355**	**$84,685,355**	1.513	**$128,094,198**
2031	$36,000,000	$0	**$36,000,000**	$10,000,000	$0	**$10,000,000**	**$46,000,000**	1.558	**$71,666,501**
2032	$36,000,000	$0	**$36,000,000**	$20,000,000	$0	**$20,000,000**	**$56,000,000**	1.605	**$89,863,561**
2033	$33,750,000	$0	**$33,750,000**	$20,000,000	$0	**$20,000,000**	**$53,750,000**	1.653	**$88,840,560**
2034	$0	$0	**$0**	$20,000,000	$0	**$20,000,000**	**$20,000,000**	1.702	**$34,048,661**
2035	$36,000,000	$0	**$36,000,000**	$13,976,800	$0	**$13,976,800**	**$49,976,800**	1.754	**$87,634,621**
2036	$72,000,000	$0	**$72,000,000**	$10,000,000	$0	**$10,000,000**	**$82,000,000**	1.806	**$148,101,121**
2037	$72,000,000	$0	**$72,000,000**	$12,441,200	$0	**$12,441,200**	**$84,441,200**	1.860	**$157,085,506**
2038	$72,000,000	$0	**$72,000,000**	$10,000,000	$0	**$10,000,000**	**$82,000,000**	1.916	**$157,120,480**
2039	$72,000,000	$0	**$72,000,000**	$10,000,000	$0	**$10,000,000**	**$82,000,000**	1.974	**$161,834,094**
2040	$72,000,000	$0	**$72,000,000**	$10,000,000	$0	**$10,000,000**	**$82,000,000**	2.033	**$166,689,117**
2041	$72,000,000	$0	**$72,000,000**	$10,000,000	$0	**$10,000,000**	**$82,000,000**	2.094	**$171,689,790**
2042	$72,000,000	$0	**$72,000,000**	$10,000,000	$0	**$10,000,000**	**$82,000,000**	2.157	**$176,840,484**
2043	$72,000,000	$0	**$72,000,000**	$10,000,000	$0	**$10,000,000**	**$82,000,000**	2.221	**$182,145,698**
2044	$52,200,000	$0	**$52,200,000**	$2,987,760	$0	**$2,987,760**	**$55,187,760**	2.288	**$126,265,603**
2045	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.357	**$84,836,358**
2046	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.427	**$87,381,449**
2047	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.500	**$90,002,892**
2048	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.575	**$92,702,979**
2049	$19,350,000	$0	**$19,350,000**	$0	$0	**$0**	**$19,350,000**	2.652	**$51,322,687**
2050	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.732	**$0**
2051	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.814	**$0**
2052	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.898	**$0**
2053	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.985	**$0**
2054	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.075	**$0**
2055	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.167	**$0**
2056	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.262	**$0**
2057	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.360	**$0**
2058	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.461	**$0**
2059	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.565	**$0**
2060	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.671	**$0**

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Source: San Joaquin County; City of Manteca; LWA; EPS.

[1] Calculated as annual projected dwelling units/bldg. sq. ft. multiplied by AV per dwelling unit/bldg. sq. ft. See Table B-6 for development projections.
[2] Based on a 3 percent annual growth factor.

Table B-5
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Assessed Value of New Development - Manteca Annexation Areas (2016 and Real $)

Manteca Annexation Area

Fiscal Year Ending	Assessed Value of New Development [1]								
	Single Family Low Density	Multifamily	**Subtotal Residential**	Retail	Industrial	**Subtotal Nonres.**	**Total (2016$)**	Escalation Factor [2]	**Total with Annual Sales Price Increase**
	AV per Dwelling Unit			*AV per Bldg. Sq. Ft.*					
Assumption	*$ 450,000*	*$ 180,000*		*$ 200*	*$ 85*				
2018	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	1.061	**$36,000,000**
2019	$27,000,000	$0	**$27,000,000**	$0	$0	**$0**	**$27,000,000**	1.093	**$27,000,000**
2020	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.126	**$0**
2021	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.159	**$0**
2022	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.194	**$0**
2023	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.230	**$0**
2024	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.267	**$0**
2025	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.305	**$0**
2026	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.344	**$0**
2027	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.384	**$0**
2028	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.426	**$0**
2029	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.469	**$0**
2030	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.513	**$0**
2031	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.558	**$0**
2032	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.605	**$0**
2033	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.653	**$0**
2034	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.702	**$0**
2035	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	1.754	**$36,000,000**
2036	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	1.806	**$36,000,000**
2037	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	1.860	**$36,000,000**
2038	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	1.916	**$36,000,000**
2039	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	1.974	**$36,000,000**
2040	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.033	**$36,000,000**
2041	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.094	**$36,000,000**
2042	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.157	**$36,000,000**
2043	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.221	**$36,000,000**
2044	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.288	**$36,000,000**
2045	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.357	**$36,000,000**
2046	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.427	**$36,000,000**
2047	$36,000,000	$0	**$36,000,000**	$0	$0	**$0**	**$36,000,000**	2.500	**$36,000,000**
2048	$27,450,000	$0	**$27,450,000**	$0	$0	**$0**	**$27,450,000**	2.575	**$27,450,000**
2049	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.652	**$0**
2050	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.732	**$0**
2051	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.814	**$0**
2052	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.898	**$0**
2053	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.985	**$0**
2054	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.075	**$0**
2055	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.167	**$0**
2056	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.262	**$0**
2057	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.360	**$0**
2058	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.461	**$0**
2059	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.565	**$0**
2060	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.671	**$0**

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Source: San Joaquin County; City of Manteca; LWA; EPS.

[1] Calculated as annual projected dwelling units/bldg. sq. ft. multiplied by AV per dwelling unit/bldg. sq. ft. See Table B-6 for development projections.
[2] Based on a 3 percent annual growth factor.

Table B-6
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Incremental Development Projections - Manteca

Manteca

Fiscal Year Ending	Existing City						Annexation Area					
	Dwelling Units			Building Square Feet			Dwelling Units			Building Square Feet		
	Low Density Residential	High Density Residential	TOTAL	Retail	Industrial	Total	Low Density Residential	High Density Residential	TOTAL	Retail	Industrial	Total
2018	80	-	**80**	-	-	**-**	80	-	**80**	-	-	**-**
2019	80	-	**80**	-	-	**-**	60	-	**60**	-	-	**-**
2020	139	28	**167**	-	-	**-**	-	-	**-**	-	-	**-**
2021	80	80	**160**	-	-	**-**	-	-	**-**	-	-	**-**
2022	100	160	**260**	-	-	**-**	-	-	**-**	-	-	**-**
2023	160	92	**252**	-	-	**-**	-	-	**-**	-	-	**-**
2024	160	73	**233**	50,000	50,000	**100,000**	-	-	**-**	-	-	**-**
2025	107	-	**107**	50,000	50,000	**100,000**	-	-	**-**	-	-	**-**
2026	80	-	**80**	50,000	50,000	**100,000**	-	-	**-**	-	-	**-**
2027	80	-	**80**	50,000	50,000	**100,000**	-	-	**-**	-	-	**-**
2028	80	-	**80**	50,000	50,000	**100,000**	-	-	**-**	-	-	**-**
2029	80	-	**80**	50,000	50,000	**100,000**	-	-	**-**	-	-	**-**
2030	155	-	**155**	50,000	58,063	**108,063**	-	-	**-**	-	-	**-**
2031	80	-	**80**	50,000	-	**50,000**	-	-	**-**	-	-	**-**
2032	80	-	**80**	100,000	-	**100,000**	-	-	**-**	-	-	**-**
2033	75	-	**75**	100,000	-	**100,000**	-	-	**-**	-	-	**-**
2034	-	-	**-**	100,000	-	**100,000**	-	-	**-**	-	-	**-**
2035	80	-	**80**	69,884	-	**69,884**	80	-	**80**	-	-	**-**
2036	160	-	**160**	50,000	-	**50,000**	80	-	**80**	-	-	**-**
2037	160	-	**160**	62,206	-	**62,206**	80	-	**80**	-	-	**-**
2038	160	-	**160**	50,000	-	**50,000**	80	-	**80**	-	-	**-**
2039	160	-	**160**	50,000	-	**50,000**	80	-	**80**	-	-	**-**
2040	160	-	**160**	50,000	-	**50,000**	80	-	**80**	-	-	**-**
2041	160	-	**160**	50,000	-	**50,000**	80	-	**80**	-	-	**-**
2042	160	-	**160**	50,000	-	**50,000**	80	-	**80**	-	-	**-**
2043	160	-	**160**	50,000	-	**50,000**	80	-	**80**	-	-	**-**
2044	116	-	**116**	14,939	-	**14,939**	80	-	**80**	-	-	**-**
2045	80	-	**80**	-	-	**-**	80	-	**80**	-	-	**-**
2046	80	-	**80**	-	-	**-**	80	-	**80**	-	-	**-**
2047	80	-	**80**	-	-	**-**	80	-	**80**	-	-	**-**
2048	80	-	**80**	-	-	**-**	61	-	**61**	-	-	**-**
2049	43	-	**43**	-	-	**-**	-	-	**-**	-	-	**-**
2050	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2051	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2052	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2053	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2054	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2055	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2056	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2057	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2058	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2059	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2060	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
Total	**3,455**	**433**	**3,888**	**1,197,029**	**358,063**	**1,555,092**	**1,241**	**-**	**1,241**	**-**	**-**	**-**

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Source: San Joaquin County; City of Manteca; LWA; EPS.

APPENDIX C:

City of Stockton

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Table C-1
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Stockton (Real $)

Stockton

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	New AV Added to Roll [2]	Ending AV	Cumulative Growth in AV starting in 2018	Gross Tax Increment	Net Tax Increment				
							City [1]	City EIFD	County [1]	County EIFD	Total EIFD
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*[3]*	*h=g*34%*	*[3]*	*j=i*34%*	*h+j*
2017	$1,164,851,051	$34,945,532	$0	$1,199,796,583	$0	$0	$0	$0	$0	$0	**$0**
2018	$1,199,796,583	$35,993,897	$0	$1,235,790,480	$35,993,897	$359,939	$60,594	$20,602	$73,799	$25,092	**$45,694**
2019	$1,235,790,480	$37,073,714	$0	$1,272,864,194	$73,067,612	$730,676	$123,005	$41,822	$149,812	$50,936	**$92,758**
2020	$1,272,864,194	$38,185,926	$29,263,229	$1,340,313,349	$140,516,767	$1,405,168	$236,552	$80,428	$288,104	$97,955	**$178,383**
2021	$1,340,313,349	$40,209,400	$61,858,865	$1,442,381,614	$242,585,032	$2,425,850	$408,378	$138,849	$497,377	$169,108	**$307,957**
2022	$1,442,381,614	$43,271,448	$123,632,175	$1,609,285,238	$409,488,655	$4,094,887	$689,351	$234,379	$839,583	$285,458	**$519,838**
2023	$1,609,285,238	$48,278,557	$38,126,090	$1,695,689,885	$495,893,302	$4,958,933	$834,809	$283,835	$1,016,740	$345,692	**$629,527**
2024	$1,695,689,885	$50,870,697	$39,269,873	$1,785,830,454	$586,033,871	$5,860,339	$986,555	$335,429	$1,201,557	$408,529	**$743,958**
2025	$1,785,830,454	$53,574,914	$26,861,366	$1,866,266,733	$666,470,150	$6,664,702	$1,121,965	$381,468	$1,366,477	$464,602	**$846,070**
2026	$1,866,266,733	$55,988,002	$43,005,324	$1,965,260,059	$765,463,476	$7,654,635	$1,288,615	$360,812	$1,569,445	$439,445	**$800,257**
2027	$1,965,260,059	$58,957,802	$51,216,653	$2,075,434,514	$875,637,931	$8,756,379	$1,467,441	$410,884	$1,801,169	$504,327	**$915,211**
2028	$2,075,434,514	$62,263,035	$14,257,609	$2,151,955,158	$952,158,576	$9,521,586	$1,589,215	$444,980	$1,964,241	$549,988	**$994,968**
2029	$2,151,955,158	$64,558,655	$14,685,337	$2,231,199,150	$1,031,402,567	$10,314,026	$1,715,156	$480,244	$2,133,263	$597,314	**$1,077,557**
2030	$2,231,199,150	$66,935,975	$15,125,897	$2,313,261,022	$1,113,464,439	$11,134,644	$1,845,406	$516,714	$2,308,445	$646,364	**$1,163,078**
2031	$2,313,261,022	$69,397,831	$15,579,674	$2,398,238,527	$1,198,441,944	$11,984,419	$1,980,109	$554,431	$2,490,003	$697,201	**$1,251,631**
2032	$2,398,238,527	$71,947,156	$39,154,837	$2,509,340,520	$1,309,543,937	$13,095,439	$2,158,316	$604,329	$2,725,541	$763,152	**$1,367,480**
2033	$2,509,340,520	$75,280,216	$40,329,482	$2,624,950,217	$1,425,153,635	$14,251,536	$2,343,616	$656,213	$2,970,757	$831,812	**$1,488,025**
2034	$2,624,950,217	$78,748,507	$41,539,367	$2,745,238,091	$1,545,441,508	$15,454,415	$2,536,274	$710,157	$3,226,019	$903,285	**$1,613,442**
2035	$2,745,238,091	$82,357,143	$42,785,548	$2,870,380,781	$1,670,584,198	$16,705,842	$2,736,564	$766,238	$3,491,709	$977,679	**$1,743,917**
2036	$2,870,380,781	$86,111,423	$44,069,114	$3,000,561,318	$1,800,764,736	$18,007,647	$2,944,771	$824,536	$3,768,223	$1,055,103	**$1,879,638**
2037	$3,000,561,318	$90,016,840	$45,391,188	$3,135,969,346	$1,936,172,763	$19,361,728	$3,161,190	$885,133	$4,055,972	$1,135,672	**$2,020,805**
2038	$3,135,969,346	$94,079,080	$24,679,412	$3,254,727,838	$2,054,931,255	$20,549,313	$3,348,966	$937,710	$4,310,122	$1,206,834	**$2,144,544**
2039	$3,254,727,838	$97,641,835	$19,735,865	$3,372,105,538	$2,172,308,956	$21,723,090	$3,533,777	$989,458	$4,562,003	$1,277,361	**$2,266,818**
2040	$3,372,105,538	$101,163,166	$20,327,941	$3,493,596,645	$2,293,800,063	$22,938,001	$3,724,845	$1,042,957	$4,822,903	$1,350,413	**$2,393,370**
2041	$3,493,596,645	$104,807,899	$19,777,473	$3,618,182,018	$2,418,385,435	$24,183,854	$3,920,426	$1,097,719	$5,090,759	$1,425,413	**$2,523,132**
2042	$3,618,182,018	$108,545,461	$10,782,956	$3,737,510,434	$2,537,713,852	$25,377,139	$4,106,430	$1,149,800	$5,348,474	$1,497,573	**$2,647,373**
2043	$3,737,510,434	$112,125,313	$11,106,445	$3,860,742,193	$2,660,945,610	$26,609,456	$4,298,249	$1,203,510	$5,614,855	$1,572,160	**$2,775,669**
2044	$3,860,742,193	$115,822,266	$11,439,638	$3,988,004,097	$2,788,207,514	$27,882,075	$4,496,063	$1,258,898	$5,890,192	$1,649,254	**$2,908,152**
2045	$3,988,004,097	$119,640,123	$11,782,828	$4,119,427,047	$2,919,630,465	$29,196,305	$4,700,060	$1,316,017	$6,174,782	$1,728,939	**$3,044,956**
2046	$4,119,427,047	$123,582,811	$12,136,312	$4,255,146,171	$3,055,349,588	$30,553,496	$4,910,433	$1,374,921	$6,468,933	$1,811,301	**$3,186,222**
2047	$4,255,146,171	$127,654,385	$12,500,402	$4,395,300,958	$3,195,504,375	$31,955,044	$5,127,380	$1,435,666	$6,772,961	$1,896,429	**$3,332,095**
2048	$4,395,300,958	$131,859,029	$12,875,414	$4,540,035,400	$3,340,238,818	$33,402,388	$5,351,106	$1,498,310	$7,087,194	$1,984,414	**$3,482,724**
2049	$4,540,035,400	$136,201,062	$13,261,676	$4,689,498,138	$3,489,701,556	$34,897,016	$5,581,824	$1,562,911	$7,411,972	$2,075,352	**$3,638,263**
2050	$4,689,498,138	$140,684,944	$13,659,526	$4,843,842,609	$3,644,046,027	$36,440,460	$5,819,751	$1,629,530	$7,747,644	$2,169,340	**$3,798,871**
2051	$4,843,842,609	$145,315,278	$14,069,312	$5,003,227,200	$3,803,430,617	$38,034,306	$6,065,112	$1,698,231	$8,094,572	$2,266,480	**$3,964,712**
2052	$5,003,227,200	$150,096,816	$14,491,392	$5,167,815,407	$3,968,018,825	$39,680,188	$6,318,139	$1,769,079	$8,453,129	$2,366,876	**$4,135,955**
2053	$5,167,815,407	$155,034,462	$14,926,133	$5,337,776,003	$4,137,979,420	$41,379,794	$6,579,072	$1,842,140	$8,823,700	$2,470,636	**$4,312,776**
2054	$5,337,776,003	$160,133,280	$15,373,917	$5,513,283,200	$4,313,486,618	$43,134,866	$6,848,156	$1,917,484	$9,206,683	$2,577,871	**$4,495,355**
2055	$5,513,283,200	$165,398,496	$15,835,135	$5,694,516,831	$4,494,720,249	$44,947,202	$7,125,646	$1,995,181	$9,602,491	$2,688,697	**$4,683,878**
2056	$5,694,516,831	$170,835,505	$16,310,189	$5,881,662,525	$4,681,865,943	$46,818,659	$7,411,805	$2,075,305	$10,011,546	$2,803,233	**$4,878,538**
2057	$5,881,662,525	$176,449,876	$15,934,468	$6,074,046,869	$4,874,250,287	$48,742,503	$7,706,276	$2,157,757	$10,431,786	$2,920,900	**$5,078,658**
2058	$6,074,046,869	$182,221,406	$0	$6,256,268,275	$5,056,471,693	$50,564,717	$7,998,058	$2,239,456	$10,818,539	$3,029,191	**$5,268,647**
2059	$6,256,268,275	$187,688,048	$0	$6,443,956,324	$5,244,159,741	$52,441,597	$8,298,594	$2,323,606	$11,216,894	$3,140,730	**$5,464,337**
2060	$6,443,956,324	$193,318,690	$0	$6,637,275,013	$5,437,478,431	$54,374,784	$8,608,145	$2,410,281	$11,627,200	$3,255,616	**$5,665,897**
2061	$6,637,275,013	$199,118,250	$0	$6,836,393,264	$5,636,596,681	$56,365,967	$8,926,983	$2,499,555	$12,049,815	$3,373,948	**$5,873,504**

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Source: San Joaquin County; City of Stockton; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.
[2] See Table C-4 for new AV added to roll from 2017-18 on. It is assumed that new AV is added to roll in year after development occurs.
In 2016-17 and 2017-18 prior to the start of the EIFD, it is assumed that the growth in new assessed value will be 3% of the existing assessed value.
[3] The City and County tax allocation rates vary between TRAs within the existing City boundaries and the annexation area. See Table C-2 and Table C-3 for more details.

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Table C-2
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Stockton Existing City Boundaries (Real $)

Stockton
Existing City

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	New AV Added to Roll [2]	Ending AV	Cumulative Growth in AV *starting in 2018*	Gross Tax Increment	Net Tax Increment						
							City [1]	City EIFD Allocation	City EIFD	County [1]	County EIFD Allocation	County EIFD	Total EIFD
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*g=f*16.83%*	*h*	*i=g*h*	*j=f*20.50%*	*k*	*l=j*k*	*m=i+l*
2017	$1,164,851,051	$34,945,532	$0	$1,199,796,583	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2018	$1,199,796,583	$35,993,897	$0	$1,235,790,480	$35,993,897	$359,939	$60,594	34%	$20,602	$73,799	34%	$25,092	**$45,694**
2019	$1,235,790,480	$37,073,714	$0	$1,272,864,194	$73,067,612	$730,676	$123,005	34%	$41,822	$149,812	34%	$50,936	**$92,758**
2020	$1,272,864,194	$38,185,926	$29,263,229	$1,340,313,349	$140,516,767	$1,405,168	$236,552	34%	$80,428	$288,104	34%	$97,955	**$178,383**
2021	$1,340,313,349	$40,209,400	$61,858,865	$1,442,381,614	$242,585,032	$2,425,850	$408,378	34%	$138,849	$497,377	34%	$169,108	**$307,957**
2022	$1,442,381,614	$43,271,448	$123,632,175	$1,609,285,238	$409,488,655	$4,094,887	$689,351	34%	$234,379	$839,583	34%	$285,458	**$519,838**
2023	$1,609,285,238	$48,278,557	$38,126,090	$1,695,689,885	$495,893,302	$4,958,933	$834,809	34%	$283,835	$1,016,740	34%	$345,692	**$629,527**
2024	$1,695,689,885	$50,870,697	$39,269,873	$1,785,830,454	$586,033,871	$5,860,339	$986,555	34%	$335,429	$1,201,557	34%	$408,529	**$743,958**
2025	$1,785,830,454	$53,574,914	$26,861,366	$1,866,266,733	$666,470,150	$6,664,702	$1,121,965	34%	$381,468	$1,366,477	34%	$464,602	**$846,070**
2026	$1,866,266,733	$55,988,002	$43,005,324	$1,965,260,059	$765,463,476	$7,654,635	$1,288,615	28%	$360,812	$1,569,445	28%	$439,445	**$800,257**
2027	$1,965,260,059	$58,957,802	$44,295,484	$2,068,513,345	$868,716,762	$8,687,168	$1,462,436	28%	$409,482	$1,781,147	28%	$498,721	**$908,203**
2028	$2,068,513,345	$62,055,400	$7,128,804	$2,137,697,549	$937,900,967	$9,379,010	$1,578,904	28%	$442,093	$1,922,997	28%	$538,439	**$980,532**
2029	$2,137,697,549	$64,130,926	$7,342,669	$2,209,171,144	$1,009,374,562	$10,093,746	$1,699,226	28%	$475,783	$2,069,541	28%	$579,471	**$1,055,255**
2030	$2,209,171,144	$66,275,134	$7,562,949	$2,283,009,227	$1,083,212,645	$10,832,126	$1,823,528	28%	$510,588	$2,220,933	28%	$621,861	**$1,132,449**
2031	$2,283,009,227	$68,490,277	$7,789,837	$2,359,289,341	$1,159,492,759	$11,594,928	$1,951,941	28%	$546,544	$2,377,331	28%	$665,653	**$1,212,196**
2032	$2,359,289,341	$70,778,680	$31,131,305	$2,461,199,326	$1,261,402,744	$12,614,027	$2,123,501	28%	$594,580	$2,586,279	28%	$724,158	**$1,318,738**
2033	$2,461,199,326	$73,835,980	$32,065,244	$2,567,100,550	$1,367,303,968	$13,673,040	$2,301,780	28%	$644,498	$2,803,411	28%	$784,955	**$1,429,453**
2034	$2,567,100,550	$77,013,017	$33,027,201	$2,677,140,768	$1,477,344,186	$14,773,442	$2,487,026	28%	$696,367	$3,029,028	28%	$848,128	**$1,544,495**
2035	$2,677,140,768	$80,314,223	$34,018,017	$2,791,473,009	$1,591,676,426	$15,916,764	$2,679,498	28%	$750,260	$3,263,446	28%	$913,765	**$1,664,024**
2036	$2,791,473,009	$83,744,190	$35,038,558	$2,910,255,757	$1,710,459,174	$17,104,592	$2,879,462	28%	$806,249	$3,506,989	28%	$981,957	**$1,788,206**
2037	$2,910,255,757	$87,307,673	$36,089,715	$3,033,653,144	$1,833,856,562	$18,338,566	$3,087,195	28%	$864,415	$3,759,993	28%	$1,052,798	**$1,917,213**
2038	$3,033,653,144	$91,009,594	$15,098,895	$3,139,761,633	$1,939,965,051	$19,399,651	$3,265,823	28%	$914,430	$3,977,549	28%	$1,113,714	**$2,028,144**
2039	$3,139,761,633	$94,192,849	$9,867,933	$3,243,822,415	$2,044,025,832	$20,440,258	$3,441,003	28%	$963,481	$4,190,907	28%	$1,173,454	**$2,136,935**
2040	$3,243,822,415	$97,314,672	$10,163,971	$3,351,301,058	$2,151,504,475	$21,515,045	$3,621,937	28%	$1,014,142	$4,411,273	28%	$1,235,156	**$2,249,299**
2041	$3,351,301,058	$100,539,032	$9,308,583	$3,461,148,673	$2,261,352,090	$22,613,521	$3,806,860	28%	$1,065,921	$4,636,496	28%	$1,298,219	**$2,364,139**
2042	$3,461,148,673	$103,834,460	$0	$3,564,983,133	$2,365,186,551	$23,651,866	$3,981,659	28%	$1,114,865	$4,849,389	28%	$1,357,829	**$2,472,694**
2043	$3,564,983,133	$106,949,494	$0	$3,671,932,627	$2,472,136,045	$24,721,360	$4,161,703	28%	$1,165,277	$5,068,670	28%	$1,419,228	**$2,584,504**
2044	$3,671,932,627	$110,157,979	$0	$3,782,090,606	$2,582,294,023	$25,822,940	$4,347,148	28%	$1,217,201	$5,294,529	28%	$1,482,468	**$2,699,669**
2045	$3,782,090,606	$113,462,718	$0	$3,895,553,324	$2,695,756,741	$26,957,567	$4,538,156	28%	$1,270,684	$5,527,164	28%	$1,547,606	**$2,818,290**
2046	$3,895,553,324	$116,866,600	$0	$4,012,419,924	$2,812,623,341	$28,126,233	$4,734,894	28%	$1,325,770	$5,766,778	28%	$1,614,698	**$2,940,468**
2047	$4,012,419,924	$120,372,598	$0	$4,132,792,521	$2,932,995,939	$29,329,959	$4,937,535	28%	$1,382,510	$6,013,580	28%	$1,683,803	**$3,066,312**
2048	$4,132,792,521	$123,983,776	$0	$4,256,776,297	$3,056,979,715	$30,569,797	$5,146,254	28%	$1,440,951	$6,267,787	28%	$1,754,980	**$3,195,932**
2049	$4,256,776,297	$127,703,289	$0	$4,384,479,586	$3,184,683,003	$31,846,830	$5,361,236	28%	$1,501,146	$6,529,619	28%	$1,828,293	**$3,329,439**
2050	$4,384,479,586	$131,534,388	$0	$4,516,013,974	$3,316,217,391	$33,162,174	$5,582,666	28%	$1,563,147	$6,799,307	28%	$1,903,806	**$3,466,953**
2051	$4,516,013,974	$135,480,419	$0	$4,651,494,393	$3,451,697,810	$34,516,978	$5,810,740	28%	$1,627,007	$7,077,085	28%	$1,981,584	**$3,608,591**
2052	$4,651,494,393	$139,544,832	$0	$4,791,039,225	$3,591,242,642	$35,912,426	$6,045,656	28%	$1,692,784	$7,363,197	28%	$2,061,695	**$3,754,479**
2053	$4,791,039,225	$143,731,177	$0	$4,934,770,401	$3,734,973,819	$37,349,738	$6,287,620	28%	$1,760,533	$7,657,892	28%	$2,144,210	**$3,904,743**
2054	$4,934,770,401	$148,043,112	$0	$5,082,813,513	$3,883,016,931	$38,830,169	$6,536,842	28%	$1,830,316	$7,961,427	28%	$2,229,200	**$4,059,515**
2055	$5,082,813,513	$152,484,405	$0	$5,235,297,919	$4,035,501,336	$40,355,013	$6,793,541	28%	$1,902,191	$8,274,069	28%	$2,316,739	**$4,218,931**
2056	$5,235,297,919	$157,058,938	$0	$5,392,356,856	$4,192,560,274	$41,925,603	$7,057,941	28%	$1,976,223	$8,596,090	28%	$2,406,905	**$4,383,129**
2057	$5,392,356,856	$161,770,706	$0	$5,554,127,562	$4,354,330,979	$43,543,310	$7,330,273	28%	$2,052,476	$8,927,772	28%	$2,499,776	**$4,552,253**
2058	$5,554,127,562	$166,623,827	$0	$5,720,751,389	$4,520,954,806	$45,209,548	$7,610,775	28%	$2,131,017	$9,269,404	28%	$2,595,433	**$4,726,450**
2059	$5,720,751,389	$171,622,542	$0	$5,892,373,931	$4,692,577,348	$46,925,773	$7,899,691	28%	$2,211,914	$9,621,285	28%	$2,693,960	**$4,905,874**
2060	$5,892,373,931	$176,771,218	$0	$6,069,145,148	$4,869,348,566	$48,693,486	$8,197,276	28%	$2,295,237	$9,983,723	28%	$2,795,442	**$5,090,680**
2061	$6,069,145,148	$182,074,354	$0	$6,251,219,503	$5,051,422,920	$50,514,229	$8,503,788	28%	$2,381,061	$10,357,034	28%	$2,899,969	**$5,281,030**

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Source: San Joaquin County; City of Stockton; LWA; EPS.

[1] See RD 17 Area Finance Plan Implementation for Fiscal Year 2016-17 beginning assessed value.
[2] See Table C-4 for new AV added to roll from 2017-18 on. It is assumed that new AV is added to roll in year after development occurs.
In 2016-17 and 2017-18 prior to the start of the EIFD, it is assumed that the growth in new assessed value will be 3% of the existing assessed value.

Table C-3
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Stockton Annexation Area (Real $)

Stockton Annexation Area

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	New AV Added to Roll [2]	Ending AV	Cumulative Growth in AV *starting in 2018*	Gross Tax Increment	Net Tax Increment						
							City [1]	City EIFD Allocation	City EIFD	County [1]	County EIFD Allocation	County EIFD	Total EIFD
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*g=f*7.23%*	*h*	*i=g*h*	*j=f*28.93%*	*k*	*l=j*k*	*m=i+l*
2017	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2018	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2019	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2020	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2021	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2022	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2023	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2024	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2025	$0	$0	$0	$0	$0	$0	$0	34%	$0	$0	34%	$0	**$0**
2026	$0	$0	$0	$0	$0	$0	$0	28%	$0	$0	28%	$0	**$0**
2027	$0	$0	$6,921,169	$6,921,169	$6,921,169	$69,212	$5,005	28%	$1,402	$20,021	28%	$5,606	**$7,008**
2028	$6,921,169	$207,635	$7,128,804	$14,257,609	$14,257,609	$142,576	$10,311	28%	$2,887	$41,244	28%	$11,548	**$14,435**
2029	$14,257,609	$427,728	$7,342,669	$22,028,006	$22,028,006	$220,280	$15,931	28%	$4,461	$63,722	28%	$17,842	**$22,303**
2030	$22,028,006	$660,840	$7,562,949	$30,251,794	$30,251,794	$302,518	$21,878	28%	$6,126	$87,512	28%	$24,503	**$30,629**
2031	$30,251,794	$907,554	$7,789,837	$38,949,185	$38,949,185	$389,492	$28,168	28%	$7,887	$112,672	28%	$31,548	**$39,435**
2032	$38,949,185	$1,168,476	$8,023,532	$48,141,193	$48,141,193	$481,412	$34,816	28%	$9,748	$139,262	28%	$38,993	**$48,742**
2033	$48,141,193	$1,444,236	$8,264,238	$57,849,667	$57,849,667	$578,497	$41,837	28%	$11,714	$167,347	28%	$46,857	**$58,571**
2034	$57,849,667	$1,735,490	$8,512,165	$68,097,322	$68,097,322	$680,973	$49,248	28%	$13,789	$196,991	28%	$55,157	**$68,947**
2035	$68,097,322	$2,042,920	$8,767,530	$78,907,772	$78,907,772	$789,078	$57,066	28%	$15,978	$228,263	28%	$63,914	**$79,892**
2036	$78,907,772	$2,367,233	$9,030,556	$90,305,562	$90,305,562	$903,056	$65,309	28%	$18,286	$261,235	28%	$73,146	**$91,432**
2037	$90,305,562	$2,709,167	$9,301,473	$102,316,201	$102,316,201	$1,023,162	$73,995	28%	$20,719	$295,979	28%	$82,874	**$103,593**
2038	$102,316,201	$3,069,486	$9,580,517	$114,966,205	$114,966,205	$1,149,662	$83,143	28%	$23,280	$332,572	28%	$93,120	**$116,400**
2039	$114,966,205	$3,448,986	$9,867,933	$128,283,123	$128,283,123	$1,282,831	$92,774	28%	$25,977	$371,095	28%	$103,907	**$129,883**
2040	$128,283,123	$3,848,494	$10,163,971	$142,295,587	$142,295,587	$1,422,956	$102,908	28%	$28,814	$411,630	28%	$115,257	**$144,071**
2041	$142,295,587	$4,268,868	$10,468,890	$157,033,345	$157,033,345	$1,570,333	$113,566	28%	$31,798	$454,264	28%	$127,194	**$158,992**
2042	$157,033,345	$4,711,000	$10,782,956	$172,527,301	$172,527,301	$1,725,273	$124,771	28%	$34,936	$499,084	28%	$139,744	**$174,679**
2043	$172,527,301	$5,175,819	$11,106,445	$188,809,565	$188,809,565	$1,888,096	$136,546	28%	$38,233	$546,185	28%	$152,932	**$191,165**
2044	$188,809,565	$5,664,287	$11,439,638	$205,913,491	$205,913,491	$2,059,135	$148,916	28%	$41,696	$595,663	28%	$166,786	**$208,482**
2045	$205,913,491	$6,177,405	$11,782,828	$223,873,723	$223,873,723	$2,238,737	$161,905	28%	$45,333	$647,618	28%	$181,333	**$226,666**
2046	$223,873,723	$6,716,212	$12,136,312	$242,726,247	$242,726,247	$2,427,262	$175,539	28%	$49,151	$702,155	28%	$196,603	**$245,754**
2047	$242,726,247	$7,281,787	$12,500,402	$262,508,436	$262,508,436	$2,625,084	$189,845	28%	$53,157	$759,380	28%	$212,626	**$265,783**
2048	$262,508,436	$7,875,253	$12,875,414	$283,259,103	$283,259,103	$2,832,591	$204,852	28%	$57,359	$819,407	28%	$229,434	**$286,793**
2049	$283,259,103	$8,497,773	$13,261,676	$305,018,552	$305,018,552	$3,050,186	$220,588	28%	$61,765	$882,353	28%	$247,059	**$308,823**
2050	$305,018,552	$9,150,557	$13,659,526	$327,828,635	$327,828,635	$3,278,286	$237,084	28%	$66,384	$948,337	28%	$265,534	**$331,918**
2051	$327,828,635	$9,834,859	$14,069,312	$351,732,807	$351,732,807	$3,517,328	$254,372	28%	$71,224	$1,017,487	28%	$284,896	**$356,120**
2052	$351,732,807	$10,551,984	$14,491,392	$376,776,183	$376,776,183	$3,767,762	$272,483	28%	$76,295	$1,089,932	28%	$305,181	**$381,476**
2053	$376,776,183	$11,303,285	$14,926,133	$403,005,602	$403,005,602	$4,030,056	$291,452	28%	$81,607	$1,165,808	28%	$326,426	**$408,033**
2054	$403,005,602	$12,090,168	$15,373,917	$430,469,687	$430,469,687	$4,304,697	$311,314	28%	$87,168	$1,245,256	28%	$348,672	**$435,840**
2055	$430,469,687	$12,914,091	$15,835,135	$459,218,912	$459,218,912	$4,592,189	$332,105	28%	$92,989	$1,328,421	28%	$371,958	**$464,947**
2056	$459,218,912	$13,776,567	$16,310,189	$489,305,669	$489,305,669	$4,893,057	$353,864	28%	$99,082	$1,415,456	28%	$396,328	**$495,409**
2057	$489,305,669	$14,679,170	$15,934,468	$519,919,307	$519,919,307	$5,199,193	$376,004	28%	$105,281	$1,504,014	28%	$421,124	**$526,405**
2058	$519,919,307	$15,597,579	$0	$535,516,887	$535,516,887	$5,355,169	$387,284	28%	$108,439	$1,549,135	28%	$433,758	**$542,197**
2059	$535,516,887	$16,065,507	$0	$551,582,393	$551,582,393	$5,515,824	$398,902	28%	$111,693	$1,595,609	28%	$446,770	**$558,463**
2060	$551,582,393	$16,547,472	$0	$568,129,865	$568,129,865	$5,681,299	$410,869	28%	$115,043	$1,643,477	28%	$460,174	**$575,217**
2061	$568,129,865	$17,043,896	$0	$585,173,761	$585,173,761	$5,851,738	$423,195	28%	$118,495	$1,692,781	28%	$473,979	**$592,473**

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Source: San Joaquin County; City of Stockton; LWA; EPS.

[1] Prior to annexation of the annexation area to the City, the City receives no property tax revenue for these TRAs.
[2] See Table C-5 for new AV added to roll from 2017-18 on. It is assumed that new AV is added to roll in year after development occurs.
In 2016-17 and 2017-18 prior to the start of the EIFD, it is assumed that the growth in new assessed value will be 3% of the existing assessed value.

Table C-4
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Assessed Value of New Development - Stockton Existing City (2016 and Real $)

Stockton
Existing City

	Assessed Value of New Development [1]								
Fiscal Year Ending	Single Family Low Density	Multifamily	**Subtotal Residential**	Retail	Industrial	**Subtotal Nonres.**	**Total (2016$)**	Escalation Factor [2]	**Total with Annual Sales Price Increase**
	AV per Dwelling Unit			*AV per Bldg. Sq. Ft.*					
Assumption	*$ 325,000*	*$ 180,000*		*$ 200*	*$ 0*				
2018	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.061	**$0**
2019	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.093	**$0**
2020	$26,000,000	$0	**$26,000,000**	$0	$0	**$0**	**$26,000,000**	1.126	**$29,263,229**
2021	$26,000,000	$27,360,000	**$53,360,000**	$0	$0	**$0**	**$53,360,000**	1.159	**$61,858,865**
2022	$26,000,000	$27,540,000	**$53,540,000**	$50,000,000	$0	**$50,000,000**	**$103,540,000**	1.194	**$123,632,175**
2023	$26,000,000	$0	**$26,000,000**	$5,000,000	$0	**$5,000,000**	**$31,000,000**	1.230	**$38,126,090**
2024	$26,000,000	$0	**$26,000,000**	$5,000,000	$0	**$5,000,000**	**$31,000,000**	1.267	**$39,269,873**
2025	$15,587,000	$0	**$15,587,000**	$5,000,000	$0	**$5,000,000**	**$20,587,000**	1.305	**$26,861,366**
2026	$0	$27,000,000	**$27,000,000**	$5,000,000	$0	**$5,000,000**	**$32,000,000**	1.344	**$43,005,324**
2027	$0	$27,000,000	**$27,000,000**	$5,000,000	$0	**$5,000,000**	**$32,000,000**	1.384	**$44,295,484**
2028	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.426	**$7,128,804**
2029	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.469	**$7,342,669**
2030	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.513	**$7,562,949**
2031	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.558	**$7,789,837**
2032	$0	$14,400,000	**$14,400,000**	$5,000,000	$0	**$5,000,000**	**$19,400,000**	1.605	**$31,131,305**
2033	$0	$14,400,000	**$14,400,000**	$5,000,000	$0	**$5,000,000**	**$19,400,000**	1.653	**$32,065,244**
2034	$0	$14,400,000	**$14,400,000**	$5,000,000	$0	**$5,000,000**	**$19,400,000**	1.702	**$33,027,201**
2035	$0	$14,400,000	**$14,400,000**	$5,000,000	$0	**$5,000,000**	**$19,400,000**	1.754	**$34,018,017**
2036	$0	$14,400,000	**$14,400,000**	$5,000,000	$0	**$5,000,000**	**$19,400,000**	1.806	**$35,038,558**
2037	$0	$14,400,000	**$14,400,000**	$5,000,000	$0	**$5,000,000**	**$19,400,000**	1.860	**$36,089,715**
2038	$0	$2,880,000	**$2,880,000**	$5,000,000	$0	**$5,000,000**	**$7,880,000**	1.916	**$15,098,895**
2039	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.974	**$9,867,933**
2040	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.033	**$10,163,971**
2041	$0	$0	**$0**	$4,445,831	$0	**$4,445,831**	**$4,445,831**	2.094	**$9,308,583**
2042	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.157	**$0**
2043	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.221	**$0**
2044	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.288	**$0**
2045	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.357	**$0**
2046	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.427	**$0**
2047	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.500	**$0**
2048	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.575	**$0**
2049	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.652	**$0**
2050	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.732	**$0**
2051	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.814	**$0**
2052	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.898	**$0**
2053	$0	$0	**$0**	$0	$0	**$0**	**$0**	2.985	**$0**
2054	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.075	**$0**
2055	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.167	**$0**
2056	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.262	**$0**
2057	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.360	**$0**
2058	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.461	**$0**
2059	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.565	**$0**
2060	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.671	**$0**

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Source: San Joaquin County; City of Stockton; LWA; EPS.

[1] Calculated as annual projected dwelling units/bldg. sq. ft. multiplied by AV per dwelling unit/bldg. sq. ft. See Table C-6 for development projections.
[2] Based on a 3 percent annual growth factor.

Table C-5
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Assessed Value of New Development - Stockton Annexation Areas (2016 and Real $)

Stockton Annexation Area

	Assessed Value of New Development [1]								
Fiscal Year Ending	Single Family Low Density	Multifamily	**Subtotal Residential**	Retail	Industrial	**Subtotal Nonres.**	**Total (2016$)**	Escalation Factor [2]	**Total with Annual Sales Price Increase**
	AV per Dwelling Unit			*AV per Bldg. Sq. Ft.*					
Assumption	*$ 325,000*	*$ 180,000*		*$ 200*	*$ 85*				
2018	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.061	**$0**
2019	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.093	**$0**
2020	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.126	**$0**
2021	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.159	**$0**
2022	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.194	**$0**
2023	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.230	**$0**
2024	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.267	**$0**
2025	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.305	**$0**
2026	$0	$0	**$0**	$0	$0	**$0**	**$0**	1.344	**$0**
2027	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.384	**$6,921,169**
2028	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.426	**$7,128,804**
2029	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.469	**$7,342,669**
2030	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.513	**$7,562,949**
2031	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.558	**$7,789,837**
2032	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.605	**$8,023,532**
2033	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.653	**$8,264,238**
2034	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.702	**$8,512,165**
2035	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.754	**$8,767,530**
2036	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.806	**$9,030,556**
2037	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.860	**$9,301,473**
2038	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.916	**$9,580,517**
2039	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	1.974	**$9,867,933**
2040	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.033	**$10,163,971**
2041	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.094	**$10,468,890**
2042	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.157	**$10,782,956**
2043	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.221	**$11,106,445**
2044	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.288	**$11,439,638**
2045	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.357	**$11,782,828**
2046	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.427	**$12,136,312**
2047	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.500	**$12,500,402**
2048	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.575	**$12,875,414**
2049	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.652	**$13,261,676**
2050	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.732	**$13,659,526**
2051	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.814	**$14,069,312**
2052	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.898	**$14,491,392**
2053	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	2.985	**$14,926,133**
2054	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	3.075	**$15,373,917**
2055	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	3.167	**$15,835,135**
2056	$0	$0	**$0**	$5,000,000	$0	**$5,000,000**	**$5,000,000**	3.262	**$16,310,189**
2057	$0	$0	**$0**	$4,742,544	$0	**$4,742,544**	**$4,742,544**	3.360	**$15,934,468**
2058	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.461	**$0**
2059	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.565	**$0**
2060	$0	$0	**$0**	$0	$0	**$0**	**$0**	3.671	**$0**
									av st ann

Source: San Joaquin County; City of Stockton; LWA; EPS.

[1] Calculated as annual projected dwelling units/bldg. sq. ft. multiplied by AV per dwelling unit/bldg. sq. ft. See Table C-6 for development projections.
[2] Based on a 3 percent annual growth factor.

Table C-6
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Incremental Development Projections - Stockton

Stockton

Fiscal Year Ending	Existing City						Annexation Area					
	Dwelling Units			Building Square Feet			Dwelling Units			Building Square Feet		
	Low Density Residential	High Density Residential	TOTAL	Retail	Industrial	Total	Low Density Residential	High Density Residential	TOTAL	Retail	Industrial	Total
2018	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2019	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2020	80	-	**80**	-	-	**-**	-	-	**-**	-	-	**-**
2021	80	152	**232**	-	-	**-**	-	-	**-**	-	-	**-**
2022	80	153	**233**	250,000	-	**250,000**	-	-	**-**	-	-	**-**
2023	80	-	**80**	25,000	-	**25,000**	-	-	**-**	-	-	**-**
2024	80	-	**80**	25,000	-	**25,000**	-	-	**-**	-	-	**-**
2025	48	-	**48**	25,000	-	**25,000**	-	-	**-**	-	-	**-**
2026	-	150	**150**	25,000	-	**25,000**	-	-	**-**	-	-	**-**
2027	-	150	**150**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2028	-	-	**-**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2029	-	-	**-**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2030	-	-	**-**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2031	-	-	**-**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2032	-	80	**80**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2033	-	80	**80**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2034	-	80	**80**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2035	-	80	**80**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2036	-	80	**80**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2037	-	80	**80**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2038	-	16	**16**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2039	-	-	**-**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2040	-	-	**-**	25,000	-	**25,000**	-	-	**-**	25,000	-	**25,000**
2041	-	-	**-**	22,229	-	**22,229**	-	-	**-**	25,000	-	**25,000**
2042	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2043	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2044	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2045	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2046	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2047	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2048	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2049	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2050	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2051	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2052	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2053	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2054	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2055	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2056	-	-	**-**	-	-	**-**	-	-	**-**	25,000	-	**25,000**
2057	-	-	**-**	-	-	**-**	-	-	**-**	23,713	-	**23,713**
2058	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2059	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
2060	-	-	**-**	-	-	**-**	-	-	**-**	-	-	**-**
Total	**448**	**1,101**	**1,549**	**722,229**	**-**	**722,229**	**-**	**-**	**-**	**773,713**	**-**	**773,713**

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Source: San Joaquin County; City of Stockton; LWA; EPS.

APPENDIX D:

Unicorporated San Joaquin County

Table D-1 Projected Tax Increment to EIFD—Unincorporated San Joaquin County 35

Table D-2 Estimated Annexation Assessed Value Reduction 36

Table D-1
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Projected Tax Increment to EIFD - Unincorporated San Joaquin County (Real $)

Unincorporated San Joaquin County

Fiscal Year Ending	Beginning Assessed Value [1]	Existing AV Growth	Annexation AV Reduction	Ending AV	Cumulative Growth in AV starting in 2018	Gross Tax Increment	Net Tax Increment		
							County [1]	County EIFD Allocation	County EIFD
Formula	*a*	*b=a*3.0%*	*c*	*d=a+b+c*	*e*	*f=e*1.0%*	*i=f*21.26%*	*j*	*k=j*i*
2017	$510,001,908	$15,300,057	$0	$525,301,965	$0	$0	$0	34%	$0
2018	$525,301,965	$15,759,059	$0	$541,061,024	$15,759,059	$157,591	$33,509	34%	$11,393
2019	$541,061,024	$16,231,831	$0	$557,292,855	$31,990,890	$319,909	$68,023	34%	$23,128
2020	$557,292,855	$16,718,786	$0	$574,011,641	$48,709,675	$487,097	$103,573	34%	$35,215
2021	$574,011,641	$17,220,349	$0	$591,231,990	$65,930,025	$659,300	$140,189	34%	$47,664
2022	$591,231,990	$17,736,960	$0	$608,968,949	$83,666,984	$836,670	$177,903	34%	$60,487
2023	$608,968,949	$18,269,068	$0	$627,238,018	$101,936,053	$1,019,361	$216,749	34%	$73,695
2024	$627,238,018	$18,817,141	$0	$646,055,159	$120,753,193	$1,207,532	$256,760	34%	$87,299
2025	$646,055,159	$19,381,655	$0	$665,436,813	$140,134,848	$1,401,348	$297,972	34%	$101,310
2026	$665,436,813	$19,963,104	$0	$685,399,918	$160,097,952	$1,600,980	$340,420	28%	$95,318
2027	$685,399,918	$20,561,998	($2,436,819)	$703,525,096	$180,659,950	$1,806,599	$384,141	28%	$107,560
2028	$703,525,096	$21,105,753	$0	$724,630,849	$201,765,703	$2,017,657	$429,019	28%	$120,125
2029	$724,630,849	$21,738,925	$0	$746,369,775	$223,504,628	$2,235,046	$475,243	28%	$133,068
2030	$746,369,775	$22,391,093	$0	$768,760,868	$245,895,722	$2,458,957	$522,854	28%	$146,399
2031	$768,760,868	$23,062,826	$0	$791,823,694	$268,958,548	$2,689,585	$571,893	28%	$160,130
2032	$791,823,694	$23,754,711	$0	$815,578,405	$292,713,258	$2,927,133	$622,403	28%	$174,273
2033	$815,578,405	$24,467,352	$0	$840,045,757	$317,180,611	$3,171,806	$674,429	28%	$188,840
2034	$840,045,757	$25,201,373	$0	$865,247,130	$342,381,983	$3,423,820	$728,015	28%	$203,844
2035	$865,247,130	$25,957,414	($14,293,679)	$876,910,865	$368,339,397	$3,683,394	$783,209	28%	$219,298
2036	$876,910,865	$26,307,326	$0	$903,218,191	$394,646,723	$3,946,467	$839,147	28%	$234,961
2037	$903,218,191	$27,096,546	$0	$930,314,737	$421,743,269	$4,217,433	$896,763	28%	$251,094
2038	$930,314,737	$27,909,442	$0	$958,224,179	$449,652,711	$4,496,527	$956,107	28%	$267,710
2039	$958,224,179	$28,746,725	$0	$986,970,904	$478,399,436	$4,783,994	$1,017,232	28%	$284,825
2040	$986,970,904	$29,609,127	$0	$1,016,580,031	$508,008,563	$5,080,086	$1,080,190	28%	$302,453
2041	$1,016,580,031	$30,497,401	$0	$1,047,077,432	$538,505,964	$5,385,060	$1,145,038	28%	$320,611
2042	$1,047,077,432	$31,412,323	$0	$1,078,489,755	$569,918,287	$5,699,183	$1,211,831	28%	$339,313
2043	$1,078,489,755	$32,354,693	$0	$1,110,844,448	$602,272,980	$6,022,730	$1,280,627	28%	$358,576
2044	$1,110,844,448	$33,325,333	$0	$1,144,169,781	$635,598,313	$6,355,983	$1,351,487	28%	$378,416
2045	$1,144,169,781	$34,325,093	$0	$1,178,494,875	$669,923,407	$6,699,234	$1,424,474	28%	$398,853
2046	$1,178,494,875	$35,354,846	$0	$1,213,849,721	$705,278,253	$7,052,783	$1,499,650	28%	$419,902
2047	$1,213,849,721	$36,415,492	$0	$1,250,265,212	$741,693,745	$7,416,937	$1,577,081	28%	$441,583
2048	$1,250,265,212	$37,507,956	$0	$1,287,773,169	$779,201,701	$7,792,017	$1,656,835	28%	$463,914
2049	$1,287,773,169	$38,633,195	$0	$1,326,406,364	$817,834,896	$8,178,349	$1,738,981	28%	$486,915
2050	$1,326,406,364	$39,792,191	$0	$1,366,198,555	$857,627,087	$8,576,271	$1,823,592	28%	$510,606
2051	$1,366,198,555	$40,985,957	$0	$1,407,184,511	$898,613,044	$8,986,130	$1,910,742	28%	$535,008
2052	$1,407,184,511	$42,215,535	$0	$1,449,400,047	$940,828,579	$9,408,286	$2,000,506	28%	$560,142
2053	$1,449,400,047	$43,482,001	$0	$1,492,882,048	$984,310,580	$9,843,106	$2,092,962	28%	$586,029
2054	$1,492,882,048	$44,786,461	$0	$1,537,668,510	$1,029,097,042	$10,290,970	$2,188,193	28%	$612,694
2055	$1,537,668,510	$46,130,055	$0	$1,583,798,565	$1,075,227,097	$10,752,271	$2,286,280	28%	$640,159
2056	$1,583,798,565	$47,513,957	$0	$1,631,312,522	$1,122,741,054	$11,227,411	$2,387,310	28%	$668,447
2057	$1,631,312,522	$48,939,376	$0	$1,680,251,897	$1,171,680,430	$11,716,804	$2,491,371	28%	$697,584
2058	$1,680,251,897	$50,407,557	$0	$1,730,659,454	$1,222,087,987	$12,220,880	$2,598,554	28%	$727,595
2059	$1,730,659,454	$51,919,784	$0	$1,782,579,238	$1,274,007,770	$12,740,078	$2,708,952	28%	$758,507
2060	$1,782,579,238	$53,477,377	$0	$1,836,056,615	$1,327,485,147	$13,274,851	$2,822,663	28%	$790,346
2061	$1,836,056,615	$55,081,698	$0	$1,891,138,314	$1,382,566,846	$13,825,668	$2,939,784	28%	$823,140

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Source: San Joaquin County; LWA; EPS.

[1] See Table E-1 for Fiscal Year 2016-17 beginning assessed value.

Table D-2
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Estimated Annexation Assessed Value Reduction (2016 and Real $)

Unincorporated San Joaquin County

Jurisdiction / Project	Fiscal Year Ending [1]	Tax Rate Areas (TRA)	Total TRA Acres	Acres Annexed	Percentage of Acres Annexed	Total TRA Assessed Value (2016$)	Assessed Value Reduction (2016$) [2]	Escalation Factor [3]	Escalated Assessed Value Reduction
City of Lathrop									
South Lathrop Specific Plan	2018	102-004	744	252	33.86%	$147,440,025	$49,928,445	1.06	$52,969,087
City of Manteca									
Oakwood Shores	2018	102-003 and 102-004	789	26	3.25%	$149,163,260	$4,854,835	1.06	$5,150,495
Future Manteca Annexation Area	2035	102-001 and 102-136	1,707	275	16.13%	$50,538,468	$8,151,485	1.75	$14,293,679
City of Stockton									
Future Stockton Annexation Area	2027	102-135 and 102-032	1,597	69	4.33%	$40,617,157	$1,760,410	1.38	$2,436,819

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Source: LWA; EPS.

[1] It is assumed that the full project acreage will be annexed into the City on the initial year of development for each project.
[2] Represents the loss of assessed value to the unincorporated San Joaquin County. Potential revenue from the newly developed TRAs within the City is calculated in the potential revenue from each jurisdiction.
[3] Assumes a 3 percent annual escalation factor.

APPENDIX E:

Supporting Tables for EIFD Revenue Analysis

Table E-1 Existing Land Use Assessed Value (2 pages) 37

Table E-2 Gross Property Tax Revenue and Tax Allocation Percentages—Fiscal Year 2015/2016 (3 pages) 39

Table E-3 Preliminary Property Tax Allocations— City of Lathrop Annexation Area 42

Table E-4 Preliminary Property Tax Allocations— City of Manteca Annexation Areas..... 43

Table E-5 Preliminary Property Tax Allocations— City of Stockton Annexation Area 44

Table E-1
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Existing Land Use Assessed Value (2016$)

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Existing Assessed Value
City of Lathrop				
Residential Land Uses	**980**	**$370,230,558**	**$878,593,739**	**$1,248,824,297**
Residential	908	$367,600,440	$876,029,761	$1,243,630,201
Rural Residential	73	$2,630,118	$2,563,978	$5,194,096
Nonresidential Land Uses	**2,765**	**$188,205,577**	**$767,676,296**	**$955,881,873**
Commercial	1,639	$78,742,792	$113,030,060	$191,772,852
Industrial	1,126	$109,462,785	$654,646,236	$764,109,021
Agricultural Land Uses	**1,203**	**$6,739,902**	**$1,669,608**	**$8,409,510**
Agricultural	1,203	$6,739,902	$1,669,608	$8,409,510
Vacant Land Uses	**1,219**	**$91,390,335**	**$3,738,709**	**$95,129,044**
Vacant	46	$926,502	$2,225	$928,727
Vacant Commercial	358	$40,182,348	$2,117,142	$42,299,490
Vacant Industrial	397	$23,375,813	$1,334,174	$24,709,987
Vacant Residential	418	$26,905,672	$285,168	$27,190,840
Total All Land Uses	**6,167**	**$656,566,372**	**$1,651,678,352**	**$2,308,244,724**
City of Manteca				
Residential Land Uses	**257**	**$110,286,435**	**$251,689,748**	**$361,976,183**
Residential	220	$109,101,838	$250,251,012	$359,352,850
Rural Residential	37	$1,184,597	$1,438,736	$2,623,333
Nonresidential Land Uses	**517**	**$29,444,637**	**$82,500,316**	**$111,944,953**
Commercial	468	$25,198,755	$63,335,323	$88,534,078
Industrial	48	$4,245,882	$19,164,993	$23,410,875
Agricultural Land Uses	**1,057**	**$6,383,314**	**$1,368,597**	**$7,751,911**
Agricultural	1,057	$6,383,314	$1,368,597	$7,751,911
Vacant Land Uses	**615**	**$43,910,440**	**$193,406**	**$44,103,846**
Vacant	-	-	-	-
Vacant Commercial	248	$14,174,986	$123,037	$14,298,023
Vacant Industrial	184	$21,295,297	$70,369	$21,365,666
Vacant Residential	183	$8,440,157	-	$8,440,157
Total All Land Uses	**2,446**	**$190,024,826**	**$335,752,067**	**$525,776,893**

Table E-1
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Existing Land Use Assessed Value (2016$)

Land Use	Total Acres	FY 2016/17 Assessed Value: Existing Land Value	Existing Land Improvement Value	Total Existing Assessed Value
City of Stockton				
Residential Land Uses	**930**	**$316,918,551**	**$813,742,433**	**$1,130,660,984**
Residential	929	$316,909,439	$813,641,895	$1,130,551,334
Rural Residential	1	$9,112	$100,538	$109,650
Nonresidential Land Uses	**205**	**$10,207,346**	**$16,054,558**	**$26,261,904**
Commercial	204	$10,106,860	$15,898,118	$26,004,978
Industrial	0	$100,486	$156,440	$256,926
Agricultural Uses	**44**	**$100,007**	**$143,279**	**$243,286**
Agricultural	44	$100,007	$143,279	$243,286
Vacant Land Uses	**88**	**$7,495,877**	**$189,000**	**$7,684,877**
Vacant	34	$58,476	-	$58,476
Vacant Commercial	24	$4,839,068	-	$4,839,068
Vacant Industrial	-	-	-	-
Vacant Residential	30	$2,598,333	$189,000	$2,787,333
Total All Land Uses	**1,266**	**$334,721,781**	**$830,129,270**	**$1,164,851,051**
Unincorporated County				
Residential Land Uses	**1,668**	**$106,325,543**	**$190,439,390**	**$296,764,933**
Residential	504	$71,251,861	$140,165,313	$211,417,174
Rural Residential	1,164	$35,073,682	$50,274,077	$85,347,759
Nonresidential Land Uses	**2,046**	**$44,370,769**	**$66,368,756**	**$110,739,525**
Commercial	1,542	$17,985,353	$20,216,306	$38,201,659
Industrial	504	$26,385,416	$46,152,450	$72,537,866
Agricultural Uses	**7,934**	**$52,225,562**	**$26,058,121**	**$78,283,683**
Agricultural	7,934	$52,225,562	$26,058,121	$78,283,683
Vacant Land Uses	**474**	**$23,592,416**	**$621,351**	**$24,213,767**
Vacant	11	$123,494	-	$123,494
Vacant Commercial	109	$5,688,270	$97,678	$5,785,948
Vacant Industrial	253	$10,753,716	$378,051	$11,131,767
Vacant Residential	101	$7,026,936	$145,622	$7,172,558
Total All Land Uses	**12,121**	**$226,514,290**	**$283,487,618**	**$510,001,908**

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Source: San Joaquin County; City of Manteca; City of Lathrop; City of Stockton; LWA; EPS.

Table E-2
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Gross Property Tax Revenue and Tax Allocation Percentages - Fiscal Year 2015-16

	2016-17 Gross Property Tax Revenue			Tax Allocation Percentage	
TRA [1]	City	County	Total	City	County
Lathrop					
7000	$70,111	$104,731	$574,230	12.21%	18.24%
7002	$4,520	$6,217	$34,480	13.11%	18.03%
7007	$247,087	$281,189	$1,982,085	12.47%	14.19%
7008	$428	$554	$3,612	11.85%	15.34%
7010	$15,699	$13,808	$87,033	18.04%	15.87%
7012	$65,393	$93,684	$523,682	12.49%	17.89%
7013	$121,035	$108,089	$672,749	17.99%	16.07%
7014	$935,002	$1,675,780	$8,661,455	10.79%	19.35%
7022	$68,728	$97,910	$553,779	12.41%	17.68%
7029	$3,968	$4,950	$33,785	11.75%	14.65%
7032	$0	$0	$2	14.11%	18.40%
7041	$64,978	$72,383	$425,534	15.27%	17.01%
7043	$248,222	$321,722	$1,898,697	13.07%	16.94%
7046	$717,122	$664,675	$4,098,403	17.50%	16.22%
7047	$6,337	$9,027	$50,749	12.49%	17.79%
7048	$71,666	$64,310	$403,669	17.75%	15.93%
7049	$80,971	$71,665	$448,883	18.04%	15.97%
7071	$571,972	$794,075	$4,408,394	12.97%	18.01%
7074	$7,999	$29,638	$146,080	5.48%	20.29%
Total Lathrop	**$3,301,238**	**$4,414,410**	**$25,007,300**	**13.20%**	**17.65%**

Table E-2
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Gross Property Tax Revenue and Tax Allocation Percentages - Fiscal Year 2015-16

	2016-17 Gross Property Tax Revenue			Tax Allocation Percentage	
TRA [1]	City	County	Total	City	County
Manteca					
TRAs not in RDA					
2000	$4,509,871	$6,184,998	$31,301,644	14.41%	19.76%
2060	$90,961	$134,984	$681,533	13.35%	19.81%
2063	$141,007	$244,258	$1,103,346	12.78%	22.14%
2064	$2,783	$4,821	$21,462	12.97%	22.46%
2087	$1,265,222	$1,714,116	$8,716,830	14.51%	19.66%
2088	$159,915	$243,657	$1,223,149	13.07%	19.92%
Subtotal	**$6,169,758**	**$8,526,835**	**$43,047,964**	**14.33%**	**19.81%**
TRAs in RDA					
2005	$32	$40	$630	5.04%	6.34%
2006	$18	$30	$870	2.07%	3.40%
2057	$489	$621	$1,340,337	0.04%	0.05%
2058	$197	$250	$1,193,411	0.02%	0.02%
2059	$14,405	$24,954	$112,420	12.81%	22.20%
2070	$7,004	$12,133	$66,686	10.50%	18.19%
2071	$415	$719	$9,843	4.22%	7.31%
2074	$26,292	$34,608	$551,774	4.77%	6.27%
2076	$16	$27	$19,748	0.08%	0.14%
2077	$94	$163	$784	12.00%	20.79%
2078	$953	$8,581	$40,149	2.37%	21.37%
Subtotal	**$49,916**	**$82,125**	**$3,336,652**	**1.50%**	**2.46%**
Total Manteca	**$6,219,674**	**$8,608,960**	**$46,384,615**		
Stockton					
3159	$129,476	$152,921	$758,880	17.06%	20.15%
3206	$232,854	$275,003	$1,364,731	17.06%	20.15%
3238	$1,735,549	$2,053,144	$10,193,453	17.03%	20.14%
3240	$104,286	$142,177	$608,830	17.13%	23.35%
3289	$83,255	$97,440	$485,296	17.16%	20.08%
3312	$7,192	$12,459	$52,088	13.81%	23.92%
3463	$21,850	$85,722	$285,122	7.66%	30.07%
3464	$182	$215	$1,061	17.15%	20.25%
Total Stockton	**$2,314,645**	**$2,819,080**	**$13,749,463**	**16.83%**	**20.50%**

Table E-2
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Gross Property Tax Revenue and Tax Allocation Percentages - Fiscal Year 2015-16

	2016-17 Gross Property Tax Revenue			Tax Allocation Percentage	
TRA [1]	City	County	Total	City	County
Unincorporated [1]					
102001	$0	$228,594	$1,124,627	0.00%	20.33%
102003	$0	$3,514	$16,805	0.00%	20.91%
102004	$0	$323,492	$1,506,098	0.00%	21.48%
102032	$0	$796	$3,570	0.00%	22.31%
102034	$0	$20,087	$90,146	0.00%	22.28%
102038	$0	$27,313	$123,194	0.00%	22.17%
102041	$0	$164	$766	0.00%	21.43%
102044	$0	$5,635	$30,877	0.00%	18.25%
102049	$0	$38,368	$234,090	0.00%	16.39%
102058	$0	$2,671	$14,482	0.00%	18.45%
102060	$0	$205,880	$946,766	0.00%	21.75%
102065	$0	$14,212	$65,428	0.00%	21.72%
102066	$0	$24,483	$143,447	0.00%	17.07%
102067	$0	$42,970	$194,550	0.00%	22.09%
102073	$0	$25,626	$118,745	0.00%	21.58%
102099	$0	$3,393	$15,650	0.00%	21.68%
102100	$0	$10,808	$54,584	0.00%	19.80%
102108	$0	$21	$101	0.00%	20.81%
102121	$0	$17,862	$79,805	0.00%	22.38%
102135	$0	$172,291	$772,729	0.00%	22.30%
102136	$0	$14,804	$72,951	0.00%	20.29%
102138	$0	$142	$638	0.00%	22.22%
102151	$0	$172,705	$844,843	0.00%	20.44%
102154	$0	$13,475	$62,884	0.00%	21.43%
102159	$0	$25,764	$115,554	0.00%	22.30%
102175	$0	$178,997	$802,456	0.00%	22.31%
102177	$0	$46,605	$209,764	0.00%	22.22%
102178	$0	$108,254	$485,521	0.00%	22.30%
Total Unincorporated	**$0**	**$1,728,928**	**$8,131,069**	**0.00%**	**21.26%**
TOTAL	**$11,835,557**	**$17,571,378**	**$93,272,448**		

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Source: San Joaquin County Assessor; San Joaquin County Auditor-Controller; EPS.

[1] For each city, includes all TRAs in the existing city boundary within the RD17 boundary. This differs from the allocations used in the individual City fiscal impact analyses because those analyses include only the allocation for TRAs with anticipated development.

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Table E-3
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Preliminary Property Tax Allocations - City of Lathrop Annexation Area

City of Lathrop

Tax Code	Entity	Existing Tax Rate Area (TRA) Post-ERAF	Adjusted Existing Base Revenue [1]	Property Tax Sharing Agreement [2]	Newly Created TRA [3]: Base Revenue	Newly Created TRA [3]: Post-ERAF Distribution
Formula		*a*	*b*	*c*	*d = c * $41,854*	*e = d / $162,934*
Subject to Detachment						
10001	County General Fund	21.47880%	$34,996	80%	$33,483	20.54993%
10527	Road District #5	4.20920%	$6,858	-	-	0.00000%
40600	City of Lathrop	0.00000%	-	20%	$8,371	5.13748%
	Subtotal	**25.68800%**	**$41,854**	**100%**	**$41,854**	**20.54993%**
Not Subject to Detachment						
10618	County Library	1.73420%	$2,826	-	$2,826	1.73416%
12601	Manteca Unified School District	28.50000%	$46,435	-	$46,435	28.49933%
13001	San Joaquin Delta Community College	3.85840%	$6,287	-	$6,287	3.85830%
13201	San Joaquin County Office of Education	1.38660%	$2,259	-	$2,259	1.38655%
14901	Lathrop-Manteca Fire District (LMFD)	9.35930%	$15,249	-	$15,249	9.35907%
16001	San Joaquin Flood Control	0.16920%	$276	-	$276	0.16920%
21901	Mosquito Abatement	0.75950%	$1,237	-	$1,237	0.75949%
22001	Reclamation District #17	0.92480%	$1,507	-	$1,507	0.92478%
41100	Education Revenue Augmentation Fund (ERAF)	27.62000%	$45,005	-	$45,005	27.62172%
	Subtotal	**74.31200%**	**$121,081**	**0%**	**$121,081**	**74.31259%**
Total		**100.00000%**	**$162,934**	**100%**	**$162,934**	**100.00000%**

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Source: San Joaquin County Auditor-Controller; EPS.

[1] Provided by the San Joaquin County Auditor-Controller.

[2] Based on the most recent tax-sharing agreement between San Joaquin County and the City of Lathrop dated November 2012 related to annexed areas to the City.

[3] The newly created TRA 007-092 will be effective in FY 2017-18. Base revenue and distribution estimated herein may differ from the final values when the TRA becomes effective.

Table E-4
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Preliminary Property Tax Allocations - City of Manteca Annexation Areas

City of Manteca

Tax Code	Entity	Existing Tax Rate Area (TRA) Post-ERAF Distribution [1] TRA 102-136	TRA 102-001	Gross Revenue (FY 2016-17) [1] TRA 102-136	TRA 102-001	Total	Property Tax Sharing Agreement [2]	Post Annexation Average Base Revenue	Post-ERAF Distribution
Formula		*a*	*b*	*e*	*f*	*g = e + f*	*h*	*e = d * $396,888*	*f = e / $1,197,578*
Subject to Detachment									
10001	County General	20.32600%	20.29360%	$228,594	$14,804	$243,398	80%	$317,510	26.51271%
10527	Road District 5	3.97920%	3.97840%	$44,751	$2,902	$47,653	-	-	0.00000%
14901	Lathrop-Manteca Rural Fire	8.83690%	8.84610%	$99,384	$6,453	$105,837	-	-	0.00000%
40200	City of Manteca	0.00000%	0.00000%	-	-	-	20%	$79,378	6.62818%
	Subtotal	**33.14210%**	**33.11810%**	**$372,728**	**$24,160**	**$396,888**	**100%**	**$396,888**	**33.14089%**
Not Subject to Detachment									
10618	County Library	1.63940%	1.63910%	$18,437	$1,196	$19,633	-	$19,633	1.63940%
12601	Manteca Unified Schools	26.94230%	26.93720%	$303,000	$19,651	$322,650	-	$322,650	26.94192%
13001	S.J. Delta Comm College	3.64750%	3.64670%	$41,021	$2,660	$43,681	-	$43,681	3.64745%
13201	County Office Of Education	1.28960%	1.31780%	$14,501	$961	$15,463	-	$15,463	1.29115%
16001	Sjc Flood Control	0.16000%	0.15990%	$1,799	$117	$1,916	-	$1,916	0.15997%
21901	Sjc Mosquito Abatement	0.71800%	0.71790%	$8,075	$524	$8,598	-	$8,598	0.71797%
24601	South San Joaquin Irrigation	5.41160%	5.41660%	$60,861	$3,951	$64,813	-	$64,813	5.41200%
41100	ERAF - Educational Revenue Augmentation Fund	27.04950%	27.04670%	$304,205	$19,731	$323,936	-	$323,936	27.04926%
	Subtotal	**66.85790%**	**66.88190%**	**$751,899**	**$48,791**	**$800,690**	**0%**	**$800,690**	**66.85911%**
Total		**100.00000%**	**100.00000%**	**$1,124,627**	**$72,951**	**$1,197,578**	**100%**	**$1,197,578**	**100.00000%**

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Source: San Joaquin County Auditor-Controller; EPS.

[1] Provided by the San Joaquin County Auditor-Controller.
[3] Based on the most recent tax-sharing agreement between San Joaquin County and the City of Manteca dated December 2014

Table E-5
RD 17 Area Finance Plan Implementation
EIFD Revenue Analysis
Preliminary Property Tax Allocations - City of Stockton Annexation Area

City of Stockton

Tax Code	Entity	Existing Tax Rate Area (TRA) Post-ERAF Distribution [1]		Gross Revenue (FY 2016-17) [1]			Property Tax Sharing Agreement [2]	Post Annexation Average	
		TRA 102-135	TRA 102-032	TRA 102-135	TRA 102-032	Total		Base Revenue	Post-ERAF Distribution
Formula		*a*	*b*	*e*	*f*	*g = e + f*	*h*	*e = d * $278,126*	*f = e / $769,158*
Subject to Detachment									
10001	County General	22.29650%	22.30610%	$172,291	($796)	$171,495	80%	$222,501	28.92784%
10527	Road District 1	4.26040%	4.26030%	$32,921	($152)	$32,769	-	-	0.00000%
14401	French Camp-Mc Kinley Rural Fire	9.60300%	9.60300%	$74,205	($343)	$73,862	-	-	0.00000%
40400	City of Stockton	0.00000%	0.00000%	-	-	-	20%	$55,625	7.23196%
	Subtotal	**36.15990%**	**36.16940%**	**$279,417**	**($1,291)**	**$278,126**	**100%**	**$278,126**	**36.15980%**
Not Subject to Detachment									
10618	County Library	1.80010%	1.80010%	$13,910	($64)	$13,846	-	$13,846	1.80013%
12601	Manteca Unified Schools	29.58380%	29.58380%	$228,602	($1,056)	$227,546	-	$227,546	29.58378%
13001	S.J. Delta Comm College	4.00510%	4.00510%	$30,949	($143)	$30,806	-	$30,806	4.00514%
13201	County Office Of Education	1.43850%	1.42890%	$11,116	($51)	$11,065	-	$11,065	1.43855%
16001	Sjc Flood Control	0.17560%	0.17570%	$1,357	($6)	$1,351	-	$1,351	0.17564%
21901	Sjc Mosquito Abatement	0.78840%	0.78840%	$6,092	($28)	$6,064	-	$6,064	0.78838%
41100	ERAF - Educational Revenue Augmentation Fund	26.04860%	26.04860%	$201,285	($930)	$200,355	-	$200,355	26.04859%
	Subtotal	**63.84010%**	**63.83060%**	**$493,311**	**($2,279)**	**$491,032**	-	**$491,032**	**63.84020%**
Total		**100.00000%**	**100.00000%**	**$772,729**	**($3,570)**	**$769,158**	**100%**	**$769,158**	**100.00000%**

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Source: San Joaquin County Auditor-Controller; EPS.

[1] Provided by the San Joaquin County Auditor-Controller.
[2] Based on the most recent tax-sharing agreement between San Joaquin County and the City of Stockton dated March 2005 related to annexed areas to the City.

ATTACHMENT H:
UPDATED FINANCING PLAN TABLES

Table 4	ULOP Adequate Progress Sources & Uses Statement (through 2026)	E1
Table 5	ULOP Levee Program Cash Flow and Financing Analysis	E2
Table A1	Total Development Impact Fee Revenue Estimate	E4
Table A2	Development Impact Fee Revenue Estimate - Single Family	E5
Table A3	Development Impact Fee Revenue Estimate – Multifamily	E6
Table A4	Development Impact Fee Revenue Estimate – Commercial	E7
Table A5	Development Impact Fee Revenue Estimate – Industrial	E8
Table E17	Financing Revenues and Debt Service	E9

Table 4
RD 17 Basin Financing Plan Implementaion
ULOP Adequate Progress Sources & Uses Statement (through 2026)

Item	Total [1]	Notes
Project Uses		
LSRP Expenditures		
LSRP - Phase I	$ 2,831,307	
LSRP - Phase II	$ 10,824,871	
LSRP - Phase III	$ 48,075,436	
Subtotal: LSRP Expenditures	**$ 61,731,614**	
ULOP Program Planning & Implementation		
Pre-Project Expenditures (PBI/LWA/ETC)	$ 3,256,360	
Funding Program Implementation Costs	$ 1,250,000	
Subtotal: ULOP Program Planning & Implementation	**$ 4,506,360**	
Fix-In-Place Project Expenditures		
Soft Costs	$ 29,936,611	
Construction Costs	$ 99,940,992	
Right-of-Way	$ 20,957,007	
Dryland Levee Extension	$ 20,774,042	
Subtotal: Fix-In-Place Project Expenditures	**$ 171,608,651**	
Total Project Uses	**$ 237,846,625**	
Project Sources		
State Funding for LSRP (EIP Program)	$ 36,899,224	[2]
Subtotal State Funding	*$ 36,899,224*	
Local Funding Sources		
LSRP Funding		
LSRP - RD 17 Mossdale Tract Assessments (Net Revenues)	$ 30,879,936	[3]
LSRP - RD 17 Mossdale Tract (Bond Revenues)	$ 26,584,731	[4]
LSRP - RD 17 Mossdale Tract (Debt Service)	($ 23,376,706)	[5]
Fix in Place Project Funding		
Developer Advances / City Funding	*$ 2,936,728*	[6]
RD 17 LIA Overlay Assessment - ULDC	$ 48,662,422	[7]
Development Fee Program	$ 18,756,332	[8]
EIFD Revenues	$ 18,627,464	[9]
Future EIFD / Assessment Overlay Financing (Bond Proceeds)	$ 100,000,000	[10]
Future EIFD / Assessment Overlay Financing (Debt Service Carry)	($ 21,986,527)	[11]
Subtotal Local Funding	*$ 201,084,380*	
Total Project Sources	**$ 237,983,604**	
Total Project Sources less Uses	**$ 136,979**	

Source: LWA

[1] Total Amounts between 2010 & 2026 including escalation.

[2] Assumed State Share of Funding for RD 17 LSRP

[3] Assumed share of RD 17 Assessment Revenues that are used to fund Project Costs and Debt Service for the LSRP during the time frame of the Analysis

[4] Bond Proceeds assumed to be availble to fund Project Costs as calculated per the Cash Flow Analysis on Table 5

[5] Debt service for RD 17 PFA Financing during period of analysis.

[6] Funding advanced by Cities and Developers from 2010 to 2016 for ULDC Analysis & Implementation of the Funding Program.

[7] New overlay assessment revenues during period of implementation.

[8] Development Impact fee revenues collected during period of implementation.

[9] EIFD revenues collected during period of implementation.

[10] Assumed financing secured by Overlay Assessment and EIFD Revenues.

[11] Debt service for for the Hybrid EIFD and Assessment Financing during period of analysis.

Table 5
RD 17 Basin Financing Plan Implementaion
ULOP Levee Program Cash Flow and Financing Analysis

Year	*Reference* (ULOP APR)	Total	Credit [1]	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
LSRP Beginning Balance				-	-	**2,777,476**	**2,608,239**	**4,869,577**	**4,790,676**	**4,374,002**	**9,373,198**	**10,662,483**	**8,610,965**	**4,938,005**	**7,169,738**	**7,466,524**	**7,782,551**	**8,119,436**	**8,479,402**	**8,856,550**
LSRP Expenditures																				
LSRP - Phase I	*Table C4*	**2,831,307**	2,389,737	4,736	5,416	3,256	1,147	999	426,016	-	-	-	-	-	-	-	-	-	-	-
LSRP - Phase II	*Table C4*	**10,824,871**	4,422,373	4,105,206	486,457	1,435,354	202,861	24,374	148,246	-	-	-	-	-	-	-	-	-	-	-
LSRP - Phase III	*Table C4 & Table C1*	**48,075,436**	200,296	1,266,817	777,723	300,622	288,589	648,653	606,490	867,918	15,813,404	13,844,826	13,360,098	100,000	-	-	-	-	-	-
Total LSRP Expenditures		**61,731,614**	**7,012,406**	**5,376,759**	**1,269,596**	**1,739,232**	**492,597**	**674,025**	**1,180,753**	**867,918**	**15,813,404**	**13,844,826**	**13,360,098**	**100,000**	**-**	**-**	**-**	**-**	**-**	**-**
State Sources																				
State EIP Funding (State Share)	*Table C3*	**32,341,160**	-	1,991,867	2,355,408	420,838	1,041,086	-	-	-	3,487,795	11,555,042	9,431,795	2,057,330	-	-	-	-	-	-
State EIP Funding (Local Credit)	*Table C3*	**4,558,064**	-	1,077,608	473,025	31,194	576,149	-	-	-	2,400,088	-	-	-	-	-	-	-	-	-
Local Sources																				
RD 17 Assessment Net Revenues - LSRP	*Table C5*	**30,879,936**	-	1,925,564	2,478,092	2,379,632	2,399,375	1,852,919	1,956,198	574,322	1,639,361	1,659,764	1,680,205	1,700,671	1,721,153	1,741,638	1,762,115	1,782,571	1,802,992	1,823,365
Total LSRP Revenues		**67,779,160**	**-**	**4,995,039**	**5,306,525**	**2,831,664**	**4,016,610**	**1,852,919**	**1,956,198**	**574,322**	**7,527,243**	**13,214,806**	**11,112,000**	**3,758,001**	**1,721,153**	**1,741,638**	**1,762,115**	**1,782,571**	**1,802,992**	**1,823,365**
Preliminary Ending Balance LSRP Expenditures			**(7,012,406)**	**(381,720)**	**4,036,929**	**3,869,908**	**6,132,252**	**6,048,470**	**5,566,122**	**4,080,406**	**1,087,038**	**10,032,463**	**6,362,866**	**8,596,006**	**8,890,891**	**9,208,162**	**9,544,666**	**9,902,006**	**10,282,394**	**10,679,915**
RD 17 Bond Financing - 2009																				
Assumed Draws on Proceeds / Cash on Hand	*Calculated [2]*	**20,053,525**	7,012,406	2,041,119	-	-	-	-	-	-	11,000,000	-	-	-	-	-	-			
Debt Service	*Table C5*	**(9,131,524)**	-	(1,659,399)	(1,259,453)	(1,261,669)	(1,262,675)	(1,257,794)	(1,192,120)	(1,238,414)	-	-	-	-	-	-	-	-	-	-
RD 17 Bond Refunding - 2016																				
Net New Proceeds	*Assumed [3]*	**6,531,206**	-	-	-	-	-	-	-	6,531,206	-	-	-	-	-	-	-	-	-	-
Combined Debt Service post refunding	*From OS*	**(14,245,182)**	-	-	-	-	-	-	-	-	(1,424,554)	(1,421,499)	(1,424,861)	(1,426,267)	(1,424,367)	(1,425,611)	(1,425,230)	(1,422,605)	(1,425,844)	(1,424,344)
Ending Balance LSRP Expenditures			**-**	**-**	**2,777,476**	**2,608,239**	**4,869,577**	**4,790,676**	**4,374,002**	**9,373,198**	**10,662,483**	**8,610,965**	**4,938,005**	**7,169,738**	**7,466,524**	**7,782,551**	**8,119,436**	**8,479,402**	**8,856,550**	**9,255,571**
Fix-In-Place Project Beginning Balance				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**(819,632)**	**6,117,340**	**10,931,392**	**16,290,352**	**21,364,044**	**2,651,185**	**(21,503,953)**	**(60,698,442)**	**(93,605,015)**
Fix-In-Place Project Expenditures																				
Pre-Project Expenditures (PBI/LWA/ETC)	*Table A7*	**3,256,360**	-	-	-	-	-	719,212	719,212	859,041	958,896	-	-	-	-	-	-	-	-	-
Funding Program Implementation Costs	*Assumed*	**1,250,000**	-	-	-	-	-	-	-	-	500,000	750,000	-	-	-	-	-	-	-	-
Soft Costs	*Table 7*	**29,936,611**	-	-	-	-	-	-	-	-	-	-	3,236,330	3,333,419	3,433,422	5,769,541	5,635,794	4,501,552	4,026,552	-
Construction Costs	*Table 7*	**99,940,992**	-	-	-	-	-	-	-	-	-	-	-	-	-	19,055,403	24,533,831	30,323,816	26,027,942	-
Right-of-Way	*Table 7*	**20,957,007**	-	-	-	-	-	-	-	-	-	-	-	-	-	1,552,268	1,598,836	6,874,761	5,384,799	5,546,343
Dryland Levee Extension	*Table 7*	**20,774,042**	-	-	-	-	-	-	-	-	-	-	-	-	-	2,195,862	2,261,738	8,037,656	8,278,786	-
Total Fix-In-Place Project Expenditures		**176,115,011**	**-**	**-**	**-**	**-**	**-**	**719,212**	**719,212**	**859,041**	**1,458,896**	**750,000**	**3,236,330**	**3,333,419**	**3,433,422**	**28,573,074**	**34,030,200**	**49,737,785**	**43,718,078**	**5,546,343**
Fix-In-Place Project Revenues																				
State Sources																				
State UFRR Funding (Preliminary Design Only)	*N/A*	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
State Funding (Future Bond)	*N/A*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Local Sources																				
RD 17 LIA Overlay Assessment - ULDC	*Overlay Model*	**48,662,422**	-	-	-	-	-	-	-	-	-	5,500,000	5,475,493	5,451,642	5,425,588	5,407,899	5,381,462	5,360,816	5,338,937	5,320,586
Lathrop/Manteca/Developer Advance Funding	[4]	**2,936,728**	-	-	-	-	-	719,212	719,212	859,041	639,264	-	-	-	-	-	-	-	-	-
Development Fee Program	*Table B1 [5]*	**18,756,332**	-	-	-	-	-	-	-	-	-	2,186,972	2,126,206	2,332,330	1,643,656	2,508,737	1,911,287	2,021,570	1,689,267	2,336,307
Regional EIFD TI Revenues	*Table B1*	**18,627,464**	-	-	-	-	-	-	-	-	-	-	448,683	908,407	1,437,870	1,943,580	2,582,312	3,160,910	3,783,302	4,362,399
Total Fix-In-Place Project Revenues		**88,982,946**		**-**	**-**	**-**	**-**	**719,212**	**719,212**	**859,041**	**639,264**	**7,686,972**	**8,050,382**	**8,692,379**	**8,507,114**	**9,860,216**	**9,875,061**	**10,543,296**	**10,811,505**	**12,019,292**
Preliminary Ending Balance Fix-In-Place Project				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**(819,632)**	**6,117,340**	**10,931,392**	**16,290,352**	**21,364,044**	**2,651,185**	**(21,503,953)**	**(60,698,442)**	**(93,605,015)**	**(87,132,066)**

RD 17 Basin Financing Plan Implementaion
ULOP Levee Program Cash Flow and Financing Analysis

Year	*Reference* (ULOP APR)	Total	Credit [1]	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
LEVEE PROGRAM - STARTING BALANCE				**-**	**-**	**2,777,476**	**2,608,239**	**4,869,577**	**4,790,676**	**4,374,002**	**9,373,198**	**9,842,851**	**14,728,305**	**15,869,397**	**23,460,090**	**28,830,568**	**71,433,736**	**43,168,892**	**38,887,778**	**1,911,762**
Net Cash Flow LSRP	[6]			-	2,777,476	(169,237)	2,261,338	(78,900)	(416,675)	4,999,196	1,289,285	(2,051,519)	(3,672,959)	2,231,733	296,785	316,027	336,885	359,966	377,148	399,021
Net Cash Flow Fix-In-Place	[6]			-	-	-	-	-	-	-	(819,632)	6,936,972	4,814,052	5,358,959	5,073,692	(18,712,858)	(24,155,139)	(39,194,489)	(32,906,573)	6,472,949
Program Financing																				
Bridge Financing Costs (Developer Advances / Other)																				
Proceeds	*N/A*	**-**		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AD & EIFD Borrowing																				
Proceeds		**100,000,000**		-	-	-	-	-	-	-	-	-	-	-	-	61,000,000	-	39,000,000	-	-
Debt Service Costs		**(21,986,527)**		-	-	-	-	-	-	-	-	-	-	-	-	-	(4,446,591)	(4,446,591)	(4,446,591)	(8,646,754)
LEVEE PROGRAM - ENDING BALANCE				**-**	**2,777,476**	**2,608,239**	**4,869,577**	**4,790,676**	**4,374,002**	**9,373,198**	**9,842,851**	**14,728,305**	**15,869,397**	**23,460,090**	**28,830,568**	**71,433,736**	**43,168,892**	**38,887,778**	**1,911,762**	**136,979**

[1] Credit amounts shown for LSRP on Table C2
[2] Amount needed to support project cashflows prior to 2017. Amount in 2017 is amount projected by RD 17. The amount is assumed to come from Bond Proceeds or Reserves available to support the LSRP.
[3] Amount based on RD 17 refunding bond issuance.
[4] Amount provided by Lathrop Council Actions. Amounts already committed by the Cities of Lathrop & Manteca from General, Enterpise and Developer committed funding. Reference Table A7.
[5] Assumed Development Impact Fee revenues based on projected absorption assumptions. To the extent that development absorption does not generate the needed development fee revenues, it is assumed the development interests advance fund development impact fees at a sufficient pace to cash flow the near term revenue shortfalls in order to cover projected expenditures in a similar fashion as has been done in the past, *reference Note [4]* .
[6] Prior to 2020, the net cash flows of the LSRP RD 17 Project and the Fix-In-Place urban project are assumed to be required to independently cash flow the respective projects, however, after January 2021, it is assumed that the combined cashflows of the respective projects have the benefit of comibined funding sources, therefore, the Levee Program Ending Balance is required to be positive in order to ensure that the Levee Program is able to cash flow program expenditures.

Table A1
RD 17 Basin Financing Plan Implementaion
Updated Regional Development Fee Revenue Analysis
Total Development Impact Fee Revenue Estimate

	Revenue by Land Use				
Year	**Single Family**	**Multifamily**	**Commercial**	**Industrial**	**Total Fee Revenue**
	Table A2	*Table A3*	*Table A4*	*Table A5*	
2016	$ 0	$ 0	$ 0	$ 0	$ 0
2017	$ 0	$ 0	$ 0	$ 0	$ 0
2018	$ 1,095,591	$ 82,978	$ 217,931	$ 790,472	$ 2,186,972
2019	$ 1,034,824	$ 82,978	$ 217,931	$ 790,472	$ 2,126,206
2020	$ 1,215,577	$ 108,351	$ 217,931	$ 790,472	$ 2,332,330
2021	$ 848,335	$ 294,147	$ 233,475	$ 267,698	$ 1,643,656
2022	$ 929,227	$ 367,233	$ 944,578	$ 267,698	$ 2,508,737
2023	$ 1,171,903	$ 167,100	$ 304,586	$ 267,698	$ 1,911,287
2024	$ 1,171,903	$ 149,910	$ 376,041	$ 323,715	$ 2,021,570
2025	$ 905,465	$ 84,045	$ 376,041	$ 323,715	$ 1,689,267
2026	$ 767,835	$ 137,385	$ 1,105,978	$ 325,109	$ 2,336,307
2027	$ 767,835	$ 137,385	$ 1,147,736	$ 325,109	$ 2,378,065
2028	$ 767,835	$ 1,586	$ 1,147,736	$ 325,109	$ 2,242,266
2029	$ 767,835	$ 1,586	$ 1,147,736	$ 325,109	$ 2,242,266
2030	$ 1,044,071	$ 1,586	$ 1,147,736	$ 334,143	$ 2,527,536
2031	$ 309,374	$ 1,586	$ 469,440	$ 415,498	$ 1,195,898
2032	$ 309,374	$ 74,012	$ 540,896	$ 415,498	$ 1,339,780
2033	$ 290,846	$ 74,012	$ 540,896	$ 415,498	$ 1,321,251
2034	$ 12,915	$ 74,012	$ 540,896	$ 415,498	$ 1,043,320
2035	$ 702,922	$ 74,012	$ 497,857	$ 415,498	$ 1,690,288
2036	$ 1,032,776	$ 74,012	$ 665,655	$ 830,996	$ 2,603,438
2037	$ 1,032,776	$ 74,012	$ 683,098	$ 830,996	$ 2,620,882
2038	$ 1,032,776	$ 16,071	$ 687,714	$ 830,996	$ 2,567,557
2039	$ 1,032,776	$ 1,586	$ 687,714	$ 830,996	$ 2,553,071
2040	$ 1,032,776	$ 1,586	$ 687,714	$ 830,996	$ 2,553,071
2041	$ 1,447,729	$ 42,985	$ 350,569	$ 13,835	$ 1,855,119
2042	$ 1,447,729	$ 42,985	$ 287,340	$ 13,835	$ 1,791,890
2043	$ 1,447,729	$ 42,985	$ 287,340	$ 13,835	$ 1,791,890
2044	$ 1,266,674	$ 42,985	$ 221,765	$ 13,835	$ 1,545,259
2045	$ 1,118,537	$ 42,985	$ 193,825	$ 13,835	$ 1,369,183
2046	$ 1,118,537	$ 42,985	$ 193,825	$ 13,835	$ 1,369,183
2047	$ 1,118,537	$ 42,985	$ 193,825	$ 13,835	$ 1,369,183
2048	$ 1,039,869	$ 42,985	$ 193,825	$ 13,835	$ 1,290,515
2049	$ 621,370	$ 42,985	$ 193,825	$ 13,835	$ 872,016
2050	$ 428,531	$ 42,985	$ 193,825	$ 13,835	$ 679,176
2051	$ 428,531	$ 42,985	$ 193,825	$ 13,835	$ 679,176
2052	$ 428,531	$ 42,985	$ 193,825	$ 13,835	$ 679,176
2053	$ 428,531	$ 42,985	$ 193,825	$ 13,835	$ 679,176
2054	$ 428,531	$ 42,985	$ 193,825	$ 13,835	$ 679,176
2055	$ 428,531	$ 42,985	$ 193,825	$ 13,835	$ 679,176
2056	$ 428,531	$ 42,985	$ 193,825	$ 13,835	$ 679,176
2057	$ 428,531	$ 42,985	$ 191,675	$ 13,835	$ 677,026
2058	$ 428,531	$ 42,985	$ 152,067	$ 13,835	$ 637,418
2059	$ 428,531	$ 42,985	$ 152,067	$ 13,835	$ 637,418
2060	$ 428,531	$ 42,985	$ 152,067	$ 13,835	$ 637,418
Total	**$ 34,618,096**	**$ 2,940,880**	**$ 18,708,102**	**$ 11,965,696**	**$ 68,232,774**

Table A2
RD 17 Basin Financing Plan Implementaion
Updated Regional Development Fee Revenue Analysis
Development Impact Fee Revenue Estimate - Single Family

	Single Family Acres By Jurisdiction					
Year	Lathrop	Manteca	Stockton	Unincorp County	Total	Fee Revenue
	Table E13	*Table E7*	*Table E10*	*Table E16*		*Table AX*
					Fee Rate/Acre	***$ 16,558***
2016	0.0	0.0	0.0	0.0	0.0	$ 0
2017	0.0	0.0	0.0	0.0	0.0	$ 0
2018	28.5	23.0	0.0	14.7	66.2	$ 1,095,591
2019	28.5	23.0	0.0	11.0	62.5	$ 1,034,824
2020	28.5	33.1	11.9	0.0	73.4	$ 1,215,577
2021	22.3	17.1	11.9	0.0	51.2	$ 848,335
2022	22.3	22.0	11.9	0.0	56.1	$ 929,227
2023	22.3	36.7	11.9	0.0	70.8	$ 1,171,903
2024	22.3	36.7	11.9	0.0	70.8	$ 1,171,903
2025	22.3	25.3	7.1	0.0	54.7	$ 905,465
2026	26.8	19.5	0.0	0.0	46.4	$ 767,835
2027	26.8	19.5	0.0	0.0	46.4	$ 767,835
2028	26.8	19.5	0.0	0.0	46.4	$ 767,835
2029	26.8	19.5	0.0	0.0	46.4	$ 767,835
2030	26.8	36.2	0.0	0.0	63.1	$ 1,044,071
2031	0.8	17.9	0.0	0.0	18.7	$ 309,374
2032	0.8	17.9	0.0	0.0	18.7	$ 309,374
2033	0.8	16.8	0.0	0.0	17.6	$ 290,846
2034	0.8	0.0	0.0	0.0	0.8	$ 12,915
2035	0.8	41.7	0.0	0.0	42.5	$ 702,922
2036	0.8	61.6	0.0	0.0	62.4	$ 1,032,776
2037	0.8	61.6	0.0	0.0	62.4	$ 1,032,776
2038	0.8	61.6	0.0	0.0	62.4	$ 1,032,776
2039	0.8	61.6	0.0	0.0	62.4	$ 1,032,776
2040	0.8	61.6	0.0	0.0	62.4	$ 1,032,776
2041	25.9	61.6	0.0	0.0	87.4	$ 1,447,729
2042	25.9	61.6	0.0	0.0	87.4	$ 1,447,729
2043	25.9	61.6	0.0	0.0	87.4	$ 1,447,729
2044	25.9	50.6	0.0	0.0	76.5	$ 1,266,674
2045	25.9	41.7	0.0	0.0	67.6	$ 1,118,537
2046	25.9	41.7	0.0	0.0	67.6	$ 1,118,537
2047	25.9	41.7	0.0	0.0	67.6	$ 1,118,537
2048	25.9	36.9	0.0	0.0	62.8	$ 1,039,869
2049	25.9	11.6	0.0	0.0	37.5	$ 621,370
2050	25.9	0.0	0.0	0.0	25.9	$ 428,531
2051	25.9	0.0	0.0	0.0	25.9	$ 428,531
2052	25.9	0.0	0.0	0.0	25.9	$ 428,531
2053	25.9	0.0	0.0	0.0	25.9	$ 428,531
2054	25.9	0.0	0.0	0.0	25.9	$ 428,531
2055	25.9	0.0	0.0	0.0	25.9	$ 428,531
2056	25.9	0.0	0.0	0.0	25.9	$ 428,531
2057	25.9	0.0	0.0	0.0	25.9	$ 428,531
2058	25.9	0.0	0.0	0.0	25.9	$ 428,531
2059	25.9	0.0	0.0	0.0	25.9	$ 428,531
2060	25.9	0.0	0.0	0.0	25.9	$ 428,531
Total	***856.5***	***1,142.2***	***66.4***	***25.7***	***2,090.8***	***$34,618,096***

Source:
P:\15400 Lathrop Manteca\15433 - Imp Governance\Fiscal & EIFD Analysis\[15400

Table A3
RD 17 Basin Financing Plan Implementaion
Updated Regional Development Fee Revenue Analysis
Development Impact Fee Revenue Estimate - Multifamily

	Multifamily Acres By Jurisdiction					
Year	**Lathrop**	**Manteca**	**Stockton**	**Unincorp County**	**Total**	**Fee Revenue**
	Table E13	*Table E7*	*Table E10*	*Table E16*		*Table AX*
					Fee Rate/Acre	***$ 18,123***
2016	0.0	0.0	0.0	0.0	0.0	$ 0
2017	0.0	0.0	0.0	0.0	0.0	$ 0
2018	4.6	0.0	0.0	0.0	4.6	$ 82,978
2019	4.6	0.0	0.0	0.0	4.6	$ 82,978
2020	4.6	1.4	0.0	0.0	6.0	$ 108,351
2021	4.6	4.0	7.6	0.0	16.2	$ 294,147
2022	4.6	8.0	7.6	0.0	20.3	$ 367,233
2023	4.6	4.6	0.0	0.0	9.2	$ 167,100
2024	4.6	3.6	0.0	0.0	8.3	$ 149,910
2025	4.6	0.0	0.0	0.0	4.6	$ 84,045
2026	0.1	0.0	7.5	0.0	7.6	$ 137,385
2027	0.1	0.0	7.5	0.0	7.6	$ 137,385
2028	0.1	0.0	0.0	0.0	0.1	$ 1,586
2029	0.1	0.0	0.0	0.0	0.1	$ 1,586
2030	0.1	0.0	0.0	0.0	0.1	$ 1,586
2031	0.1	0.0	0.0	0.0	0.1	$ 1,586
2032	0.1	0.0	4.0	0.0	4.1	$ 74,012
2033	0.1	0.0	4.0	0.0	4.1	$ 74,012
2034	0.1	0.0	4.0	0.0	4.1	$ 74,012
2035	0.1	0.0	4.0	0.0	4.1	$ 74,012
2036	0.1	0.0	4.0	0.0	4.1	$ 74,012
2037	0.1	0.0	4.0	0.0	4.1	$ 74,012
2038	0.1	0.0	0.8	0.0	0.9	$ 16,071
2039	0.1	0.0	0.0	0.0	0.1	$ 1,586
2040	0.1	0.0	0.0	0.0	0.1	$ 1,586
2041	2.4	0.0	0.0	0.0	2.4	$ 42,985
2042	2.4	0.0	0.0	0.0	2.4	$ 42,985
2043	2.4	0.0	0.0	0.0	2.4	$ 42,985
2044	2.4	0.0	0.0	0.0	2.4	$ 42,985
2045	2.4	0.0	0.0	0.0	2.4	$ 42,985
2046	2.4	0.0	0.0	0.0	2.4	$ 42,985
2047	2.4	0.0	0.0	0.0	2.4	$ 42,985
2048	2.4	0.0	0.0	0.0	2.4	$ 42,985
2049	2.4	0.0	0.0	0.0	2.4	$ 42,985
2050	2.4	0.0	0.0	0.0	2.4	$ 42,985
2051	2.4	0.0	0.0	0.0	2.4	$ 42,985
2052	2.4	0.0	0.0	0.0	2.4	$ 42,985
2053	2.4	0.0	0.0	0.0	2.4	$ 42,985
2054	2.4	0.0	0.0	0.0	2.4	$ 42,985
2055	2.4	0.0	0.0	0.0	2.4	$ 42,985
2056	2.4	0.0	0.0	0.0	2.4	$ 42,985
2057	2.4	0.0	0.0	0.0	2.4	$ 42,985
2058	2.4	0.0	0.0	0.0	2.4	$ 42,985
2059	2.4	0.0	0.0	0.0	2.4	$ 42,985
2060	2.4	0.0	0.0	0.0	2.4	$ 42,985
Total	***85.7***	***21.6***	***55.0***	***0.0***	***162.3***	***$2,940,880***

Source:
P:\15400 Lathrop Manteca\15433 - Imp Governance\Fiscal & EIFD Analysis\[15400 200-

Table A4
RD 17 Basin Financing Plan Implementaion
Updated Regional Development Fee Revenue Analysis
Development Impact Fee Revenue Estimate - Commercial

	Commercial Acres By Jurisdiction					
Year	**Lathrop**	**Manteca**	**Stockton**	**Unincorp County**	**Total**	**Fee Revenue**
	Table E13	*Table E7*	*Table E10*	*Table E16*		*Table AX*
					Fee Rate/Acre	***$ 18,676***
2016	0.0	0.0	0.0	0.0	0.0	$ 0
2017	0.0	0.0	0.0	0.0	0.0	$ 0
2018	11.7	0.0	0.0	0.0	11.7	$ 217,931
2019	11.7	0.0	0.0	0.0	11.7	$ 217,931
2020	11.7	0.0	0.0	0.0	11.7	$ 217,931
2021	12.5	0.0	0.0	0.0	12.5	$ 233,475
2022	12.5	0.0	38.1	0.0	50.6	$ 944,578
2023	12.5	0.0	3.8	0.0	16.3	$ 304,586
2024	12.5	3.8	3.8	0.0	20.1	$ 376,041
2025	12.5	3.8	3.8	0.0	20.1	$ 376,041
2026	51.6	3.8	3.8	0.0	59.2	$ 1,105,978
2027	51.6	3.8	6.0	0.0	61.5	$ 1,147,736
2028	51.6	3.8	6.0	0.0	61.5	$ 1,147,736
2029	51.6	3.8	6.0	0.0	61.5	$ 1,147,736
2030	51.6	3.8	6.0	0.0	61.5	$ 1,147,736
2031	15.3	3.8	6.0	0.0	25.1	$ 469,440
2032	15.3	7.7	6.0	0.0	29.0	$ 540,896
2033	15.3	7.7	6.0	0.0	29.0	$ 540,896
2034	15.3	7.7	6.0	0.0	29.0	$ 540,896
2035	15.3	5.3	6.0	0.0	26.7	$ 497,857
2036	25.8	3.8	6.0	0.0	35.6	$ 665,655
2037	25.8	4.8	6.0	0.0	36.6	$ 683,098
2038	25.8	5.0	6.0	0.0	36.8	$ 687,714
2039	25.8	5.0	6.0	0.0	36.8	$ 687,714
2040	25.8	5.0	6.0	0.0	36.8	$ 687,714
2041	8.1	5.0	5.6	0.0	18.8	$ 350,569
2042	8.1	5.0	2.2	0.0	15.4	$ 287,340
2043	8.1	5.0	2.2	0.0	15.4	$ 287,340
2044	8.1	1.5	2.2	0.0	11.9	$ 221,765
2045	8.1	0.0	2.2	0.0	10.4	$ 193,825
2046	8.1	0.0	2.2	0.0	10.4	$ 193,825
2047	8.1	0.0	2.2	0.0	10.4	$ 193,825
2048	8.1	0.0	2.2	0.0	10.4	$ 193,825
2049	8.1	0.0	2.2	0.0	10.4	$ 193,825
2050	8.1	0.0	2.2	0.0	10.4	$ 193,825
2051	8.1	0.0	2.2	0.0	10.4	$ 193,825
2052	8.1	0.0	2.2	0.0	10.4	$ 193,825
2053	8.1	0.0	2.2	0.0	10.4	$ 193,825
2054	8.1	0.0	2.2	0.0	10.4	$ 193,825
2055	8.1	0.0	2.2	0.0	10.4	$ 193,825
2056	8.1	0.0	2.2	0.0	10.4	$ 193,825
2057	8.1	0.0	2.1	0.0	10.3	$ 191,675
2058	8.1	0.0	0.0	0.0	8.1	$ 152,067
2059	8.1	0.0	0.0	0.0	8.1	$ 152,067
2060	8.1	0.0	0.0	0.0	8.1	$ 152,067
Total	***723.5***	***99.0***	***179.2***	***0.0***	***1,001.7***	***$18,708,102***

Table A5
RD 17 Basin Financing Plan Implementaion
Updated Regional Development Fee Revenue Analysis
Development Impact Fee Revenue Estimate - Industrial

	Industrial Acres By Jurisdiction					
Year	**Lathrop**	**Manteca**	**Stockton**	**Unincorp County**	**Total**	**Fee Revenue**
	Table E13	*Table E7*	*Table E10*	*Table E16*		*Table AX*
					Fee Rate/Acre	***$ 14,641***
2016	0.0	0.0	0.0	0.0	0.0	$ 0
2017	0.0	0.0	0.0	0.0	0.0	$ 0
2018	54.0	0.0	0.0	0.0	54.0	$ 790,472
2019	54.0	0.0	0.0	0.0	54.0	$ 790,472
2020	54.0	0.0	0.0	0.0	54.0	$ 790,472
2021	18.3	0.0	0.0	0.0	18.3	$ 267,698
2022	18.3	0.0	0.0	0.0	18.3	$ 267,698
2023	18.3	0.0	0.0	0.0	18.3	$ 267,698
2024	18.3	3.8	0.0	0.0	22.1	$ 323,715
2025	18.3	3.8	0.0	0.0	22.1	$ 323,715
2026	18.4	3.8	0.0	0.0	22.2	$ 325,109
2027	18.4	3.8	0.0	0.0	22.2	$ 325,109
2028	18.4	3.8	0.0	0.0	22.2	$ 325,109
2029	18.4	3.8	0.0	0.0	22.2	$ 325,109
2030	18.4	4.4	0.0	0.0	22.8	$ 334,143
2031	28.4	0.0	0.0	0.0	28.4	$ 415,498
2032	28.4	0.0	0.0	0.0	28.4	$ 415,498
2033	28.4	0.0	0.0	0.0	28.4	$ 415,498
2034	28.4	0.0	0.0	0.0	28.4	$ 415,498
2035	28.4	0.0	0.0	0.0	28.4	$ 415,498
2036	56.8	0.0	0.0	0.0	56.8	$ 830,996
2037	56.8	0.0	0.0	0.0	56.8	$ 830,996
2038	56.8	0.0	0.0	0.0	56.8	$ 830,996
2039	56.8	0.0	0.0	0.0	56.8	$ 830,996
2040	56.8	0.0	0.0	0.0	56.8	$ 830,996
2041	0.9	0.0	0.0	0.0	0.9	$ 13,835
2042	0.9	0.0	0.0	0.0	0.9	$ 13,835
2043	0.9	0.0	0.0	0.0	0.9	$ 13,835
2044	0.9	0.0	0.0	0.0	0.9	$ 13,835
2045	0.9	0.0	0.0	0.0	0.9	$ 13,835
2046	0.9	0.0	0.0	0.0	0.9	$ 13,835
2047	0.9	0.0	0.0	0.0	0.9	$ 13,835
2048	0.9	0.0	0.0	0.0	0.9	$ 13,835
2049	0.9	0.0	0.0	0.0	0.9	$ 13,835
2050	0.9	0.0	0.0	0.0	0.9	$ 13,835
2051	0.9	0.0	0.0	0.0	0.9	$ 13,835
2052	0.9	0.0	0.0	0.0	0.9	$ 13,835
2053	0.9	0.0	0.0	0.0	0.9	$ 13,835
2054	0.9	0.0	0.0	0.0	0.9	$ 13,835
2055	0.9	0.0	0.0	0.0	0.9	$ 13,835
2056	0.9	0.0	0.0	0.0	0.9	$ 13,835
2057	0.9	0.0	0.0	0.0	0.9	$ 13,835
2058	0.9	0.0	0.0	0.0	0.9	$ 13,835
2059	0.9	0.0	0.0	0.0	0.9	$ 13,835
2060	0.9	0.0	0.0	0.0	0.9	$ 13,835
Total	***789.9***	***27.4***	***0.0***	***0.0***	***817.3***	***$11,965,696***

Table E17
RD 17 Basin Financing Plan Implementaion
Updated EIFD & Financing Supporting Tables
Financing Revenues and Debt Service

AD at $5.5 Million Starting

Year	Gross Available Assessment Revenues	Gross EIFD Revenues	Gross Revenues for Project & Financing	Debt Service	Assessment Revenue for Debt Service	EIFD Revenue for Debt Service [1]	Net Assessment Revenue for PayGo / Services	Net EIFD Revenue for PayGo & Future Projects [1]
2016	$0	$0	$0	$0	$0	$0	$0	$0
2017	$0	$0	$0	$0	$0	$0	$0	$0
2018	$5,500,000	$0	$5,500,000	$0	$0	$0	$5,500,000	$0
2019	$5,475,493	$448,683	$5,924,176	$0	$0	$0	$5,475,493	$448,683
2020	$5,451,642	$908,407	$6,360,049	$0	$0	$0	$5,451,642	$908,407
2021	$5,425,588	$1,437,870	$6,863,458	$0	$0	$0	$5,425,588	$1,437,870
2022	$5,407,899	$1,943,580	$7,351,479	$0	$0	$0	$5,407,899	$1,943,580
2023	$5,381,462	$2,582,312	$7,963,774	$4,446,591	$4,446,591	$0	$934,871	$2,582,312
2024	$5,360,816	$3,160,910	$8,521,726	$4,446,591	$4,446,591	$0	$914,225	$3,160,910
2025	$5,338,937	$3,783,302	$9,122,239	$4,446,591	$4,446,591	$0	$892,346	$3,783,302
2026	$5,320,586	$4,362,399	$9,682,985	$8,646,754	$5,070,586	$3,576,168	$250,000	$786,231
2027	$5,295,837	$4,213,729	$9,509,566	$8,646,754	$5,045,837	$3,600,917	$250,000	$612,812
2028	$5,270,668	$4,872,213	$10,142,881	$8,646,754	$5,020,668	$3,626,087	$250,000	$1,246,127
2029	$5,246,839	$5,522,401	$10,769,239	$8,646,754	$4,996,839	$3,649,915	$250,000	$1,872,485
2030	$5,223,010	$6,203,491	$11,426,501	$8,646,754	$4,973,010	$3,673,744	$250,000	$2,529,747
2031	$5,196,086	$6,966,543	$12,162,630	$8,646,754	$4,946,086	$3,700,668	$250,000	$3,265,875
2032	$5,182,929	$7,479,523	$12,662,452	$8,646,754	$4,932,929	$3,713,825	$250,000	$3,765,698
2033	$5,168,338	$8,052,787	$13,221,125	$8,646,754	$4,918,338	$3,728,416	$250,000	$4,324,371
2034	$5,153,948	$8,646,435	$13,800,383	$8,646,754	$4,903,948	$3,742,807	$250,000	$4,903,629
2035	$5,142,560	$9,209,808	$14,352,368	$8,646,754	$4,892,560	$3,754,194	$250,000	$5,455,614
2036	$5,124,150	$9,879,131	$15,003,281	$8,646,754	$4,874,150	$3,772,604	$250,000	$6,106,527
2037	$5,095,411	$10,717,568	$15,812,979	$8,646,754	$4,845,411	$3,801,343	$250,000	$6,916,225
2038	$5,066,497	$11,597,043	$16,663,540	$8,646,754	$4,816,497	$3,830,257	$250,000	$7,766,786
2039	$5,038,108	$12,487,375	$17,525,483	$8,646,754	$4,788,108	$3,858,646	$250,000	$8,628,729
2040	$5,009,863	$13,410,029	$18,419,892	$8,646,754	$4,759,863	$3,886,892	$250,000	$9,523,137
2041	$4,981,617	$14,372,085	$19,353,702	$8,646,754	$4,731,617	$3,915,137	$250,000	$10,456,948
2042	$4,961,855	$15,329,503	$20,291,359	$8,646,754	$4,711,855	$3,934,899	$250,000	$11,394,605
2043	$4,942,730	$16,316,690	$21,259,420	$8,646,754	$4,692,730	$3,954,024	$250,000	$12,362,666
2044	$4,923,605	$17,344,593	$22,268,197	$8,646,754	$4,673,605	$3,973,150	$250,000	$13,371,443

Table E17
RD 17 Basin Financing Plan Implementaion
Updated EIFD & Financing Supporting Tables
Financing Revenues and Debt Service

AD at $5.5 Million Starting

Year	Gross Available Assessment Revenues	Gross EIFD Revenues	Gross Revenues for Project & Financing	Debt Service	Assessment Revenue for Debt Service	EIFD Revenue for Debt Service [1]	Net Assessment Revenue for PayGo / Services	Net EIFD Revenue for PayGo & Future Projects [1]
2045	$4,907,095	$18,356,126	$23,263,221	$8,646,754	$4,657,095	$3,989,659	$250,000	$14,366,467
2046	$4,892,467	$19,364,800	$24,257,267	$8,646,754	$4,642,467	$4,004,287	$250,000	$15,360,512
2047	$4,877,839	$20,412,755	$25,290,594	$8,646,754	$4,627,839	$4,018,916	$250,000	$16,393,840
2048	$4,863,211	$21,501,442	$26,364,652	$8,646,754	$4,613,211	$4,033,544	$250,000	$17,467,898
2049	$4,849,432	$22,624,426	$27,473,858	$8,646,754	$4,599,432	$4,047,322	$250,000	$18,577,104
2050	$4,840,176	$23,723,271	$28,563,446	$8,646,754	$4,590,176	$4,056,578	$250,000	$19,666,692
2051	$4,833,003	$24,813,436	$29,646,439	$6,423,459	$4,583,003	$1,840,456	$250,000	$22,972,980
2052	$4,825,830	$25,943,945	$30,769,775	$4,200,163	$4,200,163	$0	$625,667	$25,943,945
2053	$4,818,657	$27,116,236	$31,934,893	$4,200,163	$4,200,163	$0	$618,494	$27,116,236
2054	$4,811,484	$28,331,799	$33,143,283	$0	$0	$0	$4,811,484	$28,331,799
2055	$4,804,311	$29,592,176	$34,396,487	$0	$0	$0	$4,804,311	$29,592,176
2056	$4,797,138	$30,898,961	$35,696,099	$0	$0	$0	$4,797,138	$30,898,961
2057	$4,789,965	$32,253,804	$37,043,769	$0	$0	$0	$4,789,965	$32,253,804
2058	$4,782,814	$33,657,537	$38,440,350	$0	$0	$0	$4,782,814	$33,657,537
2059	$4,776,061	$35,096,132	$39,872,193	$0	$0	$0	$4,776,061	$35,096,132
2060	$4,769,308	$36,587,036	$41,356,343	$0	$0	$0	$4,769,308	$36,587,036
Total	***$217,925,260***	***$631,522,291***	***$849,447,551***	***$244,332,413***	***$146,647,957***	***$97,684,456***	***$71,277,303***	***$533,837,835***

[1] Pay go Revenues from the EIFD are collected through 2026. The total amount of PayGo revenues needed to funding the 200-Year Project total $15,051,296. The total debt service supported by EIFD revenues is $97,684,456. Combined, the total EIFD revenue needed is $112,735,751.

Appendix E

Economic and Life Loss Evaluation
Technical Memorandum

TECHNICAL MEMORANDUM

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Appendix E
Mossdale Tract Area
Urban Flood Risk Reduction
Economic and Life Loss Evaluation

Prepared for: *San Joaquin Area Flood Control Agency (SJAFCA)* ***November 7, 2019***
Rev. June 10, 2021

Prepared by: Brittney Salvador, E.I.T. & Michael Pantell, P.E., C.F.M.
Reviewed by: Mike Rossiter, P.E., C.F.M. & Dave Peterson, P.E.

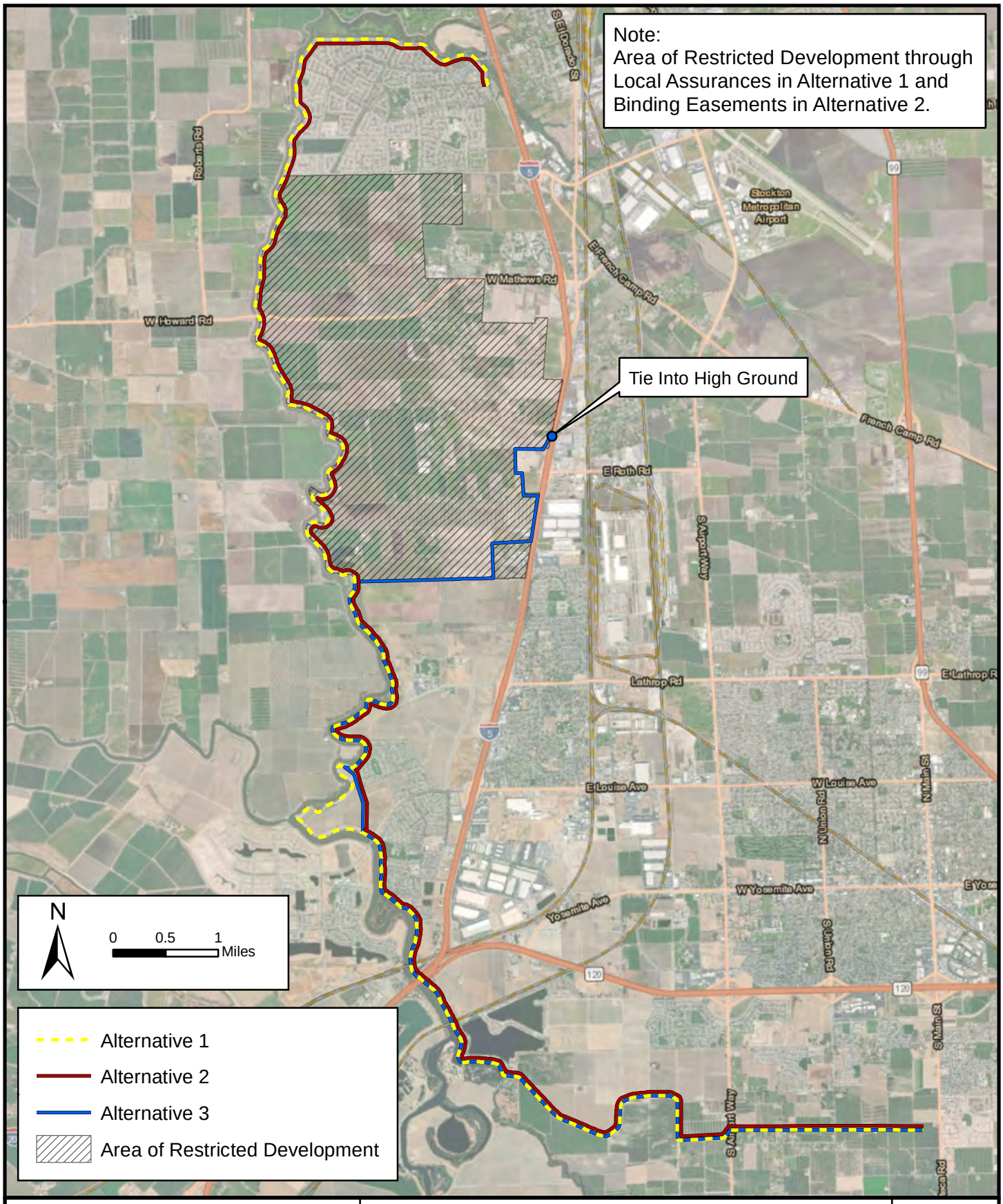
1.0 Introduction

The City of Lathrop was awarded an Urban Flood Risk Reduction (UFRR) grant to study alternatives for achieving an Urban Level of Protection (ULOP) in the Mossdale Tract Area. The State of California is particularly concerned that increased growth, induced by the levees meeting ULDC, compounded with the effects of climate change could increase economic damages and life loss in the case of flooding. The UFRR Feasibility Study proposed and evaluated three alternative project designs built to an estimated 2040 climate change condition.

The alternatives are discussed in detail in the main body of the report, and are briefly described as follows:

- Alternative 1: Full fix in place levee improvements accommodating year 2040 climate change, with local assurances for wise use of the floodplain. The key feature of local assurances is development prohibitions in the State's Delta Plan.
- Alternative 2: Full fix in place levee improvements accommodating year 2040 climate change, with binding easements on 5,050 acres for wise use of the floodplain.
- Alternative 3: Partial fix in place of levees fronting Lathrop and Manteca, plus a new secondary levee along the northern boundary of Lathrop. Levee improvements accommodate year 2040 climate change. Growth north of that line would be restricted due to not achieving Urban Level of Protection (ULOP).

Figure 1 provides an overview of the Alternative layouts. The UFRR analysis evaluated and compared each alternative for current and 2065 projected climate change hydrologic conditions. This technical memorandum lays out the methodology used to estimate the economic and life loss benefits of each alternative.



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MOSSDALE TRACT AREA

Key Flood Risk Management Features of Alternatives

FIGURE

1

2.0 Analysis Methodology

To estimate the economic and life loss benefits of each alternative, a model of the study area was developed using the Hydrologic Engineering Center Flood Damage Analysis (HEC-FDA) software. Where possible, the methodology and assumptions from the 2012 Central Valley Flood Protection Plan (CVFPP) were followed for this analysis. HEC-FDA calculates expected annual damage (EAD) and expected annual life loss (EALL) with the following input parameters:

- Stage-exceedance probability
- Interior-Exterior Stage Relationship
- Levee Failure Probability-Stage Relationship
- Damage-Stage Relationship

The difference between the with- and without- project EAD and EALL is the economic and life loss benefit, respectively. EAD is the probability weighted average of all possible peak annual damages. Normally this is estimated by calculating the area under the damage-frequency curve. While mathematically elegant, this method only works if there is a single damage value associated with a probability of occurrence. Uncertainty in the various inputs creates a range of probable damages for a given probability of occurrence.

To account for these uncertainties, HEC-FDA uses the Monte Carlo Simulation algorithm to calculate EAD. The Monte Carlo Simulation algorithm calculates the damages for tens of thousands of randomly generated events. The EAD is defined as the average of all possible values of damage determined by exhaustive Monte Carlo sampling (USACE, 2008b). Figure 2 shows the basic relationship between the input parameters and the FDA generated samples of these relationships.

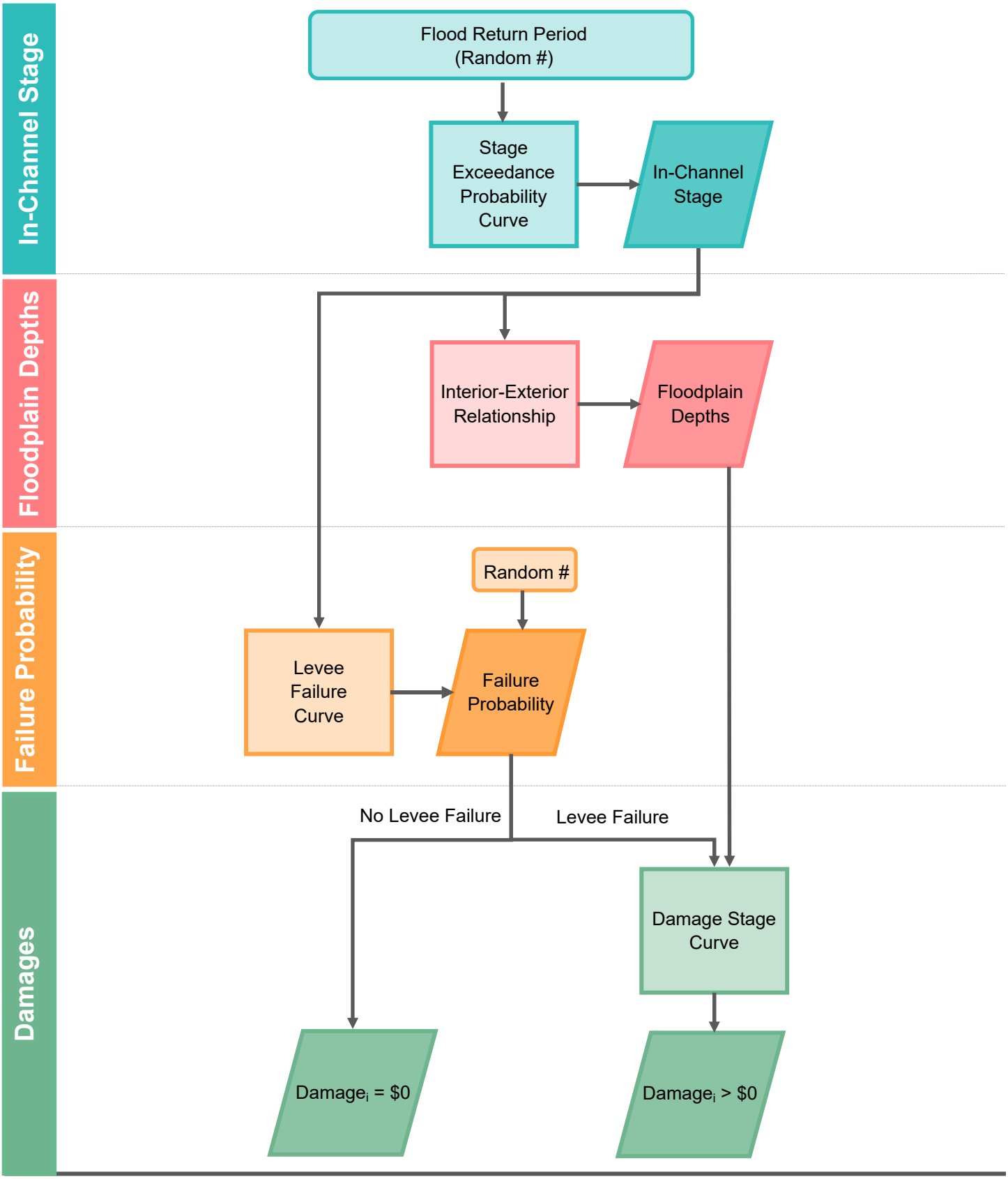
For a given alternative and planning horizon, each location on the levee would have unique parameters that affect the EAD and EALL results. To account for this, the EAD and EALL were calculated for six (6) index points along the Mossdale Tract levee. The six index points, shown in Figure 3, were taken from the US Army Corps of Engineers (USACE) Lower San Joaquin River Feasibility Study (LSJRFS) (DWR, 2018) and produce a representative picture of the consequences. It is worth noting that an index point represents an entire reach of levee and not just the specific point.

In addition, EAD and EALL are also affected by the hydrologic conditions for the analysis year. For the purposes of this study, 2018 and 2065 analysis years were used. The 2018 analysis year represents current hydrologic conditions while 2065 incorporates climate change estimates

from the Basin Wide Feasibility Study (BWFS) (DWR, 2017). While the alternatives will be designed to a 2040 ULDC standard, the 2065 climate change condition was analyzed to verify the resiliency of the project over approximately 50 years.

The following section outlines the methods used to determine the four input relationships used by HEC-FDA to calculate the EAD and EALL of each alternative.

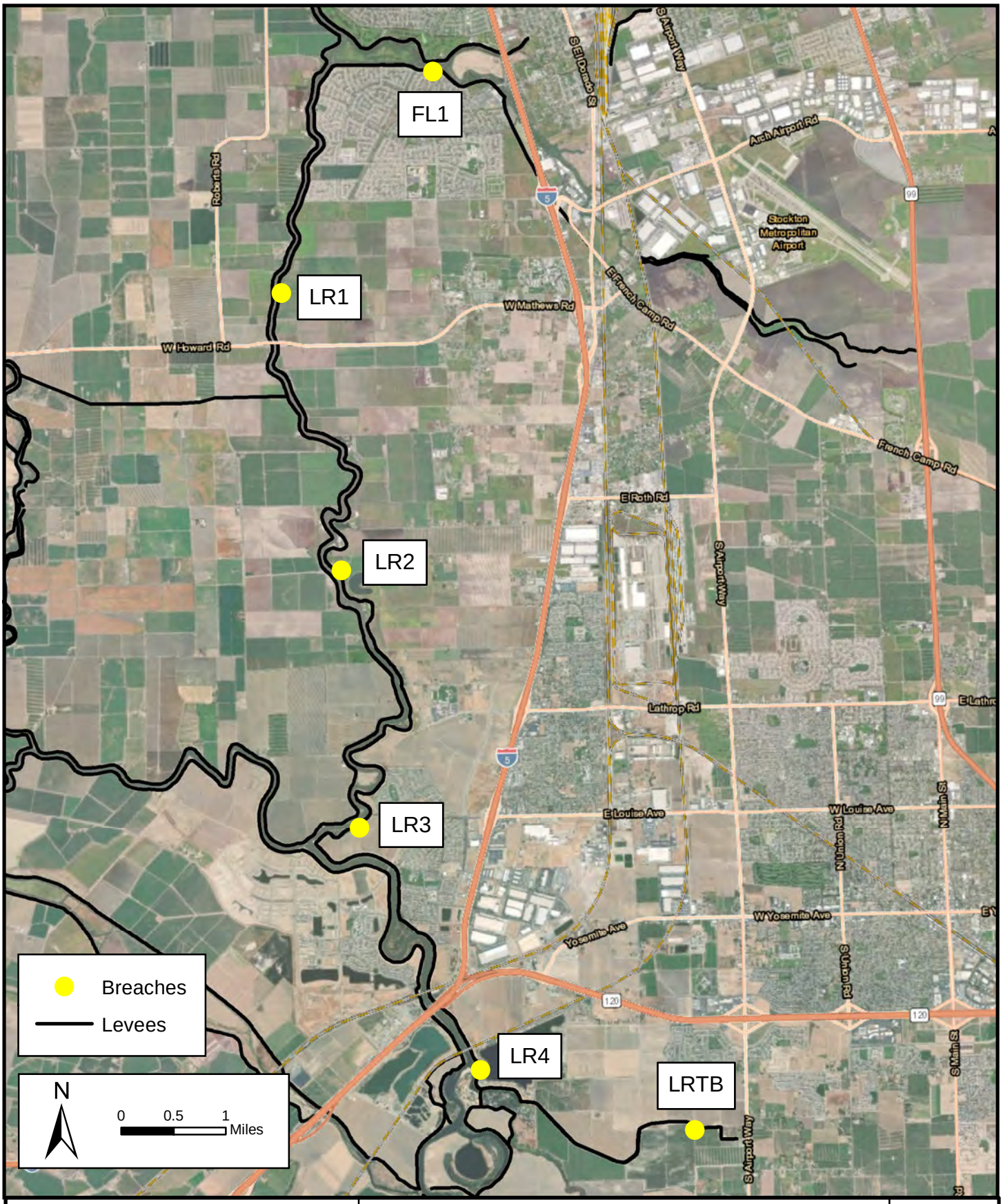
Figure 2: FDA Model Framework



Expected Annual Damages

$$EAD = \frac{\sum_{i=1}^{n} Damages_i}{n}$$

Where n is very large (e.g. 10,000-100,000)



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Index Point Locations

FIGURE

3

2.1 Stage-Exceedance Probability

The exceedance probability function is the annual probability that a given in-channel stage will occur. The exceedance probability curves vary with index points, hydrologic conditions, and with- or without- project conditions. To prepare the stage-exceedance probability curves, Peterson Brustad Inc (PBI) created a 1D/2D HEC-RAS 5.0 model (Peterson Brustad Inc, 2018). This model used information from the 2017 CVFPP to determine the 2018 and 2065 inflows from the San Joaquin River and corresponding Delta Stage conditions for six (6) return periods. The 10-, 25-, 50-, 100-, 200-, and 500-year return periods were modeled in HEC-RAS for the without project condition and each alternative, assuming levees can overtop, but do not fail (levees holding).

The stages for each of the return periods were extracted from the HEC-RAS model and imported into HEC-FDA. The channel invert was also extracted and used as the stage for the 1-year return period for each index point. HEC-FDA then calculates stage-exceedance probability curves by extrapolating out the data to a 10,000-year event. After examining these curves, it was observed that at a single index point the alternatives have approximately the same stage-exceedance probability curve. For each index point, the stage-exceedance probability curves for the various alternatives were combined into a single with-project curve.

To account for the uncertainty in the stage-exceedance probability function, HEC-FDA uses equivalent years of record. Since the hydrologic data was derived from the 2017 CVFPP data, the equivalent of 91 years of record was taken from the 2017 CVFPP and used for this analysis. From this, HEC-FDA computes the uncertainty for each of the stage-exceedance probability curves. Figure 4 shows an example stage-exceedance probability curve calculated within HEC-FDA. See Attachment A for all exceedance probability curves used in the HEC-FDA model.

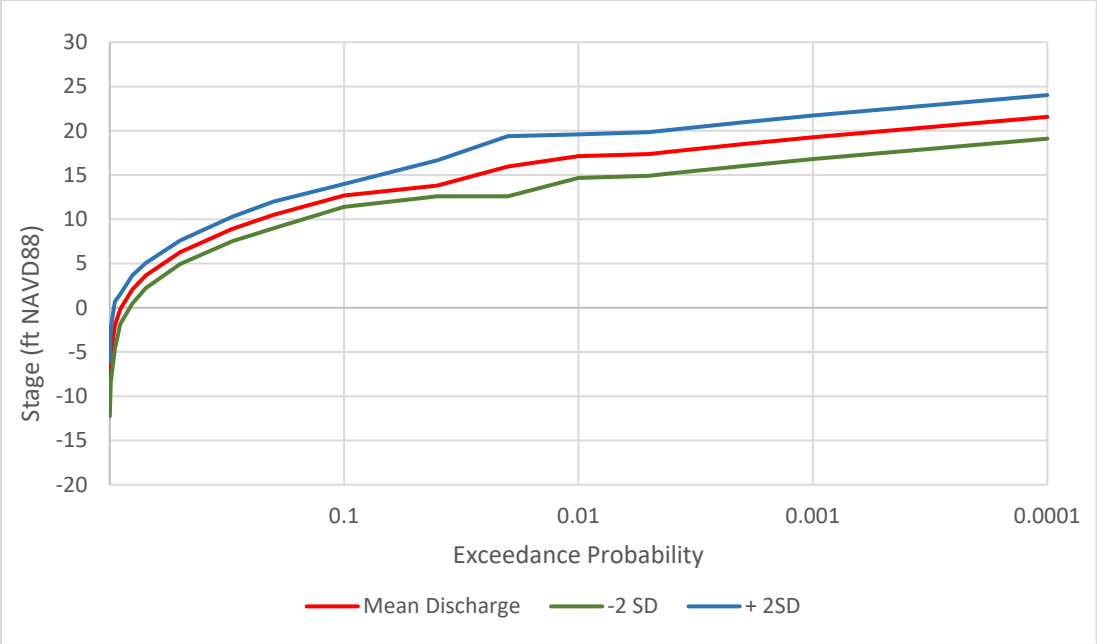


Figure 4: Example of Stage-Frequency Curve

2.2 Interior-Exterior Stage Relationship

The interior-exterior stage relationship describes the in-channel stage (exterior-stage) and the stage associated with the floodplain (interior-stage). HEC-FDA uses this relationship to determine the depth across the entire floodplain if the levee were to fail for the following return periods: 10-, 25-, 50-, 100-, 250-, and 500-year. To calculate this, PBI used the 1D/2D HEC-RAS 5.0 model of the Mossdale Tract Area (Peterson Brustad Inc, 2018). The HEC-RAS 5.0 model computes the maximum floodplain which would be produced by levee overtopping and/or levee failure of an index point for the Mossdale Tract Area using a 2D mesh that is divided into approximately 250 by 250-foot grid cells.

Floodplains were created by coding breaches into the HEC-RAS model. This generated over 150 unique floodplains for the Mossdale Tract Area. Since each floodplain does not have an equal stage at all locations, the grid cells were used to determine the interior stages in the floodplain for each index point. This was done by assigning each grid cell in the Mossdale Tract Area a unique station value. The average ground elevation of each grid cell was extracted, and the floodplain stage associated with each return period for each grid cell was put in a table. The exterior stage associated with each scenario was taken from the stage-exceedance probability curve from the previous section. The final product is a table that has the ground (invert) elevation for each grid cell, the exterior-stage for the channel for each scenario, and the

interior-stage for the Mossdale Tract floodplain area for each scenario. Figure 5 shows an example of an interior-exterior stage relationship input.

WSP_Name	Description		Plan		Year		Stream		Type		Notes
FL1_Alt1 _2018			FL1_Alt1		2018		LSJ		STAGE_FREQUENCY		
WSP_Probability											
		0.5	0.2	0.1	0.04	0.02	0.01	0.004	0.002		
WSP_Station	Invert	Stage	Stage	Stage	Stage	Stage	Stage	Stage	Stage		
0	9.47	0.47	0.47	0.47	0.47	7.47	10.70	11.21	12.56		
0.5	-1.02	-1.02	-1.02	10.34	11.66	12.68	13.44	13.77	14.47		
1	8.62	-0.38	-0.38	-0.38	6.62	9.24	10.70	11.21	12.56		
2	8.56	-0.44	-0.44	-0.44	6.56	9.24	10.70	11.21	12.56		
3	6.81	-2.19	-2.19	4.81	8.24	9.24	10.70	11.21	12.56		
4	6.27	-2.73	-2.73	4.27	8.24	9.24	10.70	11.21	12.56		
5	6.89	-2.11	-2.11	4.89	8.24	9.24	10.70	11.21	12.56		
6	5.46	-3.54	-3.54	3.46	8.24	9.24	10.70	11.21	12.56		
7	5.54	-3.46	-3.46	3.54	8.24	9.24	10.70	11.21	12.56		
8	6.14	-2.86	-2.86	4.14	8.24	9.24	10.70	11.21	12.56		
9	6.57	-2.43	-2.43	4.57	8.24	9.24	10.70	11.21	12.56		
10	6.63	-2.38	-2.38	4.63	8.24	9.24	10.70	11.21	12.56		
11	6.47	-2.53	-2.53	4.47	8.24	9.24	10.70	11.21	12.56		
12	6.40	-2.60	-2.60	4.40	8.24	9.24	10.70	11.21	12.56		
13	7.53	-1.47	-1.47	5.53	8.24	9.24	10.70	11.21	12.56		
14	7.55	-1.45	-1.45	5.55	8.24	9.24	10.70	11.21	12.56		
15	7.47	-1.53	-1.53	5.47	8.24	9.24	10.70	11.21	12.56		
16	8.94	-0.06	-0.06	-0.06	6.94	9.24	10.70	11.21	12.56		
17	9.31	0.31	0.31	0.31	0.31	7.31	10.70	11.21	12.56		

Figure 5: Example of an Interior Exterior Relationship

As previously mentioned, the interior-exterior stage relationship was calculate using PBI's 1D/2D HEC-RAS 5.0 model of the Mossdale Tract Area (Peterson Brustad Inc, 2018). However, PBI's 1D/2D HEC-RAS 5.0 model did not include the 250-year return period – the closest return period being the 200-year event. A sensitivity analysis was performed to evaluate how the depths differ between the 200- and 250-year events and, most importantly, how this difference impacts the EAD/EALL. The results of the sensitivity analysis show that the difference between the 200- and 250-year depths is minimal and does not impact the final EAD/EALL because of the low frequency of these events. Therefore, the 200-year depths from the 1D/2D HEC-RAS 5.0 model were used for the 250-year event of the interior-exterior stage relationship in FDA.

2.3 Levee Failure Probability-Stage Relationship

The levee failure probability-stage relationship (also referred to as the levee fragility curve) describes the probability of the levee failing at a given channel stage. The levee fragility curve is

drawn using geotechnical characteristics of the levee such as shape, size, height presence of cutoff wall and presence of toe berms.

The 2012 CVFPP used geotechnical analyses conducted on levees throughout the Central Valley to develop a calculator that would estimate the levee fragility curve at various locations for unimproved and improved levees. The CVFPP calculator assigns unimproved levee systems a standard S-curve shape levee fragility curve with a 50% levee failure probability halfway up the height of the levee. The CVFPP improved levee fragility curve has a very low failure probability at the design water surface elevation (DWSE) and gradually increase to the top of levee. For the improved levee fragility curve, the 2012 CVFPP calculator assigns a probability of failure of 0% at the landside toe of the levee, approximately 2% at the DWSE, approximately 9% at the DWSE + 3', and 100% at the crown of the levee. Using the calculator, the 2012 CVFPP provided existing condition levee fragility curves for each index point based on geotechnical information at the time.

Since 2012, the Mossdale Tract Levee Seepage Repair Project (LSRP) has improved segments of levee and will continue to do so in the future. The without project conditions assume that Phases 1-2 of the LSRP have been completed, but Phase 3 is in-progress. While many of the index point locations have been improved by the LSRP, much of the levee remain unimproved. While index points are point locations, they inherently represent a reach of levee, the entirety of which needs to be improved before the levee fragility curve is changed. To date, the reach represented by LR3 has been entirely improved under LSRP Phase 3; therefore, the without project levee fragility curve for LR3 was updated for this analysis. To calculate this levee fragility curve as well as the with-project levee fragility curves for the remaining index points, ENGEO used the 2012 CVFPP calculator along with the DWSE and top of levee elevation information provided by PBI. These fragility curves were imported into HEC-FDA.

The exception to this was the without project scenario at the LRTB index point. Since LRTB without project represents the end of the tieback levee, there is no levee at this point and, thus, no levee fragility curve. A surrogate levee fragility curve was created by PBI for the purposes of modeling. The surrogate levee fragility curve was developed with the understanding that flanking will occur 100% of the time that the floodplain stages reach 23.23' NAVD88.

Table 1 shows the source of each levee fragility curve used for this study/analysis. Figure 6 shows an example of a levee fragility curve for LR1 with the project. See Attachment B for all levee fragility curves used in the HEC-FDA model.

Table 1: Source of Levee Fragility Curves

Index Point	Project Status	Source	Without Project	Alternatives 1 & 2	Alternative 3
FL1	Without	CVFPP 2012	X		X
	With	CVFPP 2012		X	
LR1	Without	CVFPP 2012	X		X
	With	ENGEO		X	
LR2	Without	CVFPP 2012	X		X
	With	ENGEO		X	
LR3	Without	PBI	X		
	With	ENGEO		X	X
LR4	Without	CVFPP 2012	X		
	With	PBI		X	X
LRTB	Without	PBI	X		
	With	ENGEO		X	X

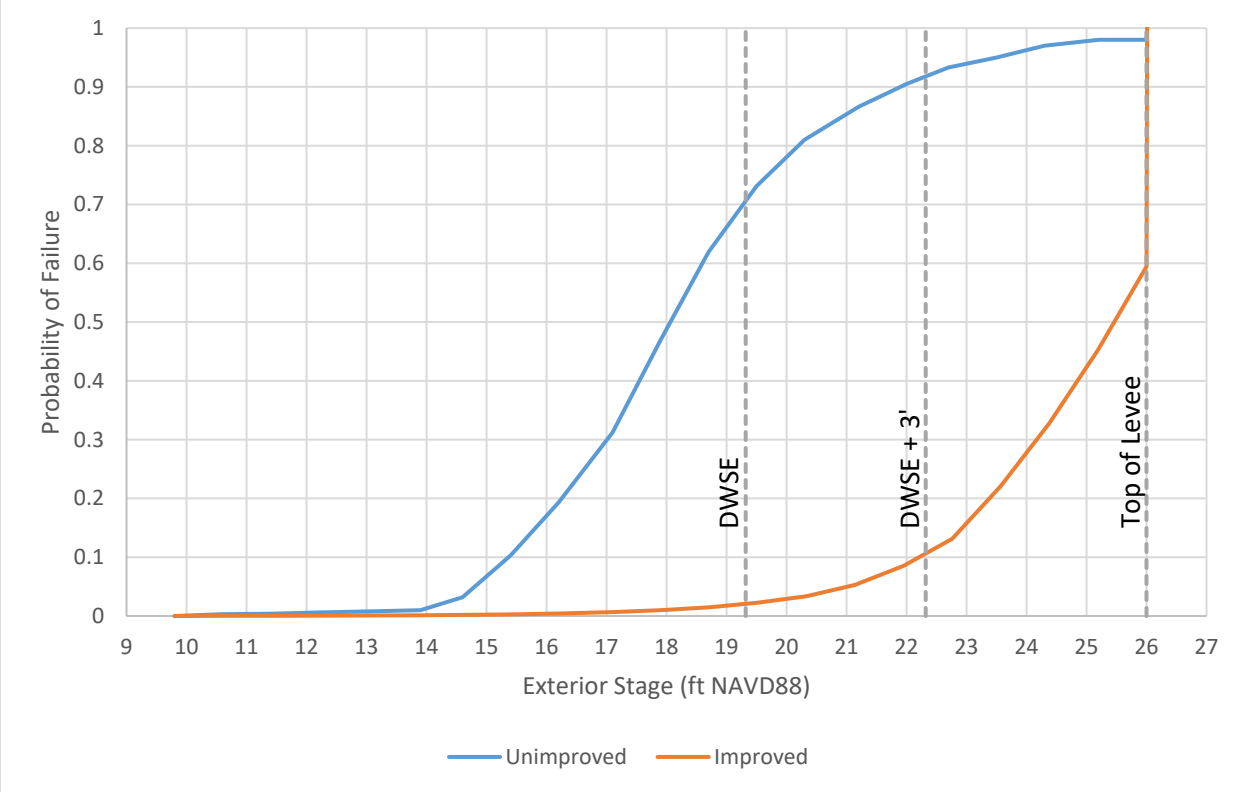


Figure 6: Example of Levee Fragility Curve

2.4 Damage-Stage Relationship

For this study, structure inventories were developed for current conditions in 2018 and future conditions in 2065 based methodology outlined by the 2012 CVFPP. It is important to note that crops and other minor damages, such as cars and business losses were not included in the structure inventory. The effort to compile crop and other minor damages were not justified in the study. See Attachment C for a summary of the assumptions made to update the 2012 CVFPP structure inventory for this study.

2.4.1 Existing Structure Inventory

A depreciated replacement value was calculated for each structure to compare the economic benefits of each alternative. The structure inventory for this HEC-FDA analysis was developed by following the California Department of Water Resources (DWR) methodology used for the 2012 CVFPP structure inventory (DWR, 2012a). Note that the 2012 CVFPP structure inventory was not used because it excluded location information such as assessor's parcel number (APN) which is necessary for this analysis. The structure inventory for this analysis was developed with the following steps:

Step 1 – Identify structure characteristics. The following structure characteristic information was acquired from the 2018 San Joaquin County assessor parcel database: description, number of units, year built, and building square footage.

Step 2 – Assign damage category and occupancy type to corresponding structure description as defined in the 2012 CVFPP structure inventory.

Step 3 – Populate missing data where necessary. Overall, less than 5% of the structures in the inventory required populating missing data. The methodology used and assumptions made to populate missing parcel data are described in the following sections.

Step 4 – Assign spatial information to each structure.

Step 5 – Estimate building cost per square foot in 2018 dollars based on occupancy type from information provided by the 2012 CVFPP. Calculate depreciated replacement value using local Marshall & Swift multipliers.

Steps 2 through 5 are described below in greater detail.

Occupancy Type

Occupancy type is a land use code used by HEC-FDA to describe the function of the structure and the number of stories. A description of the function was provided for each structure in the county database. The occupancy type of the structure was assigned according to the 2012 CVFPP San Joaquin County Land Use Codes Table A-12 (DWR, 2012a) (see Attachment D). For example, the occupancy type for a single-story single-family residence is SFR1. Where number of stories was not provided in the database, all structures were assumed to be single-story unless indicated otherwise. To calculate damages, the occupancy type is used to assign unique depth-percent damage functions to each structure.

Square Footage

Square footage was estimated differently for residential and non-residential structures. For residential structures, it was assumed that structures missing total livable area were too old to contain this information in the database. Square footage was populated for residential occupancy types, except mobile home (MH) and agriculture with residence (FARM), by averaging the total livable area for 10% of the oldest homes in the database. The average square footage assumed for each occupancy type is shown in Table 2. Note that an average was not calculated for 2-story single family residential (SFR2) because this occupancy type was not missing data.

Table 2: Populated Data for Missing Records of Residential Square Footage

Occupancy Type	Area (Sq Ft)
SFR1	1200
MFR1	1504
MFR2	5087

For non-residential structures as well as mobile homes and agricultural with residence, the parcel size rather than the structure area was provided in the database. In order to calculate the replacement value of the structure, the building square footage was estimated using an average floor area ratio (FAR). The FAR represents the relationship between the parcel size and the structure area. The FAR was calculated by sampling 10 parcels and comparing the parcel to structure areas. For non-residential structures, a FAR was developed for each land use type, referred to as damage category, as shown in Table 3. Similarly, Table 4 shows the FAR developed for mobile home and agriculture with residence.

Table 3: Floor area ratio (FAR) for Non-Residential Structures

Damage Category	Floor Area Ratio (FAR)
Commercial	0.22
Industrial	0.25
Public	0.17

Table 4: Floor area ratio (FAR) for Residential Structures

Occupancy Type	Floor Area Ratio (FAR)
MH	0.071
FARM	0.0037

The building square footage for non-residential structures was calculated using Equation 1:

$$F = A * FAR \qquad \text{Equation 1}$$

Where: F = Floor area/Building square footage
A = Parcel area
FAR = Floor to area ratio

Year Built

The year built is used to calculate a depreciation of the replacement value. For residential structures, it was assumed that structures missing year built were too old to contain this information in the database. Year built was populated for each residential occupancy type by averaging the year built for 10% of the oldest homes in the database. The average year built for each occupancy type is shown in Table 5.

Table 5: Populated Data for Missing Records of Year Built for Residential Structures

Occupancy Type	Year Built
MH	1990
FARM	1915
SFR1	1914
MFR1	1936
MFR2	1955

For non-residential structures, this information was estimated by averaging the year built for each damage category. The average year built for each damage category is shown in Table 6.

Table 6: Populated Data for Missing Records of Year Built for Non-Residential Structures

Damage Category	Year Built
Commercial	1968
Industrial	1978
Public	1970

Structure Spatial Data

To determine the depth of flooding at each structure, spatial information such as location and elevation were acquired. The location of each structure was approximated to be the centroid of the parcel. This location was spatially associated with the corresponding grid cell within the 2D mesh described in Section 2.2. While most structures are not located on the centroid of the parcel, the error associated with this assumption was determined to be minimal because most parcels are small-single family residential parcels with areas less than 10% of the size of the associated 2D grid cell.

The elevation of the structure was extracted using 1-meter resolution CVFED LiDAR (DWR, 2009). The LiDAR elevation is an approximate elevation of the terrain adjacent to the structure. Since most structures in the region are built on concrete slabs, an additional 0.5’ was assumed for the foundation height of the structure.

Calculating Depreciated Replacement Value

A building cost per square foot value was estimated for each structure based on occupancy type. The cost per square foot for each occupancy type was estimated by averaging all the values in Tables B-1 to B-33 in the 2012 CVFPP Attachment 8F (DWR, 2012a). The average cost values were updated to 2018 dollars using the local consumer price index (CPI) (BLS, 2018). Table 7 shows the average building cost per square foot value for each occupancy type.

Table 7: Average New Building Cost per Square Foot Value in 2018 Dollars.

Occupancy Type	Description	Cost	Occupancy Type	Description	Cost
C-AUTO	Service-Auto	$108.60	FIRE	Fire Stations	$167.98
C-GROC	Grocery Store	$100.21	I-HV	Heavy Manufacture	$145.04
C-HOS	Hospitals	$287.59	I-LT	Light Manufacturer	$55.75
C-HOTEL	Hotels	$128.76	I-WH	Warehouse	$57.93
C-MED	Medical	$179.38	MFR	Multi-Family	$92.20
C-OFF	Office	$156.57	MH	Mobile Home	$52.28
C-REST	Restaurants	$174.14	P-GOV	Public Church	$201.18
C-RET	Retail	$107.41	P-GOV	Government Building	$193.72
C-SERV	Full-Service Auto Dealership	$63.93	P-REC	Recreation/Assembly	$122.58
DAYCARE	Daycare Facility	$148.38	P-SCH	Public and Private Schools	$190.78
ELDER	Eldercare Facility	$110.22	SFR	Single Family Residential	$122.58

Depreciation of the structure was estimated based upon year built and an assumed life expectancy of 60 years. Marshall & Swift 2016 valuation tables were used to estimate the structure percent good, which is defined as the ratio of the current value and the replacement cost new (Marshall & Swift, 2016). For each structure, the depreciated replacement cost was calculated using Equation 2:

$$Value_{adj} = \frac{F * Cost * \%\ Good}{1000} \qquad \text{Equation 2}$$

Where:
- $Value_{adj}$ = Depreciated replacement value (in Thousands of 2018 Dollars)
- F = Building square footage
- Cost = Building cost per Sq Ft
- % Good = Marshall & Swift depreciation multiplier

See Table 8 for a summary of the 2018 structure inventory.

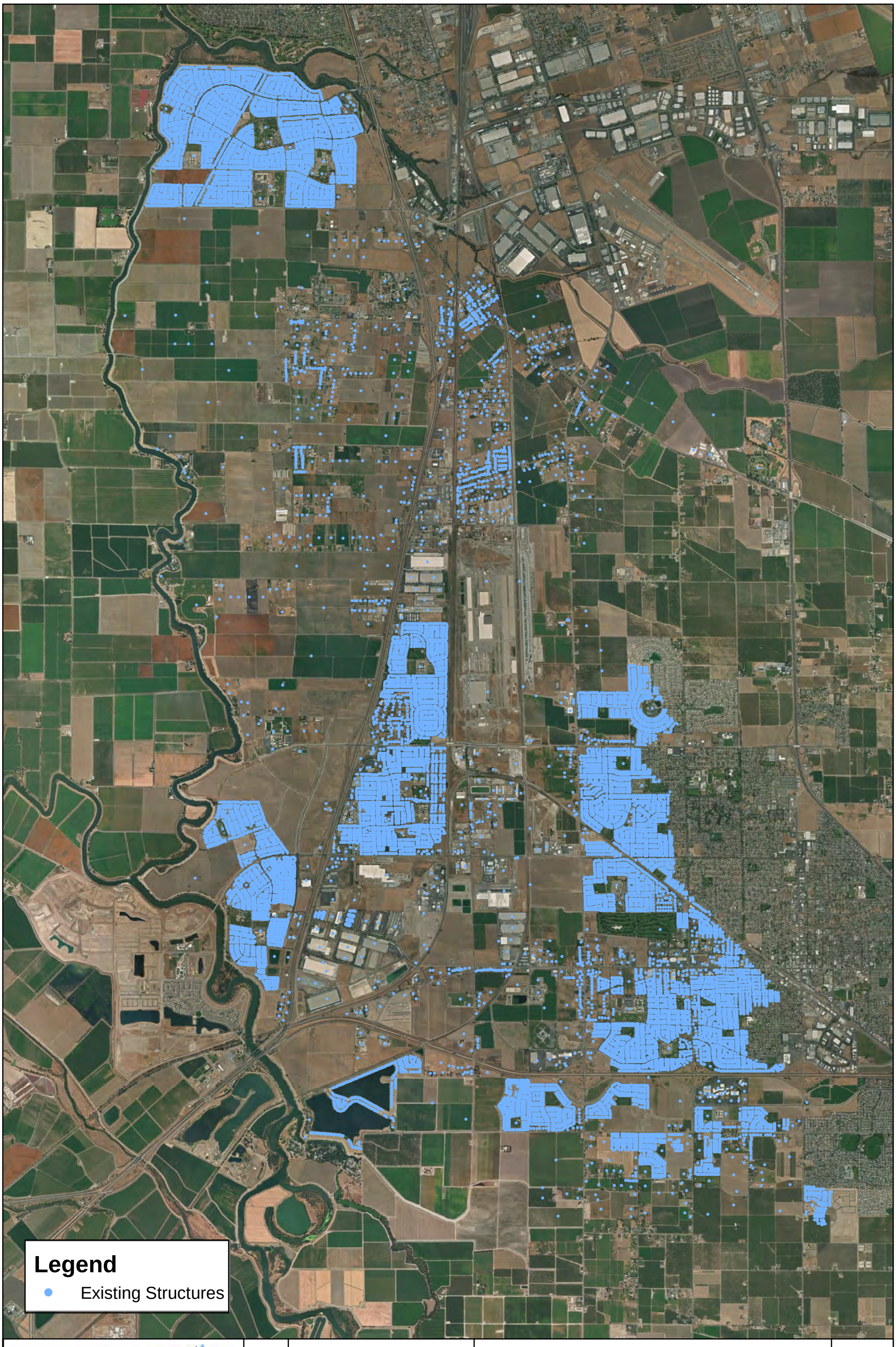
*Table 8: Summary of the 2018 Structure Inventory by Occupancy Type**

Year	Damage Category	Number of Structures	Total Structure Valuation (Thousands of 2018 Dollars)
2018	Commercial	265	$254,000
	Industrial	144	$ 1,012,000
	MISC	23	$7,000
	Public	161	$1,648,000
	Residential	20,852	$4,463,000

*This table summarizes the total structure database. The count of flooded structures depends on the flooding scenario.

In addition to structure costs, damage to the structures' contents were included in the analysis. For this analysis, the content values of each structure in the inventory input were estimated within FDA using a content-to-structure ratio for each occupancy type. This ratio was derived from the USACE American River Watershed Project, Folsom Dam Modifications and Folsom Dam Raise Project Final Economic Reevaluation Report (USACE, 2008a) (see Attachment E) and coded into the FDA model. In FDA, the content value is estimated by multiplying the depreciated value by the corresponding content-to-structure ratio.

Figure 7 shows the current structure inventory. It is important to note that various existing structures in East Lathrop and Manteca are included in this structure inventory, despite being located outside of the Mossdale Tract Study Area. These structure have no effect on the results of this analysis because the structures are located outside of the floodplains.



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2018 Structure Inventory

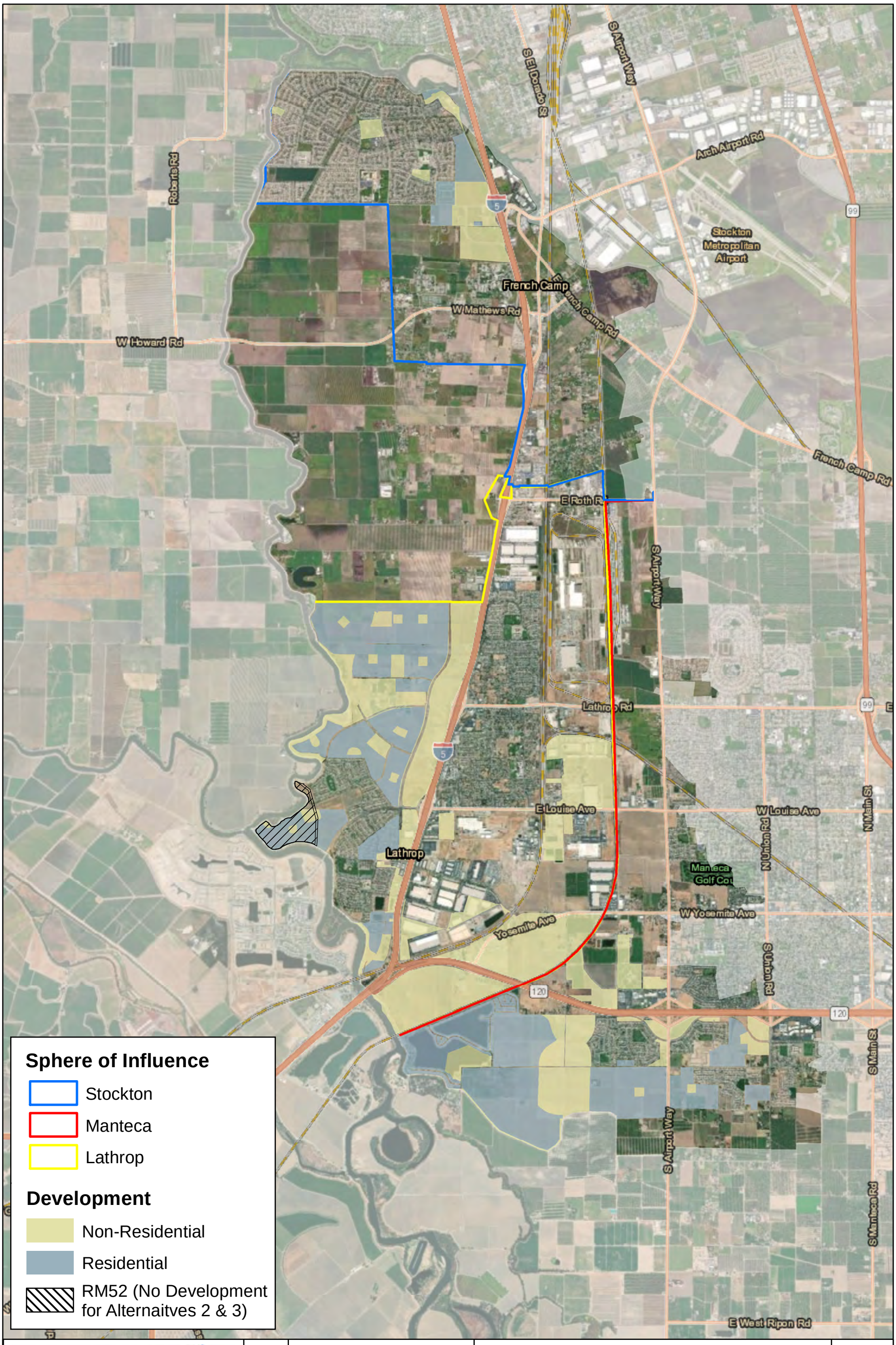
FIGURE

7

2.4.2 Future Structure Inventory

The future structure inventory includes the existing structures and new structures projected to be built by 2065 under any of the three action alternatives. For the future without-project conditions, growth would be prevented due to SB5 restrictions (no ULOP). LWA's Financing Plan Implementation report was used to develop the 2065 structure inventory (LWA, 2017). LWA provided development absorption projections for the Cities of Lathrop, Manteca, Stockton, and the unincorporated area of San Joaquin County up to the year 2065. The projection consists of 20 development areas and includes structure characteristics for each area: number of residential units; square footage of commercial, industrial, and public land; occupancy information; and projected build year. Figure 8 shows the 20 development areas.

The steps used to develop the existing structure database (see Section 2.4.1) were followed to develop the 2065 structure inventory. The 2065 structure inventory captures the number of residential structures and the square footage of non-residential structures projected by LWA. The totals projected for the various development areas are shown in Table 9.



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Mossdale 2065 Projected Development Areas

FIGURE 8

Table 9: LWA Development Projections Accompanying Project Alternatives.

Development Area	SFR	MFR	Commercial	Industrial	Public
	(du)		(sq ft)		
City of Lathrop					
Central Lathrop	5292	1026	3566.3	0	718.7
Mossdale Landing	65	62	78.4	0	211.7
Mossdale Landing East	0	144	1711.9	0	0
Mossdale Landing South	0	290	980.1	0	0
Mossdale Landing Other*	658	0	0	0	0
South Lathrop	0	0	115	2905	0
Lathrop Gateway	0	0	1825.6	2190.2	0
Crossroads	0	0	0	0	0
Historic/East Lathrop	24	206	1176.1	5227.2	0
City of Manteca					
Terra Ranch	212	200	0	0	0
Cerri	655	0	0	0	0
Future Development	0	233	712.2	358.1	0
Denali	315	0	169.9	0	0
The Trails of Manteca	1163	0	0	0	0
Oakwood Trails	676	0	0	314.9	0
Oleander	57	0	0	0	0
Sundance	347	0	0	0	0
City of Stockton					
Weston Ranch	447	1101	0	722.2	0
San Joaquin County					
Future Stockton Annex	0	0	0	773.7	0
Future Manteca Annex	1101	0	0	0	0
Oakwood Shores	105	0	0	0	0

* Buildout projection of Mossdale Landing Other differs between the alternatives because of the RM52 setback levee. The structure inventory for Alternatives 2 and 3 excludes 470 residential structures projected for buildout on the west side of the RM52 setback levee.

The following sections describe the assumptions made to develop the 2065 structure inventory.

Placement

The future structures were placed according to LWA's projections and backchecked with the City of Lathrop, Manteca, and Stockton's General Plans. The following steps describe the methodology used to place future residential structures:

Step 1 – Backcheck LWA's development areas with the General Plans provided by the City of Lathrop, Manteca, and Stockton.

Step 2 – Subdivide the development areas according to LWA's acreage assumptions (acres/unit) (Attachment F).

Step 3 – Place a structure at the centroid of each grid cell such that the number of structures projected for each development area is represented.

Figure 9 shows an example of this placement process for the development area Denali.

Occupancy Type

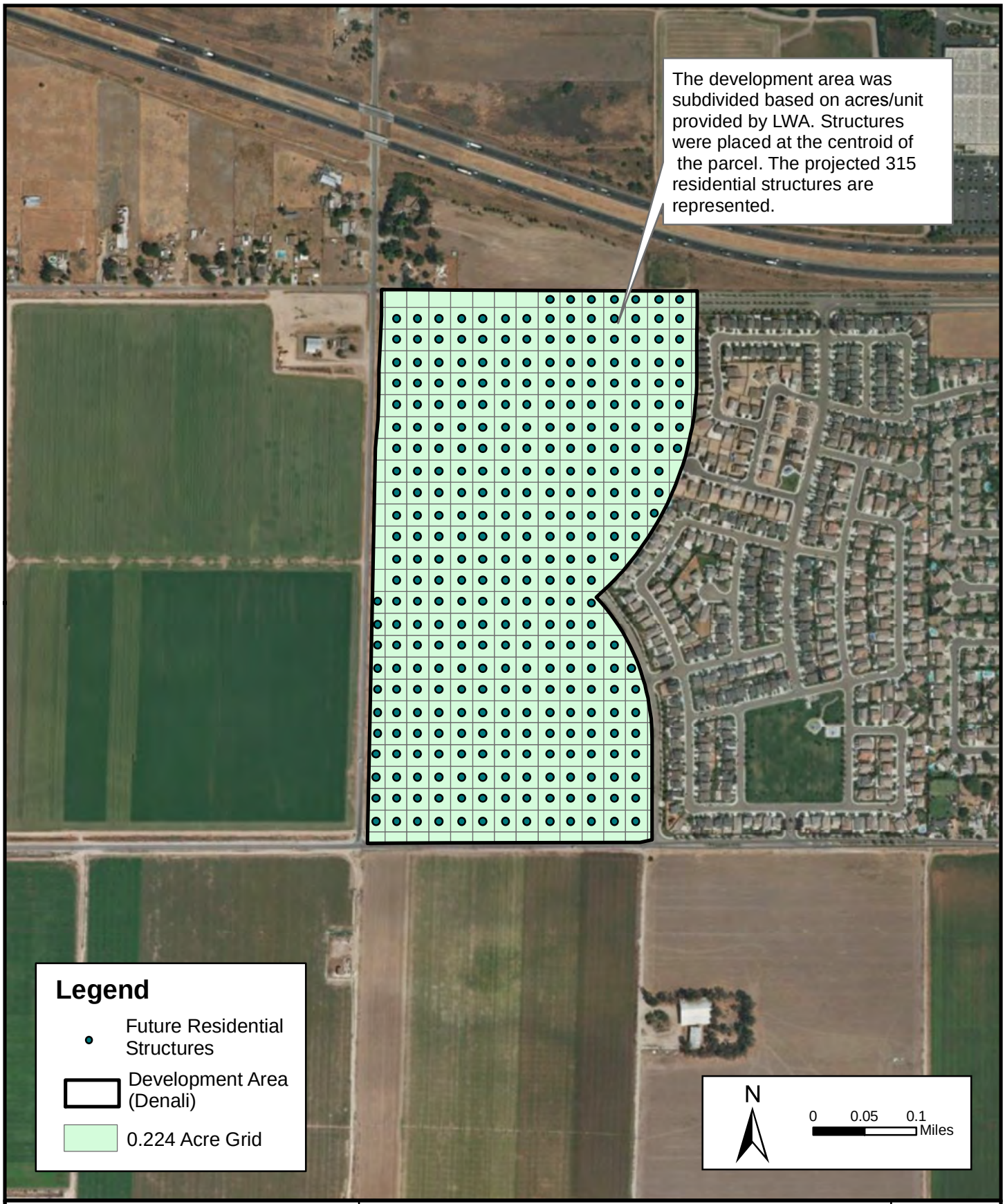
Similar to the 2018 structure inventory, occupancy type was assigned according to Attachment D. Where there was uncertainty assigning occupancy type from LWA's projections, such as differentiating single family and multi-family residence, occupancy types were randomized. It was assumed that all future non-residential structures are single-story. For residential structures, the percentage of single-story and 2-story homes was estimated from the River Islands subdivision constructed between 2014 and 2018. The percentage of single-story and 2-story homes in River Islands is 11.8% and 88.2%, respectively. The number of stories for each new structure in the Mossdale Tract Area was randomly assigned using these percentages.

Square Footage

The square footage for non-residential structures was provided in LWA's projections. A FAR of 0.3 was built in to LWA's projections (LWA, 2017).

For single family residential, the square footage was estimated by averaging the area of households in a nearby development. Weston Ranch was selected because it is a representative subdivision within the study area. The average single-story and 2-story single family residence are 1678 and 2228 Sq Ft, respectively. For multi-family residence, LWA assumed a parcel acreage per dwelling unit for each development area. An average FAR was calculated to estimate structure area from parcel size. The average FAR for MFR is 0.66, which was calculated by comparing parcel area and total livable area for all multifamily structures in the 2012 CVFPP structure inventory.

The future structure inventory with existing structures and buildout is shown in Figure 10. See Table 10 for a summary of the 2065 structure inventory.



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Future Development
Example of Residential Structures for Denali

FIGURE
9

RM 52: 470 Future Structures not included in Alternatives 2 and 3

Legend

- Existing Structures

Future Structures

- All Alternatives
- Additional Future Structures in Alternative 1

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2065 Structure Inventory
Exisitng and Future Structures

FIGURE
10

*Table 10: Summary of the 2065 Structure Inventory by Occupancy Type**

Year	Damage Category	Number of Structures			Total Structure Valuation (Thousands of 2018 Dollars)		
		Without Project	Alternative 1	Alternatives 2 & 3	Without Project	Alternative 1	Alternatives 2 & 3
2065	Commercial	265	400	400	$254,000	$1,764,000	$1,764,000
	Industrial	144	280	280	$ 1,012,000	$1,607,000	$1,607,000
	MISC	23	20	20	$7,000	$7,000	$7,000
	Public	161	160	160	$1,648,000	$1,786,000	$1,786,000
	Residential	20,852	32,930	32,460	$4,463,000	$7,937,000	$7,791,000

*Includes both existing and future structures and covers the entire model domain. Flooded structure counts will be a subset, depending on the scenario.

2.4.3 Depth-Percent Damage Function

Structure damage was estimated with a unique depth-percent damage relationship for each occupancy type. For this analysis, the depth-percent damage curves were taken directly from the 2012 CVFPP, which were originally developed by the USACE (USACE, 2008a). Figure 11 shows an example of depth-percent damage curve. See Attachment G for all depth-percent damage curves used for this analysis.

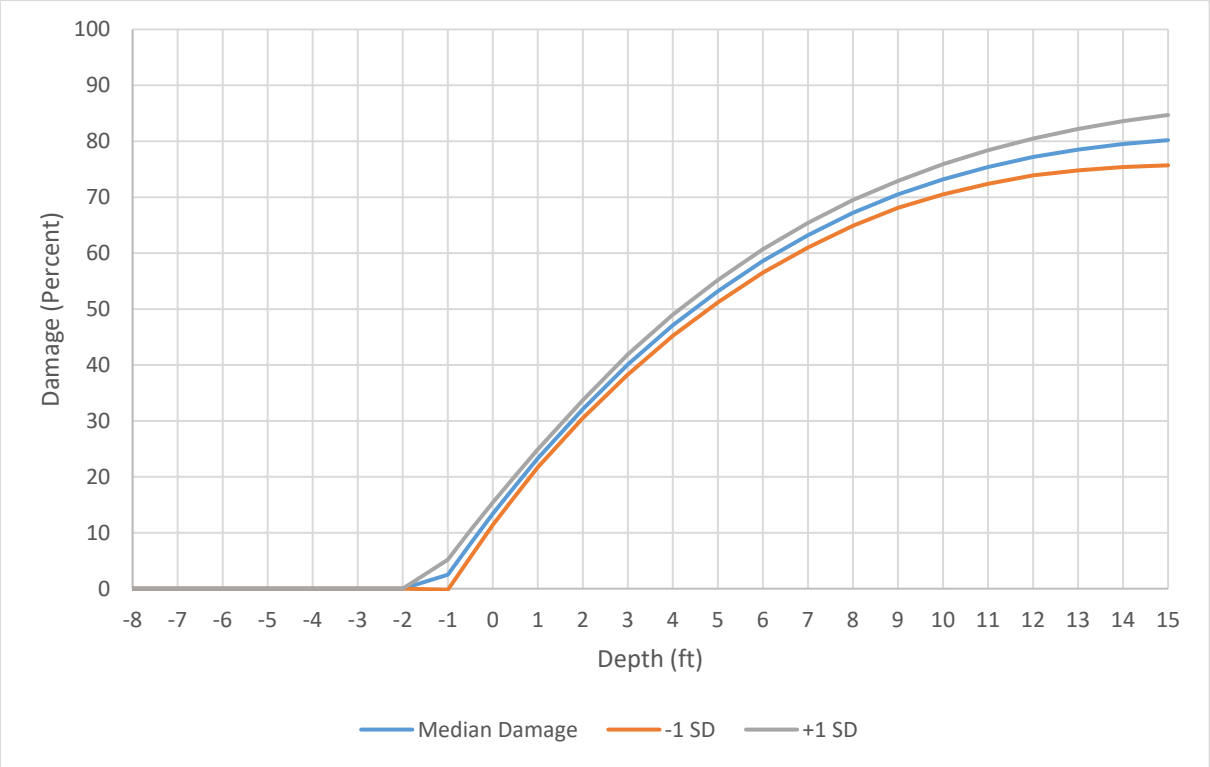


Figure 11: Example of Depth-Percent Damage Curve for Single-Story Residential.

Additionally, damage associated with the contents of each structure was also included in this analysis. For structure contents, depth-percent damage curves for each structure type were taken directly from the 2012 CVFPP. The 2012 CVFPP adjusted the curves for residential properties to reflect residents removing contents upon receiving a flood warning (Attachment G).

2.4.4 Stage-Damage Functions

In HEC-FDA, a stage-damage function is computed for each structure in the inventory using the structure inventory, interior-exterior relationships, and depth-percent damage functions as shown in Equation 3. These are combined into an aggregate stage-damage function for each damage category at each index point. Figure 12 shows an example of an aggregate stage-damage function for an index point.

$$D = V * P(d) \qquad \text{Equation 3}$$

Where: D = Flood damage
V = Depreciated replacement cost
P(d) = Depth-percent damage

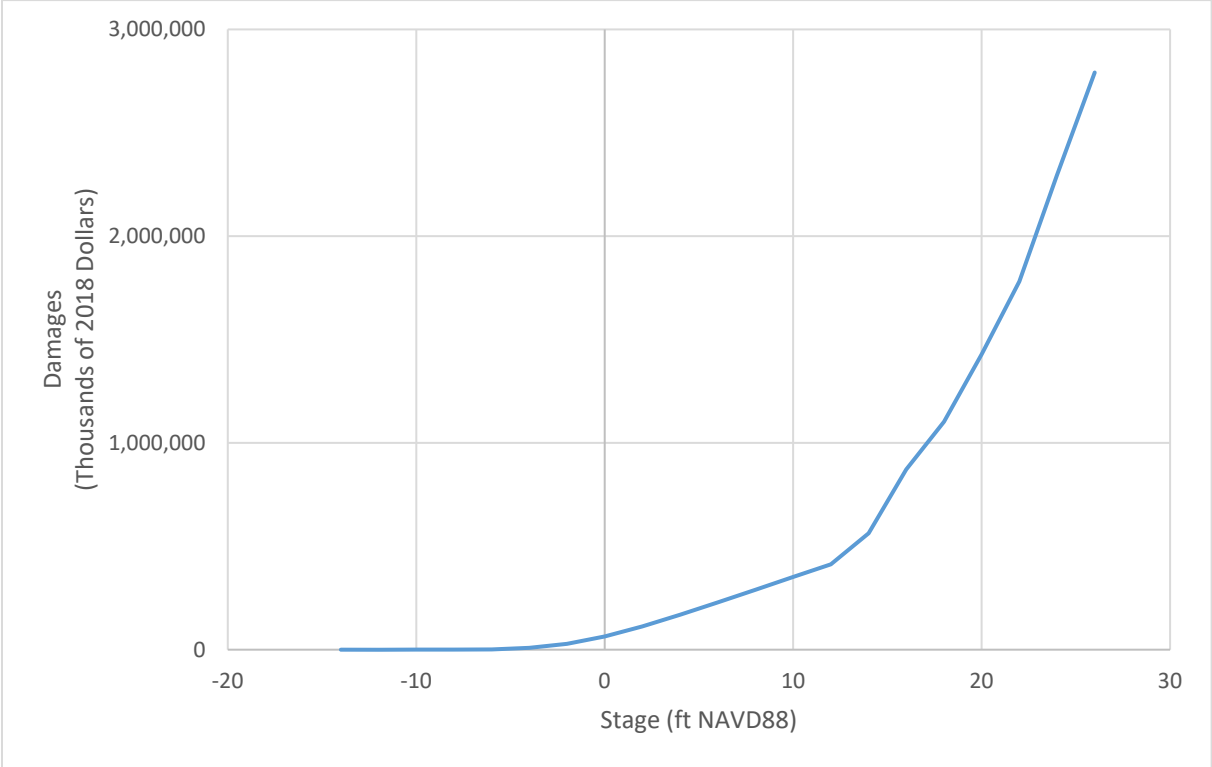


Figure 12: Example of Stage-Damage Curve for Residential Structures for an Index Point.

2.5 Stage-Life Loss Relationship

To determine the EALL for each scenario, a stage-life loss relationship was created. This was done using the following parameters:

- Number of persons who live in each structure
- Number of people who would be evacuated in a flooding event
- Depth-mortality relationship
- Depth of flooding for each structure

With the Life Loss-Stage Relationship, EALL is calculated using the same analysis procedure as the EAD. This section outlines how the Life Loss-Stage Relationship was calculated.

2.5.1 Unadjusted Person Per Structure

For both current and future conditions, the Life Loss-Stage Relationship was calculated by assigning population to structures based on occupancy type. For this analysis, it was assumed that in a flooding event the population resides only in residential buildings. The unadjusted person per structure describes the number of persons who live in each residential building. This

relationship was developed by DWR for the 2013 California Water Plan (CWP) by dividing the total population of each residential occupancy type by the total number of housing units for that residential occupancy type (DWR, 2013). The relationships for the San Joaquin River Hydrologic Region (year 2010 conditions) are 3.04 persons per structure for single family residence and mobile homes and 2.85 for multi-family residence. These values do not account for the people who will respond to a flood warning by evacuating.

As aforementioned, various existing structures in the inventory are located outside of the Mossdale Tract Study Area. Therefore, the populations in Table 11 do not directly correspond to Tables 2-3, 3-8, 3-10, and 3-12 of the Mossdale UFRR Report, which only include the population in the Mossdale Tract Study Area.

Table 11: Summary of Unadjusted Population in Structure Inventory

Condition	Population
Existing	63,300
Alternative 1 with Buildout	99,830
Alternative 2 & 3 with Buildout	98,400

2.5.2 Evacuation Rate

The number of persons per structure was adjusted for the percentage of the population who would effectively evacuate upon receiving a flood warning. The flood warning efficiency factor (eff) in Equation 4 describes the reduction in flood exposure due to warning systems in place (DWR, 2012b). The flood warning efficiency is heavily dependent on the available warning time and percent that receives warning (F_{rw}). Table 12 shows how percent warned increases as warning time increases according to the Sorensen and Mileti relationship (Sorensen, 1988).

$$eff = F_{rw} * F_w * F_c \qquad \text{Equation 4}$$

Where:
- eff = Flood warning efficiency factor
- F_{rw} = Fraction of public that receives warning
- F_w = Fraction of public that is willing to respond
- F_c = Fraction of the public that knows how to respond effectively and can respond (with or without assistance)

The variables in Equation 4 were assigned values as follows:

- F_{rw}: A value of 1.00 was used, based on a warning time of 36 hours and the Sorensen and Mileti relationship shown in Table 12.

- F_w: A value of 1.00 was used, derived from the Emergency Flood Response and Preparedness (EFREP) Initial Project Feasibility Study from the Sacramento and San Joaquin River Basin Comprehensive Study (Comp Study) (USACE, 2003).
- F_c: A value of 0.7 was used, derived from the Comp Study (USACE, 2003).

Table 12: Fraction of the Public that Receives Warning.

Available Warning Time (X)	Percent Warned (F_{rw})
<0.8 hour	$F_{rw} = 81.83(X)^{3.488}$
0.8 – 3 hours	$F_{rw} = 59.58(X)^{0.4753}$
3 – 7 hours	$F_{rw} = 66.63(X)^{0.2089}$
≥ 7 hours	100

2.5.3 Adjusted Person Per Structure

The number of persons remaining in each residential structure was estimated using Equation 5 (DWR, 2012b):

$$PPS_{adj} = (1 - eff) * PPS \quad \text{Equation 5}$$

Where: PPS_{adj} = Adjusted persons per structure
eff = Flood warning efficiency factor
PPS = Unadjusted persons per structure

The variables in Equation 5 were assigned values as follows:

- Eff: A value of 0.70 was used, calculated from Equation 4.
- PPS: A value of 3.04 for single family residence and mobile homes. A value of 2.85 for multi-family residence. Developed by the 2013 California Water Plan (DWR, 2013).

The evaluation also takes in to account that life risk varies depending on age group and structure height. The 2017 CVFPP used census data to approximate the number of persons over 65 in each structure. This analysis resulted in an average of 7% of the population to be over 65 years old. Therefore, for this analysis, 7% of the residents were assumed to be over 65 years of age and the remaining 93% were under 65 years of age. Population was assigned to each residential structure accordingly.

Table 13 is a summary of the person per structure values. Additionally, Table 13 shows a breakdown of the adjusted population values (PPS_{adj}) for over and under 65 years old. Residential structures were assigned an adjusted population over and under 65 years old based on occupancy type. The sum of the over and under populations is the adjusted value calculated using Equation 5.

Table 13: Adjusted Persons per Structure based on Occupancy Type and Age Group.

Occupancy Type	PPS	PPS_{adj} (0.3*PPS)		
		Under 65	Over 65	Total
SFR	3.04	0.848	0.064	0.912
MFR	2.85	0.795	0.060	0.855
MH	3.04	0.848	0.064	0.912

2.5.4 Depth-Percent Mortality Functions

Similar to Section 2.4.3, unique depth-percent mortality functions were assigned based on the factors of age group and structure height. These functions were taken directly from the 2017 CVFPP, which were originally developed by the USACE. Due to a lack of mobility, the curves assume that persons over 65 years of age would not be able to get on the roof of a home in an effort to avoid flood risk. This greatly reduces their chance of survival if the depth of the water reaches the roof of the home. Figure 13 shows the depth-percent mortality functions for single- and two-story residential homes. This figure shows that at 9 feet of flooding for a single-story home and 18 feet of flooding for a two-story home, the mortality rate jumps to 91% for persons over 65.

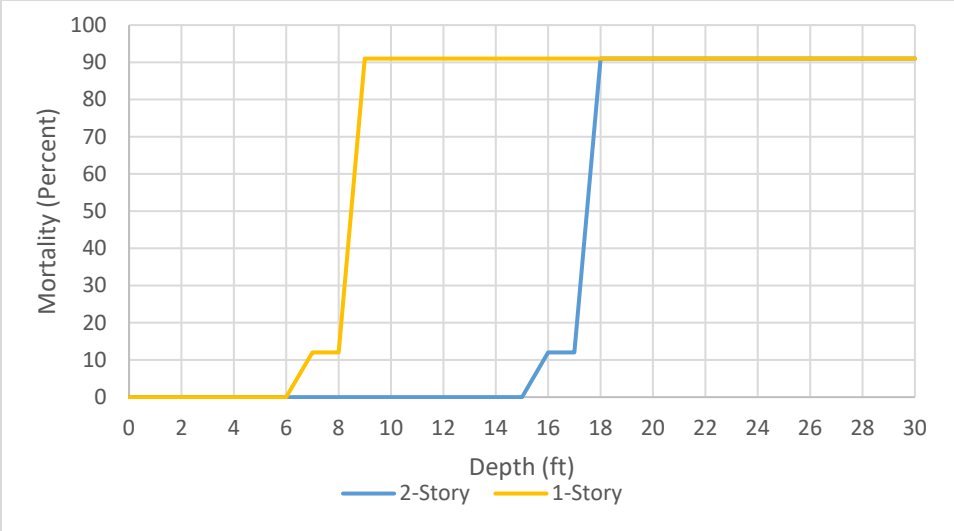


Figure 13: Example of Depth-Percent Mortality function for Single-Story and 2-Story Homes for Persons Over 65 Years.

2.5.5 Stage-Mortality Functions

Stage-mortality is calculated for each index point for all alternatives and climate scenarios using Equation 6.

$$D = PPS_{adj} * P(d)$$ Equation 6

Where: D = Life loss
PPS_{adj} = Person per structure
P(d) = Depth-percent mortality

Figure 14 shows an example of an aggregate stage-mortality function for an index point.

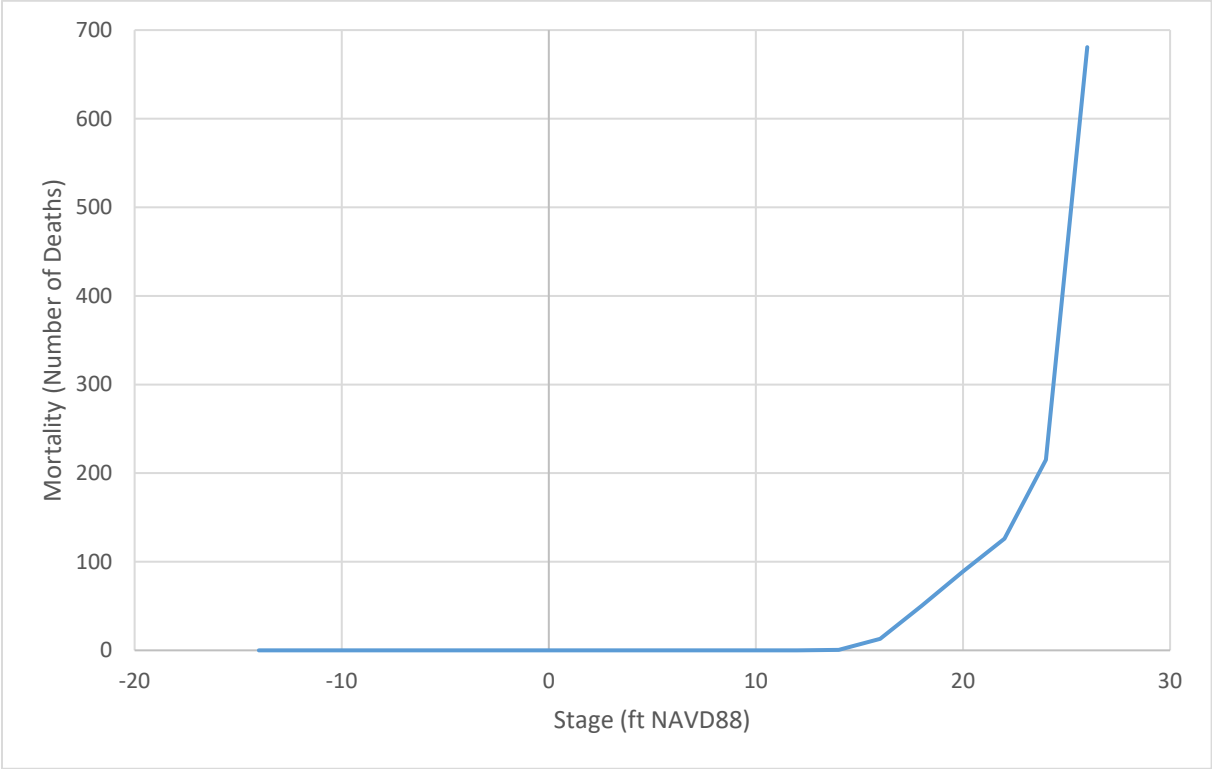


Figure 14: Example of Stage-Mortality Curve for an Index Point.

3.0 Results

The HEC-FDA model was coded with the input parameters described in the previous sections for the with- and without-project conditions for each index point and analysis year. The controlling index point is the index point with the worst-case EAD and EALL for each alternative, unless otherwise noted. The controlling index points were used to determine the economic and life risk benefits of each alternative for 2018 and 2065 conditions. The following sections provide the results from the HEC-FDA model.

Please note that a sensitivity analysis was performed to evaluate model input parameters extrapolated in HEC-FDA. The results of the sensitivity analysis show that various scenarios are controlled by low frequency events (greater than 500-year) which are derived through extrapolated data.

3.1 Expected Annual Damage

Table 14 shows the annualized flood damages (in thousands of 2018 dollars) for Without Project, Alternative 1, Alternative 2, and Alternative 3 at each index point location. The index point with the greatest annualized damage for each scenario is the controlling index point and is shown in bold in Table 15. Figure 15 shows how the controlling annualized damages for each alternative over time.

Table 14: Annualized Damage for Each Breach Scenario for 2018 and 2065 Conditions (in thousands of 2018 Dollars).

Year	Index Point	Without Project	Alternative 1	Alternative 2	Alternative 3
2018	FL1	$783	$154	$154	$132
	LR1	$30,035	$803	$803	**$10,248**
	LR2	$11,413	$1,683	$1,683	$6,444
	LR3	$6,523	$3,751	$3,745	$4,302
	LR4	**$46,984**	**$3,990**	**$3,988**	$4,034
	LRTB	$14,443	$3,276	$3,276	$3,553
	RD17 (Controlling)	**$46,984**	**$3,990**	**$3,988**	**$10,248**
2065	FL1	$35,551	$840	$833	$411
	LR1	$99,405	$4,682	$4,607	**$50,003**
	LR2	$34,449	$6,014	$5,926	$17,015
	LR3	$10,895	$5,638	$5,497	$7,481
	LR4	**$169,938**	**$36,378**	**$36,011**	$37,720
	LRTB	$98,037	$23,399	$23,180	$24,247
	RD17 (Controlling)	**$169,938**	**$36,378**	**$36,011**	**$50,003**

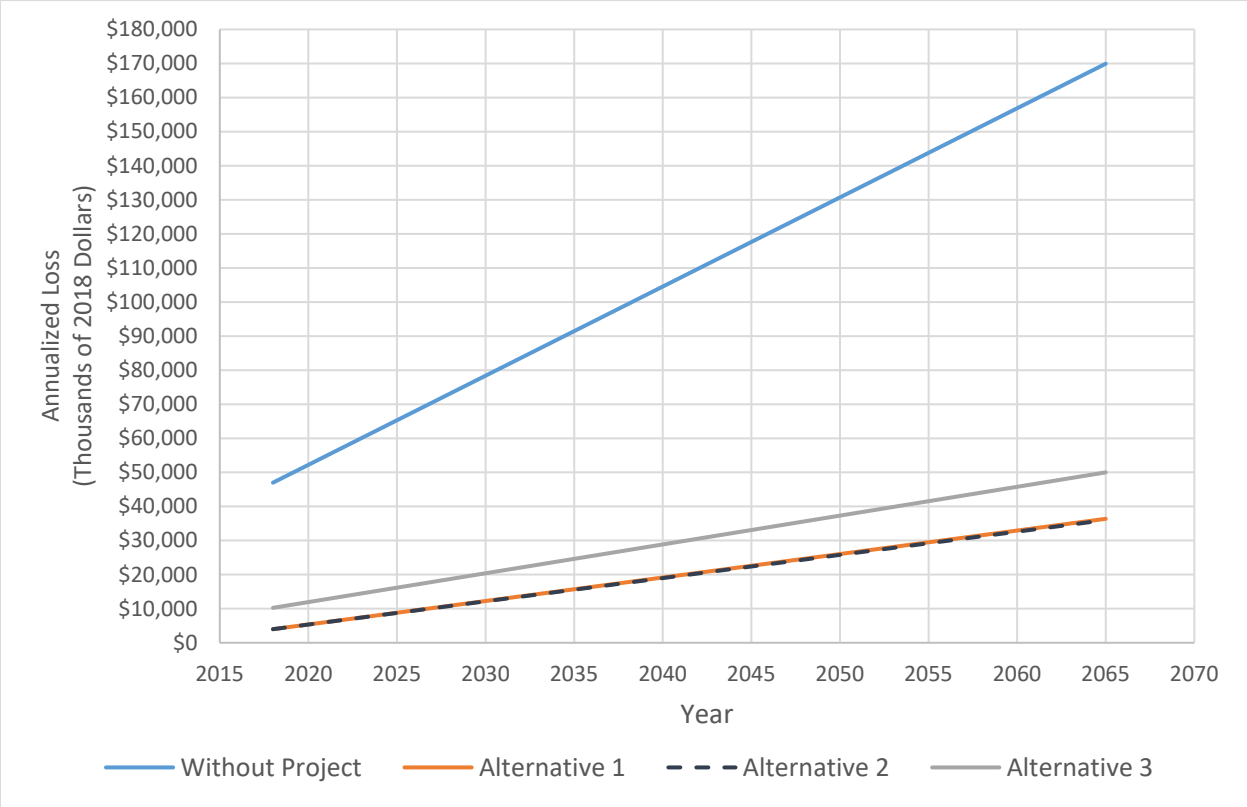


Figure 15: Annualized Flood Damage for Without Project, Alternative 1, 2, and 3.

The HEC-FDA results reveal that for the 2018 scenarios LR4 is the controlling index point for Without Project, Alternatives 1, and 2 while LR1 is controlling for Alternative 3. In the Without Project condition, the LR4 index point has an unrepaired levee and large floodplains that impacts the most urbanized areas. These factors cause it to have the most damages associated with it. For Alternatives 1 and 2, all of the levees are repaired which greatly improves the performance and decreases the damages at each of the index points. For Alternative 3, the FL1, LR1, and LR2 index points remained unrepaired. The damages for each of these index points decrease because the secondary levee blocks the water from reaching the urban areas of Lathrop and Manteca, but the Stockton urban area remained highly susceptible to both flooding and damages.

In 2065, each scenario has the same controlling index point but, due to much higher flow from climate change, the damages are amplified greatly.

Appendix H provides the performance statistics from the HEC FDA model for each index point and alternative.

3.2 Expected Annual Life Loss

Table 15 shows the annualized life loss for Without Project, Alternative 1, Alternative 2, and Alternative 3 at each index point location. The index point with the greatest annualized life loss for each scenario is the controlling index point and is shown in bold in Table 15. Figure 16 shows how the controlling annualized life loss for each alternative change over time.

Table 15: Annualized Life loss at Each Breach Location for 2018 and 2065 Conditions.

Year	Index Point	Without Project	Alternative 1	Alternative 2	Alternative 3
2018	FL1	0.03	0.00	0.00	0.00
	LR1	0.75	0.03	0.03	0.37
	LR2	0.39	0.11	0.11	0.38
	LR3	0.36	0.28	0.28	0.35
	LR4	**1.27**	**0.61**	**0.61**	**0.68**
	LRTB	0.88	0.21	0.21	0.43
	RD17 (Controlling)	**1.27**	**0.61**	**0.61**	**0.68**
2065	FL1	5.67	0.00	0.00	0.00
	LR1	4.53	0.08	0.08	**2.10**
	LR2	1.53	0.23	0.23	0.83
	LR3	0.70	0.13	0.13	0.16
	LR4	**6.65**	**1.13**	**1.12**	1.39
	LRTB	6.48	0.97	0.97	1.22
	RD17 (Controlling)	**6.65**	**1.13**	**1.12**	**2.10**

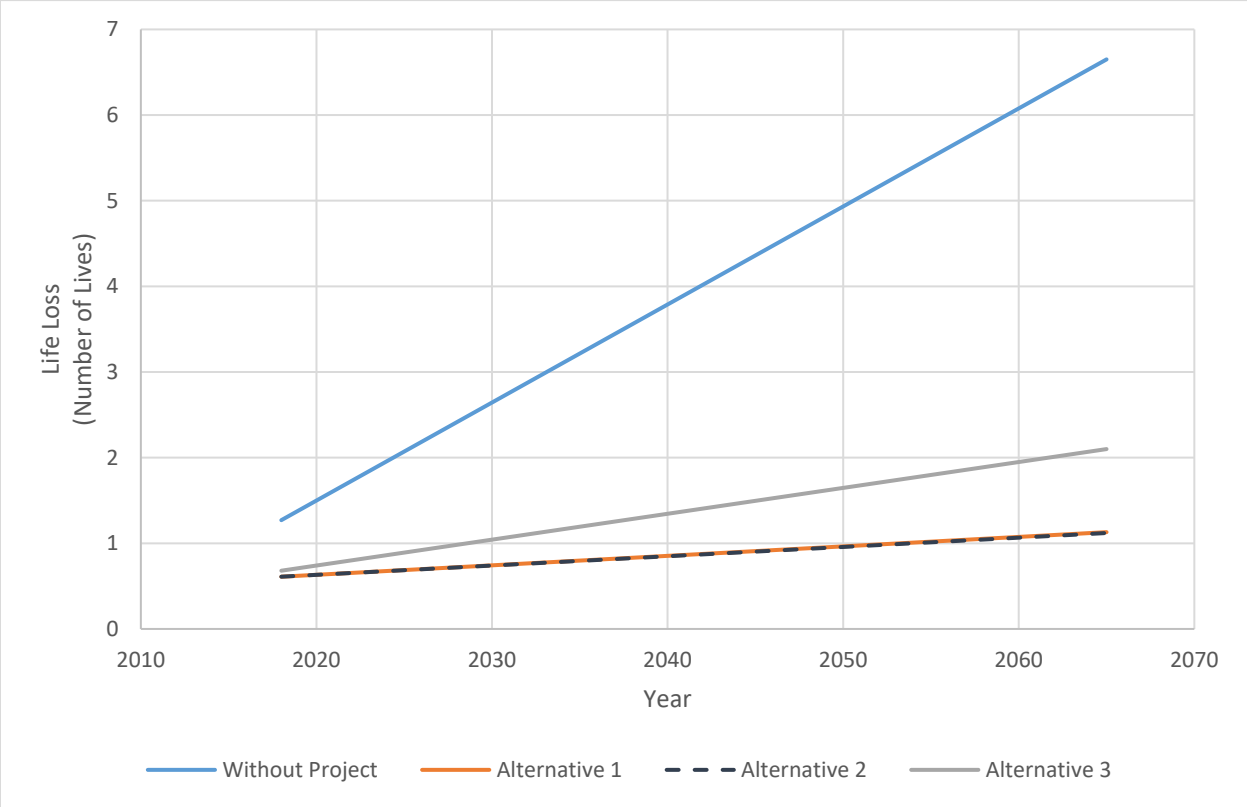


Figure 16: Annualized Life Loss for Without Project, Alternative 1, 2, and 3.

The HEC-FDA results show that for the both the 2018 and 2065 scenarios the life loss results are very similar to the damage results with the exception of the controlling index point 2018 Alternative 3 scenario. While the fragility curve for LR1 is worse, LR4 is still the controlling index point because the secondary levee protects the urban areas during a breach at LR1. Additionally, the secondary levee also makes a breach at LR4 worse because water ponds against it. This changes in the 2065 scenario, where the poor performing levee fragility curve and larger floodplains cases LR1 to be the controlling index point again.

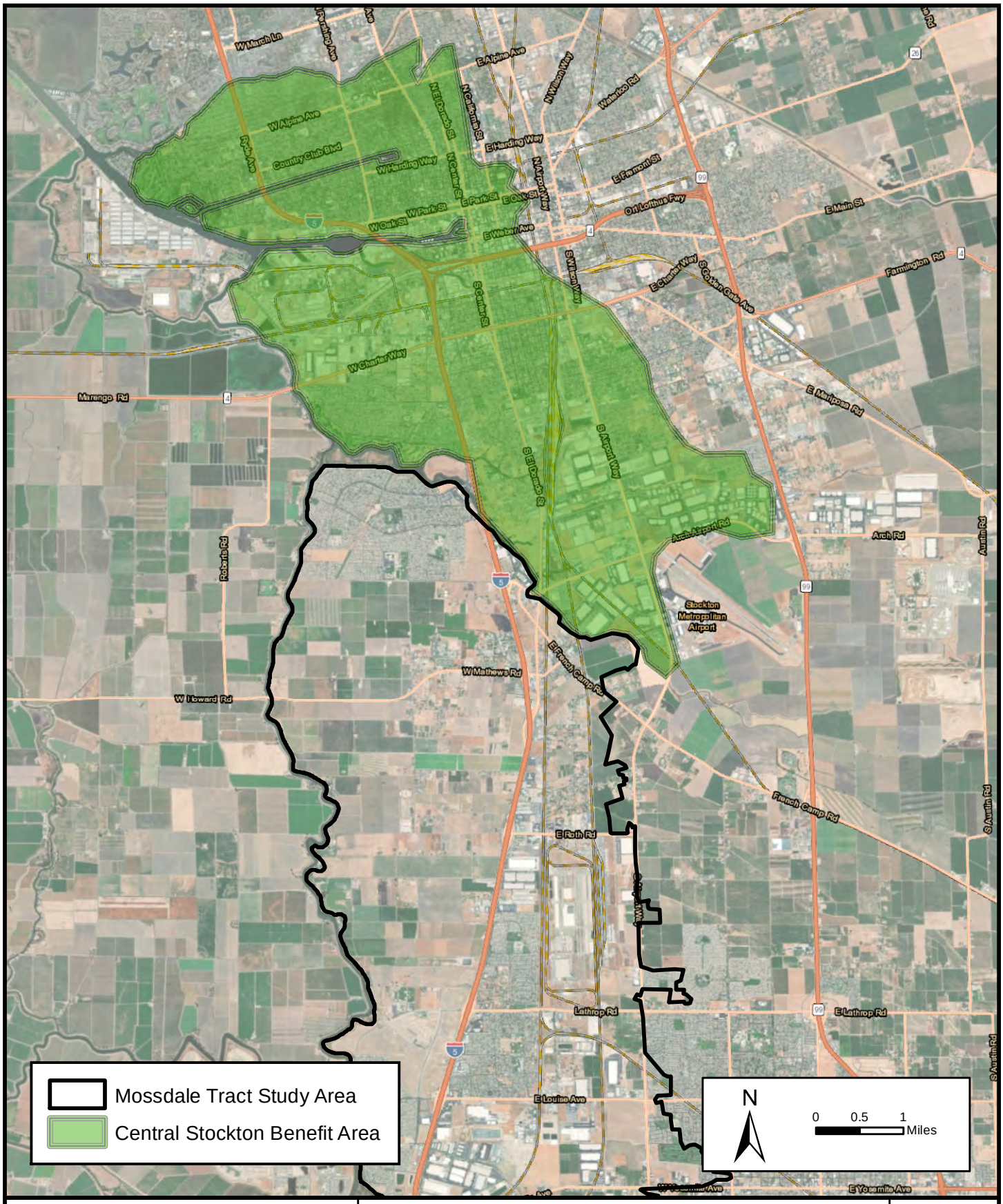
3.3 Annualized Benefits

The annualized benefit of a project is the difference of the without- and with-project annualized damages. Section 3.1 outlined the controlling annualized damages for each scenario analyzed as a part of this study.

Additional economic benefit for Central Stockton was identified in the LSJRFS (USACE, 2018) accruing the improvement of the Mossdale Tract Area levees. More specifically, the benefit is due to the extension of the RD17 dryland levee which eliminates flanking of the Mossdale Tract Area. Figure 17 shows the approximate benefit area that all alternatives would provide to the Central Stockton Region. These flood waters would overtop the French Camp Slough left bank levee, and then flank the French Camp Slough right bank levee, flooding Central Stockton. This LSJRFS analyzed various alternatives both with and without the extension to the RD17 dryland levee. Alternative LS-7a does not include the dryland levee extension while Alternative LS-7b does.

The difference in damages in Central Stockton between the two alternatives provides the added benefit to Central Stockton by extending the dryland levee. Table 4-1 from the Economics Report (Appendix A of LSJRFS) shows that residual annualized damages to Central Stockton of Alternative LS-7a and Alternative LS-7b are $25,000,000 and $21,000,000, respectively. The difference between these values ($4,000,000) is the annualized flood damage benefits provided to Central Stockton associated with the construction of any Mossdale Tract Area alterative that includes the dryland levee extension. Thus, $4,000,000 of annual flood benefit was added to each alternative.

The $4,000,000 margin benefit is a low estimate, because it does not reflect extension of the French Camp Slough right levee upstream of the Union Pacific rail yard. That extension was included in the authorized LS-7a, but it was not included in the authorized LS-7b. So, LS-7b was more susceptible to flanking of the French Camp Slough right levee and flooding Central Stockton. Since the extension is included in the authorized project, completion of the Mossdale project would reduce residual damages in Central Stockton below the $21M noted in the report. While this benefit likely would increase with climate change, for the purposes of this study, the same benefit was added to all scenarios.



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MOSSDALE TRACT AREA

Central Stockton Benefit Area

FIGURE

17

Table 17 shows the reduction in expected flood damage (i.e. project benefit) by implementing each alternative, including the added benefit to Central Stockton. As expected, both alternatives have less flood damage than the system without the project. When comparing the alternatives, Alternatives 1 & 2 are more effective at reducing flood damages in both current and future conditions.

Table 17: Annualized Flood Damage Reduction Benefit for Alternatives.

Annual Flood Damage Benefit ($1,000 of 2018 Dollars)			
Alternative	Within Project Area	Central Stockton	**Total Project Benefit**
2018			
1	$42,994	$4,000	**$46,994**
2	$42,996	$4,000	**$46,996**
3	$36,736	$4,000	**$40,736**
2065			
1	$133,560	$4,000	**$137,560**
2	$133,927	$4,000	**$137,927**
3	$119,935	$4,000	**$123,935**

Table 18 shows the reduction in expected life loss by implementing each alternative. It is important to note that the LSJRFS did not analyze the life loss benefit to Central Stockton by extending the dryland levee. Therefore, the life loss benefits in Table 18 do not include the Central Stockton adjustment.

All alternatives reduce annualized loss of life compared to the without-project condition. When comparing the alternatives, Alternatives 1 & 2 are more effective at reducing life loss in both current and future conditions. Table 18 shows that the life loss benefits increase over time for all alternatives, with Alternatives 1 & 2 producing the largest benefit in 2065.

Table 18: Annualized Life Loss Reduction Benefit for Alternatives.

	Annual Life Loss Benefit	
Alternative(s)	2018	2065
1	0.66	5.52
2	0.66	5.53
3	0.59	4.55

4.0 References

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Attachment A: Exceedance Probability Curves

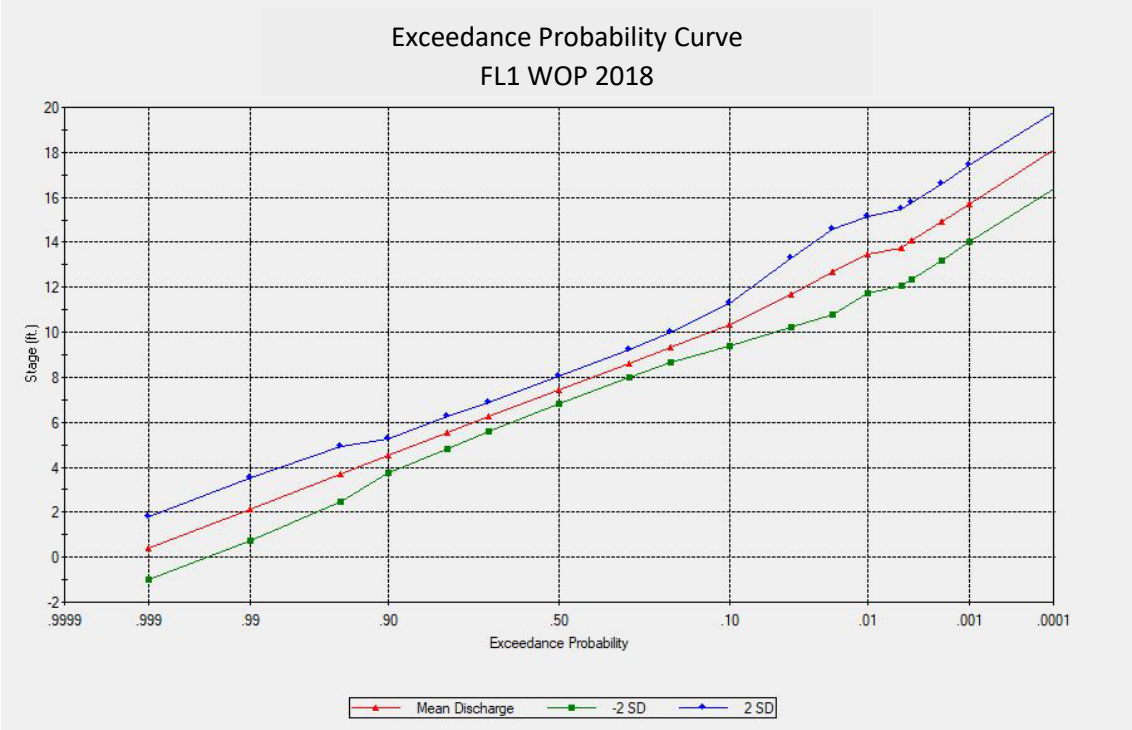


Figure A-1: Exceedance Probability Curve for FL1 WOP 2018

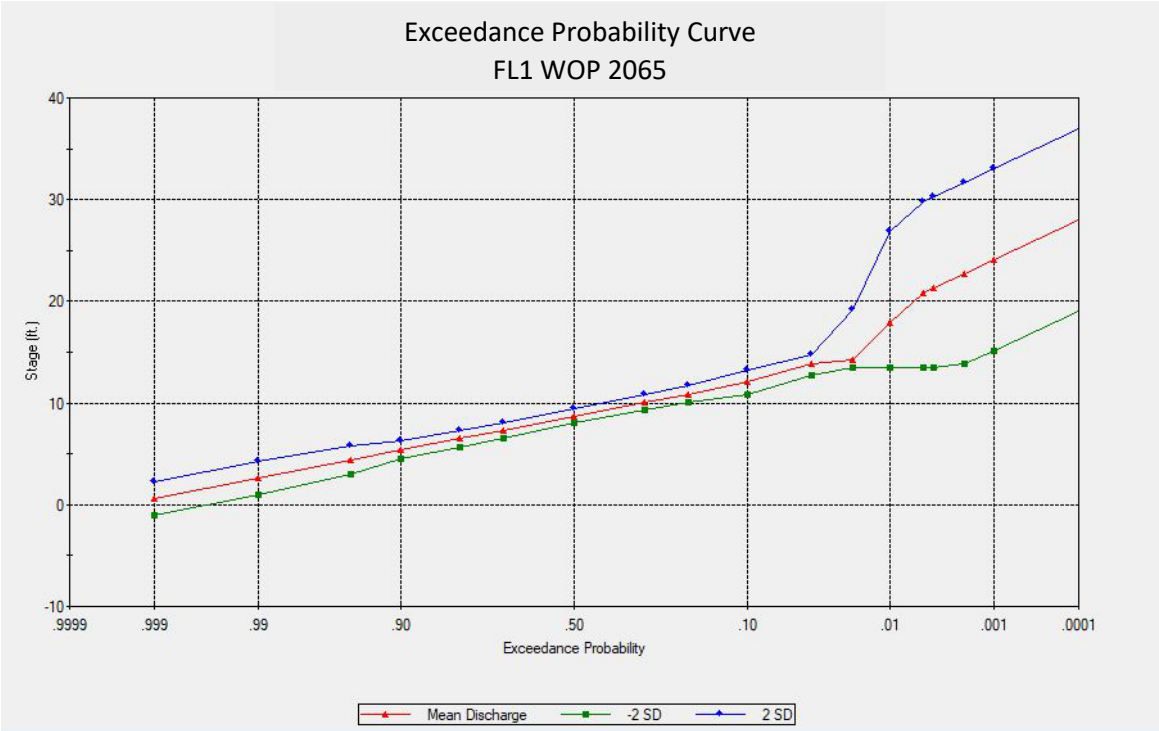


Figure A-2: Exceedance Probability Curve for FL1 WOP 2065

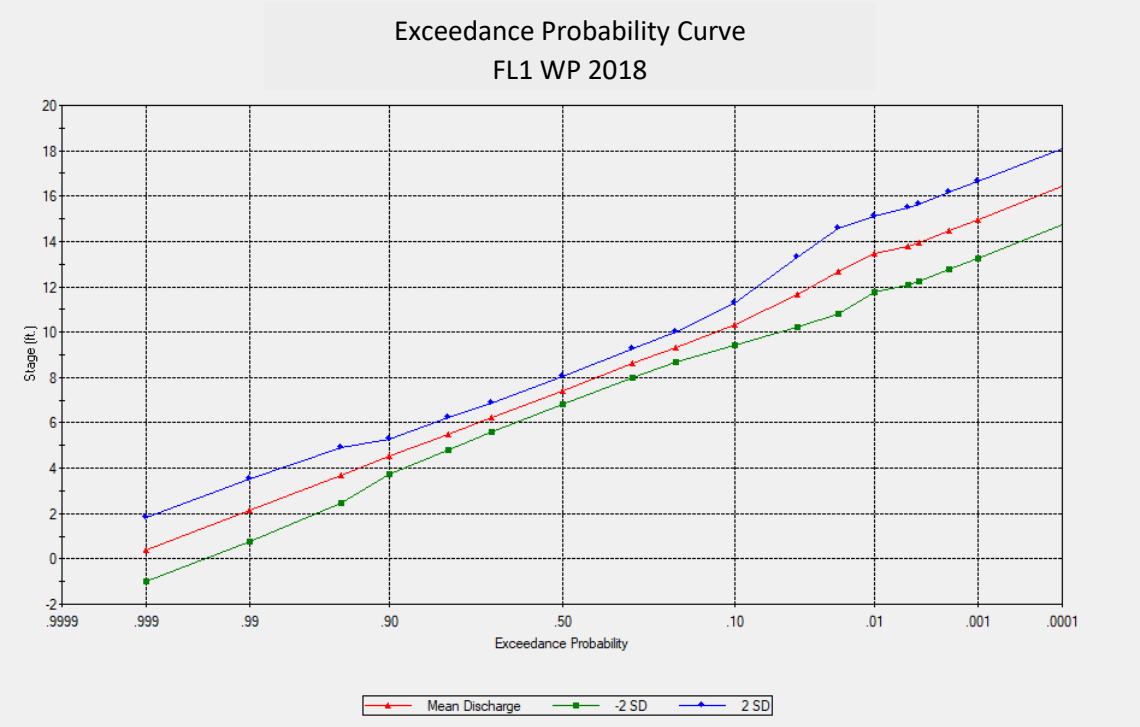


Figure A-3: Exceedance Probability Curve for FL1 WP 2018

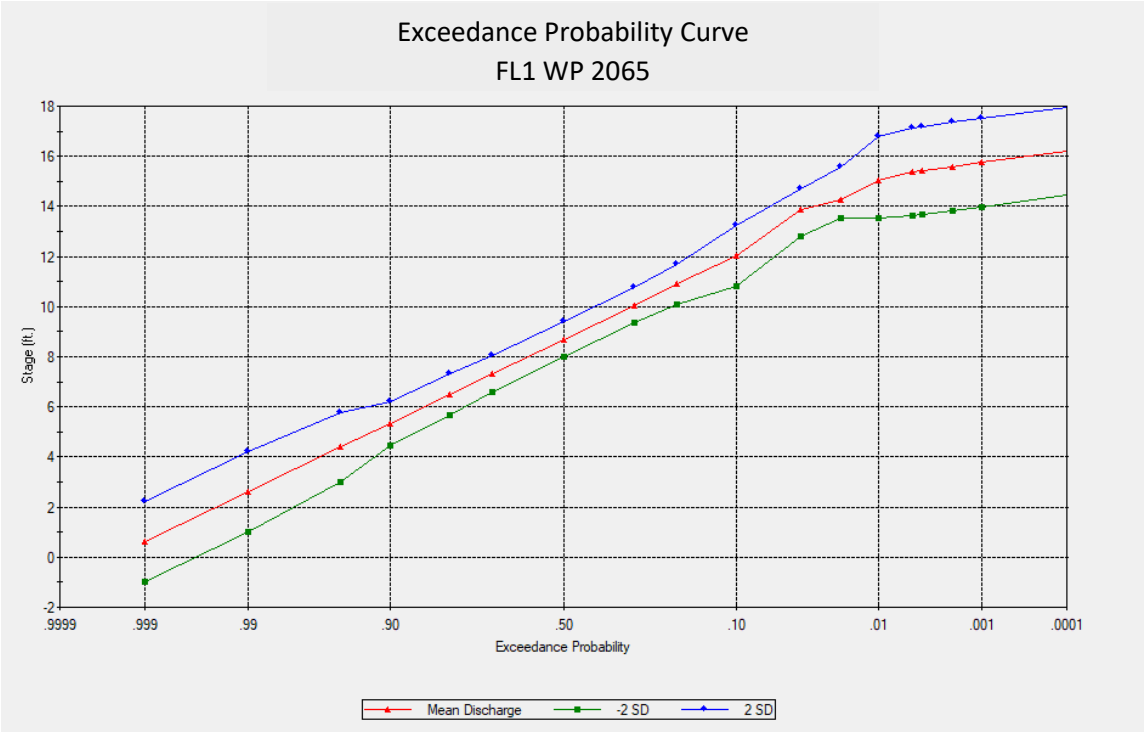


Figure A-4: Exceedance Probability Curve for FL1 WP 2065

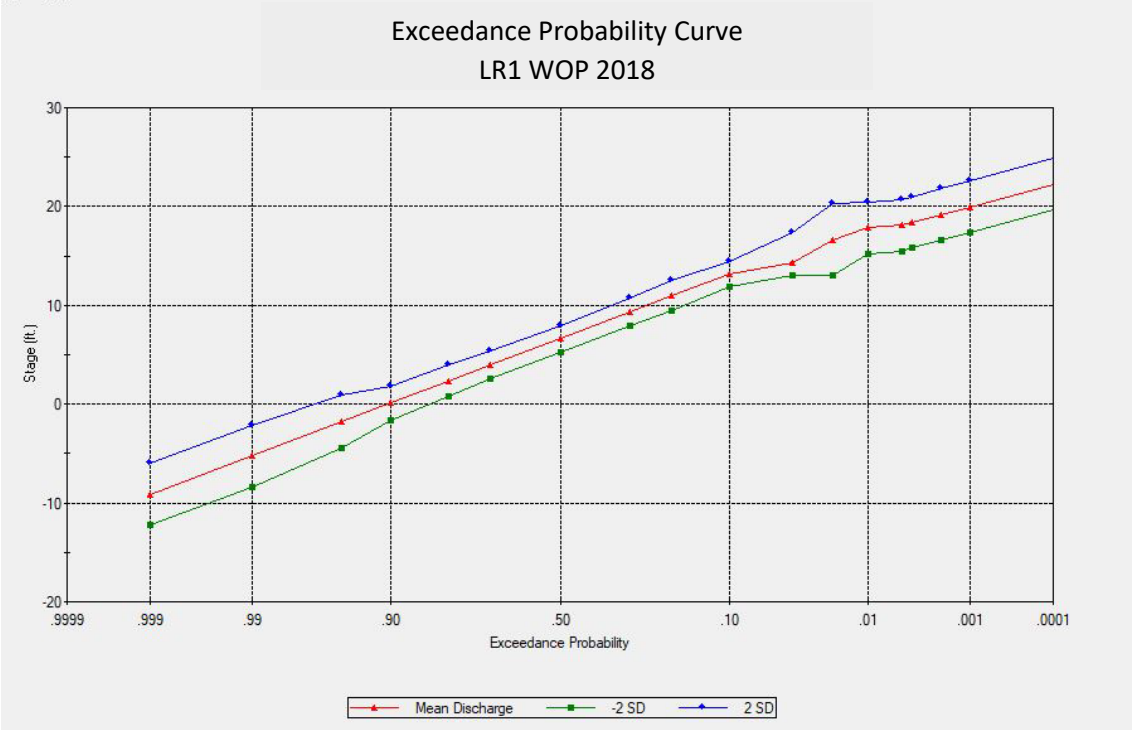


Figure A-5: Exceedance Probability Curve for LR1 WOP 2018

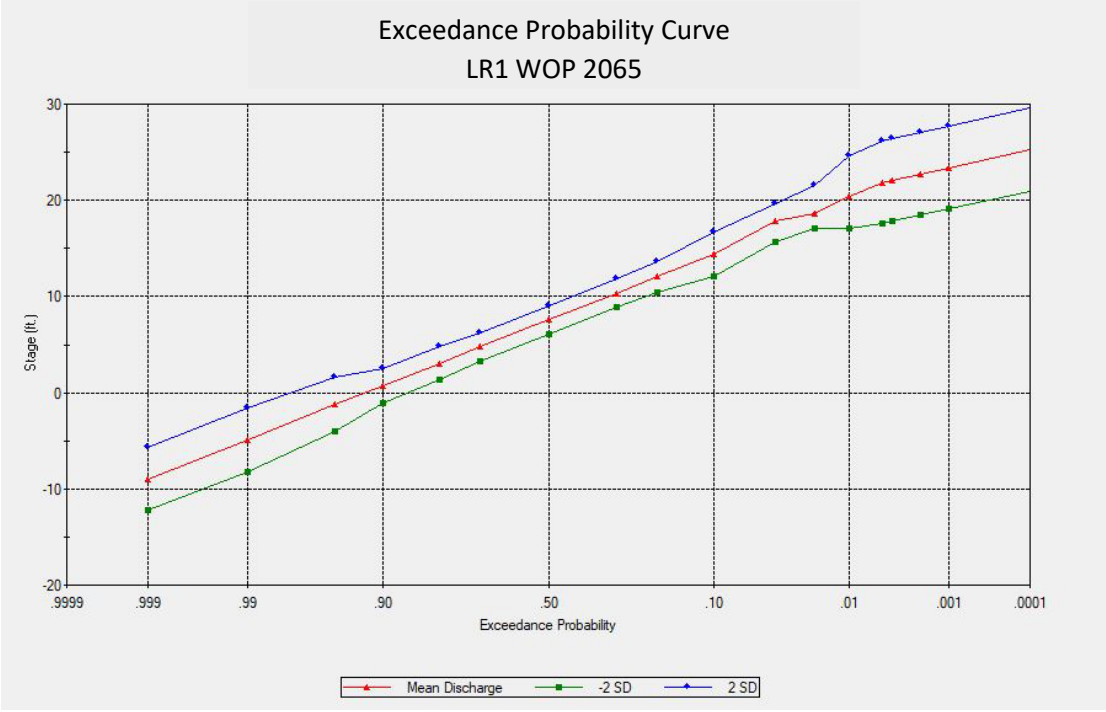


Figure A-6: Exceedance Probability Curve for LR1 WOP 2065

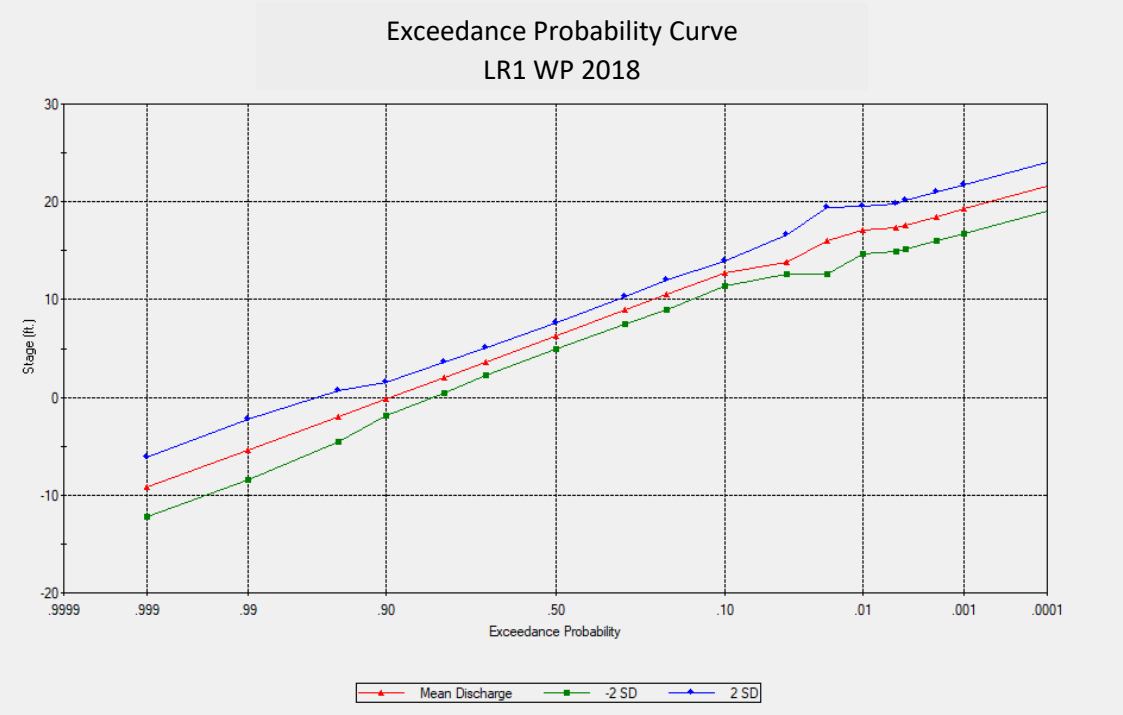


Figure A-7: Exceedance Probability Curve for LR1 WP 2018

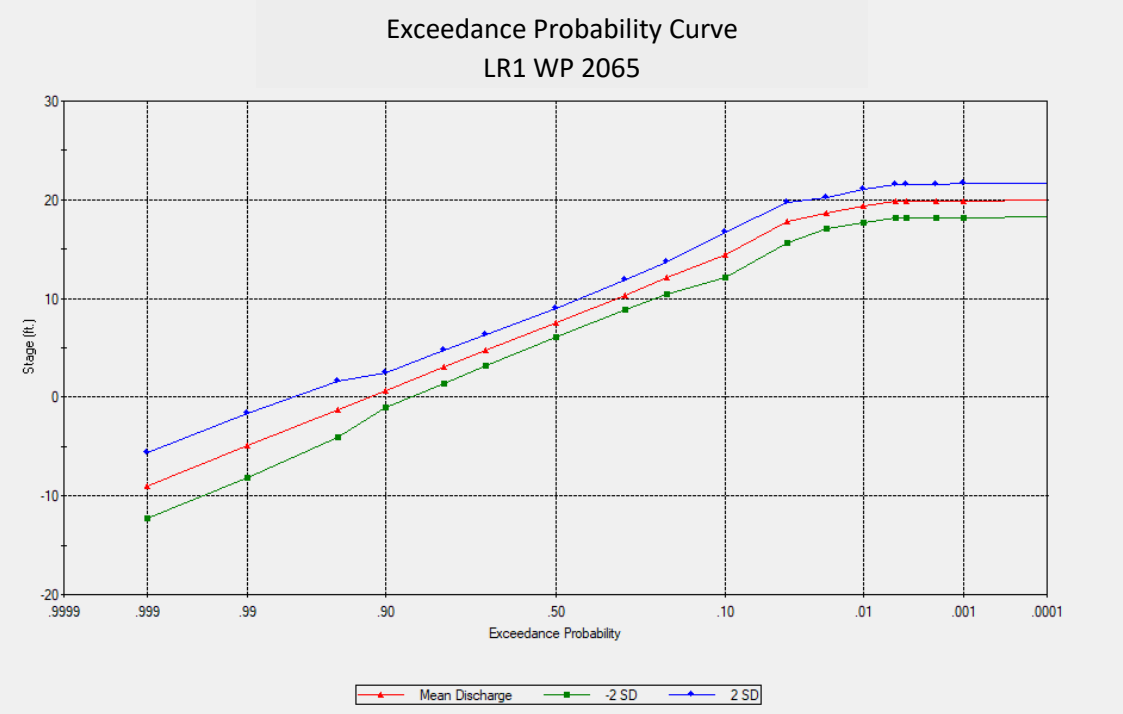


Figure A-8: Exceedance Probability Curve for LR1 WP 2065

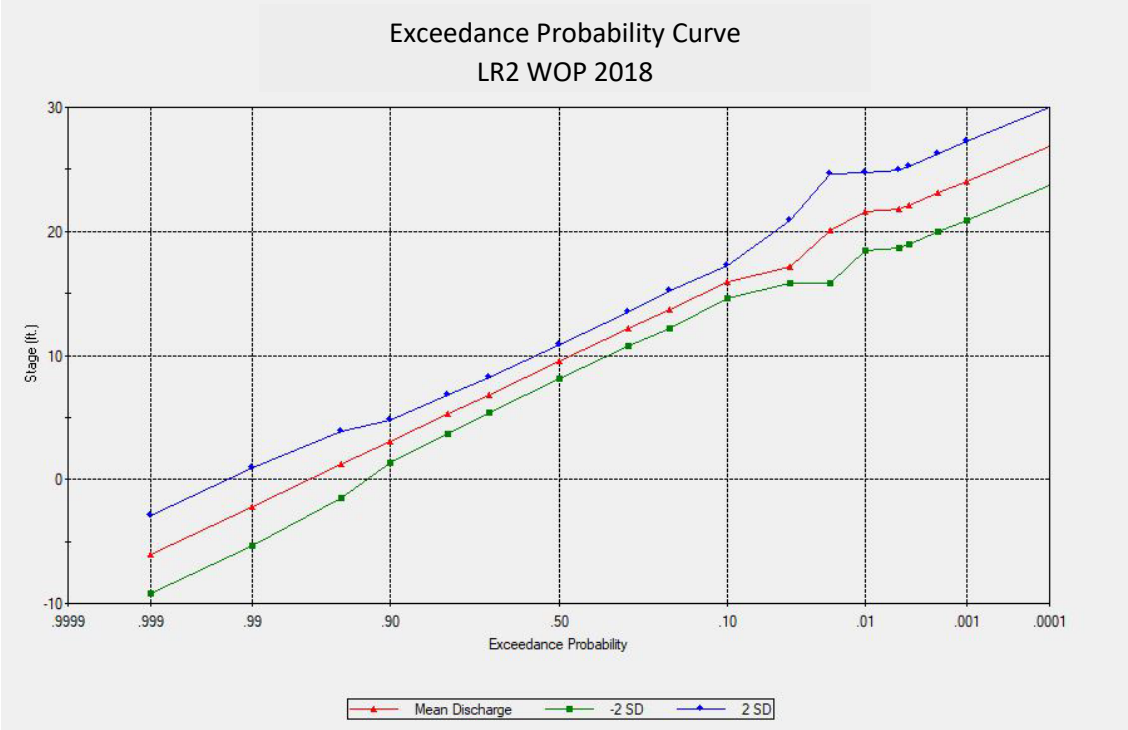


Figure A-9: Exceedance Probability Curve for LR2 WOP 2018

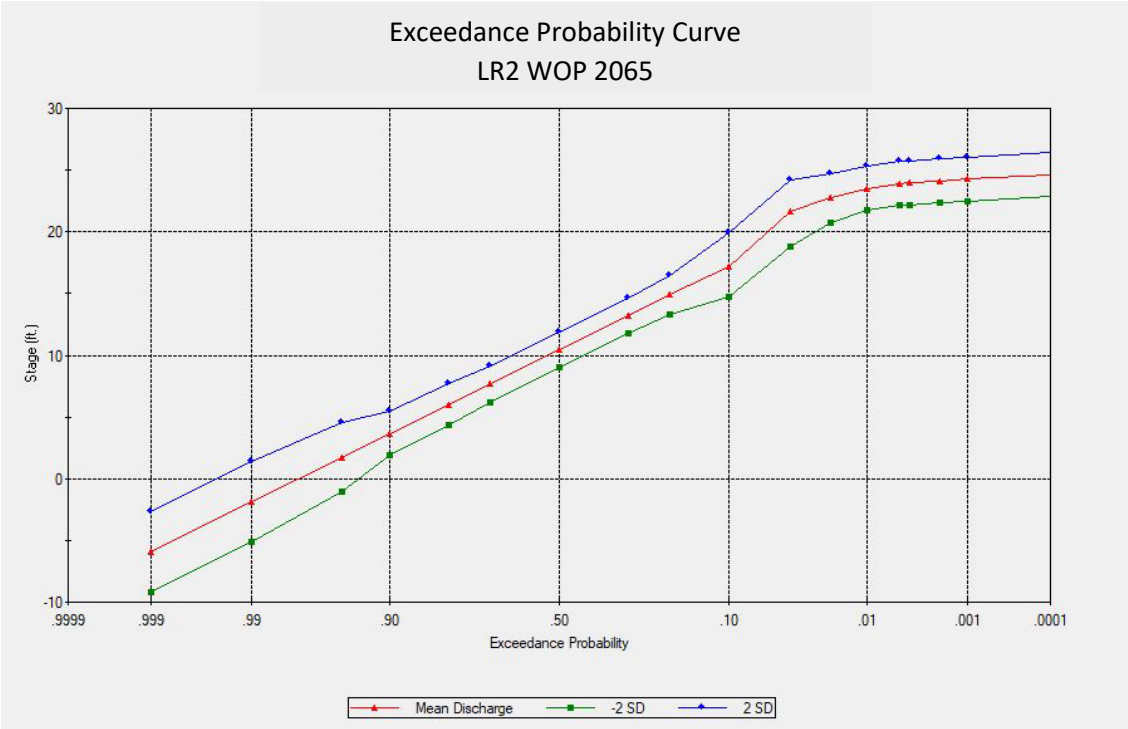


Figure A-10: Exceedance Probability Curve for LR2 WOP 2065

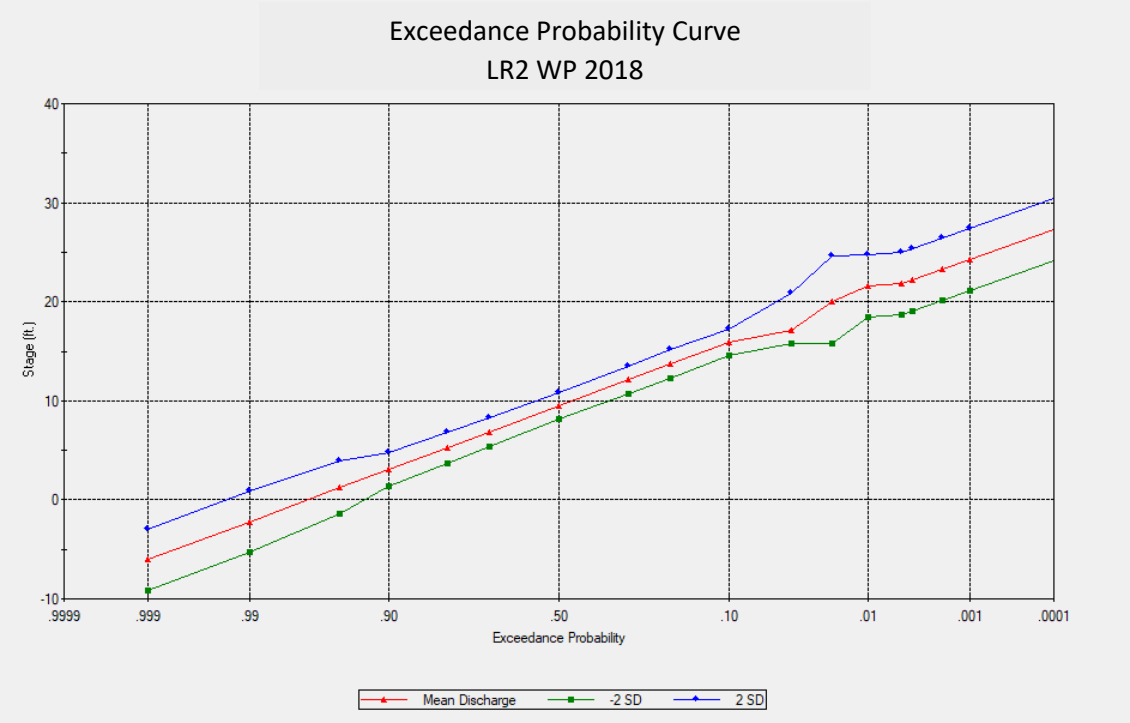


Figure A-11: Exceedance Probability Curve for LR2 WP 2018

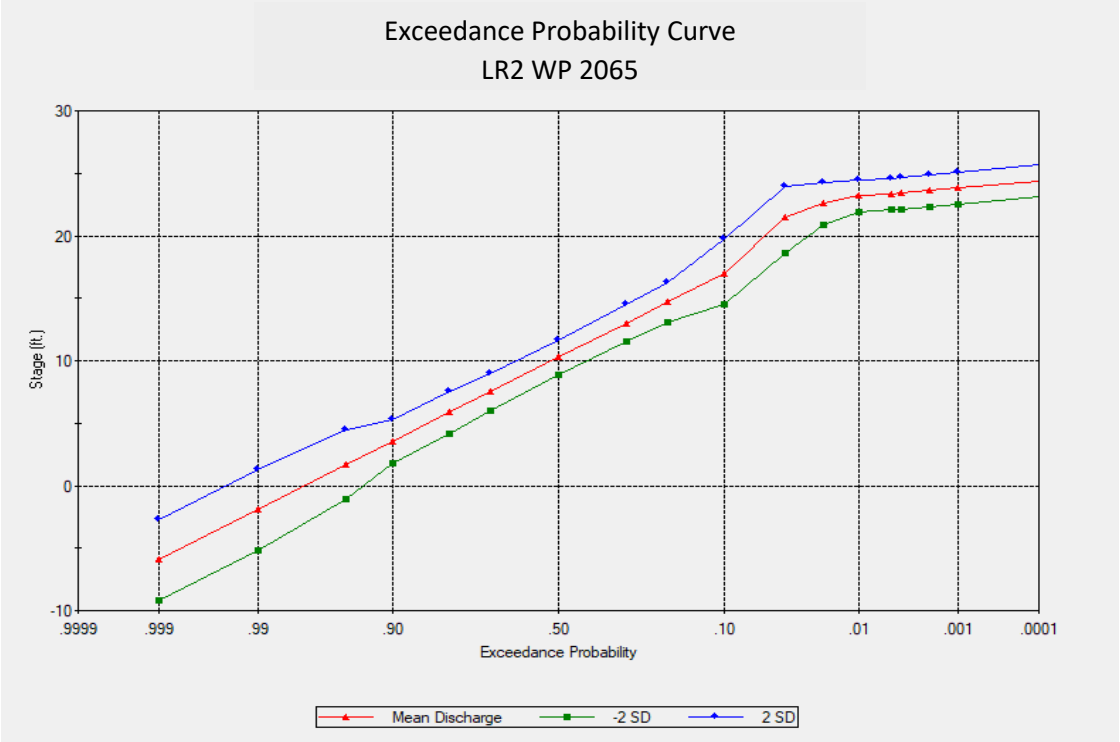


Figure A-12: Exceedance Probability Curve for LR2 WP 2065

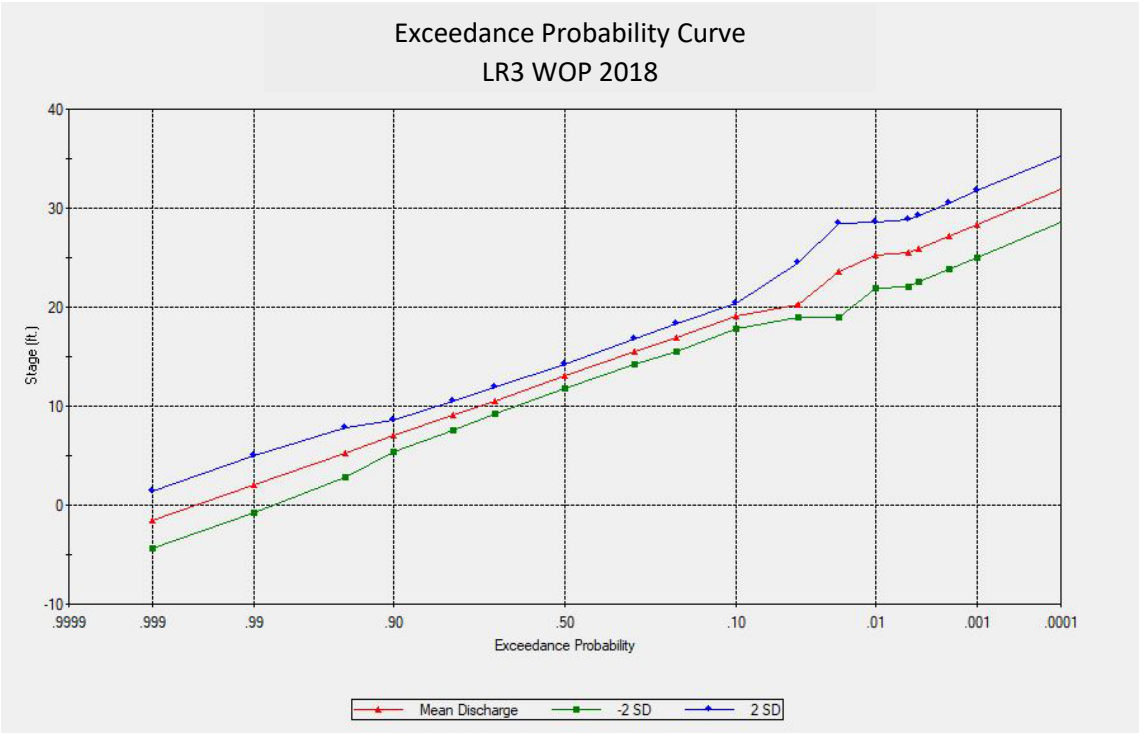


Figure A-13: Exceedance Probability Curve for LR3 WOP 2018

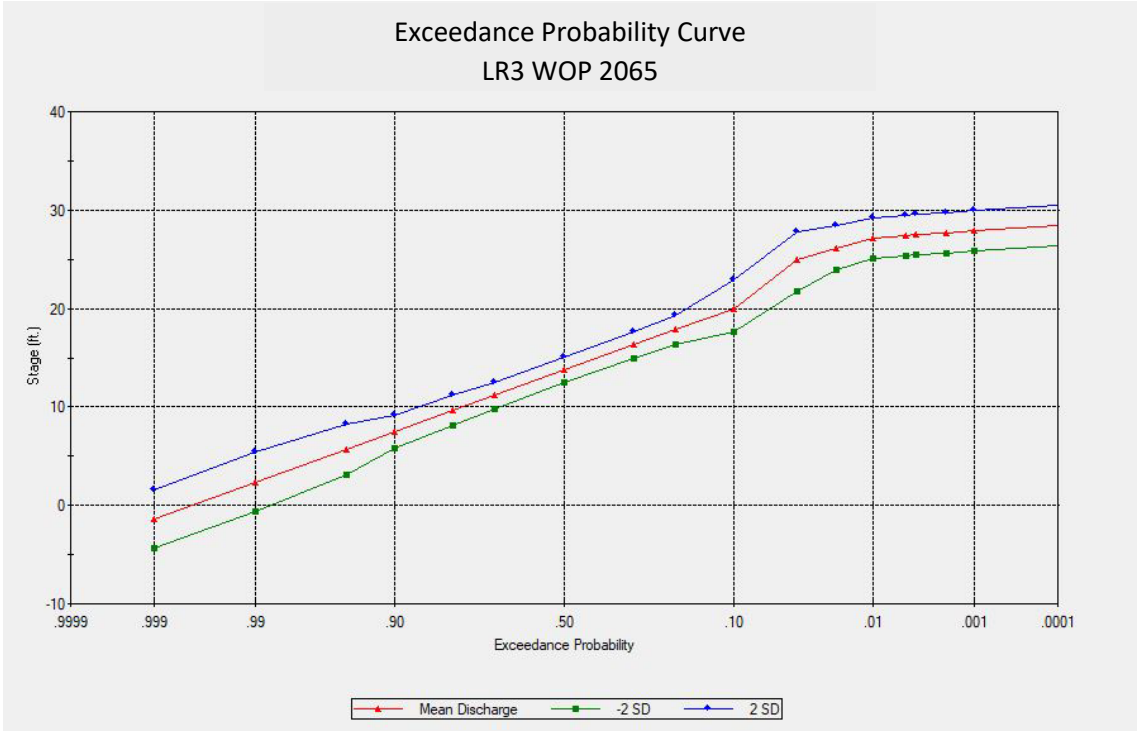


Figure A-14: Exceedance Probability Curve for LR3 WOP 2065

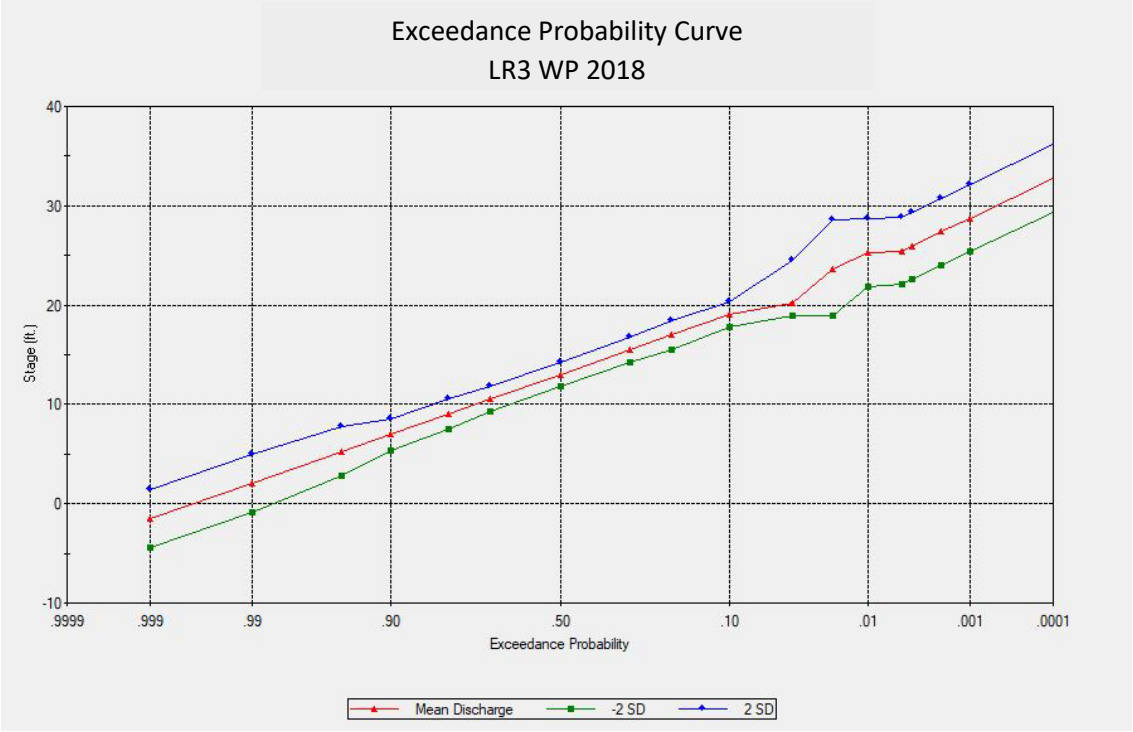


Figure A-15: Exceedance Probability Curve for LR3 WP 2018

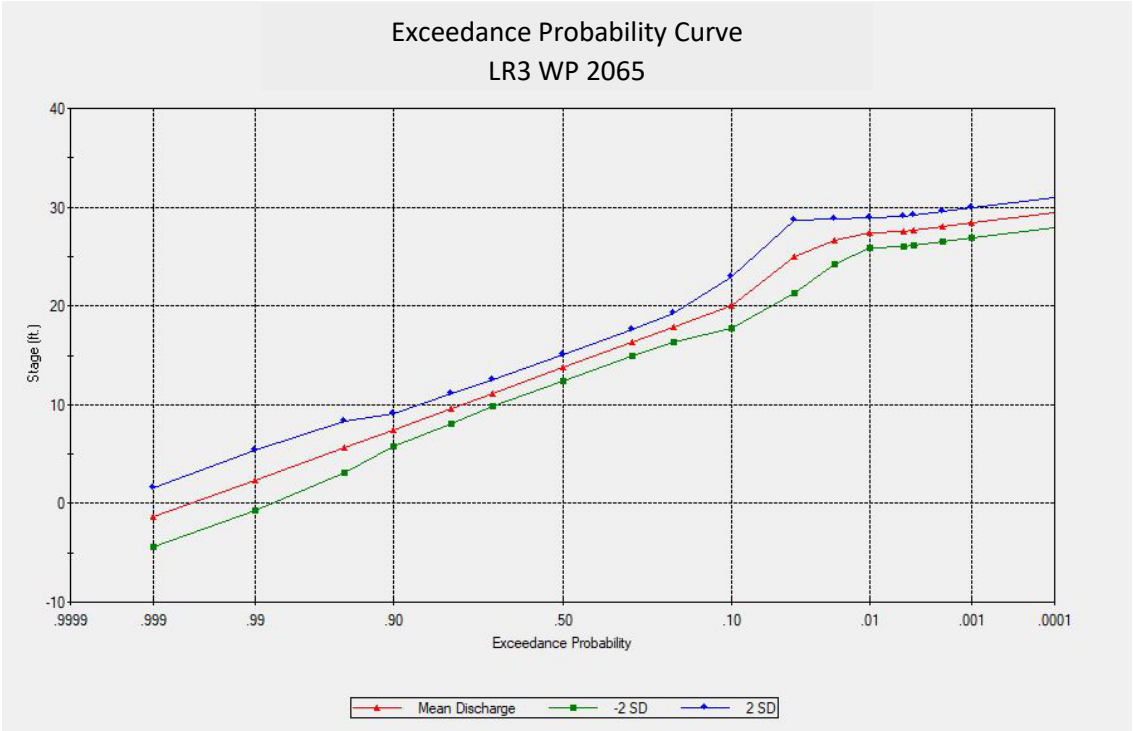


Figure A-16: Exceedance Probability Curve for LR3 WP 2065

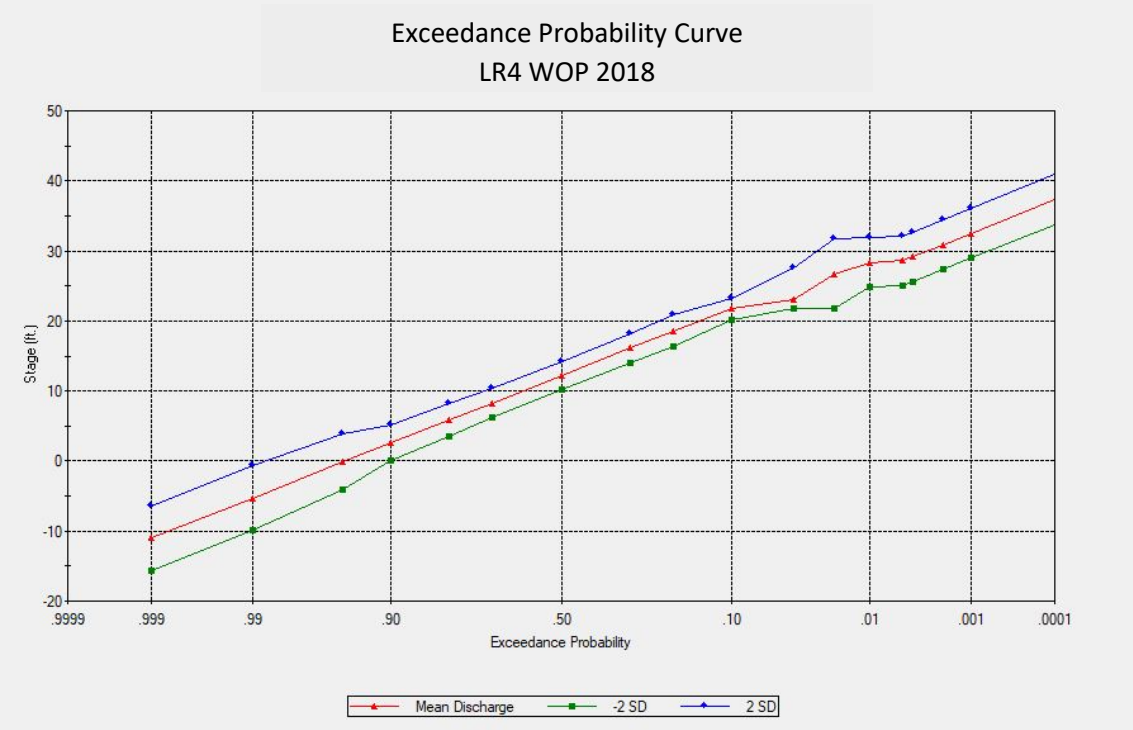


Figure A-17: Exceedance Probability Curve for LR4 WOP 2018

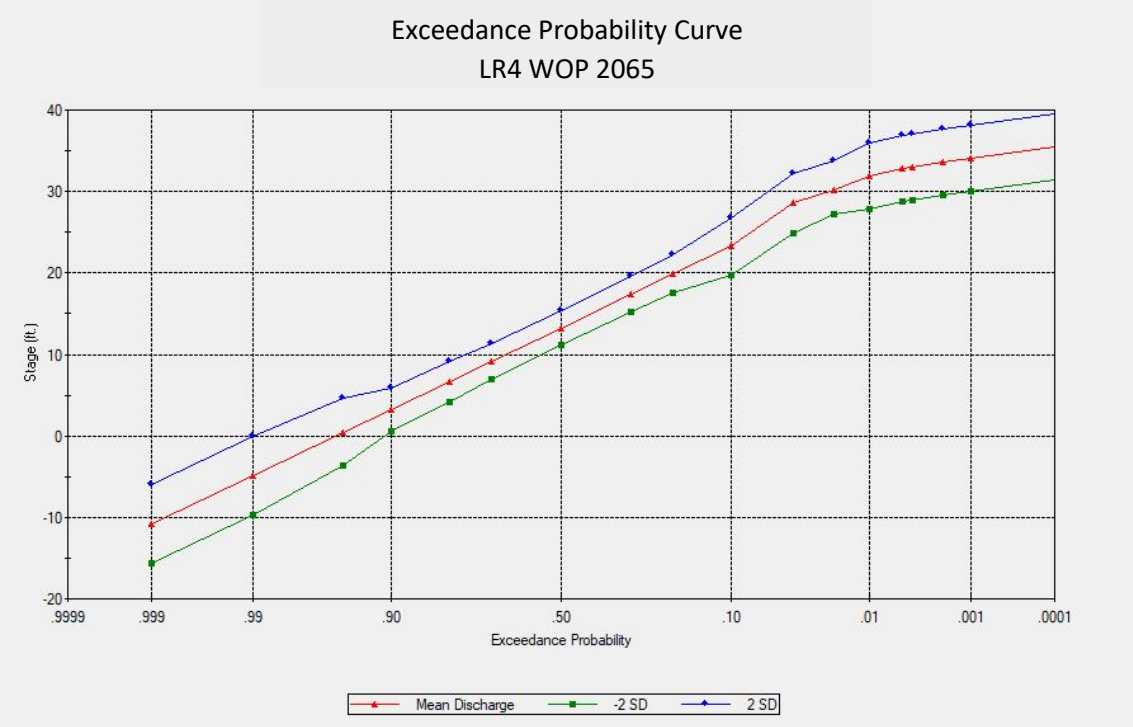


Figure A-18: Exceedance Probability Curve for LR4 WOP 2065

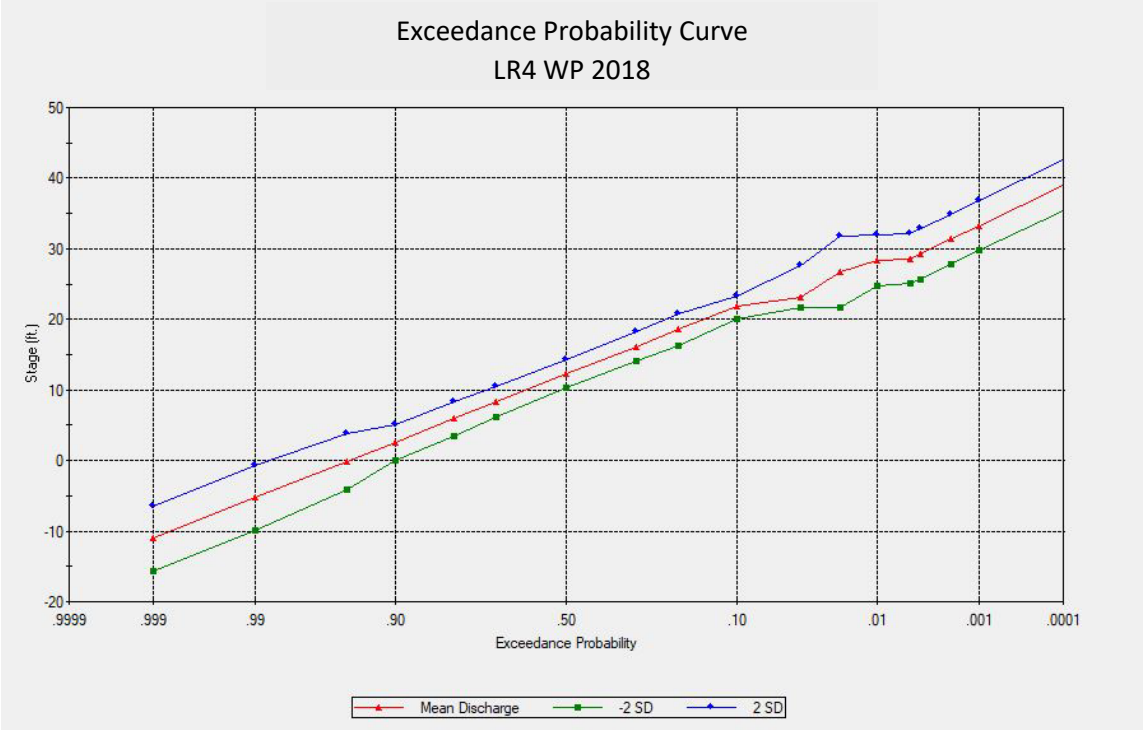


Figure A-19: Exceedance Probability Curve for LR4 WP 2018

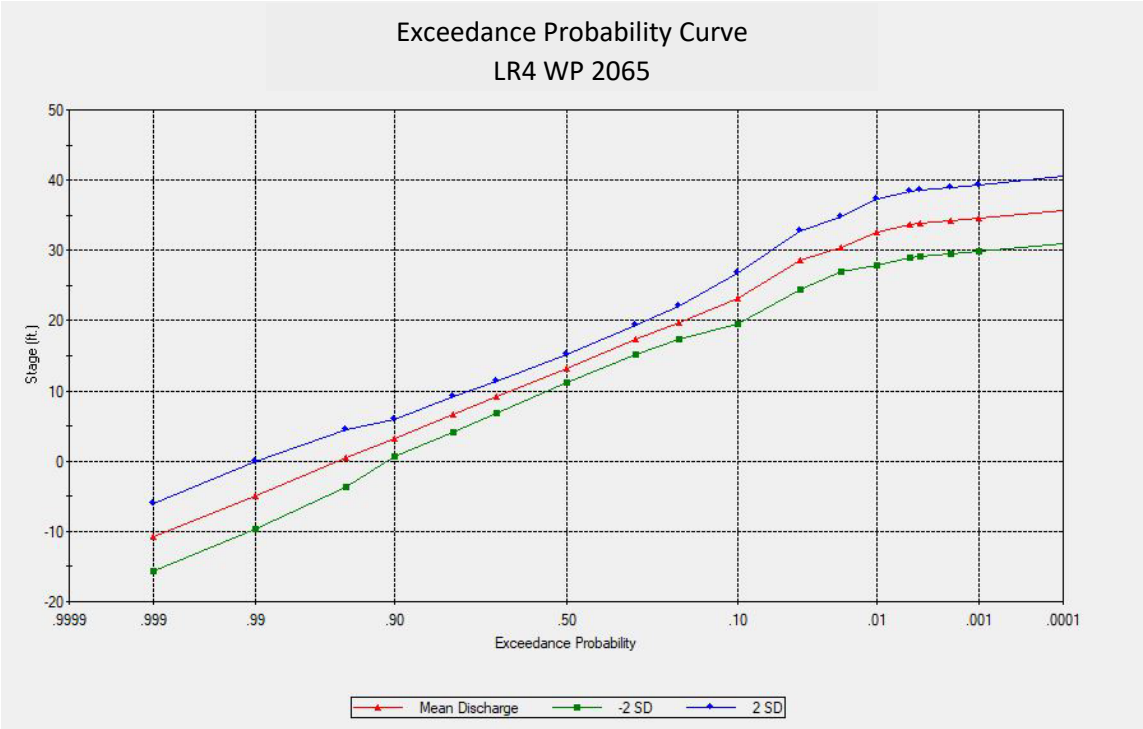


Figure A-20: Exceedance Probability Curve for LR4 WP 2065

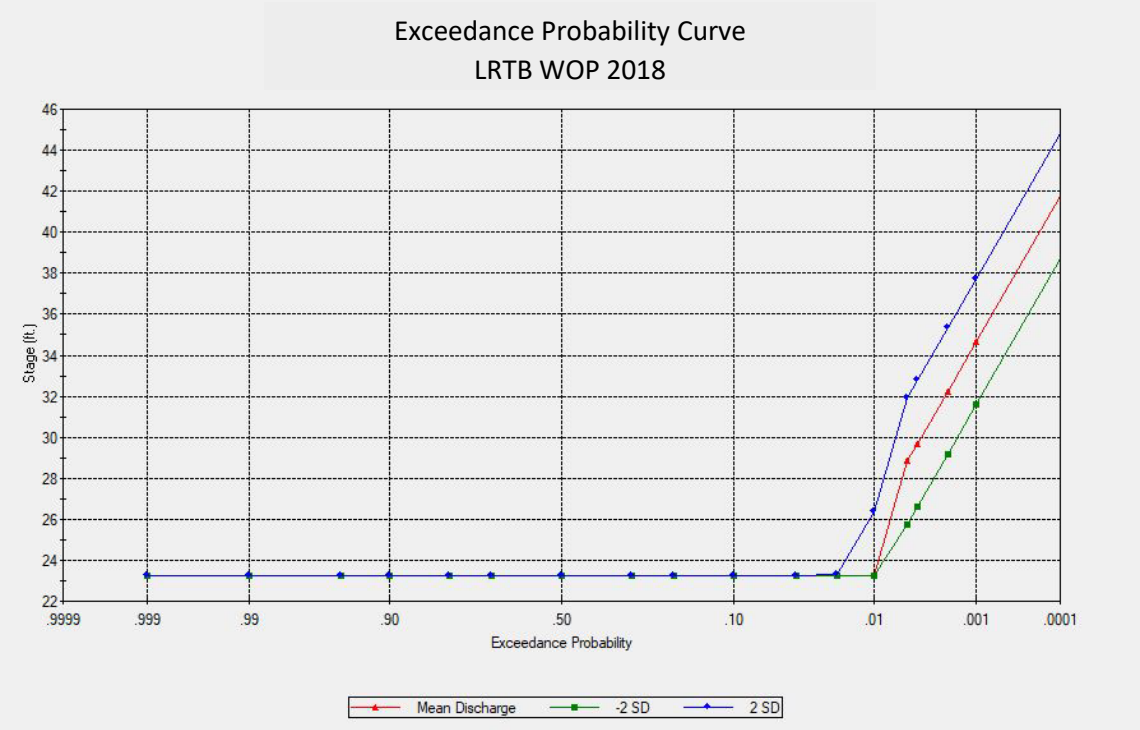


Figure A-21: Exceedance Probability Curve for LRTB WOP 2018

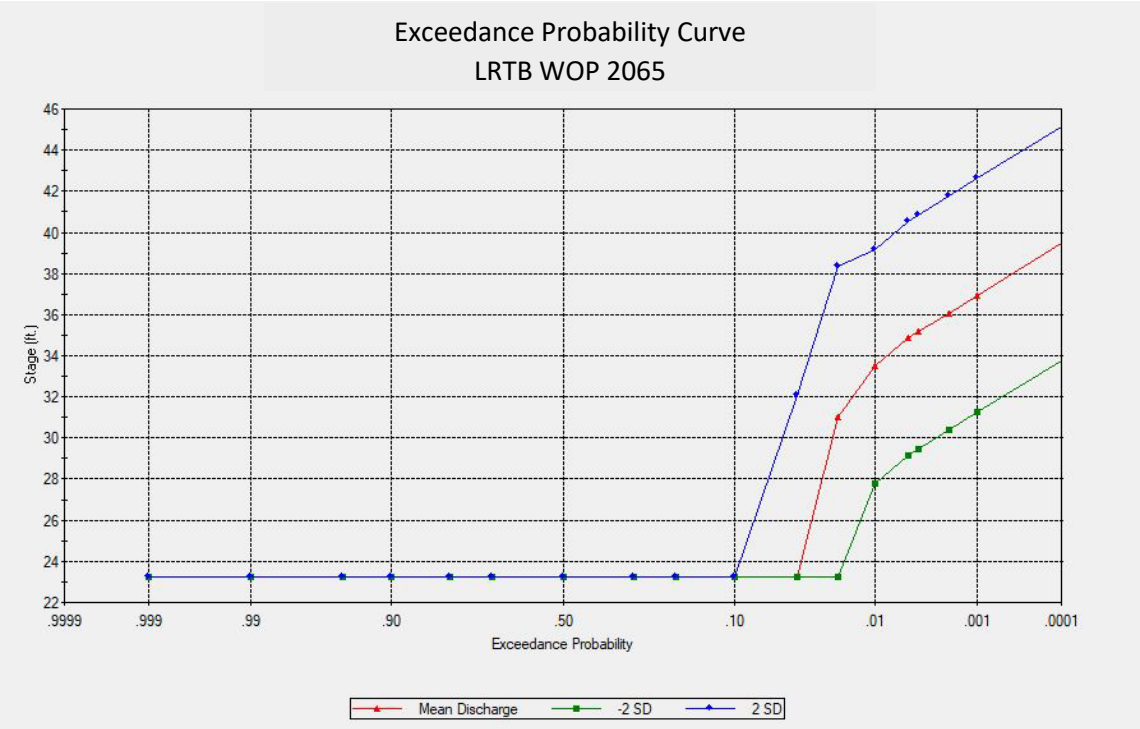


Figure A-22: Exceedance Probability Curve for LRTB WOP 2065

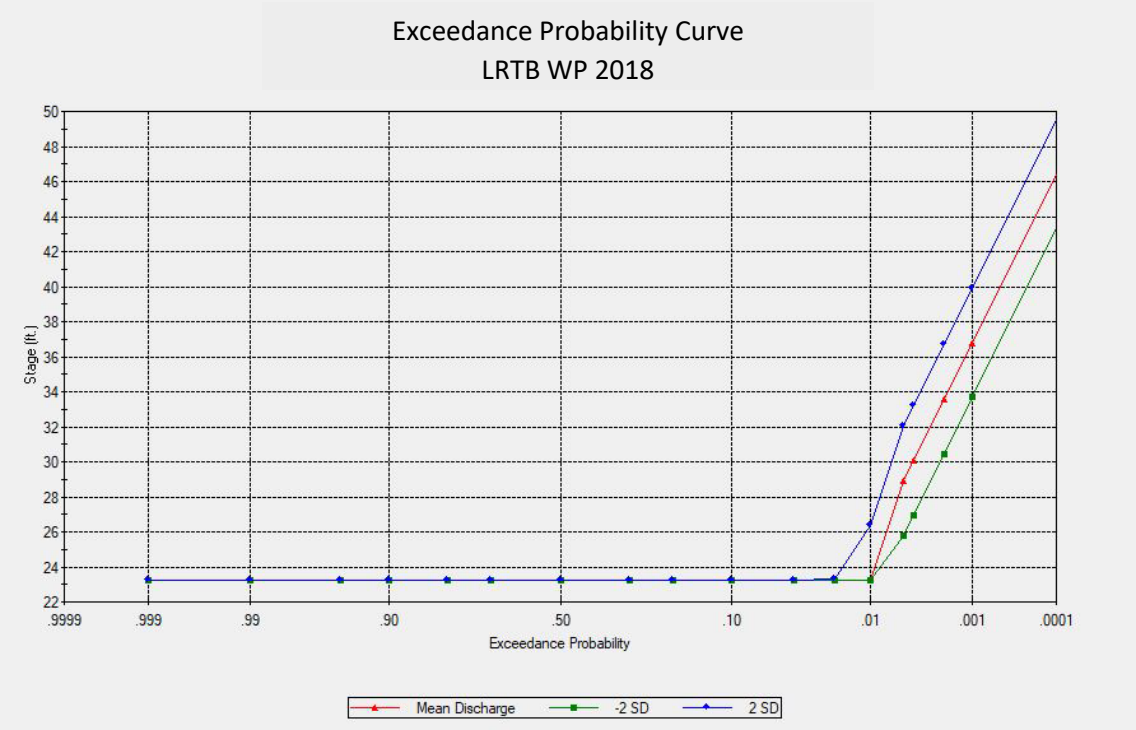


Figure A-23: Exceedance Probability Curve for LRTB WP 2018

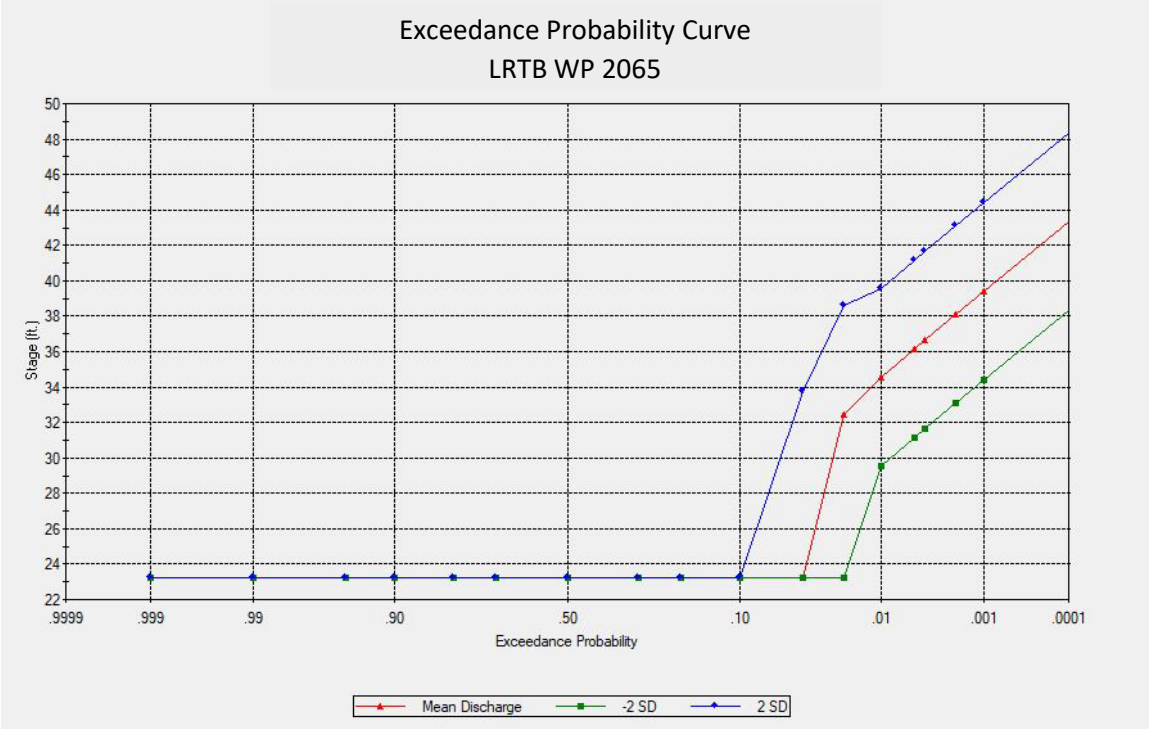


Figure A-24: Exceedance Probability Curve for LRTB WP 2065

Attachment B: Levee Fragility Curves

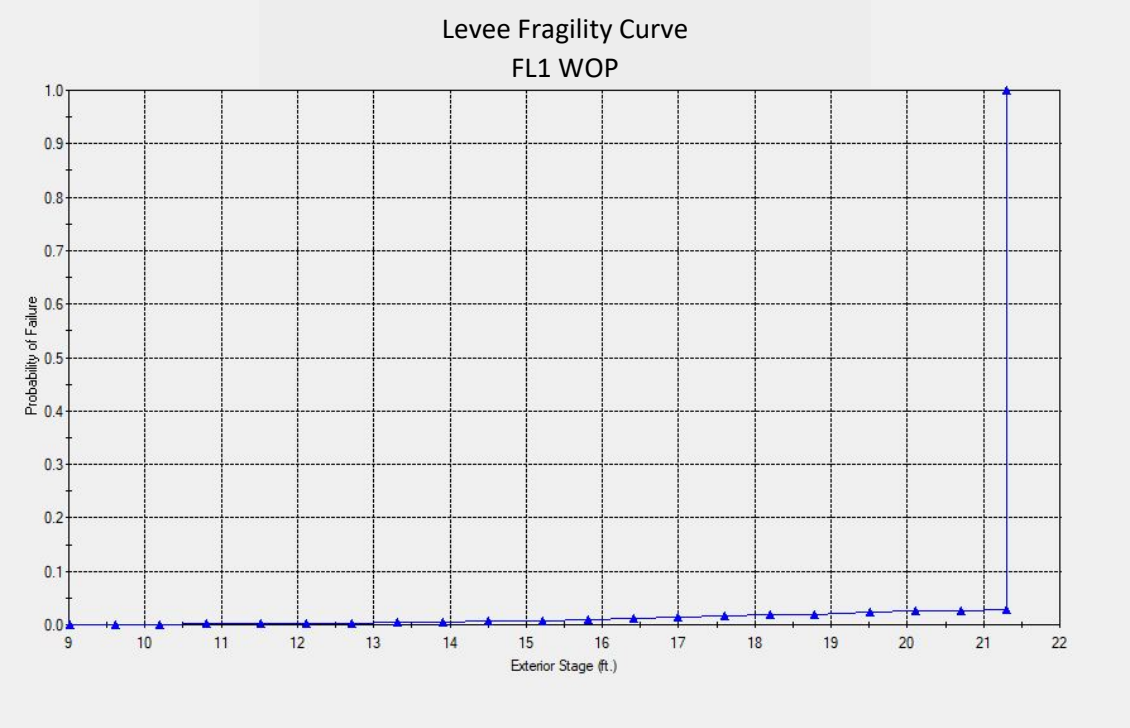


Figure B-1: Levee Fragility Curve for FL1 WOP

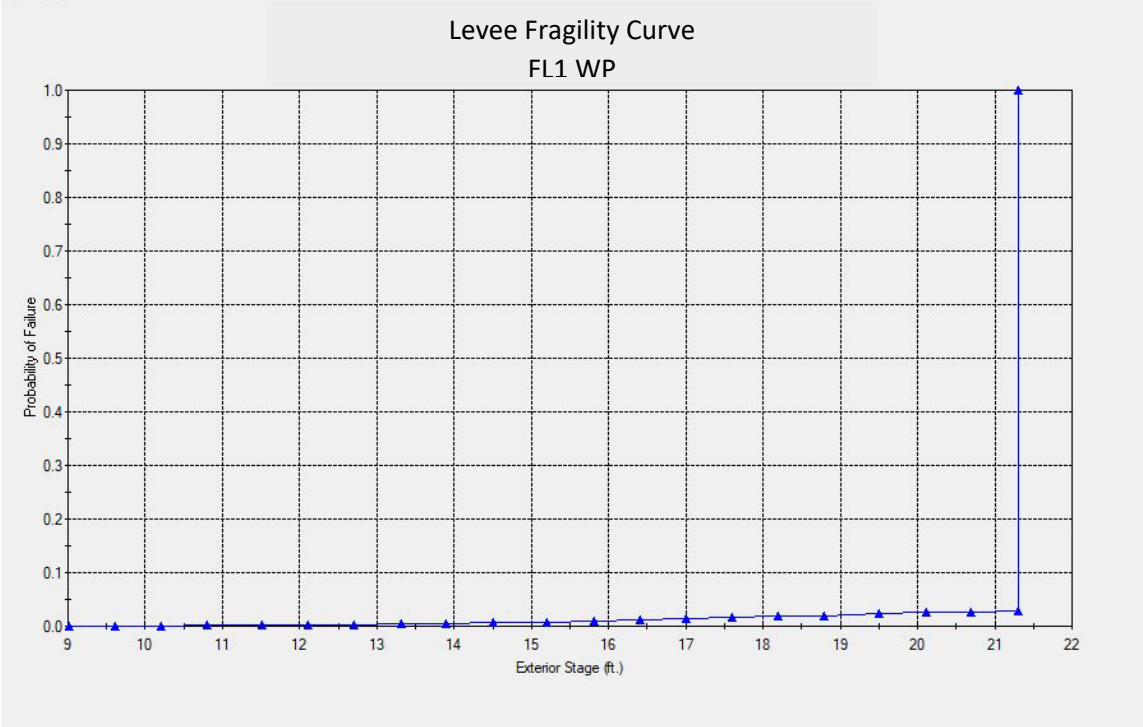


Figure B-2: Levee Fragility Curve for FL1 WP

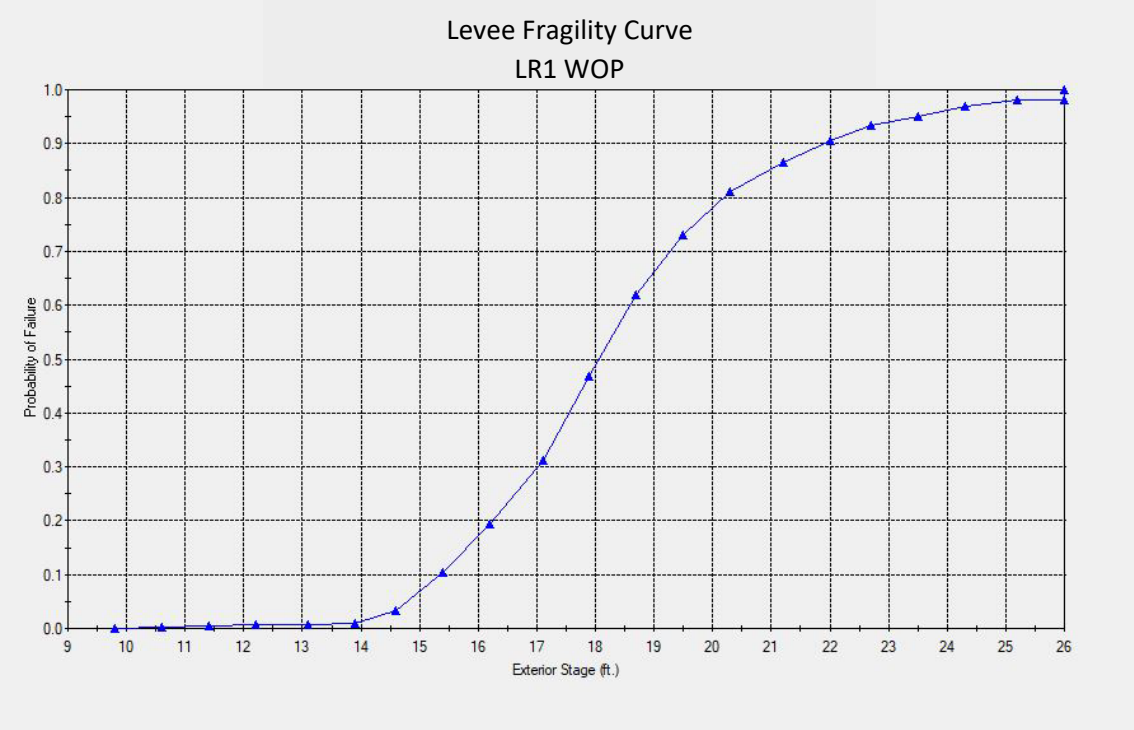


Figure B-3: Levee Fragility Curve for LR1 WOP

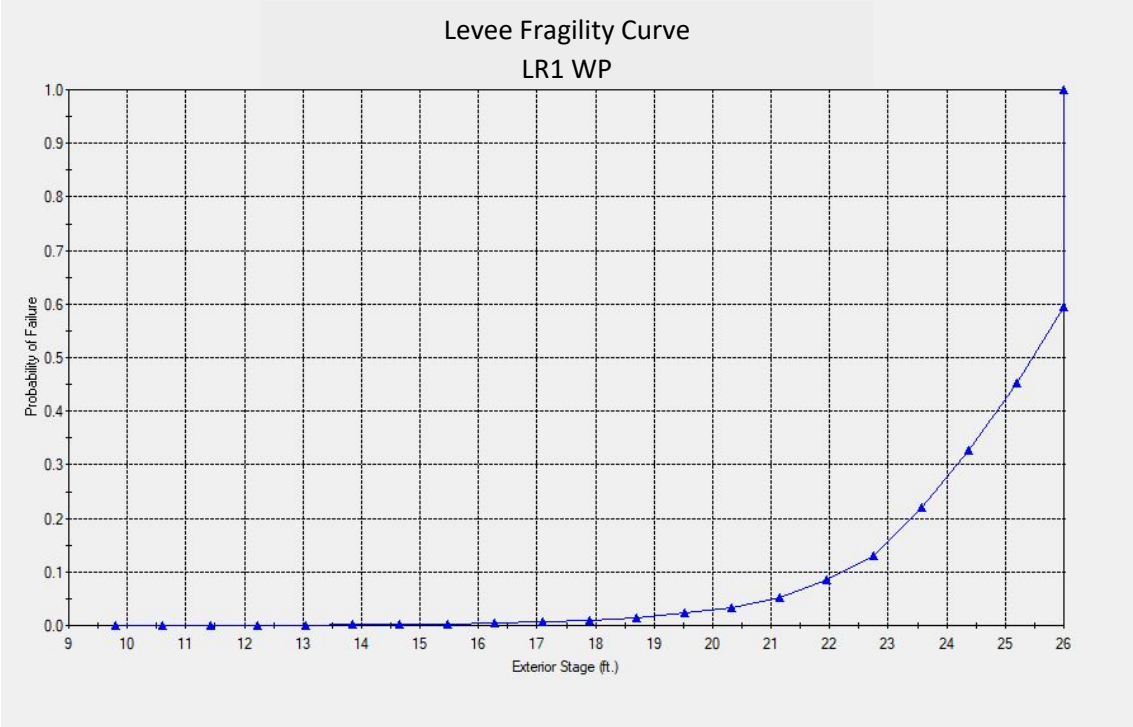


Figure B-4: Levee Fragility Curve for LR1 WP

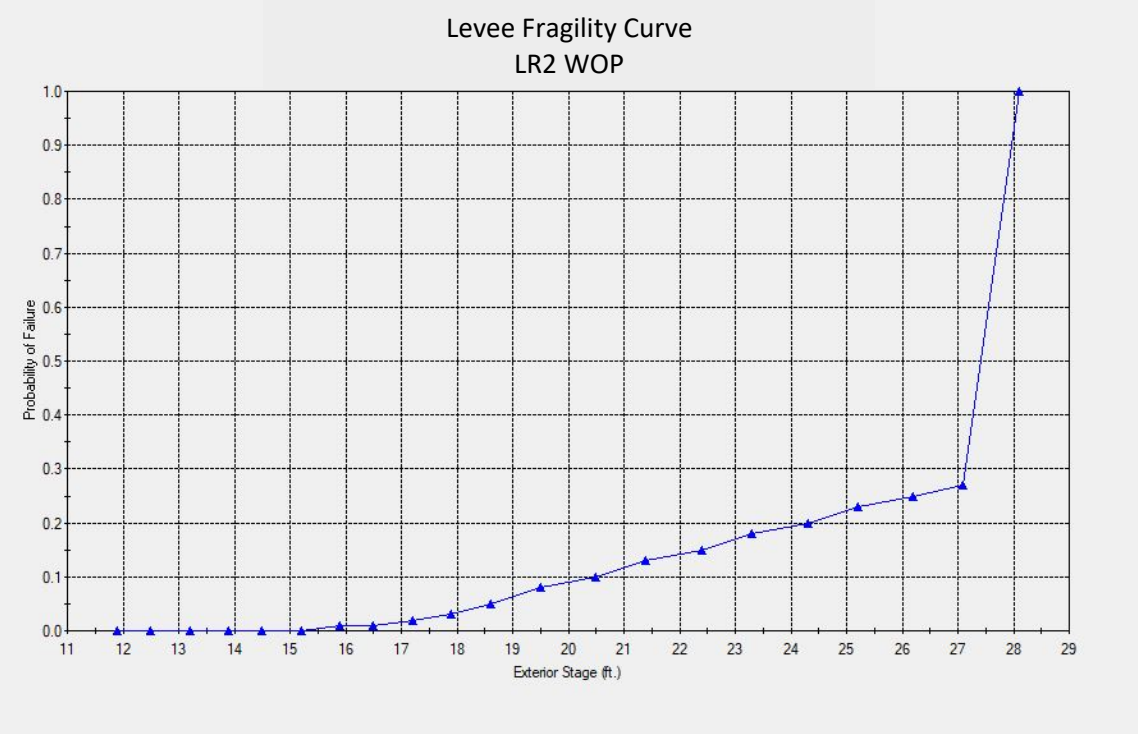


Figure B-5: Levee Fragility Curve for LR2 WOP

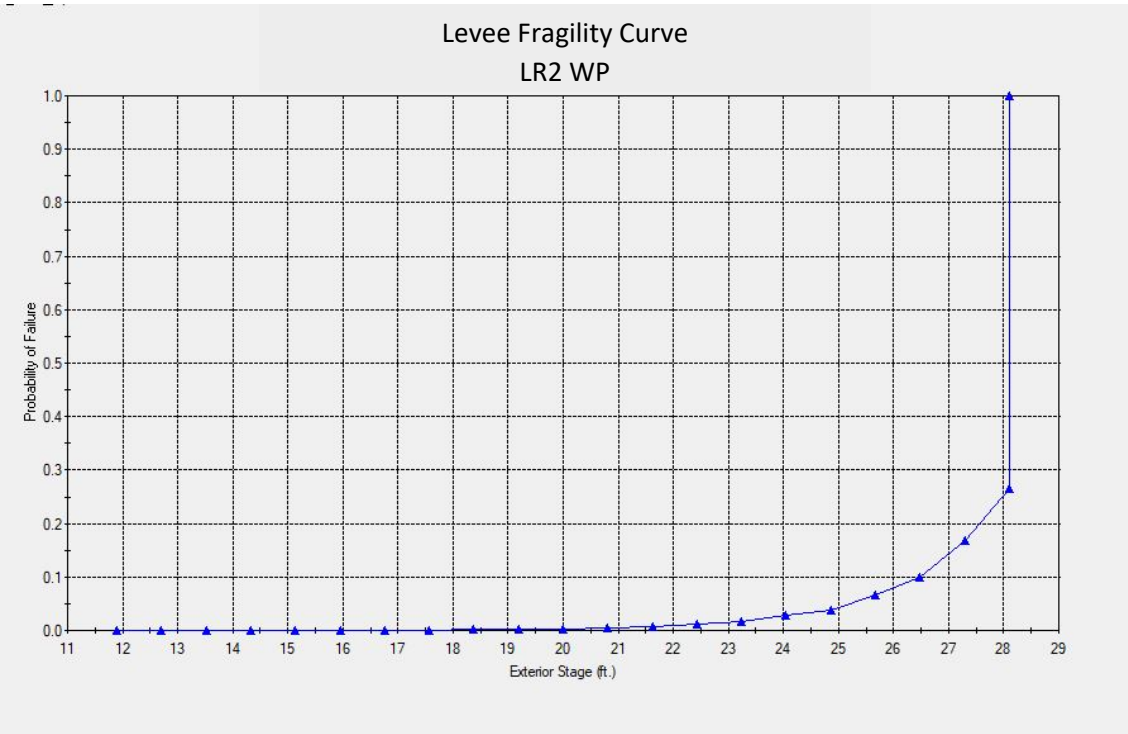


Figure B-6: Levee Fragility Curve for LR2 WP

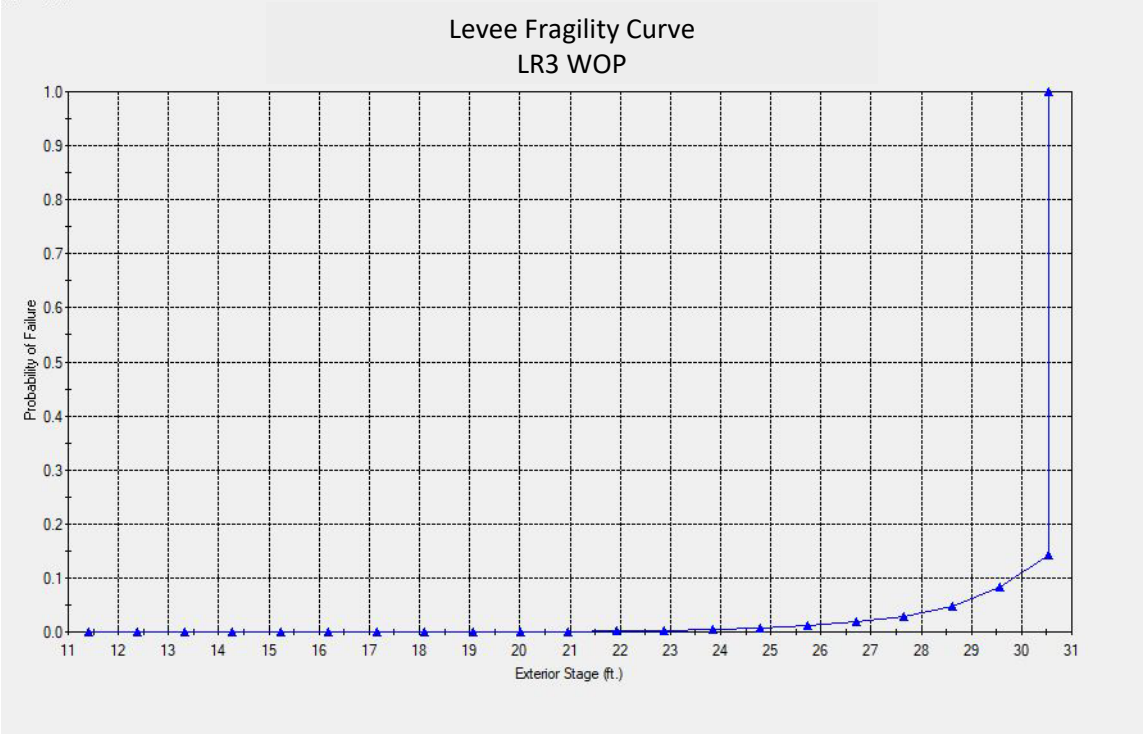


Figure B-7: Levee Fragility Curve for LR3 WOP

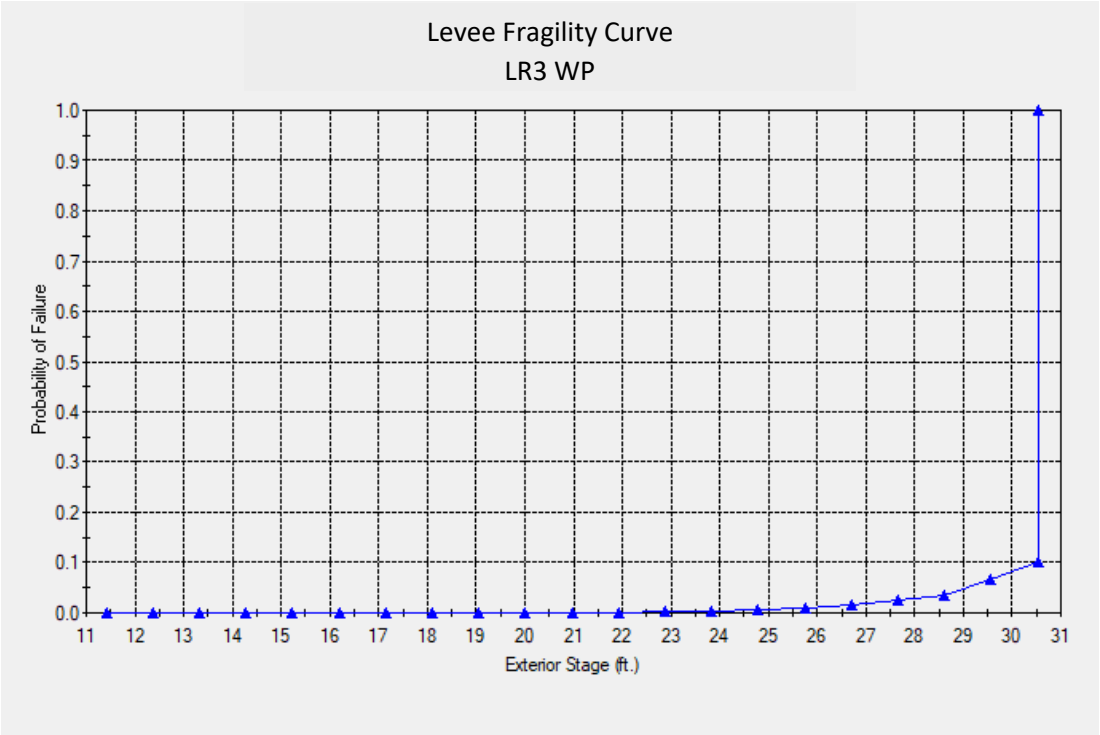


Figure B-8: Levee Fragility Curve for LR3 WP

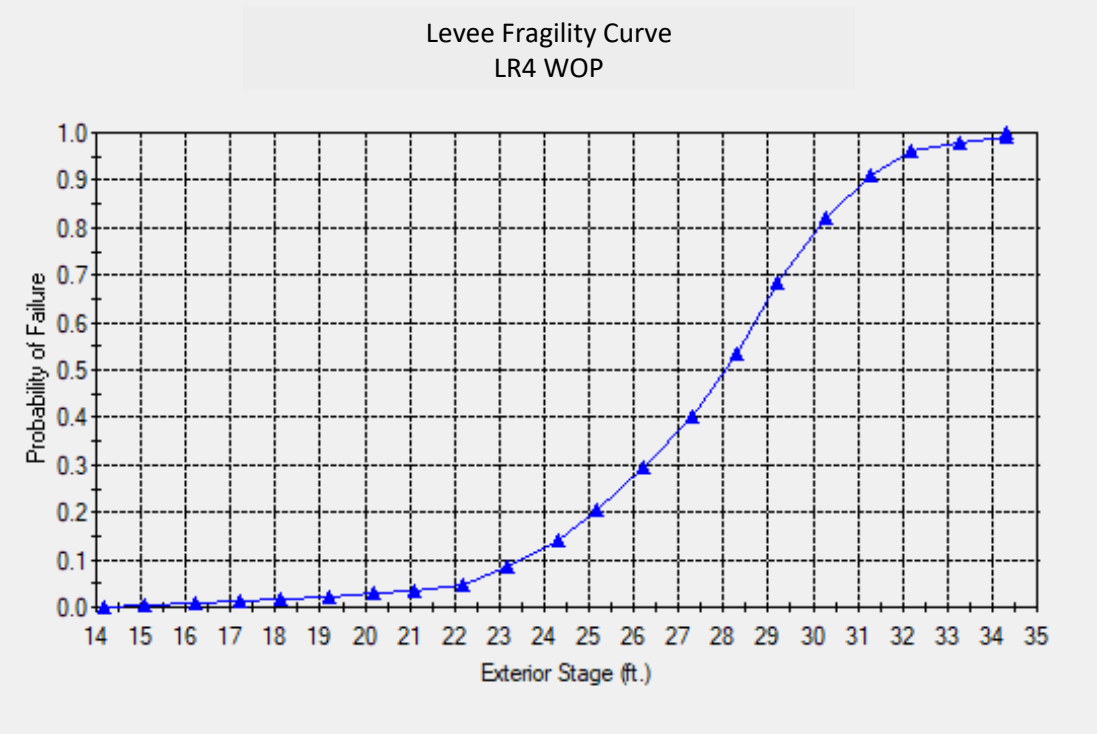


Figure B-9: Levee Fragility Curve for LR4 WOP

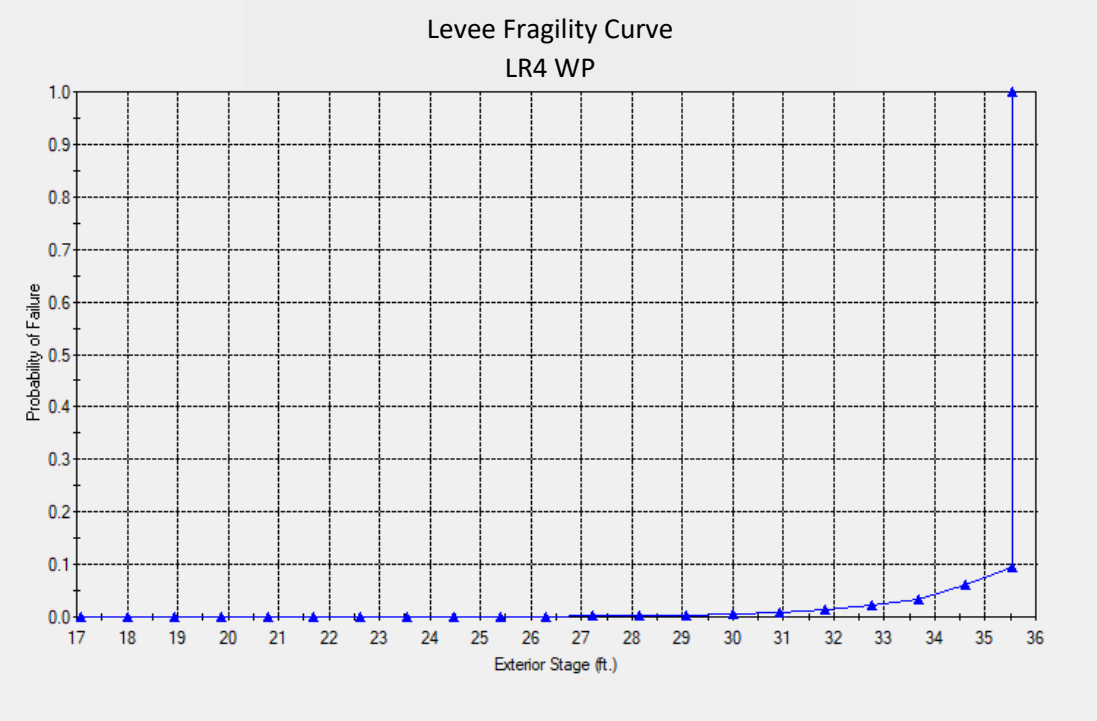


Figure B-10: Levee Fragility Curve for LR4 WP

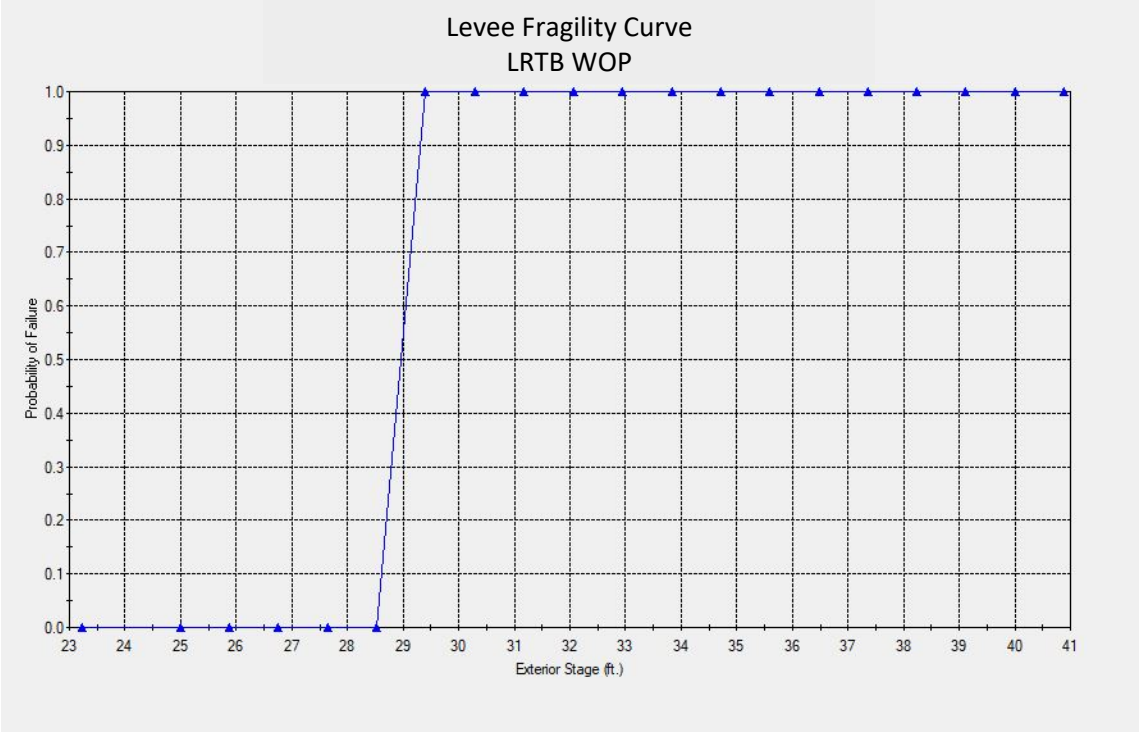


Figure B-11: Levee Fragility Curve for LRTB WOP

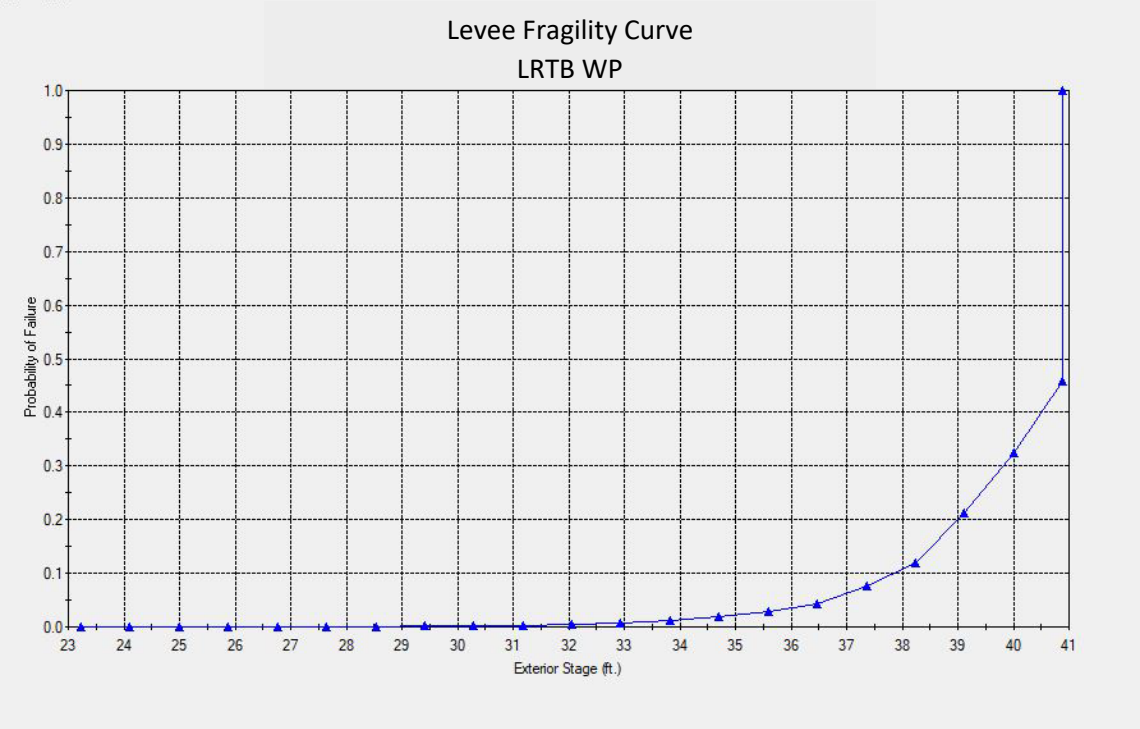


Figure B-12: Levee Fragility Curve for LRTB WP

Attachment C: Structure Inventory Assumptions

Table C-1: Assumptions for 2018 Structure Inventory

Existing (2018)	
Valuation	**Assumptions**
Price per Square Foot	2012 CVFPP Attachment 8F cost value tables were averaged for each occupancy type. Class A-S and Excellent-Cheap were included in the average. Cost value tables were not provided for the following occupancy types: MISC-COMM and MISC-PUB. Assumed that the cost value for MISC-COMM and MISC-PUB are equivalent to C-RET and P-GOV, respectively. San Francisco 2017 annual average CPI was used to convert cost values from 2010 dollars to 2018 dollars. 2017 CPI was used rather than 2018 because the year has not been completed therefore the annual average is unavailable. 2017-2010 CPI ratio – 1.21 https://www.bls.gov/regions/west/data/consumerpriceindex_sanfrancisco_table.pdf
Square Footage	For non-residential, the square footage was calculated using an average floor area ratio (FAR). The FAR for each land use type was determined by sampling 10 parcels and comparing the structure to parcel area. Commercial – 0.22 Industrial – 0.25 Public – 0.17 Mobile Home – 0.071 Agricultural W/ Residence – 0.0037 Sq Ft = polygon area*avg FAR For residential, it was assumed that structures missing livable area were too old to contain that information in the database. Square footage was assumed by averaging livable area for 10% of the oldest homes in the database. SFR1 – 1200 Sq Ft MRF1 – 1504 Sq Ft MFR2 – 5087 Sq Ft
Depreciation	Marshall and Swift 2016 valuation tables were used to calculate depreciation of residential and non-residential buildings. Life expectancy was assumed to be 60 years for all structures. If age is greater than life expectancy, then percent depreciated was assumed to be 60%. https://mcassessor.maricopa.gov/static/docs/2016-Valuation-Tables.pdf
Year	For non-residential, year built was assumed by averaging the information provided for each land use type. Commercial – 1968 Industrial – 1978 Public – 1970 Mobile Home – 1990

Table C-1: Assumptions for 2018 Structure Inventory (cont.)

	For residential, it was assumed that structures missing year built were too old to contain that information in the database. Year built was assumed by averaging information for 10% of the oldest homes in the database. SFR1 – 1914 MRF1 – 1936 MFR2 – 1955 Agricultural W/ Residence – 1915
Occupancy Type	**Assumptions**
Stories	In the database, assumed 0 story is 1 story. For non-residential, all structures are assumed to be 1 story unless indicated otherwise.
Land Use	Codes were assigned according to the 2012 CVFPP Attachment 8F Table A-12 for San Joaquin County.
Spatial	**Assumptions**
FDA Cell	-
Elevation	-
Life Loss	**Assumptions**
Persons per Household	Persons-per-household values came from the 2017 CVFPP Draft Report Attachment 12A. Assumed a flood warning efficiency factor of 70%. SFR – 3.04 MH – 3.04 MFR – 2.85
Population by Age Group	Assumed 7% of the population is Over 65.

Table C-2: Assumptions for 2065 Structure Inventory

Future (2065)	
Valuation	**Assumptions**
Price per Square Foot	2012 CVFPP Attachment 8F cost value tables were averaged for each occupancy type. Class A-S and Excellent-Cheap were included in the average. San Francisco 2017 annual average CPI was used to convert cost values from 2010 dollars to 2018 dollars. 2017 CPI was used rather than 2018 because the year has not been completed therefore the annual average is unavailable. 2017-2010 CPI ratio – 1.21 https://www.bls.gov/regions/west/data/consumerpriceindex_sanfrancisco_table.pdf
Square Footage	Square footage for single family households was determined by averaging 1 story and 2 story households in a nearby development. SFR1 – 1678 Sq Ft SFR2 – 2228 Sq Ft For multifamily, the square footage was calculated using LWA's acreage assumptions and an average floor area ratio (FAR). The FAR was determined by averaging the ratio of total livable area and parcel area for all multifamily parcels included in the existing structures database. MRF – 0.66 Non-residential areas reflect LWA's projection for each development. The structure-to-parcel ratio (FAR of 0.3) is accounted for in LWA's calculations.
Dwelling Units	LWA's projections were adjusted for number of structures already built. LWA's acreage assumptions were used to reflect number of units in each development in 2065.
Depreciation	Assumed no depreciation for structures in 2065.
Occupancy Type	**Assumptions**
Stories	For residential, percentage of 1 story and 2 story homes was determined using River Island Development. River Islands is the newest development in the region which has 88% 2 story homes and 12% 1 story. This was used at the request of City of Lathrop. For non-residential, all structures were assumed to be 1 story.
Land Use	Combined Mossdale Landing sub-developments (i.e. East, South, and Other) to capture LWA's projections. City of Manteca "Future Development" was assumed to be the unidentified development area located within City of Manteca jurisdiction. Codes were assigned according to the 2012 CVFPP Attachment 8F Table A-12 for San Joaquin County.

Table C-2: Assumptions for 2065 Structure Inventory (cont.)

Spatial	**Assumptions**
FDA Cell	-
Elevation	-
Life Loss	**Assumptions**
Persons per Household	Persons-per-household values came from the 2017 CVFPP Draft Report Attachment 12A. Assumed a flood warning efficiency factor of 70%. SFR – 3.04 MH – 3.04 MFR – 2.85
Population by Age Group	Assumed 7% of the population is Over 65.

Attachment D: Occupancy Types

ATTACHMENT D

Table D-1: Occupancy Types from 2012 CVFPP [1]

Description	FDA_Damage	OCC-Name	Description	FDA_Damage	OCC-Name
OTHER SALES CENTERS (TRAILERS,MOBILE HOMES,REC VEHICLES, ETC)	Commercial	C-AUTO1	INDUSTRIAL COMMON AREA	Industrial	I-LT1
USED CAR LOT	Commercial	C-AUTO1	RETAIL LUMBER YARD	Industrial	I-LT1
AUTO SALES W/SERVICE CENTER	Commercial	C-AUTO1	POTENTIAL INDUSTRIAL SUBDIVISION	Industrial	I-LT1
GROCERY STORE	Commercial	C-GROC1	WAREHOUSING - ACTIVE	Industrial	I-WH1
VETERINARY HOSPITAL	Commercial	C-HOS1	MINI STORAGE WAREHOUSING	Industrial	I-WH1
FULL SERVICE HOSPITAL	Commercial	C-HOS1	TRUCK TERMINAL	Industrial	I-WH1
MOTELS LESS THAN 50 UNITS	Commercial	C-HOTEL1	WAREHOUSING - YARD	Industrial	I-WH1
MOTELS OVER 50 UNITS	Commercial	C-HOTEL1	11-20 RES UNITS - 2 OR MORE BUILDINGS	Residential	MFR1
MORTUARIES & FUNERAL HOMES	Commercial	C-MED1	RURAL RES - 2 OR MORE RESIDENCES	Residential	MFR1
1 STORY OFFICE BUILDING	Commercial	C-OFF1	TWO SFDS ON SINGLE PARCEL	Residential	MFR1
OFFICE BLDG W/RES UNIT OR UNITS	Commercial	C-OFF1	5-10 RES UNITS - 2 OR MORE BUILDINGS	Residential	MFR1
MEDICAL OFFICES	Commercial	C-OFF1	THREE UNITS - 2 OR MORE STRUCTURES	Residential	MFR1
3 OR MORE STORY OFFICE BUILDING	Commercial	C-OFF1	ONE DUPLEX - ONE BUILDING	Residential	MFR1
DENTAL OFFICES	Commercial	C-OFF1	FOUR UNITS, 2 OR MORE STRUCTURES	Residential	MFR1
MULTIPLE COMBINATION OF OFFICES, SHOPS AND/OR STORES	Commercial	C-OFF1	INDUSTRIAL CONDOMINIUM	Residential	MFR1
ONE STORY OFFICE CONDOMINUM	Commercial	C-OFF1	CONTINUING CARE RETIREMENT COMMUNITY	Residential	MFR1
2 STORY OFFICE BUILDING	Commercial	C-OFF2	CONGREGATE SENIORS HOUSING	Residential	MFR1
RESTAURANTS	Commercial	C-REST1	5-10 RES UNITS - SINGLE BUILDING	Residential	MFR1
COCKTAIL LOUNGE - BARS	Commercial	C-REST1	SINGLE TRIPLEX -(3 UNITS, 1 STRUCTURE)	Residential	MFR1

[1] California Department of Water Resources (DWR). (2012a). *Central Valley Flood Protection Plan, Attachment 8F: Flood Damage Analysis. June.*

Table D-1: Occupancy Types from 2012 CVFPP (cont.)

RESTAURANT W/RES UNIT OR UNITS	Commercial	C-REST1	VAC LOT ZONED FOR 3 OR 4 UNITS	MISC	MFR1
FAST FOOD RESTAURANTS	Commercial	C-RESTFF1	CONDOMINIUM UNIT	Residential	MFR1
INDIVIDUAL PARCEL WITHIN REGIONAL SHOPPING CENTER	Commercial	C-RET1	SINGLE FOURPLEX	Residential	MFR1
SUPERMARKETS	Commercial	C-RET1	21-40 RES UNITS	Residential	MFR2
NEIGHBORHOOD SHOPPING CENTER	Commercial	C-RET1	OVER 100 UNITS	Residential	MFR2
CONVENIENCE STORE	Commercial	C-RET1	41-100 RES UNITS	Residential	MFR2
SINGLE STORY STORE	Commercial	C-RET1	11-20 RES UNITS - ONE STRUCTURE	Residential	MFR2
COUNTY HOSPITALS	Commercial	C-RET1	RES LOT W/MOBILEHOME	Residential	MH
STORE W/RES UNIT OR UNITS	Commercial	C-RET1	RURAL RES W/MOBILHOME	Residential	MH
SHOP-WORK AREA W/SMALL OFFICE	Commercial	C-RET1	RESORT TYPE TRAILER PARK	Residential	MH
CONVENIENCE STORE W/GAS SALES	Commercial	C-RET1	MOBILE HOME PARK	Residential	MH
COMMUNITY SHOPPING CENTER	Commercial	C-RET1	MOBILE HOME PARK W/OVERNIGHT FACILITIES	Residential	MH
COMMERCIAL COMMON AREA - NON SHOPPING CENTER	Commercial	C-RET1	VAC COMMERCIAL LAND W/MISC IMPROVEMENTS	Commercial	MISC-COM1
INDIVIDUAL PARCEL WITHIN COMMUNITY SHOPPING CENTER	Commercial	C-RET1	VAC COMMERCIAL LAND W/UTILITIES	Commercial	MISC-COM1
BANKS	Commercial	C-RET1	VAC COMMERICAL LAND - UNDEVELOPED	Commercial	MISC-COM1
RETAIL NURSERY	Commercial	C-RET1	COMMERCIAL USE-DOES NOT REASONABLY FIT ANY OTHER CATEGORY	Commercial	MISC-COM1
SELF SERVICE STATION W/MINI MART	Commercial	C-SERV1	MULTIPLE STORES IN ONE BUILDING	Commercial	MISC-COM1
AUTO & TRUCK REPAIRS & ACCESSORIES	Commercial	C-SERV1	MISC CITY PROPERTY	Public	MISC-PUB1
CONVENIENCE STORE (MINI-MART) W/GAS SALES & CAR WASH	Commercial	C-SERV1	VAC CITY LANDS	Public	MISC-PUB1
SERVICE STATION W/CAR WASH	Commercial	C-SERV1	MISC COUNTY PROPERTY	Public	P-GOV1

Table D-1: Occupancy Types from 2012 CVFPP (cont.)

SELF SERVICE CAR WASH	Commercial	C-SERV1	MUNI. UTILITY PROP.(RESERVOIRS,SEWER PLANTS, DUMP SITES,ETC)	Public	P-GOV1
AUTO BODY SHOP	Commercial	C-SERV1	WATER DISTRICT PROPERTY	Public	P-GOV1
FULL SERVICE STATIONS	Commercial	C-SERV1	CHURCH, SYNAGOGUE OR TEMPLE	Public	P-GOV1
SPECIALTY SHOPS (TIRES, BRAKES, ETC.)	Commercial	C-SERV1	RADIO & TV BROADCAST SITE	Public	P-GOV1
DAY CARE CENTER	Commercial	DAYCARE1	VAC FEDERAL LANDS	Public	P-GOV1
SPECIALTY HOME (DEVELOPMENTALLY DISABLE)	Commercial	ELDER1	CABLE T.V.	Public	P-GOV1
FIRE DISTRICT PROPERTY	Public	FIRE1	OTHER CHURCH PROPERTY	Public	P-GOV1
VOLUNTEER FIRE DEPARTMENT	Public	FIRE1	MISC STATE PROPERTY	Public	P-GOV1
LIGHT MFG. & LIGHT INDUSTRIAL	Industrial	I-HV1	MILITARY INSTALLATION	Public	P-GOV1
PACKING PLANTS	Industrial	I-HV1	MISC FEDERAL PROPERTY	Public	P-GOV1
MINERAL PROCESSING	Industrial	I-HV1	MULTIPLE SCREEN THEATERS	Public	P-REC1
HEAVY INDUSTRY	Industrial	I-HV1	CITY PARKS & OTHER RECREATIONAL FACILITIES	Public	P-REC1
COLD STORAGE OR REFRIGERATED WHOLESALE	Industrial	I-LT1	CLUBS, LODGE HALLS	Public	P-REC1
VAC INDUSTRIAL LAND UNDEVELOPED	Industrial	I-LT1	18 HOLE PUBLIC GOLF COURSE	Public	P-REC1
LIGHT INDUSTRIAL & WAREHOUSING	Industrial	I-LT1	COMMON AREAS - W/STRUCTURES	Public	P-REC1
INDUSTRIAL USE THAT DOES NOT REASONABLY FIT ANY OTHER CATEGORY	Industrial	I-LT1	SWIM CENTERS	Public	P-REC1
VAC INDUSTRIAL LAND W/MISCELLANEOUS IMPROVEMENTS	Industrial	I-LT1	SCHOOL DISTRICT PROPERTY	Public	P-SCH1
FEED & GRAIN MILLS	Industrial	I-LT1	PRIVATE SCHOOL	Public	P-SCH1
MISC. INDUSTRIAL MULTIPLE USES - NONE FULLY DOMINANT	Industrial	I-LT1	SPECIAL SCHOOL	Public	P-SCH1
LIGHT INDUSTRIAL WAREHOUSE W/MULTIPLE TENNANTS	Industrial	I-LT1	SINGLE FAMILY DWELLING(SFD)	Residential	SFR1
OTHER FOOD PROCESSING	Industrial	I-LT1	RURAL RESIDENCE - 1 RESIDENCE	Residential	SFR1

Table D-1: Occupancy Types from 2012 CVFPP (cont.)

SPECIALTY LUMBER PRODUCTS(MOULDINGS, SAWDUST, CHIPS)	Industrial	I-LT1	IRRIGATED PASTURE W/RESIDENCE	Agriculture	SFR1
MEAT PRODUCTS	Industrial	I-LT1	VAC RES LOT - DEV W/UTILITIES	MISC	SFR1

Attachment E: Content-to-Structure Ratios

Table E-1: Content-to-Structure Ratios from 2012 CVFPP [1]

Occupancy Type	Description	Ratio
C-AUTO1	SERVICE-AUTO — 1 STORY	62%
C-GROC1	GROCERY STORE — 1 STORY	106%
C-HOS1	HOSPITALS — 1 STORY	92%
C-HOTEL1	HOTELS — 1 STORY	69%
C-MED1	MEDICAL — 1 STORY	148%
C-OFF1	OFFICE — 1 STORY	34%
C-OFF2	OFFICE — 2 STORY	28%
C-REST1	RESTAURANTS — 1 STORY	134%
C-RESTFF1	FAST FOOD RESTAURANTS — 1 STORY	42%
C-RET1	RETAIL — 1 STORY	51%
C-SERV1	FULL SERVICE AUTO DEALERSHIP — 1 STORY	193%
DAYCARE1	DAYCARE FACILITY — 1 STORY	*
ELDER1	ELDERCARE FACILITY — 1 STORY	*
FIRE1	FIRE STATIONS — 1 STORY	35%
I-HV1	HEAVY MANUFACTURE — 1 STORY	31%
I-LT1	LIGHT MANUFACTURER — 1 STORY	188%
I-WH1	WAREHOUSE — 1 STORY	89%
MFR1	MULTI-FAMILY — 1 STORY	50%
MFR2	MULTI-FAMILY — 2 STORY	50%
MH	MOBILE HOME	50%
P-GOV1	GOVERNMENT BUILDING — 1 STORY	35%
P-GOV1	PUBLIC CHURCH — 1 STORY	20%
P-REC1	RECREATION/ASSEMBLY — 1 STORY	132%
P-SCH1	PUBLIC AND PRIVATE SCHOOLS — 1 STORY	38%
SFR1	SINGLE FAMILY RESIDENTIAL — 1 STORY	50%
SFR2	SINGLE FAMILY RESIDENTIAL — 2 STORY	50%

[1] U.S. Army Corps of Engineers (USACE). (2008a). *Final Economic Reevaluation Report. American River Watershed Project, California. Folsom Dam Modification and Folsom Dam Raise Projects. Appendix D -- Economics. February.*

Attachment F: Summary of LWA Acreage Assumptions

ATTACHMENT F

Table F-1: LWA Acreage Assumptions [1]

Development Area	Occupancy Type	Acres/Unit
Central Lathrop	SFR	0.125
	MFR	0.063
Mossdale Landing	SFR	0.217
	MFR	0.063
Mossdale Landing East	MFR	0.063
Mossdale Landing South	MFR - Medium	0.135
	MFR - High	0.04
Mossdale Landing Other	SFR	0.2
Historic/East Lathrop	SFR	0.2
	MFR - Medium	0.1
	MFR - High	0.063
Terra Ranch	SFR	0.288
	MFR	0.05
Cerri	SFR	0.244
Future Development	MFR	0.05
Denali	SFR	0.224
The Trails of Manteca	SFR	0.271
Oakwood Trails	SFR	0.249
Oleander	SFR	0.208
Sundance	SFR	0.214
Weston Ranch	SFR	0.149
	MFR	0.05
Future Manteca Annex	SFR	0.25
Oakwood Shores	SFR	0.245

[1] Larsen Wurzel & Associates, Inc. (2017). *RD17 Area: Financial Plan Implementation -- Summary of Financial Analyses. Administrative Review Draft Report. September.*

Attachment G: Depth-Percent Damage Curves

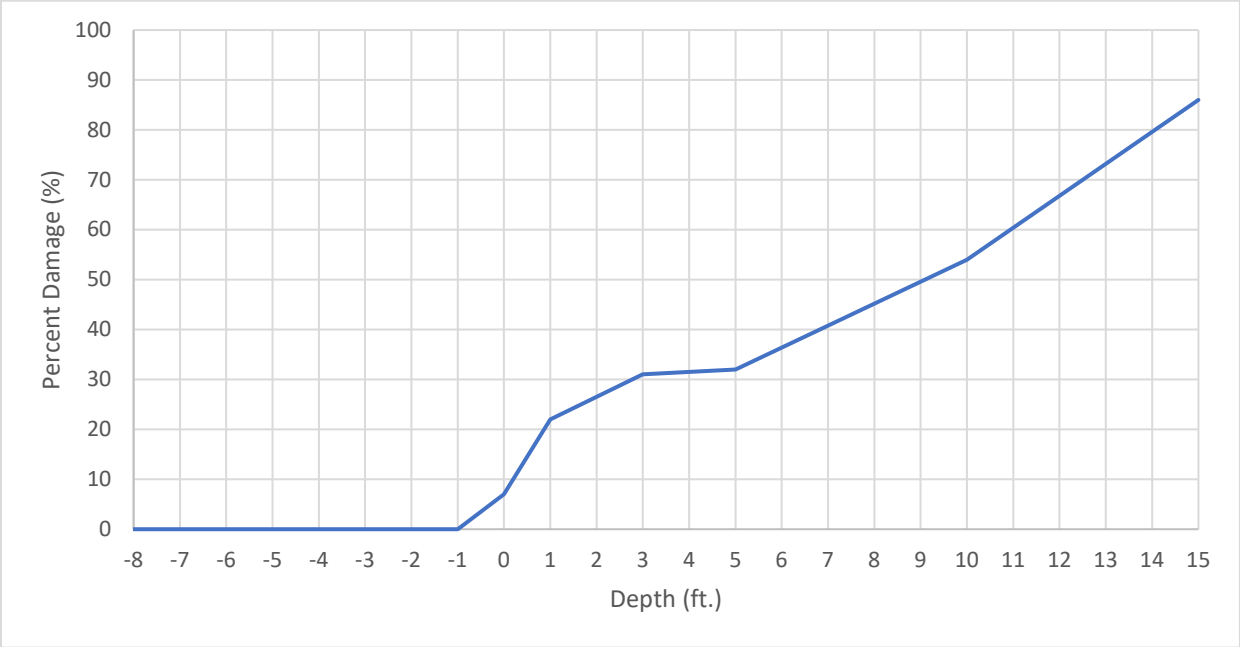


Figure G-1: Depth-Percent Damage Curve for C-AUTO1 Structures

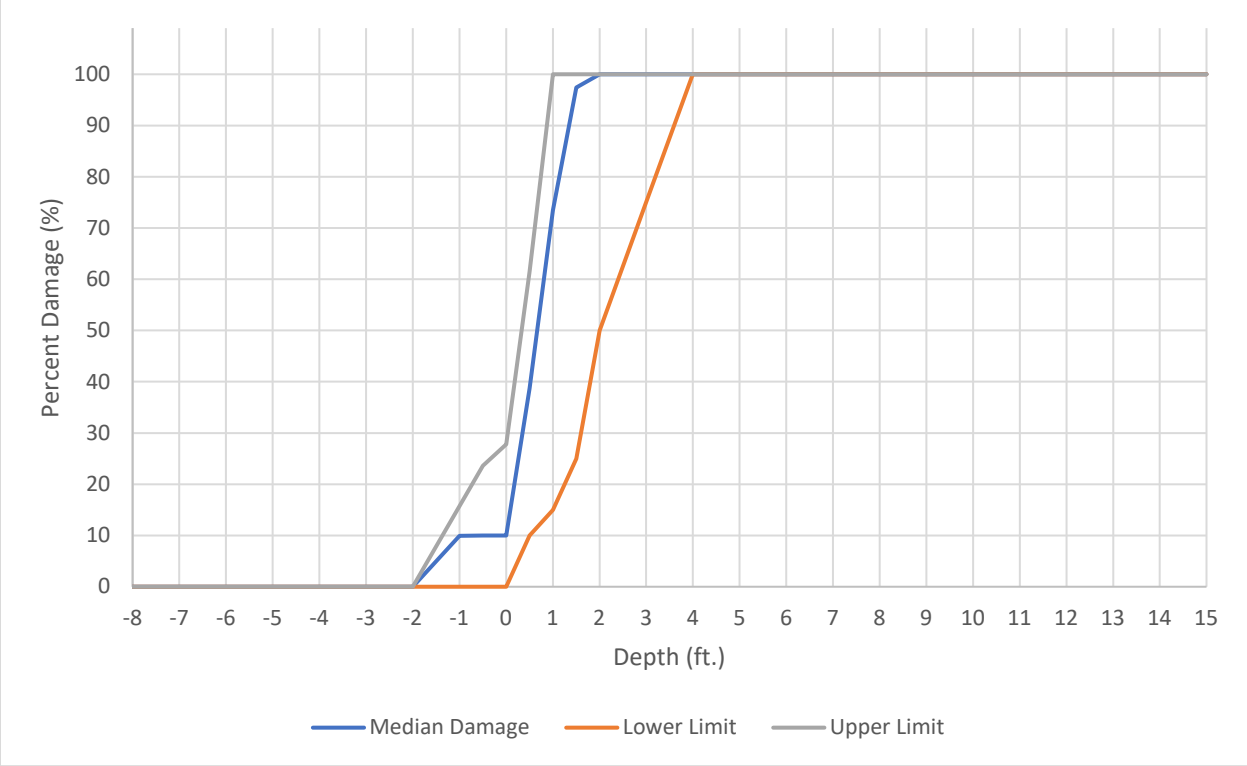


Figure G-2: Depth-Percent Damage Curve for C-AUTO1 Content

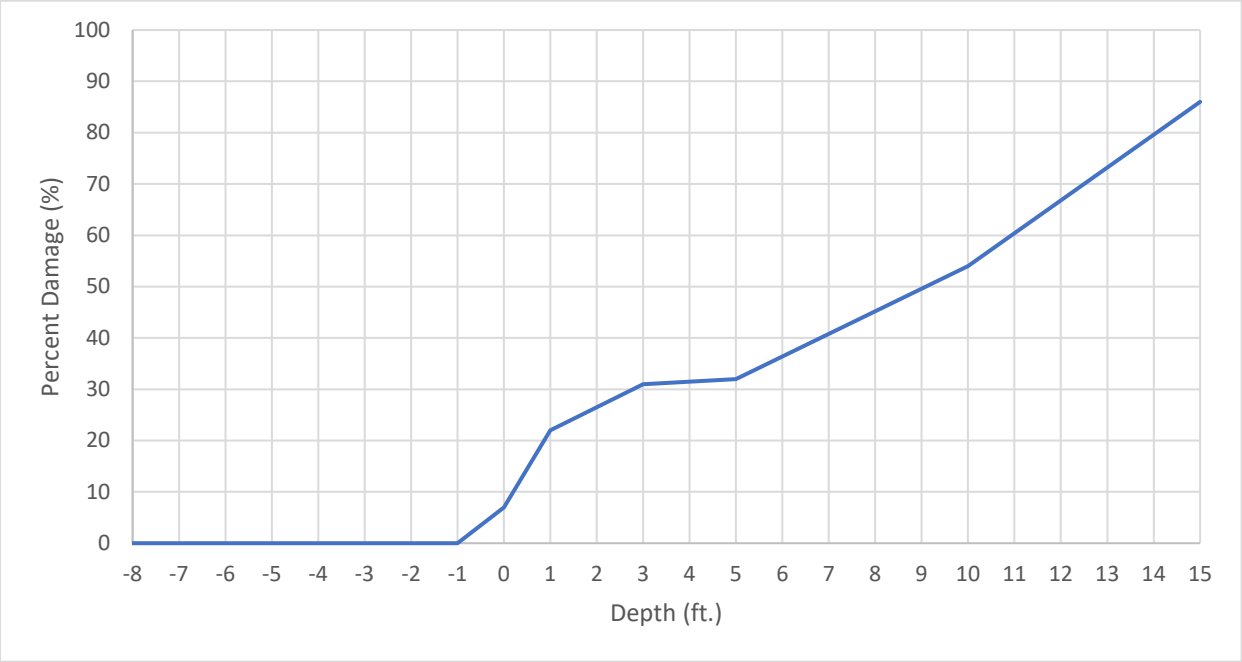


Figure G-3: Depth-Percent Damage Curve for C-GROC1 Structures

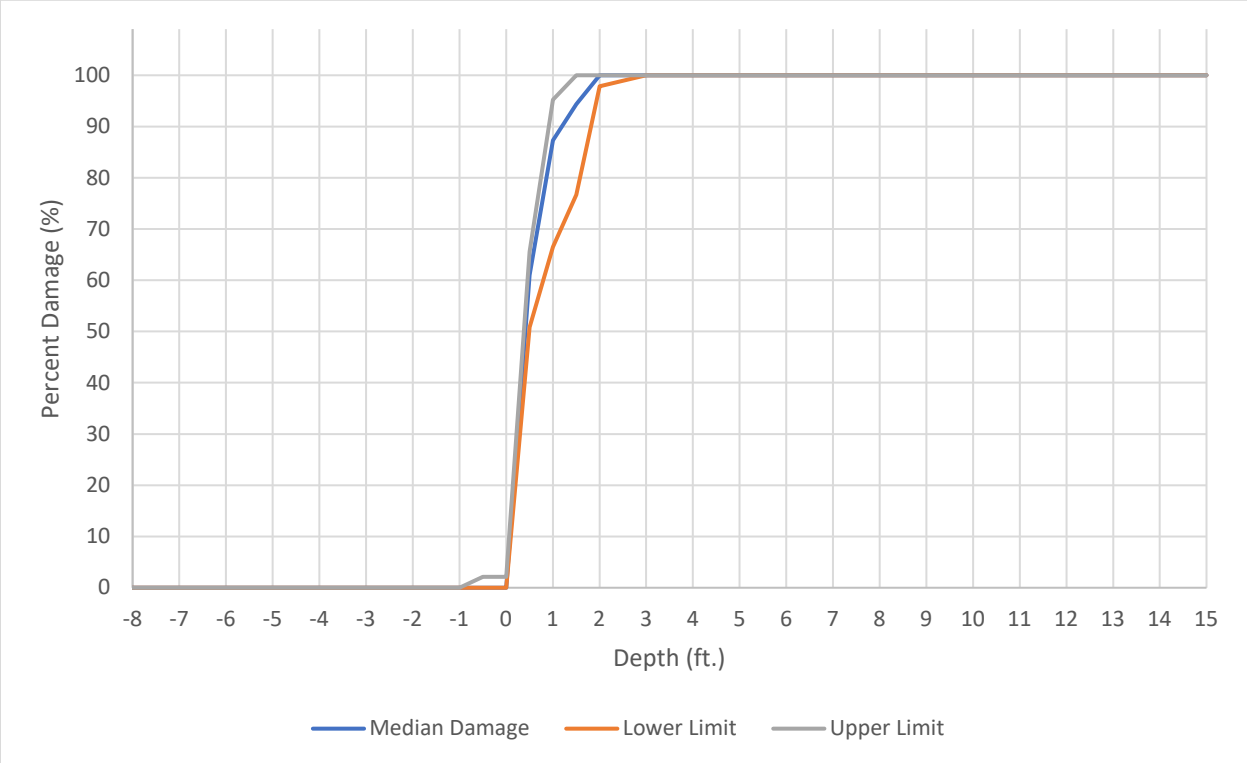


Figure G-4: Depth-Percent Damage Curve for C-GROC1 Content

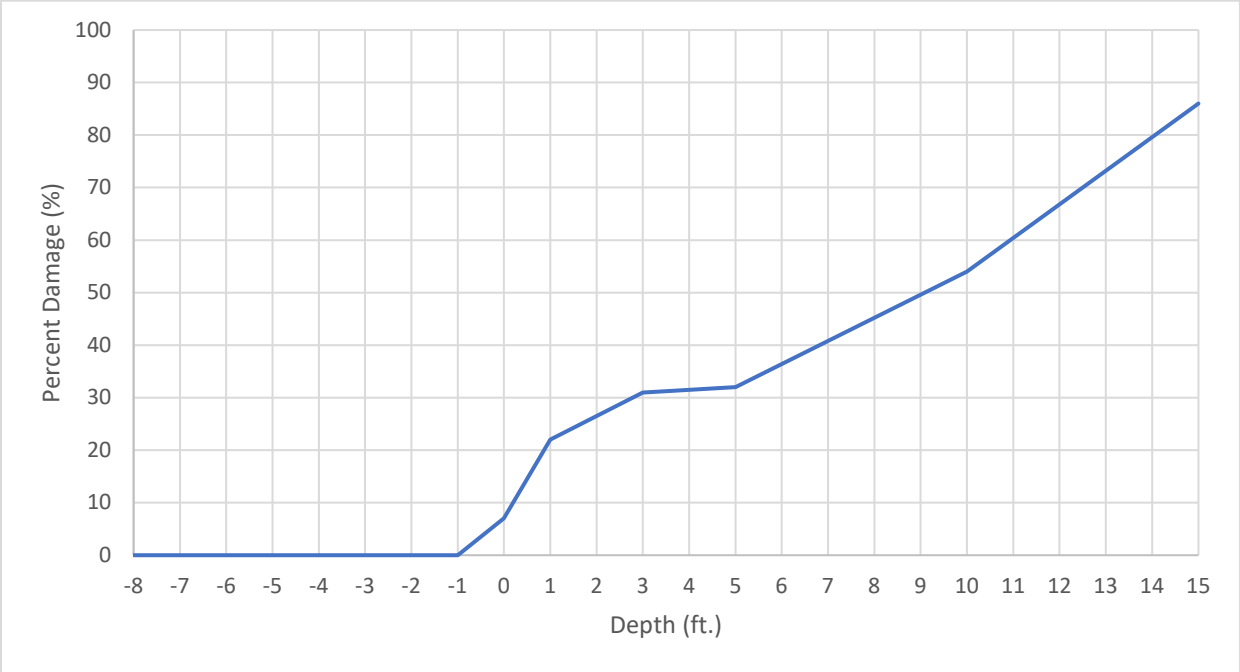


Figure G-5: Depth-Percent Damage Curve for C-HOS1 Structures

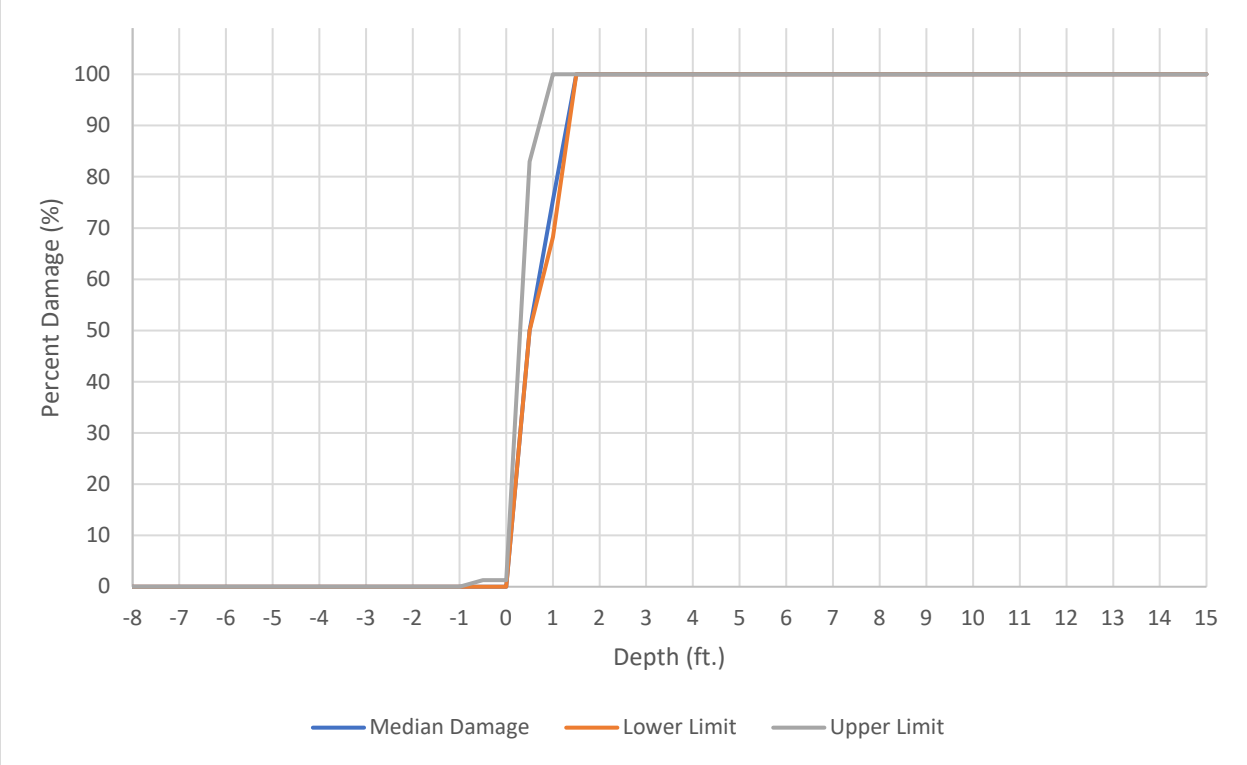


Figure G-6: Depth-Percent Damage Curve for C-HOS1 Content

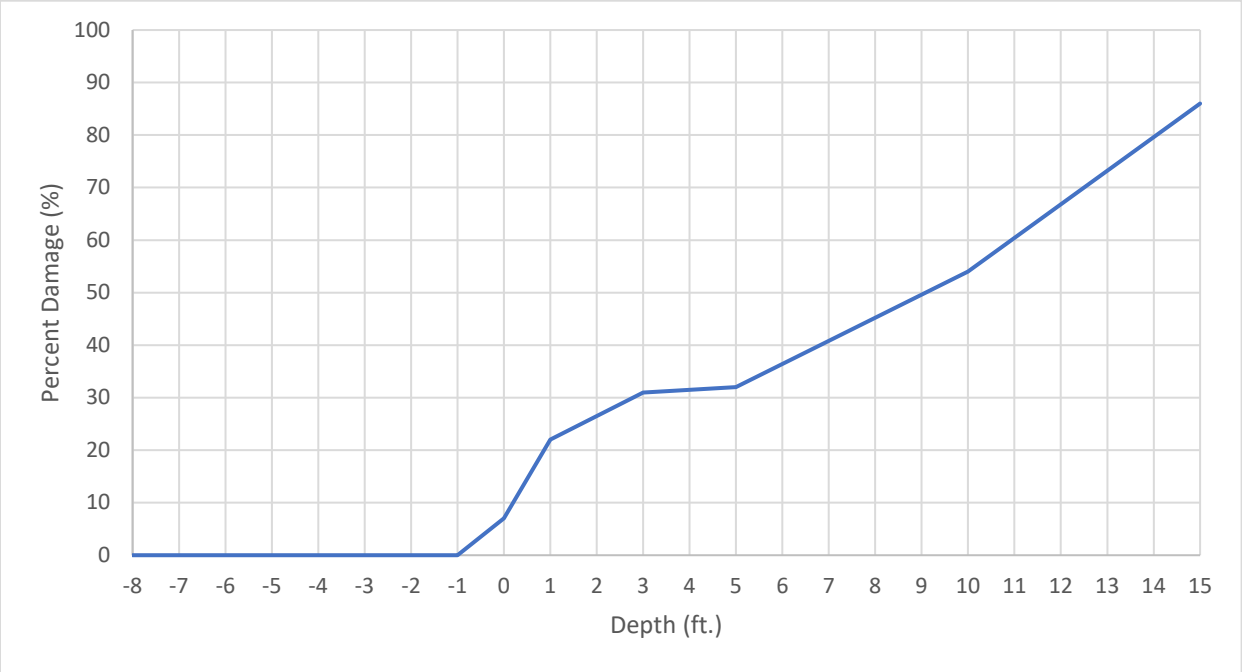


Figure G-7: Depth-Percent Damage Curve for C-HOTEL1 Structures

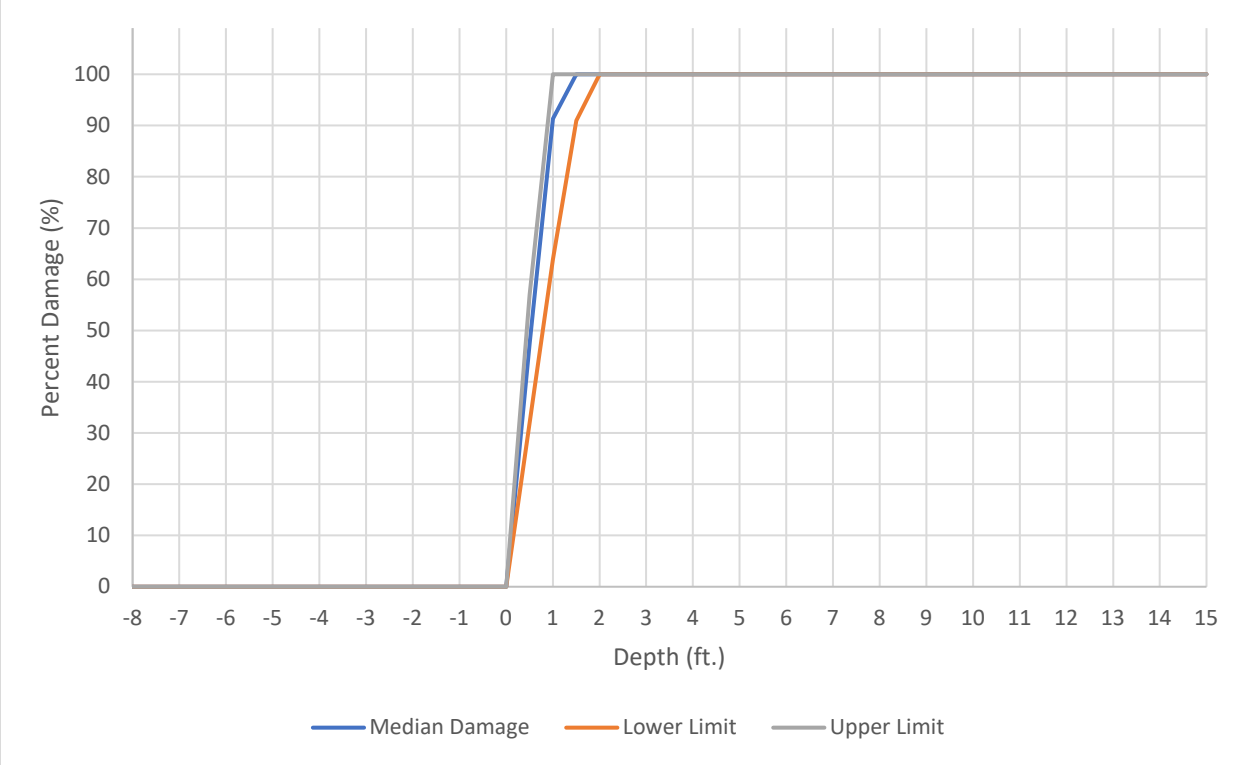


Figure G-8: Depth-Percent Damage Curve for C-HOTEL1 Content

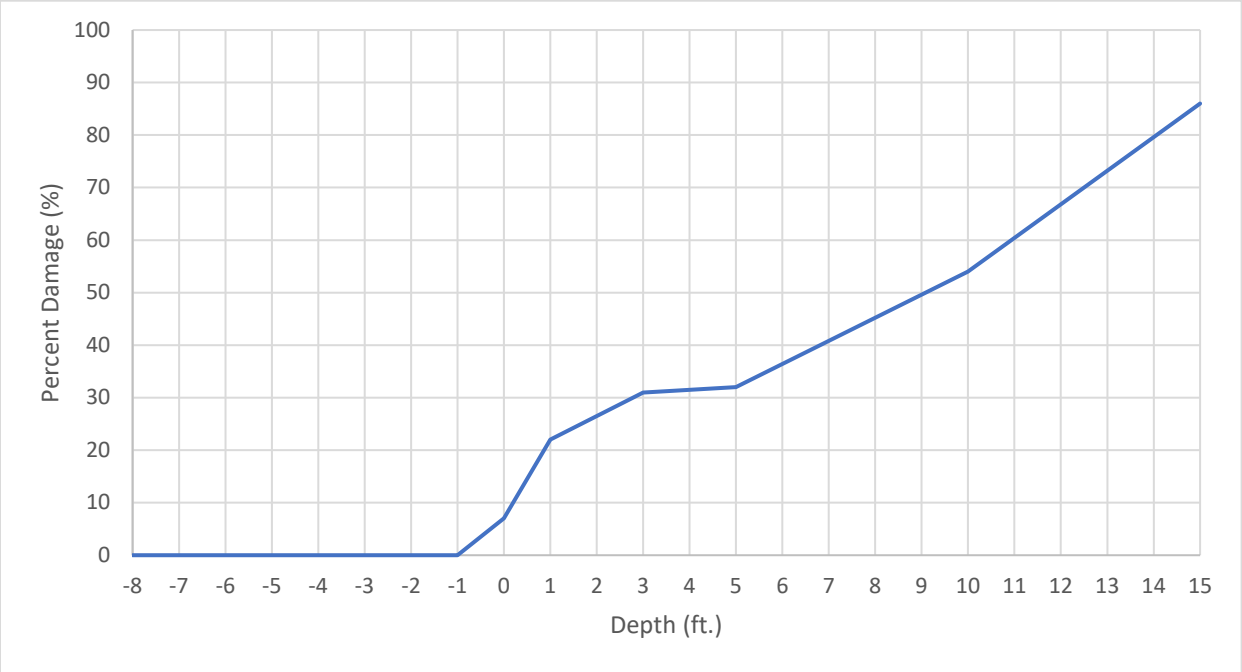


Figure G-9: Depth-Percent Damage Curve for C-MED1 Structures

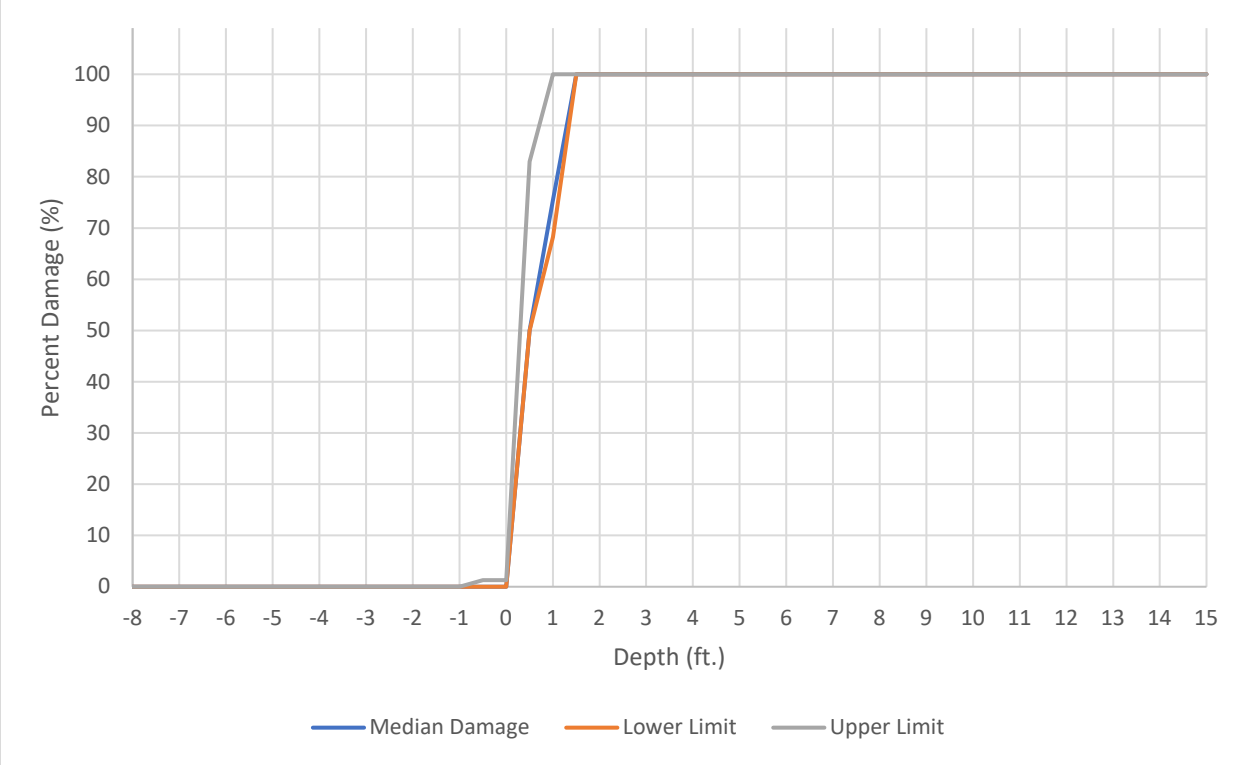


Figure G-10: Depth-Percent Damage Curve for C-MED1 Content

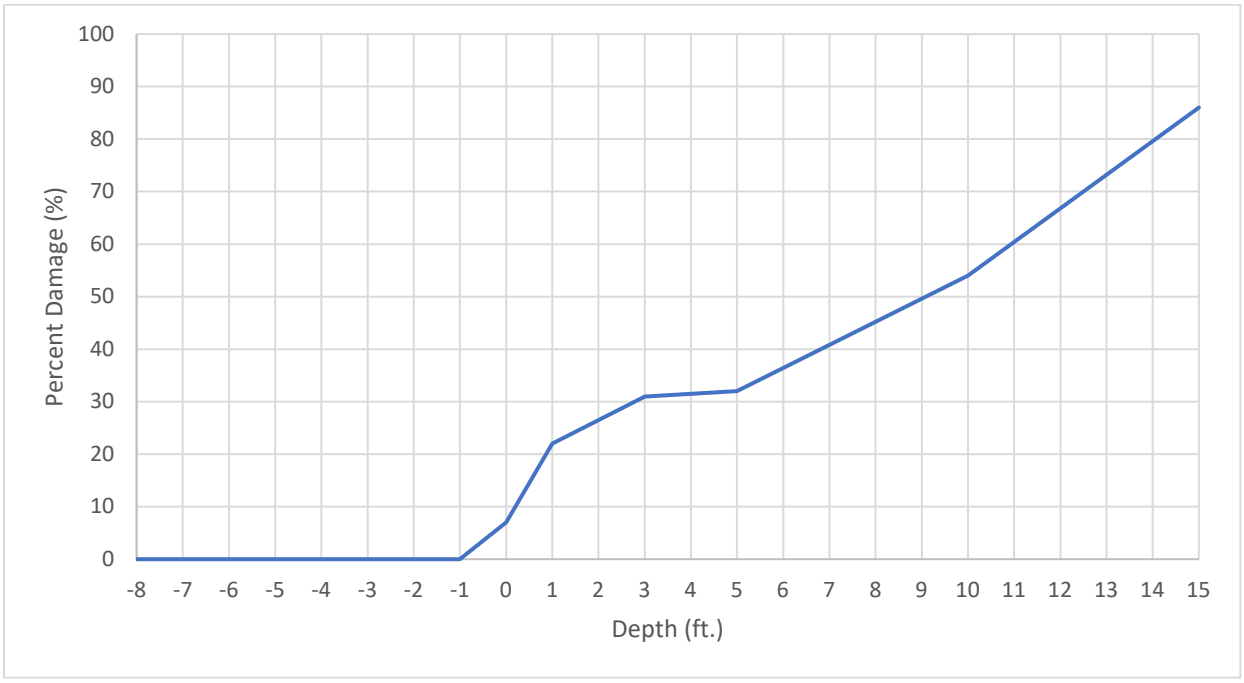


Figure G-11: Depth-Percent Damage Curve for C-OFF1 Structures

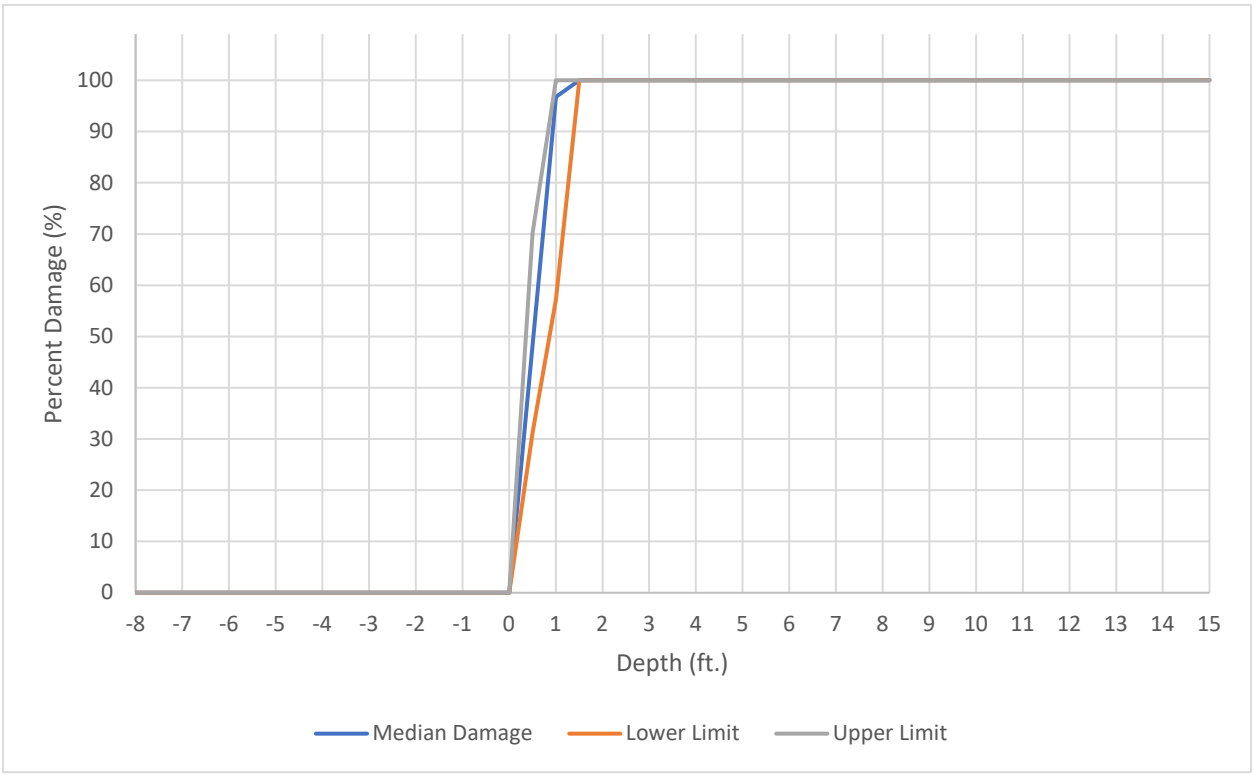


Figure G-12: Depth-Percent Damage Curve for C-OFF1 Content

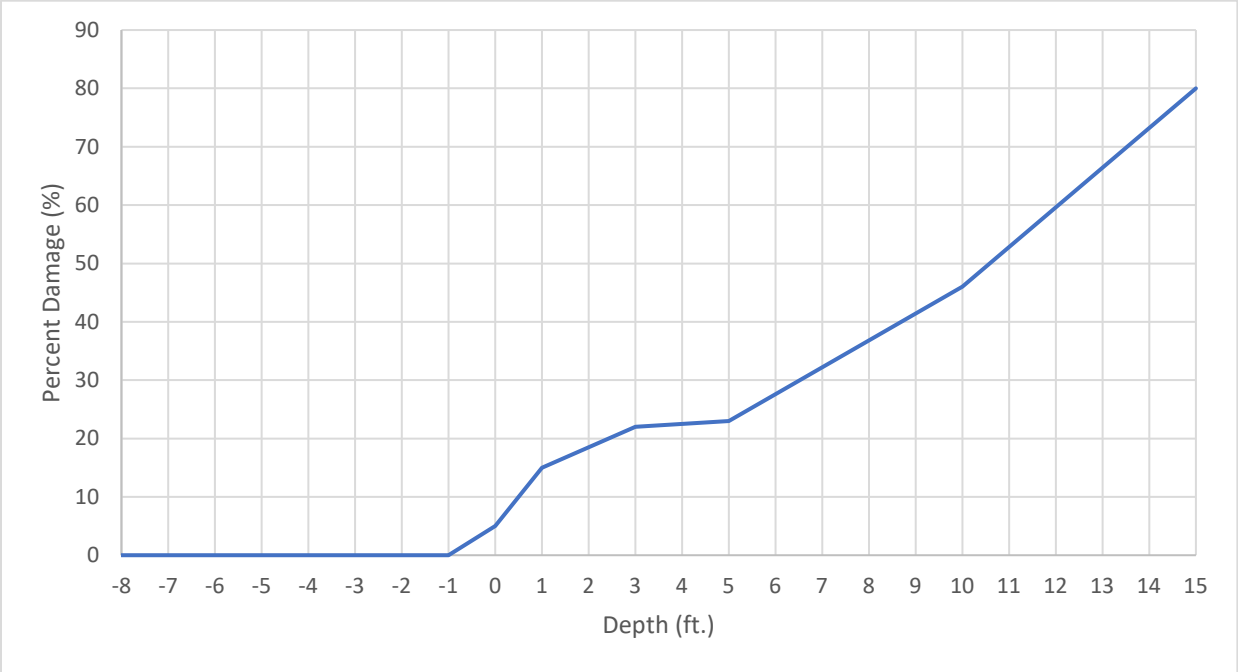


Figure G-13: Depth-Percent Damage Curve for C-OFF2 Structures

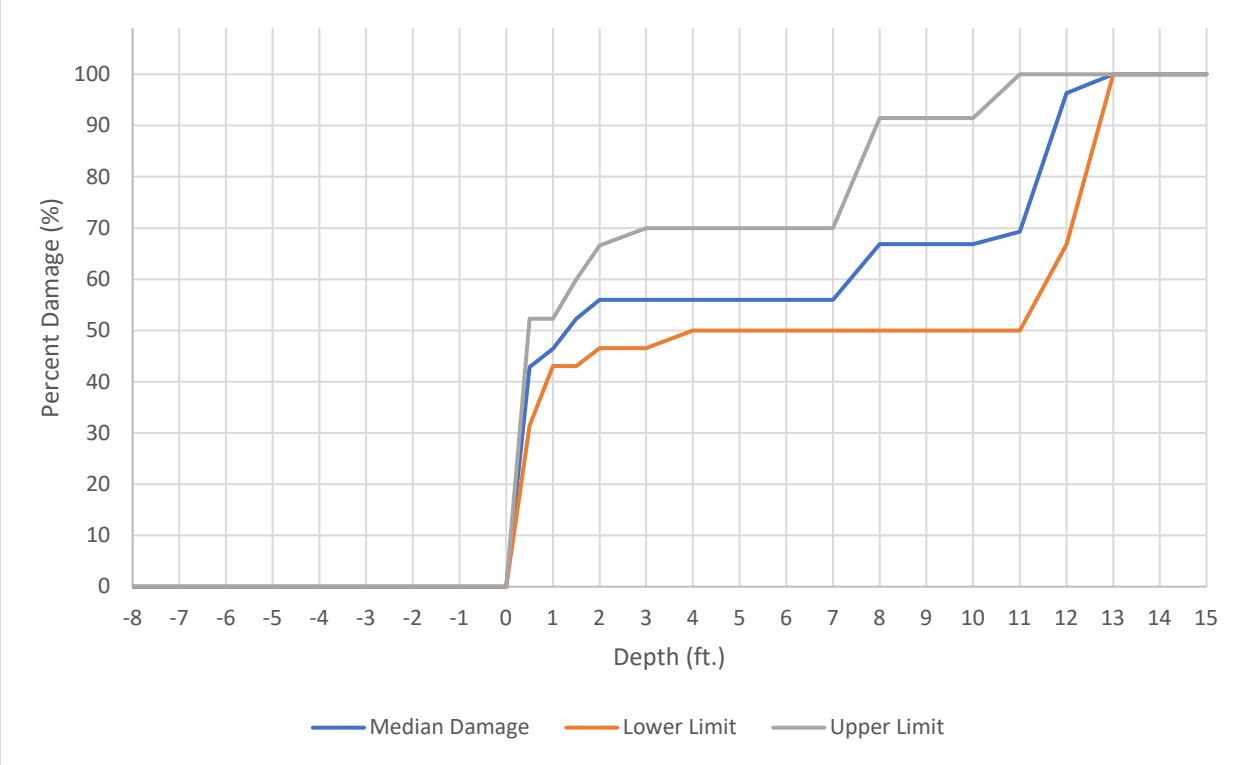


Figure G-14: Depth-Percent Damage Curve for C-OFF2 Content

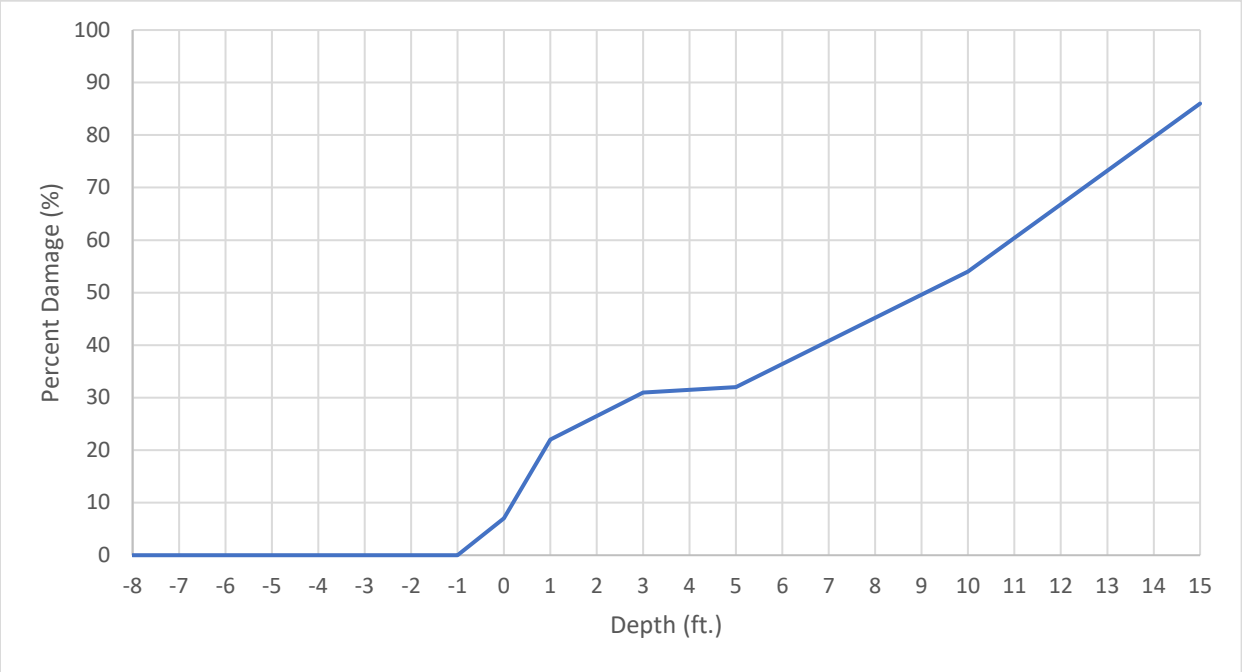


Figure G-15: Depth-Percent Damage Curve for C-REST1 Structures

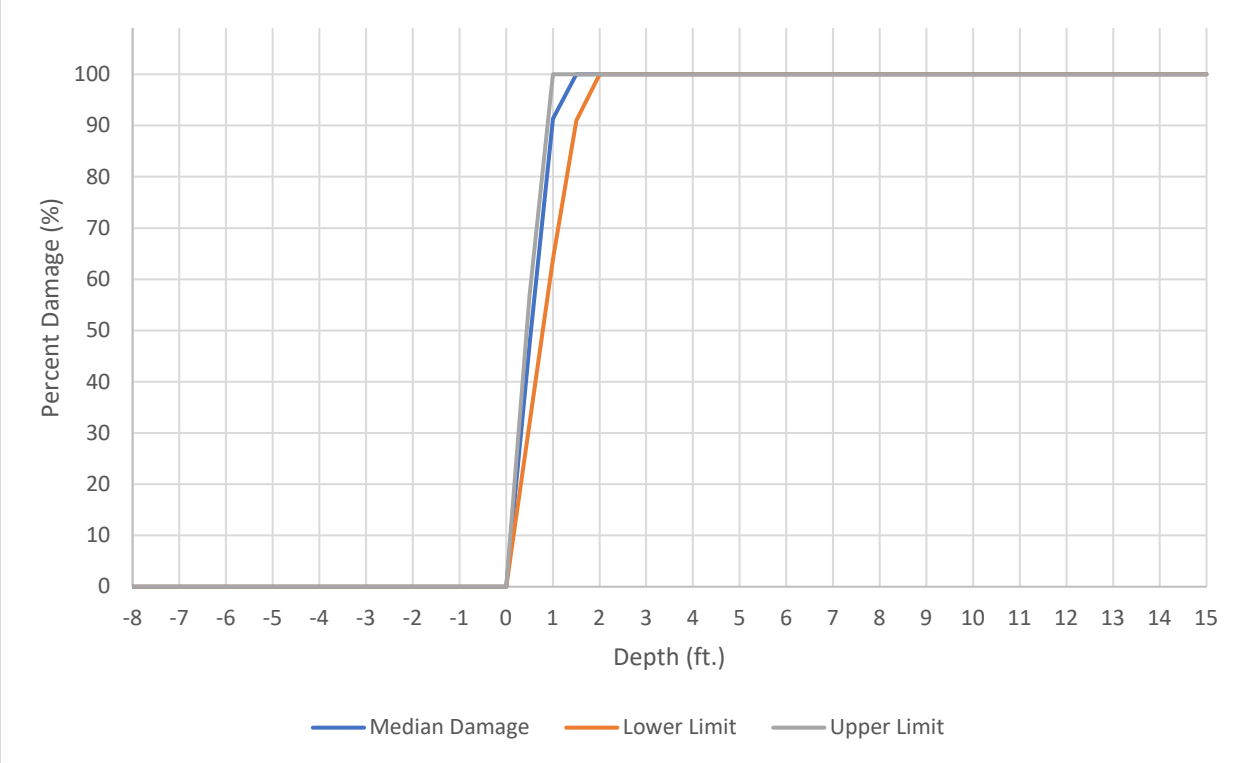


Figure G-16: Depth-Percent Damage Curve for C- REST1 Content

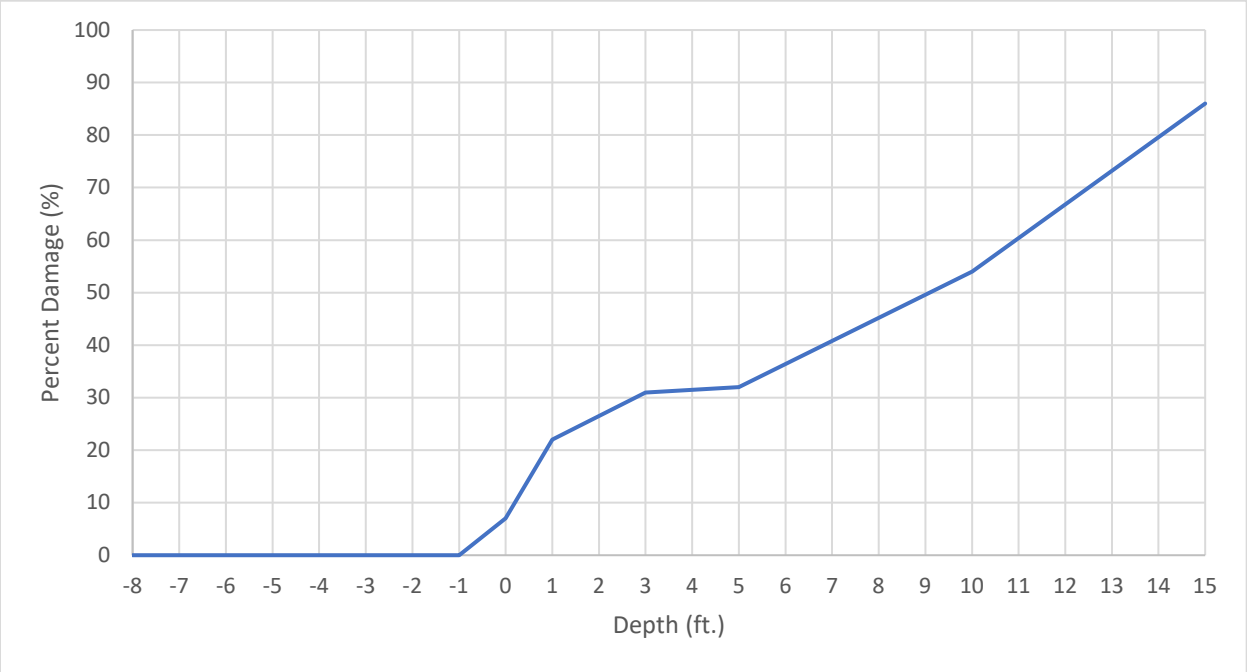


Figure G-17: Depth-Percent Damage Curve for C- RESTFF1 Structures

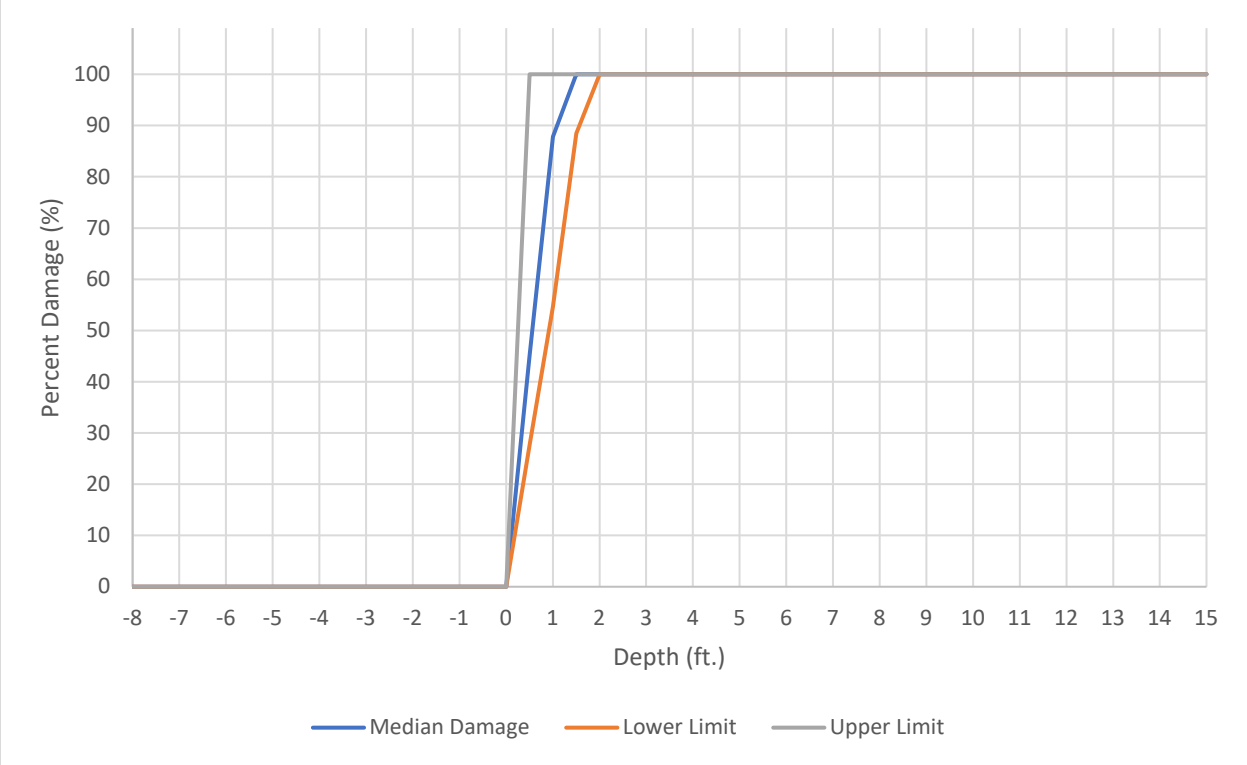


Figure G-18: Depth-Percent Damage Curve for C- RESTFF1 Content

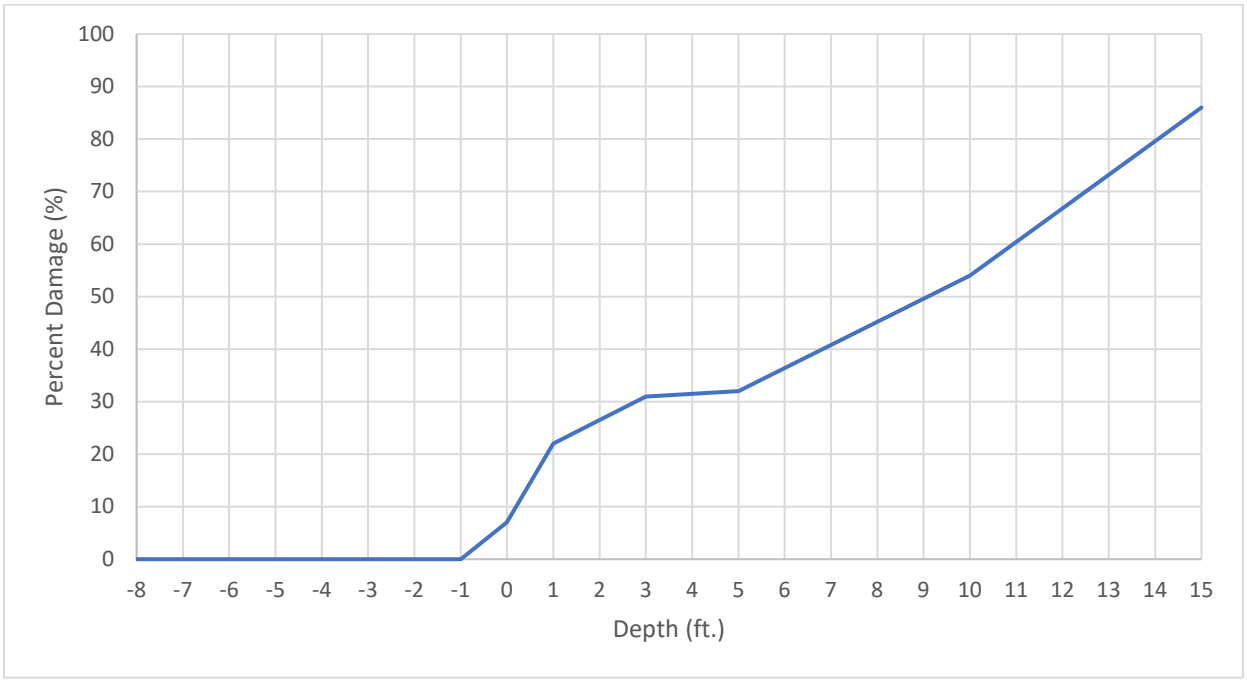


Figure G-19: Depth-Percent Damage Curve for C-RET1 Structures

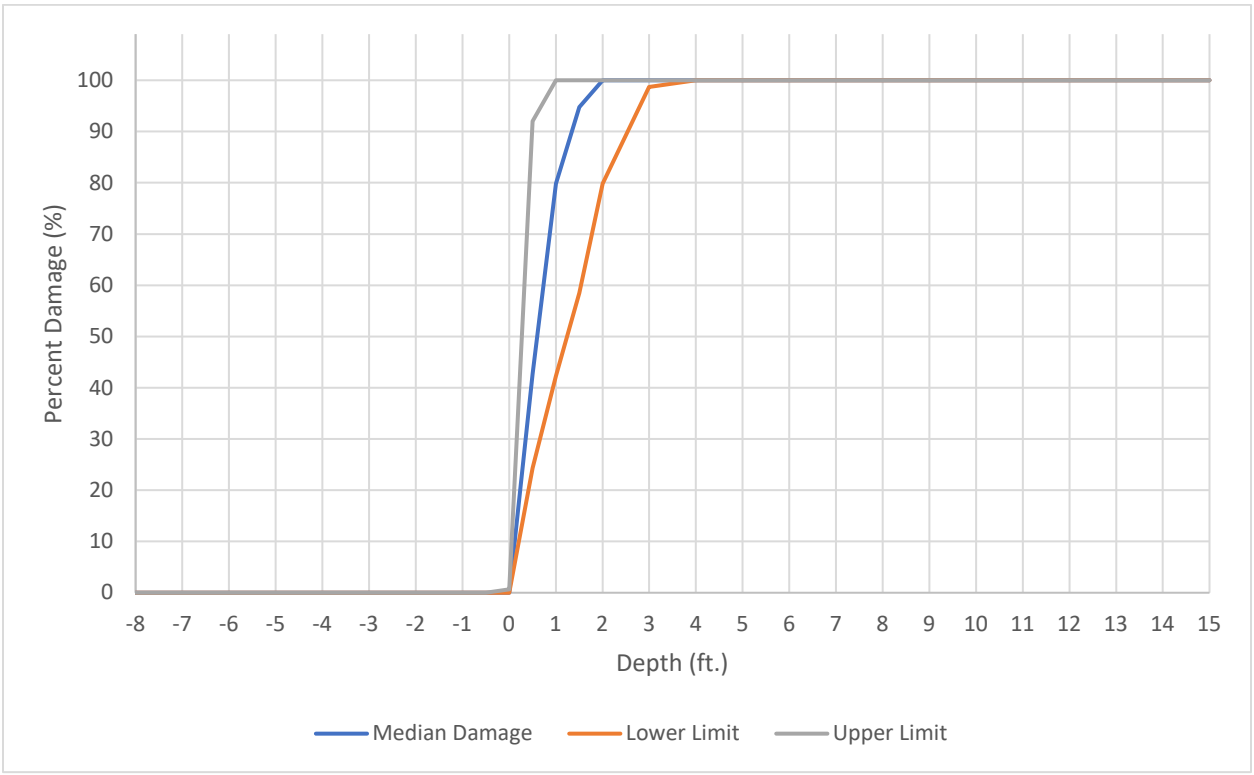


Figure G-20: Depth-Percent Damage Curve for C-RET1 Content

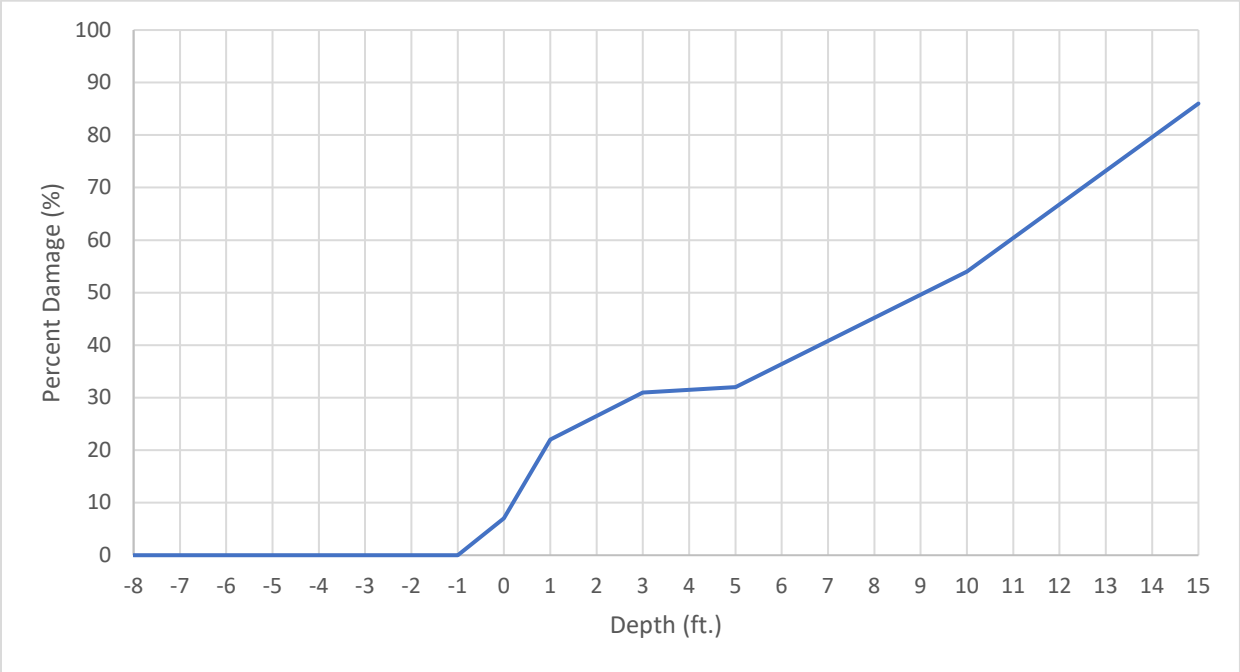


Figure G-21: Depth-Percent Damage Curve for C-SERV1 Structures

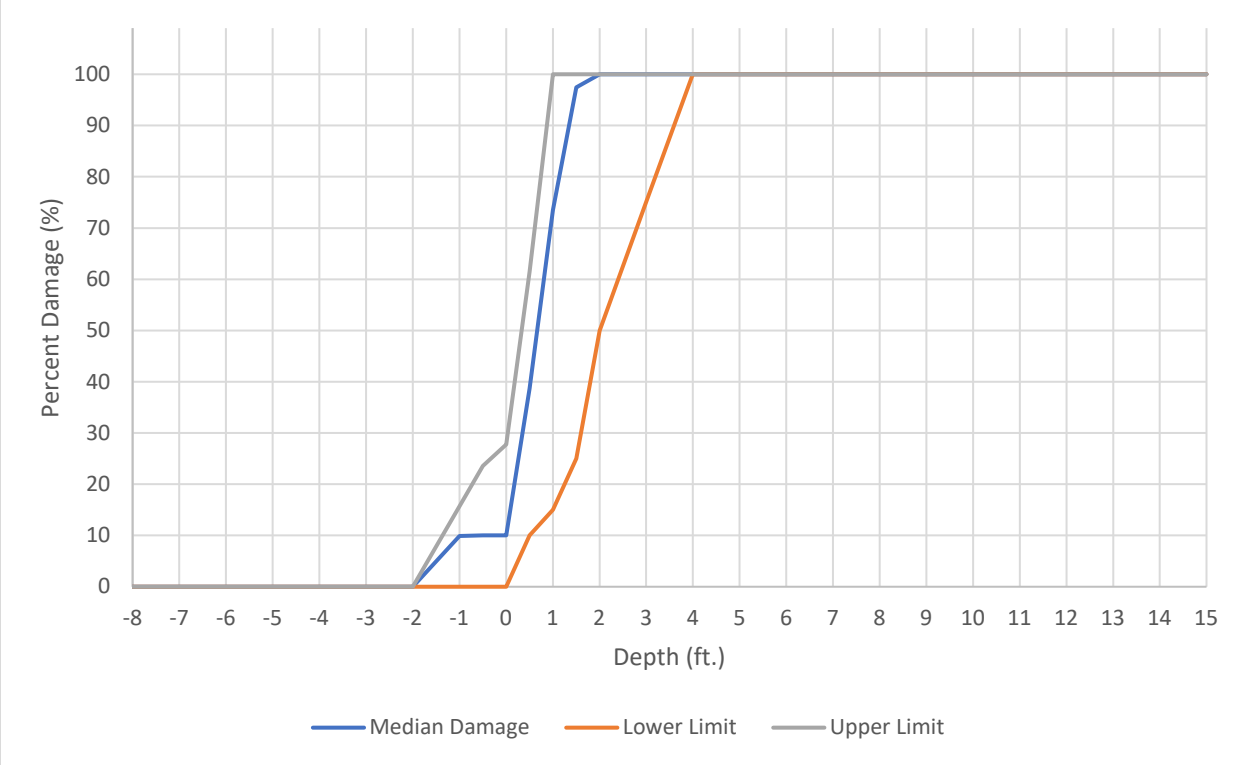


Figure G-22: Depth-Percent Damage Curve for C-SERV1 Content

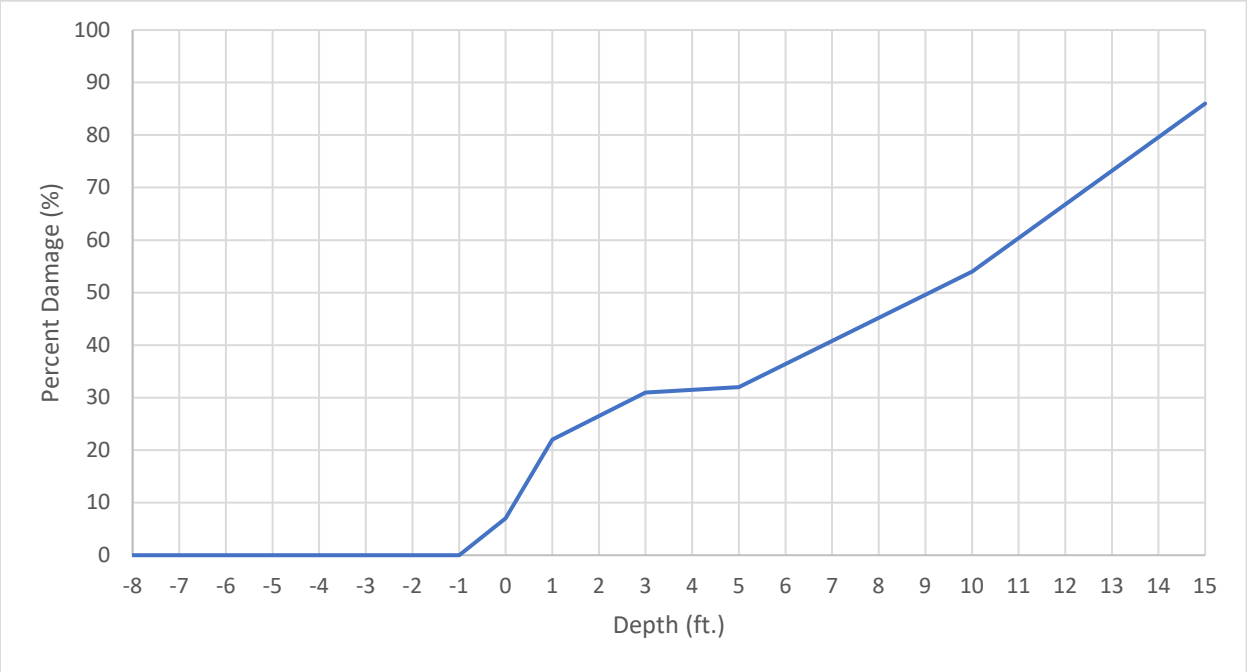


Figure G-23: Depth-Percent Damage Curve for DAYCARE1 Structures

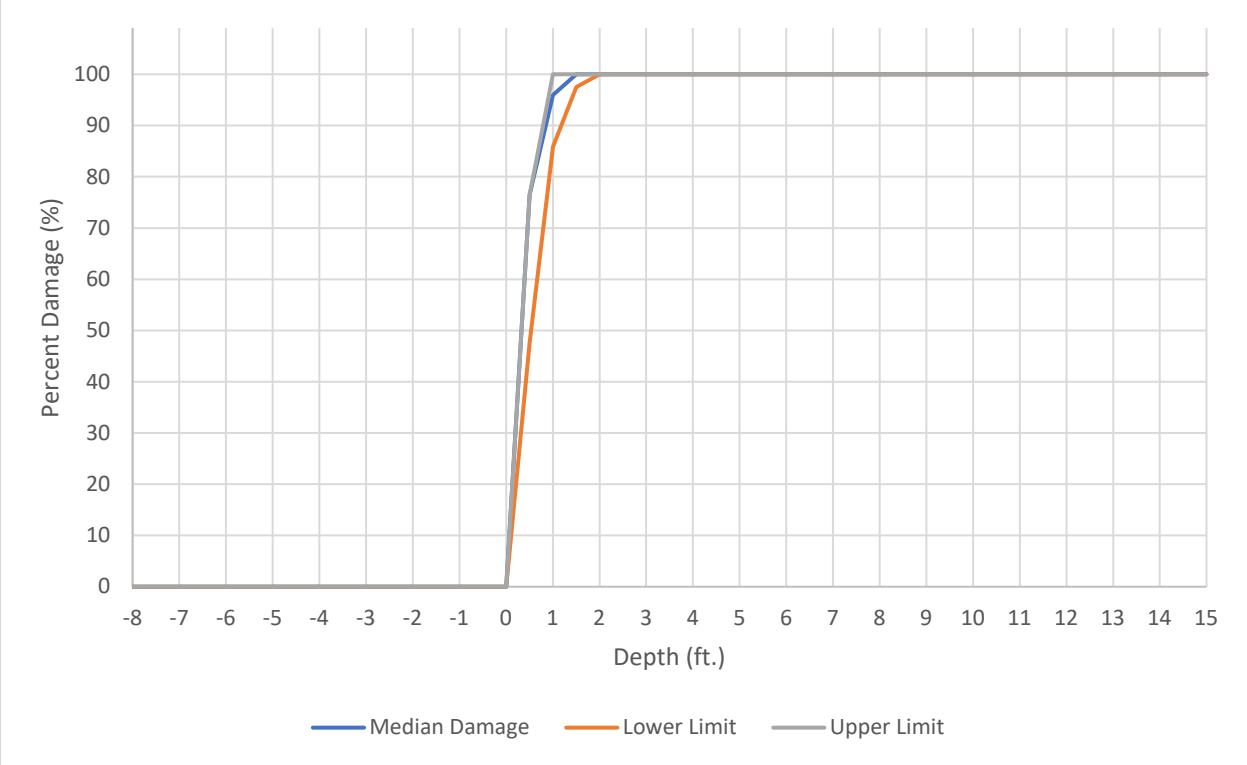


Figure G-24: Depth-Percent Damage Curve for DAYCARE1 Content

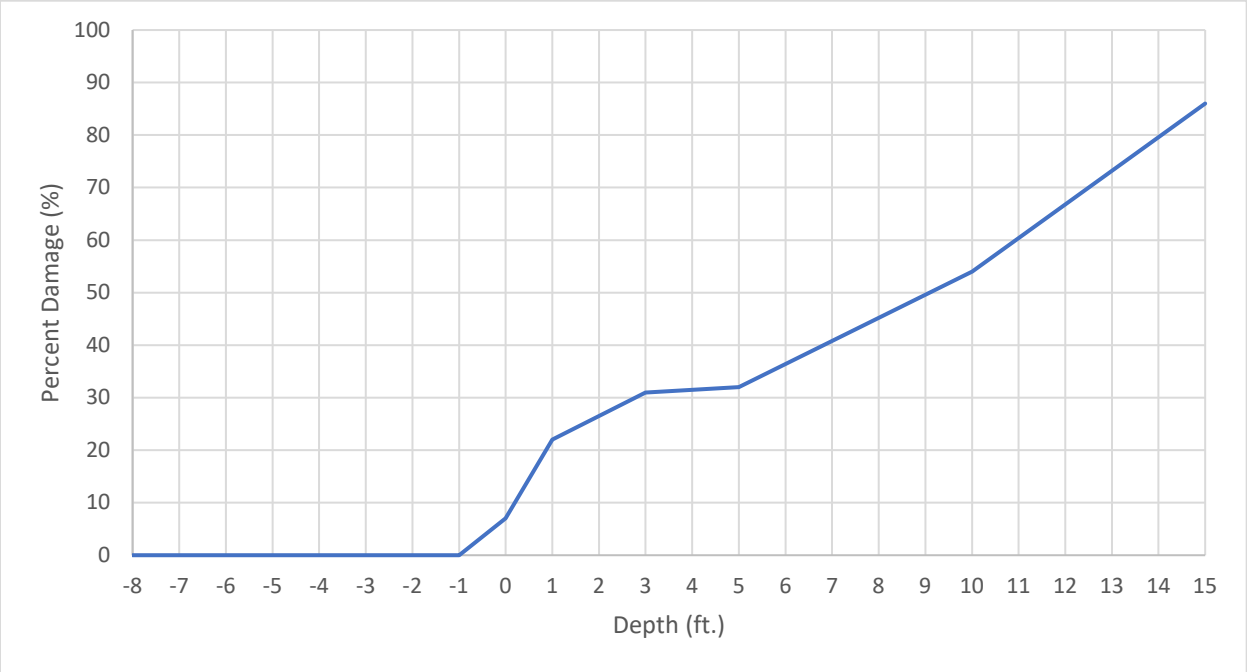


Figure G-25: Depth-Percent Damage Curve for ELDER1 Structures

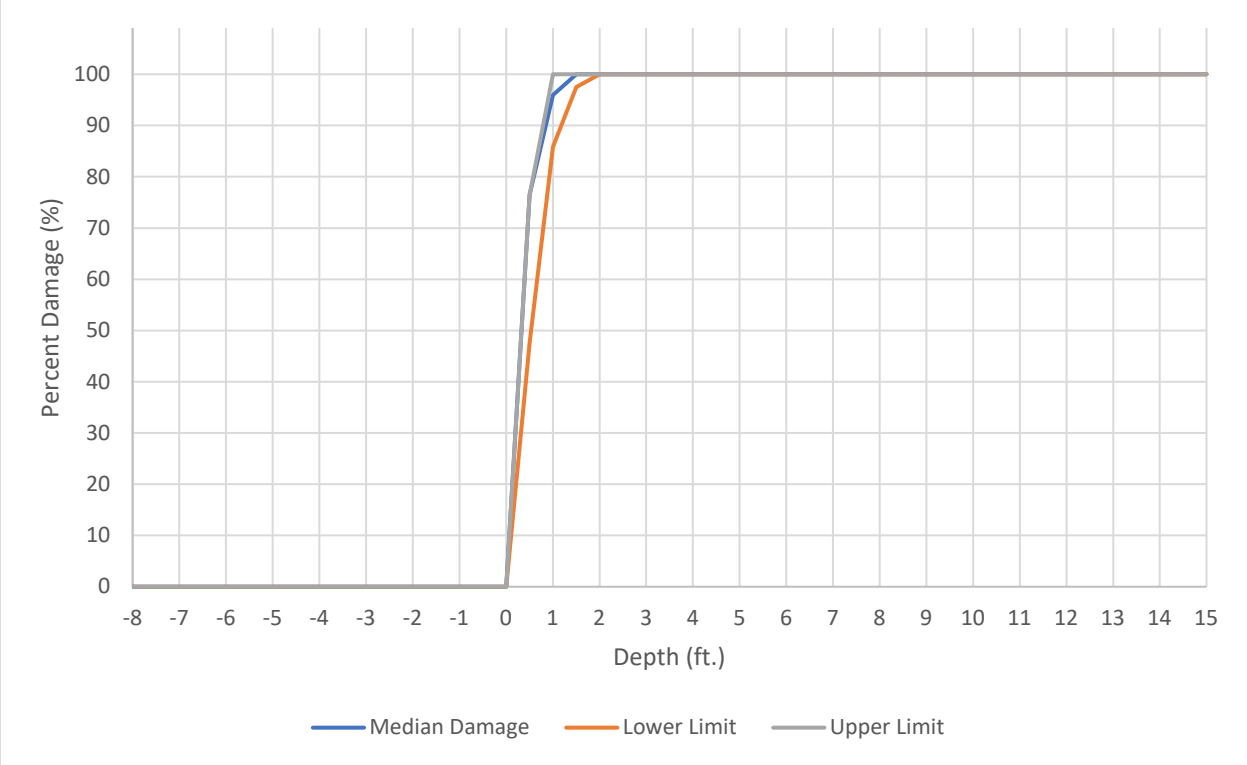


Figure G-26: Depth-Percent Damage Curve for ELDER1 Content

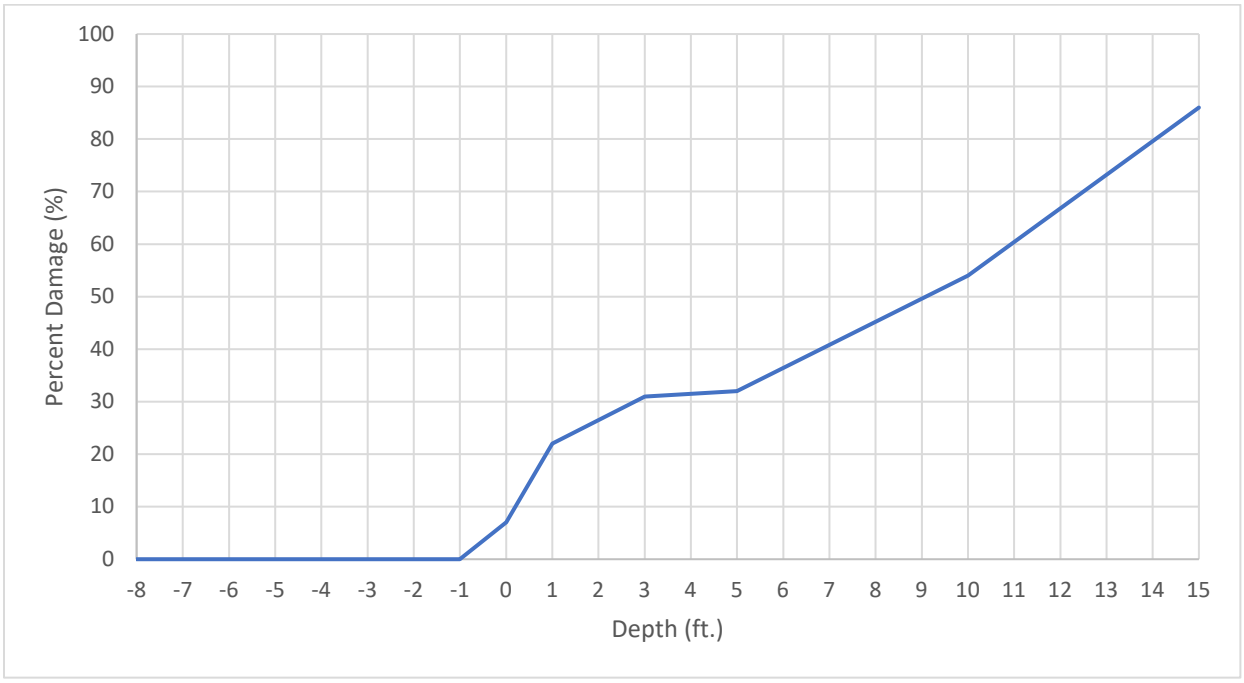


Figure G-27: Depth-Percent Damage Curve for FIRE1 Structures

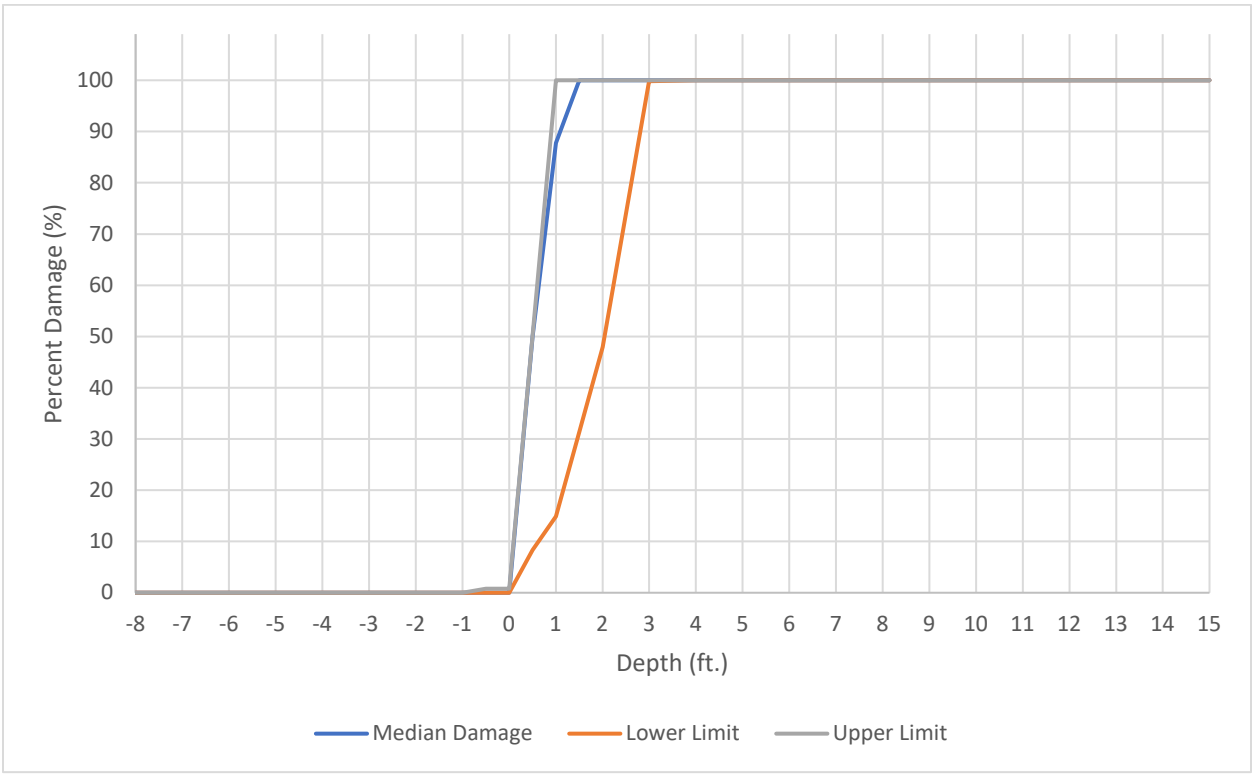


Figure G-28: Depth-Percent Damage Curve for FIRE1 Content

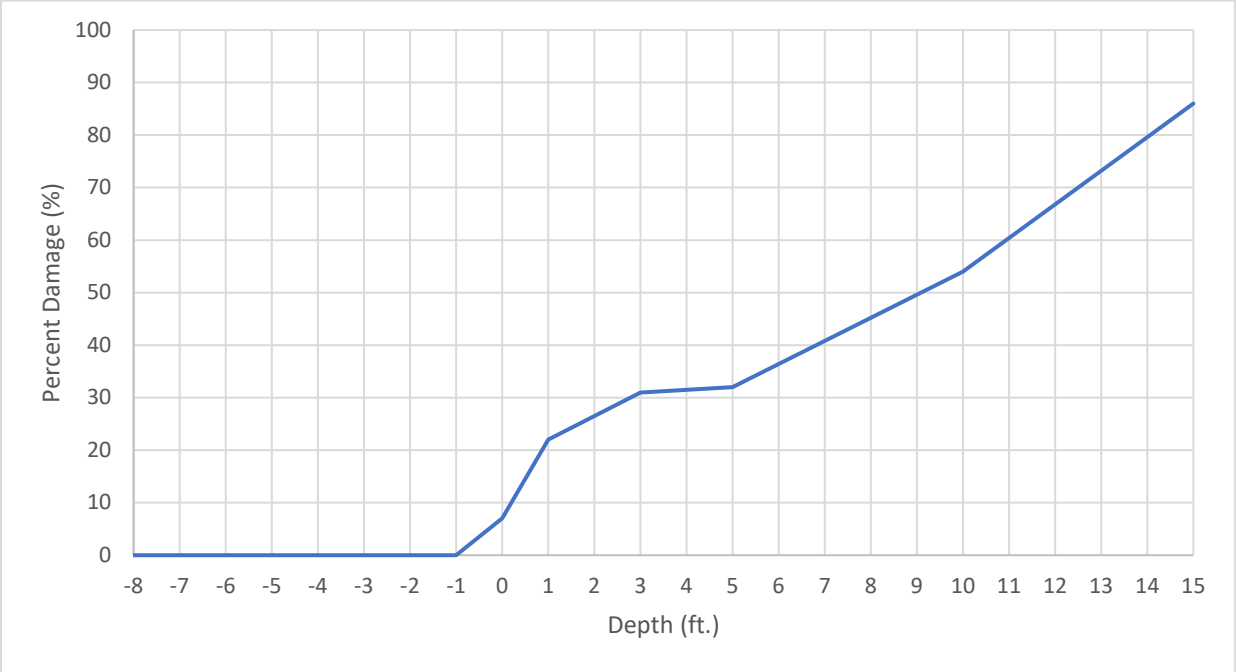


Figure G-29: Depth-Percent Damage Curve for I-HV1 Structures

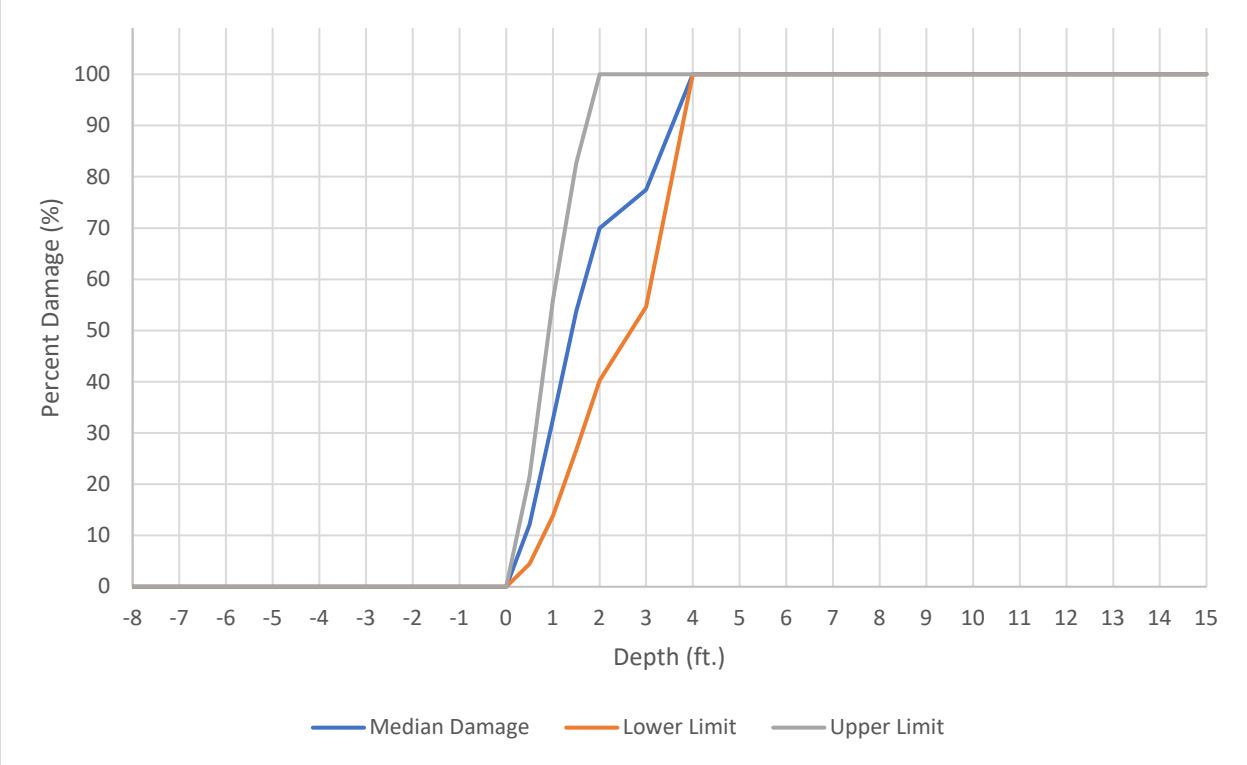


Figure G-30: Depth-Percent Damage Curve for I-HV1 Content

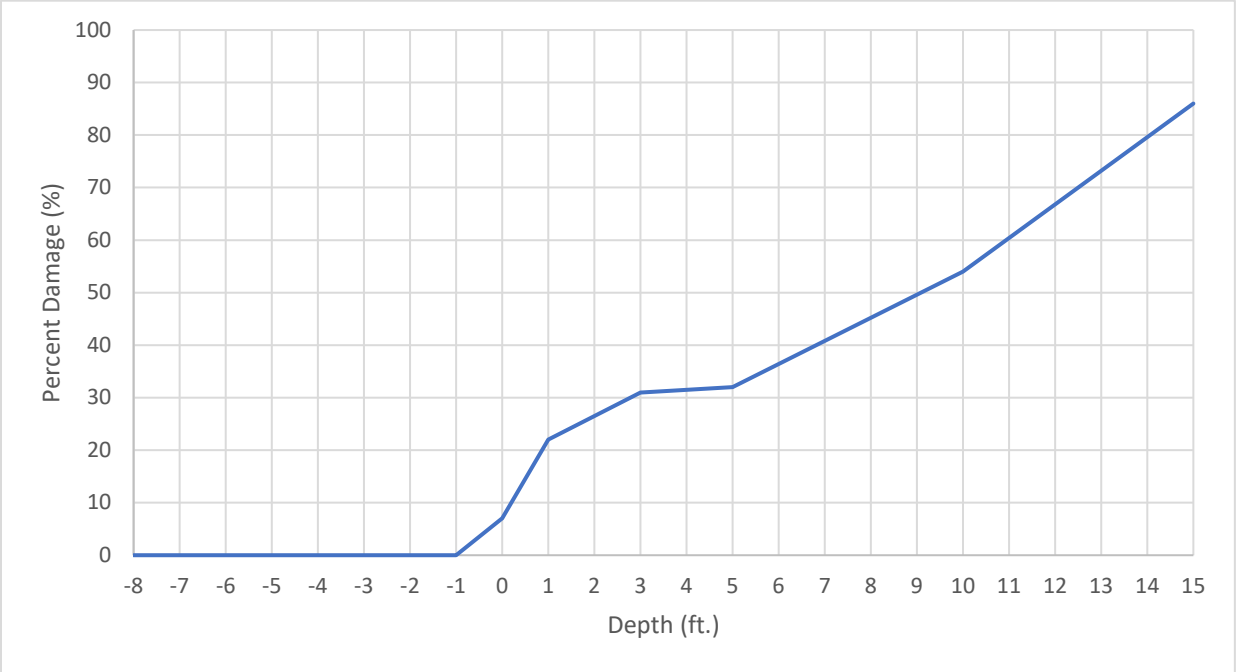


Figure G-31: Depth-Percent Damage Curve for I-LT1 Structures

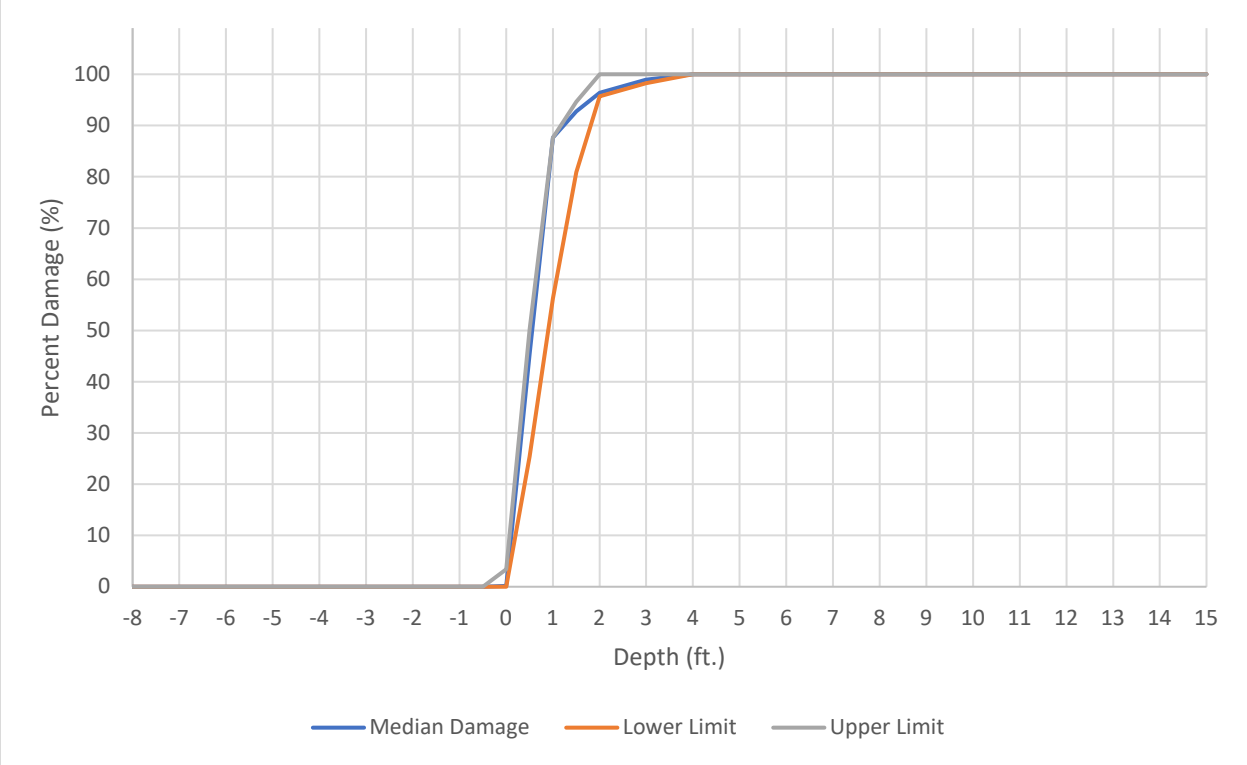


Figure G-32: Depth-Percent Damage Curve for I-LT1 Content

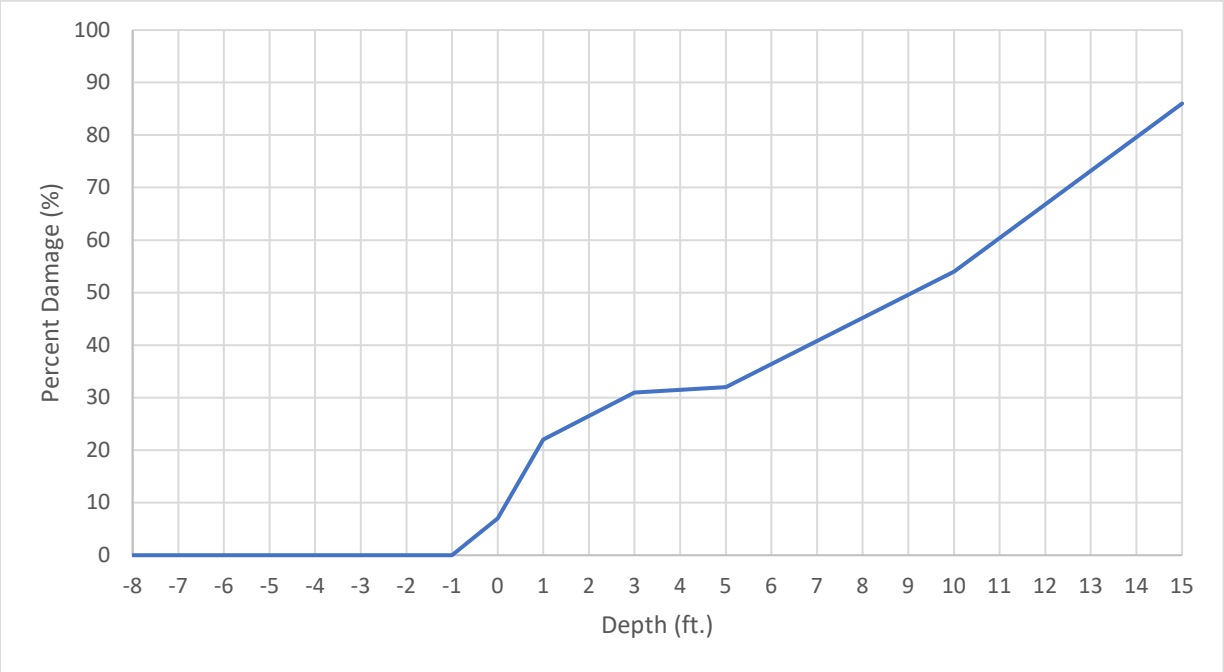


Figure G-33: Depth-Percent Damage Curve for I-WH1 Structures

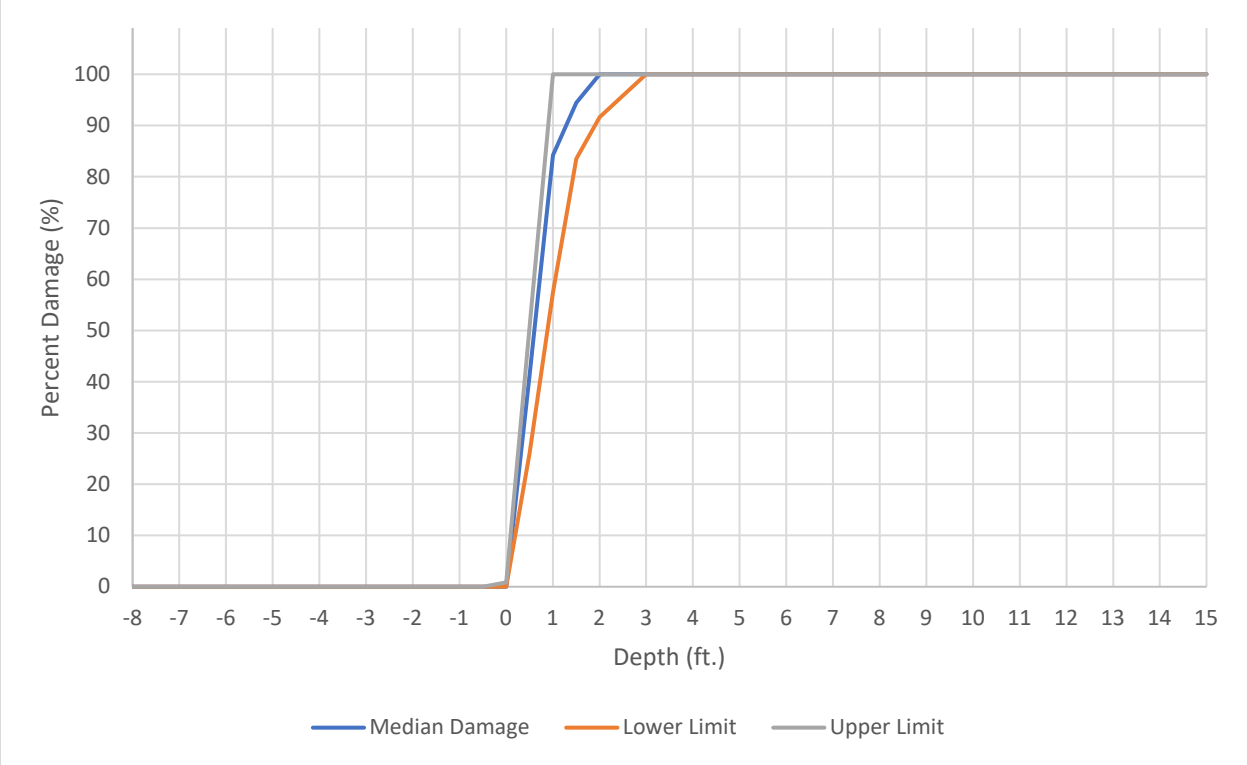


Figure G-34: Depth-Percent Damage Curve for I-WH1 Content

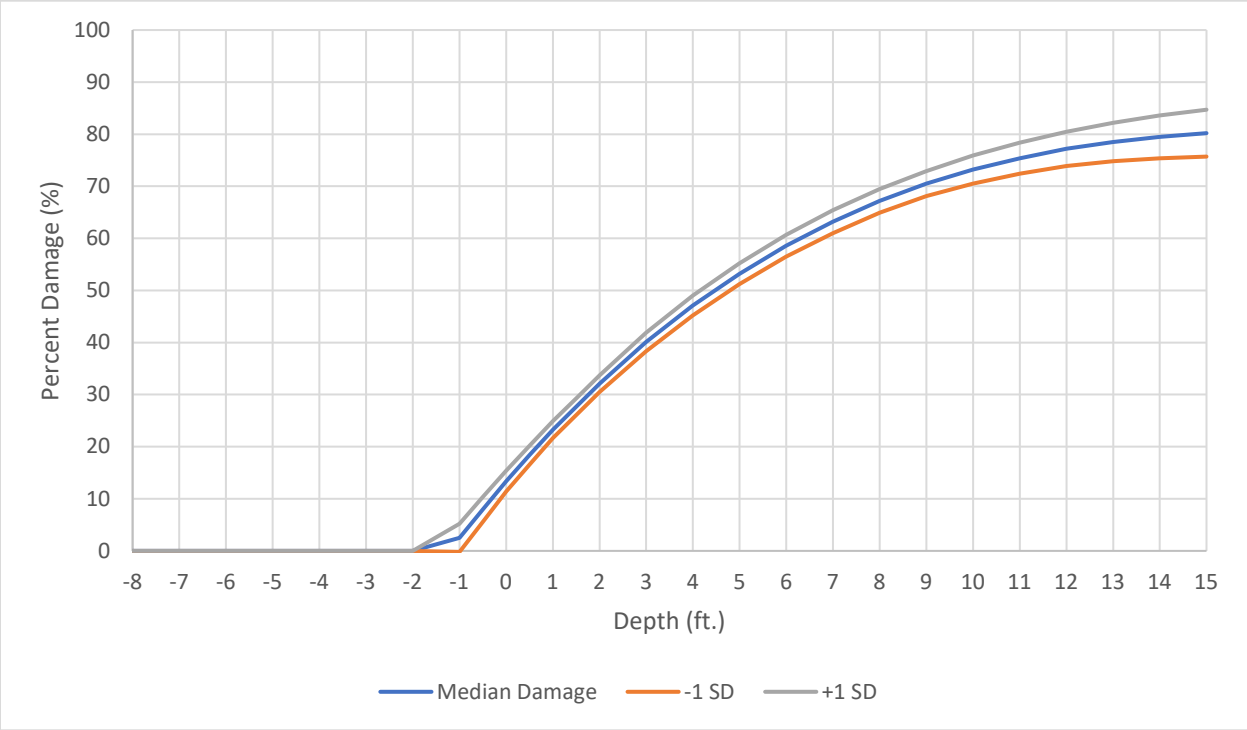


Figure G-35: Depth-Percent Damage Curve for MFR1 Structures

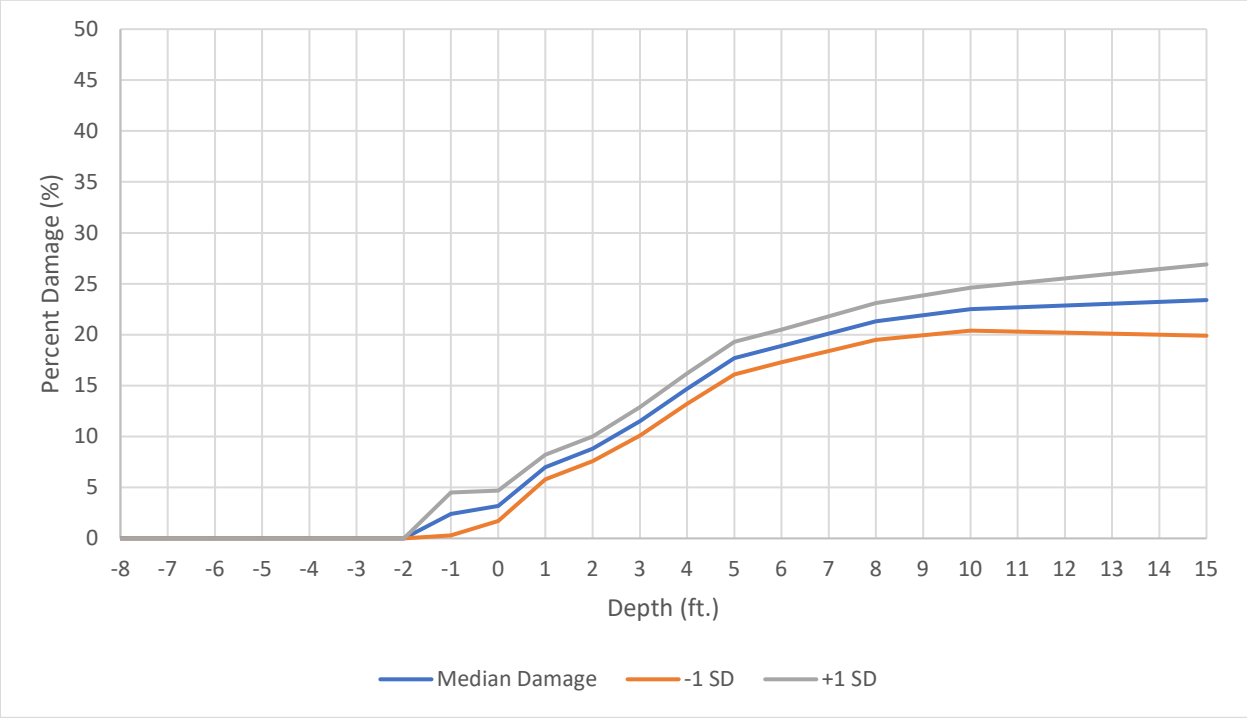


Figure G-36: Depth-Percent Damage Curve for MFR1 Content

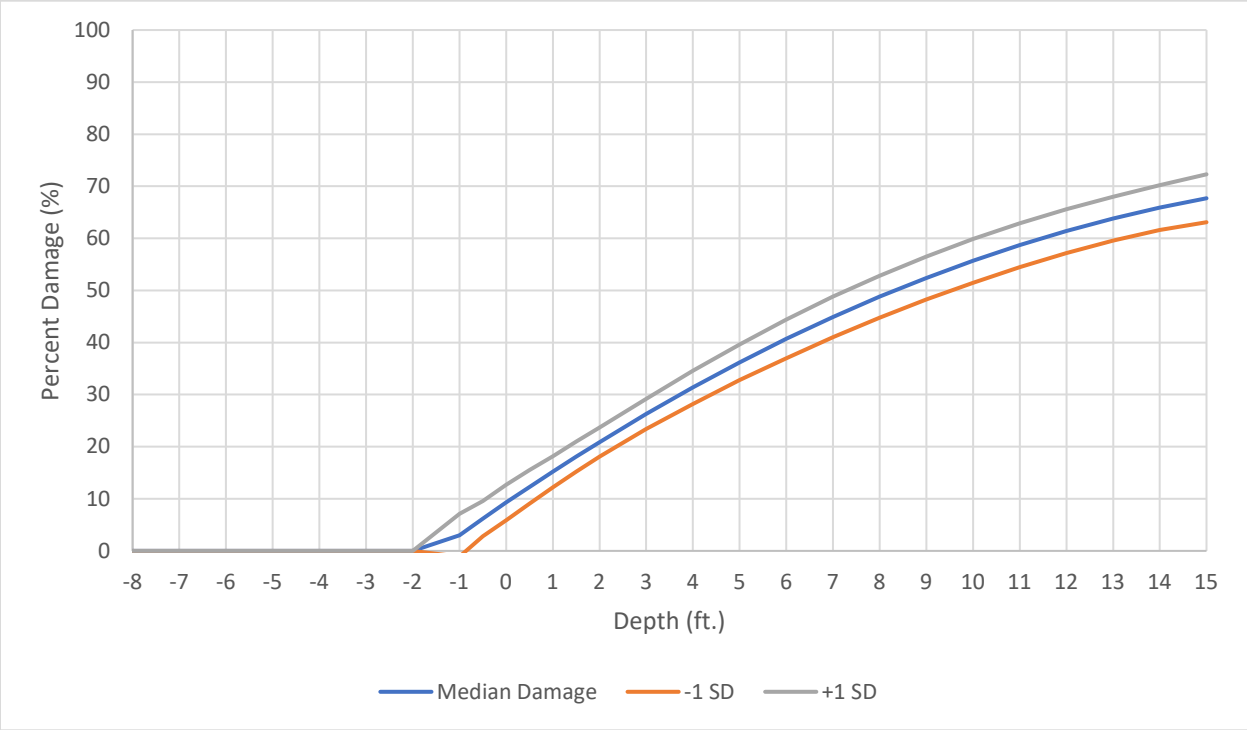


Figure G-37: Depth-Percent Damage Curve for MFR2 Structures

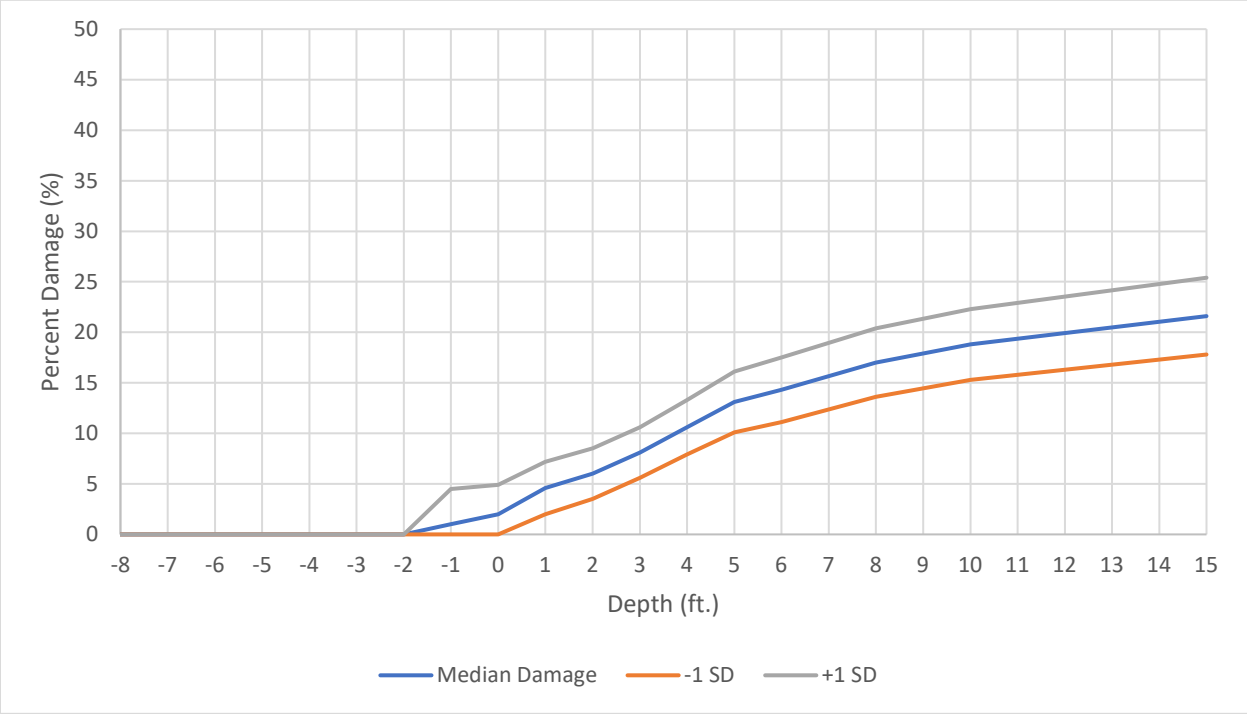


Figure G-38: Depth-Percent Damage Curve for MFR2 Content

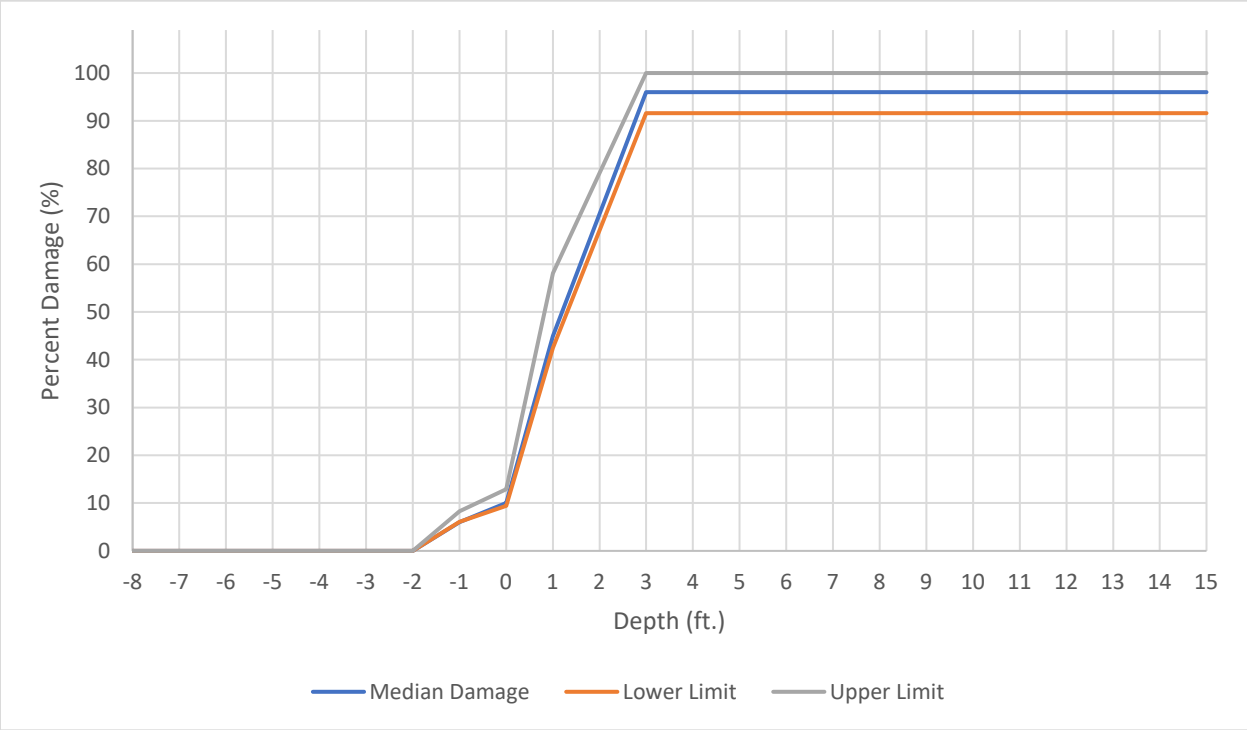


Figure G-39: Depth-Percent Damage Curve for MH Structures

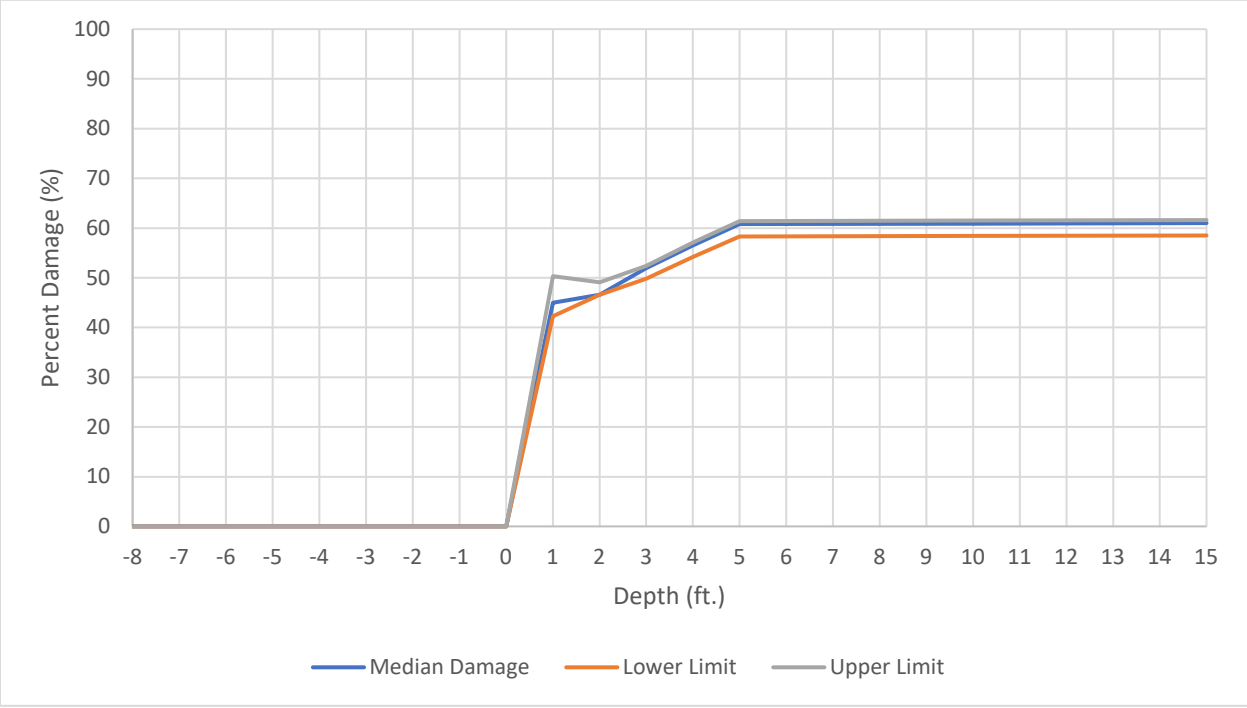


Figure G-40: Depth-Percent Damage Curve for MH Content

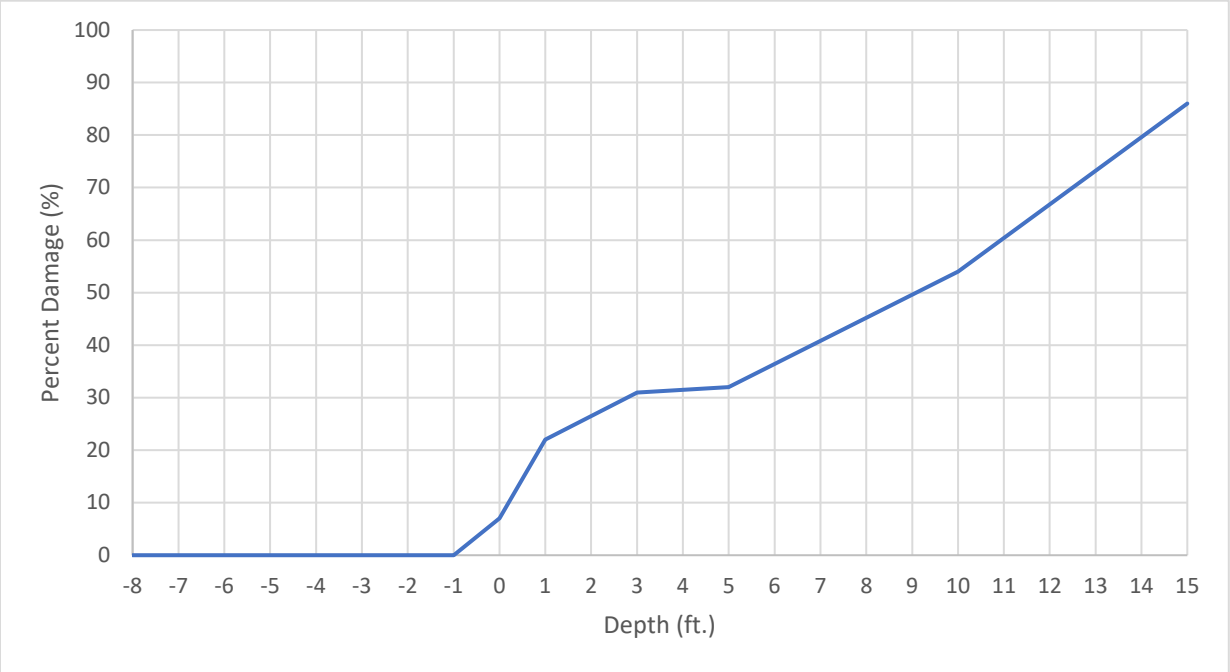


Figure G-41: Depth-Percent Damage Curve for MISC-COM1 Structures

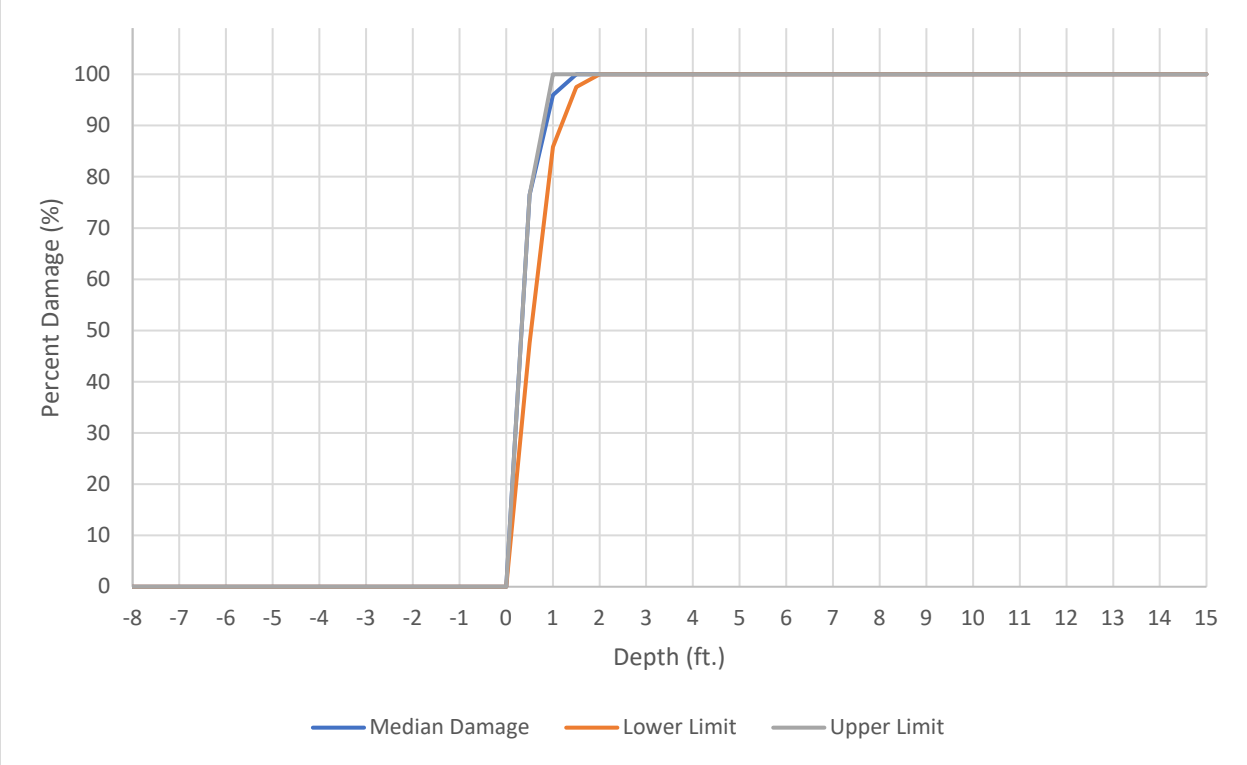


Figure G-42: Depth-Percent Damage Curve for MISC-COM1 Content

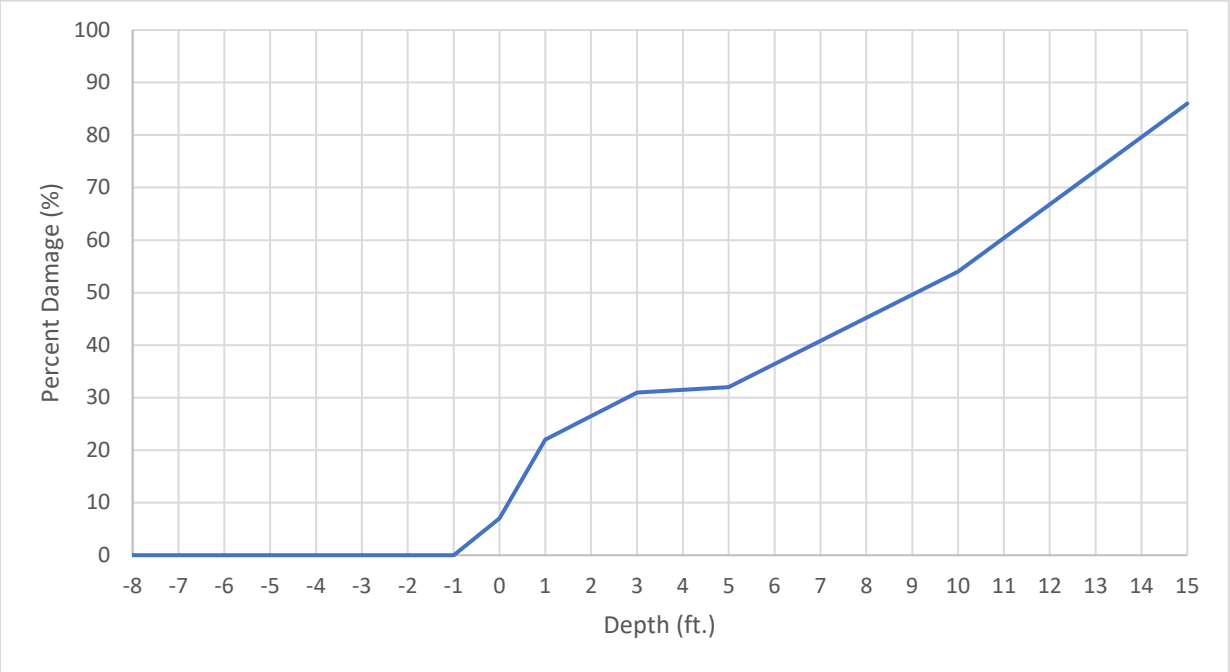


Figure G-43: Depth-Percent Damage Curve for MISC-PUB1 Structures

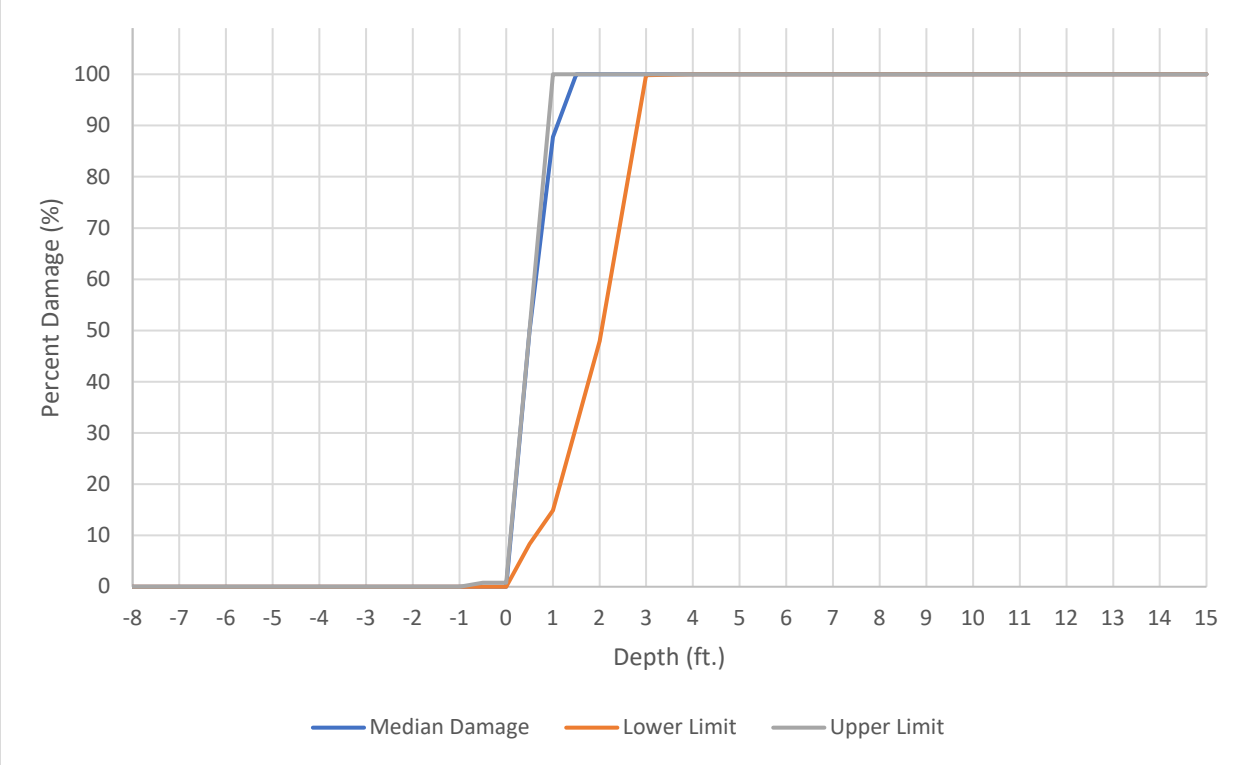


Figure G-44: Depth-Percent Damage Curve for MISC-PUB1 Content

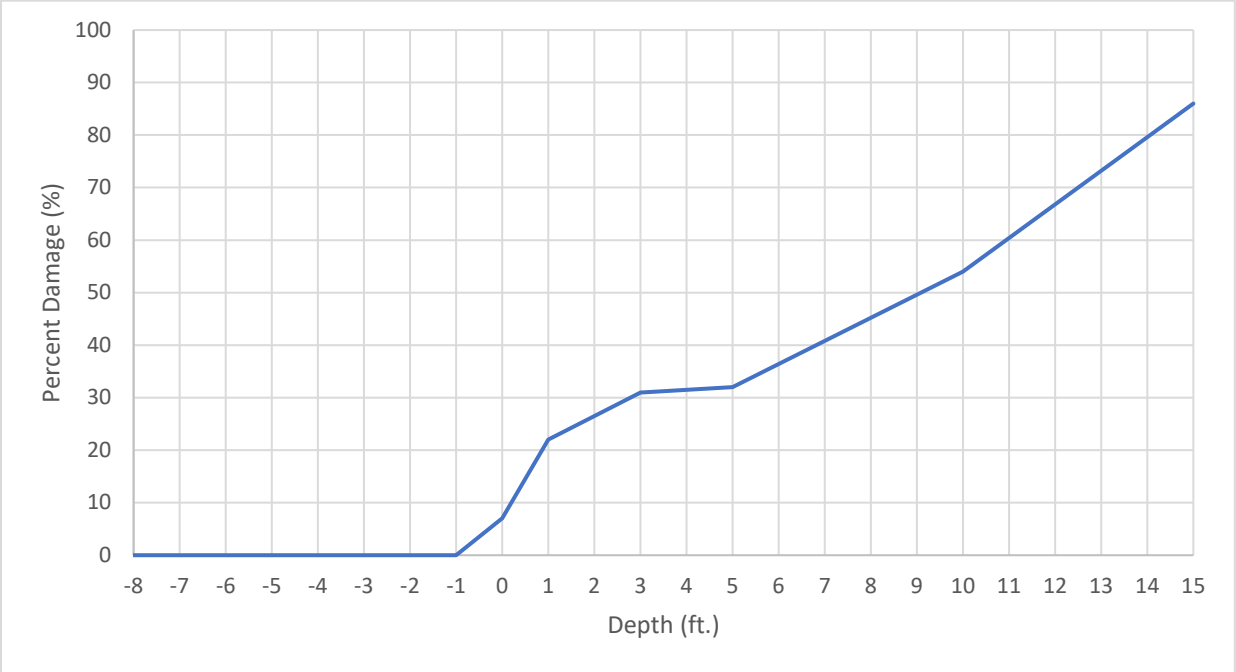


Figure G-45: Depth-Percent Damage Curve for P-GOV1 Structures

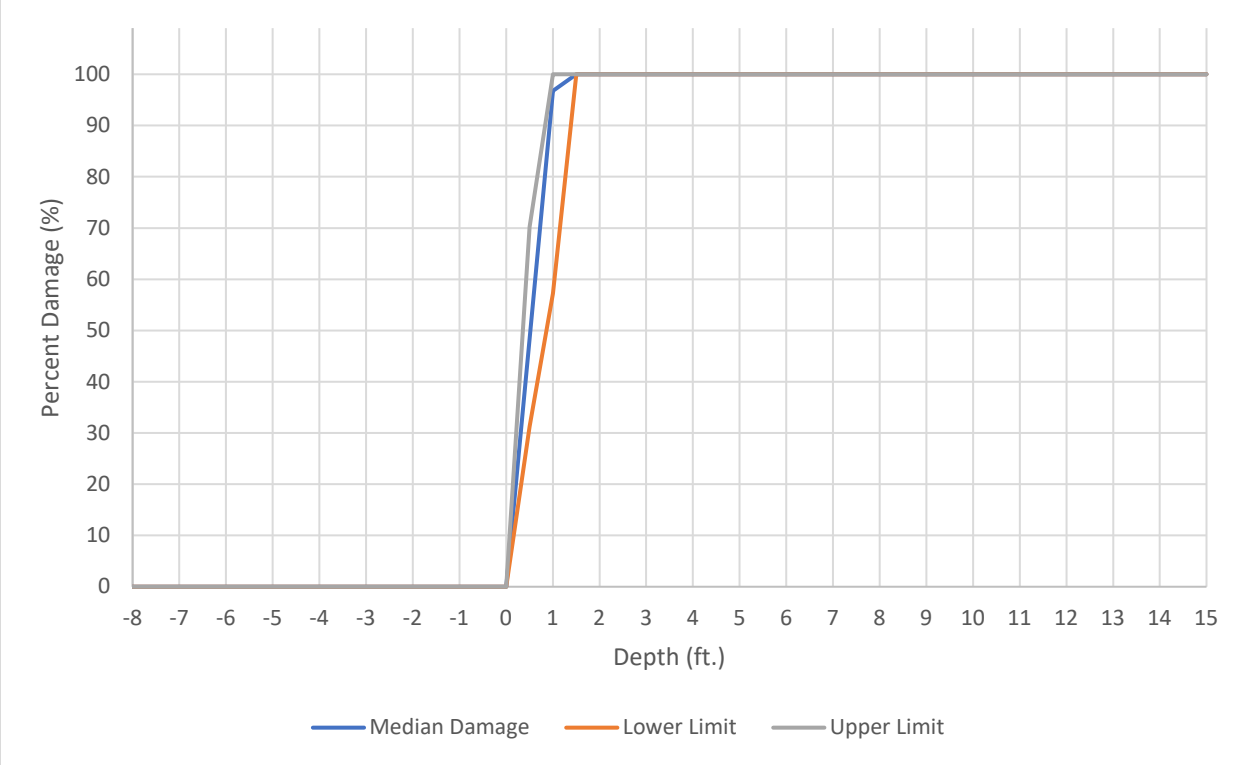


Figure G-46: Depth-Percent Damage Curve for P-GOV1 Content

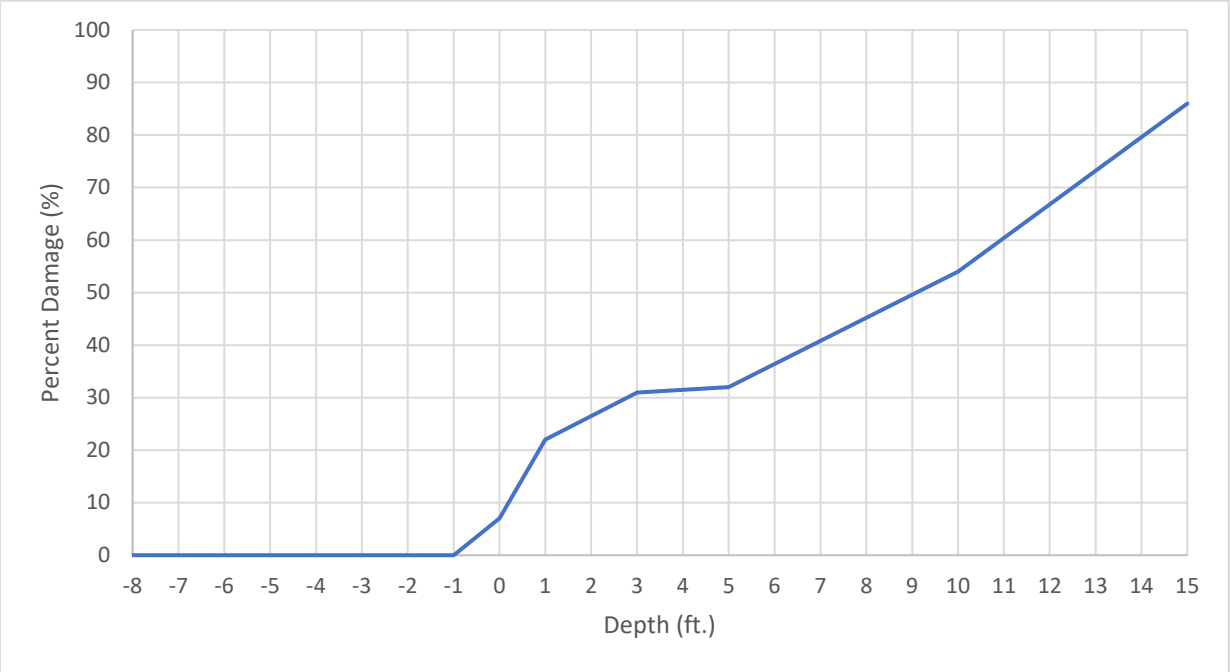


Figure G-47: Depth-Percent Damage Curve for P-REC1 Structures

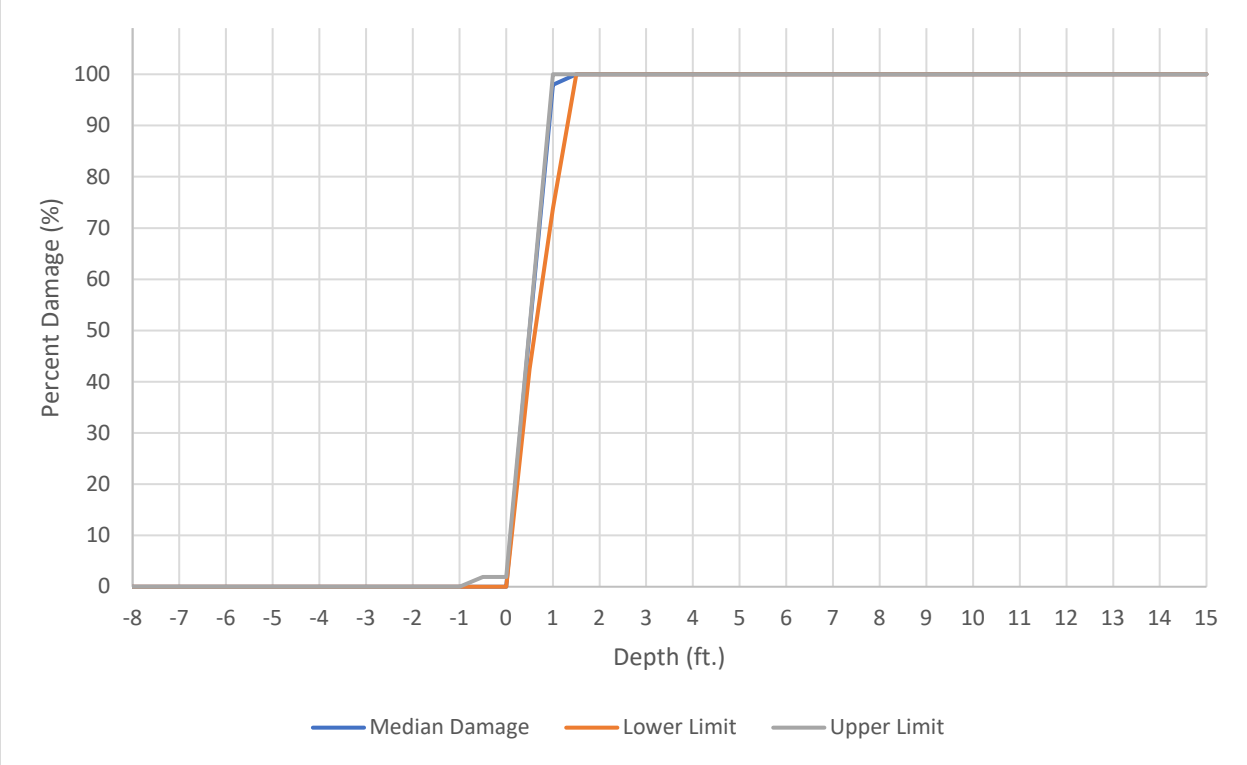


Figure G-48: Depth-Percent Damage Curve for P-REC1 Content

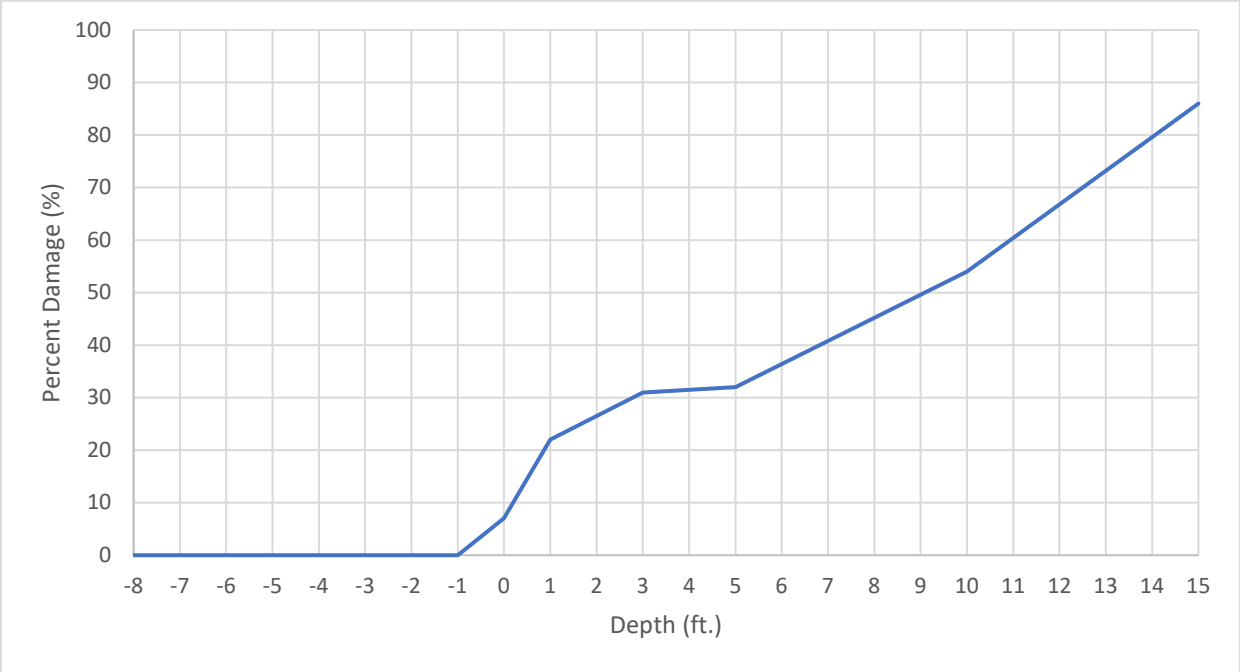


Figure G-49: Depth-Percent Damage Curve for P-SCH1 Structures

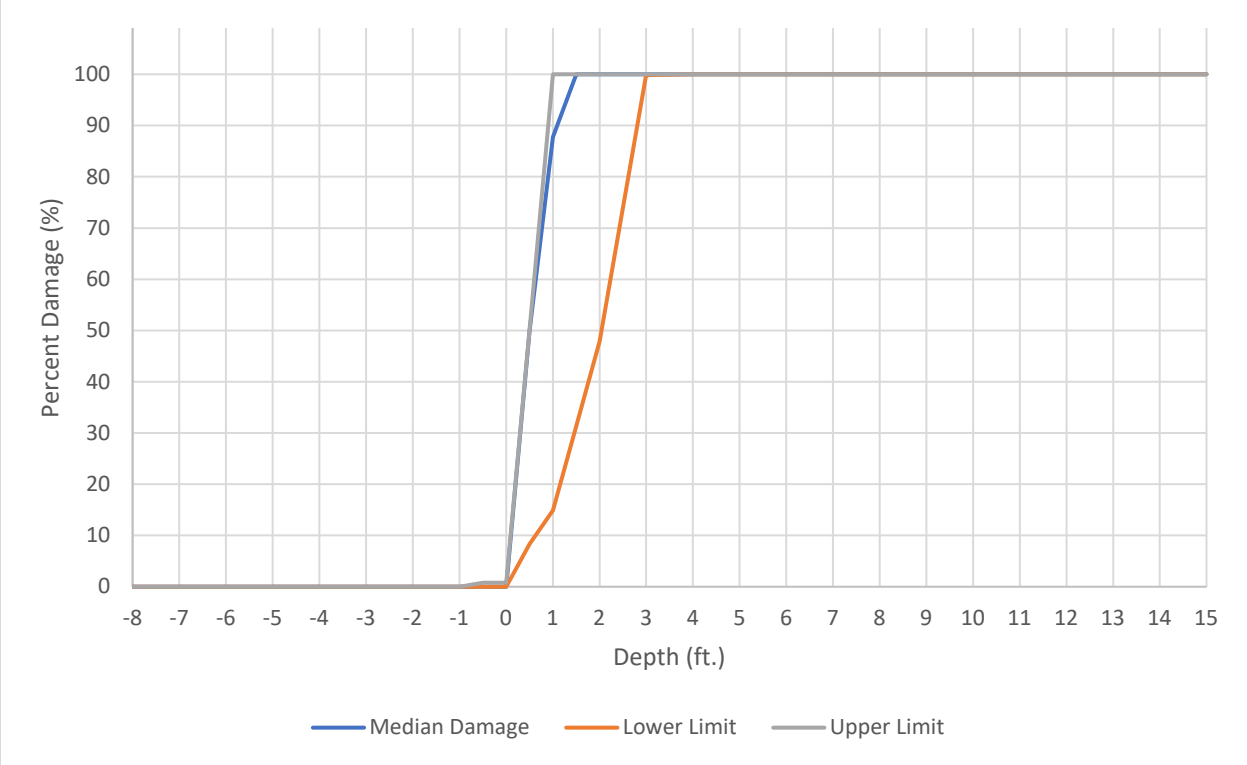


Figure G-50: Depth-Percent Damage Curve for P-SCH1 Content

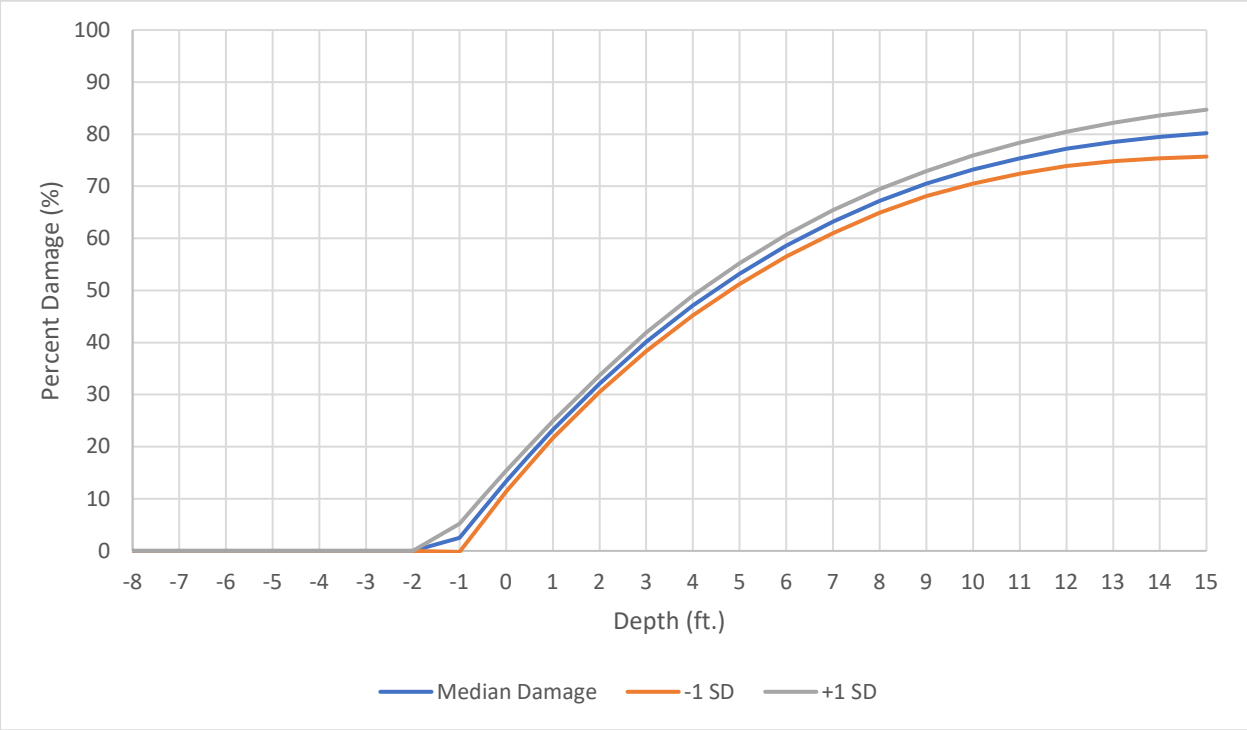


Figure G-51: Depth-Percent Damage Curve for SFR1 Structures

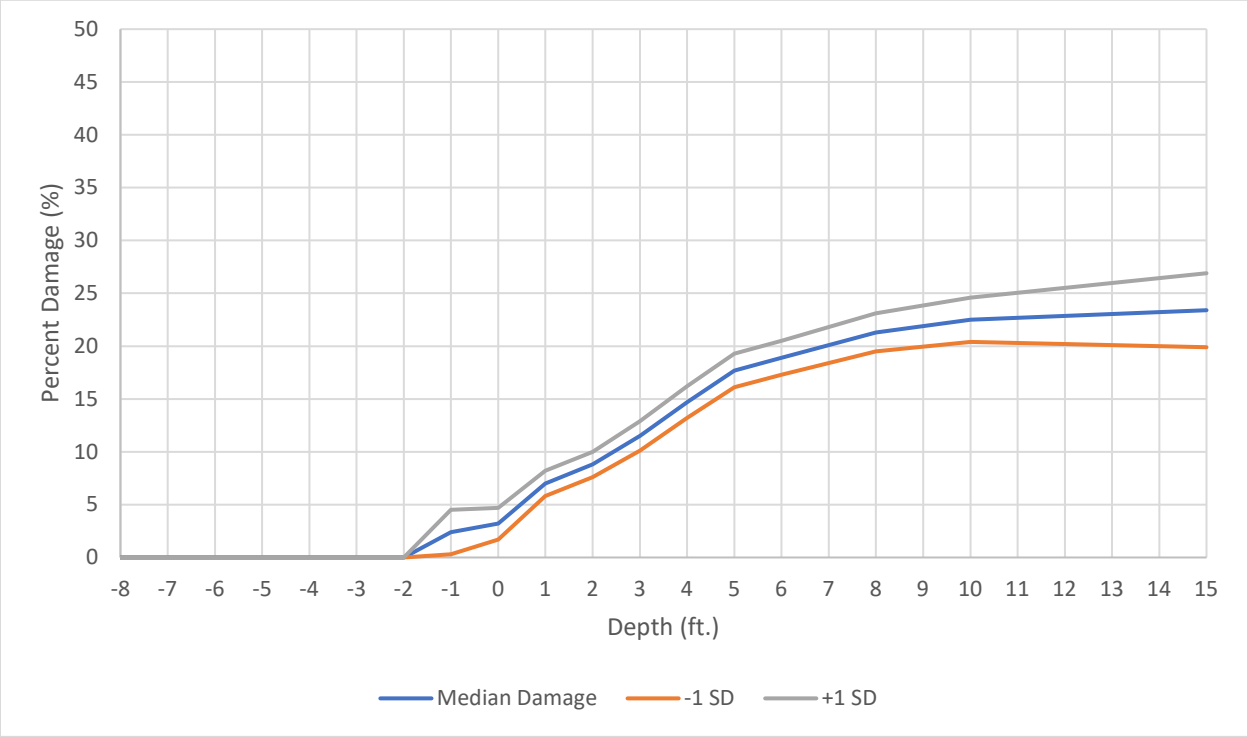


Figure G-52: Depth-Percent Damage Curve for SFR1 Content

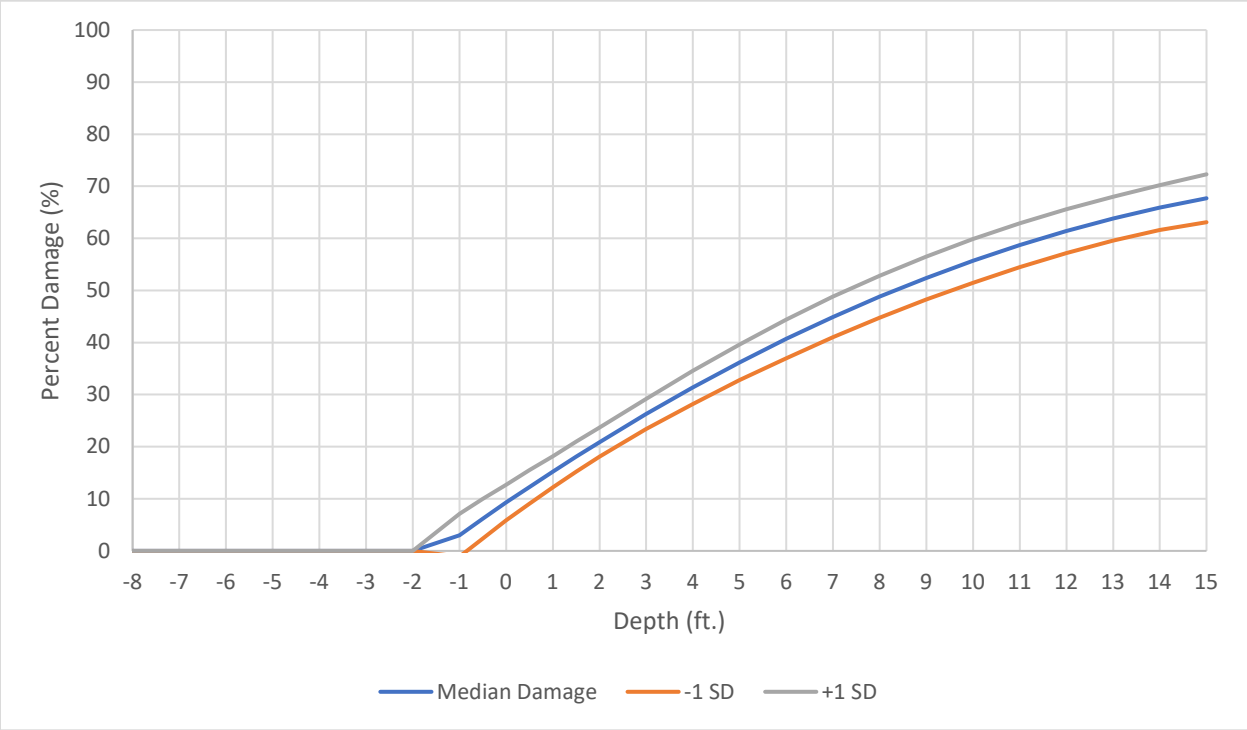


Figure G-53: Depth-Percent Damage Curve for SFR2 Structures

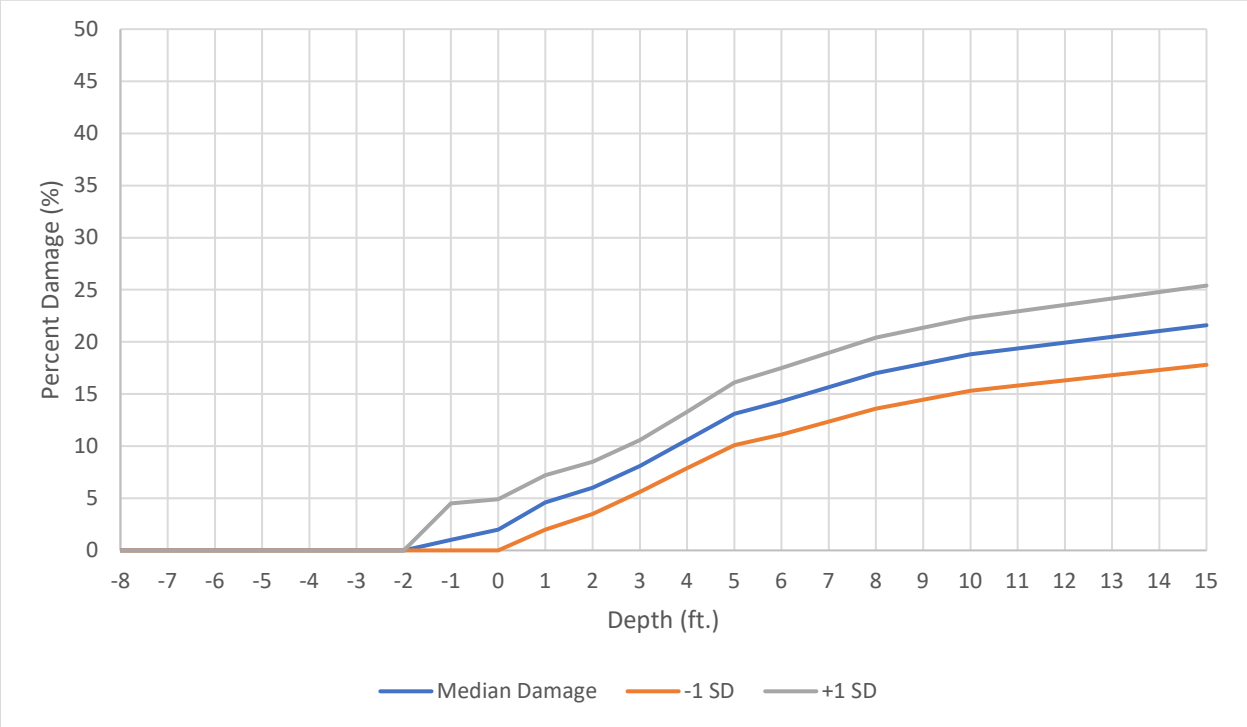


Figure G-54: Depth-Percent Damage Curve for SFR2 Content

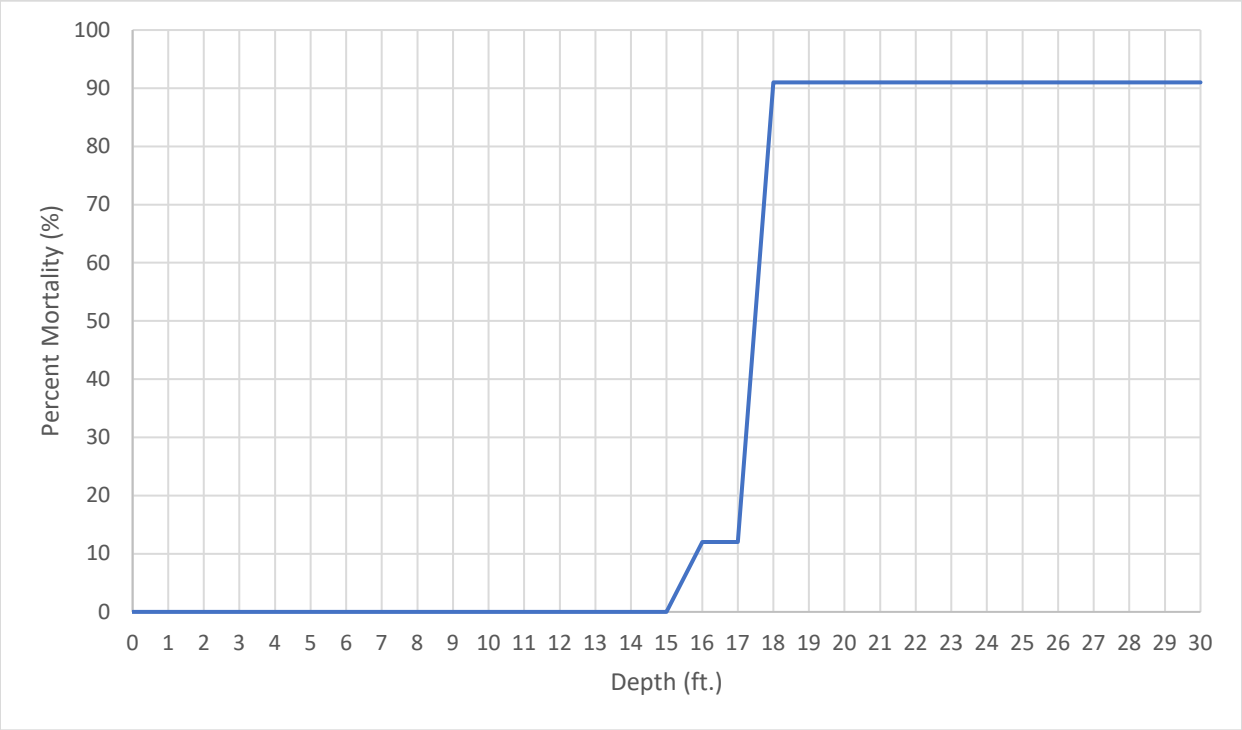


Figure G-55: Under 65 Years of Age Depth-Percent Mortality Curve for LOL_1STRY Structures

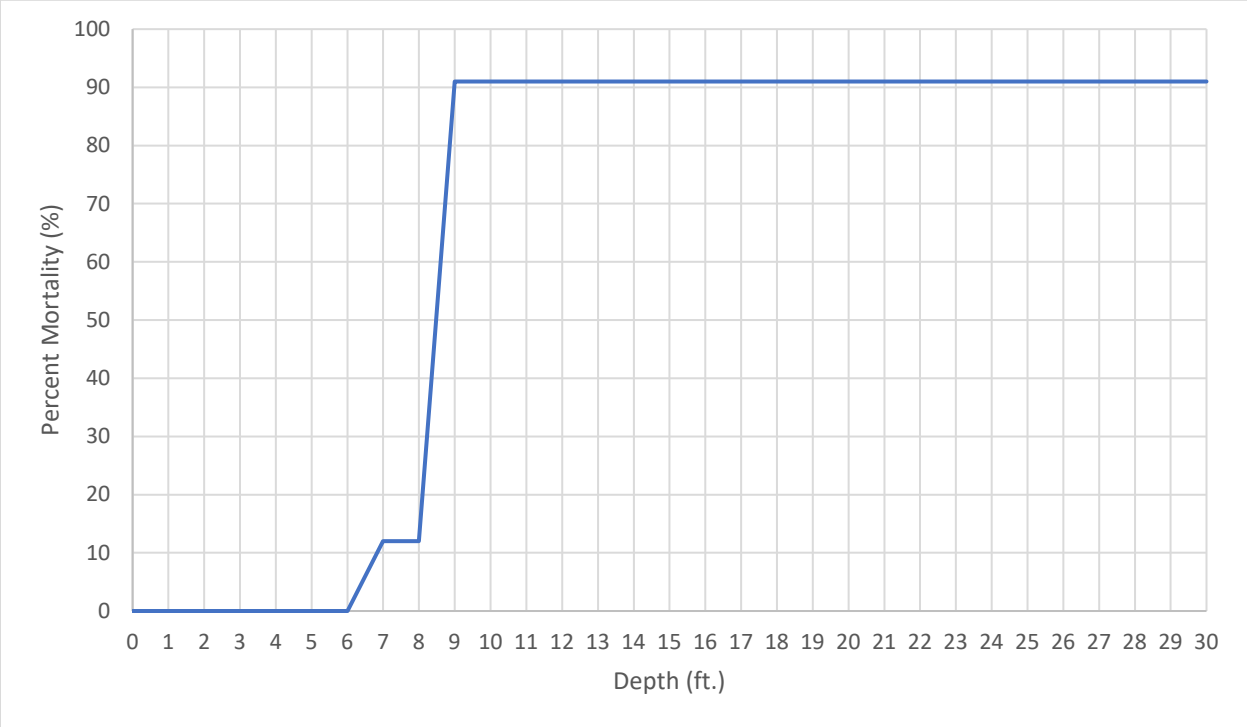


Figure G-56: Over 65 Years of Age Depth-Percent Mortality Curve for LOL_1STRY Content

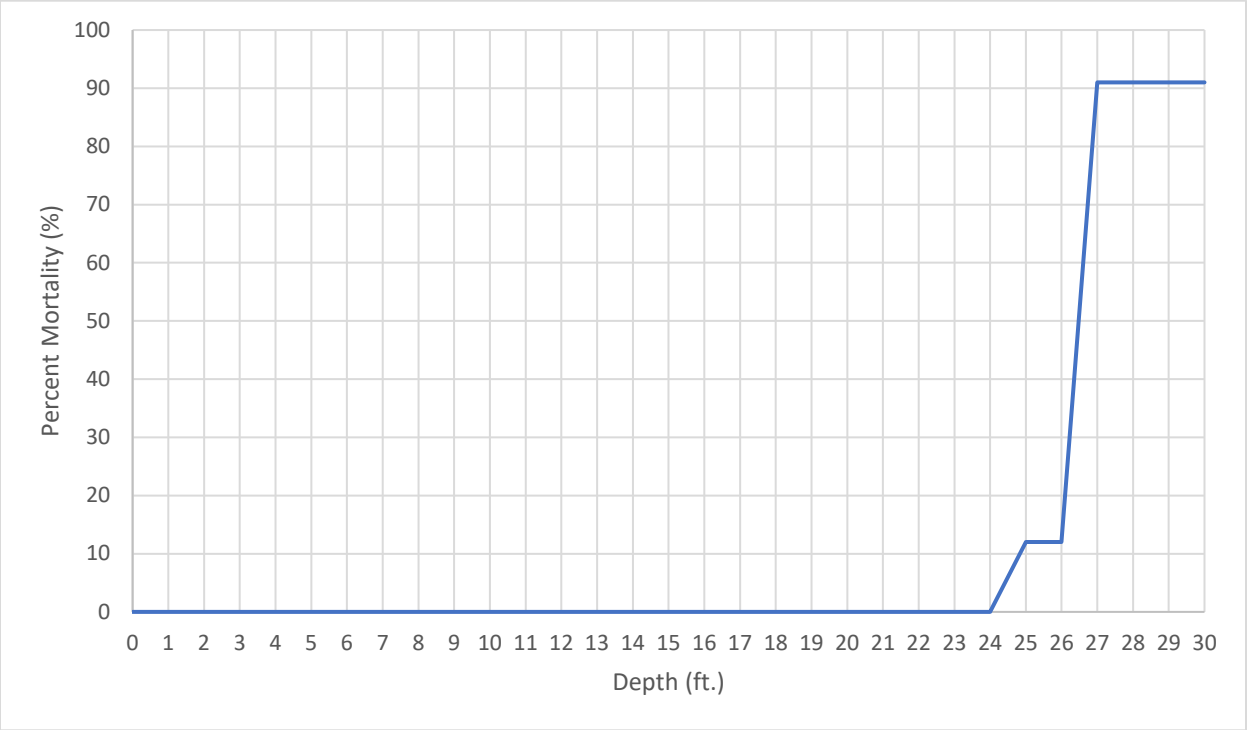


Figure G-57: Under 65 Years of Age Depth-Percent Mortality Curve for LOL_2STRY Structures

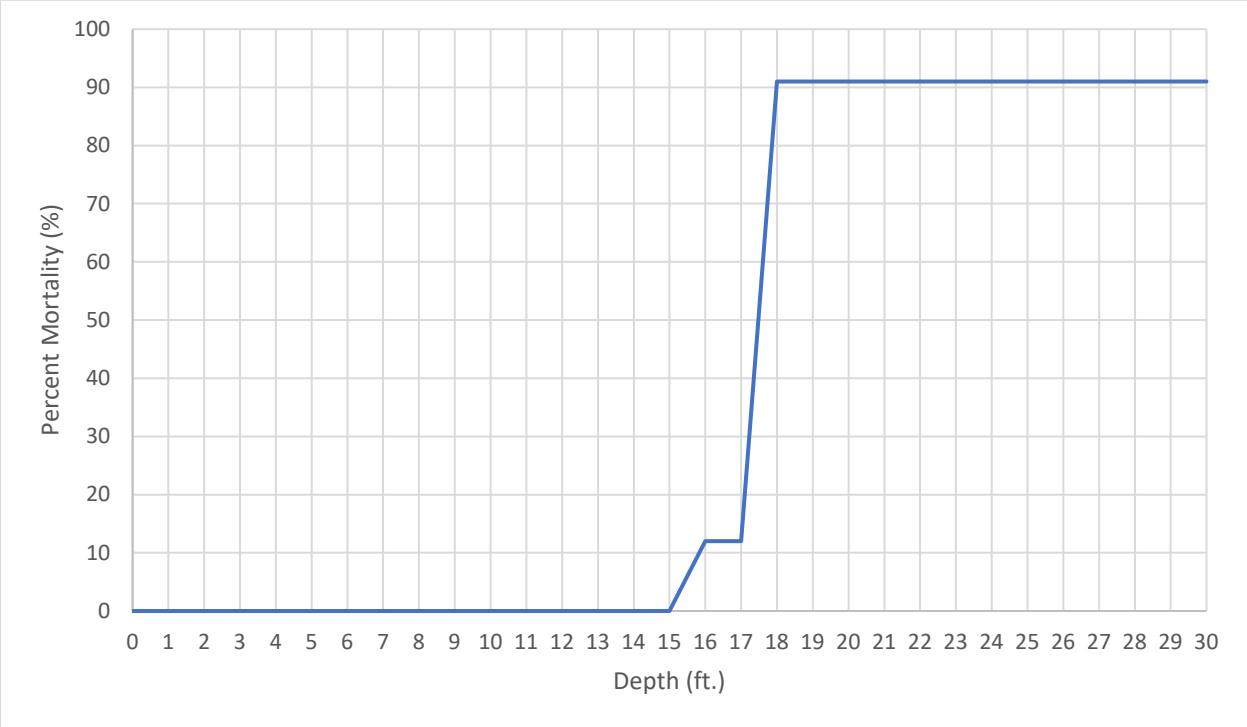


Figure G-58: Over 65 Years of Age Depth-Percent Mortality Curve for LOL_2STRY Content

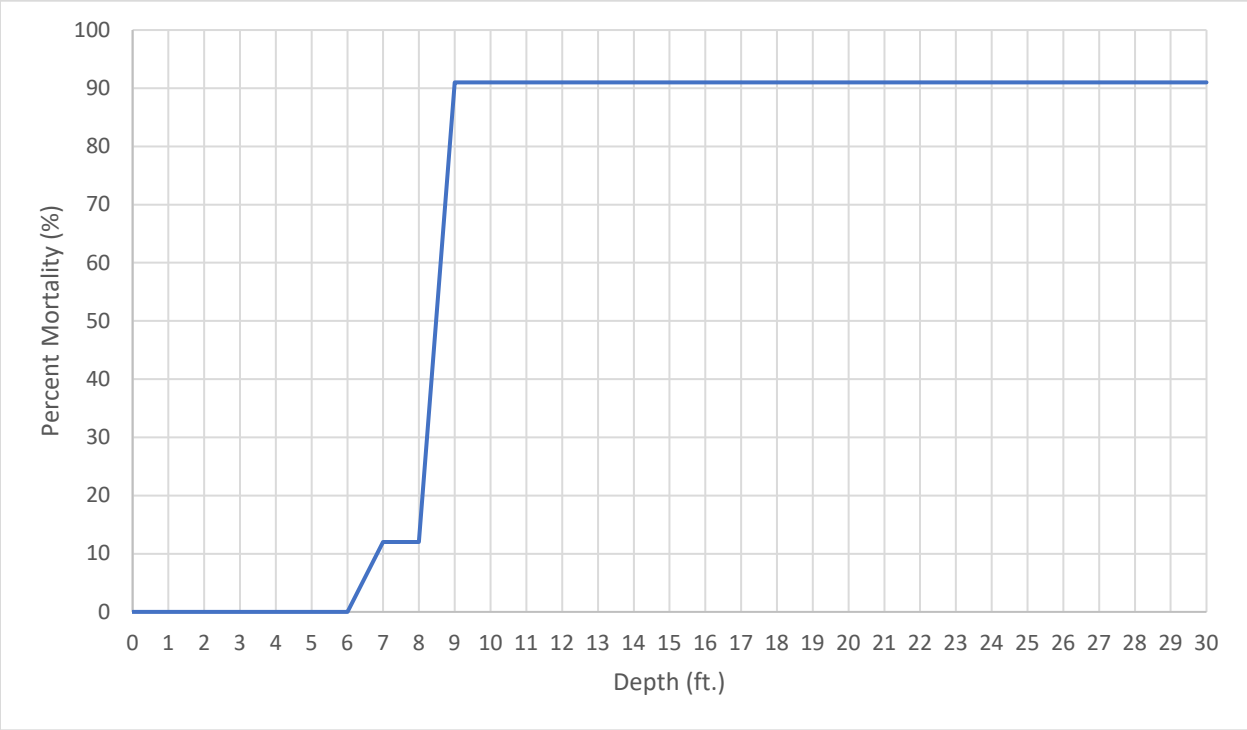


Figure G-59: Under 65 Years of Age Depth-Percent Mortality Curve for LOL_MOBILE Structures

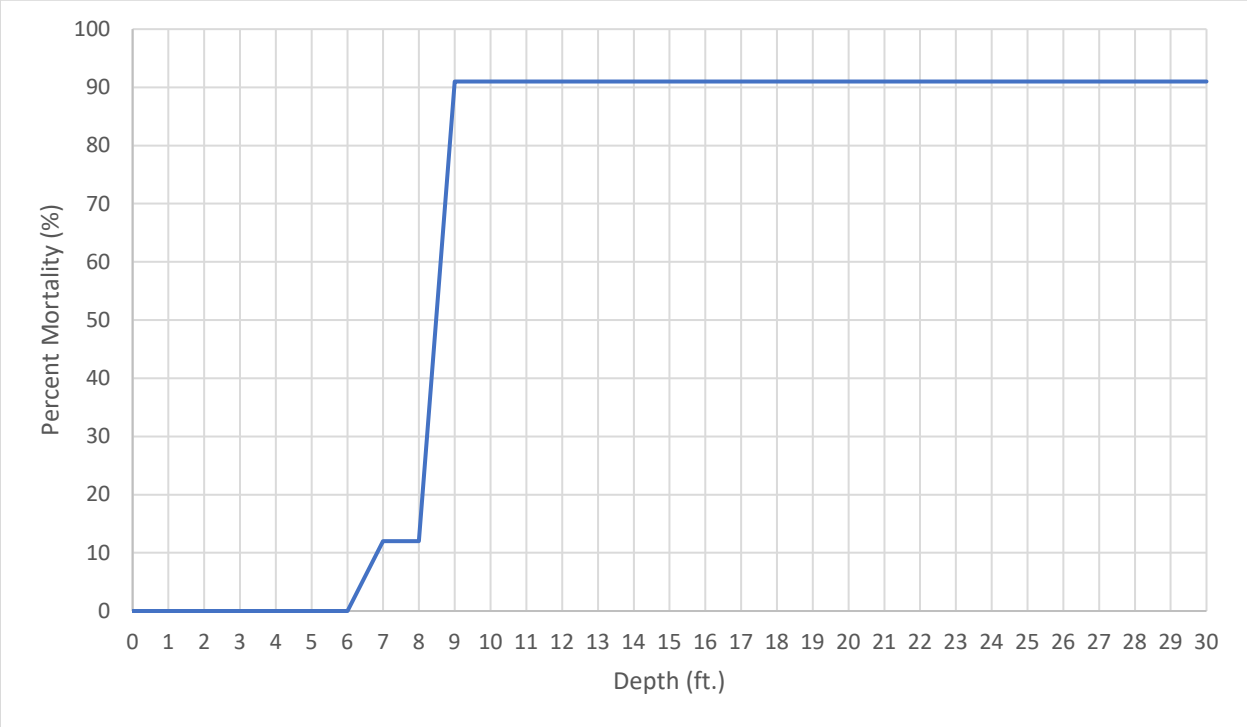


Figure G-60: Over 65 Years of Age Depth-Percent Mortality Curve for LOL_MOBILE Content

Attachment H: Performance Statistics

2018		Target Stage Annual Exceedance Probability		Long Term Risk (years)			Conditional Non-Exceedance Probability by Events					
Stream Name	Target Stage	Median	Expected	10	30	50	10%	4%	2%	1%	0.40%	0.20%
FL1_Alt1	21.3	0.0005	0.0005	0.0047	0.0142	0.0235	0.9983	0.9972	0.9962	0.9952	0.9945	0.9936
FL1_Alt2	21.3	0.0005	0.0005	0.0047	0.0142	0.0235	0.9983	0.9972	0.9962	0.9952	0.9945	0.9936
FL1_Alt3	21.3	0.0005	0.0005	0.0047	0.0142	0.0235	0.9983	0.9972	0.9962	0.9953	0.9945	0.9936
FL1_WOP	21.3	0.0005	0.0005	0.0048	0.0143	0.0237	0.9983	0.9972	0.9962	0.9952	0.9943	0.9926
LR1_Alt1	26	0.0004	0.0005	0.0049	0.0146	0.0242	0.9991	0.9978	0.9944	0.9911	0.9886	0.9827
LR1_Alt2	26	0.0004	0.0005	0.0049	0.0146	0.0242	0.9991	0.9978	0.9944	0.9911	0.9886	0.9827
LR1_Alt3	26	0.009	0.0108	0.1033	0.2789	0.4201	0.9926	0.9553	0.7811	0.6474	0.5692	0.4442
LR1_WOP	26	0.0127	0.0144	0.1352	0.3533	0.5164	0.9903	0.9286	0.7	0.5374	0.4604	0.3476
LR2_Alt1	28.1	0.0004	0.0006	0.006	0.018	0.0298	0.9995	0.9983	0.9929	0.9884	0.9845	0.9715
LR2_Alt2	28.1	0.0004	0.0006	0.006	0.018	0.0298	0.9995	0.9983	0.9929	0.9884	0.9845	0.9715
LR2_Alt3	28.1	0.0046	0.0051	0.0497	0.1417	0.2249	0.9917	0.967	0.9048	0.867	0.8516	0.8202
LR2_WOP	28.1	0.0045	0.005	0.0492	0.1405	0.2231	0.9917	0.9672	0.905	0.8672	0.8526	0.824
LR3_Alt1	30.54	0.0007	0.001	0.0101	0.0299	0.0493	0.9995	0.9986	0.9919	0.9873	0.979	0.9303
LR3_Alt2	30.54	0.0007	0.001	0.01	0.0298	0.0492	0.9995	0.9986	0.9919	0.9874	0.9791	0.9304
LR3_Alt3	30.54	0.0007	0.001	0.01	0.0298	0.0492	0.9995	0.9986	0.9919	0.9874	0.9791	0.9304
LR3_WOP	30.53	0.0011	0.0016	0.0162	0.0479	0.0786	0.9988	0.9965	0.9787	0.9661	0.9505	0.8918
LR4_Alt1	35.53	0.0005	0.0007	0.0071	0.021	0.0348	0.9999	0.9993	0.9974	0.9956	0.993	0.9694
LR4_Alt2	35.53	0.0005	0.0007	0.007	0.021	0.0347	0.9999	0.9993	0.9974	0.9956	0.9931	0.9695
LR4_Alt3	35.53	0.0005	0.0007	0.007	0.021	0.0347	0.9999	0.9993	0.9974	0.9956	0.9931	0.9695
LR4_WOP	34.3	0.0227	0.025	0.224	0.5327	0.7186	0.951	0.8707	0.6067	0.4371	0.348	0.1777
LRTB_Alt1	40.89	0.0005	0.0006	0.0055	0.0164	0.0271	0.9995	0.9996	0.9996	0.9998	0.9975	0.9881
LRTB_Alt2	40.89	0.0005	0.0006	0.0055	0.0164	0.0271	0.9995	0.9996	0.9996	0.9998	0.9975	0.9881
LRTB_Alt3	40.89	0.0005	0.0006	0.0055	0.0164	0.0271	0.9995	0.9996	0.9996	0.9998	0.9975	0.9881
LRTB_WOP	40.89	0.0048	0.0047	0.046	0.1317	0.2096	0.9998	0.9998	0.9998	0.9998	0.207	0

2065		Target Stage Annual Exceedance Probability		Long Term Risk (years)			Conditional Non-Exceedance Probability by Events					
Stream Name	Target Stage	Median	Expected	10	30	50	10%	4%	2%	1%	0.40%	0.20%
FL1_Alt1	21.3	0.001	0.001	0.0105	0.0311	0.0514	0.9968	0.9951	0.9938	0.9921	0.9911	0.9907
FL1_Alt2	21.3	0.001	0.001	0.0105	0.0311	0.0514	0.9968	0.9951	0.9938	0.9921	0.9911	0.9907
FL1_Alt3	21.3	0.001	0.001	0.0105	0.0311	0.0512	0.9966	0.9951	0.9937	0.992	0.991	0.9905
FL1_WOP	21.3	0.0051	0.0068	0.066	0.1851	0.289	0.9969	0.9951	0.9899	0.7639	0.4842	0.3631
LR1_Alt1	26	0.0012	0.0013	0.013	0.0385	0.0633	0.9975	0.989	0.9837	0.9762	0.9694	0.969
LR1_Alt2	26	0.0012	0.0013	0.013	0.0385	0.0633	0.9975	0.989	0.9837	0.9762	0.9694	0.969
LR1_Alt3	26	0.0366	0.0389	0.3276	0.696	0.8626	0.9399	0.5472	0.411	0.3088	0.2521	0.2497
LR1_WOP	26	0.0386	0.0408	0.3407	0.7134	0.8754	0.9392	0.5448	0.3921	0.2462	0.131	0.0989
LR2_Alt1	28.1	0.0009	0.001	0.01	0.0298	0.0491	0.9986	0.9905	0.9855	0.9809	0.9788	0.9765
LR2_Alt2	28.1	0.0009	0.001	0.01	0.0298	0.0491	0.9986	0.9905	0.9855	0.9809	0.9788	0.9765
LR2_Alt3	28.1	0.0108	0.0113	0.1078	0.2897	0.4346	0.9759	0.8707	0.8419	0.8257	0.8202	0.8148
LR2_WOP	28.1	0.0115	0.012	0.114	0.3045	0.454	0.9725	0.8673	0.8378	0.8172	0.805	0.8013
LR3_Alt1	30.54	0.0009	0.0011	0.011	0.0327	0.0538	0.999	0.9902	0.9828	0.9767	0.9733	0.9667
LR3_Alt2	30.54	0.0009	0.0011	0.0109	0.0324	0.0534	0.999	0.9903	0.983	0.977	0.9735	0.9668
LR3_Alt3	30.54	0.0009	0.0011	0.0109	0.0324	0.0534	0.999	0.9903	0.983	0.977	0.9735	0.9668
LR3_WOP	30.53	0.0022	0.0027	0.0272	0.0793	0.1286	0.9977	0.976	0.9597	0.9334	0.9169	0.9062
LR4_Alt1	35.53	0.0008	0.0036	0.0352	0.1018	0.1639	0.9994	0.9949	0.9785	0.8667	0.7289	0.6735
LR4_Alt2	35.53	0.0008	0.0036	0.0351	0.1018	0.1638	0.9994	0.995	0.9785	0.8668	0.7291	0.6736
LR4_Alt3	35.53	0.0008	0.0036	0.0351	0.1018	0.1638	0.9994	0.995	0.9785	0.8668	0.7291	0.6736
LR4_WOP	34.3	0.0553	0.0573	0.4459	0.8299	0.9478	0.8846	0.4119	0.2373	0.1159	0.0613	0.0442
LRTB_Alt1	40.89	0.0012	0.0023	0.0226	0.0664	0.1082	0.9997	0.9981	0.9767	0.958	0.8725	0.7549
LRTB_Alt2	40.89	0.0012	0.0023	0.0226	0.0664	0.1082	0.9997	0.9981	0.9767	0.958	0.8725	0.7549
LRTB_Alt3	40.89	0.0012	0.0023	0.0226	0.0664	0.1082	0.9997	0.9981	0.9767	0.958	0.8724	0.7547
LRTB_WOP	40.89	0.0242	0.0239	0.2145	0.5153	0.701	0.9995	0.9019	0.3436	0.0613	0.0189	0.0085

Appendix F

Transfer of Risk and Mitigation Evaluation Technical Memorandum

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Appendix F:
Mossdale Tract Area Urban Flood Risk Reduction
Transfer of Risk and Mitigation Evaluation

Prepared for: *San Joaquin Area Flood Control Agency (SJAFCA)* *June 15, 2021*

Prepared by: Brittney Salvador, E.I.T.
Reviewed by: Michael Rossiter, P.E.

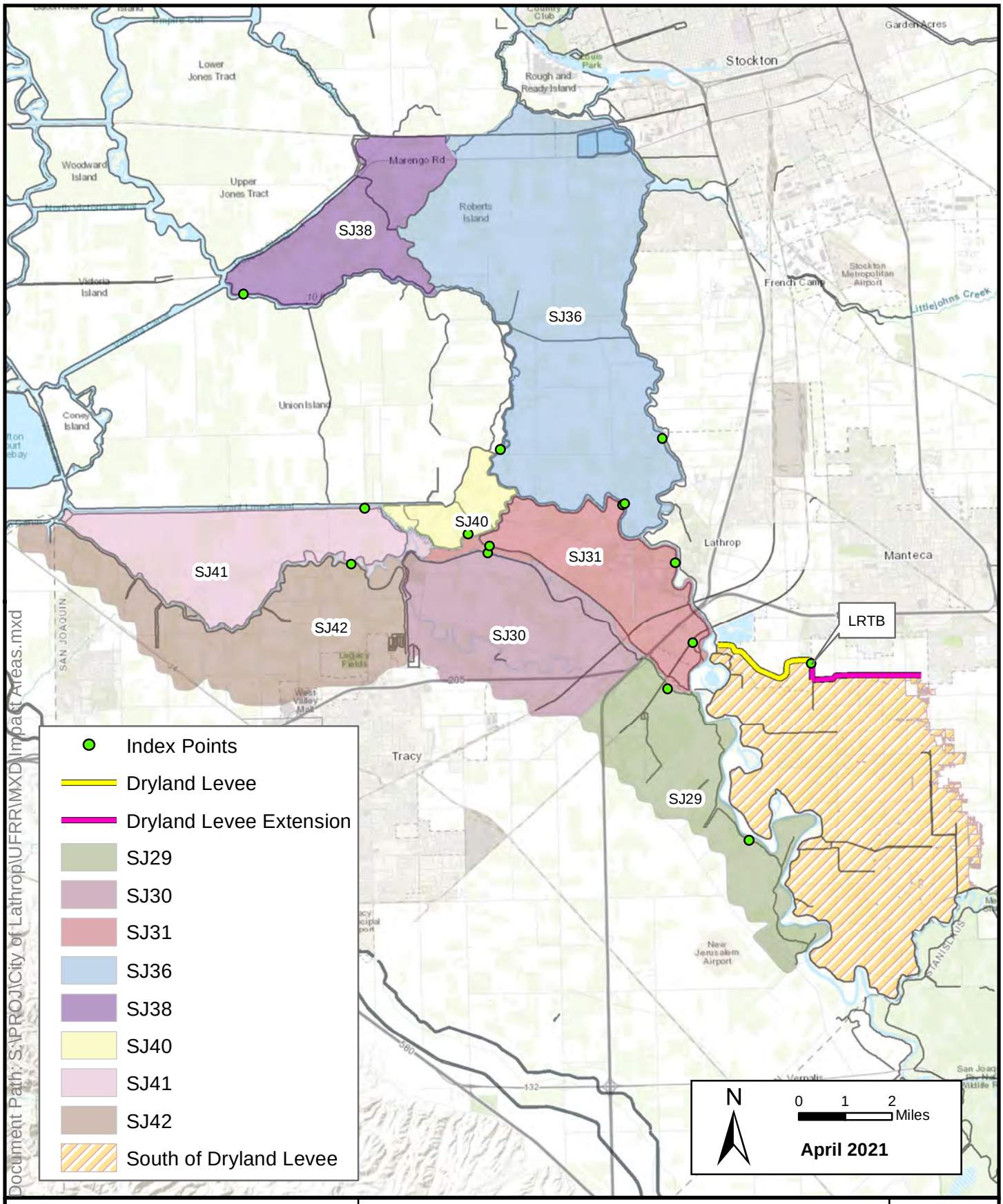
1.0 Introduction

The City of Lathrop was awarded an Urban Flood Risk Reduction (UFRR) grant to study alternatives for achieving an Urban Level of Protection (ULOP) in the Mossdale Tract area. Hydraulic modeling indicated that all the Mossdale Tract ULOP flood risk reduction project alternatives would effectively protect more people and property as compared to without project. However, a flood risk reduction project would displace water that would otherwise be temporarily conveyed through and stored on the Mossdale Tract during flooding. This means that providing improved flood protection to the Mossdale Tract area has the potential to result in a transfer of hydraulic impacts to areas outside of the protected region.

This technical memorandum (TM) discusses a transfer of risk analysis that was conducted to quantify the hydraulic impacts of the flood risk reduction project, most notably the dryland levee extension component of the project, which is featured in all the UFRR alternatives. Guidance for this analysis was provided by United States Army Corps of Engineers (USACE) 33 USC 408 (EC 1165-2-220).

2.0 Analysis Methodology

This TM discusses transfer of risk to nine (9) index locations outside of the Mossdale Tract protection region: one (1) area directly south of the dryland levee extension and eight (8) south Delta islands located on the west side of the San Joaquin River (SJR). The nine (9) index locations were selected to represent the overall hydraulic impacts to the system by the project. The south Delta islands index locations are consistent with the 2017 Central Valley Flood Protection Plan (CVFPP). Figure 1 provides an overview of the index locations used in this analysis. As the most direct impacts of the dryland levee extension would be seen in the area immediately south of the dryland levee, this area was analyzed separately from the south Delta islands. Figure 2 provides an overview of the impact area south of the dryland levee.



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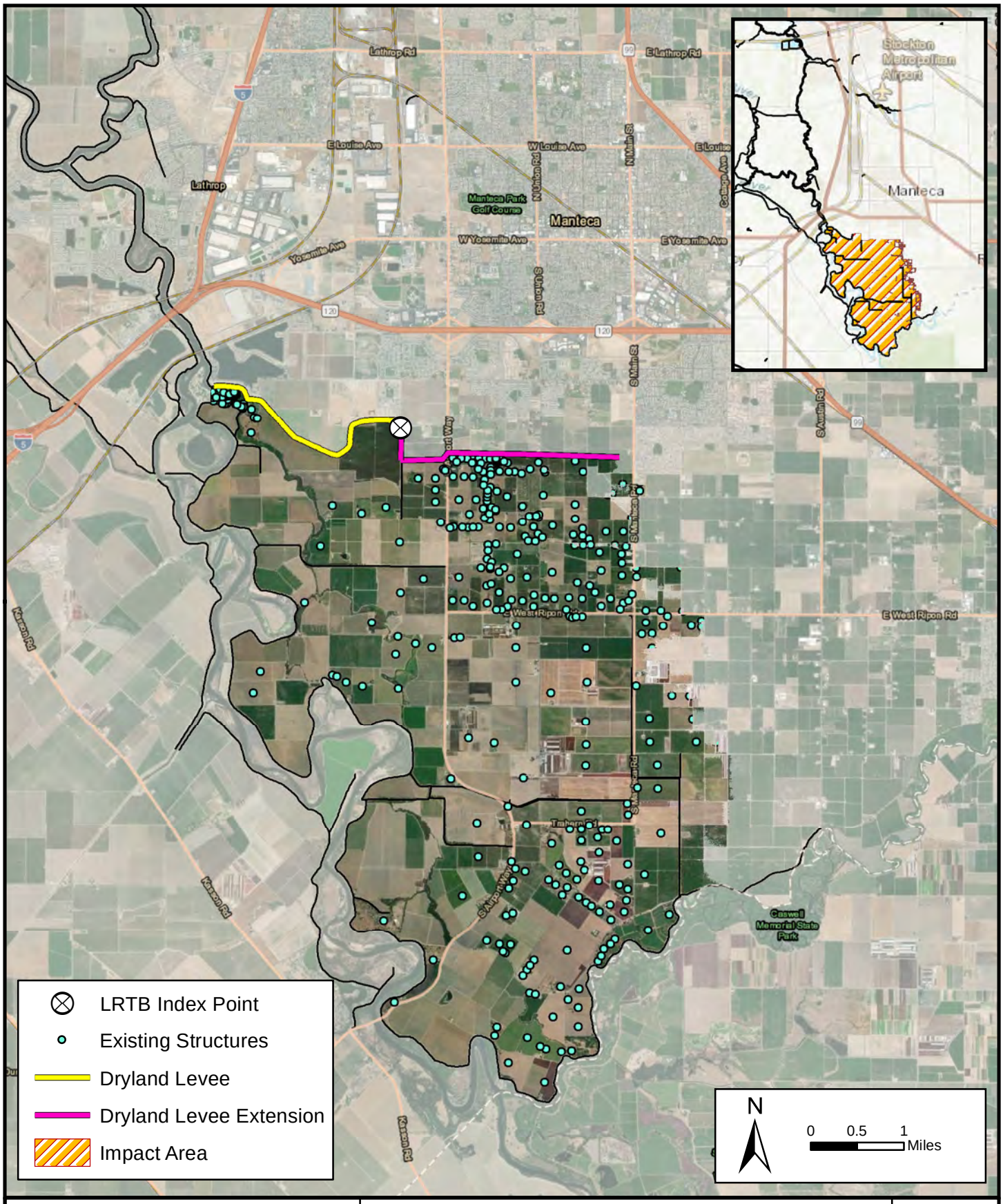
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MOSSDALE TRACT AREA

Transfer of Risk Study Area

FIGURE

1



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Overview of Impact Area South of the Dryland Levee Extension

FIGURE

2

Hydrologic Engineering Center Flood Damage Analysis (HEC-FDA) software was used to calculate expected annual damage (EAD) and expected annual life loss (EALL) for the nine (9) index locations outside of the Mossdale Tract protection region. The difference between the with- and without-project EAD and EALL then represents the transfer of risk induced by the proposed flood risk reduction project.

The USACE 33 USC 408 guidance only requires system performance analyses for *existing* hydrologic conditions; however, for planning purposes, additional future hydrologic scenarios were analyzed at the request of the California Department of Water Resources (DWR). Transfer of risk was analyzed for the three (3) different hydrologic scenarios: the 2018 analysis year represents current hydrologic conditions, the 2040 analysis year represents climate change hydrology projected to an intermediate planning horizon, and the 2065 analysis year represents climate change hydrology projected to a long-term planning horizon.

Hydrology & Hydraulics

Analyzing transfer of risk requires hydraulic modeling of the SJR system, the Mossdale Tract system, and the surrounding areas that may be impacted by the flood risk reduction project. A 1D/2D HEC-RAS 5.0 model developed for the Mossdale Tract area (Peterson Brustad Inc, 2018a) was used for this analysis. For a detailed description on the development of the hydraulic model, see the *Hydraulic Modeling* technical memorandum provided in Appendix A of the main UFRR study report.

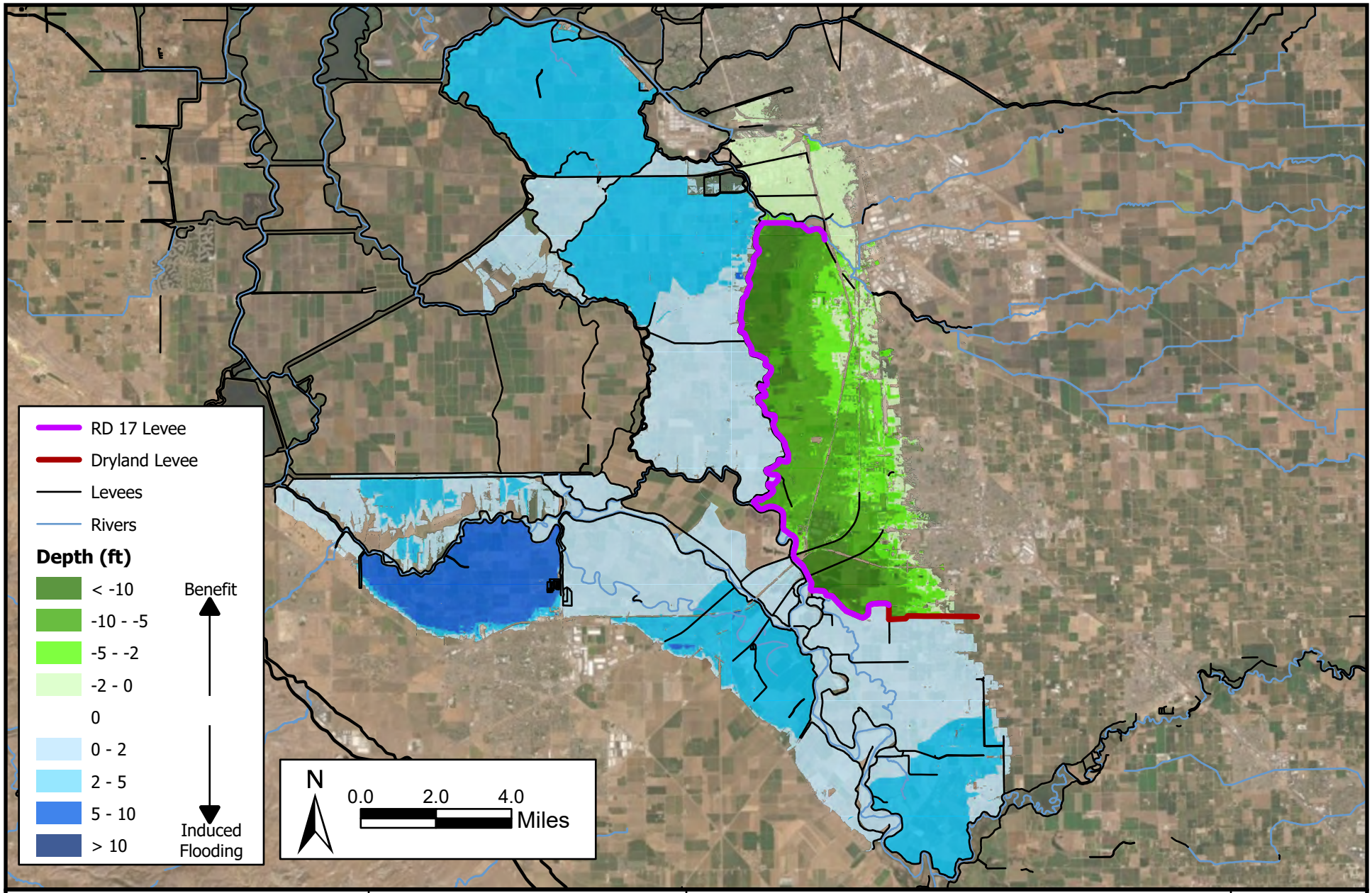
Flows on the SJR system are consistent with 2017 CVFPP hydrology for the 2018 and 2065 analysis years. The projected 2040 climate change hydrology was estimated using linear interpolation between the 2018 and 2065 peak flows for each event. Table 1 summarizes the peak flows at Vernalis used in this study for each analysis year. Figure 3 shows the change in floodplain depths as a result of the project for the 2040 climate change 200-year levees holding scenario.

Table 1: Summary Peak Flow Frequency at Vernalis including future climate

Return Period (Year)	2018 CVFPP Hydrology (cfs)	2040 Interpolated Hydrology (cfs)	2065 CVFPP Hydrology (cfs)
10	43,868	45,807	47,745
25	49,086	64,861	80,635
50	64,532	90,072	115,611
100	82,371	143,025	203,679
200	95,786	202,925	310,064
500	153,864	328,700	503,536

Results from the HEC-RAS model were used to define the interior-exterior stage relationship which includes a table of ground (invert) elevations for each grid cell, the exterior-stage for the channel for each scenario, and the interior-stage was created based on the water surface elevations in the floodplains. For a detailed description of the methodology used to create the interior-exterior stage relationship, see the *Economic and Life Loss Evaluation* technical memorandum provided in Appendix E of the main UFRR study report.

The following sub-sections describe the methodology used to the estimate EAD and EALL for each index location.



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N
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Miles

January 2021

MOSSDALE TRACT AREA

Year 2040 Climate Conditions
200-Year Floodplain
Project Impacts Levees Holding Scenario

FIGURE

3

***Floodplain results predate the RD 2062 levee improvements. According to RD 2062, the Stewart Tract will not flood during the 2040 and 2065 scenarios.

South of Dryland Levee

As previously mentioned, a HEC-FDA model of the area directly south of the dryland levee extension was developed to calculate EAD and EALL for 2018, 2040, and 2065 hydrologic conditions. The EAD calculated for this area includes structure and contents damage. HEC-FDA calculates EAD and EALL with the following input parameters:

- Stage-Exceedance Probability
- Interior-Exterior Stage Relationship
- Levee Failure Probability-Stage Relationship (Fragility Curves)
- Damage-Stage Relationship

The dryland levee index point (LRTB) presents a somewhat unique case for a HEC-FDA analysis in that the model is being asked to assess EAD and EALL on the waterside of a dryland levee rather than the more typical analysis for the landside of a levee in a riverine setting. Therefore, the EAD and EALL for the area south of the dryland levee are theoretical. The LRTB model input parameters were adjusted accordingly to account for this inland index point located on the waterside of the dryland levee, including:

- Stage-Exceedance Probability: A surrogate stage-exceedance probability curve was created for the purpose making the model bypass the stage-exceedance probability parameter, which is typically used in riverine settings, and compute damages based the interior-exterior stage relationship.
- Interior-Exterior Stage Relationship: For a typical riverine setting, the interior-exterior stage relationships are based on the breach floodplains at a given index point. However, when analyzing the dryland levee, the LRTB interior-exterior stage tables were set up for a flooding scenario where the dryland levee does not breach, as this would capture the greatest damages for the area south of the dryland levee for the purposes of the transfer of risk evaluation.
- Levee Failure Probability-Stage Relationship: For the dryland levee scenario, the LRTB levee fragility curve was set up so that the flooding identified in the interior-exterior stage relationships does not require a levee failure, but rather allows the specified flooding to take place in all scenarios.

For the damage-stage parameter, a depreciated replacement value was calculated for each structure south of the dryland levee. The structure inventory was developed following the same methodology used for the Mossdale Tract area's existing structure inventory. For a detailed description of the methodology, see the *Economic and Life Loss Evaluation* technical memorandum provided in Appendix E of the main UFRR study report. It was assumed that there is no future development in the area south of the dryland levee and therefore the same structure inventory was used for the 2018, 2040, and 2065 analysis years.

South Delta Islands

To analyze economic and life loss impacts for the south Delta islands, the HEC-FDA models developed by the DWR for the 2017 CVFPP were used (DWR, 2017). The EAD calculated for the south Delta islands includes structure and contents damage, crop damage, and business losses. The DWR HEC-FDA models calculate EAD and EALL with the following input parameters:

- Discharge-Exceedance Probability
- Stage-Discharge Relationship
- Levee Failure Probability-Stage Relationship (Fragility Curves)
- Damage-Stage Relationship

The levee failure probability-stage relationships and the damage-stage relationships in the 2017 CVFPP HEC-FDA models were used as is. For all three analysis years, the discharge-exceedance relationships and the stage-discharge curves in the 2017 CVFPP HEC-FDA models were updated with the results from the 1D/2D HEC-RAS 5.0 model (Peterson Brustad Inc, 2018) to remain consistent with the other FDA models used in this study.

It was assumed that there is no future development in the south Delta islands, with the exception of the River Islands community which is represented by impact area SJ31. To account for future development expected in River Islands, the 2040 and 2065 EAD and EALL for damage area SJ31 were multiplied by a population growth factor, which is consistent with the CVFPP methodology. The population growth factor was estimated as the projected Master Plan single family structures divided by existing single family structures, which is estimated at 6.1.

3.0 Results

This section describes the EAD and EALL results from the various HEC-FDA scenarios run for the transfer of risk analysis.

South of Dryland Levee

Table 2 presents annualized flood damages (in thousands of 2018 dollars) for the impact area south of the dryland levee. The results show that, with the proposed Mossdale project, there is an increase of EAD of $27,000, $171,000, and $300,000 for 2018, 2040, and 2065 analysis years, respectively.

Table 2: Annualized Damage for the Area South of the Dryland Levee (in Thousands of 2018 Dollars per year over a 50-year project life).

Hydrologic Scenario (Analysis Year)	Without Project	With Project	Difference
2018	$1,936	$1,963	$27
2040	$4,371	$4,542	$171
2065	$7,975	$8,275	$300

Table 3 presents annualized life loss for the impact area south of the dryland levee. Annualized life loss increases by 0.02, 0.09, and 0.10 persons for the 2018, 2040, and 2065 analysis years, respectively.

Table 3: Annualized Life Loss for the Area South of the Dryland Levee (Lives per year over a 50-year project life).

Hydrologic Scenario (Analysis Year)	Without Project	With Project	Difference
2018	0.19	0.21	0.02
2040	0.68	0.77	0.09
2065	0.92	1.02	0.10

It should be noted that the analysis assumes a single hydrologic regime prevailing over the 50-year life of the project which may serve to inflate the results of the future hydrologic scenarios.

For example, in the 2065 scenario, 2065 climate change flows were assumed to be occurring over the entire 50-year economic period, starting in year one.

South Delta Islands

Table 4 presents annualized flood damages (in thousands of 2018 dollars) for the south Delta islands area. The results show that there is an increase of EAD of $30,000, $144,000, and $181,000 for 2018, 2040, and 2065 analysis years, respectively.

Table 4: Annualized Damage for the South Delta Islands Area (in thousands of 2018 Dollars per year over a 50-year project life).

Hydrologic Scenario (Analysis Year)	Impact Regions	Without Project	With Project	Difference
2018	SJ29	$663	$663	$0
	SJ30	$641	$645	$4
	SJ31	$1,404	$1,405	$0*
	SJ36	$4,868	$4,875	$6
	SJ38	$793	$793	$0
	SJ40	$168	$169	$0
	SJ41	$166	$167	$1
	SJ42	$554	$571	$17
	Total	**$9,257**	**$9,288**	**$30**
2040	SJ29	$1,176	$1,175	$0
	SJ30	$1,186	$1,183	$0*
	SJ31	$12,751	$12,738	$0*
	SJ36	$8,483	$8,491	$8
	SJ38	$1,658	$1,658	$0
	SJ40	$279	$278	$0*
	SJ41	$293	$303	$10
	SJ42	$1,446	$1,572	$126
	Total	**$27,271**	**$27,398**	**$144**
2065	SJ29	$1,625	$1,622	$0*
	SJ30	$1,615	$1,627	$12
	SJ31	$18,088	$18,153	$65
	SJ36	$12,025	$12,044	$19
	SJ38	$1,646	$1,646	$0
	SJ40	$388	$388	$0
	SJ41	$413	$422	$9
	SJ42	$2,033	$2,108	$75
	Total	**$37,832**	**$38,011**	**$181**

* The difference in with- and without-project damages was negligible.

Table 5 shows annualized life loss for the south Delta islands. Life loss increases by 0.01, 0.04, and 0.05 persons for 2018, 2040, and 2065 analysis years, respectively.

Table 5: Annualized Life Loss for the South Delta Islands Area (Lives per year over a 50-year project life).

Hydrologic Scenario (Analysis Year)	Impact Regions	Without Project	With Project	Difference
2018	SJ29	0.00	0.00	0.00
	SJ30	0.06	0.06	0.00
	SJ31	0.01	0.01	0.00
	SJ36	0.15	0.15	0.00
	SJ38	0.03	0.03	0.00
	SJ40	0.01	0.01	0.00
	SJ41	0.02	0.02	0.00
	SJ42	0.06	0.07	0.01
	Total	**0.34**	**0.35**	**0.01**
2040	SJ29	0.00	0.00	0.00
	SJ30	0.14	0.14	0.00
	SJ31	0.06	0.06	0.00
	SJ36	0.29	0.29	0.00
	SJ38	0.07	0.07	0.00
	SJ40	0.01	0.01	0.00
	SJ41	0.04	0.05	0.01
	SJ42	0.20	0.23	0.03
	Total	**0.81**	**0.85**	**0.04**
2065	SJ29	0.02	0.02	0.00
	SJ30	0.18	0.19	0.01
	SJ31	0.18	0.18	0.00
	SJ36	0.45	0.47	0.02
	SJ38	0.07	0.07	0.00
	SJ40	0.02	0.02	0.00
	SJ41	0.06	0.06	0.00
	SJ42	0.28	0.30	0.02
	Total	**1.26**	**1.31**	**0.05**

Again, it should be noted that the analysis assumes a single hydrologic scenario prevailing over the 50-year life of the project which will serve to inflate the results of the future hydrologic

scenarios. For example, in the 2065 scenario, 2065 climate change flows were assumed to be occurring over the entire 50-year economic period, starting in year one.

River Islands

The River Islands index point (SJ31) is included in the south Delta islands study area. Results for this particular location are detailed further in this subsection. For all three analysis years, the Mossdale project did not induce any life loss at the SJ31 index point. Similarly, negligible damages ($) were induced by the project for the 2018 and 2040 hydrologic scenarios. The 2065 hydrologic scenario showed a total of $65,000 per year in induced damages, which equates to a 0.3% increase. For the 2065 scenario, the flooding is so extreme that the largest n-year events are able to overtop the River Islands levees for both without- and with-project conditions. However, it is important to note that the induced damages in the 2065 hydrologic scenario primarily occur in the agricultural areas located outside of the River Island levees.

4.0 Conclusion

Considering the large population of the Mossdale Tract area compared to the surrounding rural areas, the marginal transfer of hydraulic impacts is considered unavoidable, and mitigation should be explored consistent with CEQA and principles enforced by the CVFPB. Other regional projects such as an expansion of Paradise Cut could mitigate some of the impacts. In other areas, obtaining flowage easements may be considered. Or, financial assistance with non-structural mitigation measures such as structure elevations, relocations, evacuation planning, and levee relief cuts could be considered.

Hypothetical Mitigation for Induced Damages

Under existing (2018) hydrologic conditions, the project increases the EAD in the region by $57,000 per year, which equates to a 0.5% increase in annual damages. Assuming a benefit-cost ratio of 1.0, a 50-year economic period, and the 2018 federal discount rate of 2.750%, this impact translates to a hypothetical mitigation cost of $1.5M which could be used for a variety of mitigation measures.

Under future 2040 hydrologic conditions, the project increases the EAD in the region by $315,000 per year. Under future 2065 hydrologic conditions, the project increases the EAD in the region by $481,000 per year. Using the assumptions above, these impacts translate to hypothetical mitigation costs of $8.5M and $13M in 2040 and 2065, respectively.

Hypothetical Mitigation for Induced Life Loss

Under existing (2018) hydrologic conditions, the project increases the EALL in the region by 0.03 lives per year. Under future 2040 hydrologic conditions, the project increases the EALL in the region by 0.13 lives per year. Under future 2065 hydrologic conditions, the project increases the EALL in the region by 0.15 lives per year. Although minimal, this increase can be reduced with targeted mitigation activities. For example, structure elevations can be focused in areas where life risk is the highest. In addition, increased public education and improvements to notification systems can be implemented to improve awareness and warning times.

Final Conclusion

The CEQA/National Environmental Policy Act (NEPA) process will allow for a natural transition and opportunity to advance the UFRR study's hydraulic impact analyses and further define proper mitigation measures through a process that involves other responsible agencies and the public. Impacts to the surrounding environment and population are at the core of what the CEQA/NEPA process is intended for. The UFRR study report includes a solid hydraulic impact analysis that can form the basis for future conversations on appropriate mitigation measures. Advancing the hydraulic impact and mitigation discussion through the CEQA/NEPA process will allow the community and regional stakeholders to provide input and will prove to be a much more transparent and constructive exercise.

Attachment A provides the performance statistics from the HEC-FDA models for each index location discussed above.

5.0 References

California Department of Water Resources (DWR). (2017). *Central Valley Flood Protection Plan, 2017 Update. August.*

Peterson Brustad Inc. (2018a). *Mossdale Tract Area Urban Flood Risk Reduction Feasibility Study, Appendix A: Hydraulics and Hydrology.*

Peterson Brustad Inc. (2018b). *Mossdale Tract Area Urban Flood Risk Reduction Feasibility Study, Appendix E: Economic and Life Loss Evaluation.*

US Army Corps of Engineers (USACE). (2018). *Engineer Circular No. 1165-2-220 Policy and Procedural Guidance for Processing Requests to Alter US Army Corps of Engineers Civil Works Projects Pursuant to 33 USC 408.*

Attachment A: Transfer of Risk Performance Statistics

2018		Target Stage Annual Exceedance Probability		Long Term Risk (years)			Conditional Non-Exceedance Probability by Events					
Stream Name	Target Stage	Median	Expected	10	30	50	10%	4%	2%	1%	0.40%	0.20%
LRTB WOP*	40.89	0.9994	0.9994	1.0000	1.0000	1.0000	0.0003	0.0000	0.0000	0.0000	0.0003	0.0003
LRTB WP*	40.89	0.9994	0.9994	1.0000	1.0000	1.0000	0.0003	0.0000	0.0000	0.0000	0.0003	0.0003
SJ29 WOP	34.54	0.0612	0.0640	0.4841	0.8627	0.9635	0.8967	0.6803	0.2531	0.0742	0.0585	0.0557
SJ29 WP	34.54	0.0612	0.0640	0.4841	0.8627	0.9635	0.8967	0.6803	0.2531	0.0742	0.0584	0.0554
SJ29a WOP	29.47	0.0412	0.0428	0.3540	0.7304	0.8875	0.9641	0.8702	0.4688	0.2352	0.1233	0.0129
SJ29a WP	29.47	0.0412	0.0428	0.3540	0.7305	0.8875	0.9641	0.8702	0.4688	0.2352	0.1181	0.0103
SJ30 WOP	25.26	0.0232	0.0260	0.2319	0.5469	0.7327	0.9742	0.9174	0.7292	0.6104	0.4361	0.0601
SJ30 WP	25.26	0.0233	0.0261	0.2327	0.5482	0.7340	0.9742	0.9174	0.7292	0.6104	0.4118	0.0329
SJ31 WOP	29.06	0.0695	0.0730	0.5313	0.8971	0.9774	0.8648	0.6055	0.2078	0.0546	0.0197	0.0010
SJ31 WP	29.06	0.0695	0.0730	0.5314	0.8971	0.9774	0.8648	0.6055	0.2078	0.0546	0.0158	0.0004
SJ31a WOP	30.18	0.1447	0.1558	0.8162	0.9938	0.9998	0.5812	0.2686	0.0736	0.0130	0.0074	0.0016
SJ31a WP	30.18	0.1447	0.1558	0.8162	0.9938	0.9998	0.5812	0.2686	0.0736	0.0130	0.0074	0.0016
SJ31b WOP	29.42	0.0810	0.0851	0.5890	0.9306	0.9883	0.9062	0.8002	0.4808	0.2962	0.1394	0.0040
SJ31b WP	29.42	0.0810	0.0851	0.5891	0.9306	0.9883	0.9062	0.8002	0.4808	0.2962	0.1227	0.0018
SJ31c WOP	31.83	0.0014	0.0018	0.0174	0.0513	0.0840	0.9986	0.9949	0.9730	0.9569	0.9446	0.9132
SJ31c WP	31.83	0.0014	0.0018	0.0177	0.0521	0.0854	0.9986	0.9949	0.9730	0.9569	0.9423	0.9043
SJ36 WOP	25.20	0.0518	0.0548	0.4307	0.8155	0.9402	0.9206	0.7289	0.2937	0.0992	0.0626	0.0225
SJ36 WP	25.20	0.0518	0.0548	0.4308	0.8156	0.9403	0.9206	0.7289	0.2937	0.0992	0.0598	0.0184
SJ36a WOP	26.30	0.0765	0.0849	0.5882	0.9301	0.9882	0.7910	0.4529	0.1315	0.0264	0.0153	0.0037
SJ36a WP	26.30	0.0765	0.0849	0.5882	0.9302	0.9882	0.7910	0.4529	0.1315	0.0264	0.0145	0.0030
SJ36b WOP	22.32	0.0129	0.0181	0.1666	0.4211	0.5979	1.0000	0.8522	0.6495	0.4401	0.2851	0.0905
SJ36b WP	22.32	0.0129	0.0181	0.1670	0.4221	0.5990	1.0000	0.8522	0.6495	0.4401	0.2754	0.0713
SJ38 WOP	10.38	0.0703	0.0739	0.5358	0.9000	0.9784	0.9503	0.6604	0.3622	0.1915	0.1007	0.0412
SJ38 WP	10.38	0.0703	0.0739	0.5358	0.9000	0.9785	0.9503	0.6604	0.3622	0.1915	0.0985	0.0380
SJ40 WOP	23.11	0.0393	0.0431	0.3562	0.7332	0.8894	0.9442	0.8013	0.4172	0.2192	0.1339	0.0186
SJ40 WP	23.11	0.0393	0.0431	0.3565	0.7335	0.8896	0.9442	0.8013	0.4172	0.2192	0.1233	0.0108
SJ41 WOP	24.57	0.0079	0.0098	0.0939	0.2560	0.3891	0.9831	0.9494	0.8682	0.8213	0.7890	0.6913
SJ41 WP	24.57	0.0080	0.0099	0.0945	0.2574	0.3911	0.9831	0.9494	0.8682	0.8213	0.7850	0.6727
SJ42 WOP	20.81	0.0068	0.0087	0.0835	0.2302	0.3535	0.9930	0.9524	0.8598	0.8104	0.7687	0.5814
SJ42 WP	20.81	0.0070	0.0089	0.0850	0.2340	0.3587	0.9930	0.9524	0.8598	0.8104	0.7634	0.5346

2040		Target Stage Annual Exceedance Probability		Long Term Risk (years)			Conditional Non-Exceedance Probability by Events					
Stream Name	Target Stage	Median	Expected	10	30	50	10%	4%	2%	1%	0.40%	0.20%
LRTB WOP*	40.89	0.9994	0.9994	1.0000	1.0000	1.0000	0.0003	0.0000	0.0000	0.0000	0.0003	0.0003
LRTB WP*	40.89	0.9994	0.9994	1.0000	1.0000	1.0000	0.0003	0.0000	0.0000	0.0000	0.0003	0.0003
SJ29 WOP	34.54	0.0964	0.1003	0.6525	0.9580	0.9949	0.8440	0.2044	0.0066	0.0000	0.0000	0.0000
SJ29 WP	34.54	0.0964	0.1003	0.6525	0.9580	0.9949	0.8440	0.2045	0.0066	0.0000	0.0006	0.0006
SJ29a WOP	29.47	0.0643	0.0655	0.4921	0.8690	0.9662	0.9487	0.4692	0.2249	0.1248	0.0697	0.0526
SJ29a WP	29.47	0.0643	0.0653	0.4908	0.8680	0.9658	0.9489	0.4710	0.2259	0.1311	0.0891	0.0518
SJ30 WOP	25.26	0.0415	0.0427	0.3539	0.7303	0.8874	0.9615	0.7470	0.5101	0.2400	0.1347	0.0963
SJ30 WP	25.26	0.0423	0.0426	0.3529	0.7290	0.8865	0.9616	0.7489	0.4861	0.2225	0.1930	0.1577
SJ31 WOP	29.06	0.1051	0.1084	0.6824	0.9680	0.9968	0.7912	0.1555	0.0352	0.0286	0.0174	0.0092
SJ31 WP	29.06	0.1051	0.1083	0.6823	0.9679	0.9968	0.7910	0.1547	0.0351	0.0302	0.0215	0.0154
SJ31a WOP	30.18	0.1929	0.2040	0.8979	0.9989	1.0000	0.4399	0.0378	0.0068	0.0033	0.0021	0.0015
SJ31a WP	30.18	0.1929	0.2040	0.8979	0.9989	1.0000	0.4399	0.0379	0.0069	0.0041	0.0029	0.0024
SJ31b WOP	29.42	0.1050	0.1091	0.6850	0.9687	0.9969	0.8785	0.4870	0.2737	0.1330	0.0680	0.0454
SJ31b WP	29.42	0.1051	0.1087	0.6835	0.9683	0.9968	0.8788	0.4891	0.2744	0.1362	0.1166	0.0937
SJ31c WOP	31.83	0.0029	0.0033	0.0322	0.0934	0.1507	0.9980	0.9775	0.9521	0.9150	0.8990	0.8883
SJ31c WP	31.83	0.0030	0.0033	0.0329	0.0956	0.1542	0.9980	0.9775	0.9498	0.9089	0.8956	0.8881
SJ36 WOP	25.20	0.0831	0.0863	0.5944	0.9333	0.9890	0.8807	0.2488	0.0665	0.0201	0.0135	0.0104
SJ36 WP	25.20	0.0831	0.0861	0.5937	0.9329	0.9889	0.8807	0.2489	0.0729	0.0264	0.0200	0.0166
SJ36a WOP	26.30	0.1177	0.1254	0.7381	0.9820	0.9988	0.6573	0.0788	0.0143	0.0070	0.0042	0.0030
SJ36a WP	26.30	0.1177	0.1254	0.7380	0.9820	0.9988	0.6573	0.0788	0.0146	0.0089	0.0061	0.0048
SJ36b WOP	22.32	0.0421	0.0468	0.3807	0.7625	0.9089	0.9537	0.6868	0.3781	0.1150	0.0366	0.0081
SJ36b WP	22.32	0.0422	0.0469	0.3812	0.7630	0.9092	0.9537	0.6868	0.3761	0.1009	0.0441	0.0125
SJ38 WOP	10.38	0.1379	0.1504	0.8040	0.9925	0.9997	0.7766	0.3458	0.1544	0.0644	0.0609	0.0542
SJ38 WP	10.38	0.1379	0.1503	0.8038	0.9924	0.9997	0.7766	0.3457	0.1572	0.0722	0.0698	0.0657
SJ40 WOP	23.11	0.0656	0.0695	0.5135	0.8849	0.9727	0.9119	0.4093	0.2043	0.1008	0.0463	0.0273
SJ40 WP	23.11	0.0657	0.0692	0.5119	0.8837	0.9723	0.9118	0.4088	0.2059	0.1048	0.0873	0.0684
SJ41 WOP	24.57	0.0149	0.0171	0.1581	0.4033	0.5771	0.9738	0.8739	0.8060	0.6903	0.6499	0.6169
SJ41 WP	24.57	0.0154	0.0176	0.1628	0.4132	0.5888	0.9738	0.8738	0.7944	0.6588	0.6294	0.5822
SJ42 WOP	20.81	0.0163	0.0198	0.1811	0.4508	0.6317	0.9823	0.8587	0.7704	0.5214	0.3518	0.2090
SJ42 WP	20.81	0.0188	0.0210	0.1908	0.4702	0.6531	0.9823	0.8587	0.7355	0.4295	0.3223	0.2203

2065		Target Stage Annual Exceedance Probability		Long Term Risk (years)			Conditional Non-Exceedance Probability by Events					
Stream Name	Target Stage	Median	Expected	10	30	50	10%	4%	2%	1%	0.40%	0.20%
LRTB WOP*	40.89	0.9994	0.9994	1.0000	1.0000	1.0000	0.0002	0.0000	0.0000	0.0000	0.0002	0.0002
LRTB WP*	40.89	0.9994	0.9994	1.0000	1.0000	1.0000	0.0002	0.0000	0.0000	0.0000	0.0002	0.0002
SJ29 WOP	34.54	0.1333	0.1383	0.7743	0.9885	0.9994	0.7530	0.0277	0.0008	0.0003	0.0008	0.0008
SJ29 WP	34.54	0.1333	0.1382	0.7740	0.9885	0.9994	0.7515	0.0282	0.0009	0.0008	0.0004	0.0002
SJ29a WOP	29.47	0.0859	0.0880	0.6018	0.9369	0.9900	0.9202	0.2654	0.0686	0.0525	0.0341	0.0146
SJ29a WP	29.47	0.0859	0.0878	0.6010	0.9365	0.9899	0.9202	0.2795	0.0800	0.0476	0.0104	0.0037
SJ30 WOP	25.26	0.0559	0.0577	0.4481	0.8319	0.9488	0.9382	0.6301	0.3882	0.1789	0.1477	0.1467
SJ30 WP	25.26	0.0560	0.0580	0.4500	0.8336	0.9497	0.9382	0.6252	0.3869	0.1792	0.1302	0.1163
SJ31 WOP	29.06	0.1301	0.1334	0.7611	0.9864	0.9992	0.6750	0.0589	0.0058	0.0057	0.0041	0.0025
SJ31 WP	29.06	0.1412	0.1452	0.7916	0.9909	0.9996	0.6718	0.0705	0.0087	0.0086	0.0064	0.0032
SJ31a WOP	30.18	0.2755	0.2870	0.9660	1.0000	1.0000	0.2708	0.0087	0.0005	0.0005	0.0003	0.0002
SJ31a WP	30.18	0.2755	0.2870	0.9660	1.0000	1.0000	0.2708	0.0089	0.0005	0.0003	0.0002	0.0002
SJ31b WOP	29.42	0.1361	0.1392	0.7767	0.9889	0.9994	0.8347	0.2911	0.1183	0.0713	0.0605	0.0593
SJ31b WP	29.42	0.1362	0.1392	0.7767	0.9889	0.9994	0.8348	0.2924	0.1186	0.0726	0.0555	0.0503
SJ31c WOP	31.83	0.0043	0.0047	0.0464	0.1328	0.2113	0.9968	0.9581	0.9312	0.8997	0.8835	0.8772
SJ31c WP	31.83	0.0045	0.0049	0.0475	0.1358	0.2160	0.9968	0.9575	0.9276	0.8948	0.8804	0.8730
SJ36 WOP	25.20	0.1093	0.1135	0.7000	0.9730	0.9976	0.8033	0.0782	0.0057	0.0012	0.0007	0.0005
SJ36 WP	25.20	0.1093	0.1134	0.6998	0.9730	0.9976	0.8033	0.0836	0.0057	0.0011	0.0006	0.0004
SJ36a WOP	26.30	0.1668	0.1788	0.8605	0.9973	0.9999	0.4814	0.0181	0.0010	0.0009	0.0007	0.0005
SJ36a WP	26.30	0.1668	0.1788	0.8605	0.9973	0.9999	0.4814	0.0185	0.0010	0.0005	0.0002	0.0003
SJ36b WOP	22.32	0.0560	0.0603	0.4629	0.8451	0.9553	0.9469	0.4125	0.1963	0.0456	0.0059	0.0030
SJ36b WP	22.32	0.0561	0.0604	0.4634	0.8455	0.9555	0.9469	0.4127	0.1942	0.0444	0.0049	0.0026
SJ38 WOP	10.38	0.1421	0.1493	0.8015	0.9922	0.9997	0.7904	0.1692	0.0650	0.0321	0.0240	0.0165
SJ38 WP	10.38	0.1421	0.1493	0.8014	0.9922	0.9997	0.7904	0.1745	0.0690	0.0339	0.0250	0.0196
SJ40 WOP	23.11	0.0922	0.0961	0.6360	0.9518	0.9936	0.8579	0.2046	0.0678	0.0456	0.0355	0.0347
SJ40 WP	23.11	0.0923	0.0962	0.6362	0.9519	0.9936	0.8579	0.2070	0.0679	0.0459	0.0282	0.0155
SJ41 WOP	24.57	0.0209	0.0241	0.2163	0.5187	0.7044	0.9613	0.8315	0.7681	0.6512	0.5920	0.5324
SJ41 WP	24.57	0.0212	0.0246	0.2202	0.5259	0.7117	0.9613	0.8301	0.7609	0.6382	0.5472	0.5023
SJ42 WOP	20.81	0.0272	0.0294	0.2577	0.5910	0.7747	0.9601	0.8193	0.6995	0.3885	0.2419	0.1750
SJ42 WP	20.81	0.0281	0.0301	0.2630	0.5997	0.7826	0.9601	0.8183	0.6747	0.3559	0.2090	0.1655

* The dryland levee index point (LRTB) presents a somewhat unique case for a HEC-FDA analysis in that the model is being asked to assess EAD and EALL on the waterside of a dryland levee rather than the more typical analysis for the landside of a levee in a riverine setting.

Appendix G

KSN ULDC 2018 Cost Estimate

KJELDSEN SINNOCK NEUDECK INC.
Civil Engineers and Land Surveyors

Stephen K. Sinnock, P.E.
Christopher H. Neudeck, P.E.
Neal T. Colwell, P.E.
Barry O'Regan, P.E.

2255-0030
05-300

TECHNICAL MEMORANDUM

March 3, 2016

Project:	Cities of Lathrop and Manteca Urban Levee Design Criteria (ULDC) Evaluation
Subject:	Identify Necessary Improvements and Cost Estimate
Prepared by:	Erik E. Almaas, P.E.
Reviewed by:	Christopher H. Neudeck, P.E. David A. Peterson, P.E.

1.0 PURPOSE

Detailed analyses and documentation have been performed and developed of the existing levee system of Reclamation District No. 17 (RD17) in order to determine the extent of Urban Levee Design Criteria (ULDC) compliance. The purpose of this technical memorandum is to identify improvements that are necessary to bring ULDC deficiencies into compliance and to determine the costs associated with said improvements. The team responsible for undertaking this effort consists of Peterson, Brustad, Inc. (PBI), Kjeldsen, Sinnock and Neudeck, Inc. (KSN), and ENGEO, Inc.

2.0 PROJECT BACKGROUND

Legislation passed in 2007 substantially limits the ability of urban communities to approve residential, commercial and industrial development after July 2016 unless they have an Urban Level of Flood Protection (ULOP) or are making adequate progress toward achieving ULOP 200-year flood protection. Background on this mandate was summarized in "*Position Paper for City of Lathrop, Compliance with SB5: ULOP 200-Year Flood Protection for Lathrop (RD 17)*" dated February 3, 2014, by Glenn Gebhardt, City Engineer for the City of Lathrop.

In April 2014, PBI prepared a Strategic Plan for ULOP Compliance for RD17 communities, which outlined a strategic plan for complying with SB5 for the area protected by RD17 levees on a schedule that will meet the requirements of the law. The main component of this Strategic Plan was to perform a comprehensive ULDC analysis and identify areas of deficiencies for each of the ULDC criteria. The identified improvements presented in this technical memorandum are intended to address these areas of deficiencies.

3.0 LEVEE ASSESSMENT AND PROPOSED IMPROVEMENTS

The analyses described in this technical memorandum have been developed at a detailed level using an assessment of the existing levee system to determine the extent of ULDC deficiencies. Individual analyses were performed for each of the ULDC criteria for this overall evaluation and compiled to identify necessary improvements.

Each ULDC criteria is included in Table 1 below and is denoted with the following attributes.

- **Analysis Only** includes ULDC items in which improvements are not needed resulting directly from the analysis. Instead, these items are utilized to consider necessary improvement in other ULDC items.
- **Long-Term Plan Required** includes ULDC items in which a long-term remediation plan is required or already currently exists.
- **Improvements Required** includes ULDC items in which remediation improvements have been identified.

Table 1 - ULDC Criteria

ULDC Criteria	Analysis Only	Long-Term Plan Required	Improvements Required
7.1 Design Water Surface Elevation	x		
7.2 Minimum Top of Levee			
7.3 Soil Sampling, Testing, and Logging	x		
7.4 Slope Stability for Intermittently Loaded Levees			x
7.5 Underseepage for Intermittently Loaded Levees			x
7.6 Frequently Loaded Levees			
7.7 Seismic Vulnerability		x	
7.8 Levee Geometry			x
7.9 Interfaces and Transitions			
7.10 Erosion			x
7.11 Right-of-Way		x	x
7.12 Encroachments		x	x
7.13 Penetrations		x	x
7.14 Floodwalls, Retaining Walls, and Closure Structures			
7.15 Animal Burrows[1]			
7.16 Levee Vegetation[1]			
7.17 Wind Setup and Wave Runup	x		
7.18 Security		x	
7.19 Sea Level Rise	x		
7.20 Emergency Actions		x	

Identified improvements consist of two categories: construction improvements and real estate improvements.

[1] 7.15 Animal Burrows and 7.16 Levee Vegetation do not require improvements but instead only require a more focused effort in identified reaches during normal operations and maintenance procedures.

3.1 Construction Improvements

Identified construction improvement projects are required as follows:

Project No. 2.1 – Dryland Levee Reconstruction and Seepage Berm:

Levee reconstruction and seepage berm improvements are necessary from Sta. 853+50 to Sta. 972+25. The improvements consist of widening the levee and constructing a drained seepage berm. They also include reconstructing pipe penetrations that cross the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.5 Underseepage for Intermittently Loaded Levees, 7.8 Levee Geometry, and 7.13 Penetrations.

Project No. 5.1 – Cutoff Wall:

Cutoff wall improvements are necessary from Sta. 119+50 to Sta. 192+00. The improvements consist of constructing a mix-in-place cutoff wall of varying depth. They also include reconstructing pipe penetrations that cross the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.4 Slope Stability for Intermittently Loaded Levees, 7.5 Underseepage for Intermittently Loaded Levees, and 7.13 Penetrations.

Project No. 5.2 – Seepage Berm:

Seepage berm improvements are necessary from Sta. 190+50 to Sta. 297+75. The improvements consist of constructing a drained seepage berm of varying width. They also include reconstructing pipe penetrations that cross the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.4 Slope Stability for Intermittently Loaded Levees, 7.5 Underseepage for Intermittently Loaded Levees, and 7.13 Penetrations.

Project No. 5.3 – Cutoff Wall:

Cutoff wall improvements are necessary from Sta. 311+00 to Sta. 518+50. The improvements consist of constructing a traditional cement/bentonite slurry cutoff wall of varying depth. They also include reconstructing pipe penetrations that cross the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.4 Slope Stability for Intermittently Loaded Levees, 7.5 Underseepage for Intermittently Loaded Levees, and 7.13 Penetrations.

Project No. 10.1 – Erosion Repairs:

Erosion repairs are necessary from Sta. 114+00 to Sta. 972+25. The improvements consist of supplementing riprap rock slope protections at varying application rates. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.10 Erosion.

Project No. 12.1 – Encroachment Remediation:

Encroachment remediation is necessary at various locations from Sta. 112+73 to Sta. 815+40. The improvements consist of removing high hazard encroachments. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.12 Encroachments.

Project No. 13.1 – Pipe Penetrations Rehabilitation:

Pipe penetration rehabilitation is necessary at various locations from Sta. 571+35 to Sta. 801+00. The improvements consist of reconstructing pipe penetrations that cross the levee. Existing ULDC deficiencies that are addressed resulting from these improvements include 7.13 Penetrations.

A summary of deficiencies and the proposed construction improvements to address said deficiencies is presented below in Figure 1. The green bars indicate compliant levee reaches, whereas the red bars indicate deficient levee reaches.

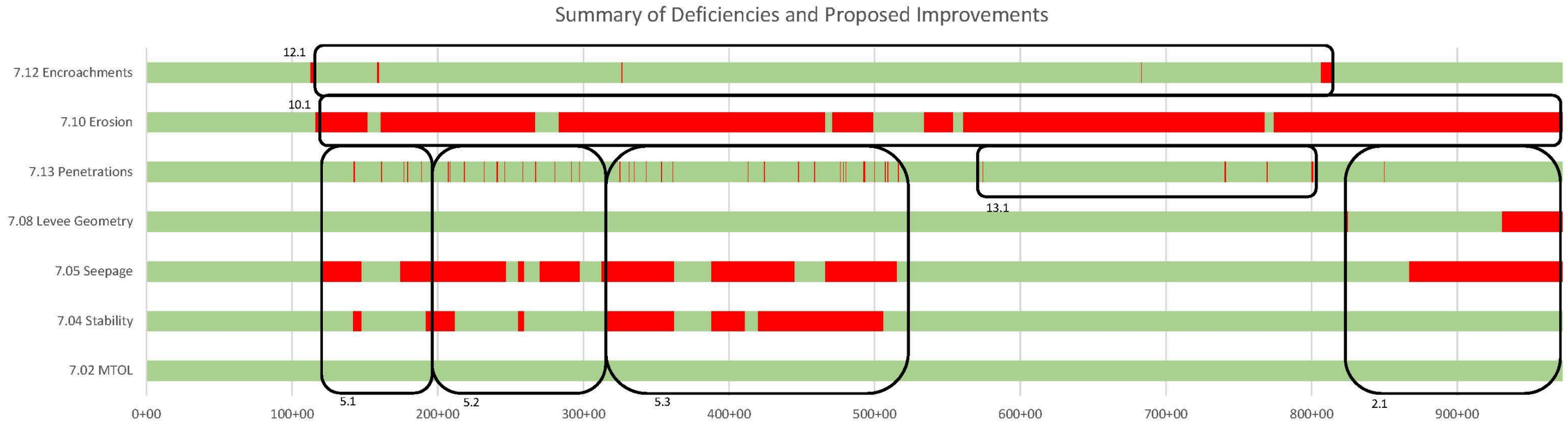


Figure 1 - Deficiencies and Proposed Construction Improvements

A tabulation of proposed construction improvements is shown below in Table 1. Conceptual level improvement plans have been prepared and are included in **EXHIBIT 1**.

Table 2 - Proposed Construction Improvements

Project No.	Project Name	7.2 MTOL	7.4 Stability	7.5 Seepage	7.8 Geometry	7.10 Erosion	7.12 Encroachments	7.13 Penetrations
2.1	Dryland Levee Reconstruction and Seepage Berm			X	X			X
5.1	Cutoff Wall		X	X				X
5.2	Seepage Berm		X	X				X
5.3	Cutoff Wall		X	X				X
10.1	Erosion Repairs					X		
12.1	Encroachment Remediation						X	
13.1	Pipe Penetration Rehabilitation							X

3.2 Real Estate Improvements

Identified real estate improvements are required as follows.

- Additional right-of-way acquisition is needed resulting from existing levee reaches that are currently deficient.
- Additional right-of-way acquisition is needed resulting from additional levee footprint for the proposed construction improvement projects as described above, where applicable.

4.0 COST ESTIMATE

The overall estimated cost to obtain full ULDC compliance for the RD17 levee system is summarized in Table 2 below.

Table 3 - Summary of Proposed Improvement Costs

Project No.	Sta. from	Sta. to	Project Name	Cost
Construction Improvements				
2.1	822+80	972+25	Dryland Levee Reconstruction and Seepage Berm	$27,765,000
5.1	119+50	192+00	Cutoff Wall	$10,224,000
5.2	190+50	297+75	Seepage Berm	$19,501,000
5.3	311+00	518+50	Cutoff Wall	$35,050,000
10.1	114+00	972+25	Erosion Repairs	$9,386,000
12.1	112+73	815+40	Encroachment Remediation	$678,000
13.1	571+35	801+00	Pipe Penetration Rehabilitation	$2,128,000
			Subtotal:	*$104,732,000*
Real Estate Improvements				
11.1			Right-of-Way Acquisition (existing deficiencies)	$12,381,000
11.2			Right-of-Way Acquisition (new construction improvements)	$3,900,000
			Subtotal:	*$16,281,000*
			Subtotal:	$121,013,000
			Dryland Levee Extension Alternative:	$15,872,000
			TOTAL:	**$136,885,000**

A detailed breakdown of the individual improvement projects that comprise this cost estimate is included in **EXHIBIT 2**. The costs for the construction improvement projects include soft costs (i.e. management, environmental, engineering, etc.). A basis for quantity calculations for the construction improvement projects in included in **EXHIBIT 3**. All costs include a contingency factor.

Cities of Lathrop and Manteca

ULDC Evaluation

Identified Improvements

EXHIBIT 1

Improvement Plans

RECLAMATION DISTRICT NO. 17

MOSSDALE TRACT

SAN JOAQUIN COUNTY, CALIFORNIA

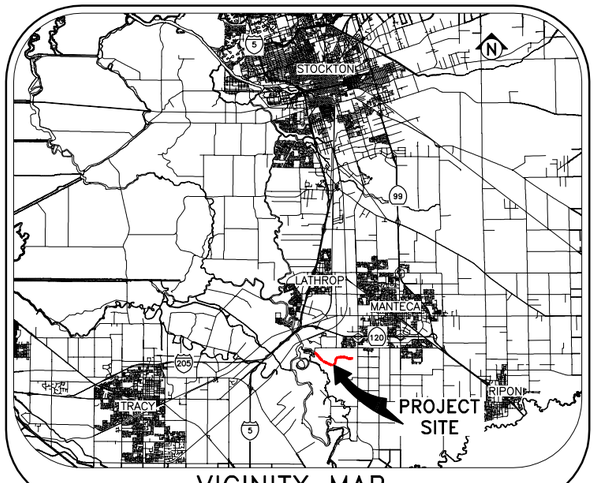
URBAN LEVEE DESIGN CRITERIA, PROJECT NO. 2.1

DRYLAND LEVEE IMPROVEMENTS

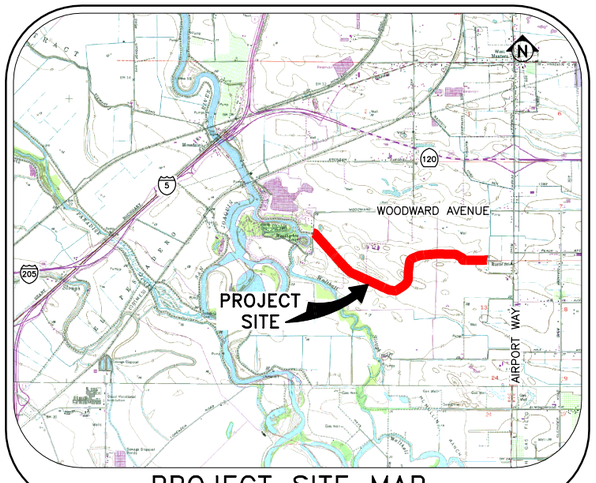
AT

VARIOUS LOCATION BETWEEN

STATION 853+50 AND STATION 972+25



VICINITY MAP



PROJECT SITE MAP

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	BASE MAP
3	DETAILS

SHEET INDEX

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Stockton, CA 95203
(209) 946-0268
1355 Halyard Drive, Suite 180
West Sacramento, CA 95691
(916) 403-5900
www.ksninc.com

CITIES OF LATHROP AND MANTECA
ULDC PROJECT 2.1 – DRYLAND LEVEE
SAN JOAQUIN COUNTY, CALIFORNIA

TITLE SHEET

Revisions				
No.	Description	Date	By	Aprvd. By

Design	EEA
Drawn	EEA
Check	CHN
Scale	AS SHOWN
Original Drawing Scale	0 ½" 1"
Date	NOVEMBER 2015
Sheet Number	1 Of 3
Project File No.	2255-0030

C-001

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C–101

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 2.1 – DRYLAND LEVEE
SAN JOAQUIN COUNTY, CALIFORNIA

BASE MAP

Revisions				
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Drawn	EEA
Check	CHN

Scale: 1" = 500'

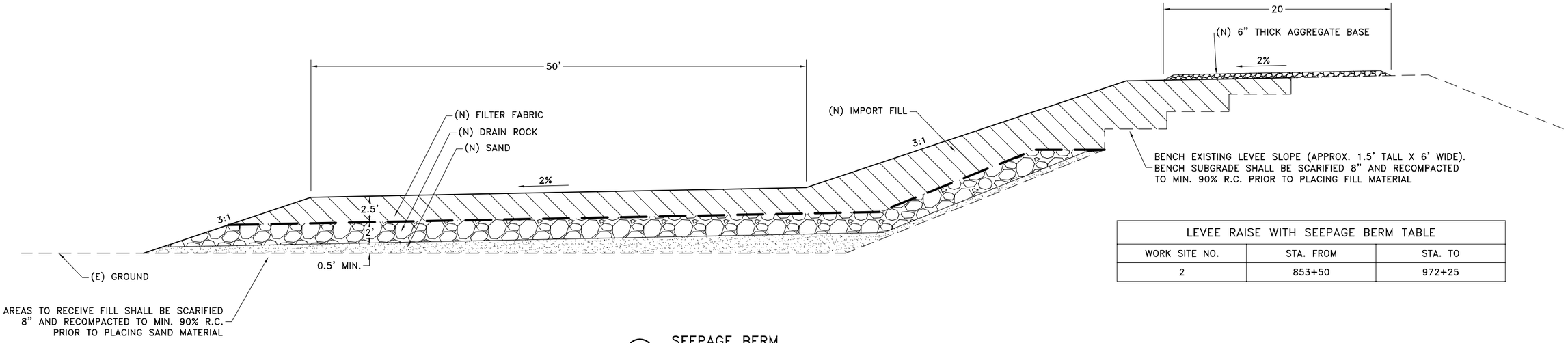
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Date: NOVEMBER 2015

Sheet Number: 2 Of 3

Project File No.: 2255–0030

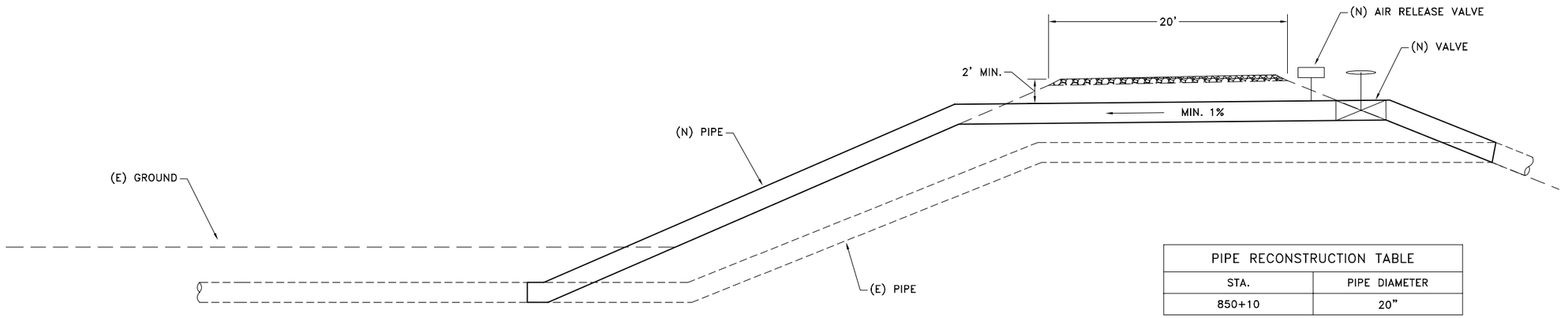
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LEVEE RAISE WITH SEEPAGE BERM TABLE		
WORK SITE NO.	STA. FROM	STA. TO
2	853+50	972+25

1 SEEPAGE BERM

SCALE: N.T.S.



PIPE RECONSTRUCTION TABLE	
STA.	PIPE DIAMETER
850+10	20"

2 PIPE RECONSTRUCTION

SCALE: N.T.S.

C-501

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 2.1 – DRYLAND LEVEE
SAN JOAQUIN COUNTY, CALIFORNIA

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Original Drawing Scale 0 ½" 1"

Date NOVEMBER 2015
Sheet Number 3 Of 3
Project File No. 2255-0030

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RECLAMATION DISTRICT NO. 17

MOSSDALE TRACT

SAN JOAQUIN COUNTY, CALIFORNIA

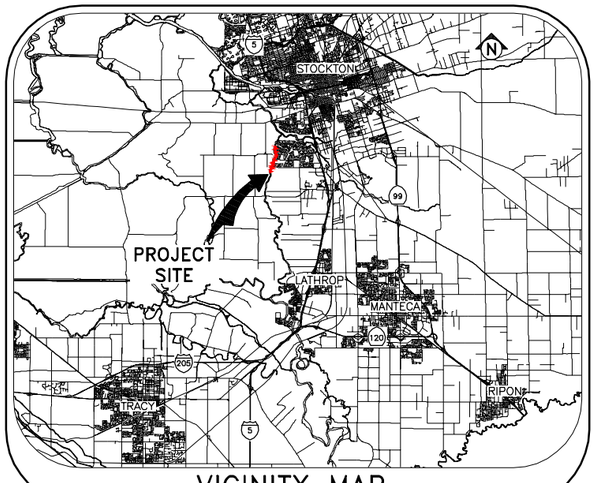
URBAN LEVEE DESIGN CRITERIA, PROJECT NO. 5.1

CUTOFF WALL IMPROVEMENTS

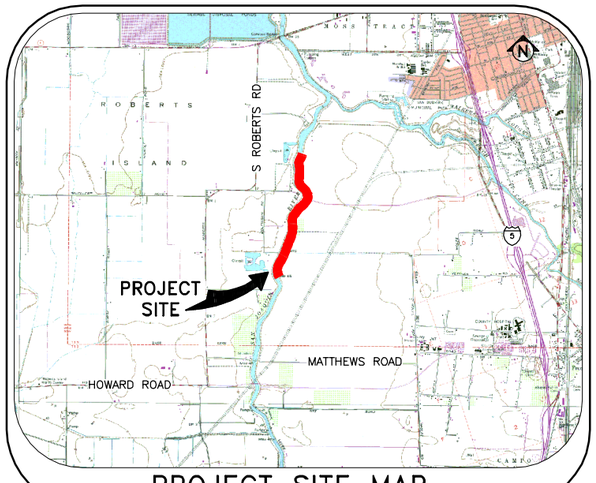
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VARIOUS LOCATION BETWEEN

STATION 119+50 AND STATION 192+00



VICINITY MAP



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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.1 – CUTOFF WALL
SAN JOAQUIN COUNTY, CALIFORNIA

TITLE SHEET

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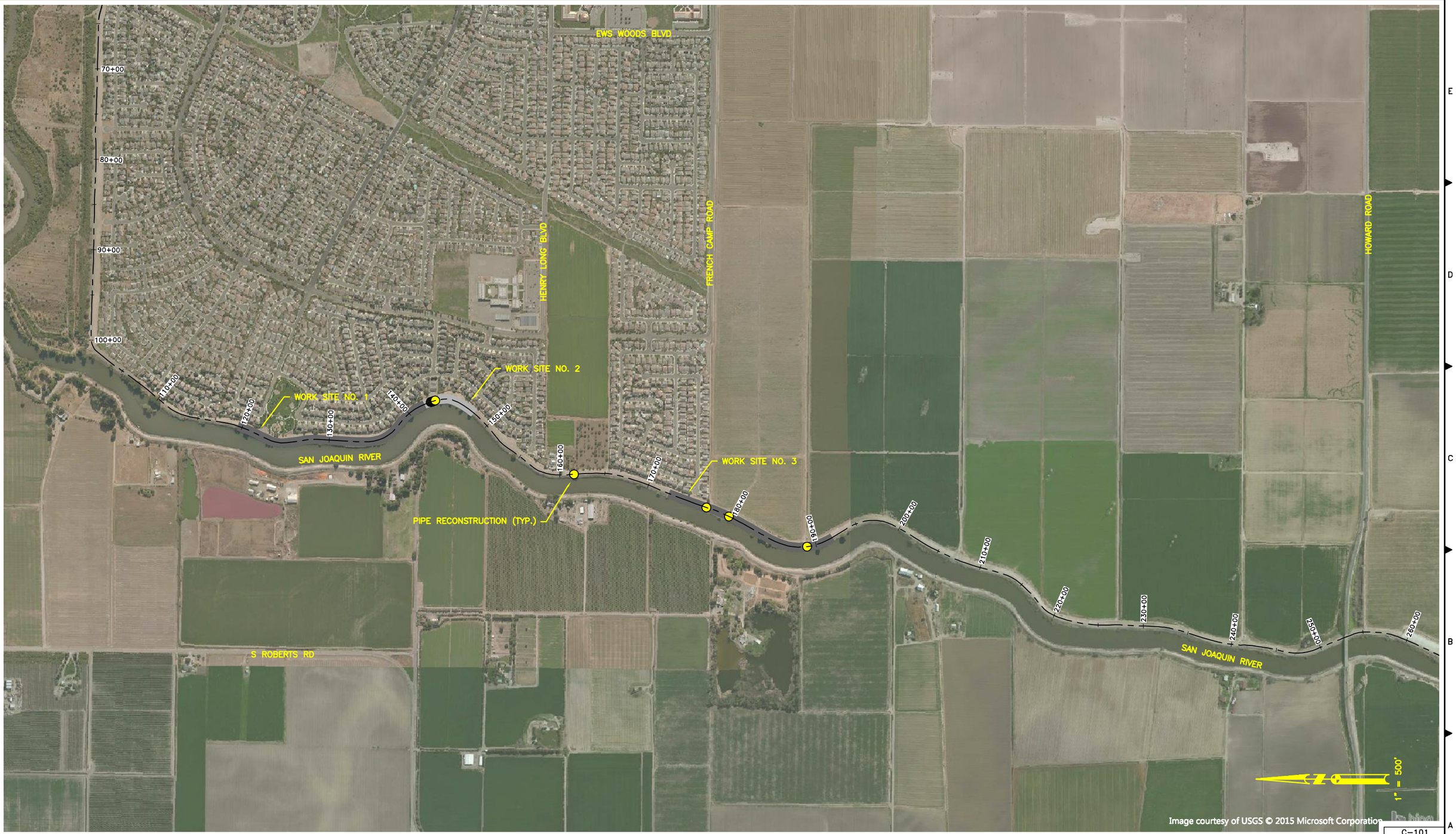
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Sheet Number 1 Of 4

Project File No. 2255-0030

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C–101

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.1 – CUTOFF WALL
SAN JOAQUIN COUNTY, CALIFORNIA

BASE MAP

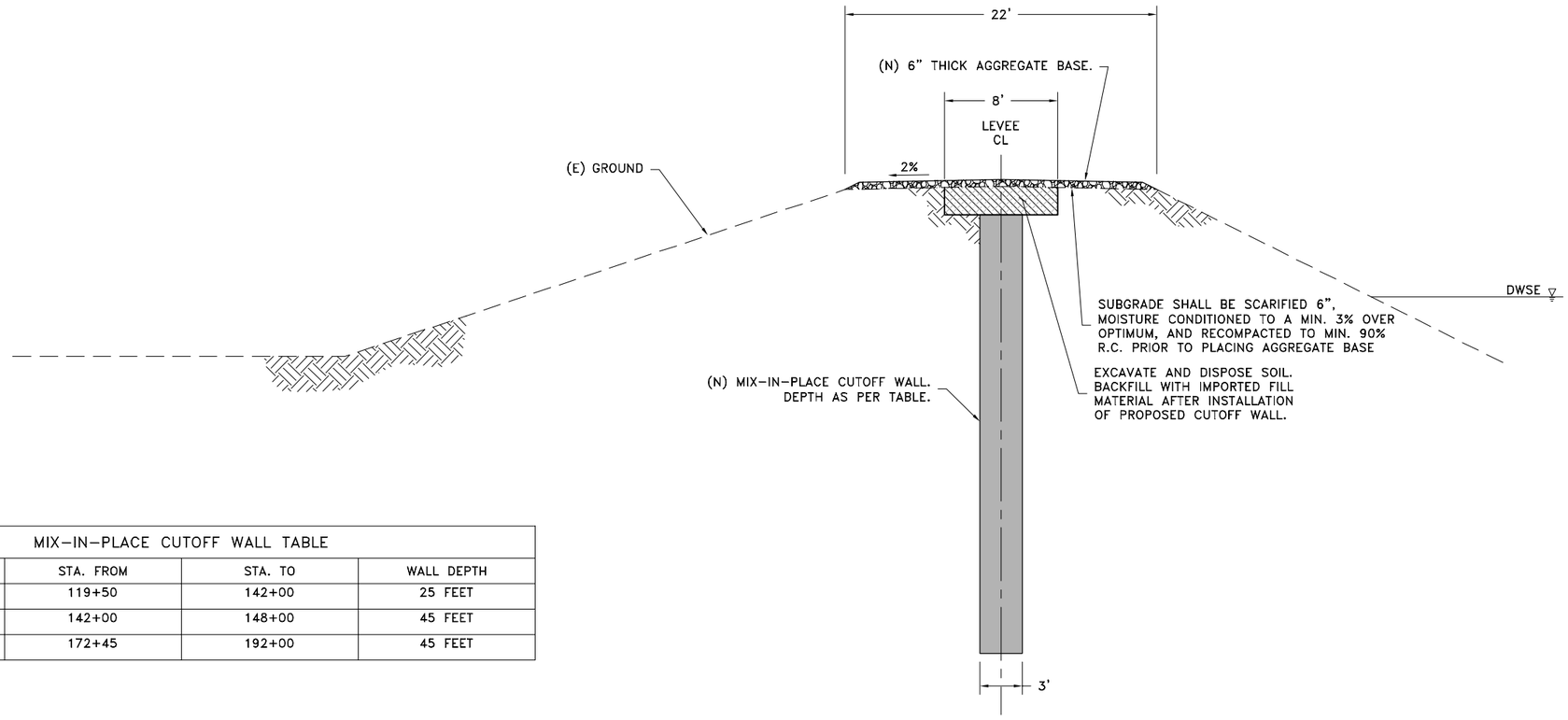
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Check CHN

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Original Drawing Scale 0 ½" 1"

Date NOVEMBER 2015
Sheet Number 2 Of 4
Project File No. 2255–0030

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MIX-IN-PLACE CUTOFF WALL TABLE			
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2	142+00	148+00	45 FEET
3	172+45	192+00	45 FEET

1 CUTOFF WALL (MIX-IN-PLACE WALL)

SCALE: N.T.S.

CALL BEFORE YOU DIG 800 227 2600 UNDERGROUND SERVICE ALERT

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10%	12/2/2015

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.1 – CUTOFF WALL
SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

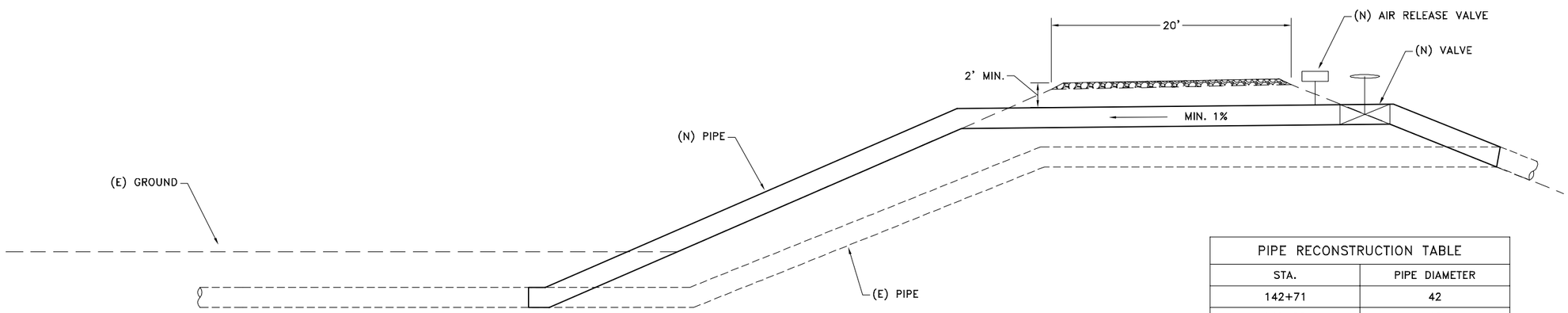
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Original Drawing Scale 0 ½" 1"

C-501
Date NOVEMBER 2015
Sheet Number 3 Of 4
Project File No. 2255-0030

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\05.1_Sht 03_Details.dwg
PLOT DATE: Dec 08, 2015 - 8:25am



2 PIPE RECONSTRUCTION

SCALE: N.T.S.

PIPE RECONSTRUCTION TABLE	
STA.	PIPE DIAMETER
142+71	42
142+80	42
142+89	42
142+97	8
142+99	8
143+07	42
143+16	42
143+25	42
161+58	8
176+88	8
179+56	16
188+98	12

CALL BEFORE YOU DIG 1-800-227-2600 UNDERGROUND SERVICE ALERT

Submittal	
%	Date
10%	12/2/2015

KSN INC. KJELDSEN SINNOCK NEUDECK
Civil Engineers and Land Surveyors
711 N. Pershing Avenue
Stockton, CA 95203
(209) 946-0268
1355 Halyard Drive, Suite 180
West Sacramento, CA 95691
(916) 403-5900
www.ksninc.com

CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.1 – CUTOFF WALL
SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

Revisions				
No.	Description	Date	By	Aprvd. By

Design EEA
Drawn EEA
Check CHN

Scale AS SHOWN
Original Drawing Scale 0 ½" 1"

Date NOVEMBER 2015
Sheet Number 4 Of 4
Project File No. 2255-0030

C-502

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\05.1_Sht 04_Details.dwg
PLOT DATE: Dec 08, 2015 - 8:24am

RECLAMATION DISTRICT NO. 17

MOSSDALE TRACT

SAN JOAQUIN COUNTY, CALIFORNIA

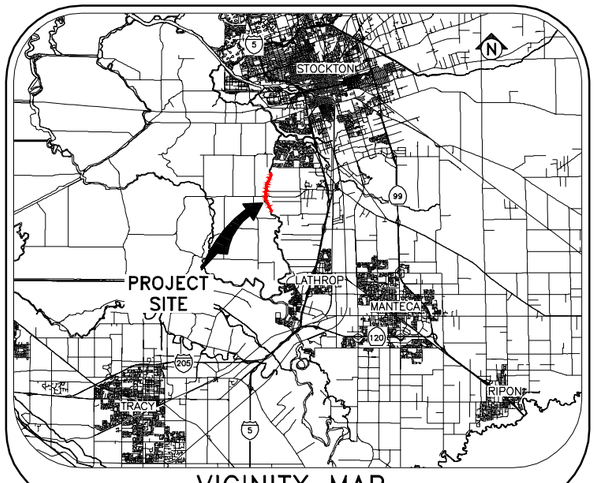
URBAN LEVEE DESIGN CRITERIA, PROJECT NO. 5.2

SEEPAGE BERM IMPROVEMENTS

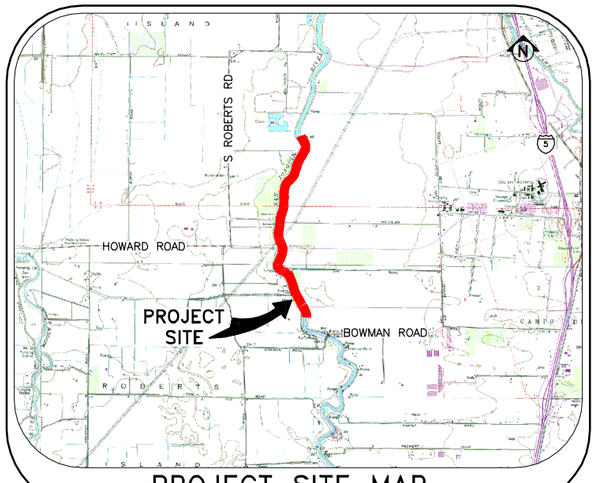
AT

VARIOUS LOCATION BETWEEN

STATION 190+50 AND STATION 297+75



VICINITY MAP



PROJECT SITE MAP

SHEET INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	BASE MAP
3–4	DETAILS

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Submittal	
%	Date
10%	12/2/2015

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.2 – SEEPAGE BERM
SAN JOAQUIN COUNTY, CALIFORNIA

TITLE SHEET

Revisions				
No.	Description	Date	By	Aprvd. By

Design	EEA
Drawn	EEA
Check	CHN
Scale	AS SHOWN
Original Drawing Scale	0 ½" 1"
Date	NOVEMBER 2015
Sheet Number	1 Of 4
Project File No.	2255-0030

C-001

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\05.2_Sht 01_Title Sheet.dwg
PLOT DATE: Dec 04, 2015 - 3:26pm



C-101

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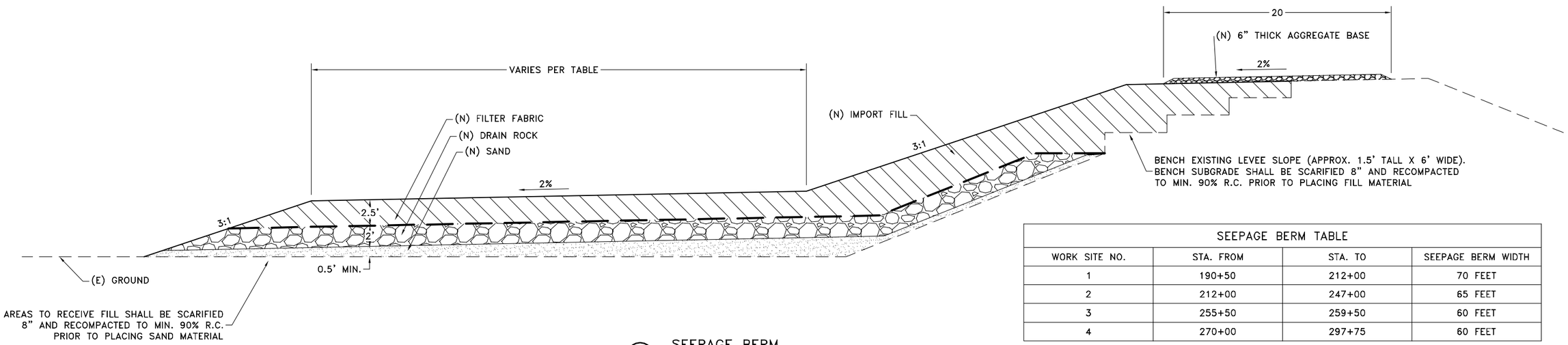
CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.2 – SEEPAGE BERM
SAN JOAQUIN COUNTY, CALIFORNIA

BASE MAP

Revisions				
No.	Description	Date	By	Aprvd. By

Design	EEA
Drawn	EEA
Check	CHN
Scale	1" = 400'
Original Drawing Scale	0 ½" 1"
Date	NOVEMBER 2015
Sheet Number	2 Of 4
Project File No.	2255-0030

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PLOT DATE: Dec 07, 2015 - 9:34am



1 SEEPAGE BERM

SCALE: N.T.S.

SEEPAGE BERM TABLE			
WORK SITE NO.	STA. FROM	STA. TO	SEEPAGE BERM WIDTH
1	190+50	212+00	70 FEET
2	212+00	247+00	65 FEET
3	255+50	259+50	60 FEET
4	270+00	297+75	60 FEET

C-501

Submittal	
%	Date
10%	12/2/2015

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West Sacramento, CA 95691
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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.2 – SEEPAGE BERM
SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

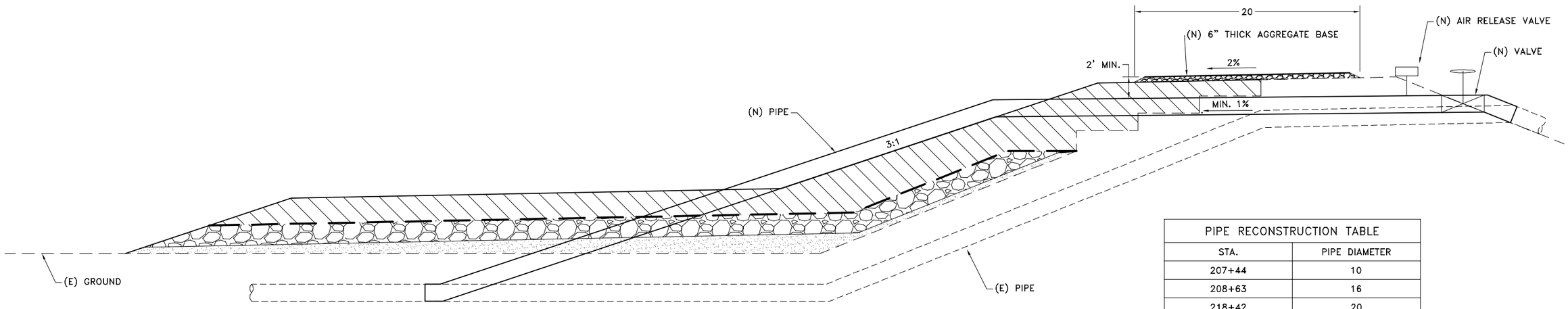
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No.	Description	Date	By	Aprvd. By

Design EEA
Drawn EEA
Check CHN

Scale AS SHOWN
Original Drawing Scale 0 ½" 1"

Date NOVEMBER 2015
Sheet Number 3 Of 4
Project File No. 2255-0030

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\05.2_Sht 03_Details.dwg
PLOT DATE: Dec 08, 2015 - 8:32am



2 PIPE RECONSTRUCTION

SCALE: N.T.S.

PIPE RECONSTRUCTION TABLE	
STA.	PIPE DIAMETER
207+44	10
208+63	16
218+42	20
232+05	8
240+95	8
241+31	8
241+46	8
246+25	10
258+70	10
267+39	10
280+59	16
291+91	12
297+44	12

CALL BEFORE YOU DIG 800-227-2600 UNDERGROUND SERVICE ALERT

Submittal	
%	Date
10%	12/2/2015

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.2 – SEEPAGE BERM
SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

Revisions				
No.	Description	Date	By	Aprvd. By

Design EEA
Drawn EEA
Check CHN

Scale AS SHOWN
Original Drawing Scale 0 ½" 1"

Date NOVEMBER 2015
Sheet Number 4 Of 4
Project File No. 2255-0030

C-502

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\05.2_Sht 04_Details.dwg
PLOT DATE: Dec 08, 2015 - 8:34am

RECLAMATION DISTRICT NO. 17

MOSSDALE TRACT

SAN JOAQUIN COUNTY, CALIFORNIA

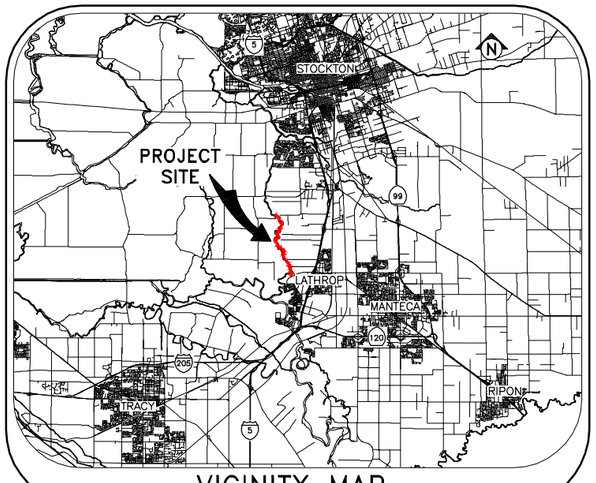
URBAN LEVEE DESIGN CRITERIA, PROJECT NO. 5.3

CUTOFF WALL IMPROVEMENTS

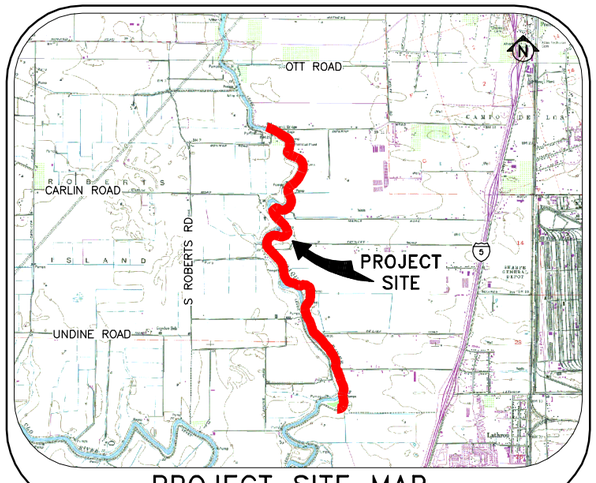
AT

VARIOUS LOCATION BETWEEN

STATION 311+00 AND STATION 518+50



VICINITY MAP



PROJECT SITE MAP

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	BASE MAP
3–4	DETAILS

SHEET INDEX

Submittal	
%	Date
10%	12/2/2015

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.3 – CUTOFF WALL
SAN JOAQUIN COUNTY, CALIFORNIA

TITLE SHEET

Revisions				
No.	Description	Date	By	Aprvd. By

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Drawn EEA
Check CHN

Scale AS SHOWN

Original Drawing Scale 0 ½" 1"

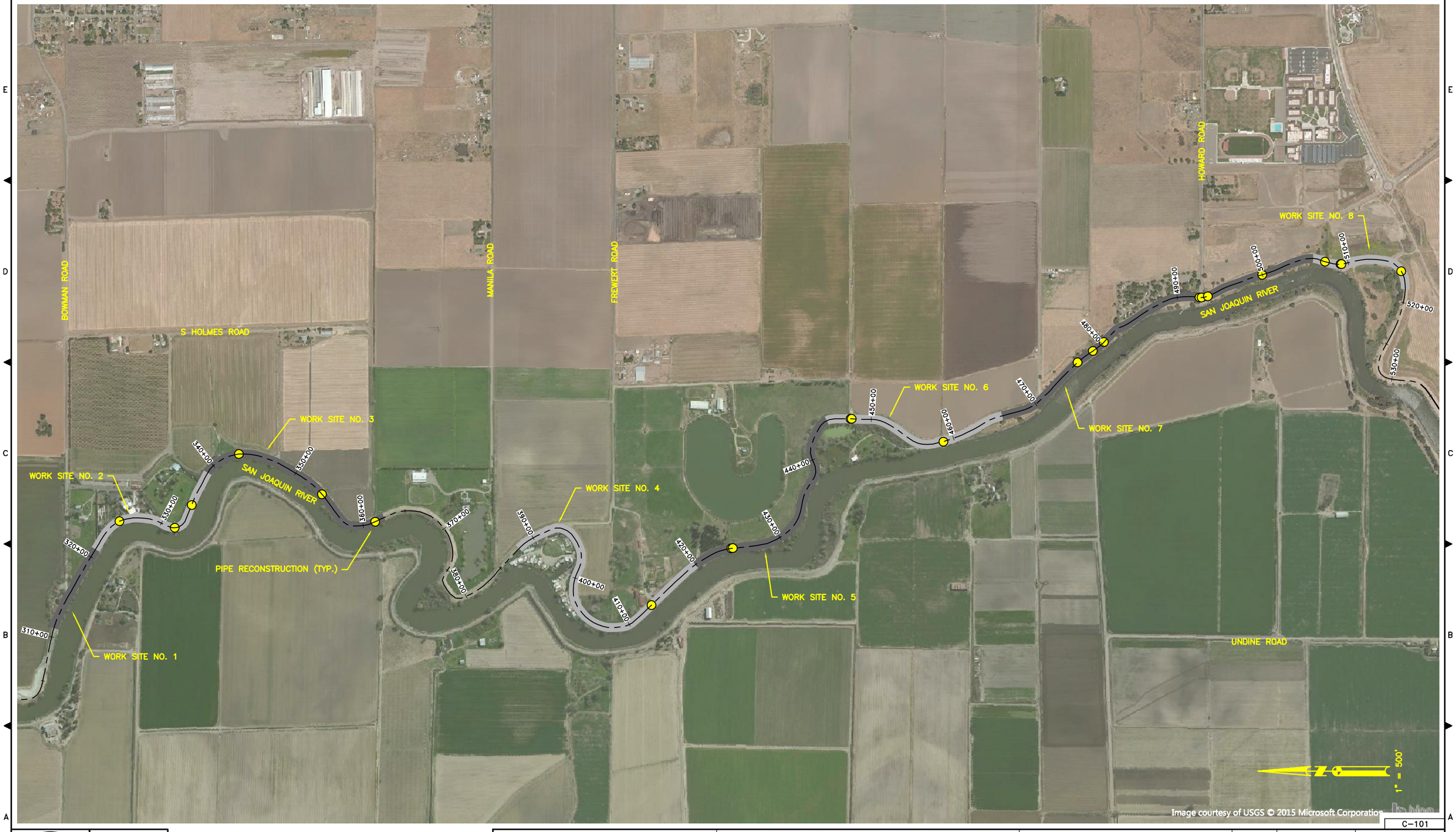
Date NOVEMBER 2015

Sheet Number 1 Of 4

Project File No. 2255-0030

C-001

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PLOT DATE: Dec 04, 2015 - 3:51pm



C-101

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.3 – CUTOFF WALL
SAN JOAQUIN COUNTY, CALIFORNIA

BASE MAP

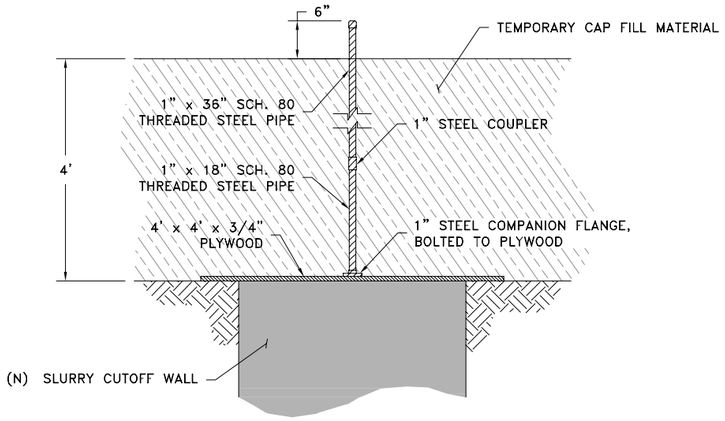
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Check CHN

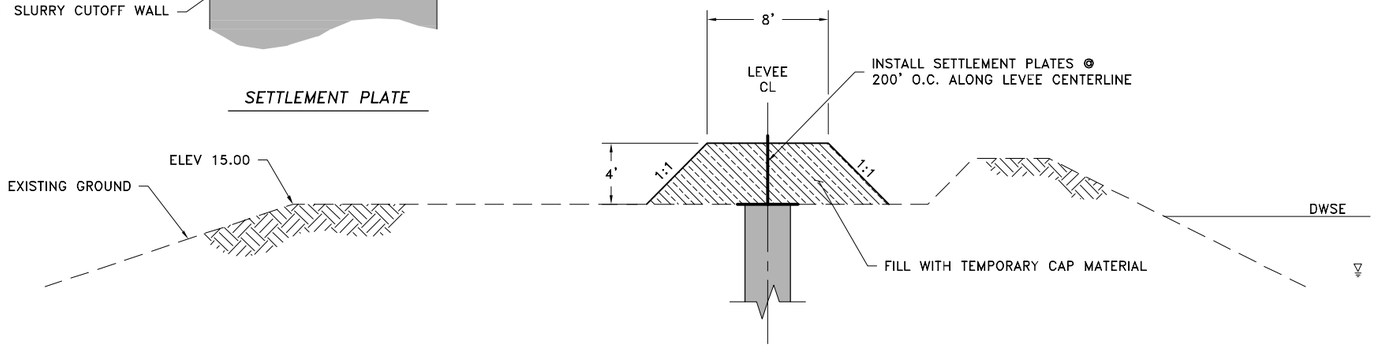
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Date NOVEMBER 2015
Sheet Number 2 Of 4
Project File No. 2255-0030

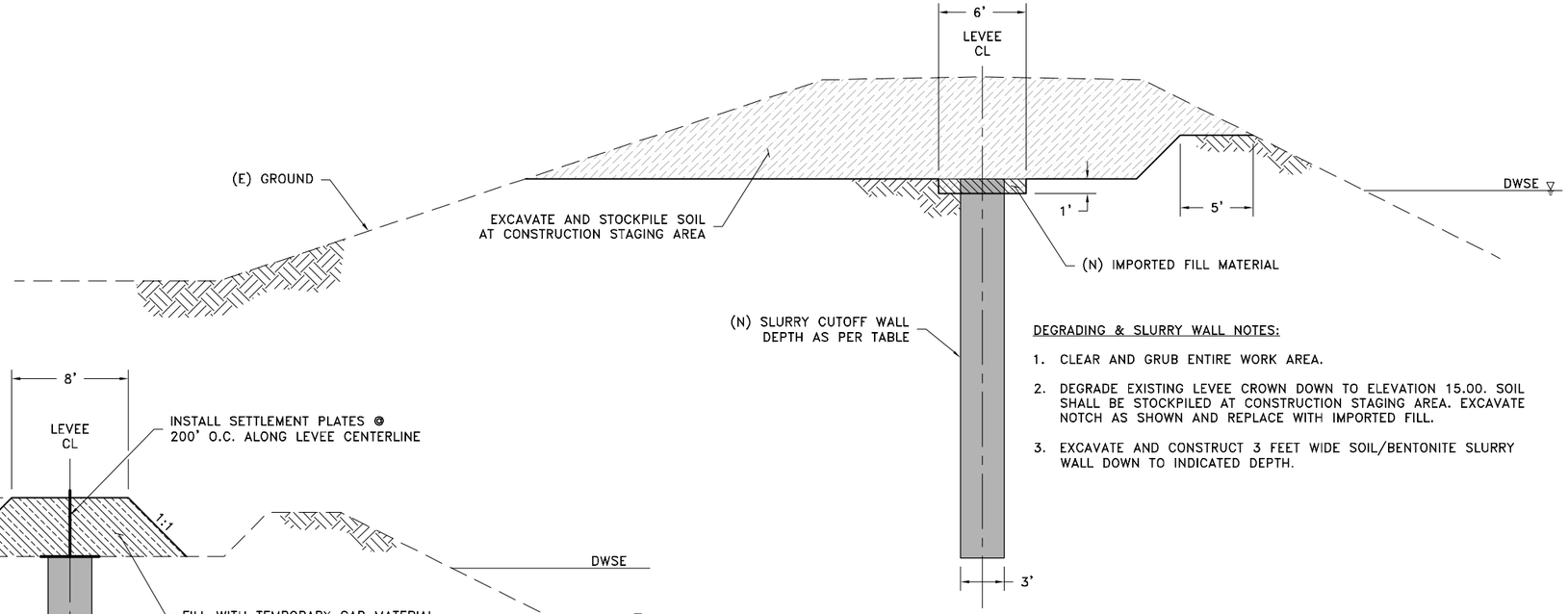
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PLOT DATE: Dec 07, 2015 - 9:35am



SETTLEMENT PLATE



TEMPORARY CAP



DEGRADING & SLURRY WALL

DEGRADING & SLURRY WALL NOTES:

1. CLEAR AND GRUB ENTIRE WORK AREA.
2. DEGRADE EXISTING LEVEE CROWN DOWN TO ELEVATION 15.00. SOIL SHALL BE STOCKPILED AT CONSTRUCTION STAGING AREA. EXCAVATE NOTCH AS SHOWN AND REPLACE WITH IMPORTED FILL.
3. EXCAVATE AND CONSTRUCT 3 FEET WIDE SOIL/BENTONITE SLURRY WALL DOWN TO INDICATED DEPTH.

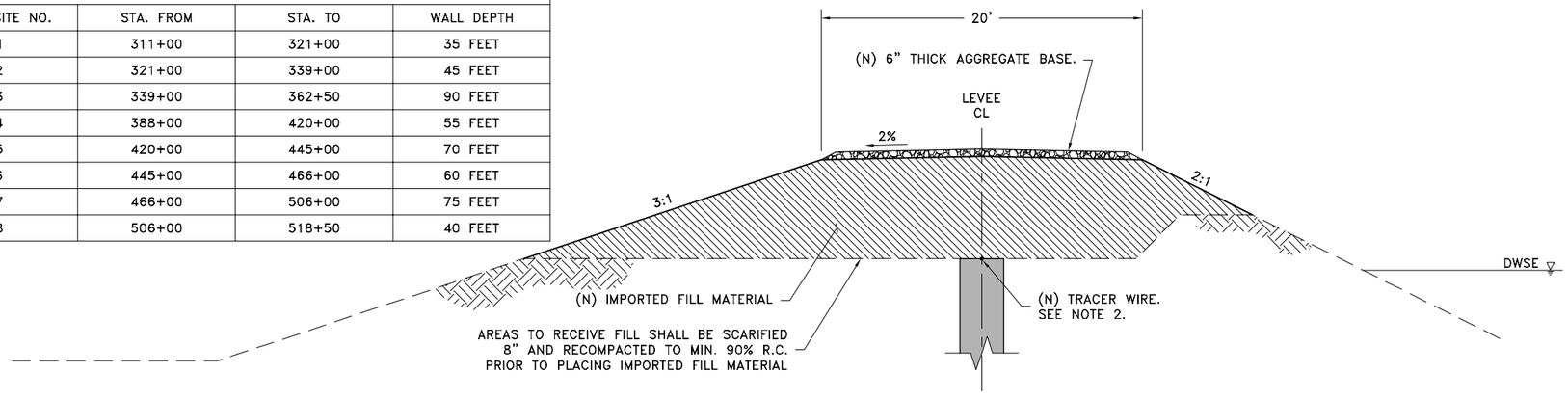
TEMPORARY CAP NOTES:

1. AFTER SLURRY WALL HAS BEEN CONSTRUCTED, PLACE TEMPORARY CAP MATERIAL AS SHOWN.
2. INSTALL SETTLEMENT PLATES @ 200' O.C. ALONG LEVEE CENTERLINE. CONTRACTOR SHALL BE RESPONSIBLE TO SURVEY THE TOP OF EACH RISER PIPE EVERY OTHER DAY FOR A MIN. 2 WEEKS AND UNTIL SETTLEMENT HAS CEASED, AS APPROVED BY THE ENGINEER. THE SURVEYING OF SETTLEMENT PLATES SHALL BE PERFORMED BY A LICENSED SURVEYOR.
3. AFTER SETTLEMENT HAS CEASED, REMOVE TEMPORARY CAP MATERIAL AND DISPOSE OF OFFSITE AT THE CONTRACTOR'S EXPENSE.

LEVEE CROWN FILL & ALL-WEATHER ROAD NOTES:

1. LEVEE CROWN FILL (PERMANENT CAP) SHALL NOT BE CONSTRUCTED UNTIL AFTER THE TEMPORARY CAP HAS CEASED TO SETTLE AND HAS BEEN REMOVED.
2. INSTALL TRACER WIRE, #10 AWG SINGLE STRAND SOFT DRAWN COPPER WIRE WITH INSULATION, CENTERED OVER TOP OF CUTOFF WALL. BRING TRACER WIRE INTO BOXES CENTERED OVER TOP OF WALL AT A 500' MAX. SPACING WITH 5' OF EXTRA WIRE COILED IN EACH BOX, FLUSH WITH TOP OF AB ROAD SURFACE. INSTALL ADDITIONAL BOXES AT EACH END OF CUTOFF WALL. BOXES SHALL BE CHRISTY G5 BOX OR APPROVED EQUAL.
3. FILL LEVEE TO PROPER ELEVATION AS SHOWN WITH IMPORTED FILL MATERIAL.
4. PLACE MIN. 6 INCHES OF COMPACTED AGGREGATE BASE MATERIAL.

SLURRY CUTOFF WALL TABLE			
WORK SITE NO.	STA. FROM	STA. TO	WALL DEPTH
1	311+00	321+00	35 FEET
2	321+00	339+00	45 FEET
3	339+00	362+50	90 FEET
4	388+00	420+00	55 FEET
5	420+00	445+00	70 FEET
6	445+00	466+00	60 FEET
7	466+00	506+00	75 FEET
8	506+00	518+50	40 FEET



LEVEE CROWN FILL (PERMANENT CAP) AND ALL-WEATHER ROAD

1 CUTOFF WALL (SLURRY WALL)

SCALE: N.T.S.

C-501

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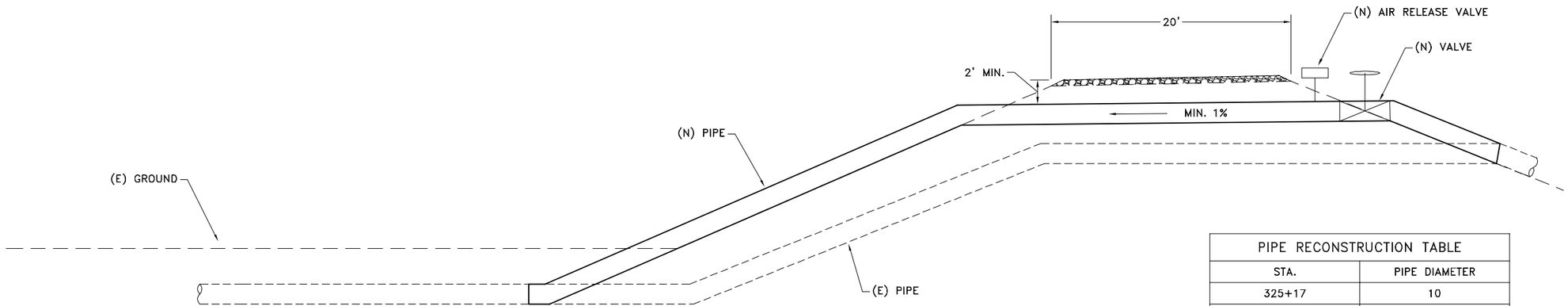
CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.3 – CUTOFF WALL
SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

Revisions				
No.	Description	Date	By	Aprvd. By

Design	EEA
Drawn	EEA
Check	CHN
Scale	AS SHOWN
Original Drawing Scale	0 ½" 1"
Date	NOVEMBER 2015
Sheet Number	3 Of 4
Project File No.	2255-0030

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\05.3_Sht 03_Details.dwg
PLOT DATE: Dec 08, 2015 - 8:42am



2 PIPE RECONSTRUCTION

SCALE: N.T.S.

PIPE RECONSTRUCTION TABLE	
STA.	PIPE DIAMETER
325+17	10
331+60	6
334+97	10
343+18	8
353+76	14
361+43	10
413+28	6
424+38	12
424+56	10
447+68	14
447+81	12
458+81	16
476+58	12
478+73	12
480+31	4
492+51	14
492+72	36
493+44	10
499+98	6
507+37	16
509+14	20
509+24	16
516+40	12

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\05.3_Snt 04_Details.dwg
PLOT DATE: Dec 08, 2015 - 8:44am

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 5.3 – CUTOFF WALL
SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

Revisions				
No.	Description	Date	By	Aprvd. By

Design EEA
Drawn EEA
Check CHN

Scale AS SHOWN
Original Drawing Scale 0 ½" 1"

Date NOVEMBER 2015
Sheet Number 4 Of 4
Project File No. 2255-0030

C-502

RECLAMATION DISTRICT NO. 17

MOSSDALE TRACT

SAN JOAQUIN COUNTY, CALIFORNIA

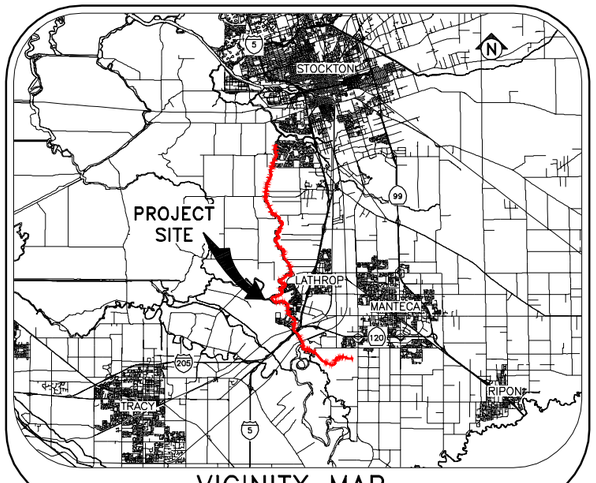
URBAN LEVEE DESIGN CRITERIA, PROJECT NO. 10.1

EROSION REPAIRS

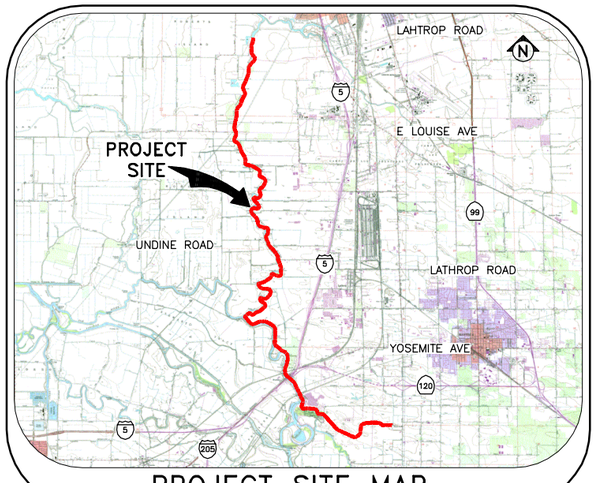
AT

VARIOUS LOCATION BETWEEN

STATION 114+00 AND STATION 972+25



VICINITY MAP



PROJECT SITE MAP

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	BASE MAP
3	DETAILS

SHEET INDEX

Submittal	
%	Date
10%	12/2/2015

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Civil Engineers and Land Surveyors
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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 10.1 – EROSION REPAIRS
SAN JOAQUIN COUNTY, CALIFORNIA

TITLE SHEET

Revisions				
No.	Description	Date	By	Aprvd. By

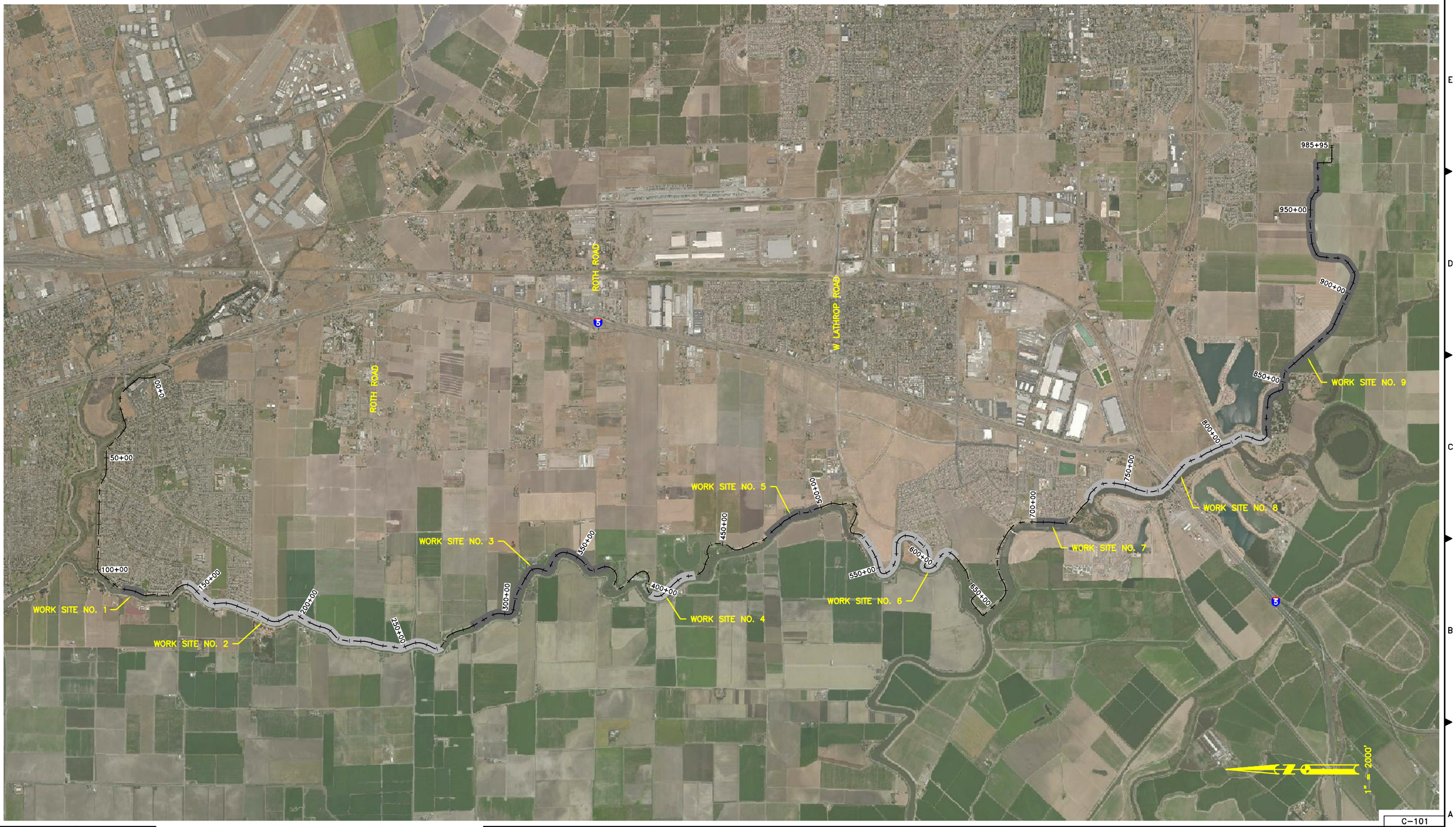
Design EEA
Drawn EEA
Check CHN

Scale AS SHOWN
Original Drawing Scale 0 ½" 1"

Date NOVEMBER 2015
Sheet Number 1 Of 3
Project File No. 2255-0030

C-001

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\10.1_Sht 01_Title Sheet.dwg
PLOT DATE: Dec 07, 2015 - 9:04am



C-101

CALL BEFORE YOU DIG 800 227 2600 UNDERGROUND SERVICE ALERT

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 10.1 – EROSION REPAIRS
SAN JOAQUIN COUNTY, CALIFORNIA

BASE MAP

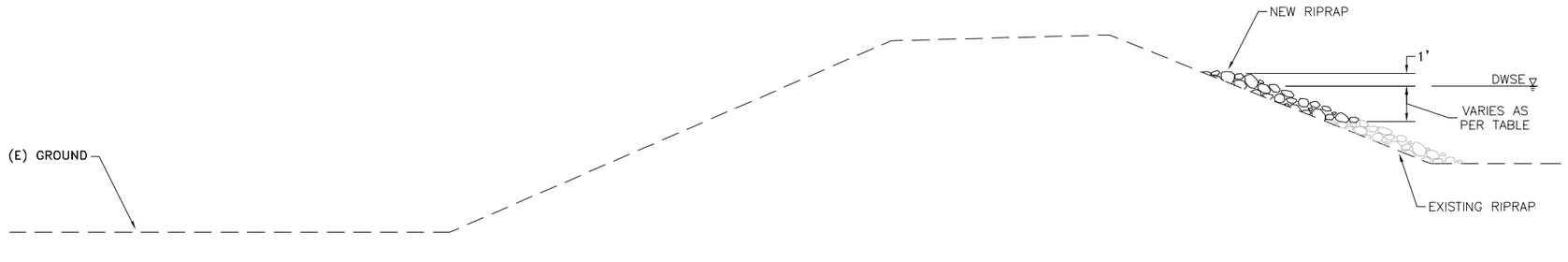
Revisions				
No.	Description	Date	By	Aprvd. By

Design EEA
Drawn EEA
Check CHN

Scale 1" = 2000'
Original Drawing Scale 0 ½" 1"

Date NOVEMBER 2015
Sheet Number 2 Of 3
Project File No. 2255-0030

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\10.1_Sht 02_Base Map.dwg
PLOT DATE: Dec 07, 2015 - 9:22am



EROSION REPAIR TABLE			
WORKS SITE NO.	STA. FROM	STA. TO	RIPRAP QUANTITFY
1	143+00	267+00	1 TO 1.5 TONS/LF
2	284+00	367+00	1 TO 1.5 TONS/LF
3	534+00	613+00	1 TO 1.5 TONS/LF
4	822+00	972+25	1 TO 1.5 TONS/LF
5	114+00	124+00	2 TO 2.5 TONS/LF
6	405+00	428+00	2 TO 2.5 TONS/LF
7	472+00	499+00	2 TO 2.5 TONS/LF
8	702+00	716+00	2 TO 2.5 TONS/LF
9	729+00	822+00	2 TO 2.5 TONS/LF

1 EROSION REPAIR

SCALE: N.T.S.

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\10.1_Sht 03_Details.dwg
PLOT DATE: Dec 08, 2015 - 8:49am

Submittal	
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10%	12/2/2015

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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 10.1 – EROSION REPAIRS
SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

Revisions				
No.	Description	Date	By	Aprvd. By

Design EEA
Drawn EEA
Check CHN

Scale AS SHOWN
Original Drawing Scale 0 ½" 1"

C-501
Date NOVEMBER 2015
Sheet Number 3 Of 3
Project File No. 2255-0030

RECLAMATION DISTRICT NO. 17

MOSSDALE TRACT

SAN JOAQUIN COUNTY, CALIFORNIA

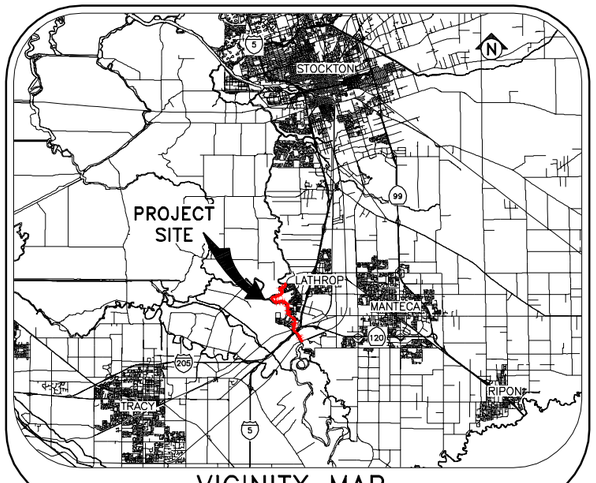
URBAN LEVEE DESIGN CRITERIA, PROJECT NO. 13.1

PENETRATION REHABILITATION

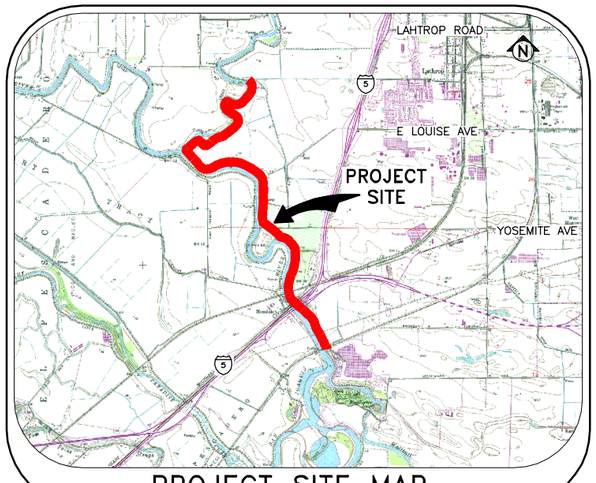
AT

VARIOUS LOCATION BETWEEN

STATION 571+35 AND STATION 801+00



VICINITY MAP



PROJECT SITE MAP

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	BASE MAP
3	DETAILS

SHEET INDEX

CALL BEFORE YOU DIG 800-227-2600 UNDERGROUND SERVICE ALERT

Submittal	
%	Date
10%	12/2/2015

KSN INC. KJELDSEN SINNOCK NEUDECK
Civil Engineers and Land Surveyors
711 N. Pershing Avenue, Stockton, CA 95203, (209) 946-0268
1355 Halyard Drive, Suite 180, West Sacramento, CA 95691, (916) 403-5900
www.ksninc.com

CITIES OF LATHROP AND MANTECA
ULDC PROJECT 13.1 – PENETRATION REHABILITATION
SAN JOAQUIN COUNTY, CALIFORNIA

TITLE SHEET

Revisions				
No.	Description	Date	By	Aprvd. By

Design	EEA
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Scale: AS SHOWN

Original Drawing Scale: 0 ½" 1"

Date: NOVEMBER 2015

Sheet Number: 1 Of 3

Project File No.: 2255-0030

C-001

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\13.1_Sht 01_Title Sheet.dwg
PLOT DATE: Dec 07, 2015 - 9:06am



C-101

Submittal	
%	Date
10%	12/2/2015

KJELDSEN SINNOCK NEUDECK INC.
Civil Engineers and Land Surveyors
711 N. Pershing Avenue
Stockton, CA 95203
(209) 946-0268
1355 Halyard Drive, Suite 180
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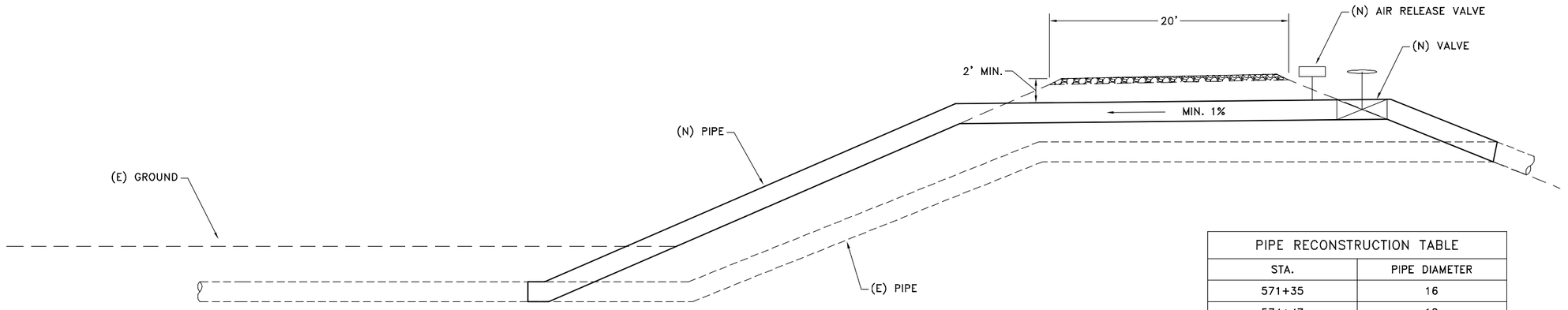
CITIES OF LATHROP AND MANTECA
ULDC PROJECT 13.1 – PENETRATION REHABILITATION
SAN JOAQUIN COUNTY, CALIFORNIA

BASE MAP

Revisions				
No.	Description	Date	By	Aprvd. By

Design	EEA
Drawn	EEA
Check	CHN
Scale	1" = 500'
Original Drawing Scale	0 ½" 1"
Date	NOVEMBER 2015
Sheet Number	2 Of 3
Project File No.	2255-0030

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\13.1_Sht 02_Base Map.dwg
PLOT DATE: Dec 08, 2015 - 8:54am



PIPE RECONSTRUCTION TABLE	
STA.	PIPE DIAMETER
571+35	16
574+47	12
574+50	12
740+78	20
740+95	48
740+99	12
769+57	18
800+31	18
800+35	18
801+00	18

1 PIPE RECONSTRUCTION

SCALE: N.T.S.

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0030_ULDC_Analyze and Identify Deficiencies\05_Civil\CAD\Improvements\13.1_Sht 03_Details.dwg
PLOT DATE: Dec 04, 2015 - 4:07pm

Submittal	
%	Date
10%	12/2/2015

KJELDSEN SINNOCK NEUDECK INC.
Civil Engineers and Land Surveyors
711 N. Pershing Avenue
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(209) 946-0268
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CITIES OF LATHROP AND MANTECA
ULDC PROJECT 13.1 – PENETRATION REHABILITATION
SAN JOAQUIN COUNTY, CALIFORNIA

DETAILS

Revisions				
No.	Description	Date	By	Aprvd. By

Design EEA
Drawn EEA
Check CHN

Scale AS SHOWN
Original Drawing Scale 0 ½" 1"

Date NOVEMBER 2015
Sheet Number 3 Of 3
Project File No. 2255-0030

C-501

Cities of Lathrop and Manteca

ULDC Evaluation

Identified Improvements

EXHIBIT 2

Detailed Cost Estimate

CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS

SUMMARY OF PROPOSED IMPROVEMENTS

Project No.	Sta.	Sta.	Proposed Project	Total Cost
Construction Improvements				
2.1	822+80	972+25	Dryland Levee Reconstruction and Seepage Berm	$27,765,000
5.1	119+50	192+00	Cutoff Wall	$10,224,000
5.2	190+50	297+75	Seepage Berm	$19,501,000
5.3	311+00	518+50	Cutoff Wall	$35,050,000
10.1	114+00	972+25	Erosion Repairs	$9,386,000
12.1	112+73	815+40	Encroachment Remediation	$678,000
13.1	571+35	801+00	Pipe Penetration Rehabilitation	$2,128,000
			Subtotal:	**$104,732,000**
Real Estate Improvements				
11.1			Right-of-Way Acquisition (existing deficiencies)	$12,381,000
11.2			Right-of-Way Acquisition (new construction improvements)	$3,900,000
			Subtotal:	**$16,281,000**
			SUBTOTAL:	$121,013,000
			DRYLAND LEVEE EXTENSION ALTERNATIVE:	$15,872,000
			TOTAL:	**$136,885,000**

Notes:

(1) This Opinion of Probable Costs is based on 2015$ and only includes an approximation of the necessary improvements that would be required to achieve full ULDC compliance. This Opinion of Probable Costs does not include any additional enhancements or multi-purpose benefits that may be required to procure grant funding from the State of California or other agencies.

(2) This Opinion of Probable Costs does not include costs associated with obtaining necessary project funding such as applying for and securing grants, assisting with the formation of assessment districts or areas of benefit, assisting in the development of builder impact fees, etc.

CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS
DETAILS OF PROPOSED IMPROVEMENTS

PROJECT NO. 2.1

DRYLAND LEVEE RECONSTRUCTION AND SEEPAGE BERM
STA. 822+80 TO STA. 972+25

Item	Description	Quantity	Unit	Unit Cost	Total Cost
Construction					
1.	Mobilization			3%	$467,800
2.	Erosion Control			3%	$467,800
3.	Clearing and Grubbing	36.9	AC	$2,000	$73,800
4.	Imported Engineered Fill	437,000	TN	$15	$6,555,000
5.	Drain Rock Material	191,800	TN	$30	$5,754,000
6.	Sand Filter Material	89,800	TN	$25	$2,245,000
7.	Filter Fabric	1,045,000	SF	$0.50	$522,500
8.	Class 2 Aggregate Base	8,800	TN	$25	$220,000
9.	Reconstruct Existing 20" Pipe	1	EA	$95,000	$95,000
10.	Air Release Valve	1	EA	$2,000	$2,000
11.	20" Valve	1	EA	$18,000	$18,000
12.	Hydroseeding	1,056,900	SF	$0.10	$105,700
				Subtotal:	**$16,526,600**
Mangement / Environmental / Engineering					
1.	Administration			5%	$826,400
2.	Planning			3%	$495,800
3.	Environmental and Permitting			5%	$826,400
4.	Geotechnical Engineering			2%	$330,600
5.	Surveying and Civil Engineering			10%	$1,652,700
6.	Construction Management and Inspection			12%	$1,983,200
7.	Mitigation			3%	$495,800
				Subtotal:	**$6,610,900**
				SUBTOTAL:	$23,137,500
				CONTINGENCY (20%):	$4,627,500
				PROJECT TOTAL:	**$27,765,000**

CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS
DETAILS OF PROPOSED IMPROVEMENTS

PROJECT NO. 5.1

CUTOFF WALL
STA. 119+50 TO STA.192+00

Item	Description	Quantity	Unit	Unit Cost	Total Cost
Construction					
1.	Mobilization			20%	$989,500
2.	Erosion Control			3%	$148,500
3.	Clearing and Grubbing	9.1	AC	$2,000	$18,200
5.	Mix-in-Place Cutoff Wall	171,300	SF	$10	$1,713,000
6.	Tracer Wire	4,900	LF	$2	$9,800
7.	Imported Engineered Fill	40,400	TN	$20	$808,000
8.	Class 2 Aggregate Base	3,600	TN	$25	$90,000
9.	Reconstruct Existing 8" Pipe	4	EA	$45,000	$180,000
10.	Reconstruct Existing 12" Pipe	1	EA	$60,000	$60,000
11.	Reconstruct Existing 16" Pipe	1	EA	$80,000	$80,000
12.	Reconstruct Existing 42" Pipe	6	EA	$250,000	$1,500,000
13.	Air Release Valve	12	EA	$2,000	$24,000
14.	8" Valve	4	EA	$2,500	$10,000
15.	12" Valve	1	EA	$4,000	$4,000
16.	16" Valve	1	EA	$8,500	$8,500
17.	42" Valve	6	EA	$70,000	$420,000
18.	Hydroseeding	216,300	SF	$0.10	$21,700
				Subtotal:	**$6,085,200**
Mangement / Environmental / Engineering					
1.	Administration			5%	$304,300
2.	Planning			3%	$182,600
3.	Environmental and Permitting			5%	$304,300
4.	Geotechnical Engineering			2%	$121,800
5.	Surveying and Civil Engineering			10%	$608,600
6.	Construction Management and Inspection			12%	$730,300
7.	Mitigation			3%	$182,600
				Subtotal:	**$2,434,500**
				SUBTOTAL:	$8,519,700
				CONTINGENCY (20%):	$1,704,000
				PROJECT TOTAL:	**$10,224,000**

CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS
DETAILS OF PROPOSED IMPROVEMENTS

PROJECT NO. 5.2

SEEPAGE BERM
STA. 190+50 TO STA. 297+75

Item	Description	Quantity	Unit	Unit Cost	Total Cost
Construction					
1.	Mobilization			3%	$328,500
2.	Erosion Control			3%	$328,500
3.	Clearing and Grubbing	29.9	AC	$2,000	$59,800
4.	Imported Engineered Fill	225,700	TN	$15	$3,385,500
5.	Drain Rock Material	137,900	TN	$30	$4,137,000
6.	Sand Filter Material	70,500	TN	$25	$1,762,500
7.	Filter Fabric	939,200	SF	$0.50	$469,600
8.	Class 2 Aggregate Base	6,600	TN	$25	$165,000
9.	Reconstruct Existing 8" Pipe	4	EA	$45,000	$180,000
10.	Reconstruct Existing 10" Pipe	4	EA	$55,000	$220,000
11.	Reconstruct Existing 12" Pipe	2	EA	$60,000	$120,000
12.	Reconstruct Existing 16" Pipe	2	EA	$80,000	$160,000
13.	Reconstruct Existing 20" Pipe	1	EA	$95,000	$95,000
14.	Air Release Valve	13	EA	$2,000	$26,000
15.	8" Valve	4	EA	$2,500	$10,000
16.	10" Valve	4	EA	$3,000	$12,000
17.	12" Valve	2	EA	$4,000	$8,000
18.	16" Valve	2	EA	$8,500	$17,000
19.	20" Valve	1	EA	$18,000	$18,000
20.	Hydroseeding	1,045,100	SF	$0.10	$104,600
				Subtotal:	**$11,607,000**
Mangement / Environmental / Engineering					
1.	Administration			5%	$580,400
2.	Planning			3%	$348,300
3.	Environmental and Permitting			5%	$580,400
4.	Geotechnical Engineering			2%	$232,200
5.	Surveying and Civil Engineering			10%	$1,160,700
6.	Construction Management and Inspection			12%	$1,392,900
7.	Mitigation			3%	$348,300
				Subtotal:	**$4,643,200**
				SUBTOTAL:	$16,250,200
				CONTINGENCY (20%):	$3,250,100
				PROJECT TOTAL:	**$19,501,000**

CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS
DETAILS OF PROPOSED IMPROVEMENTS

PROJECT NO. 5.3

CUTOFF WALL
STA. 311+00 TO STA. 518+50

Item	Description	Quantity	Unit	Unit Cost	Total Cost
Construction					
1.	Mobilization			10%	$1,846,300
2.	Erosion Control			3%	$553,900
3.	Clearing and Grubbing	38.1	AC	$2,000	$76,200
4.	Degrade Existing Levee (1/3 Height)	83,000	CY	$10	$830,000
5.	Cement-Bentonite Slurry Cutoff Wall	1,154,500	SF	$8	$9,236,000
6.	Temporary Cap (Double Handle)	32,400	CY	$10	$324,000
7.	Tracer Wire	18,200	LF	$2	$36,400
8.	Imported Engineered Fill	384,400	TN	$15	$5,766,000
9.	Class 2 Aggregate Base	13,500	TN	$25	$337,500
10.	Reconstruct Existing 4" Pipe	1	EA	$35,000	$35,000
11.	Reconstruct Existing 6" Pipe	3	EA	$40,000	$120,000
12.	Reconstruct Existing 8" Pipe	1	EA	$45,000	$45,000
13.	Reconstruct Existing 10" Pipe	5	EA	$55,000	$275,000
14.	Reconstruct Existing 12" Pipe	5	EA	$60,000	$300,000
15.	Reconstruct Existing 14" Pipe	3	EA	$75,000	$225,000
16.	Reconstruct Existing 16" Pipe	3	EA	$80,000	$240,000
17.	Reconstruct Existing 20" Pipe	1	EA	$95,000	$95,000
18.	Reconstruct Existing 36" Pipe	1	EA	$200,000	$200,000
19.	Air Release Valve	23	EA	$2,000	$46,000
20.	4" Valve	1	EA	$1,500	$1,500
21.	6" Valve	3	EA	$2,000	$6,000
22.	8" Valve	1	EA	$2,500	$2,500
23.	10" Valve	5	EA	$3,000	$15,000
24.	12" Valve	5	EA	$4,000	$20,000
25.	14" Valve	3	EA	$7,000	$21,000
26.	16" Valve	3	EA	$8,500	$25,500
27.	20" Valve	1	EA	$18,000	$18,000
28.	36" Valve	1	EA	$55,000	$55,000
29.	Hydroseeding	1,110,200	SF	$0.10	$111,100
				Subtotal:	**$20,862,900**
Mangement / Environmental / Engineering					
1.	Administration			5%	$1,043,200
2.	Planning			3%	$625,900
3.	Environmental and Permitting			5%	$1,043,200
4.	Geotechnical Engineering			2%	$417,300
5.	Surveying and Civil Engineering			10%	$2,086,300
6.	Construction Management and Inspection			12%	$2,503,600
7.	Mitigation			3%	$625,900
				Subtotal:	**$8,345,400**

SUBTOTAL:	$29,208,300
CONTINGENCY (20%):	$5,841,700
PROJECT TOTAL:	**$35,050,000**

CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS
DETAILS OF PROPOSED IMPROVEMENTS

Item	Description	Quantity	Unit	Unit Cost	Total Cost

PROJECT NO. 10.1

EROSION REPAIRS
STA. 114+00 TO STA. 972+25

Construction					
1.	Mobilization			3%	$158,100
2.	Erosion Control			3%	$158,100
3.	Clearing and Grubbing	34.0	AC	$2,000	$68,000
4.	Quarry Stone Riprap	115,600	TN	$45.00	$5,202,000
				Subtotal:	**$5,586,200**
Mangement / Environmental / Engineering					
1.	Administration			5%	$279,400
2.	Planning			3%	$167,600
3.	Environmental and Permitting			5%	$279,400
4.	Geotechnical Engineering			2%	$111,800
5.	Surveying and Civil Engineering			10%	$558,700
6.	Construction Management and Inspection			12%	$670,400
7.	Mitigation			3%	$167,600
				Subtotal:	**$2,067,300**

	SUBTOTAL:	$7,821,100
	CONTINGENCY (20%):	$1,564,300
	PROJECT TOTAL:	**$9,386,000**

CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS
DETAILS OF PROPOSED IMPROVEMENTS

Item	Description	Quantity	Unit	Unit Cost	Total Cost

PROJECT NO. 12.1

ENCROACHMENT REMEDIATION
STA. 112+73 TO STA. 815+40

Construction					
1.	Mobilization			3%	$11,700
2.	Erosion Control			1%	$3,900
3.	Remove Fence @ Weston Ranch	500	LF	$10	$5,000
4.	Wrought-Iron Fence, 6' Tall @ Weston Ranch	500	LF	$25	$12,500
5.	Remove Miscellaneous Structures	7	EA	$10,000	$70,000
6.	Remove Septic Tank @ Oak Shores	15	EA	$10,000	$150,000
7.	Remove Structures @ Oak Shores	15	EA	$10,000	$150,000
				Subtotal:	**$403,100**

Mangement / Environmental / Engineering					
1.	Administration			5%	$20,200
2.	Planning			3%	$12,100
3.	Environmental and Permitting			5%	$20,200
4.	Geotechnical Engineering			2%	$8,100
5.	Surveying and Civil Engineering			10%	$40,400
6.	Construction Management and Inspection			12%	$48,400
7.	Mitigation			3%	$12,100
				Subtotal:	**$149,400**

	SUBTOTAL:	$564,600
	CONTINGENCY (20%):	$113,000
	PROJECT TOTAL:	**$678,000**

CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS
DETAILS OF PROPOSED IMPROVEMENTS

PROJECT NO. 13.1

PENETRATION REHABILITATION
STA. 571+35 TO STA. 801+00

Item	Description	Quantity	Unit	Unit Cost	Total Cost
Construction					
1.	Mobilization			3%	$35,900
2.	Erosion Control			3%	$35,900
14.	Reconstruct Existing 12" Pipe	3	EA	$60,000	$180,000
15.	Reconstruct Existing 16" Pipe	1	EA	$80,000	$80,000
16.	Reconstruct Existing 18" Pipe	4	EA	$85,000	$340,000
17.	Reconstruct Existing 20" Pipe	1	EA	$95,000	$95,000
17.	Reconstruct Existing 48" Pipe	1	EA	$300,000	$300,000
19.	Air Release Valve	10	EA	$2,000	$20,000
24.	12" Valve	3	EA	$4,000	$12,000
25.	16" Valve	1	EA	$8,500	$8,500
26.	18" Valve	4	EA	$14,000	$56,000
27.	20" Valve	1	EA	$18,000	$18,000
27.	48" Valve	1	EA	$85,000	$85,000
				Subtotal:	**$1,266,300**
Mangement / Environmental / Engineering					
1.	Administration			5%	$63,400
2.	Planning			3%	$38,000
3.	Environmental and Permitting			5%	$63,400
4.	Geotechnical Engineering			2%	$25,400
5.	Surveying and Civil Engineering			10%	$126,700
6.	Construction Management and Inspection			12%	$152,000
7.	Mitigation			3%	$38,000
				Subtotal:	**$468,900**
				SUBTOTAL:	$1,773,200
				CONTINGENCY (20%):	$354,700
				PROJECT TOTAL:	**$2,128,000**

CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
SAN JOAQUIN COUNTY, CALIFORNIA

ULDC COST ESTIMATE
OPINION OF PROBABLE COSTS

7.11 RIGHT-OF-WAY

PROJECT NO. 11-1

RIGHT-OF-WAY ACQUISITION (EXISTING DEFICIENCIES)

Item	Description	Quantity	Unit	Unit Cost	Total Cost
Real Estate					
1.	Land Valuation (Agricultural)	40.7	AC	$25,000	$1,017,500
2.	Land Valuation (Residential)	3.0	AC	$250,000	$750,000
3.	Land Valuation (Commercial)	1.0	AC	$250,000	$250,000
4.	Improvement Valuation (Residential)	15	EA	$150,000	$2,250,000
5.	Easement Acquisition	113	EA	$50,000	$5,650,000
6.	Easement Acquisition (Oak Shores)	1	EA	$400,000	$400,000
				Subtotal:	**$10,317,500**

SUBTOTAL:	$10,317,500
CONTINGENCY (20%):	$2,063,500
PROJECT TOTAL:	**$12,381,000**

PROJECT NO. 11.2

RIGHT-OF-WAY ACQUISITION (NEW CONSTRUCTION IMPROVEMENTS)

Item	Description	Quantity	Unit	Unit Cost	Total Cost
Real Estate					
1.	Land Valuation (Agricultural)	42.0	AC	$25,000	$1,050,000
2.	Land Valuation (Commercial)	0.8	AC	$250,000	$200,000
3.	Easement Acquisition	40	EA	$50,000	$2,000,000
				Subtotal:	**$3,250,000**

SUBTOTAL:	$3,250,000
CONTINGENCY (20%):	$650,000
PROJECT TOTAL:	**$3,900,000**

Cities of Lathrop and Manteca

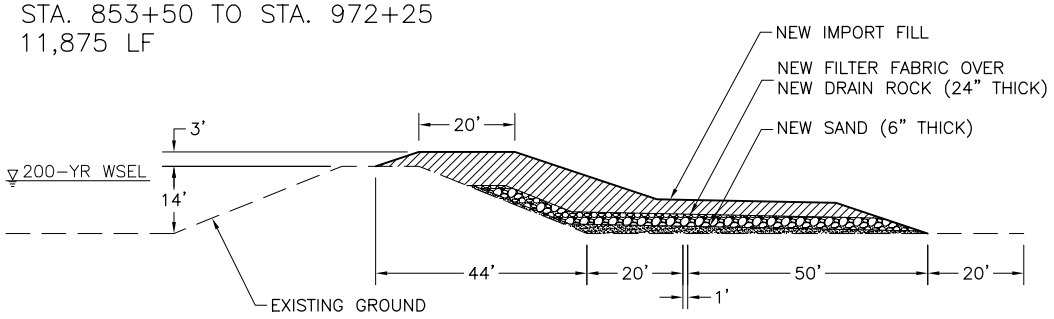
ULDC Evaluation

Identified Improvements

EXHIBIT 3

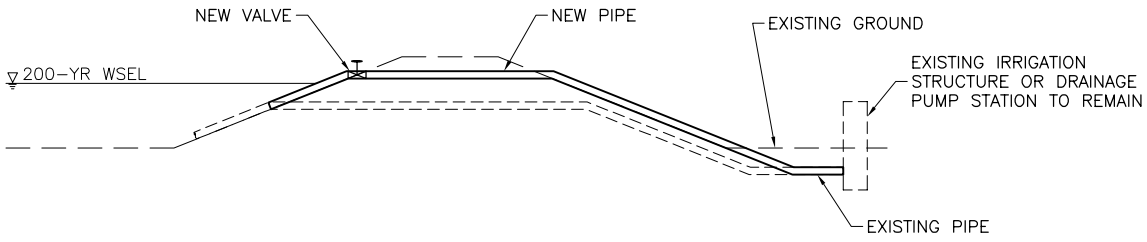
Basis of Quantity Calculations

PROJECT NO. 2-1
STA. 853+50 TO STA. 972+25
11,875 LF



CLEAR	135 SF/LF
FILL	460 CF/LF
ROCK	218 CF/LF
SAND	102 CF/LF
FABRIC	88 SF/LF
AB	10 CF/LF
SEED	89 SF/LF
ROW	71 SF/LF

STA. 853+50 TO STA. 972+25
1 EA



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Scale
N.T.S.

Original Drawing Scale
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CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
COST ESTIMATE
BASIS OF QUANTITY CALCULATIONS

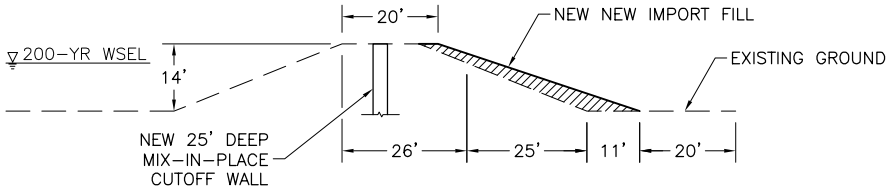
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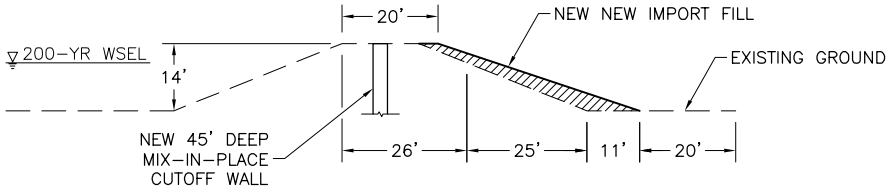
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WALL	25 SF/LF
FILL	105 CF/LF
AB	10 CF/LF
SEED	45 SF/LF
ROW	11 SF/LF

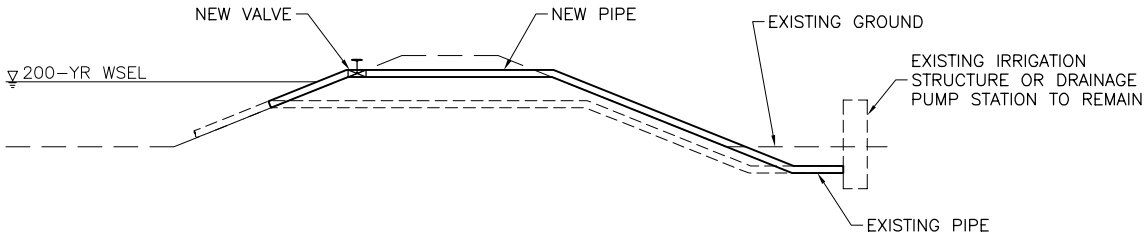


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STA. 172+45 TO STA. 192+00
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WALL	45 SF/LF
FILL	105 CF/LF
AB	10 CF/LF
SEED	45 SF/LF
ROW	11 SF/LF



STA. 119+50 TO STA. 192+00
12 EA



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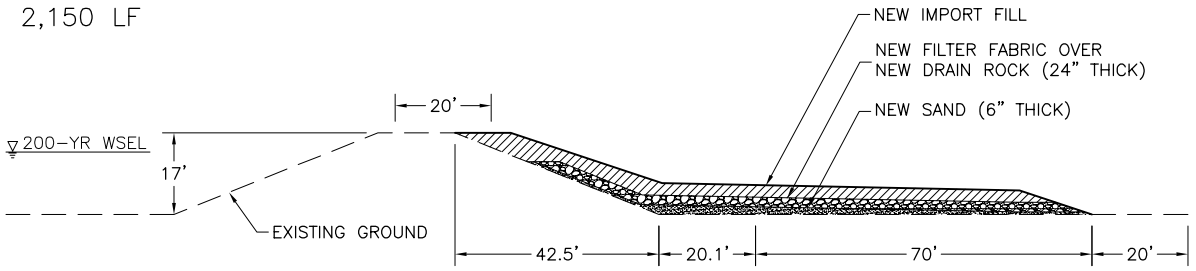
CITIES OF LATHROP AND MANTECA
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BASIS OF QUANTITY CALCULATIONS

EXHIBIT 5.1

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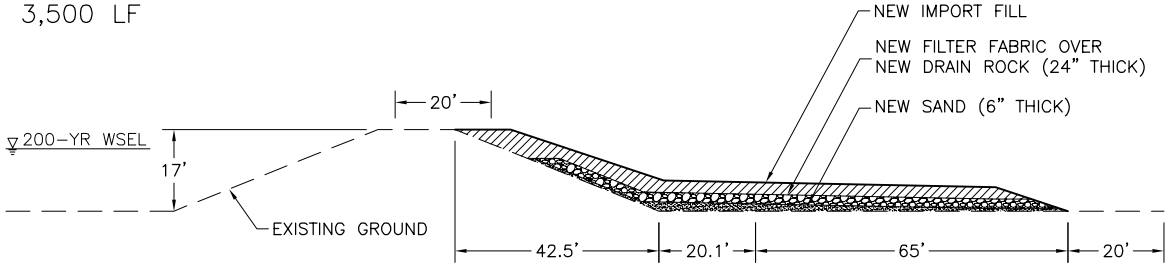
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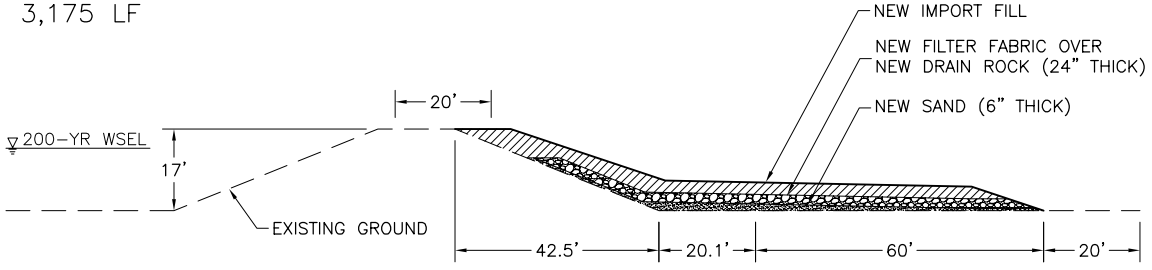
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SAND	119 CF/LF
FABRIC	112 SF/LF
AB	10 CF/LF
SEED	124 SF/LF
ROW	90 SF/LF

STA. 212+00 TO STA. 247+00
3,500 LF



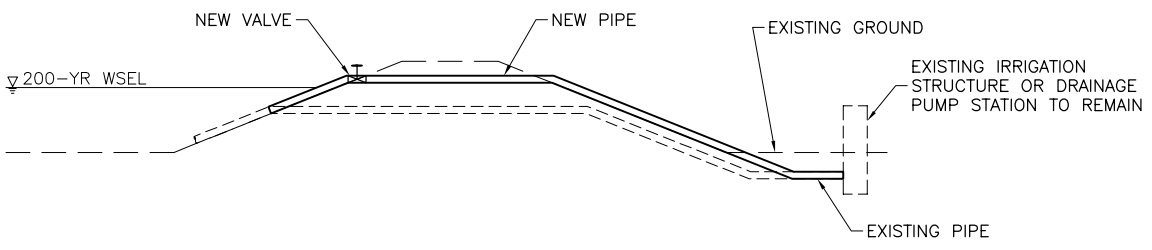
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ROCK	212 CF/LF
SAND	109 CF/LF
FABRIC	107 SF/LF
AB	10 CF/LF
SEED	119 SF/LF
ROW	85 SF/LF

STA. 255+50 TO STA. 259+50
STA. 270+00 TO STA. 297+75
3,175 LF



CLEAR	143 SF/LF
FILL	309 CF/LF
ROCK	202 CF/LF
SAND	99 CF/LF
FABRIC	102 SF/LF
AB	10 CF/LF
SEED	114 SF/LF
ROW	80 SF/LF

STA. 190+50 TO STA. 297+75
13 EA



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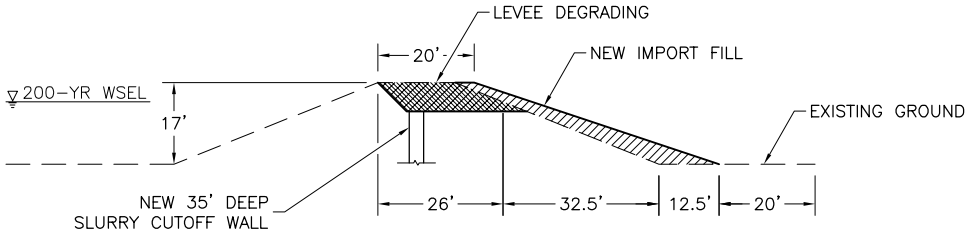
CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
COST ESTIMATE
BASIS OF QUANTITY CALCULATIONS

EXHIBIT
5.2

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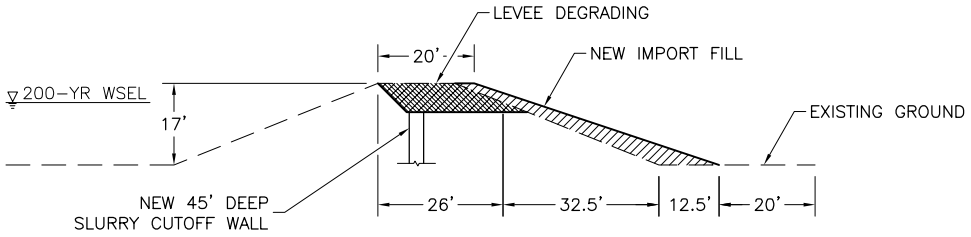
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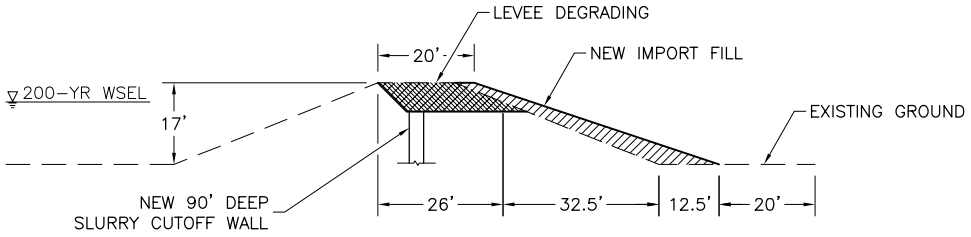
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AB	10 CF/LF
SEED	54 SF/LF
ROW	13 SF/LF

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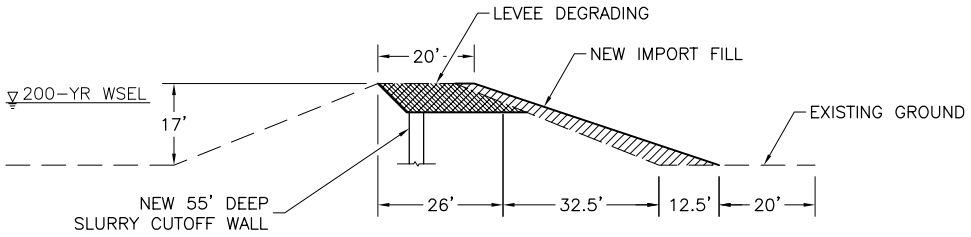
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WALL	45 SF/LF
FILL	264 CF/LF
AB	10 CF/LF
SEED	54 SF/LF
ROW	13 SF/LF

STA. 339+00 TO STA. 362+50
2,350 LF



CLEAR	91 SF/LF
DEGRADE	123 CF/LF
WALL	90 SF/LF
FILL	264 CF/LF
AB	10 CF/LF
SEED	54 SF/LF
ROW	13 SF/LF

STA. 388+00 TO STA. 420+00
3,200 LF



CLEAR	91 SF/LF
DEGRADE	123 CF/LF
WALL	55 SF/LF
FILL	264 CF/LF
AB	10 CF/LF
SEED	54 SF/LF
ROW	13 SF/LF

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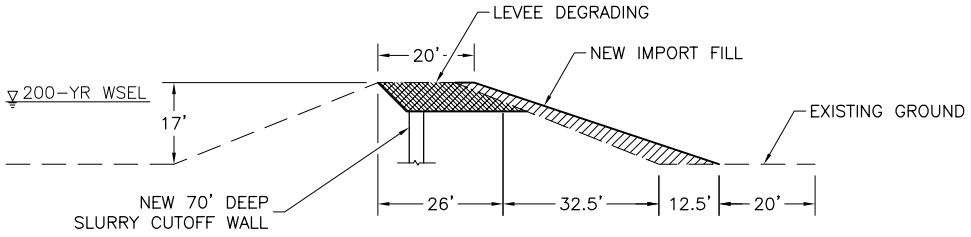
CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
COST ESTIMATE
BASIS OF QUANTITY CALCULATIONS

EXHIBIT 5.3

PAGE 1

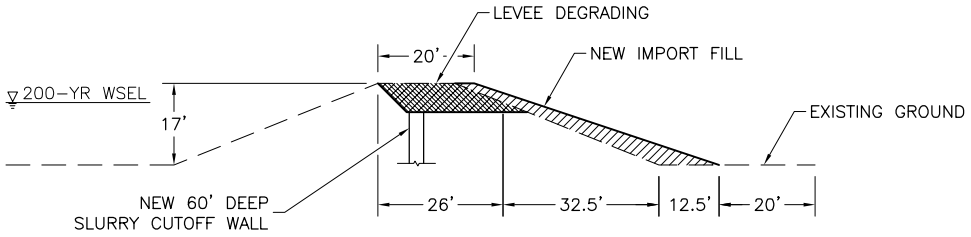
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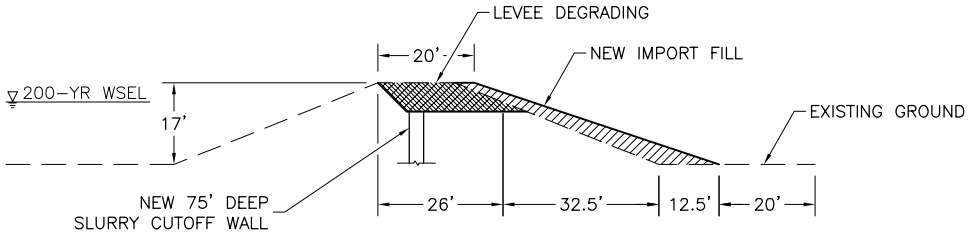
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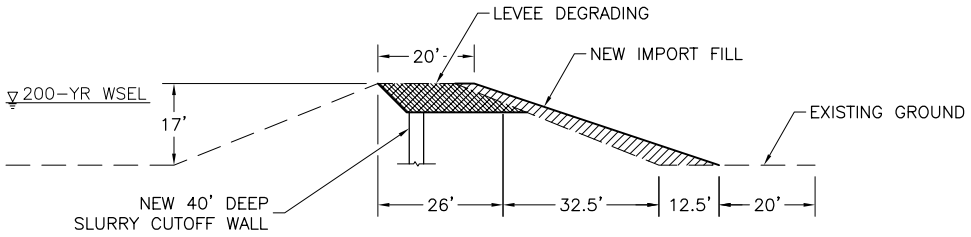
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WALL	60 SF/LF
FILL	264 CF/LF
AB	10 CF/LF
SEED	54 SF/LF
ROW	13 SF/LF

STA. 466+00 TO STA. 506+00
4,000 LF



CLEAR	91 SF/LF
DEGRADE	123 CF/LF
WALL	75 SF/LF
FILL	264 CF/LF
AB	10 CF/LF
SEED	54 SF/LF
ROW	13 SF/LF

STA. 506+00 TO STA. 518+50
1,250 LF



CLEAR	91 SF/LF
DEGRADE	123 CF/LF
WALL	40 SF/LF
FILL	264 CF/LF
AB	10 CF/LF
SEED	54 SF/LF
ROW	13 SF/LF

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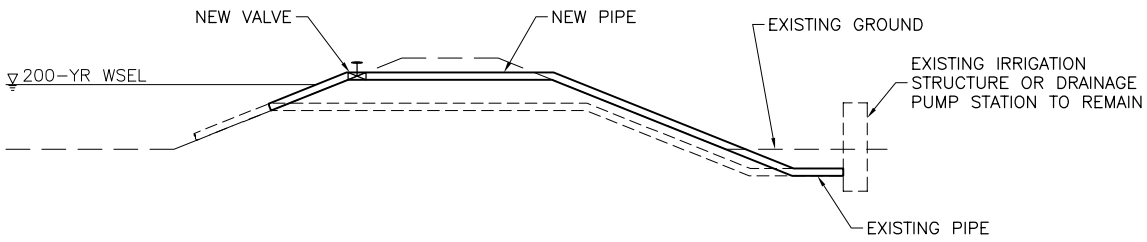
CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
COST ESTIMATE
BASIS OF QUANTITY CALCULATIONS

EXHIBIT 5.3

PAGE 2

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PLOT DATE: Mar 04, 2016 - 12:00pm

STA. 311+00 TO STA. 518+50
23 EA



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CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
COST ESTIMATE
BASIS OF QUANTITY CALCULATIONS

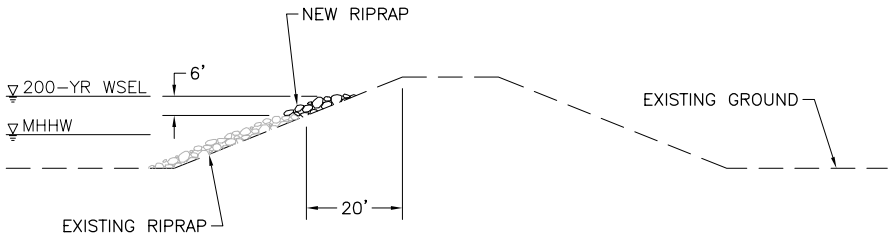
EXHIBIT
5.3

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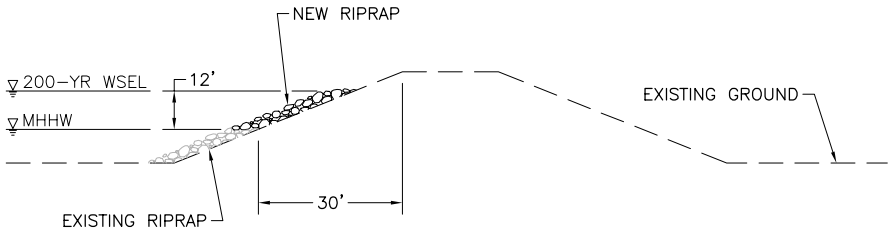
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STA. 284+00 TO STA. 383+00
STA. 534+00 TO STA. 613+00
STA. 822+00 TO STA. 972+25
45,225 LF

CLEAR 20 SF/LF
RIPRAP 21 CF/LF
ROW _ SF/LF



STA. 114+00 TO STA. 124+00
STA. 405+00 TO STA. 439+00
STA. 306+00 TO STA. 466+00
STA. 472+00 TO STA. 499+00
STA. 702+00 TO STA. 822+00
19,100 LF

CLEAR 30 SF/LF
RIPRAP 34 CF/LF
ROW _ SF/LF



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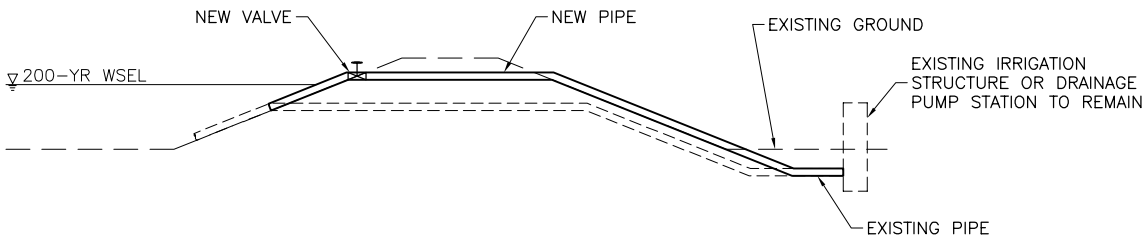
CITIES OF LATHROP AND MANTECA
ULDC EVALUATION
COST ESTIMATE
BASIS OF QUANTITY CALCULATIONS

EXHIBIT 10.1

PAGE 1

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PLOT DATE: Mar 04, 2016 - 12:00pm

PROJECT NO. 13.1
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9 EA



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EXHIBIT 13.1

PAGE 1

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PLOT DATE: Mar 04, 2016 - 12:01pm

Appendix H

KSN ULDC 2040 Cost Estimate

KJELDSEN SINNOCK NEUDECK
CIVIL ENGINEERS & LAND SURVEYORS

Stephen K. Sinnock, P.E.
Christopher H. Neudeck, P.E.
Neal T. Colwell, P.E.
Barry O'Regan, P.E.

2255-0050

TECHNICAL MEMORANDUM

December 11, 2019



Project: San Joaquin Area Flood Control Agency
Mossdale Tract Area ULDC Adjustments for Climate Change

Subject: Freeboard Deficiency Analysis

Prepared by: Erik E. Almaas, PE

Reviewed by: Christopher H. Neudeck, PE

Introduction

Recently, detailed analyses have been performed and compared to the existing levee system conditions of Reclamation District No. 17 (RD17) in order to determine the extent of Urban Levee Design Criteria (ULDC) compliance. Documentation of the analyses in the form of a ULDC Engineer's Report was performed by a team consisting of Peterson, Brustad, Inc. (PBI), Kjeldsen, Sinnock and Neudeck, Inc. (KSN), and ENGEO, Inc.

A new evaluation by PBI for potential climate change in accordance with San Joaquin Area Flood Control Agency (SJAFCA) policy has resulted in substantial elevated levels of the 200-year Design Water Surface Elevation (DWSE) along the RD17 levee, especially at the upstream end of the RD17 boundary. Whereas the ULDC Engineer's Report determined that no freeboard deficiencies existed for present day DWSE conditions, that is no longer the case with the climate change scenario. The purpose of this technical memorandum is to evaluate freeboard conditions of the RD17 levee for the climate change scenario.

Levee Assessment

This levee assessment covers the RD17 levee from Station 0+00 to Station 959+00. It also covers a proposed Dryland Levee Extension that is required to extend the existing Dryland Levee eastward in order to meet ULDC compliance. A summary of the levee segments that were analyzed are shown below in Table 1.

Table 1 - Summary of Analyzed Levee Segments

Levee Segment	Station From	Station To	Segment Status
French Camp Slough	0+00	101+00	Existing
San Joaquin River	101+00	822+80	Existing
Walthall Slough / Dryland Levee	822+80	959+00	Existing
Dryland Levee Extension	959+00	1104+20	Proposed

Data Sources

Existing data sources that were utilized in the levee assessment are as follows:

- Levee Topographic Survey, performed by KSN and Aerial Photomapping Services in 2014
- LiDAR Survey, performed by Department of Water Resources (DWR) in 2007
- ULDC Engineer's Report, prepared by PBI, KSN, and ENGEO in 2016
- Updated ULDC Hydrology and Hydraulic Adjustments for Climate Change, prepared by PBI in 2019

Assumptions

Assumptions that were made in the levee assessment are as follows:

Separate Ongoing Projects

Construction is currently underway on the RD17 Levee Seepage Repair Project, and planning is currently underway on the ULDC Levee Improvements Project. Both projects include the construction of seepage berms and necessary right-of-way acquisition. For the purposes of the climate change scenario analysis, it is assumed that all required work for these two project will be completed.

Utilized Levee Geometry

Pursuant to the 2016 ULDC Engineer's Report, the minimum levee geometry prism that was used as a comparison in this analysis is shown below in Table 2.

Table 2 - Minimum Levee Geometry

Criteria Description	Minimum Criteria
Crown Width	20'
Waterside Levee Slope	3h:1v
Landside Levee Slope	3h:1v

Analysis

The analysis of levee freeboard consisted of plotting the existing levee crown elevation along the levee centerline and comparing with the Minimum Top of Levee (MTOL) as provided by PBI. Levee reaches in which the existing levee crown elevation is below the MTOL have been identified as deficient. Cross sections were then developed from the topographic survey data at 200-foot intervals at the deficient reaches. These cross sections were compared against the design levee prism (as defined above in Table 2) oriented to coincide with the MTOL. Calculations of material quantities using the average end area method were developed using the cross sections. A full set of profiles and cross sections that comprised the analysis are included in **EXHIBIT 1**.

Deficiency Results / Proposed Design

A summary of freeboard deficient levee reaches is shown below in Table 3 and in **EXHIBIT 1**. The deficient reaches are located at the upstream end of RD17, generally the RD17 levee upstream of Old River.

Table 3 – Summary of Deficient Freeboard Reaches

Reach No.	Reach Description	Station From	Station To
1	San Joaquin River	570+00	822+80
2	Walthall Slough / Dryland Levee	822+80	959+00
3	Dryland Levee Extension	959+00	1104+20

The proposed design repairs for each of the three deficient reaches are shown in **EXHIBIT 1** and described as follows:

Reach 1

Reach 1 consists of a reach along the San Joaquin River from Station 570+00 to Station 822+80. The proposed preliminary design for Reach 1 involves primarily levee crown raising with some additional backslope work as needed. The majority of the levee reach includes existing or future seepage berms with related right-of-way; therefore, not a lot of new right-of-way acquisition is required. A floodwall is proposed in three locations in which it would be cost-prohibitive to construct an earthwork embankment due to the presence of major encroachments.

Reach 2

Reach 2 consists of the Walthall Slough / Dryland Levee from Station 822+80 to Station 959+00. The proposed preliminary design for Reach 2 involves major levee raising with backslope work. The entire levee reach includes existing or future seepage berms with related right-of-way; therefore, no new right-of-way acquisition is required.

Reach 3

Reach 3 consists of the Dryland Levee Extension. This reach includes extending a new levee eastward from the existing Dryland Levee. The proposed preliminary design for Reach 3 involves constructing a new levee prism with a 50-foot wide seepage berm. Since this reach is a brand new levee, major right-of-way acquisition is required for the full width and length of improvements.

San Joaquin Area Flood Control Agency

Mossdale Tract Area ULDC Adjustments for Climate Change

Freeboard Deficiency Analysis

EXHIBIT 1

Freeboard Analysis
(Profile/Sections/Proposed Design Details)

SAN JOAQUIN AREA FLOOD CONTROL AGENCY

ULDC ADJUSTMENTS FOR CLIMATE CHANGE

SAN JOAQUIN COUNTY, CALIFORNIA

MOSSDALE TRACT AREA
FREEBOARD DEFICIENCIES ANALYSIS



VICINITY MAP

DWG NO.	SHEET NO.	DESCRIPTION
G–001	1	TITLE SHEET
C–101	2	BASE MAP
C1–201 – C1–213	3 – 15	ROW & SLURRY WALL PROFILE VIEW
C1–301 – C1–354	16 – 69	ROW & SLURRY WALL SECTION VIEW
C2–201 – C2–213	70 – 82	ALL OTHER IMPROVEMENTS PROFILE VIEW
C2–301 – C2–350	83 – 132	ALL OTHER IMPROVEMENTS SECTION VIEW
C–501 – C–503	133 – 135	PROPOSED DESIGN DETAILS
C–601	136	RIGHT–OF–WAY CONSIDERATIONS

SHEET INDEX



PROJECT SITE MAP

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE N.T.S.

ORIGINAL DRAWING SCALE 0 ½" 1"

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1550 Harbor Drive, Suite 212
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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

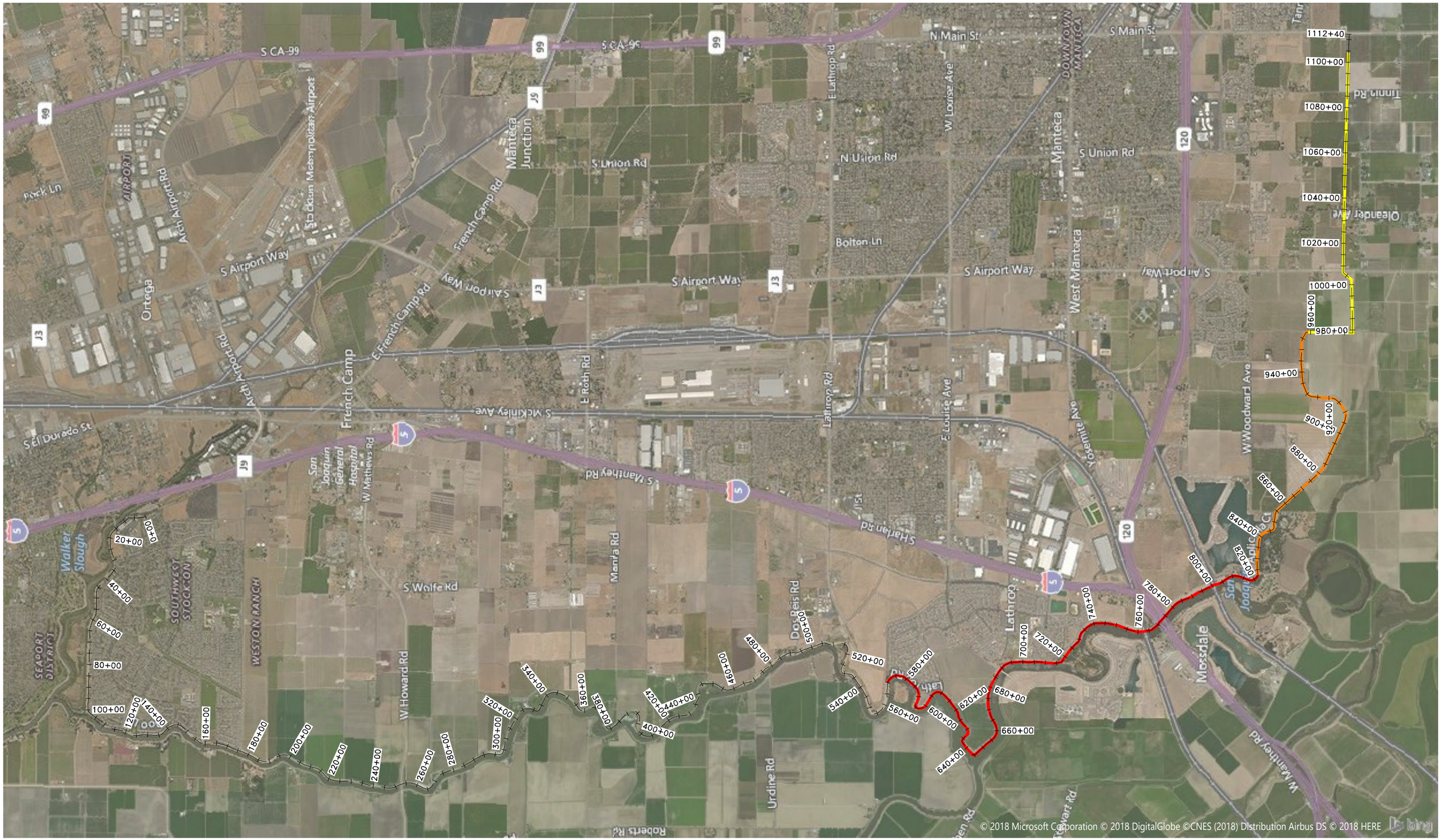
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DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
G-001
SHEET 1 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC:: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_G-001.dwg
PLOT DATE: Dec 11, 2019 - 4:27pm



FREEBOARD DEFICIENCIES LEGEND:

- REACH 1 - SAN JOAQUIN RIVER - STA 570+00 TO 822+80
- REACH 2 - WALTHALL SLOUGH / DRYLAND LEVEE - STA 822+80 TO 959+00
- REACH 3 - DRYLAND LEVEE EXTENSION - STA 959+00 TO 1104+20

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 2000'

ORIGINAL DRAWING SCALE
0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

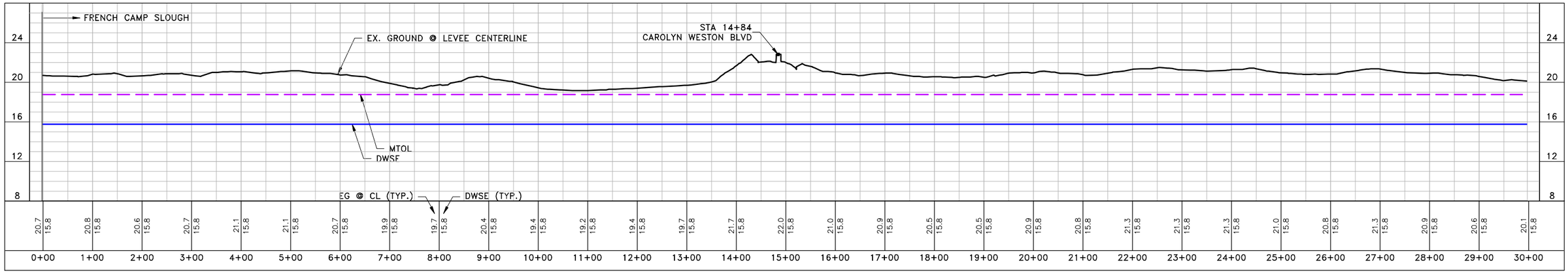
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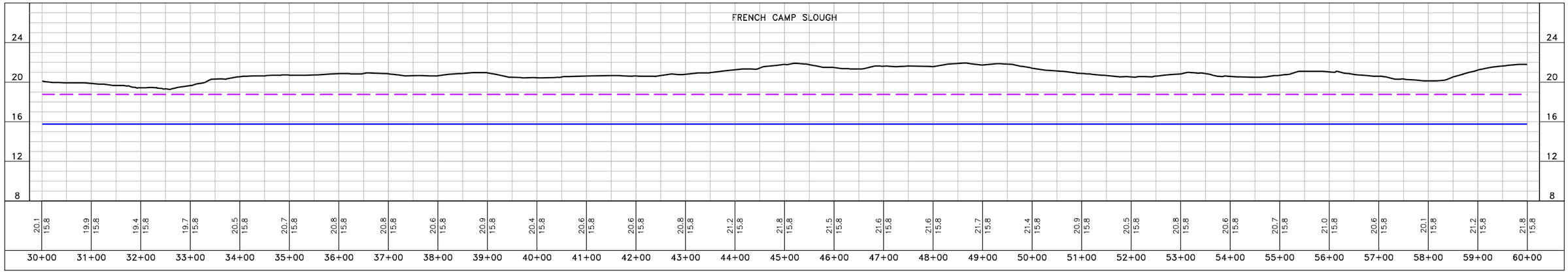
DATE
DECEMBER 11, 2019

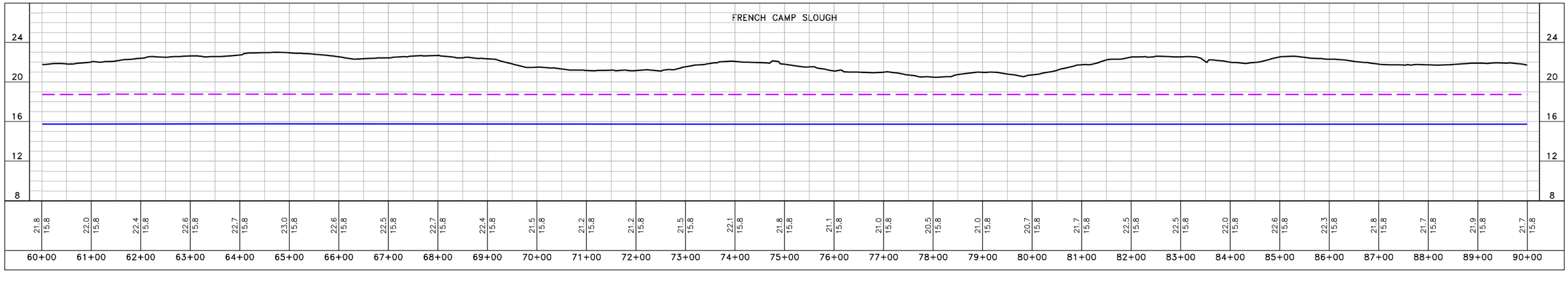
SHEET IDENTIFICATION
C-101
SHEET 2 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C-101.dwg
PLOT DATE: Dec 11, 2019 - 4:21pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

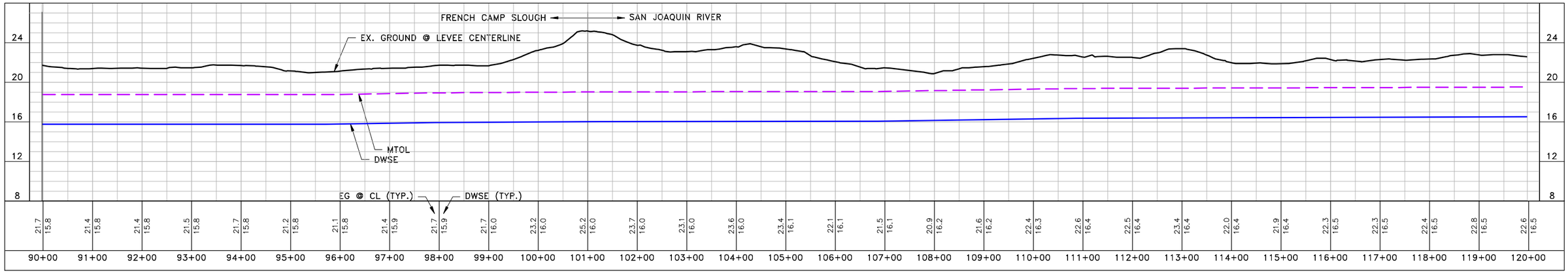
ROW AND SLURRY WALL CONSTRUCTION
PROFILE VIEW
STA 0+00 TO 90+00

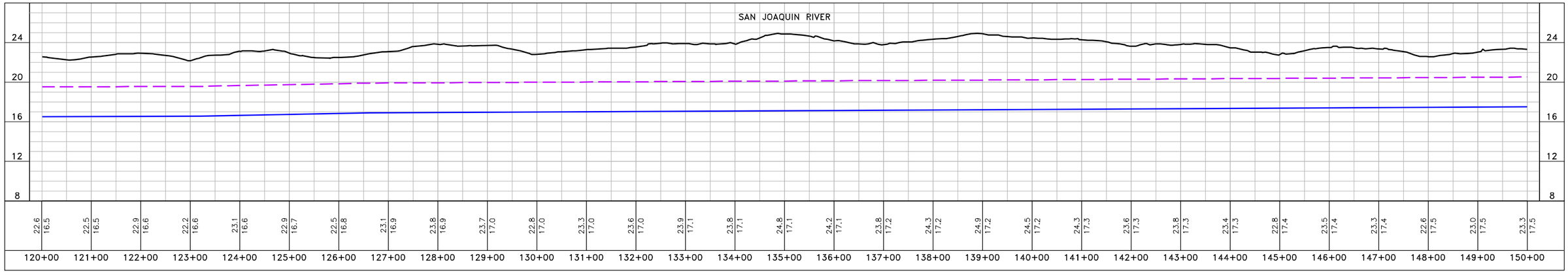
DATE
DECEMBER 11, 2019

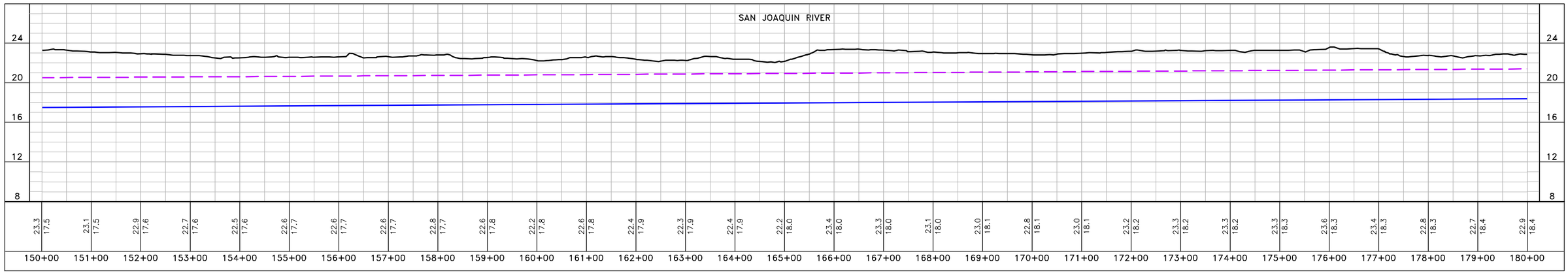
SHEET IDENTIFICATION
C1-201
SHEET 3 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 10:46am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

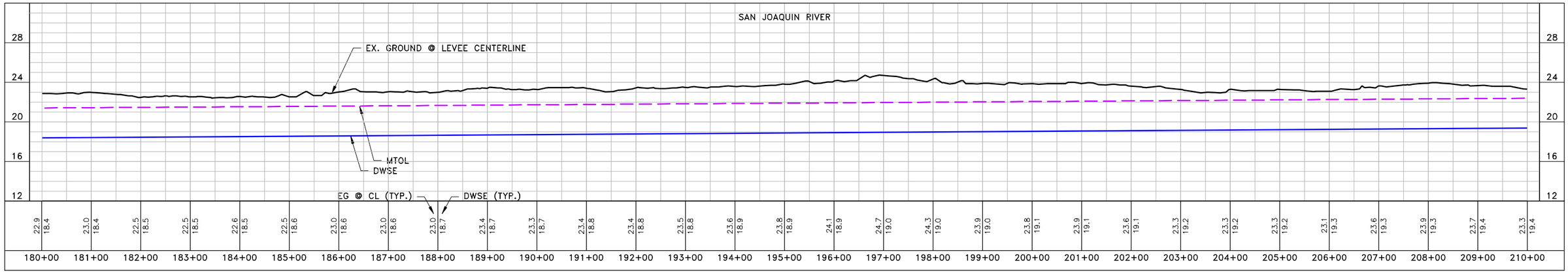
ROW AND SLURRY WALL CONSTRUCTION
PROFILE VIEW
STA 90+00 TO 180+00

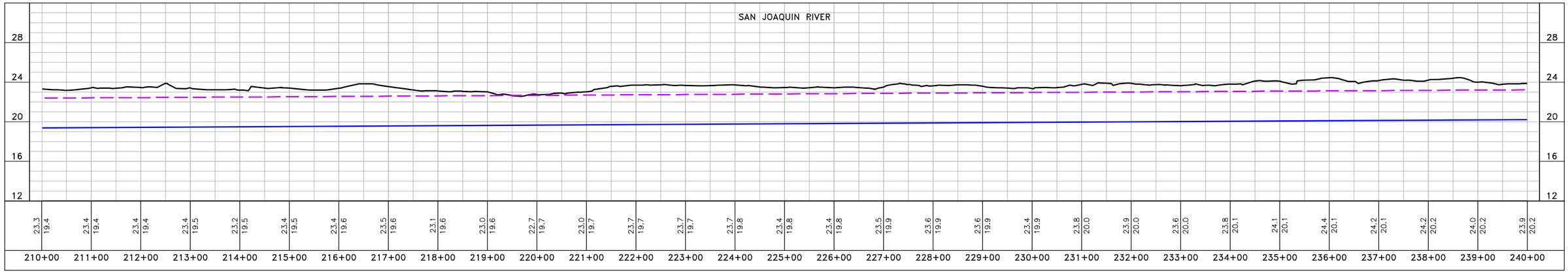
DATE
DECEMBER 11, 2019

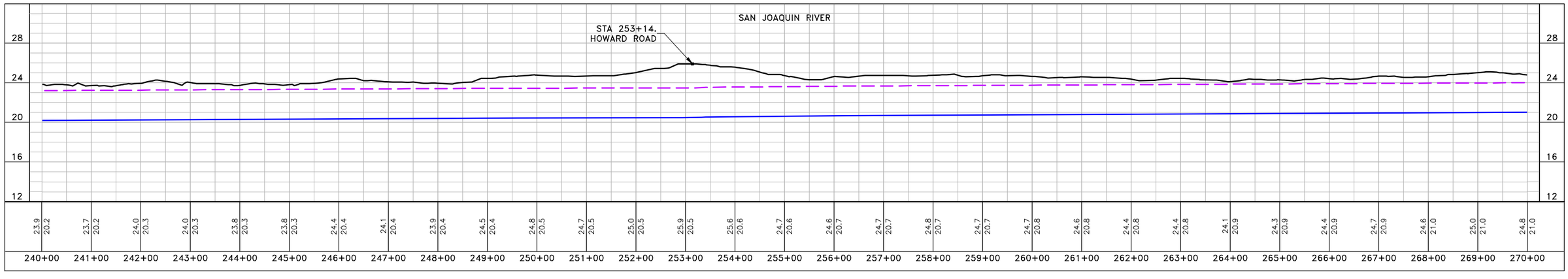
SHEET IDENTIFICATION
C1-202
SHEET 4 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 10:52am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION PROFILE VIEW

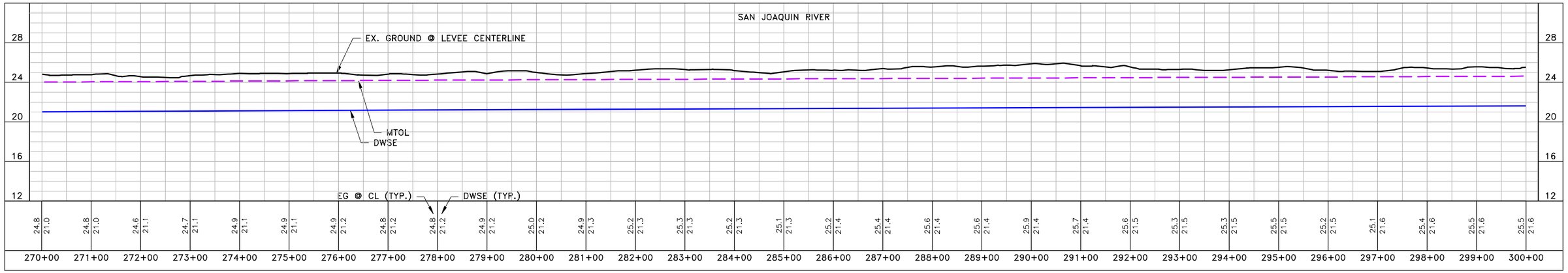
STA 180+00 TO 270+00

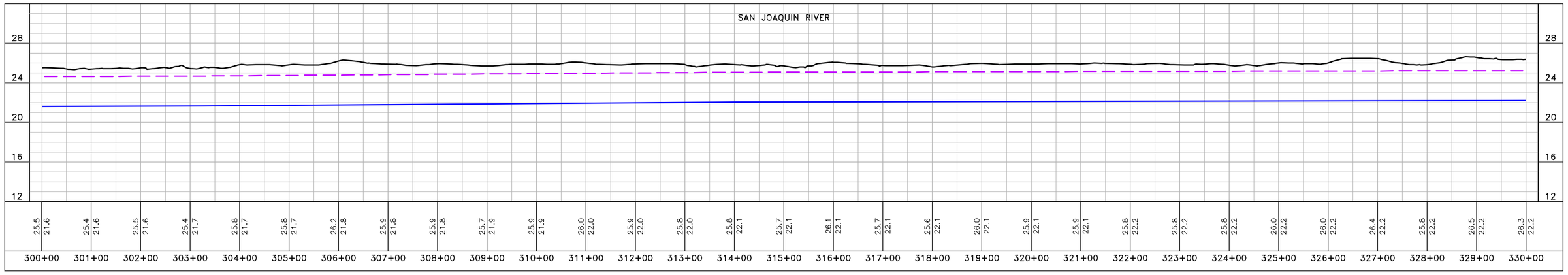
DATE
DECEMBER 11, 2019

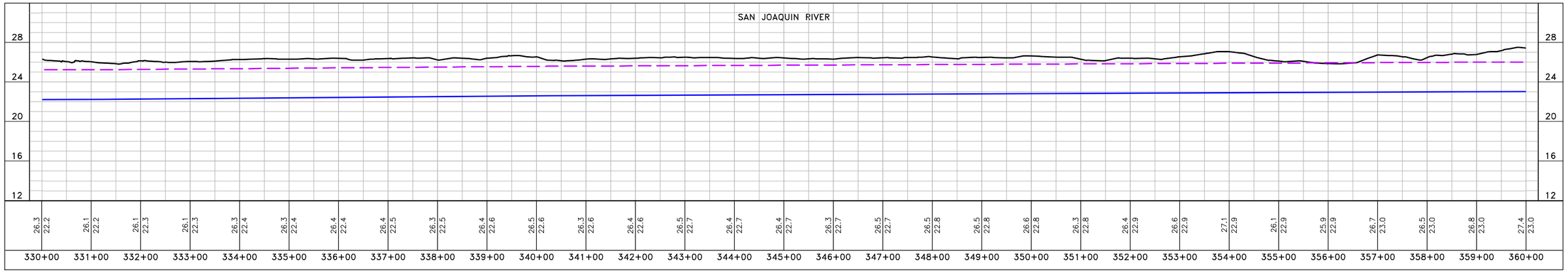
SHEET IDENTIFICATION
C1-203
SHEET 5 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 10:57am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

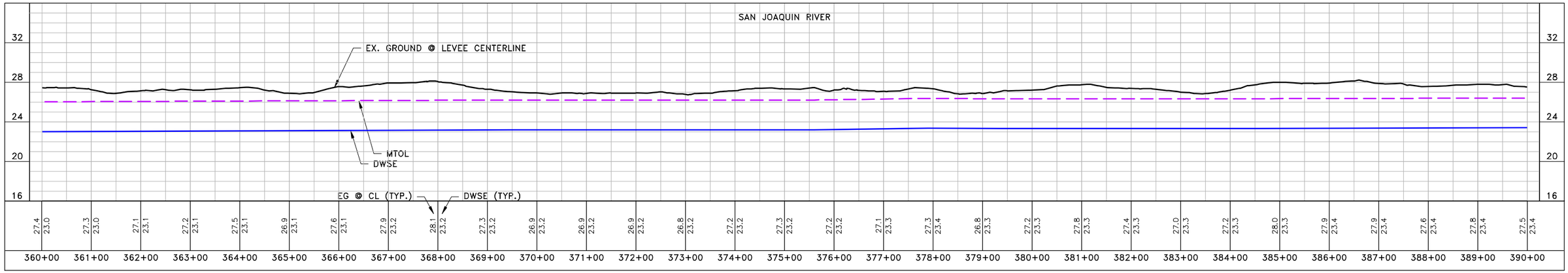
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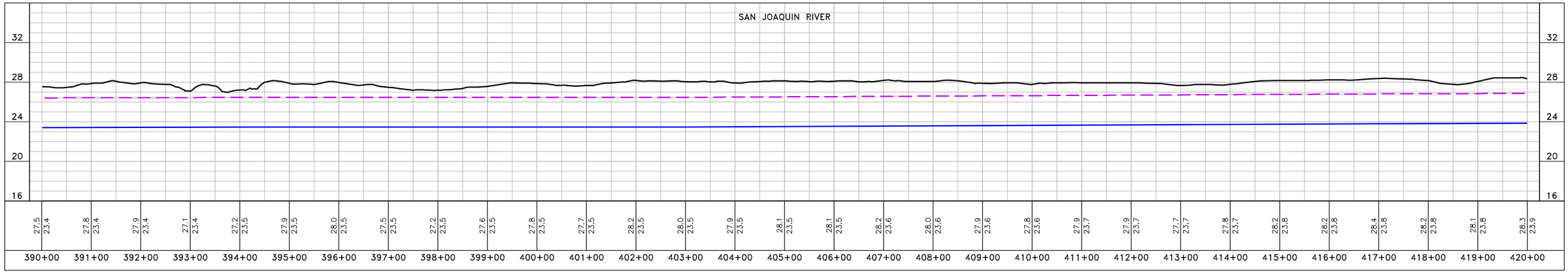
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

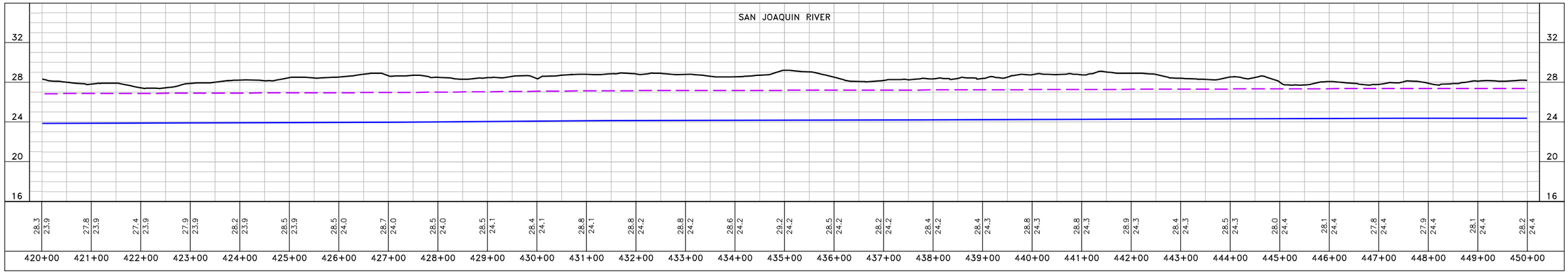
ROW AND SLURRY WALL CONSTRUCTION
PROFILE VIEW
STA 270+00 TO 360+00

DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C1-204
SHEET 6 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:03am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

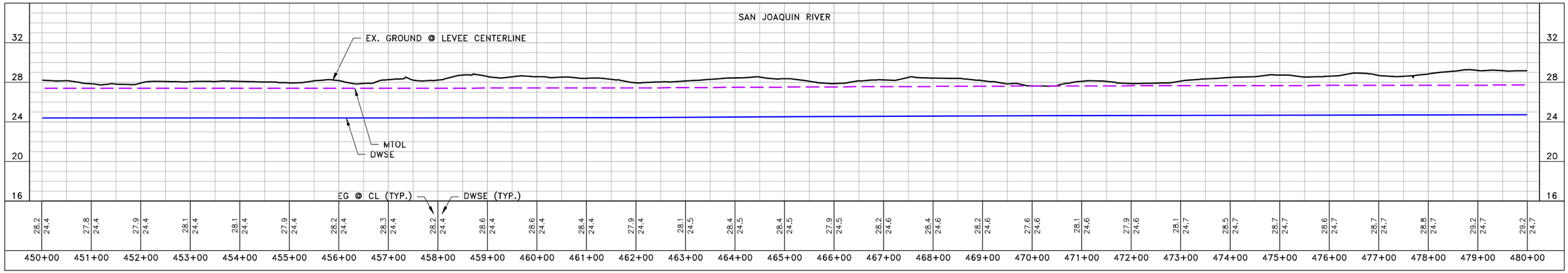
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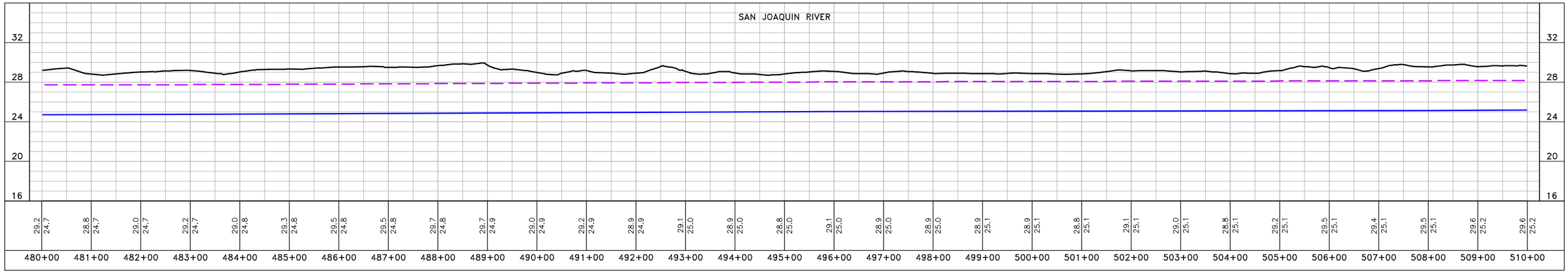
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

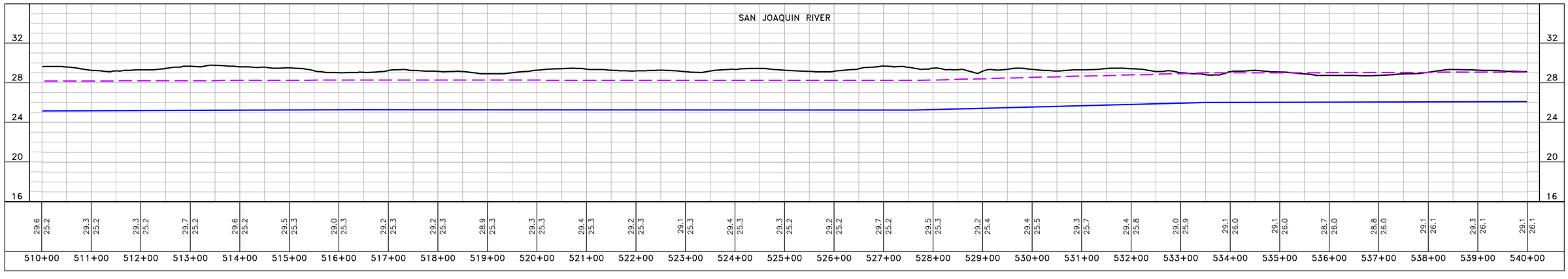
ROW AND SLURRY WALL CONSTRUCTION
PROFILE VIEW
STA 360+00 TO 450+00

DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C1-205
SHEET 7 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:09am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

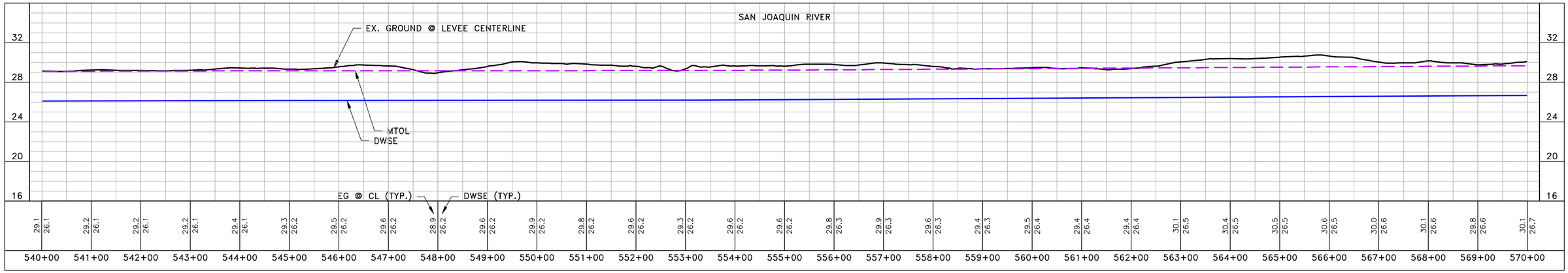
ROW AND SLURRY WALL CONSTRUCTION
PROFILE VIEW
STA 450+00 TO 540+00

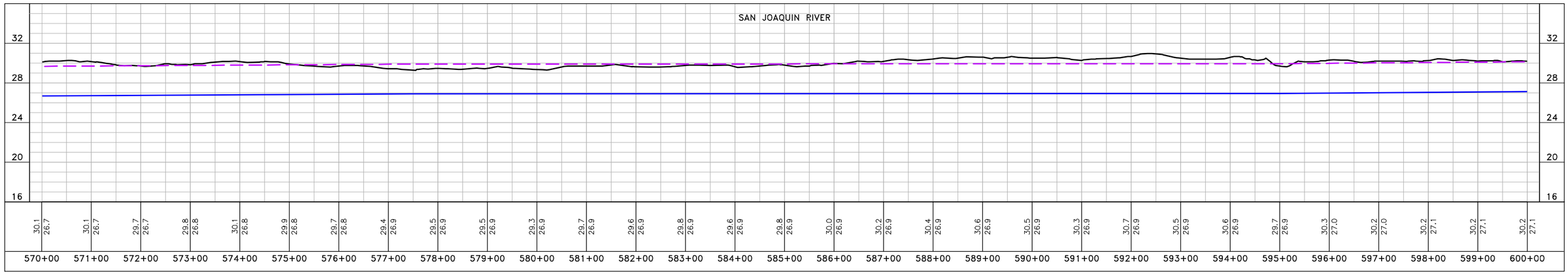
DATE
DECEMBER 11, 2019

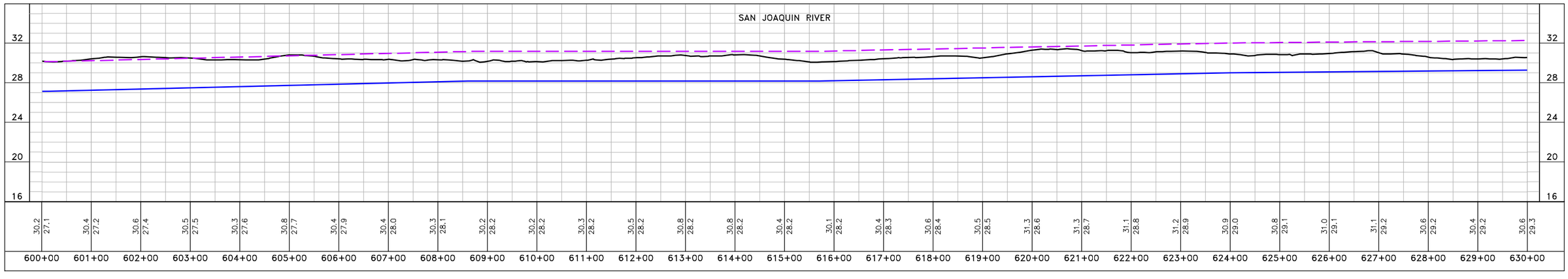
SHEET IDENTIFICATION
C1-206
SHEET 8 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:15am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION PROFILE VIEW

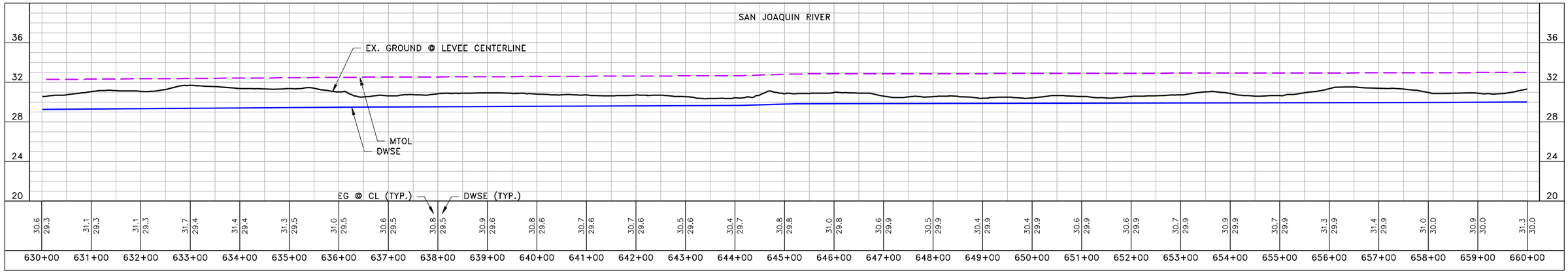
STA 540+00 TO 630+00

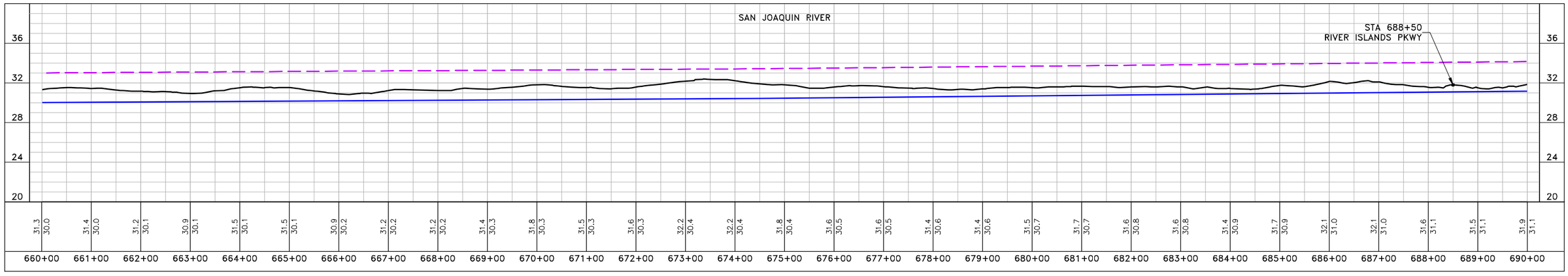
DATE
DECEMBER 11, 2019

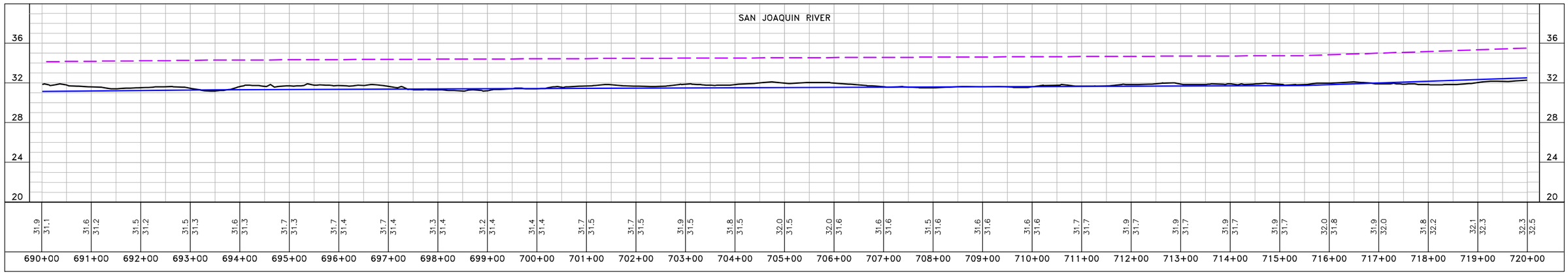
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SHEET 9 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:21am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

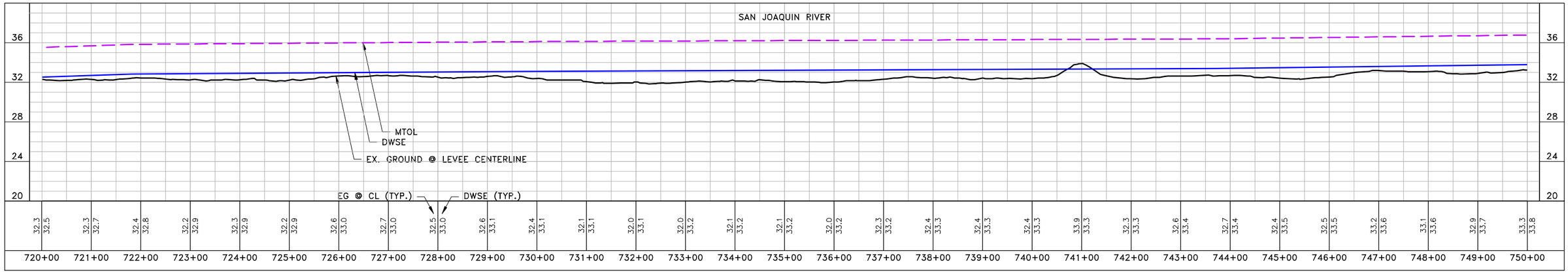
ROW AND SLURRY WALL CONSTRUCTION
PROFILE VIEW
STA 630+00 TO 720+00

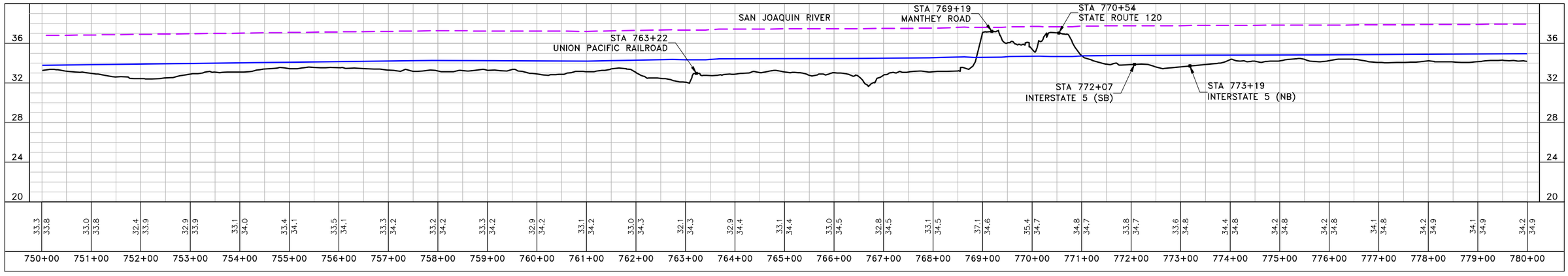
DATE
DECEMBER 11, 2019

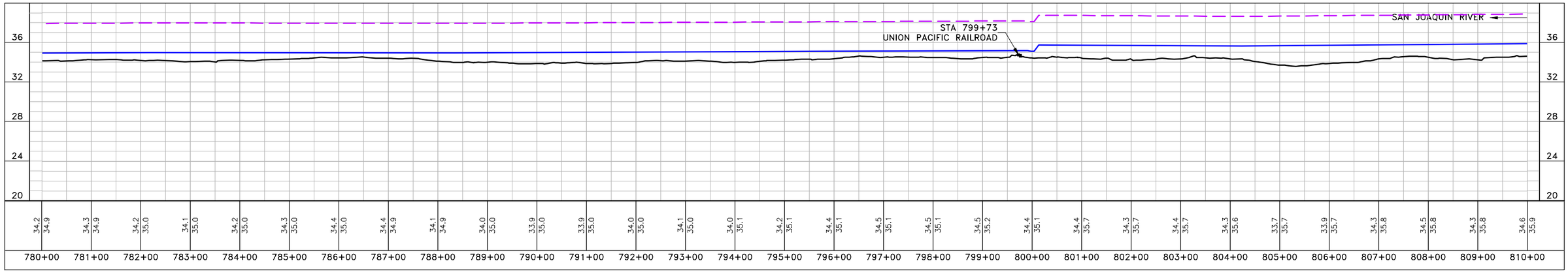
SHEET IDENTIFICATION
C1-208
SHEET 10 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:26am







NORTH ORIENTATION

PROJECT ENGINEER

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NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

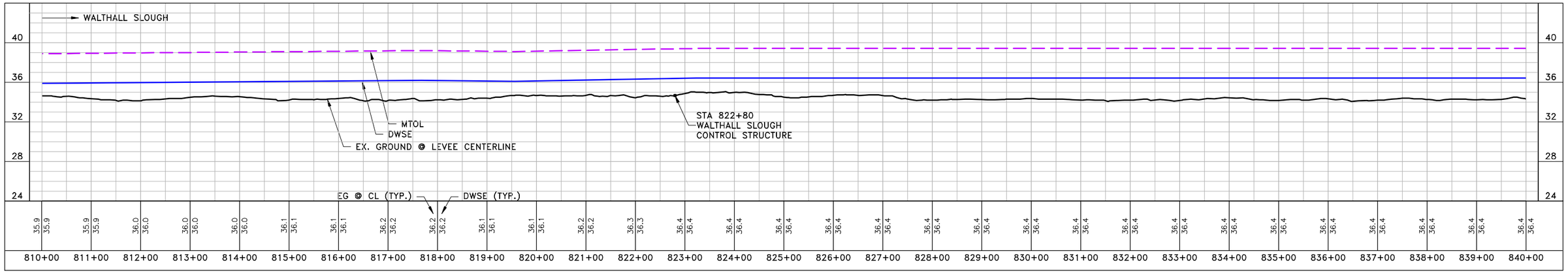
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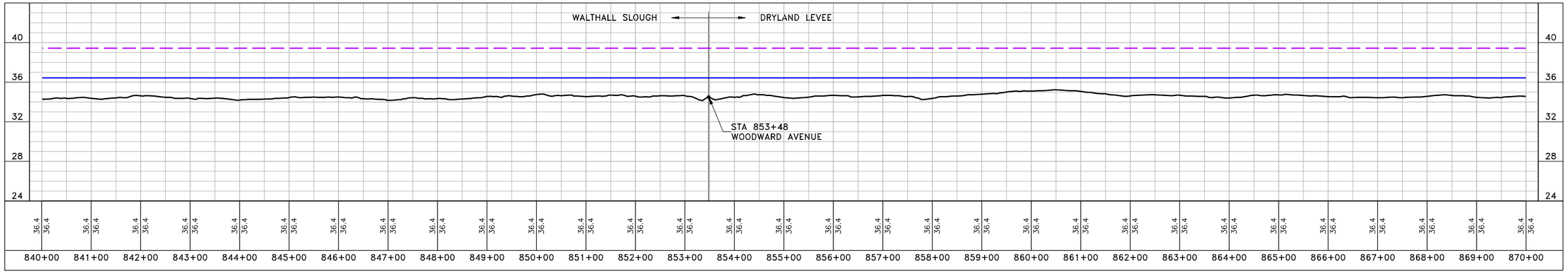
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

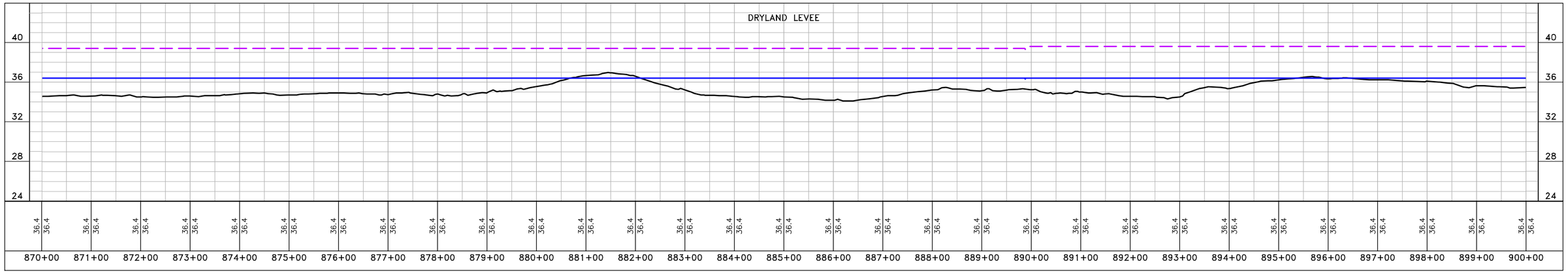
ROW AND SLURRY WALL CONSTRUCTION
PROFILE VIEW
STA 720+00 TO 810+00

DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C1-209
SHEET 11 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:32am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

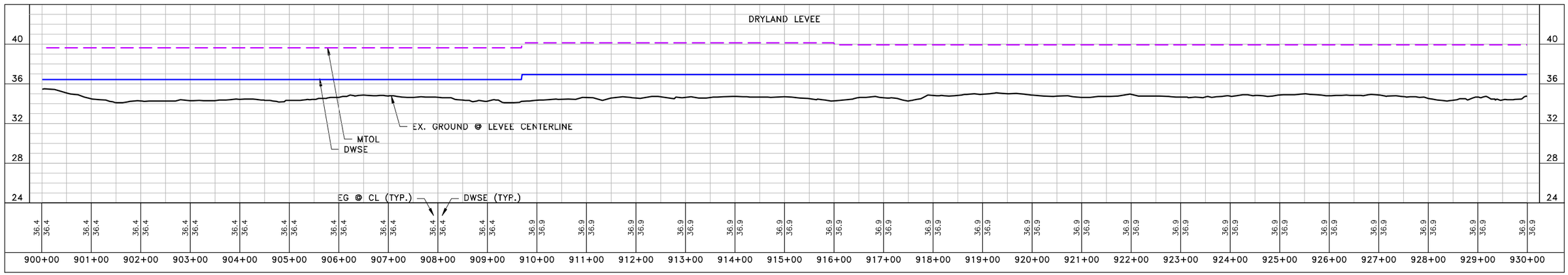
KSN inc. KJELDSEN SINNOCK NEUDECK
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711 N Pershing Avenue
Stockton, CA 95203
209-946-0268
1550 Harbor Drive, Suite 212
West Sacramento, CA 95691
916-403-5900

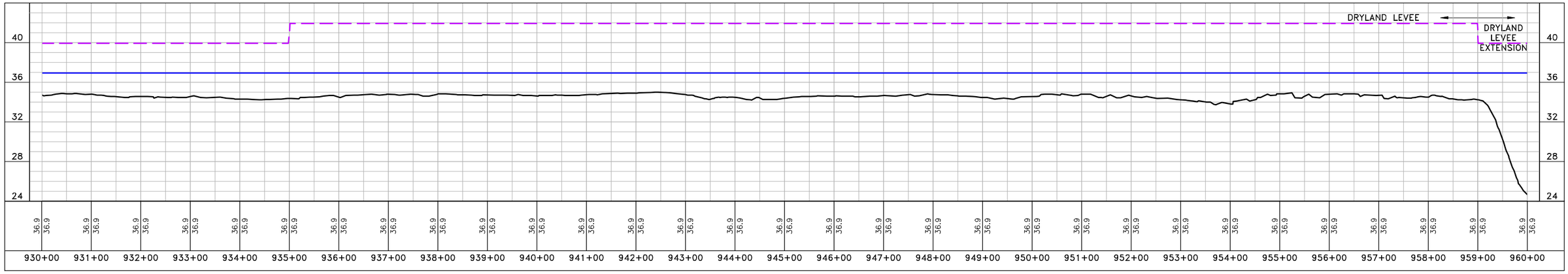
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

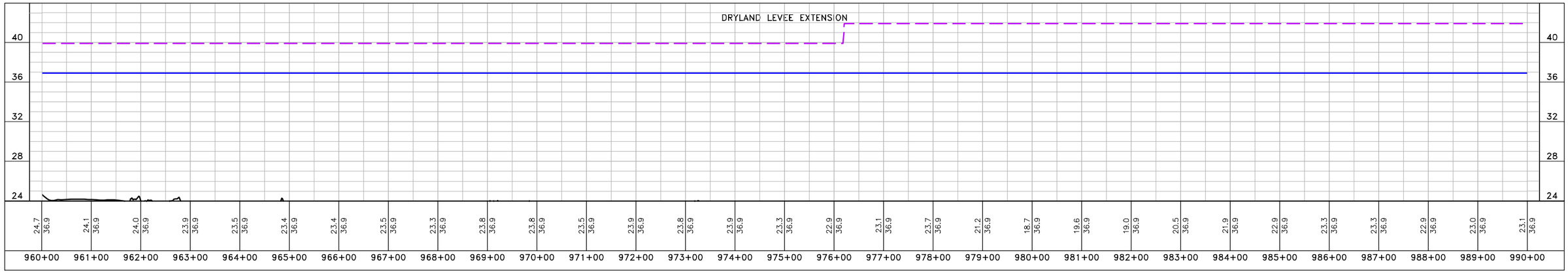
ROW AND SLURRY WALL CONSTRUCTION
PROFILE VIEW
STA 810+00 TO 900+00

DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C1-210
SHEET 12 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:39am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

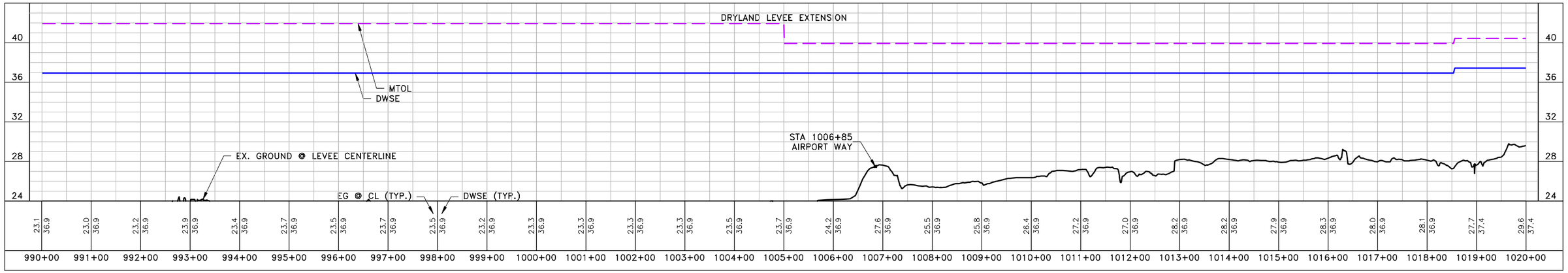
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PROFILE VIEW
STA 900+00 TO 990+00

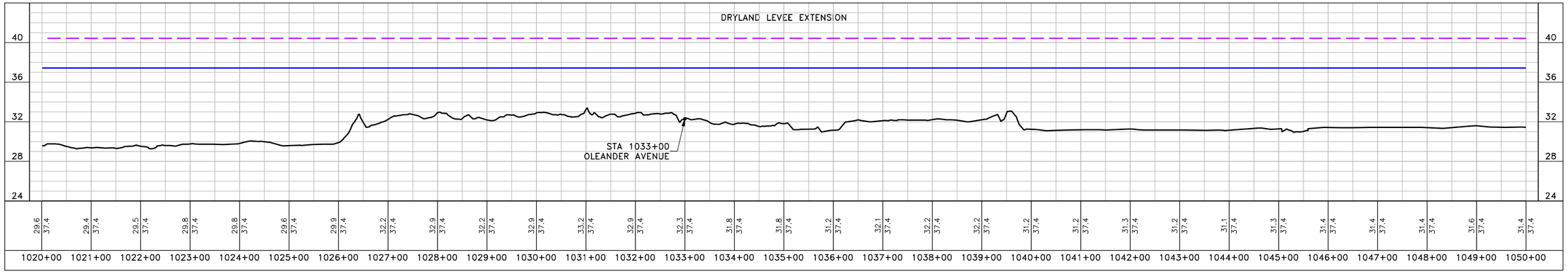
DATE
DECEMBER 11, 2019

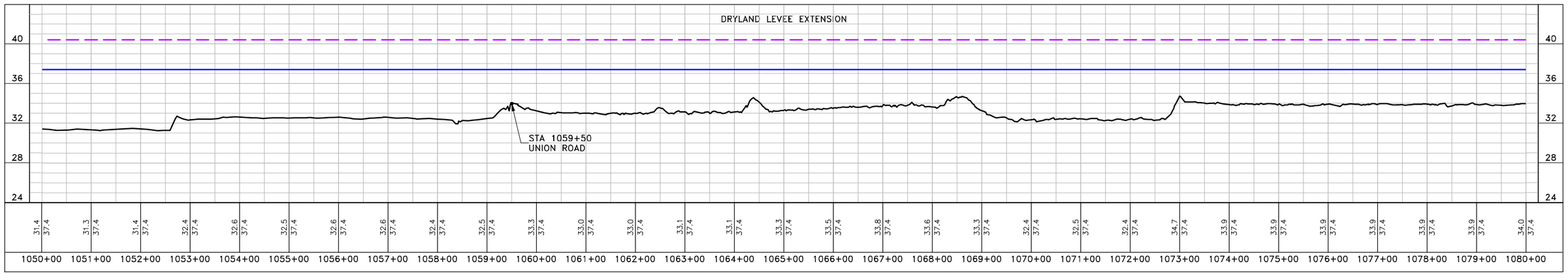
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C1-211
SHEET 13 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:44am







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION PROFILE VIEW

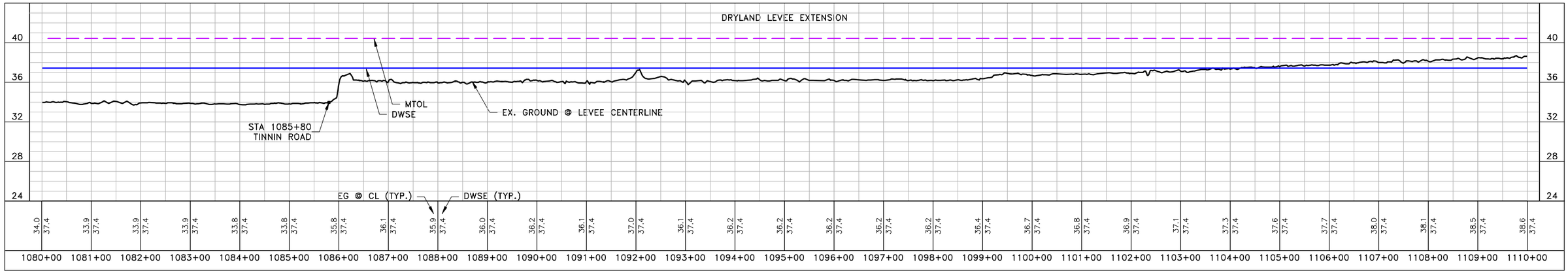
STA 990+00 TO 1080+00

DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C1-212
SHEET 14 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:51am



NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION PROFILE VIEW

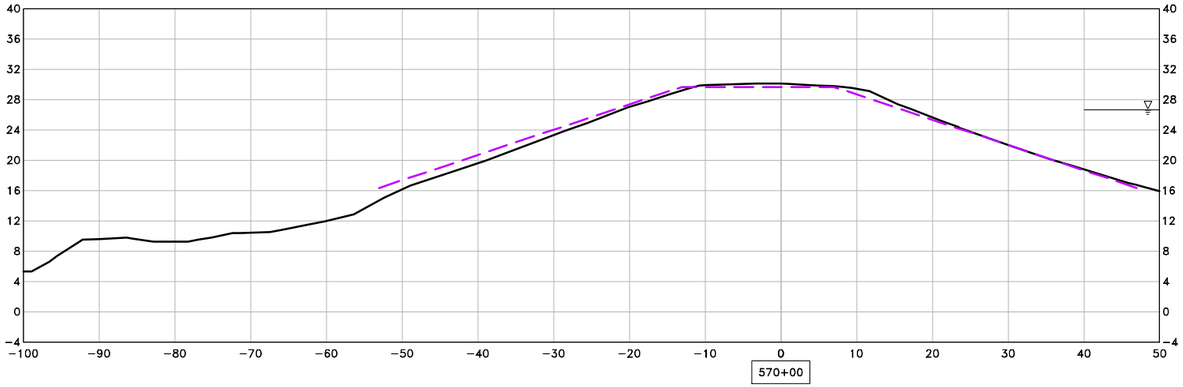
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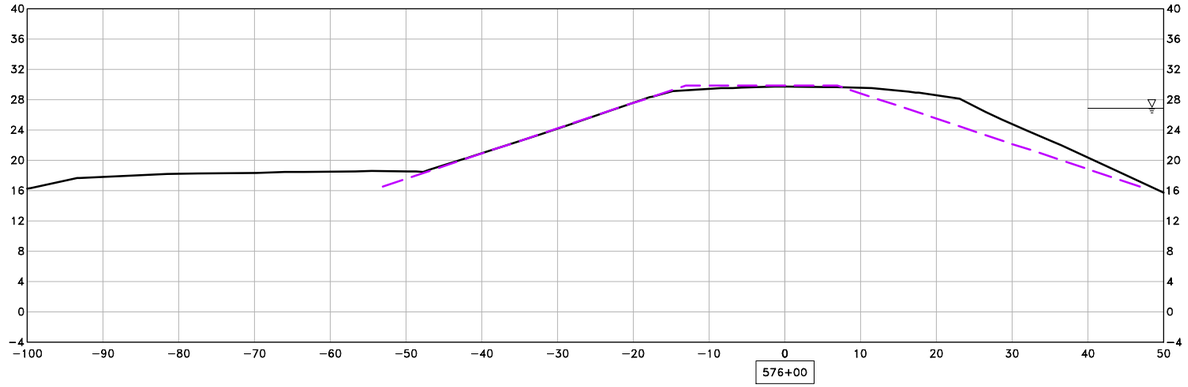
DATE
DECEMBER 11, 2019

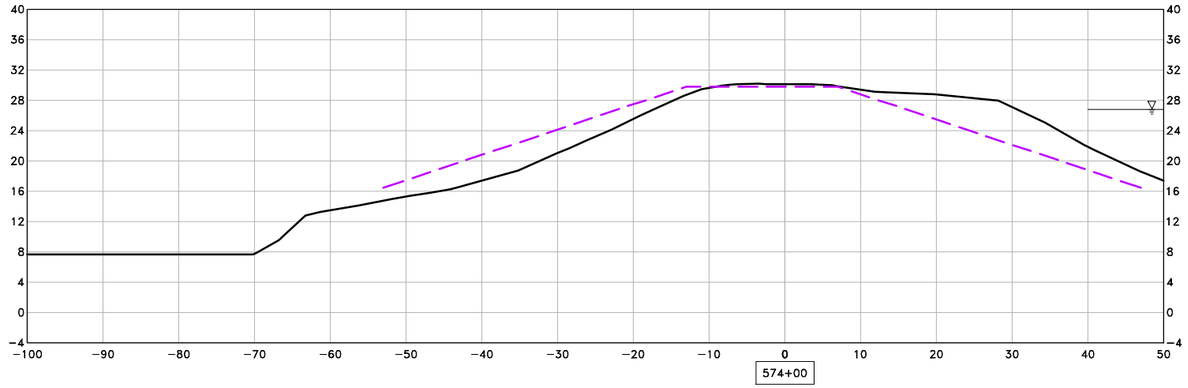
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SHEET 15 OF 136

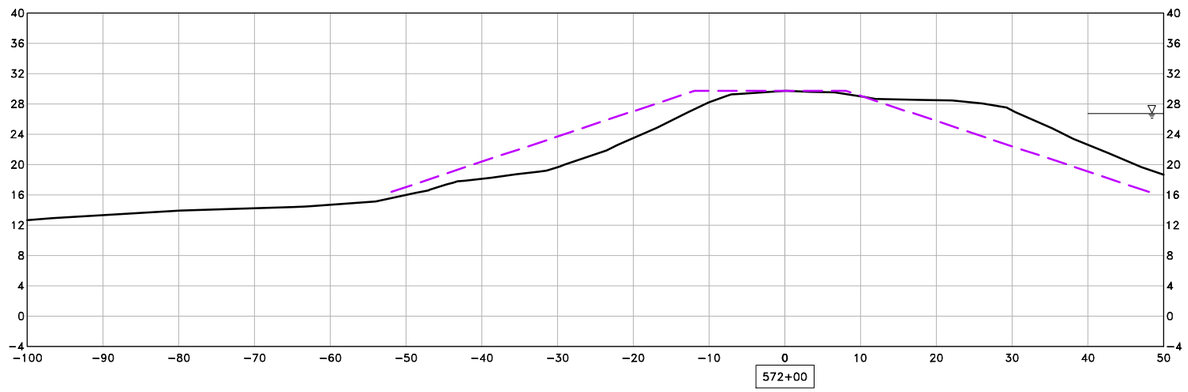
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-201.dwg
PLOT DATE: Dec 11, 2019 - 11:53am









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:09pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

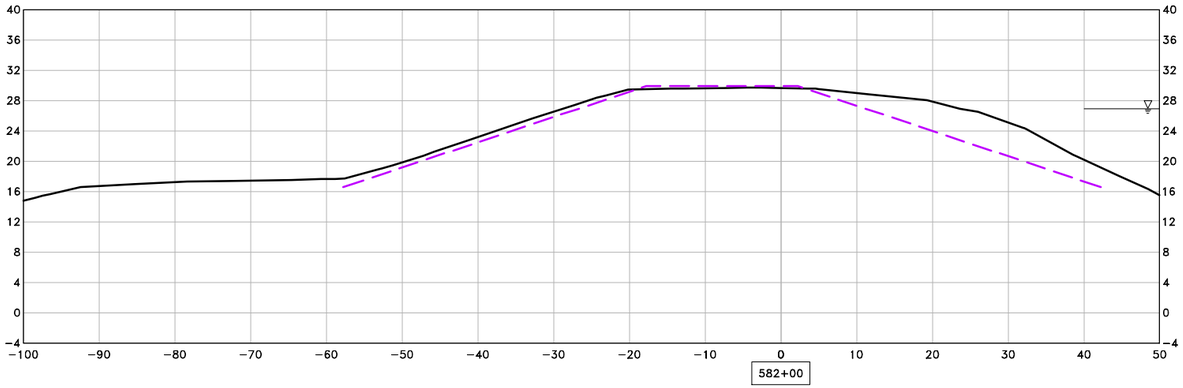
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

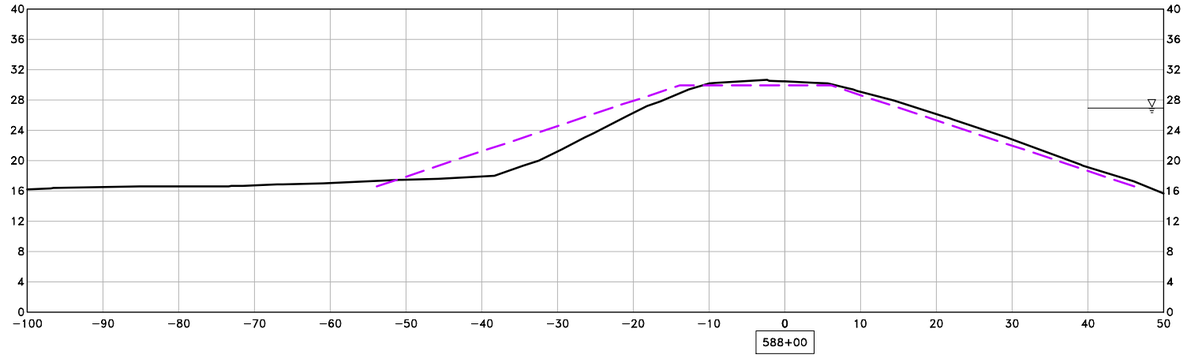
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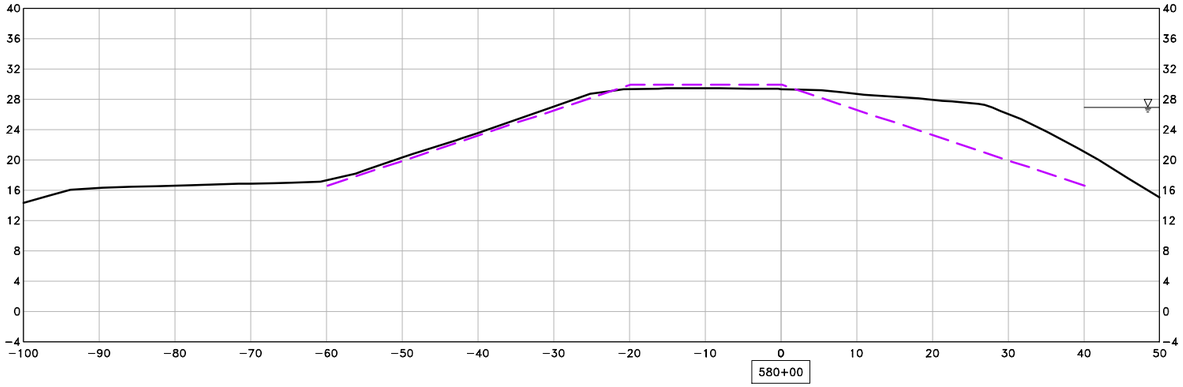
DATE
DECEMBER 11, 2019

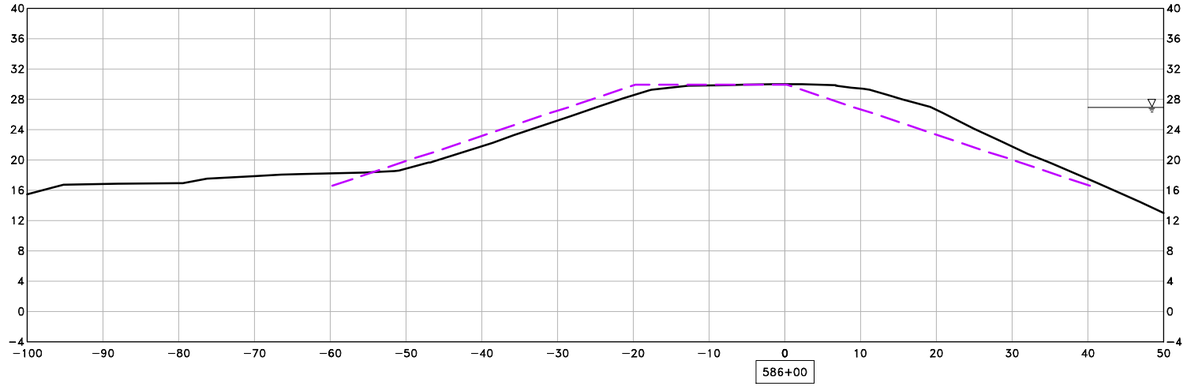
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SHEET 16 OF 136

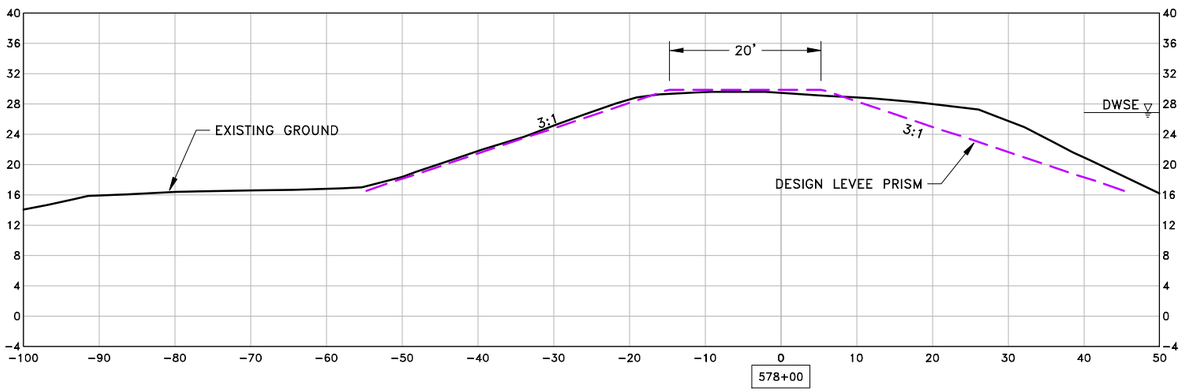
KSN PROJECT FILE NO.
2255-0050

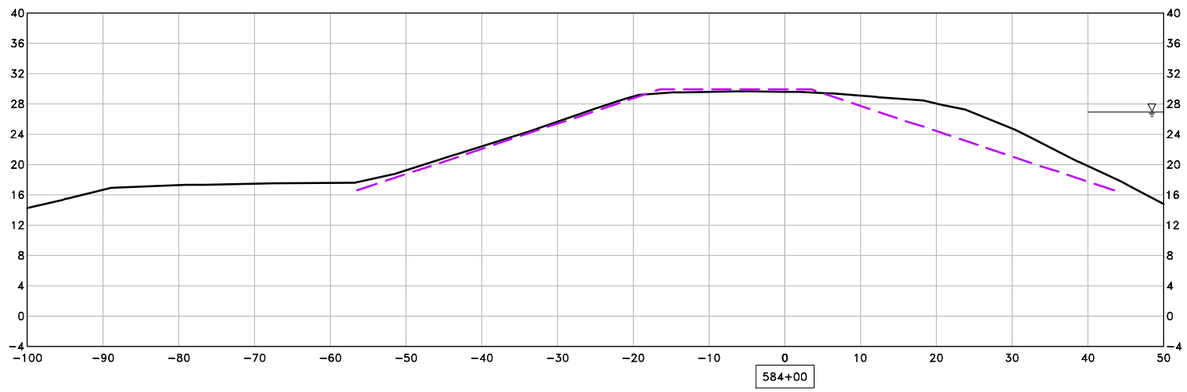












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:10pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

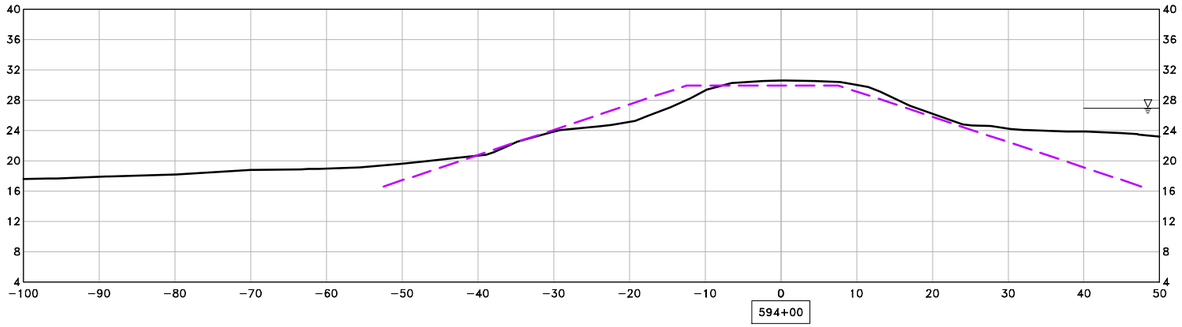
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

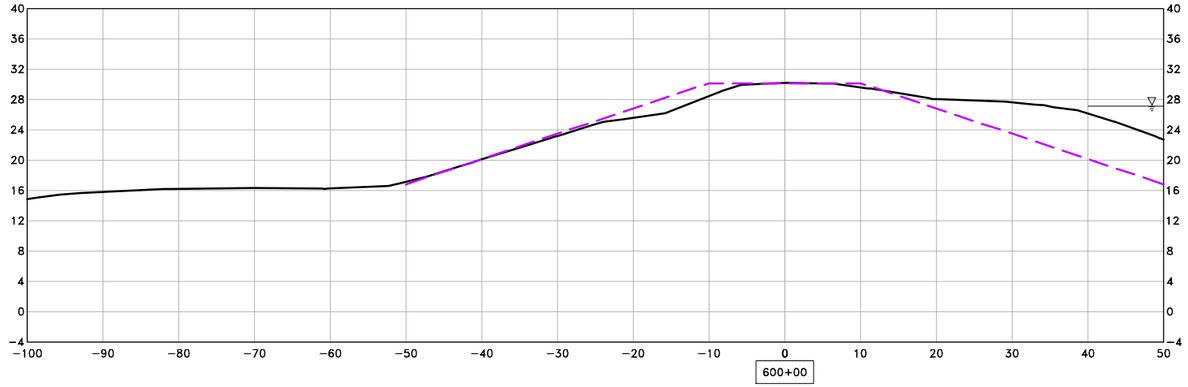
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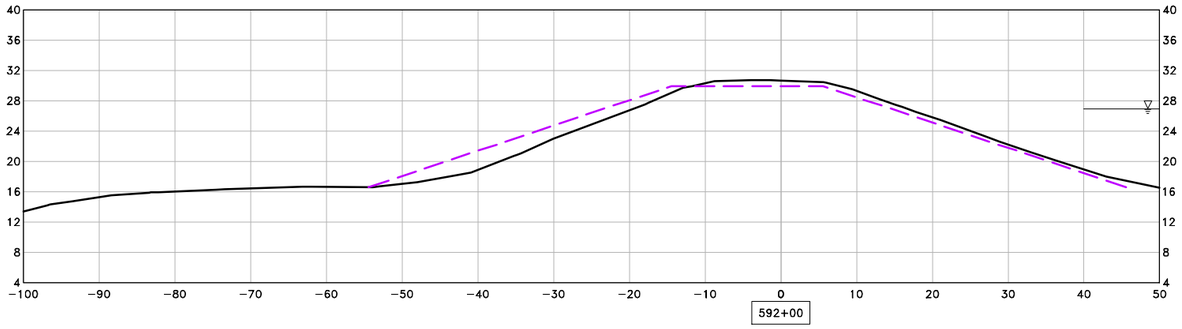
DATE
DECEMBER 11, 2019

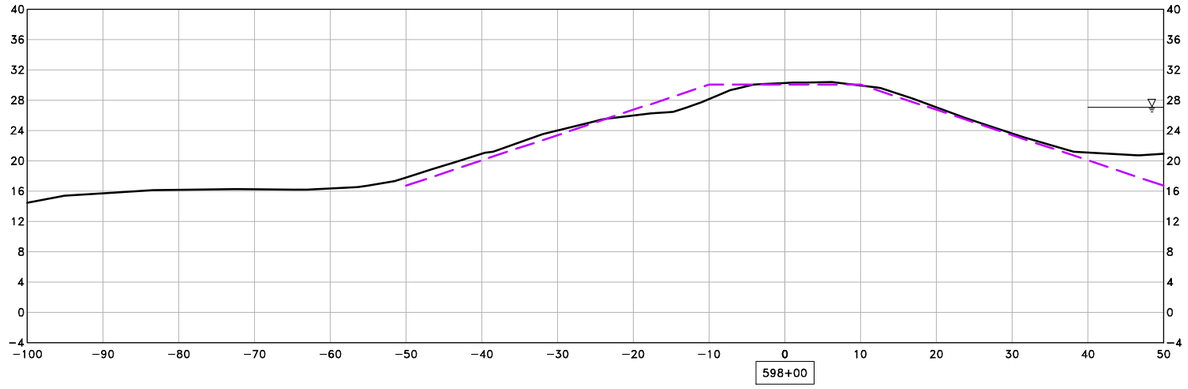
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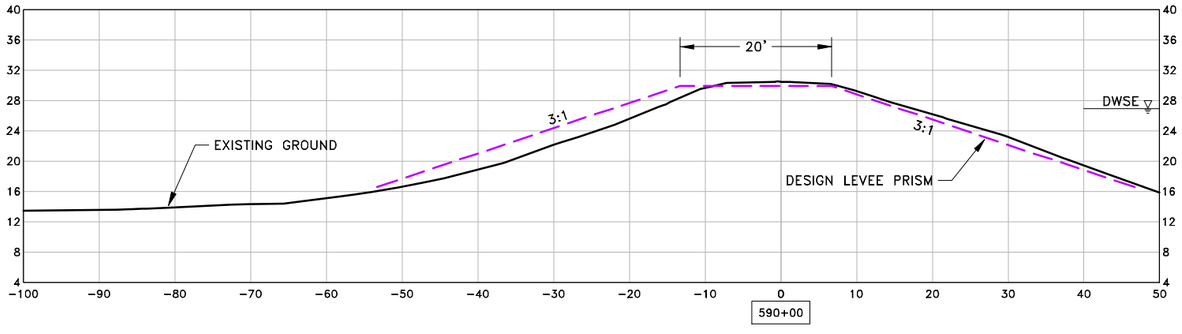
KSN PROJECT FILE NO.
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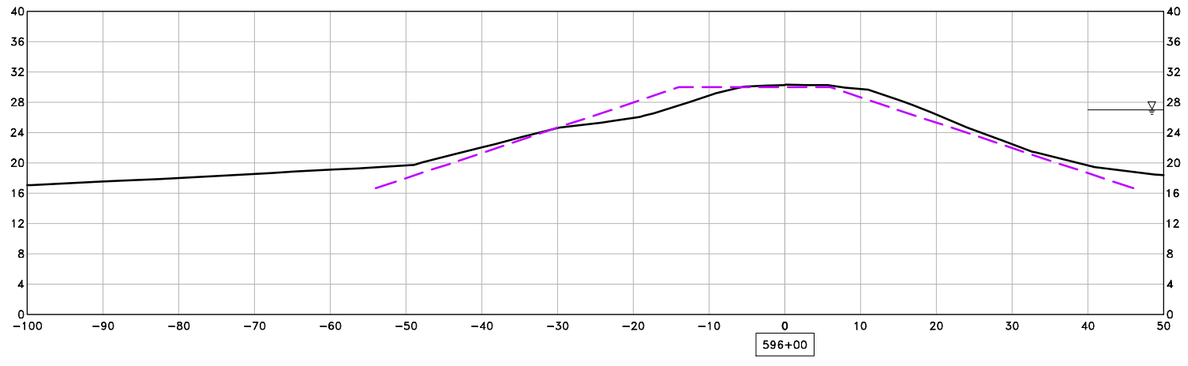












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PLOT DATE: Dec 11, 2019 - 2:12pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

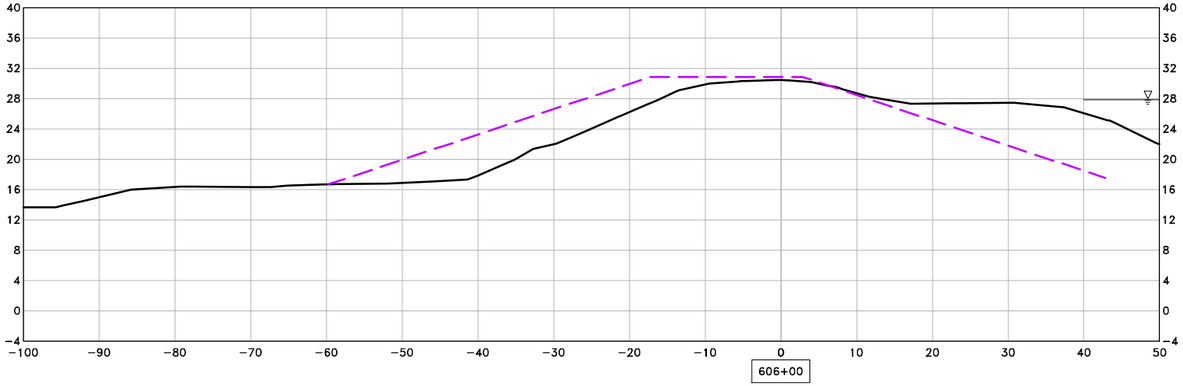
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

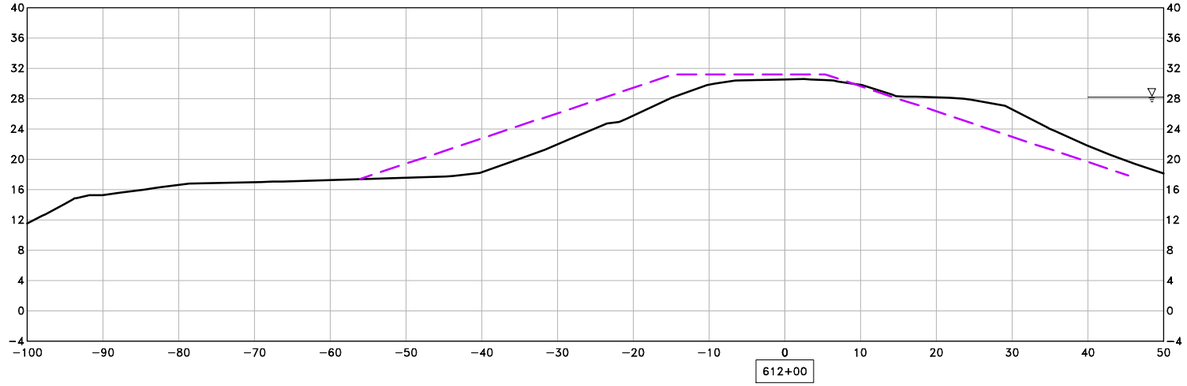
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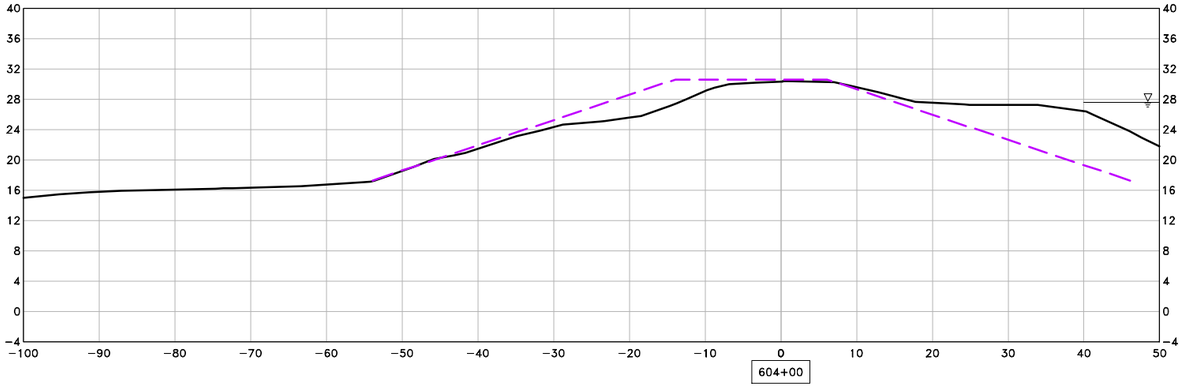
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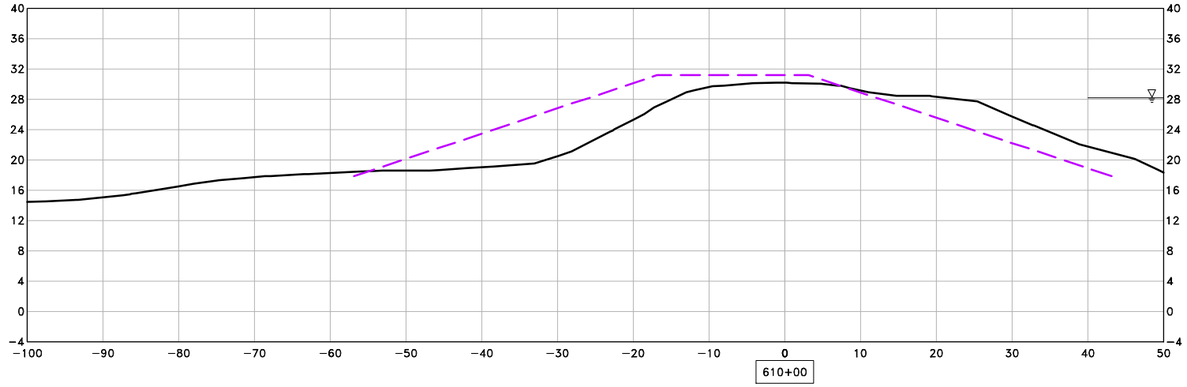
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SHEET 18 OF 136

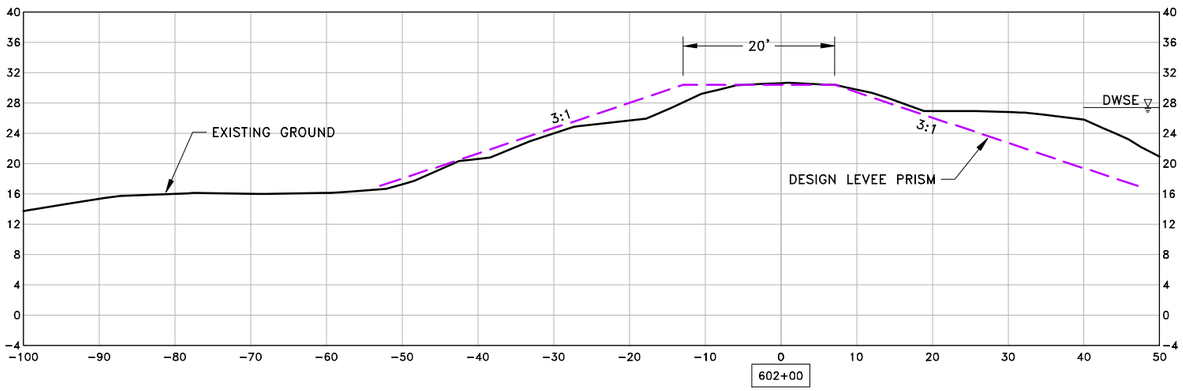
KSN PROJECT FILE NO.
2255-0050

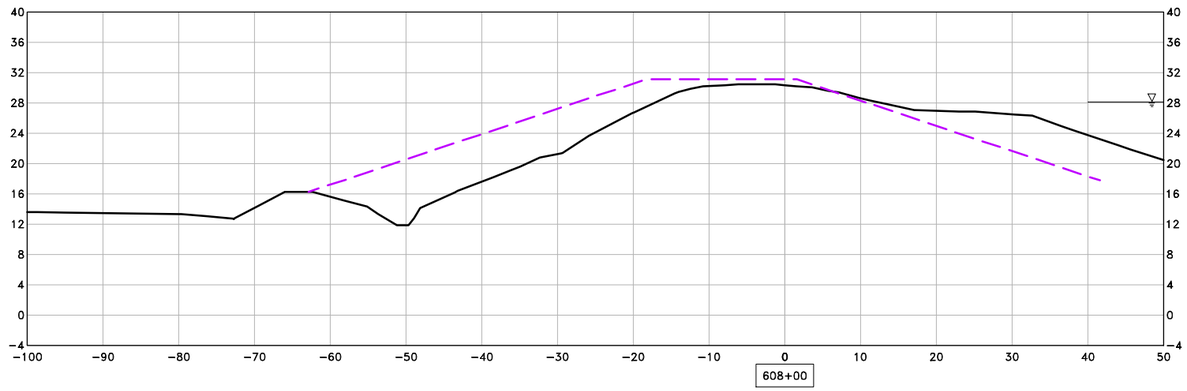












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:14pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

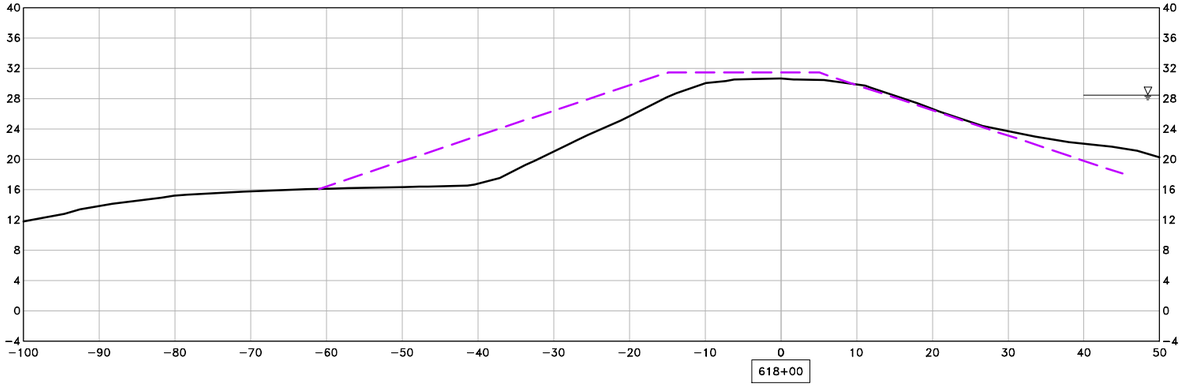
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

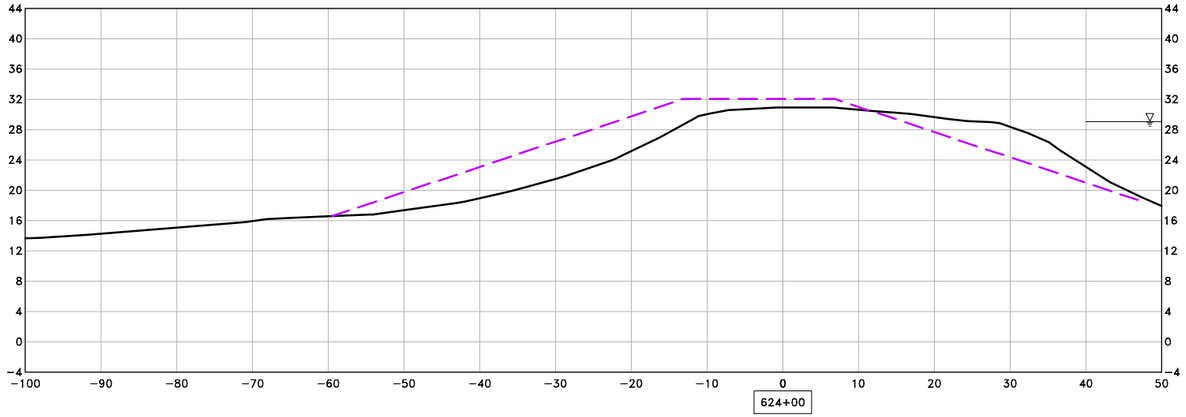
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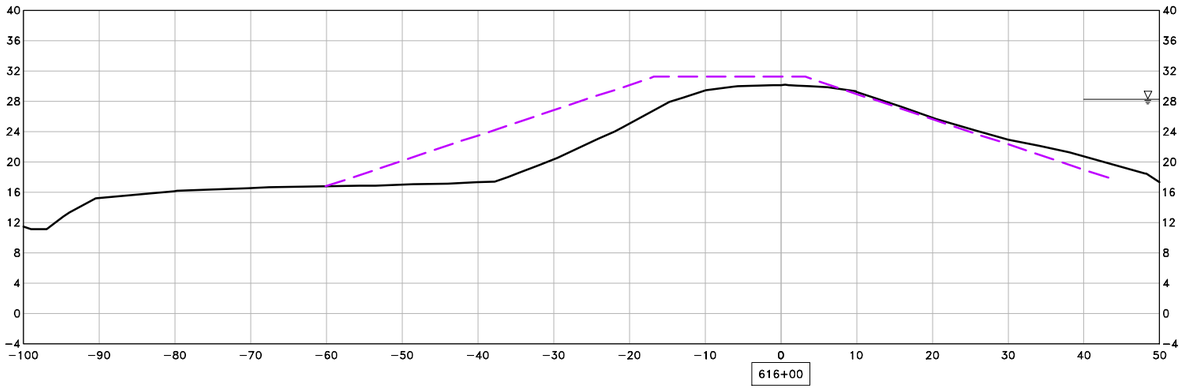
DATE
DECEMBER 11, 2019

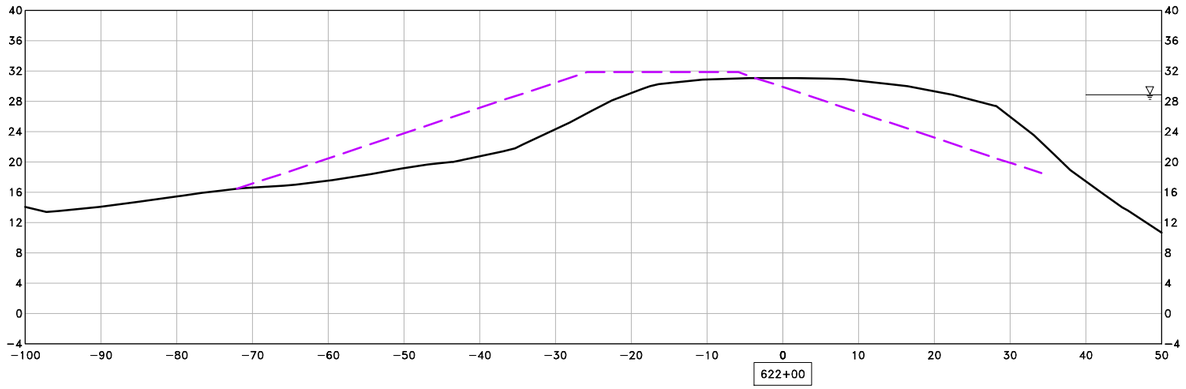
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C1-304
SHEET 19 OF 136

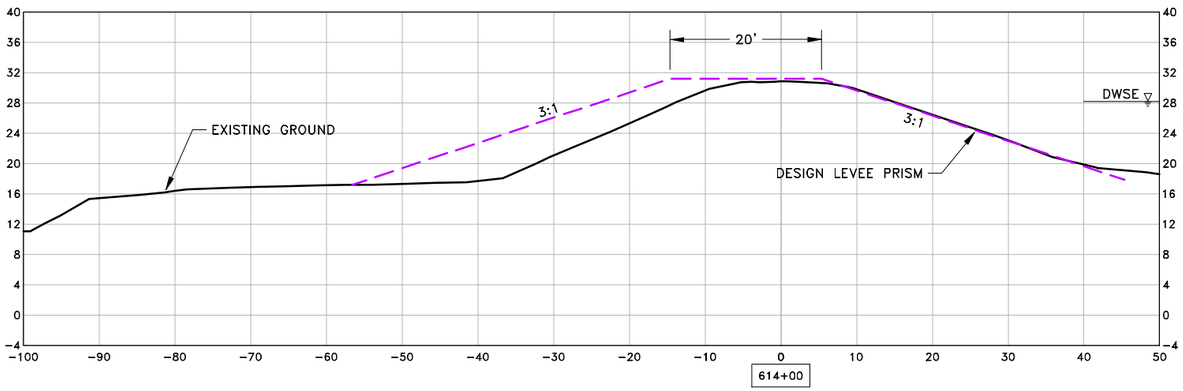
KSN PROJECT FILE NO.
2255-0050

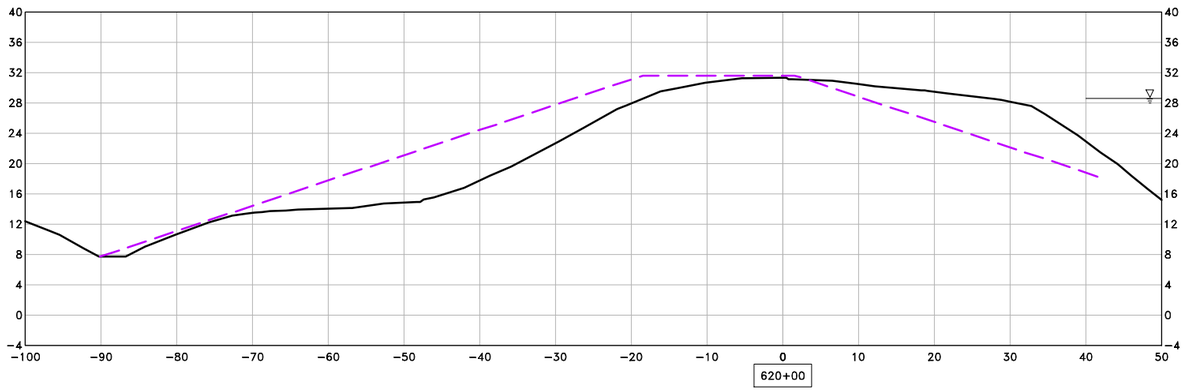












FILE SPEC:: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:16pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

KJELDSEN SINNOCK NEUDECK
CIVIL ENGINEERS & LAND SURVEYORS
www.ksninc.com
711 N Pershing Avenue
Stockton, CA 95203
209-946-0268
1550 Harbor Drive, Suite 212
West Sacramento, CA 95691
916-403-5900

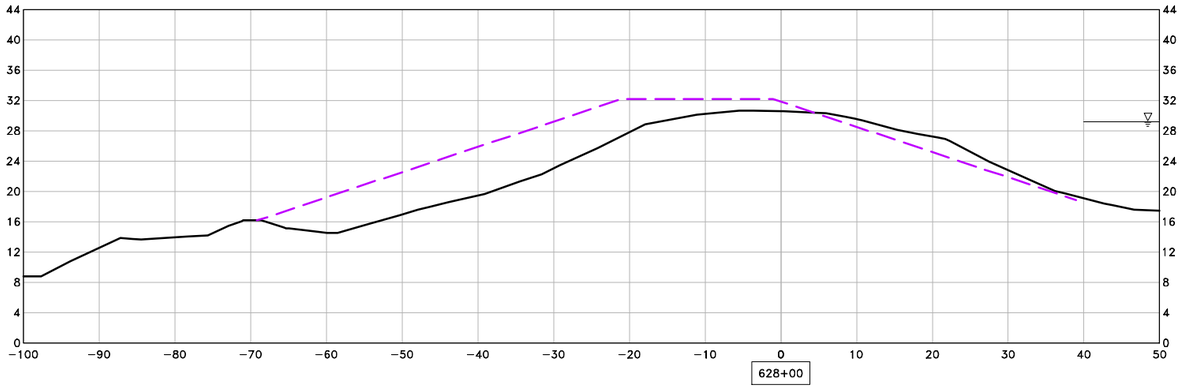
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

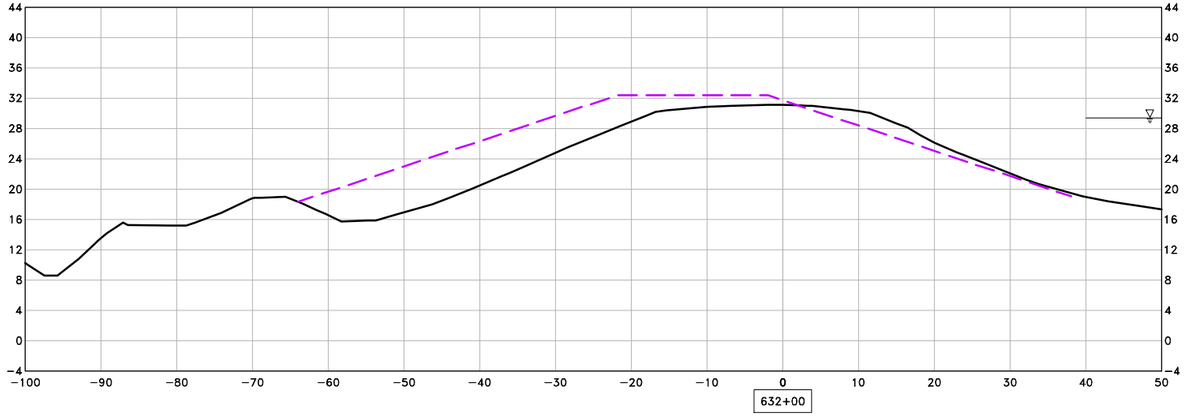
ROW AND SLURRY WALL CONSTRUCTION
SECTION VIEW
STA 614+00 TO STA 626+00

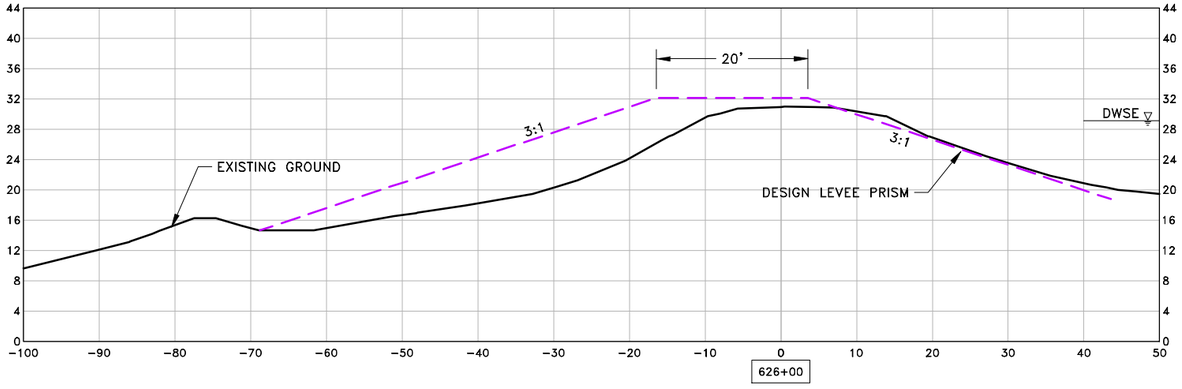
DATE
DECEMBER 11, 2019

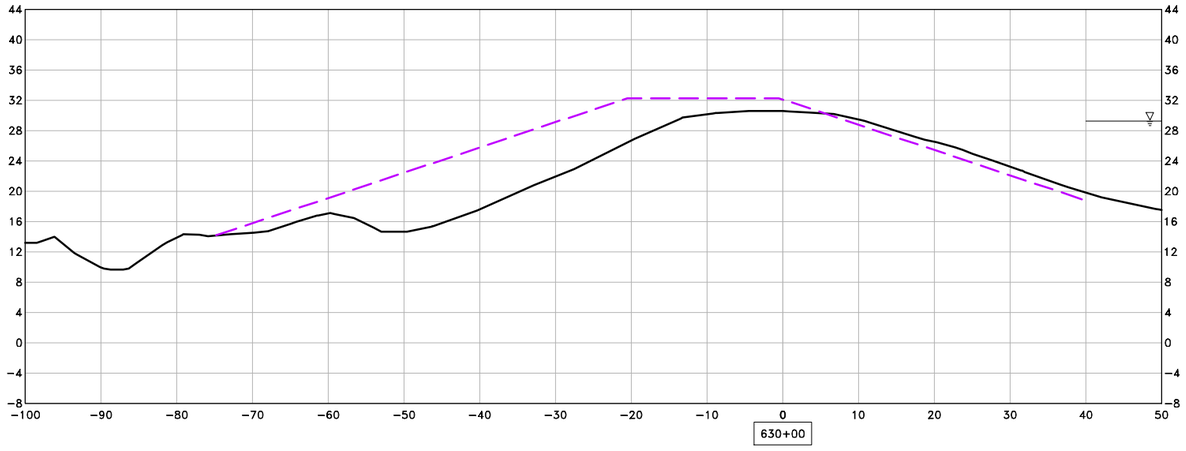
SHEET IDENTIFICATION
C1-305
SHEET 20 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:18pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

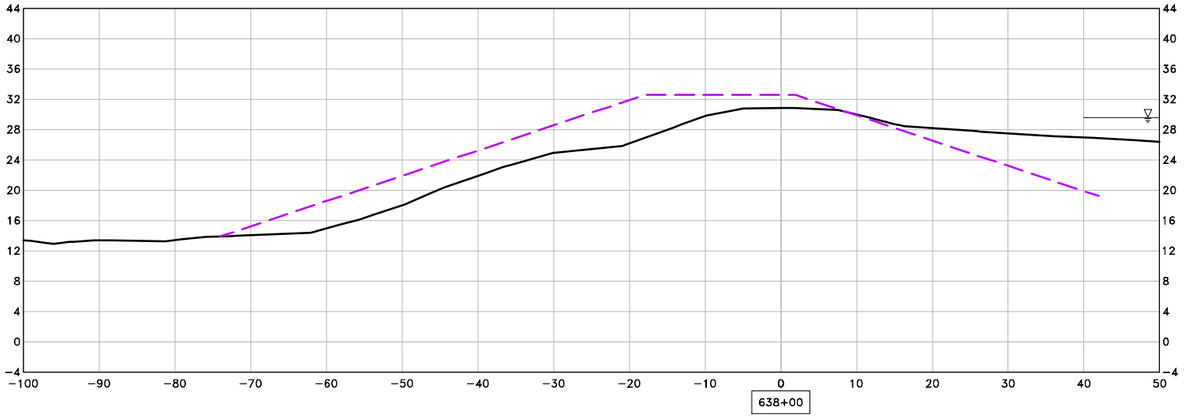
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

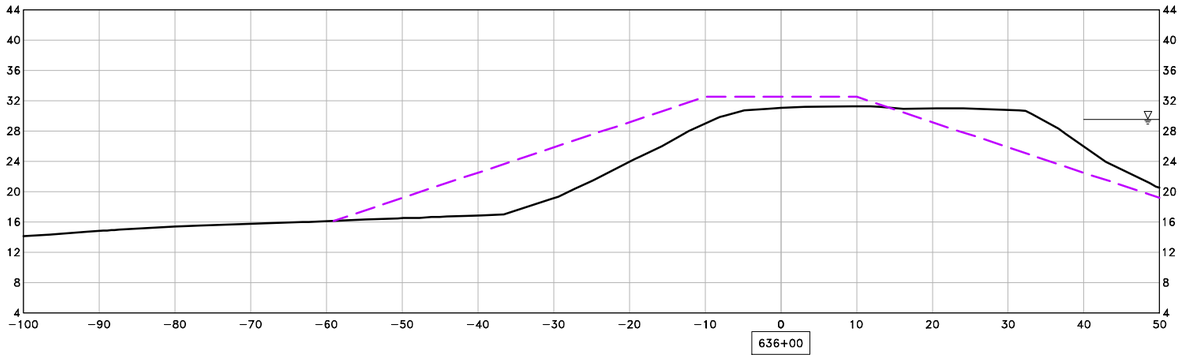
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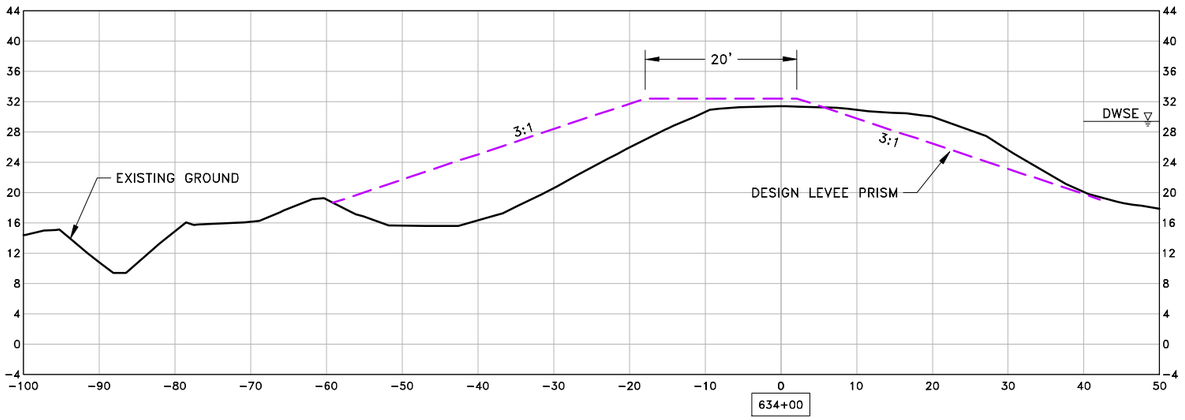
DATE
DECEMBER 11, 2019

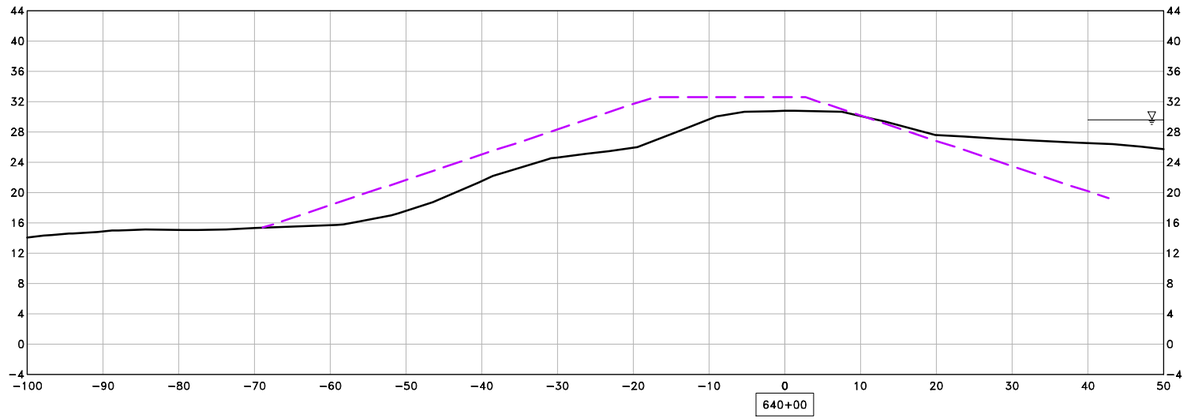
SHEET IDENTIFICATION
C1-306
SHEET 21 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:19pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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711 N Pershing Avenue
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1550 Harbor Drive, Suite 212
West Sacramento, CA 95691
916-403-5900

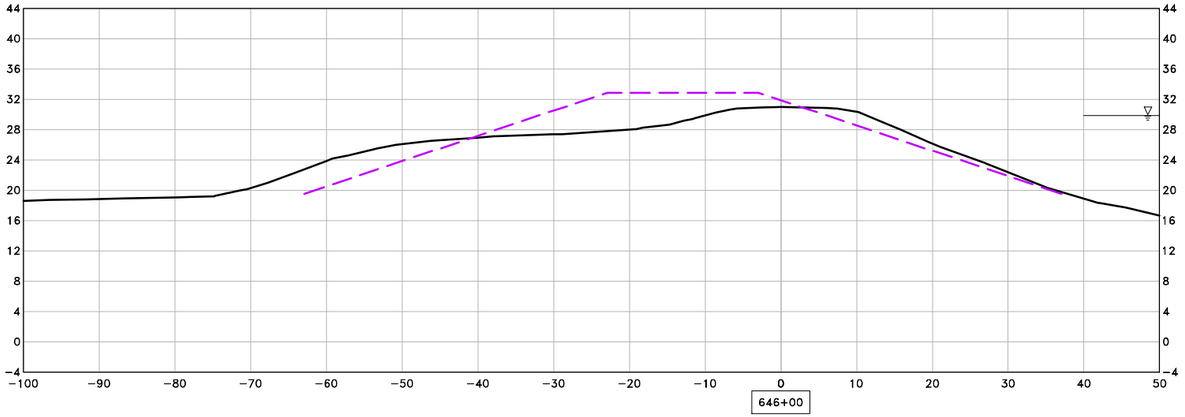
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

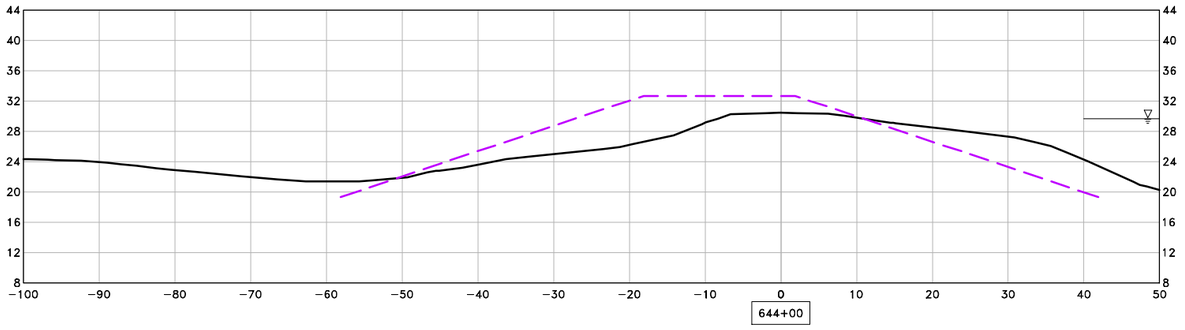
ROW AND SLURRY WALL CONSTRUCTION
SECTION VIEW
STA 634+00 TO STA 642+00

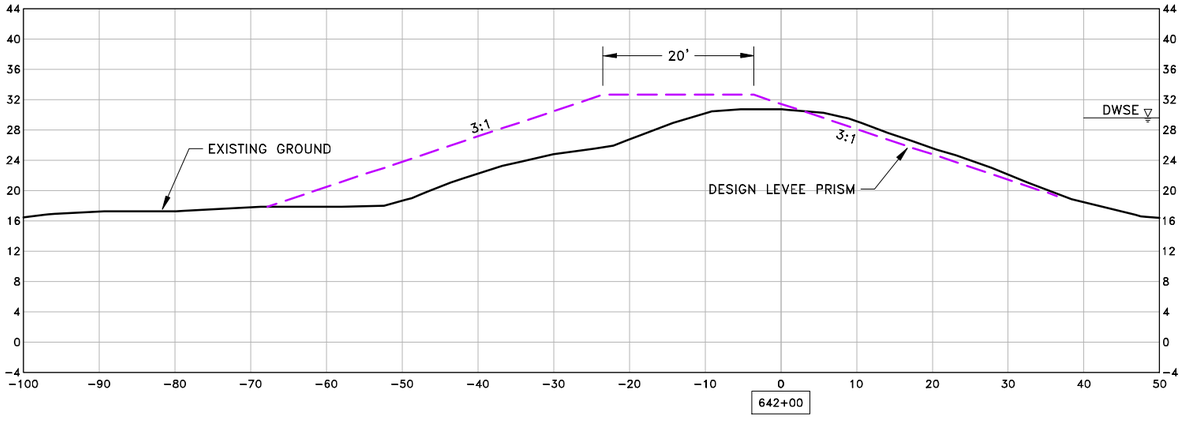
DATE
DECEMBER 11, 2019

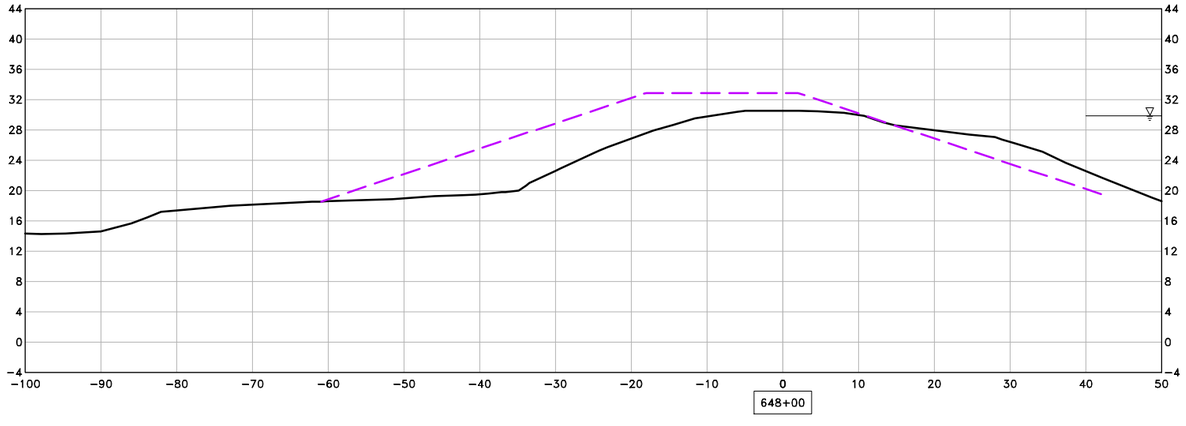
SHEET IDENTIFICATION
C1-307
SHEET 22 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:21pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

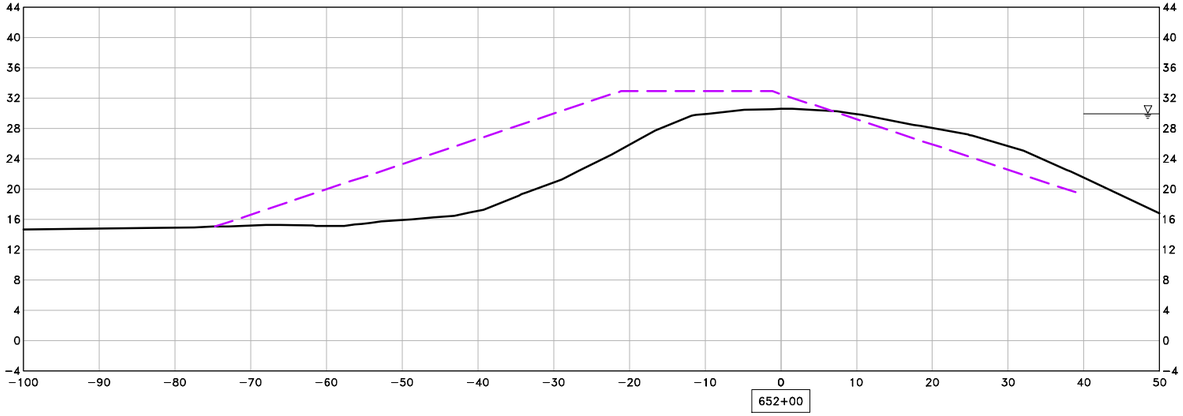
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

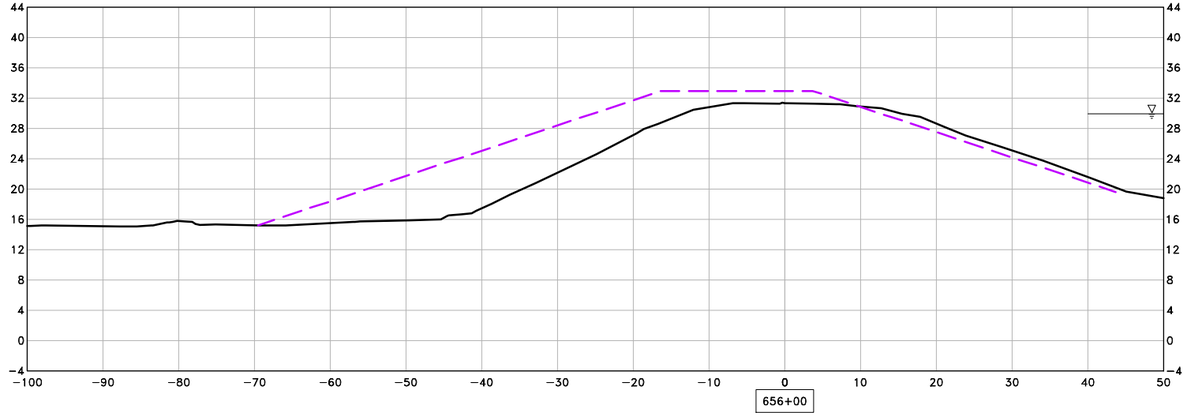
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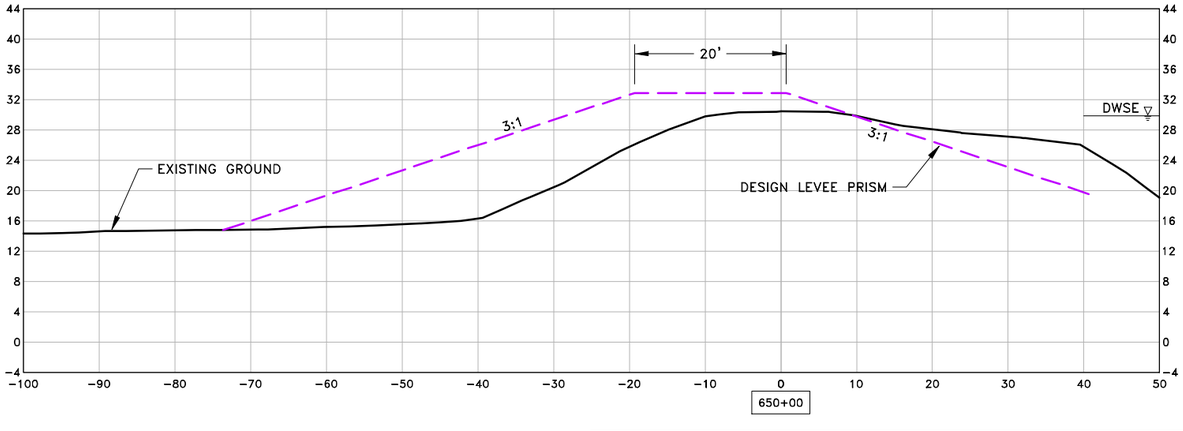
DATE
DECEMBER 11, 2019

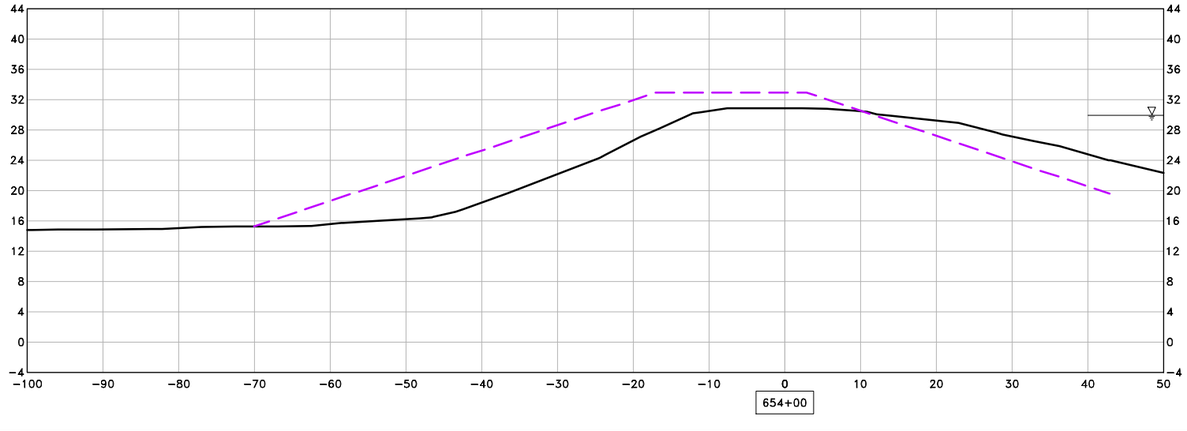
SHEET IDENTIFICATION
C1-308
SHEET 23 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:23pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMMARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

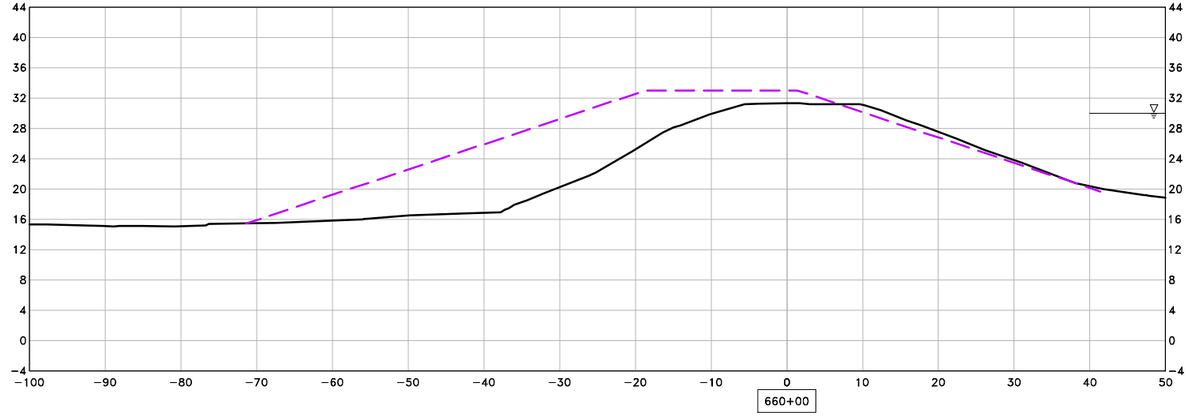
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

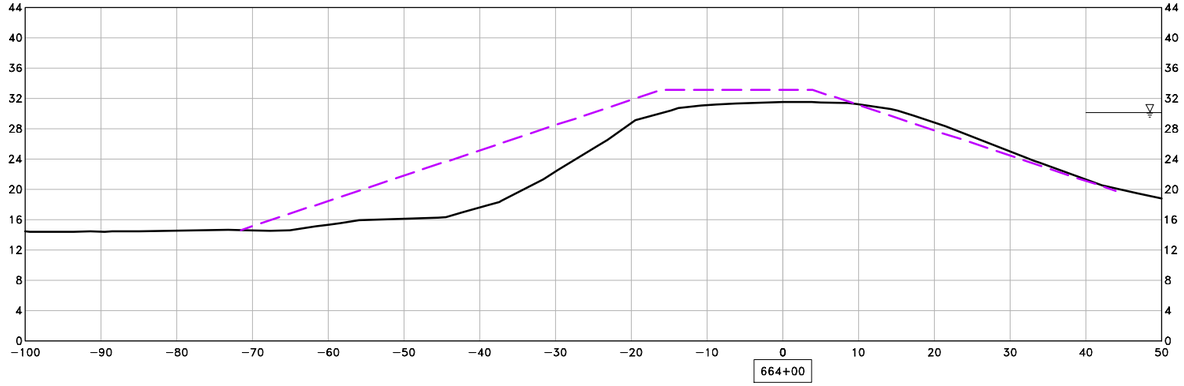
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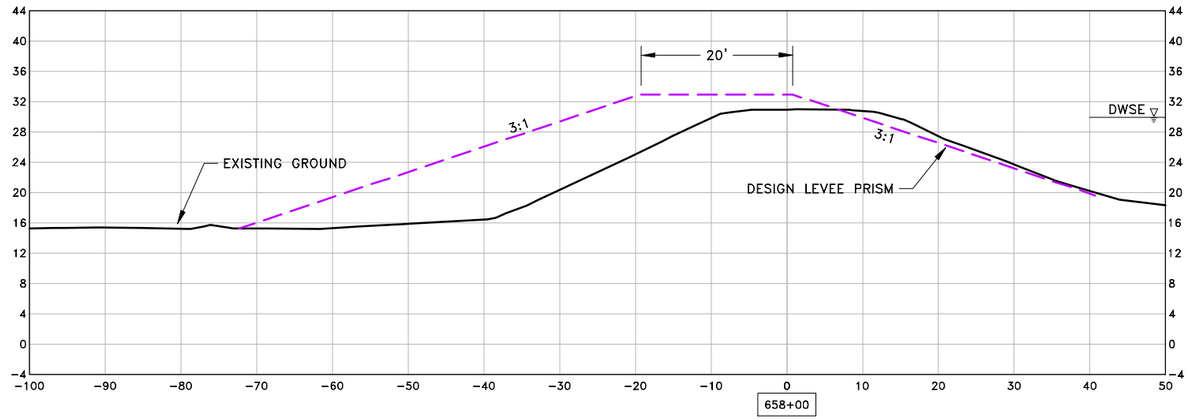
DATE
DECEMBER 11, 2019

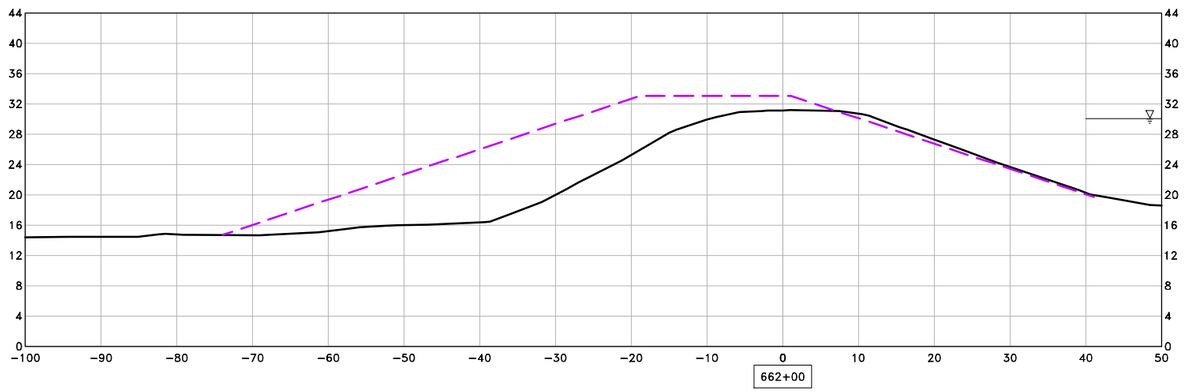
SHEET IDENTIFICATION
C1-309
SHEET 24 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC:: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:25pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

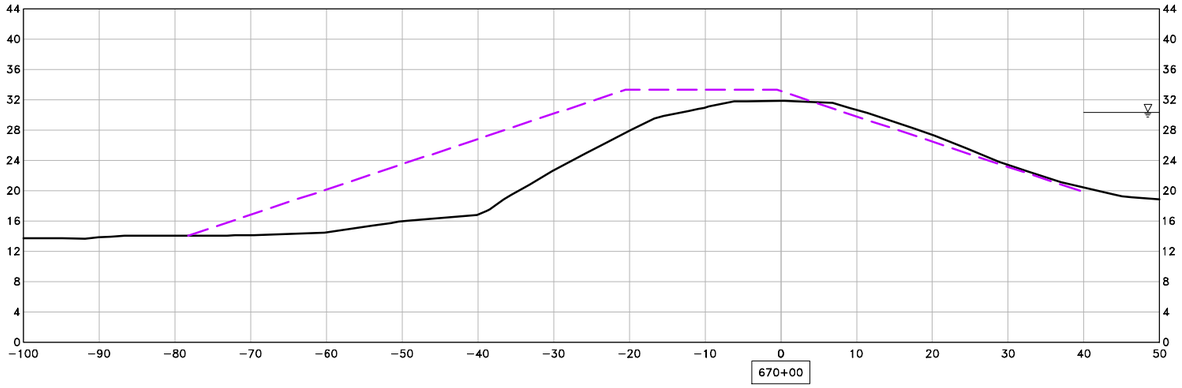
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

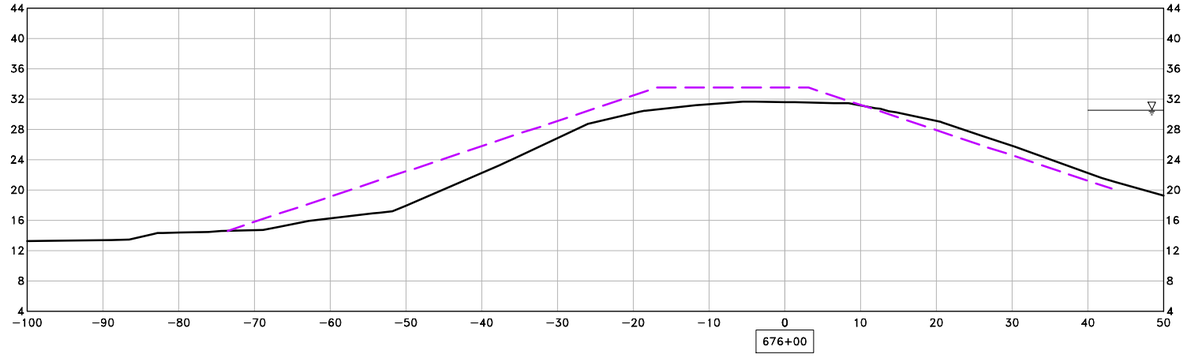
STA 658+00 TO STA 666+00

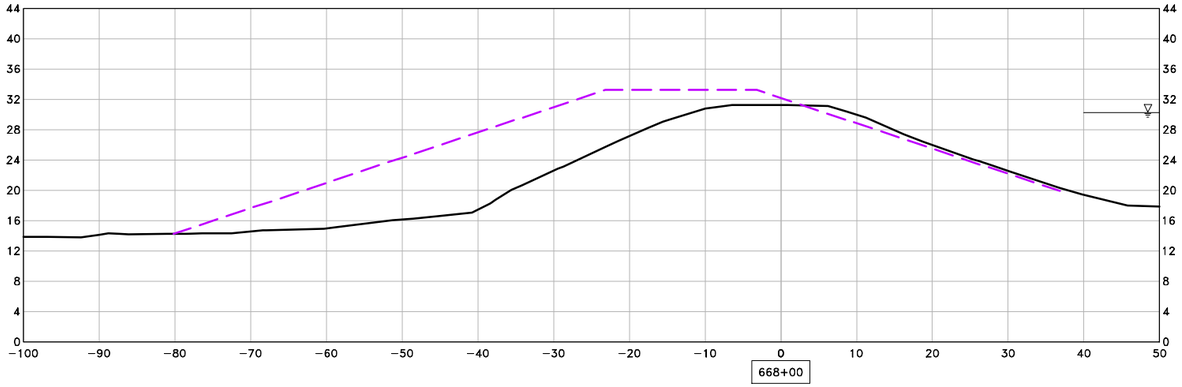
DATE
DECEMBER 11, 2019

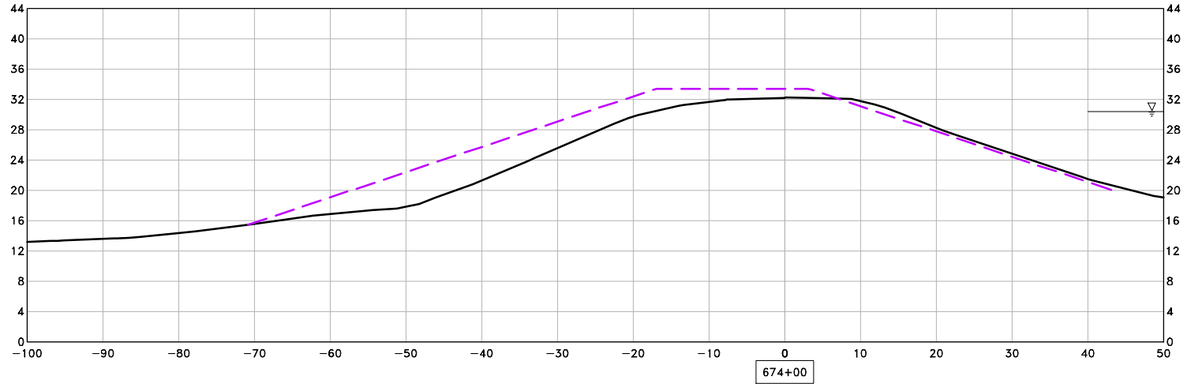
SHEET IDENTIFICATION
C1-310
SHEET 25 OF 136

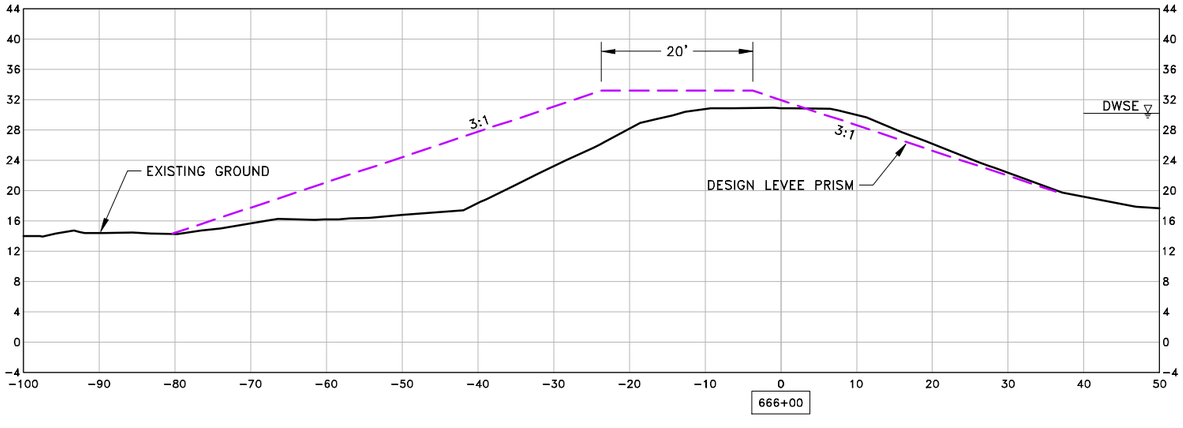
KSN PROJECT FILE NO.
2255-0050

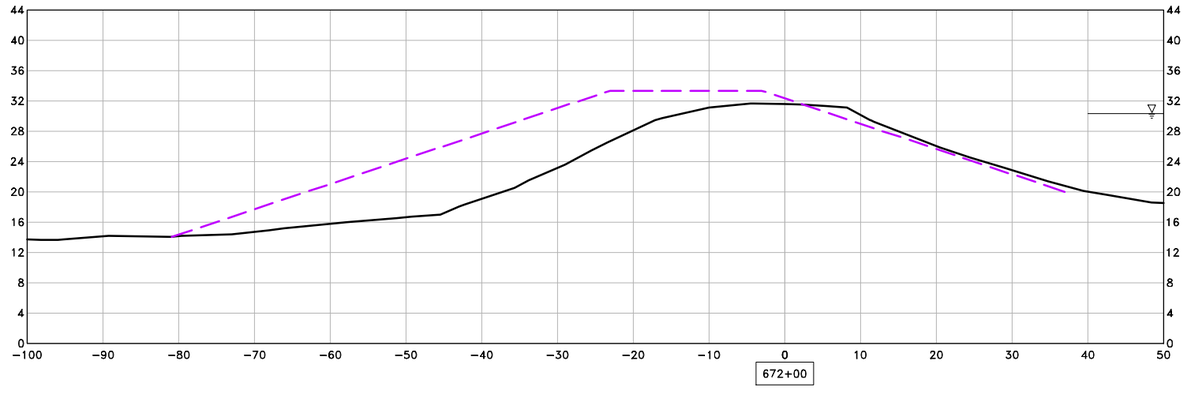












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:26pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMMARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

KSN inc. KJELDSEN SINNOCK NEUDECK
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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

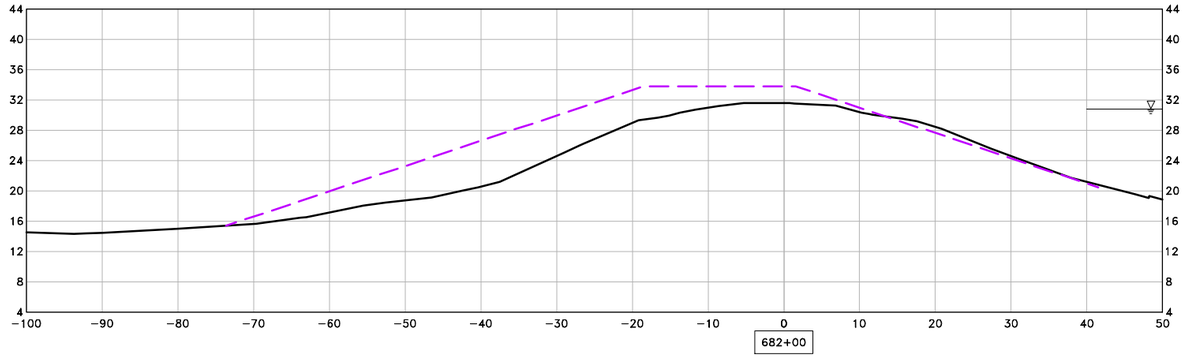
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

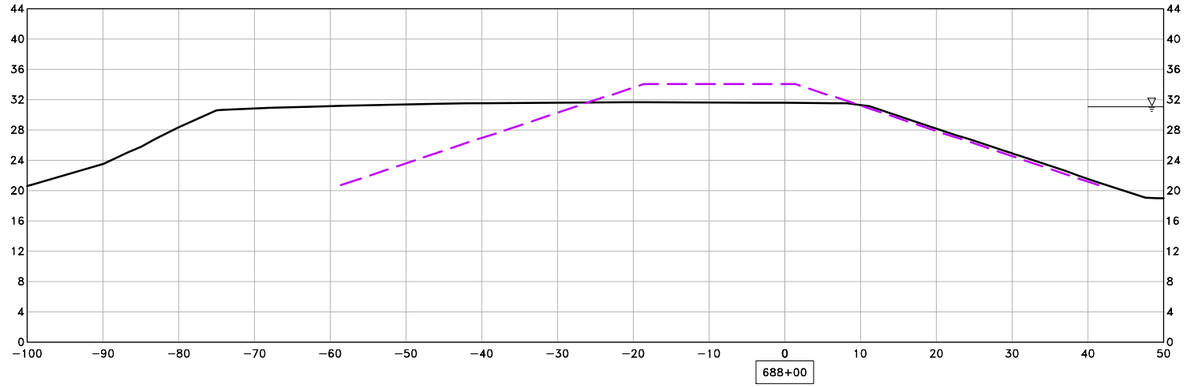
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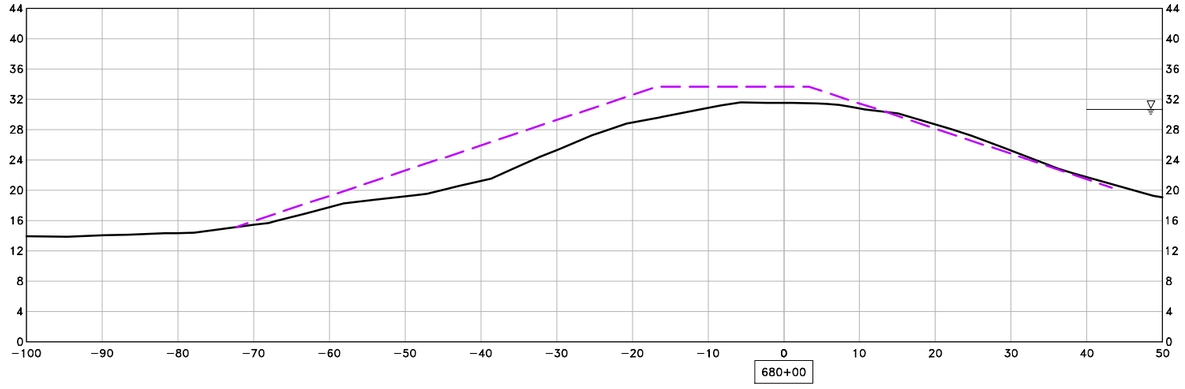
DATE
DECEMBER 11, 2019

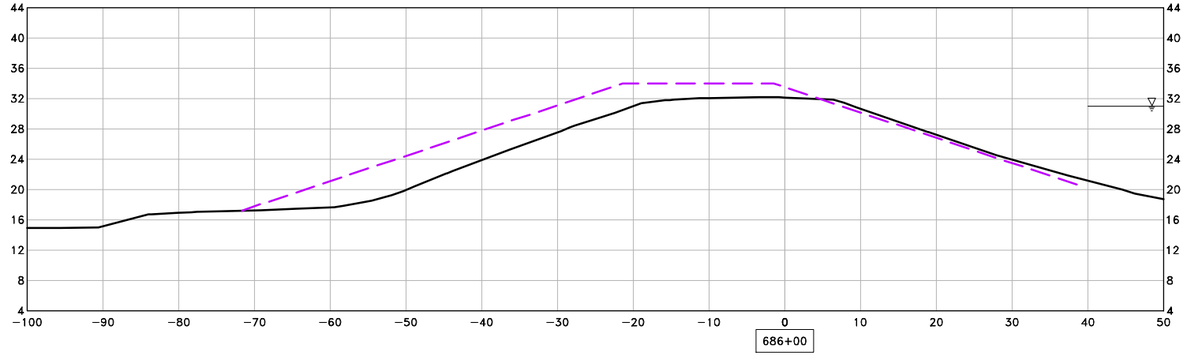
SHEET IDENTIFICATION
C1-311
SHEET 26 OF 136

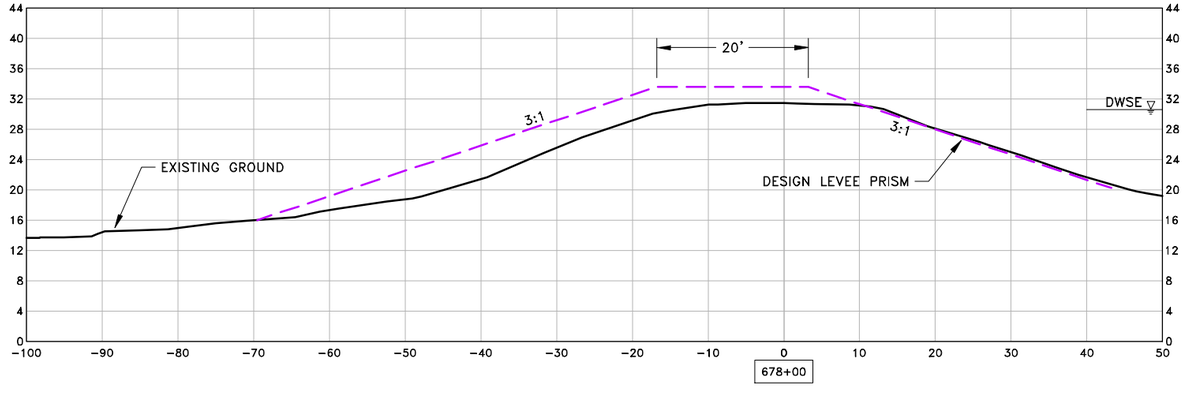
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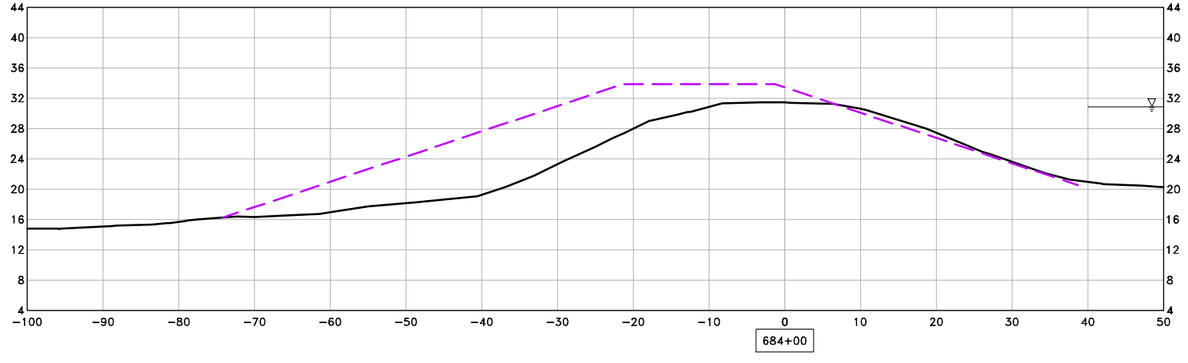












NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

KSN inc. KJELDSEN SINNOCK NEUDECK
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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

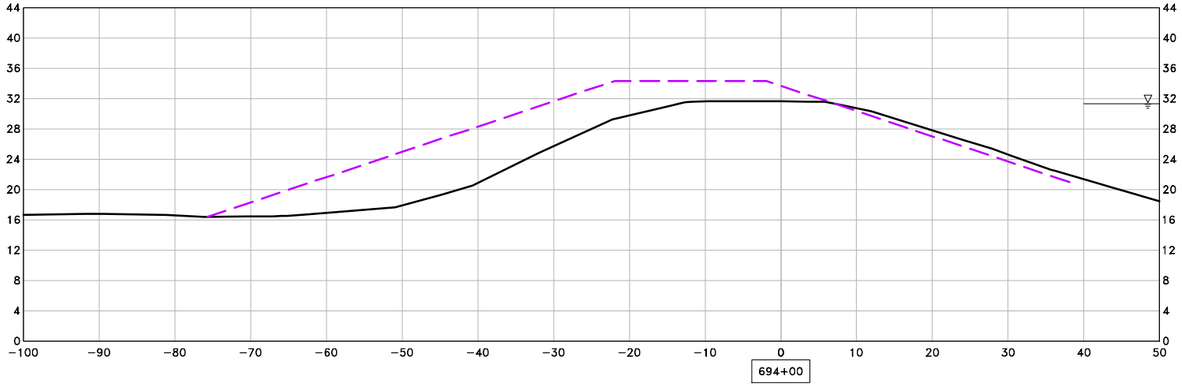
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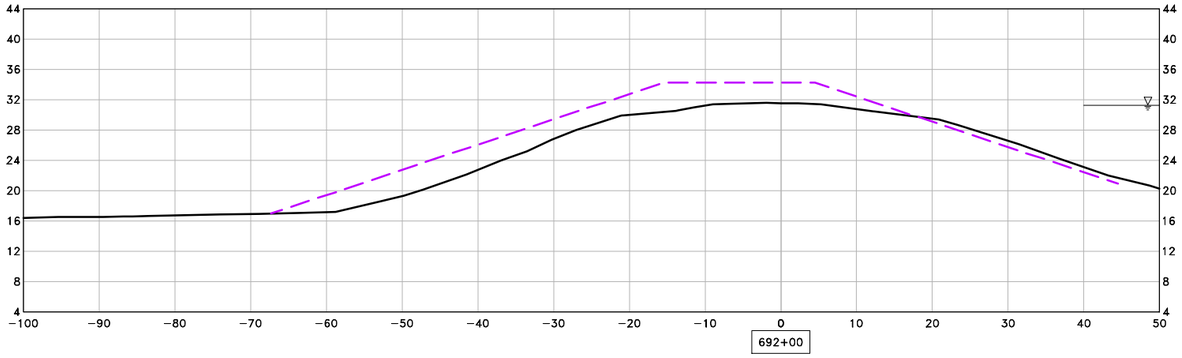
DATE
DECEMBER 11, 2019

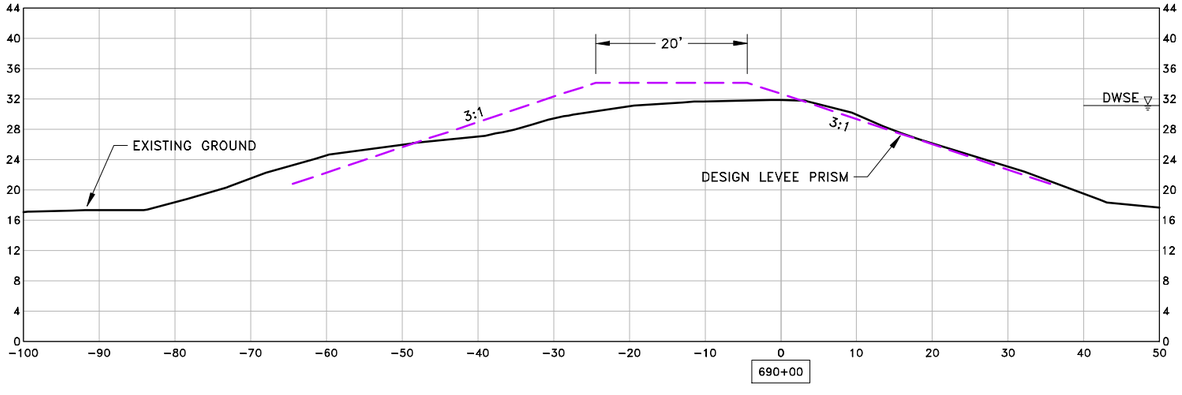
SHEET IDENTIFICATION
C1-312
SHEET 27 OF 136

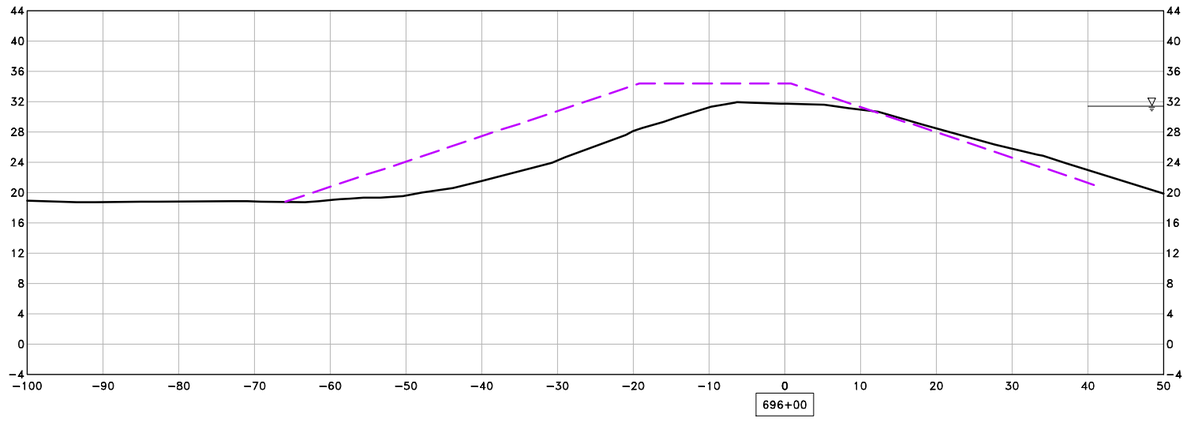
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:28pm









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:30pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

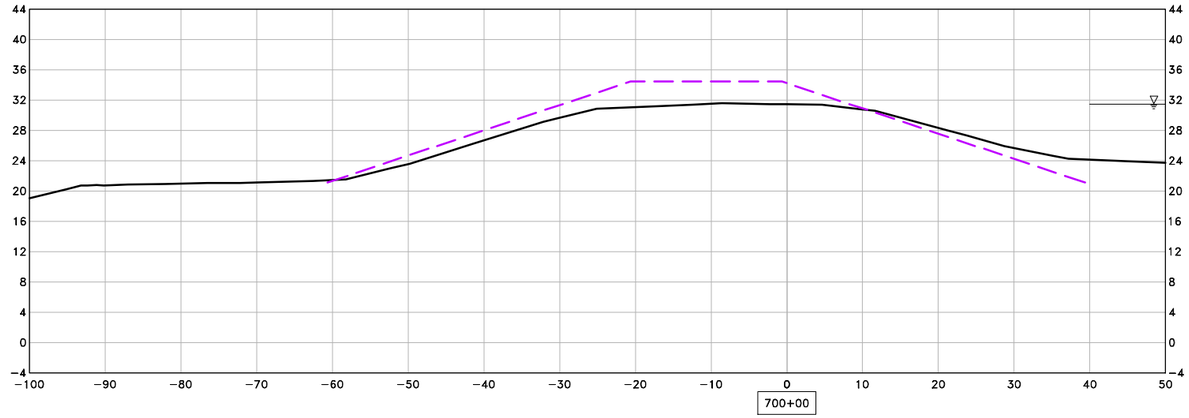
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

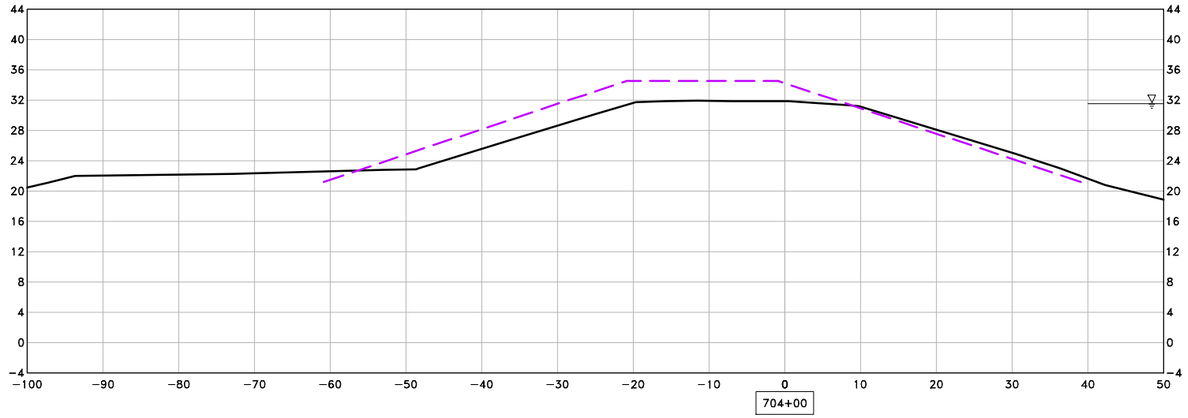
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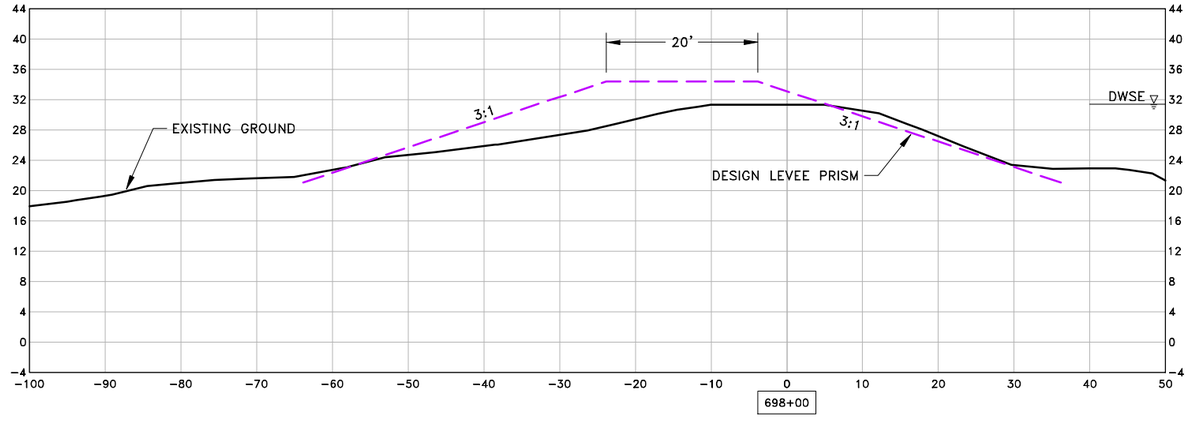
DATE
DECEMBER 11, 2019

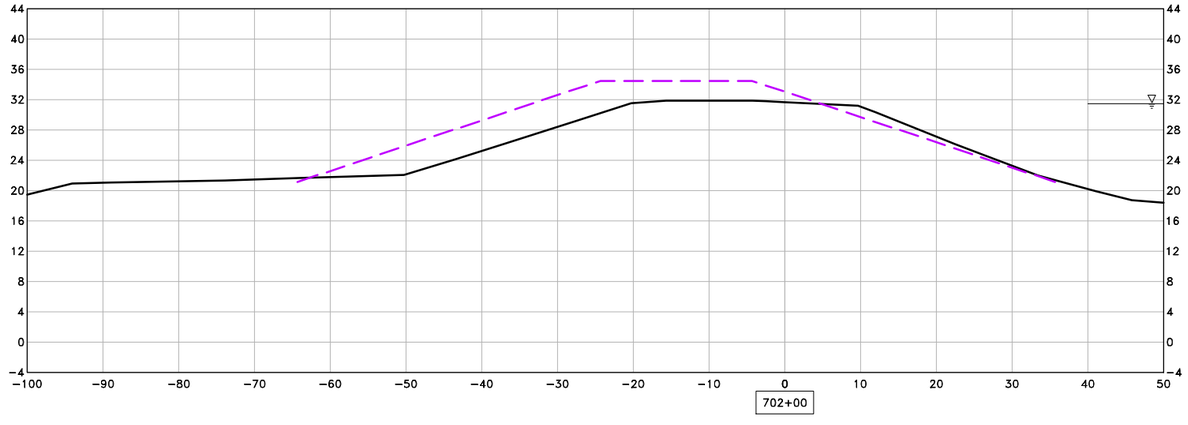
SHEET IDENTIFICATION
C1-313
SHEET 28 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC:: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:32pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

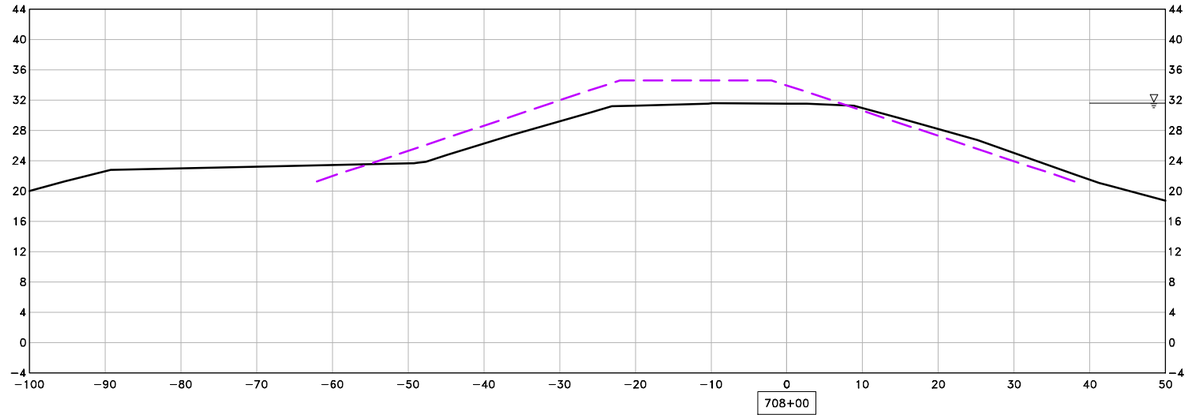
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

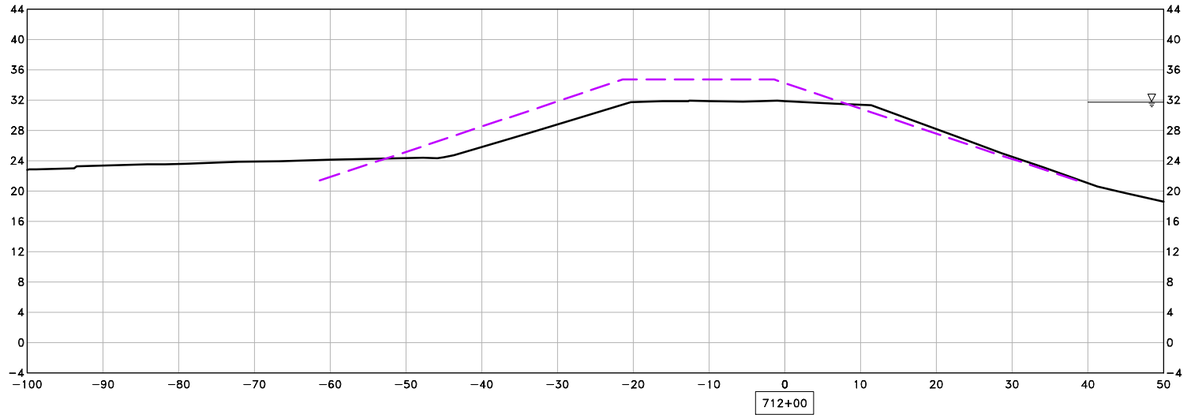
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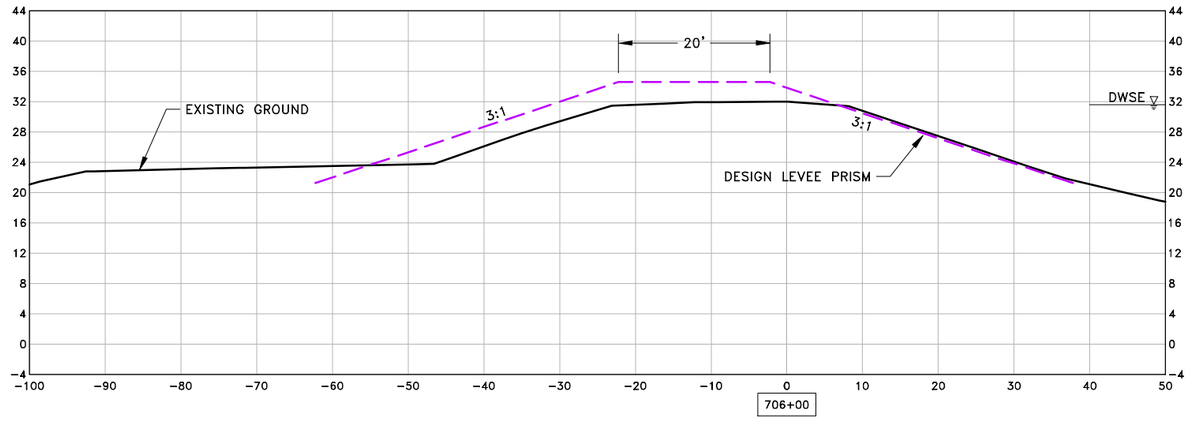
DATE
DECEMBER 11, 2019

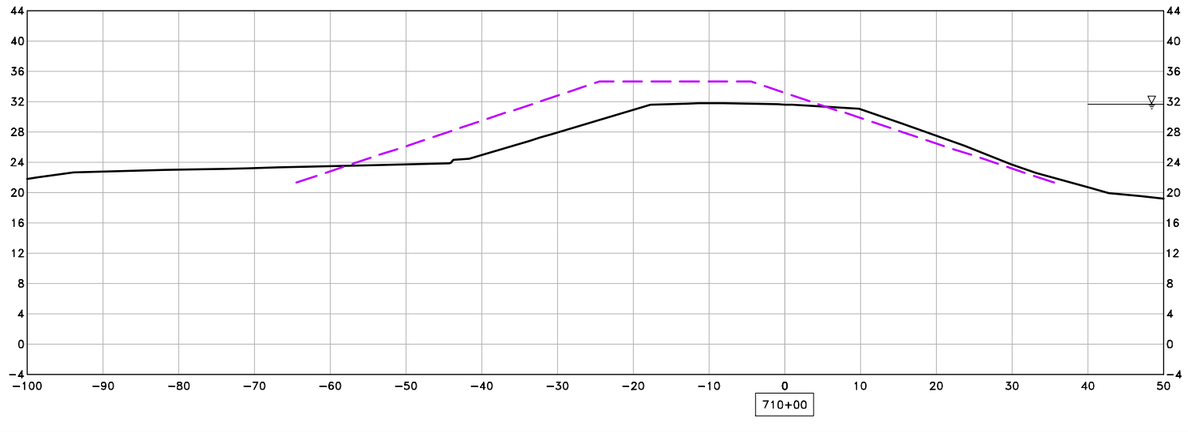
SHEET IDENTIFICATION
C1-314
SHEET 29 OF 136

KSN PROJECT FILE NO.
2255-0050









NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

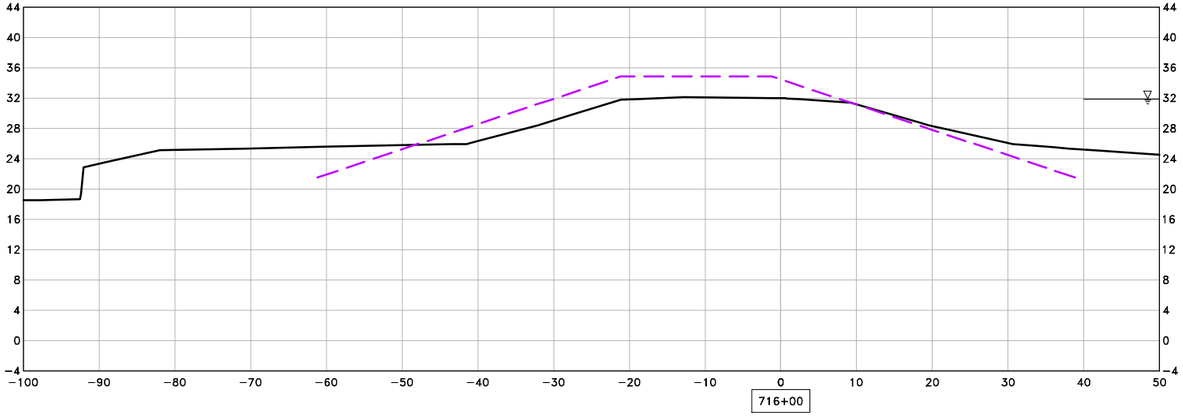
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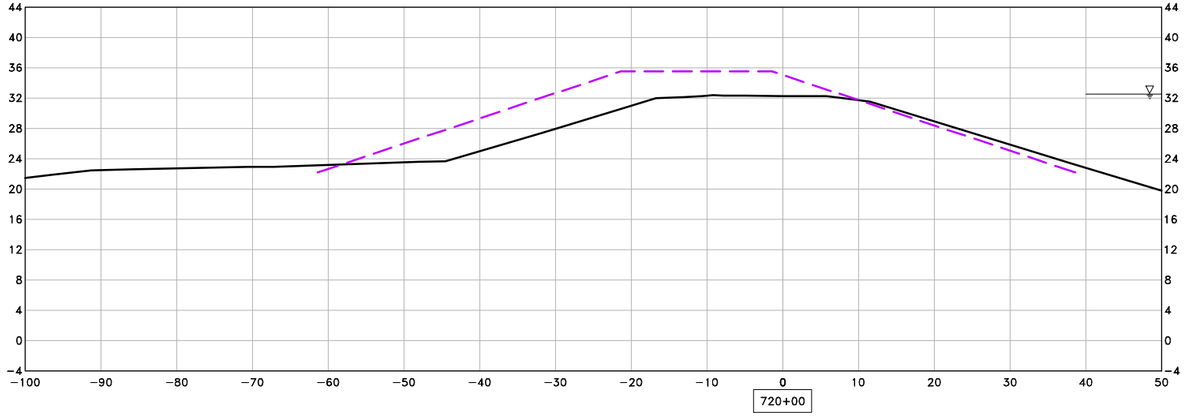
DATE
DECEMBER 11, 2019

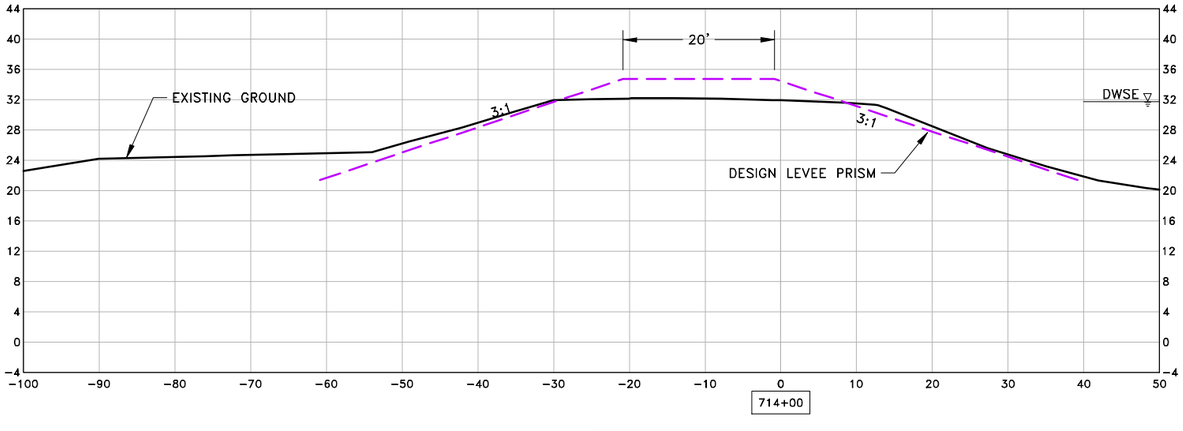
SHEET IDENTIFICATION
C1-315
SHEET 30 OF 136

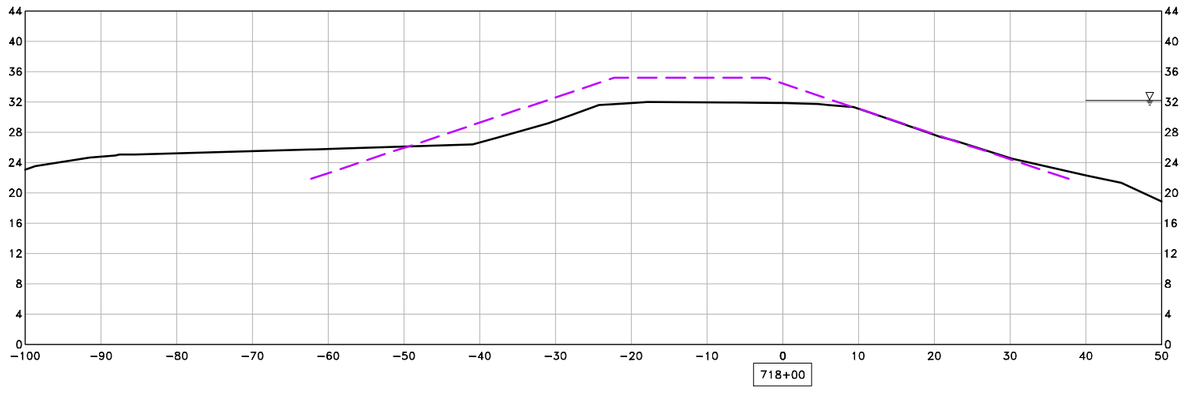
KSN PROJECT FILE NO.
2255-0050

FILE SPEC:: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:34pm









FILE SPEC:: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:35pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

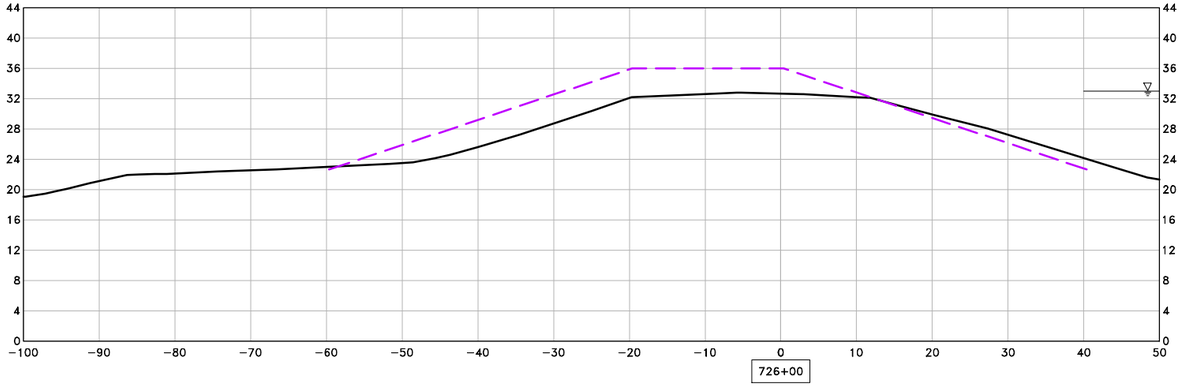
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

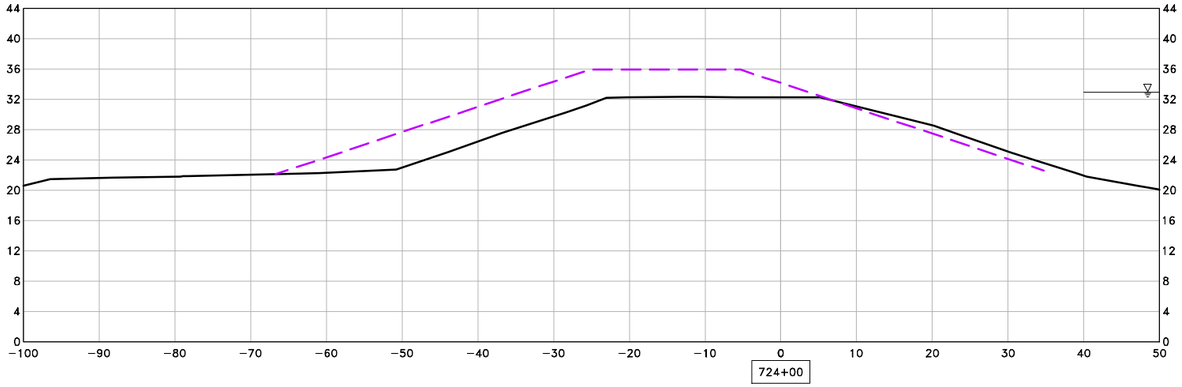
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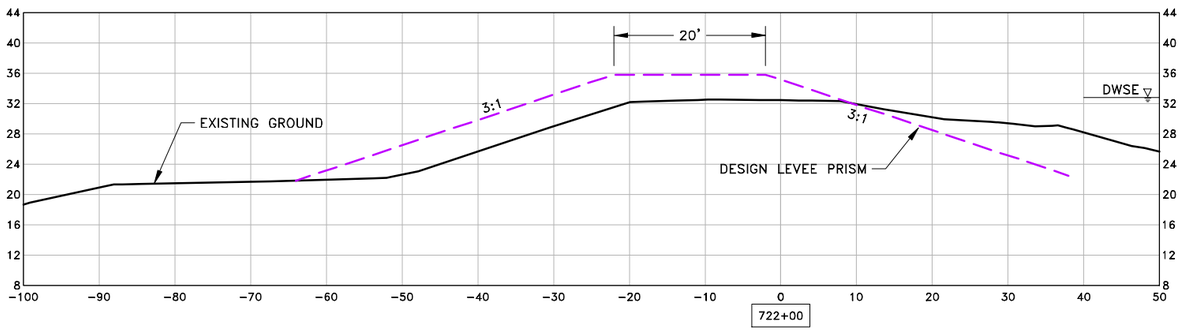
DATE
DECEMBER 11, 2019

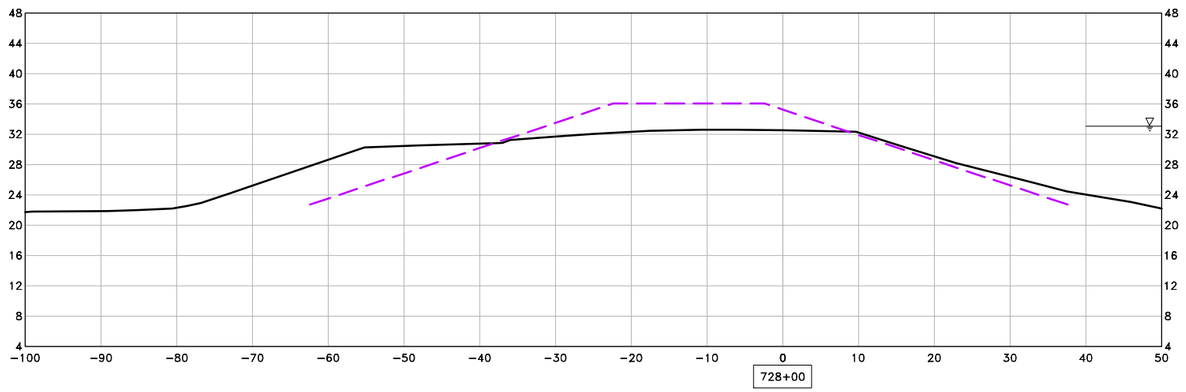
SHEET IDENTIFICATION
C1-316
SHEET 31 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:37pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

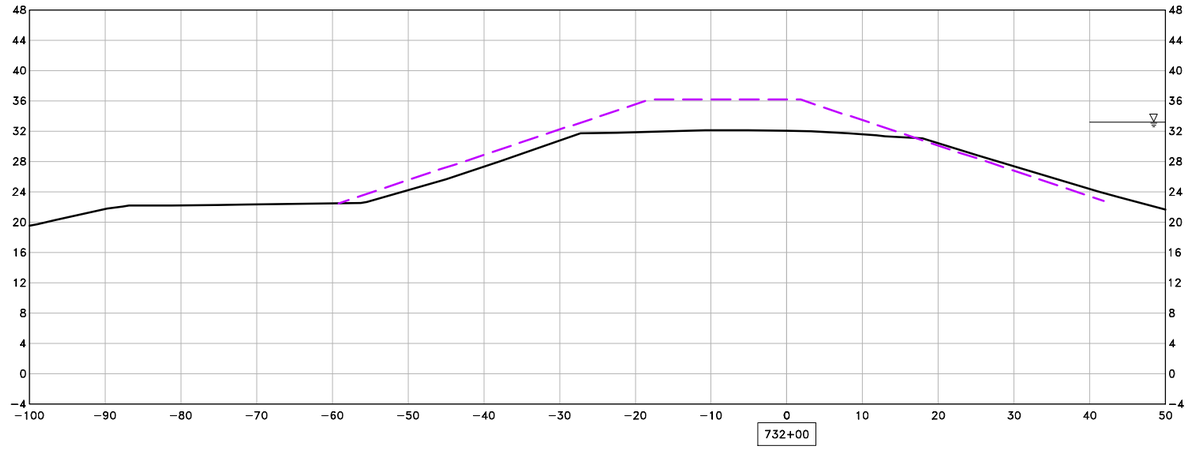
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

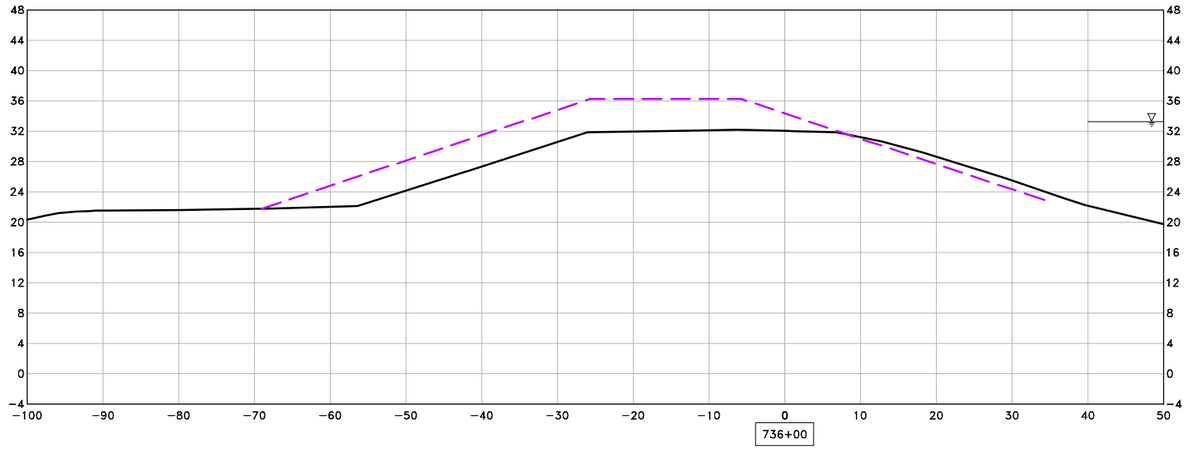
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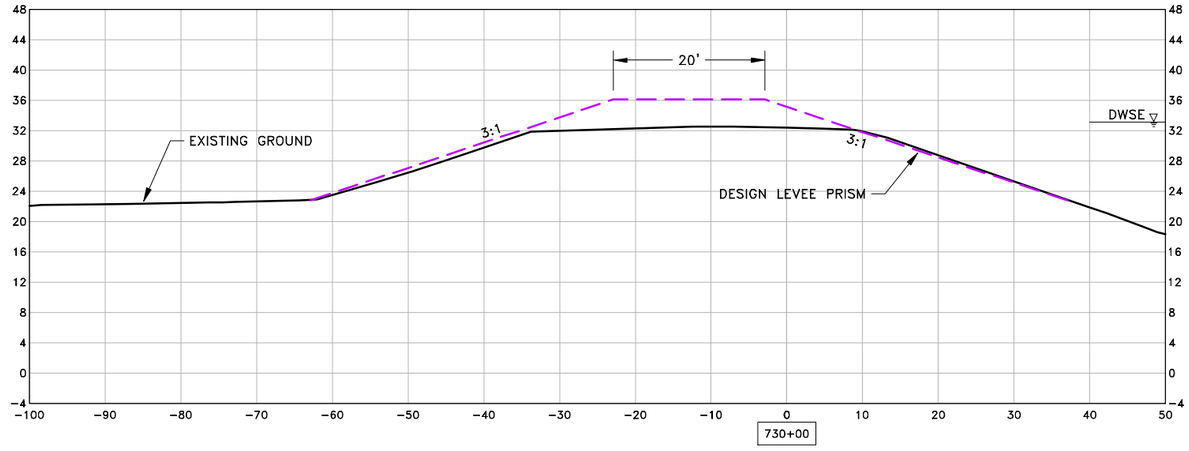
DATE
DECEMBER 11, 2019

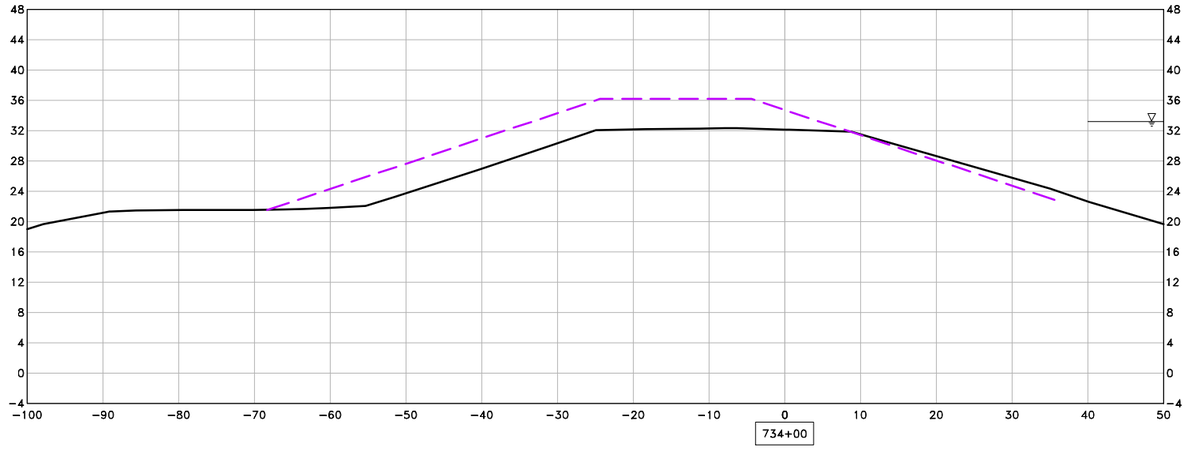
SHEET IDENTIFICATION
C1-317
SHEET 32 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:39pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

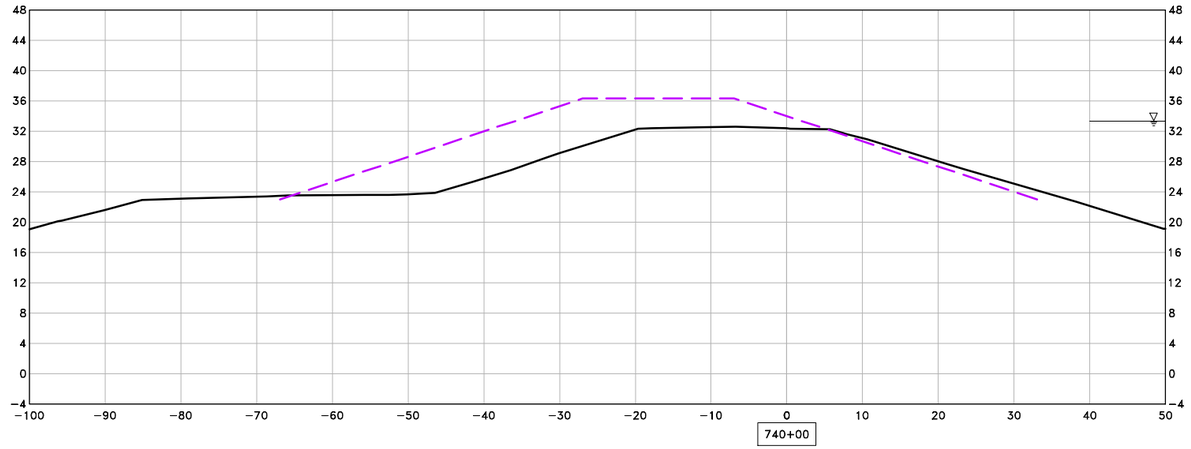
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

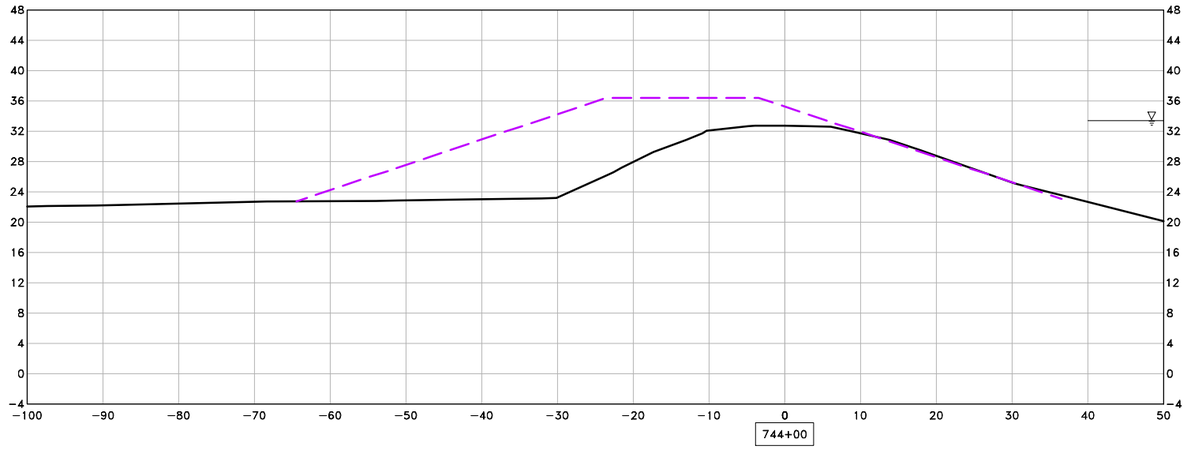
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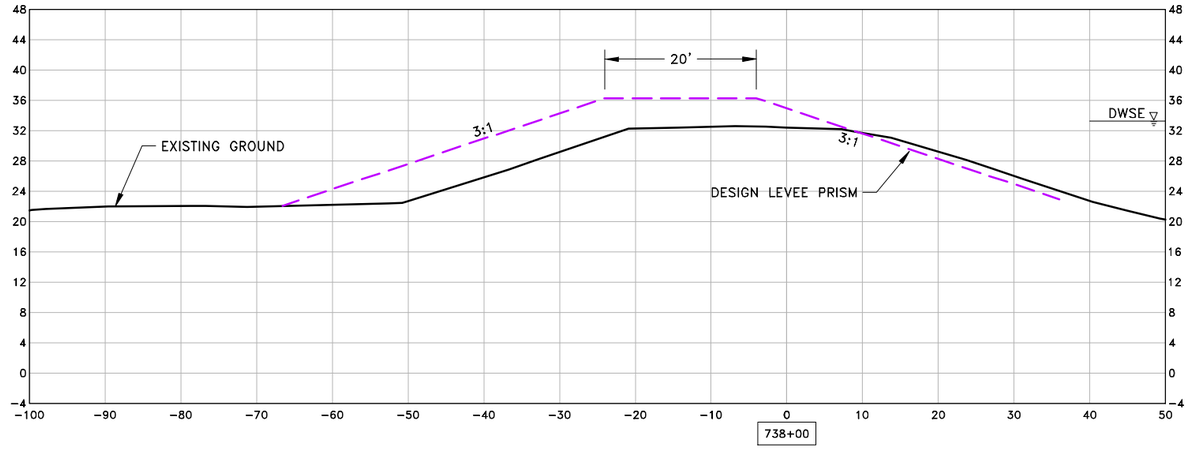
DATE
DECEMBER 11, 2019

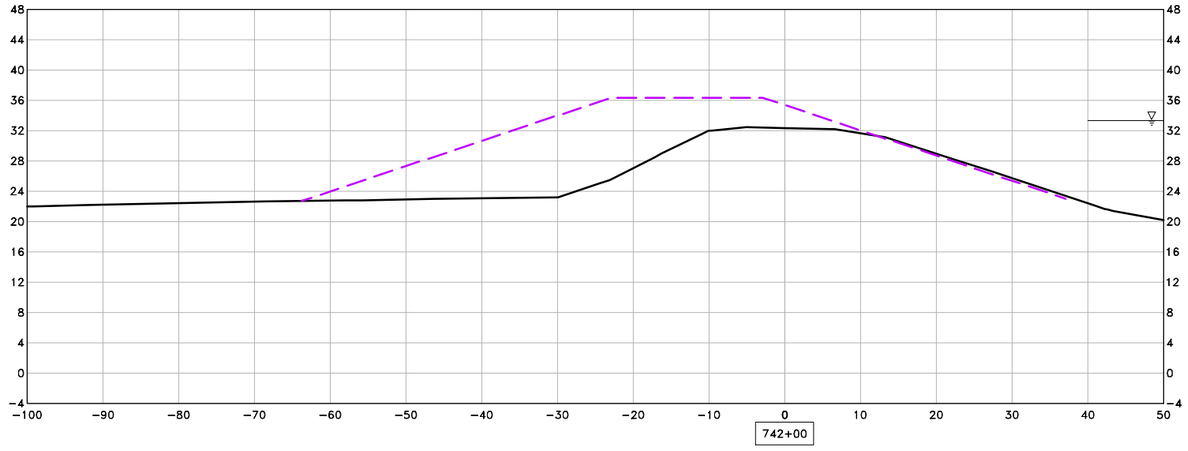
SHEET IDENTIFICATION
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KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:41pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

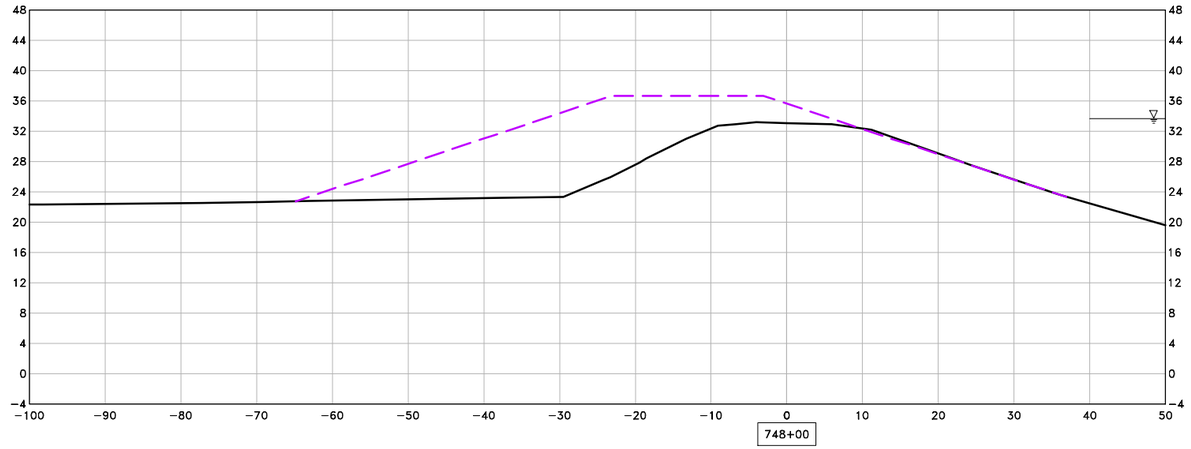
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

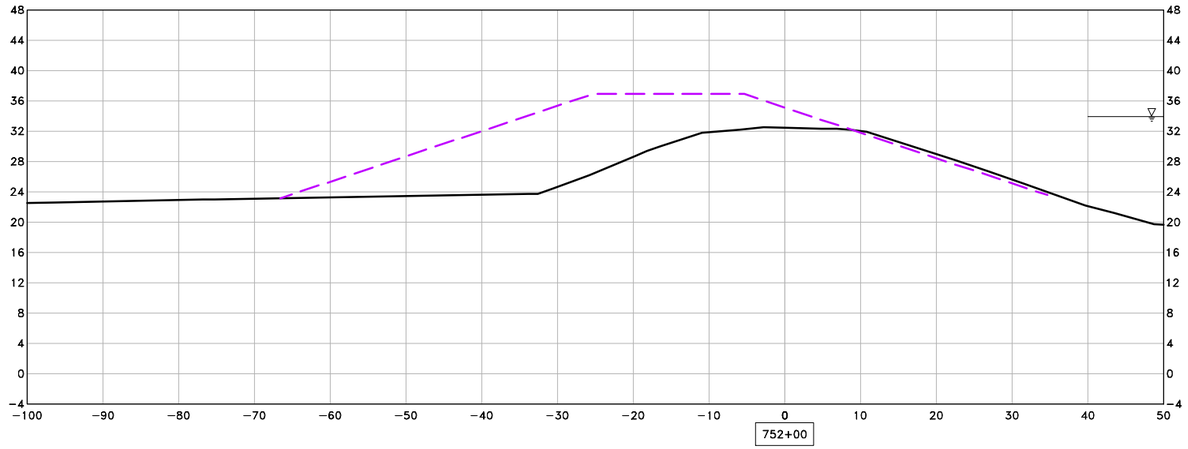
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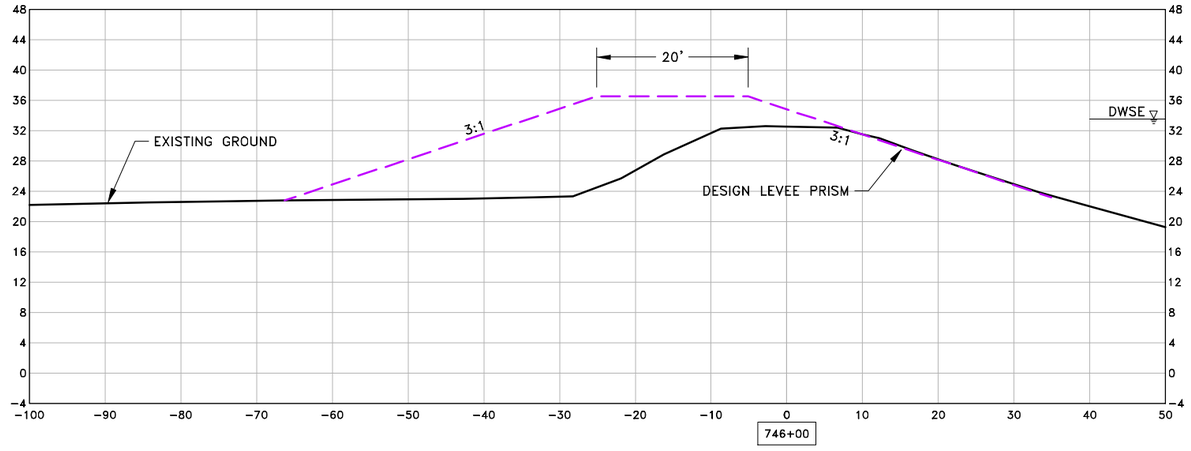
DATE
DECEMBER 11, 2019

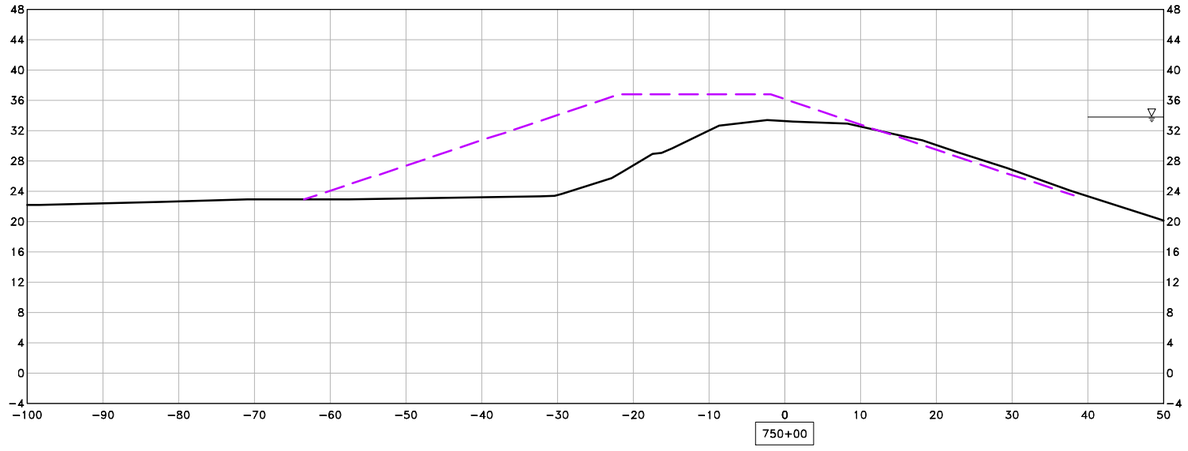
SHEET IDENTIFICATION
C1-319
SHEET 34 OF 136

KSN PROJECT FILE NO.
2255-0050









NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

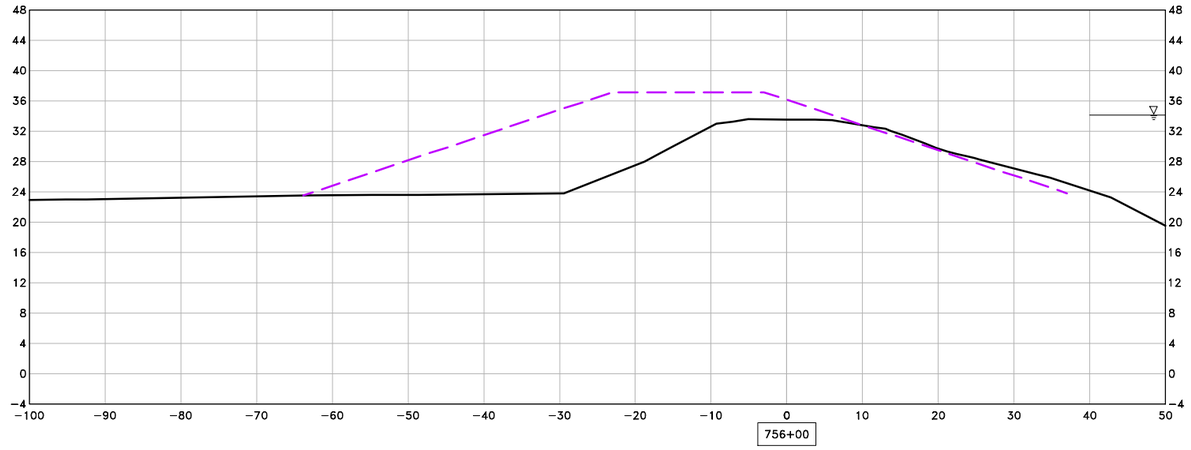
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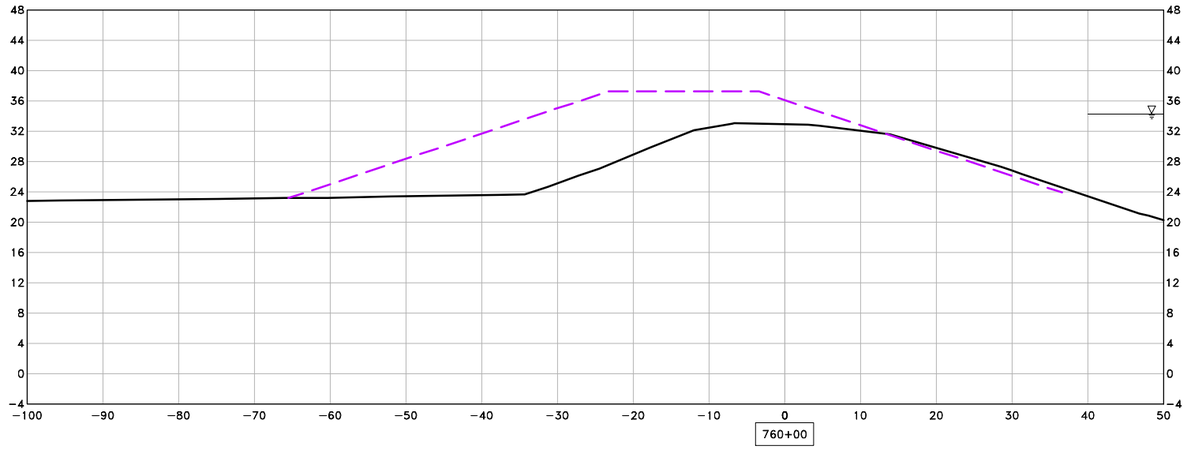
DATE
DECEMBER 11, 2019

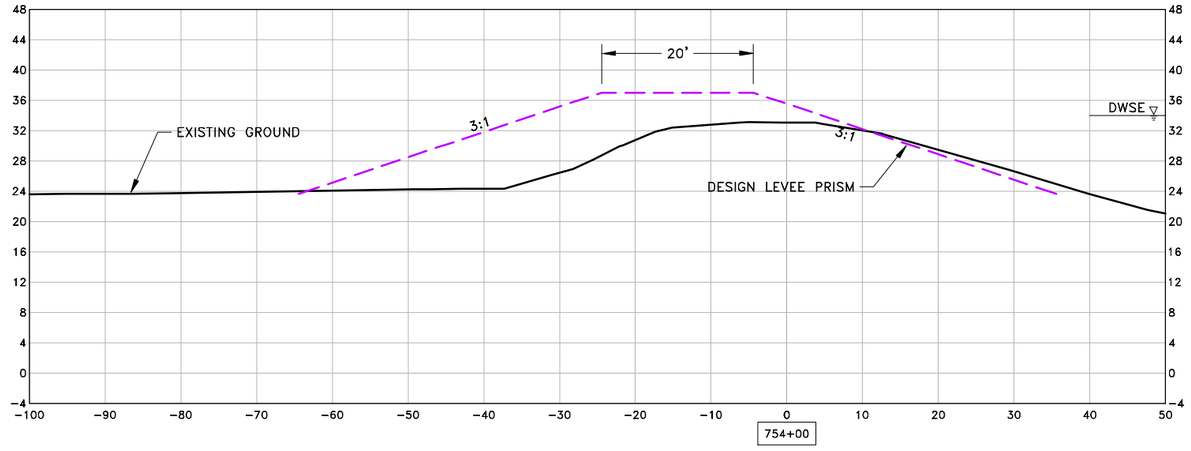
SHEET IDENTIFICATION
C1-320
SHEET 35 OF 136

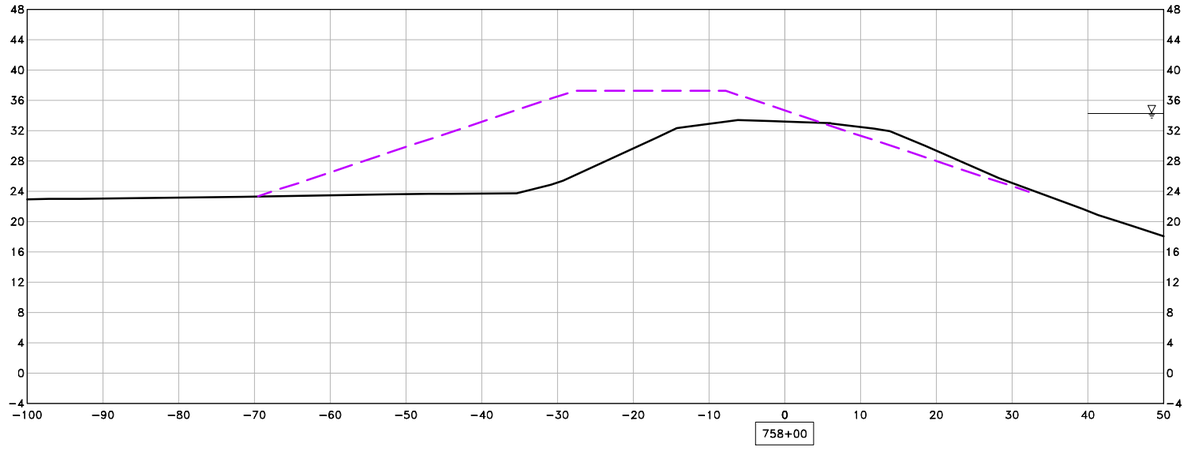
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:42pm









NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

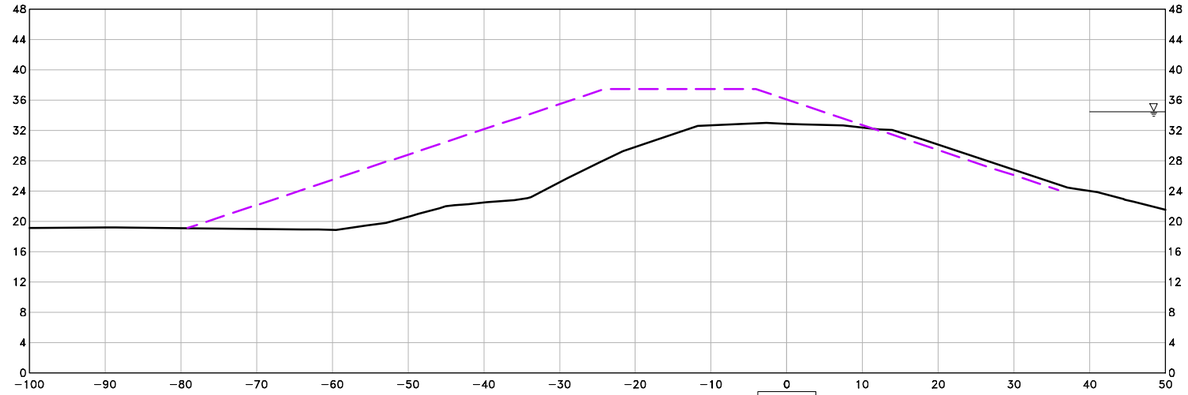
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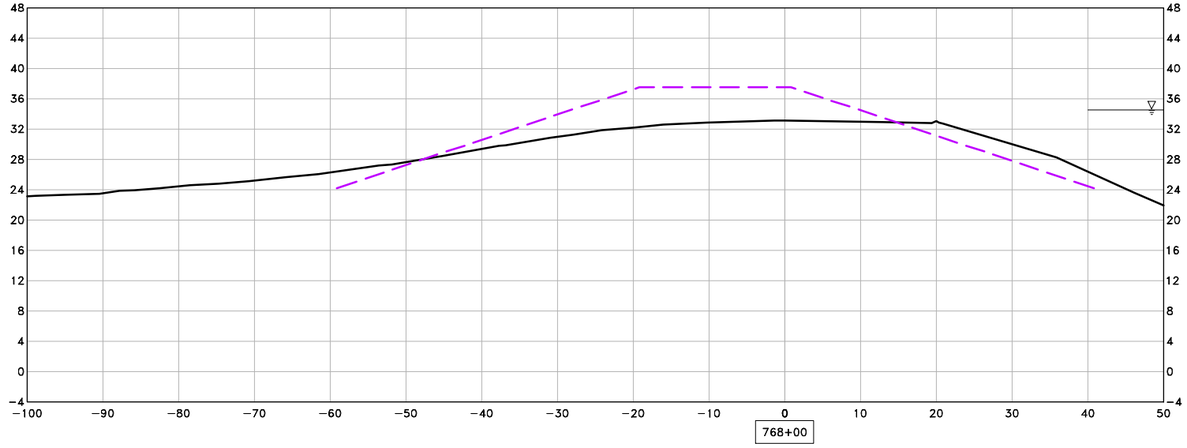
DATE
DECEMBER 11, 2019

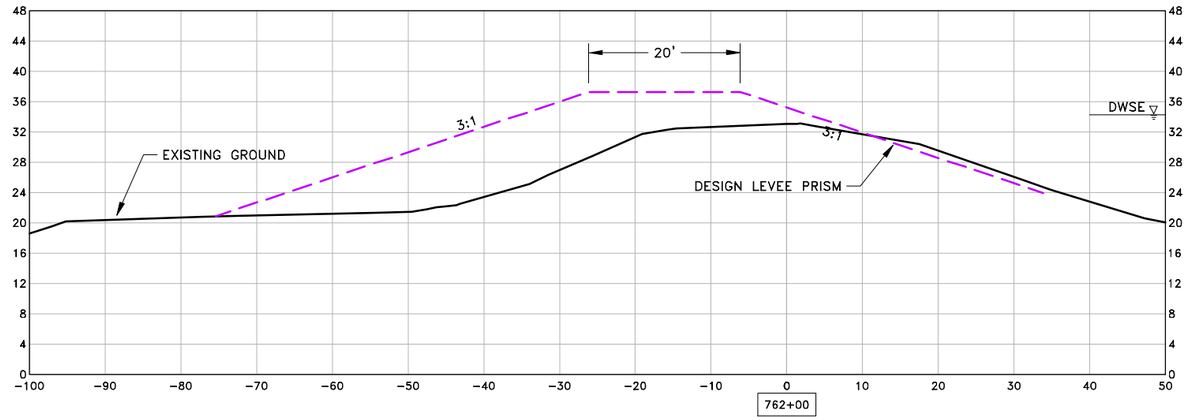
SHEET IDENTIFICATION
C1-321
SHEET 36 OF 136

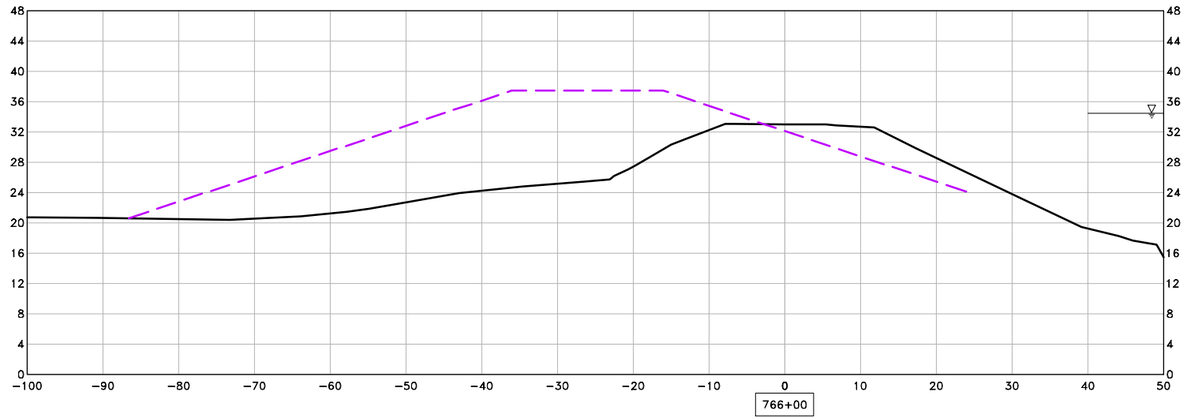
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:44pm









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:46pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

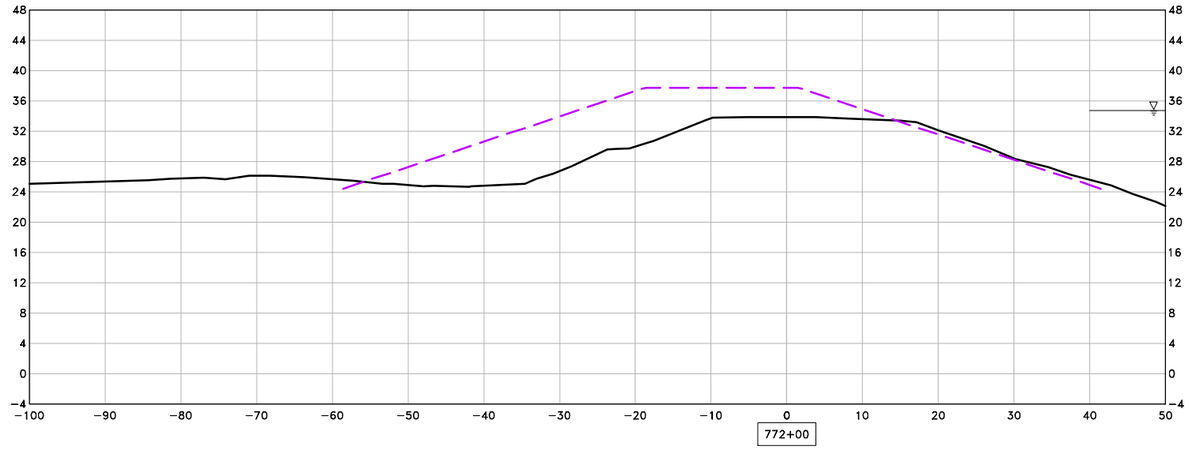
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

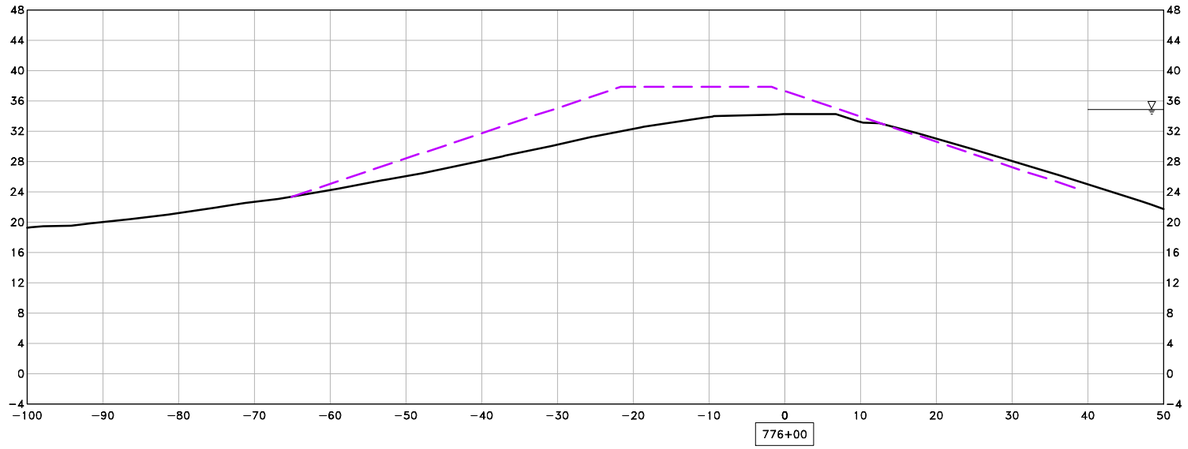
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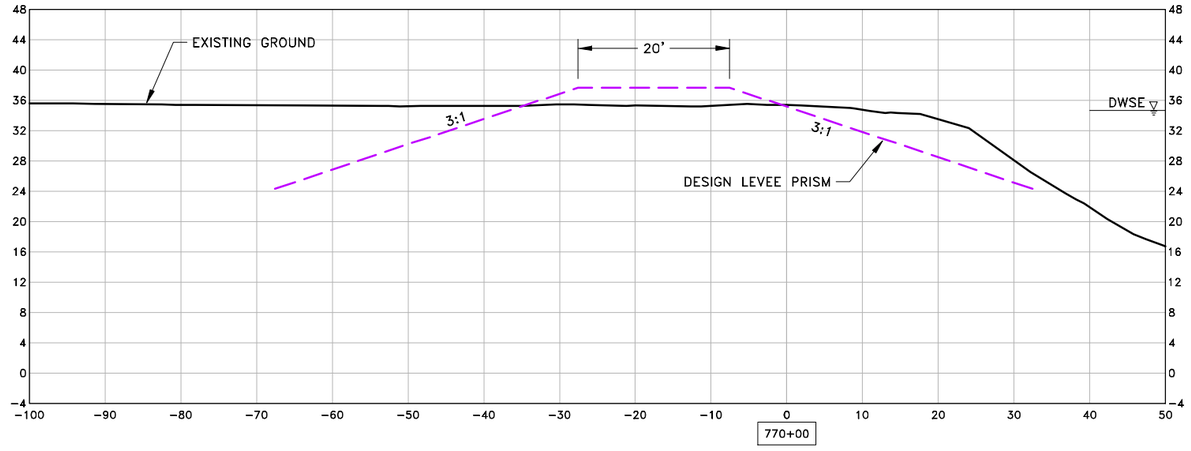
DATE
DECEMBER 11, 2019

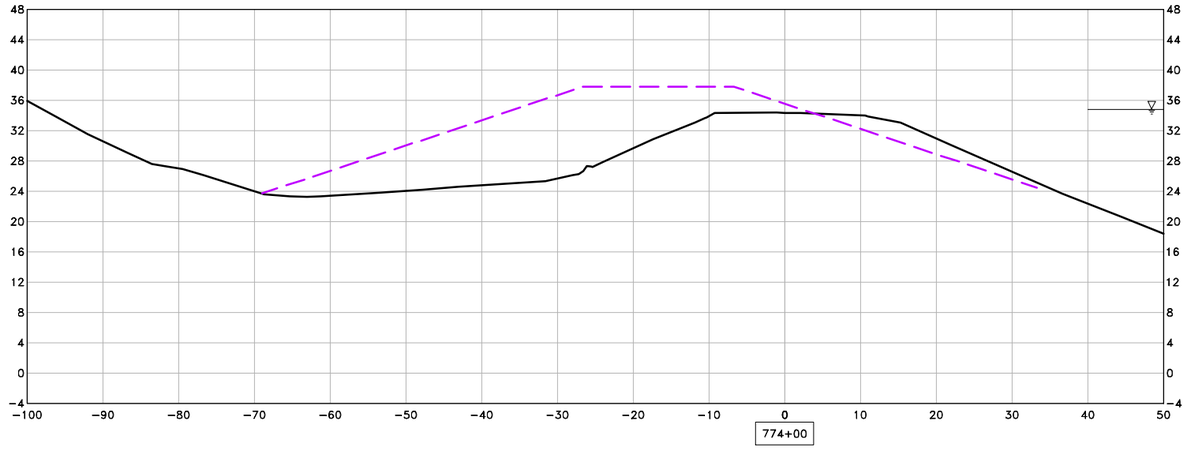
SHEET IDENTIFICATION
C1-322
SHEET 37 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:47pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

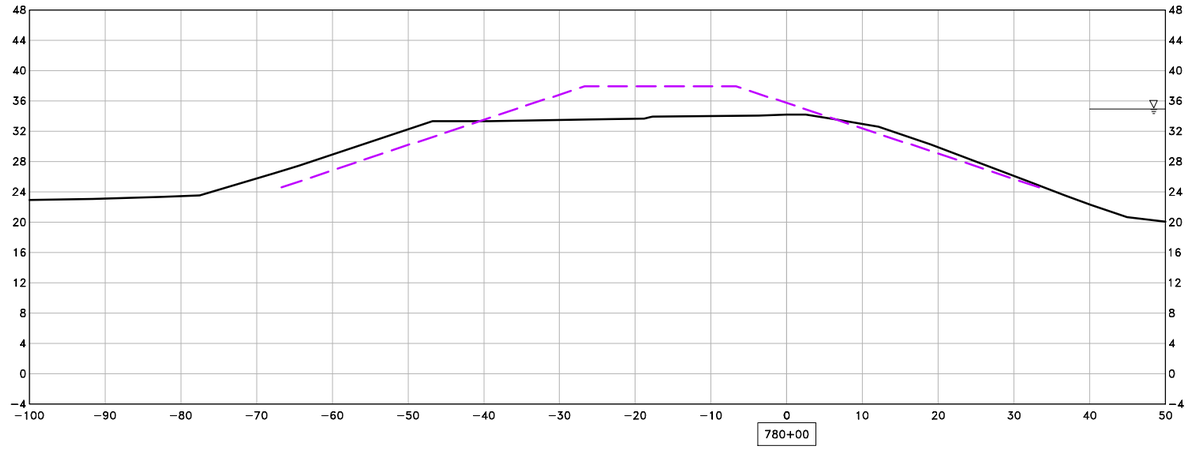
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

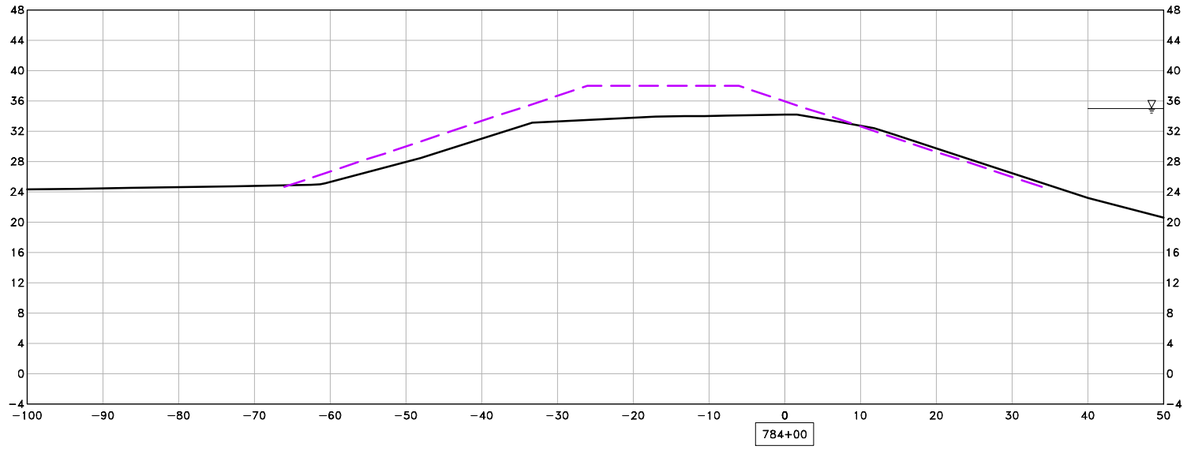
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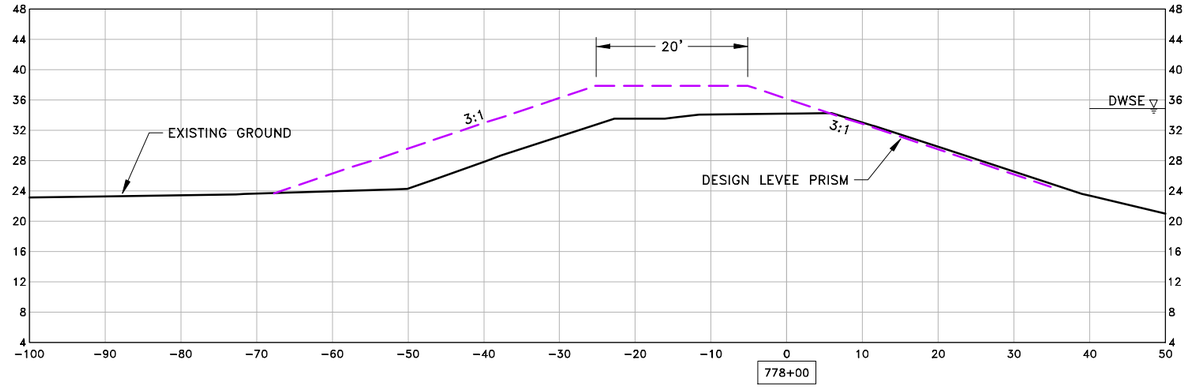
DATE
DECEMBER 11, 2019

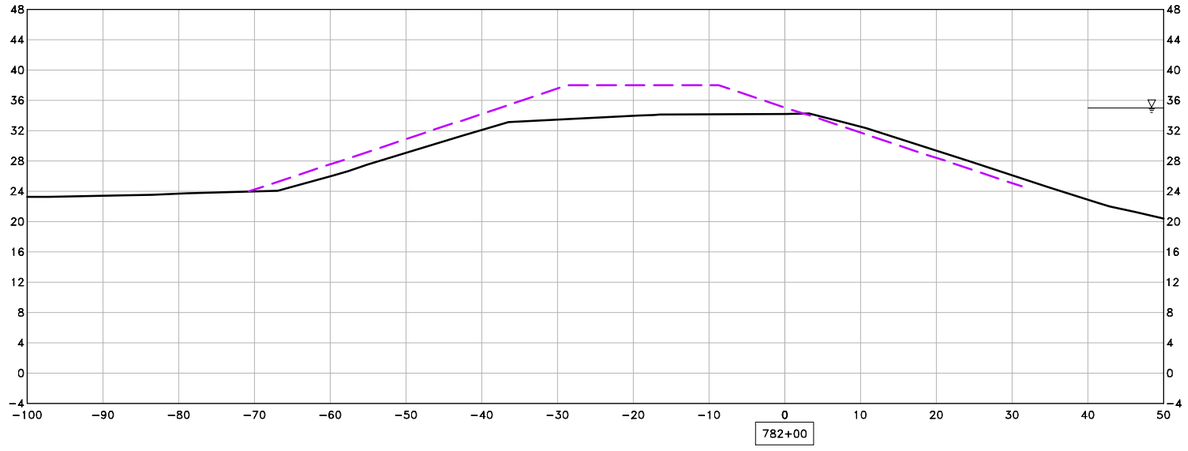
SHEET IDENTIFICATION
C1-323
SHEET 38 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:49pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

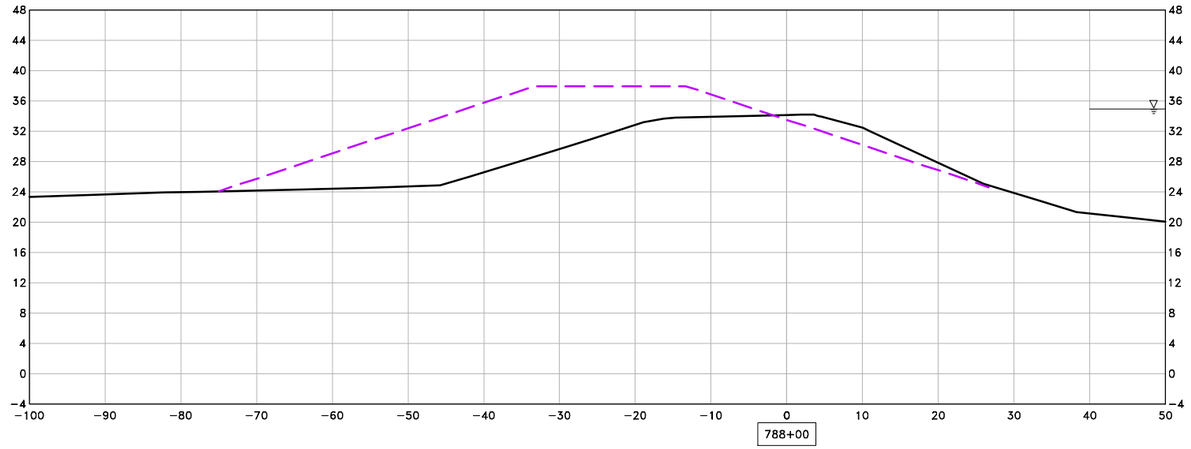
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

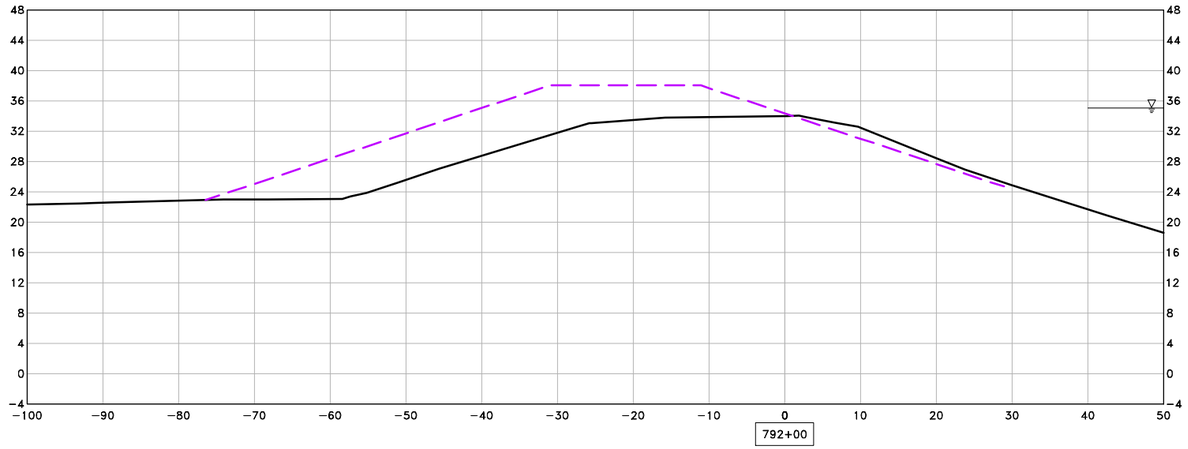
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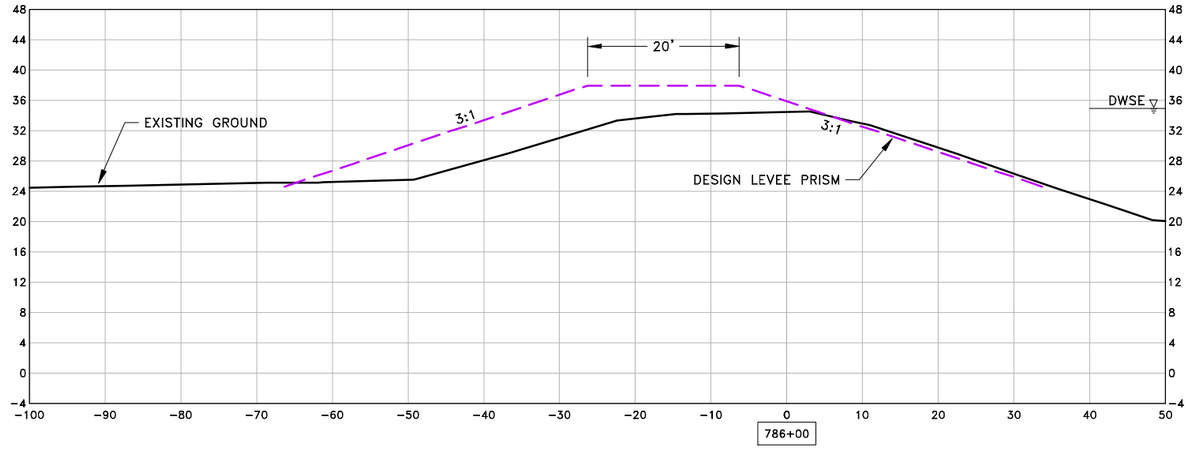
DATE
DECEMBER 11, 2019

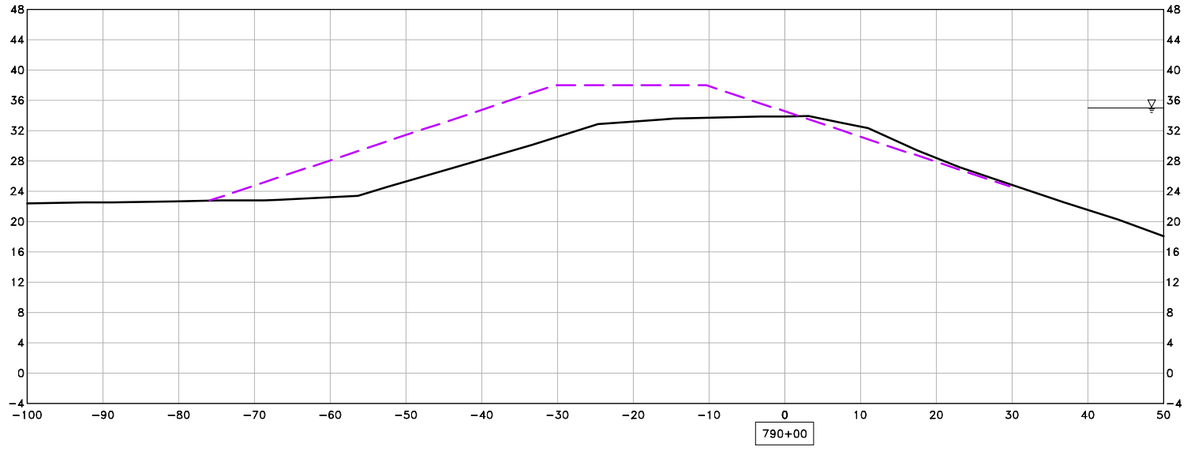
SHEET IDENTIFICATION
C1-324
SHEET 39 OF 136

KSN PROJECT FILE NO.
2255-0050









NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

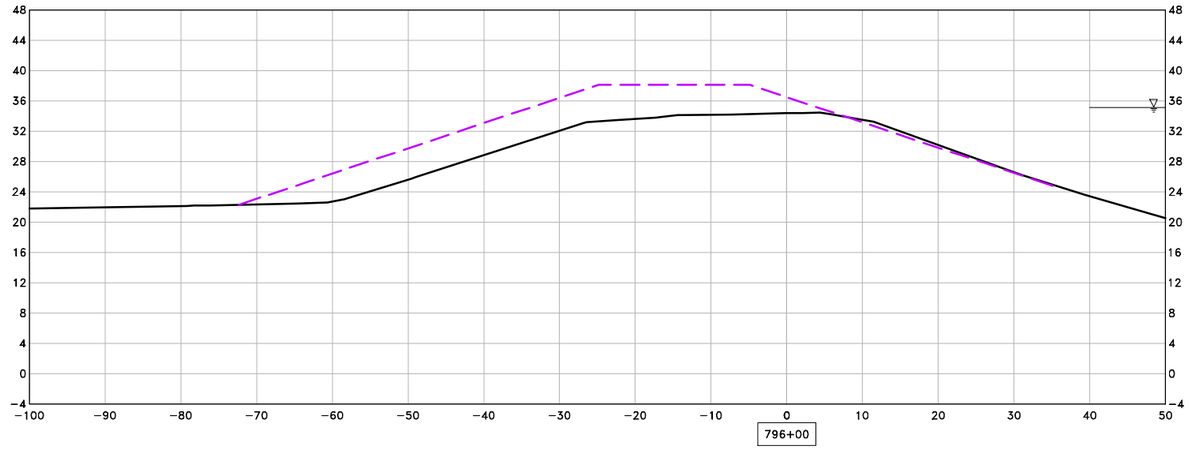
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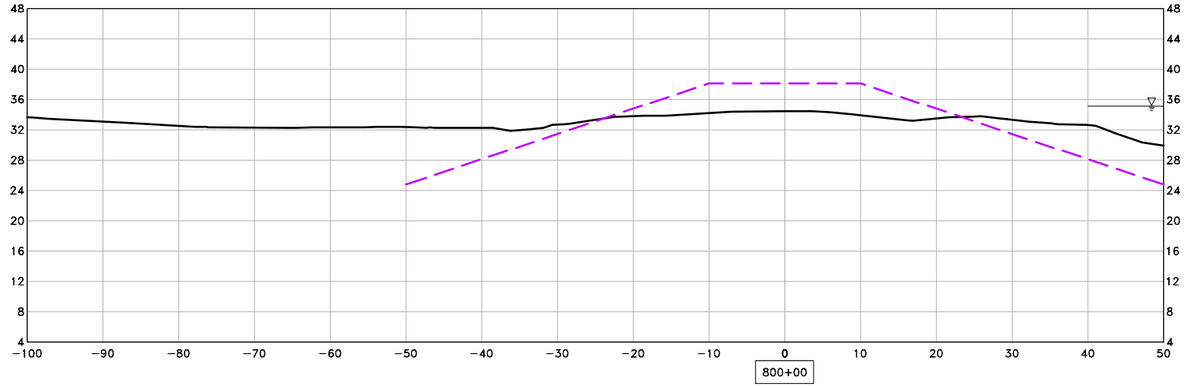
DATE
DECEMBER 11, 2019

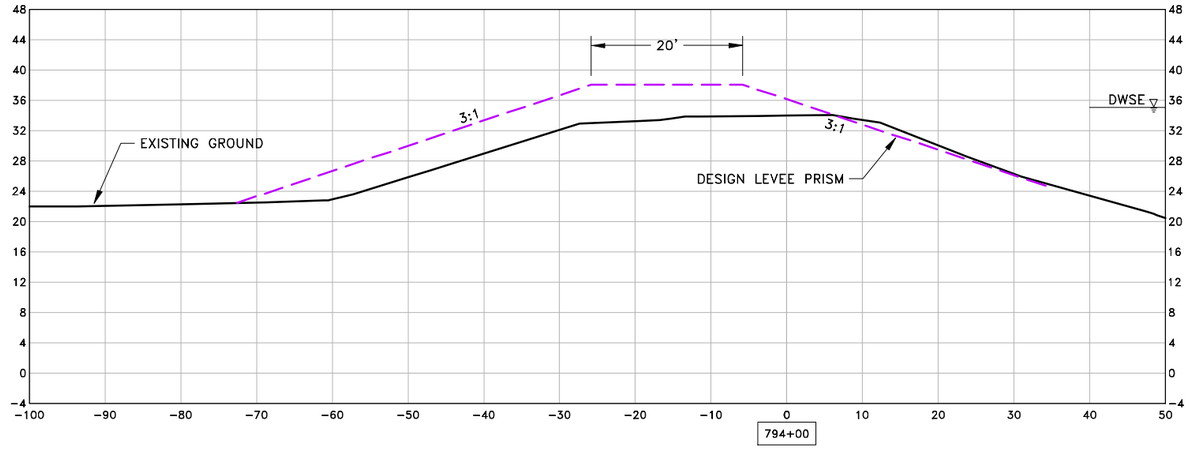
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C1-325
SHEET 40 OF 136

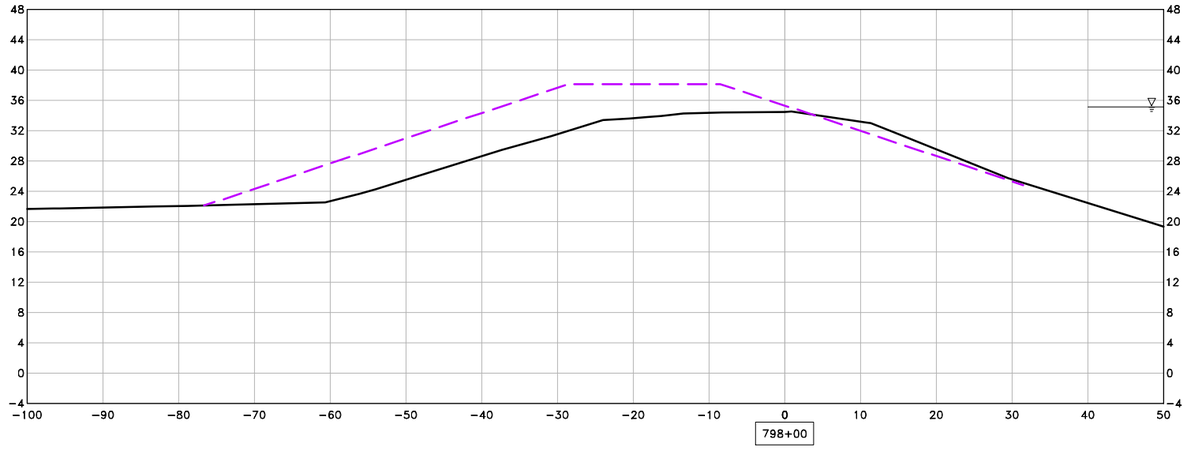
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FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:51pm









NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

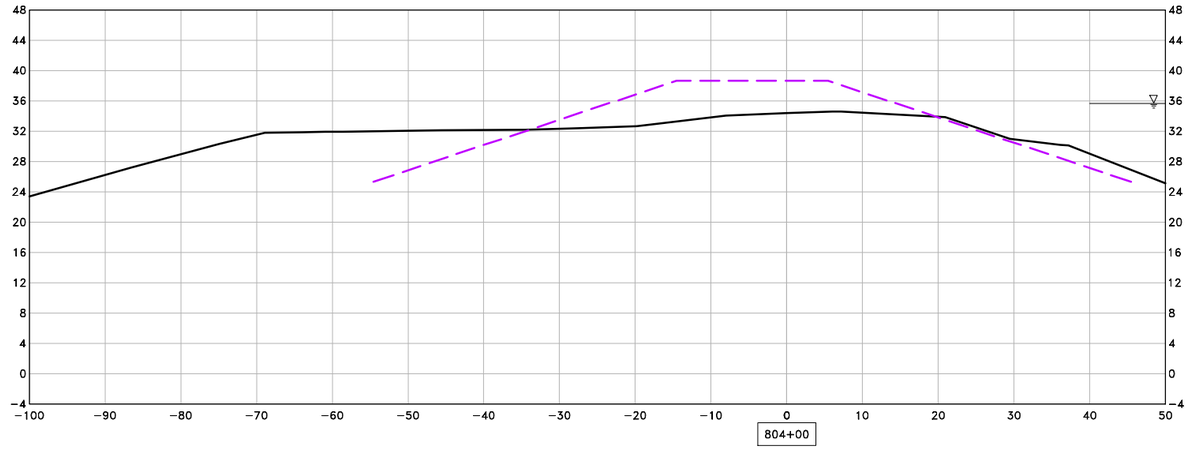
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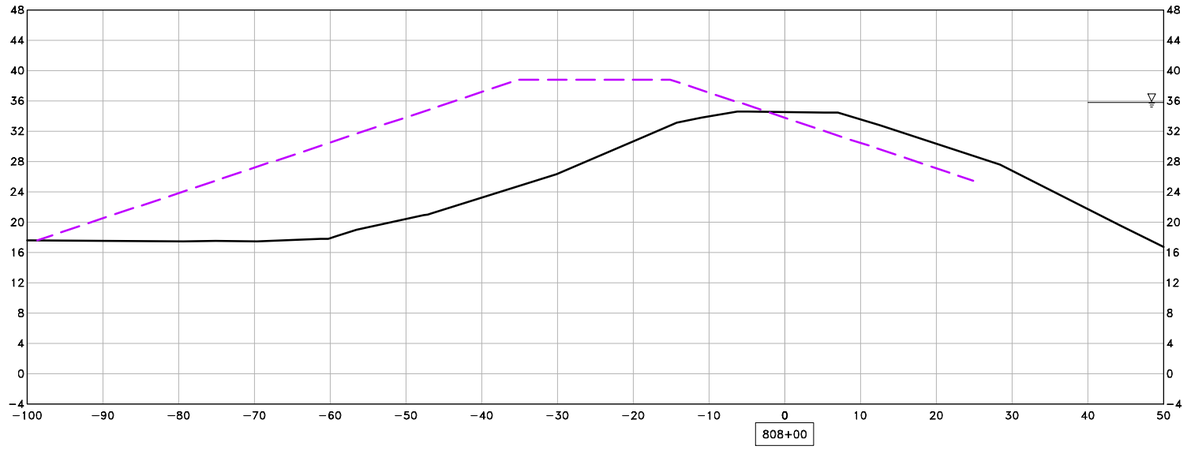
DATE
DECEMBER 11, 2019

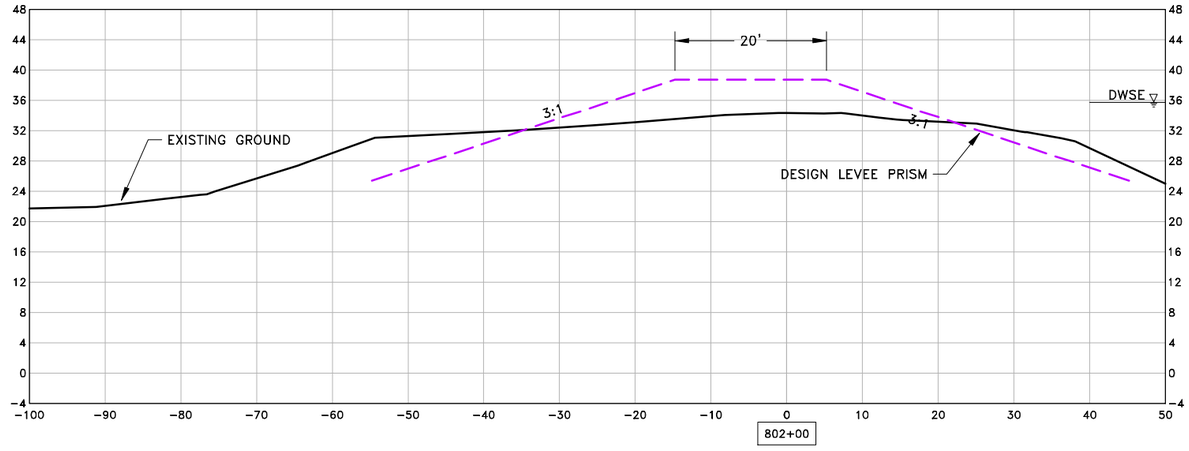
SHEET IDENTIFICATION
C1-326
SHEET 41 OF 136

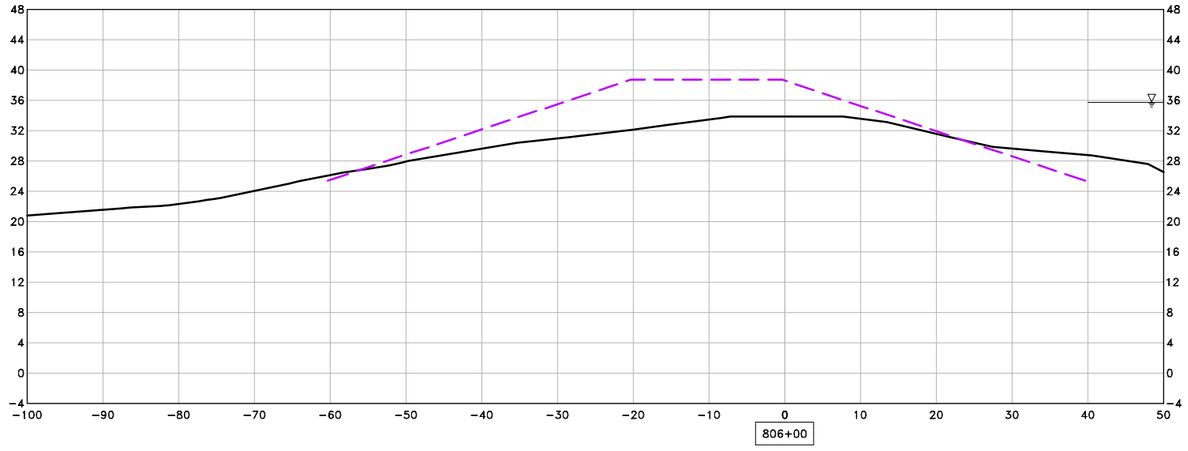
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:53pm









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:54pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

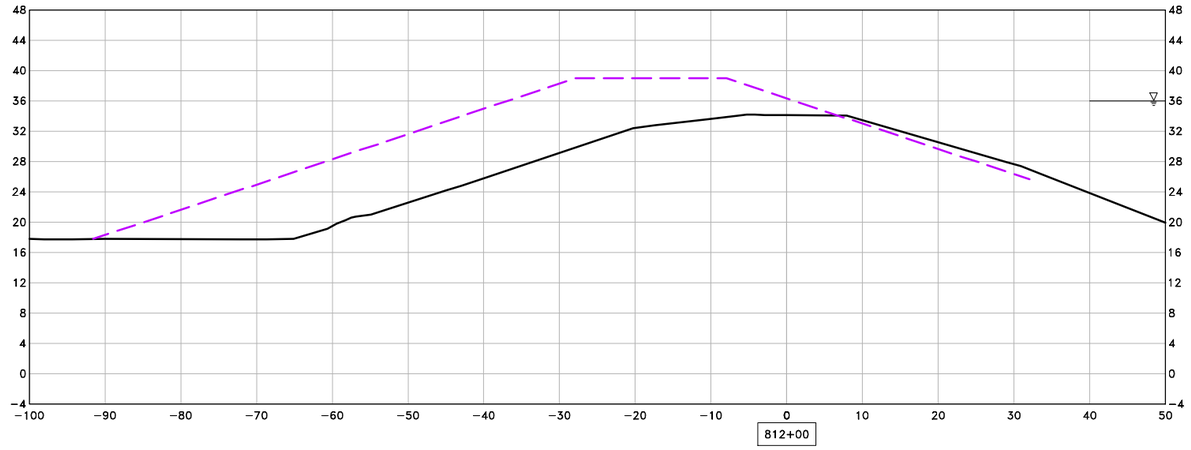
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

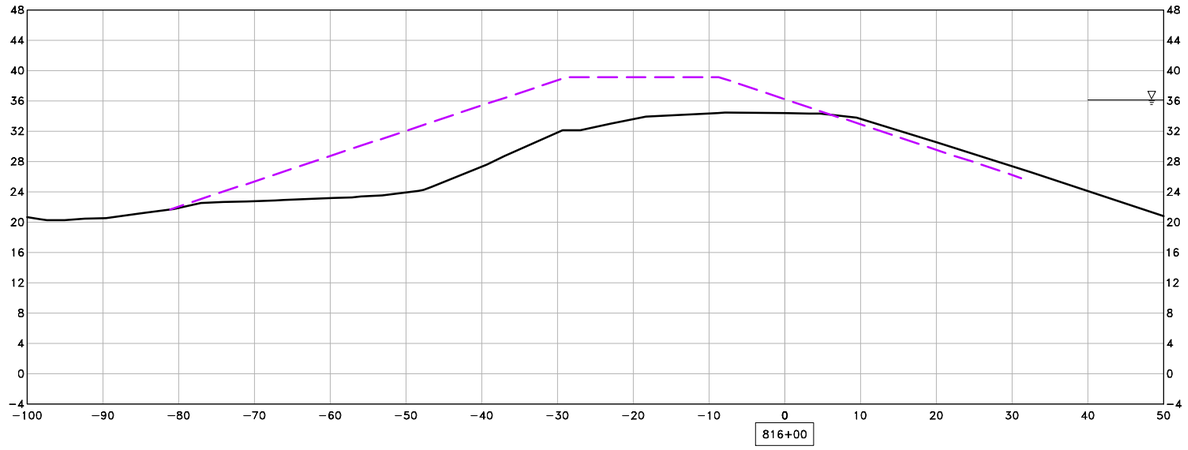
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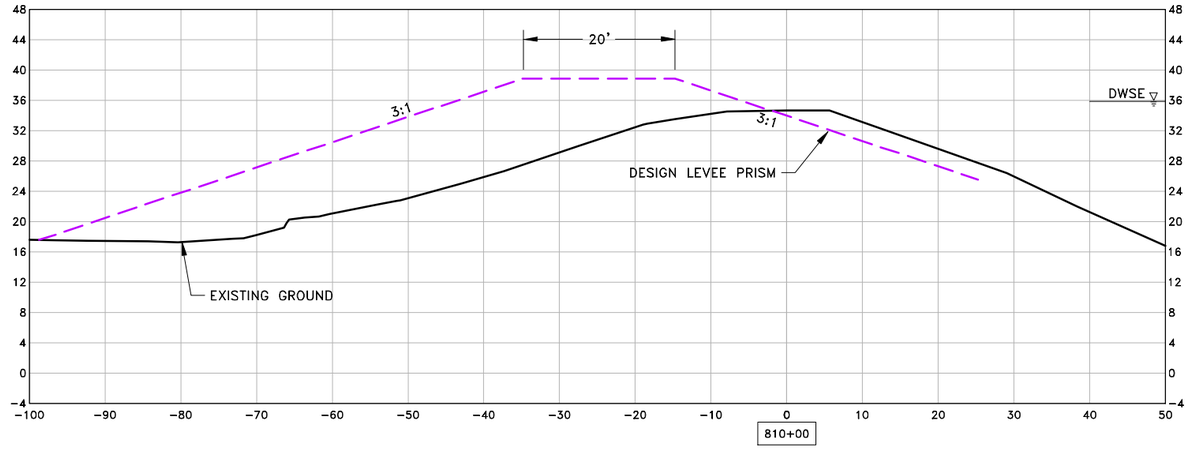
DATE
DECEMBER 11, 2019

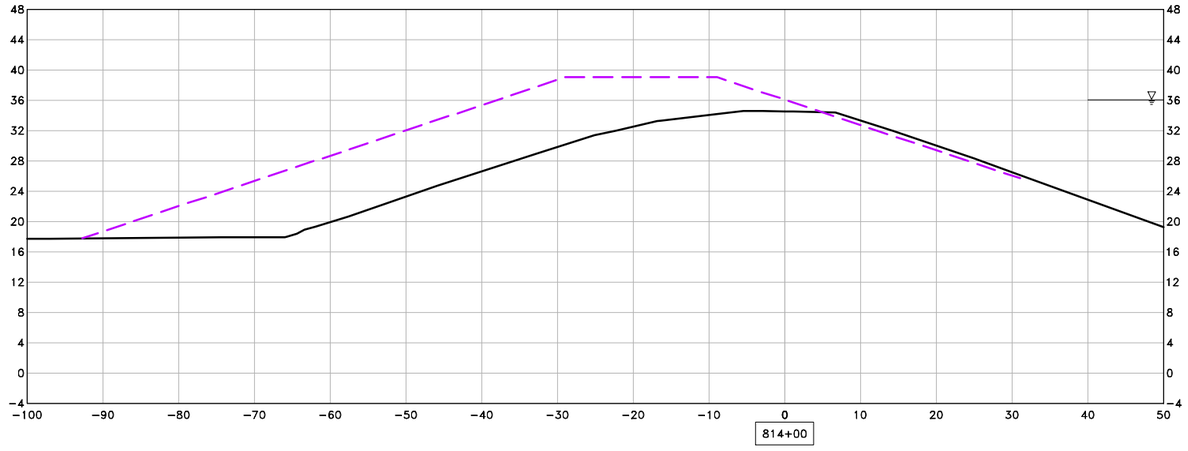
SHEET IDENTIFICATION
C1-327
SHEET 42 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:56pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

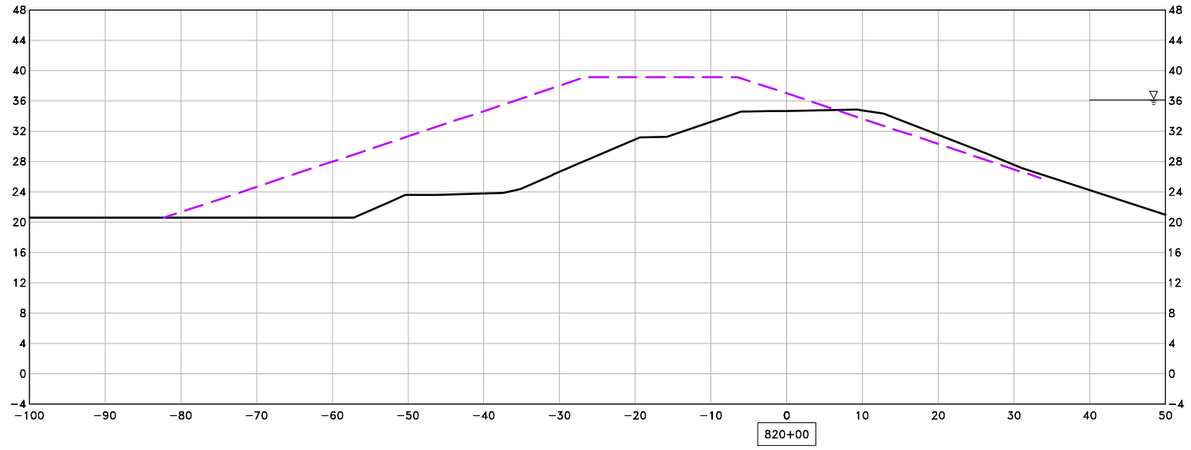
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

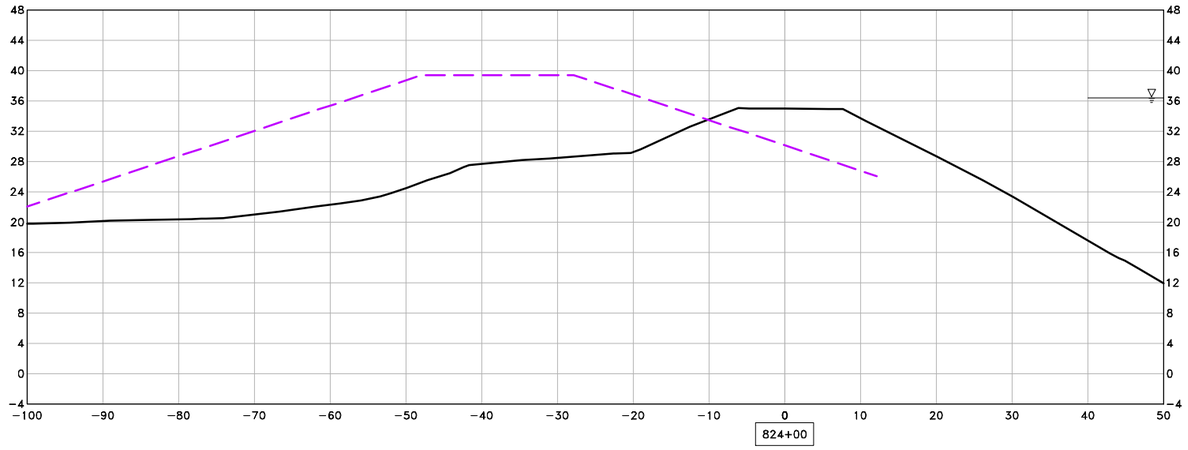
STA 810+00 TO STA 818+00

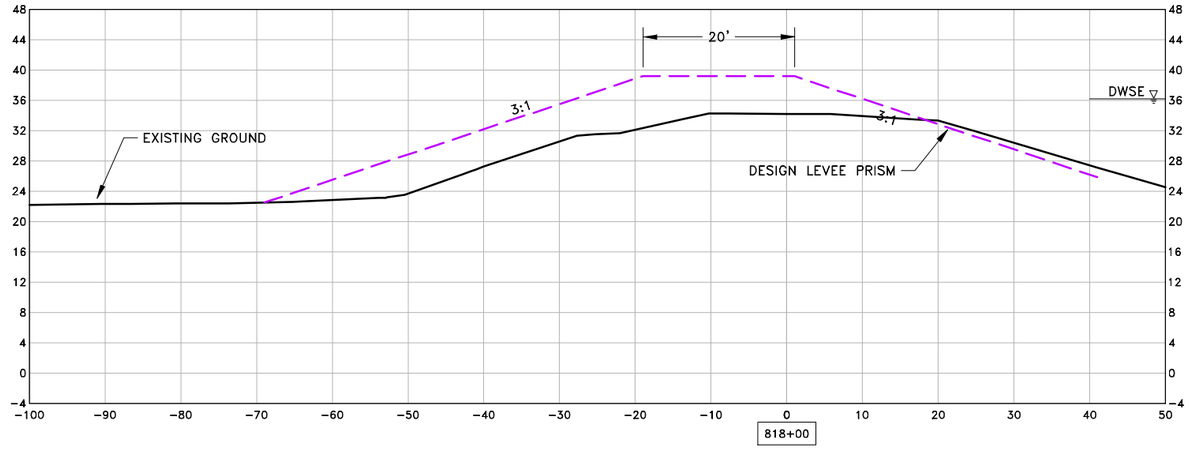
DATE
DECEMBER 11, 2019

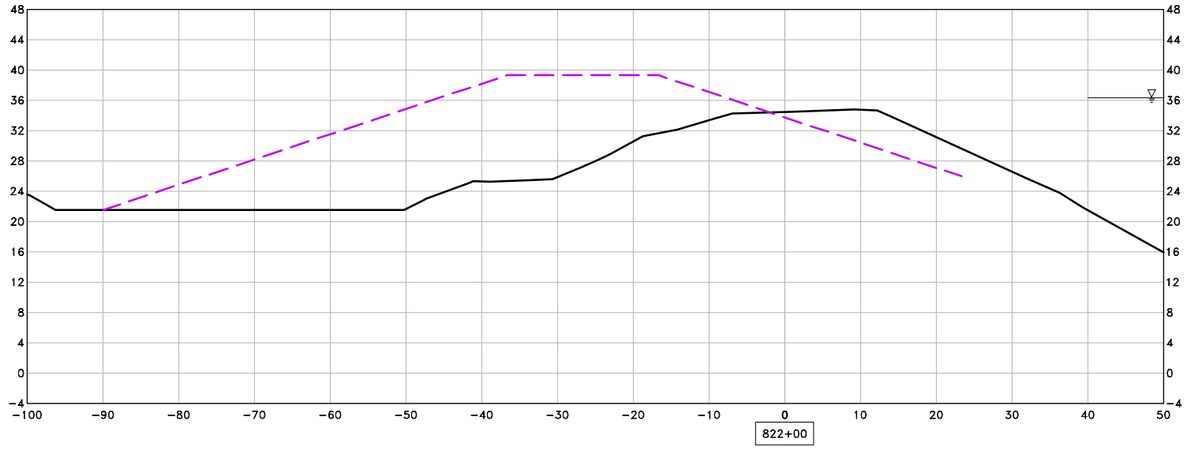
SHEET IDENTIFICATION
C1-328
SHEET 43 OF 136

KSN PROJECT FILE NO.
2255-0050









NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

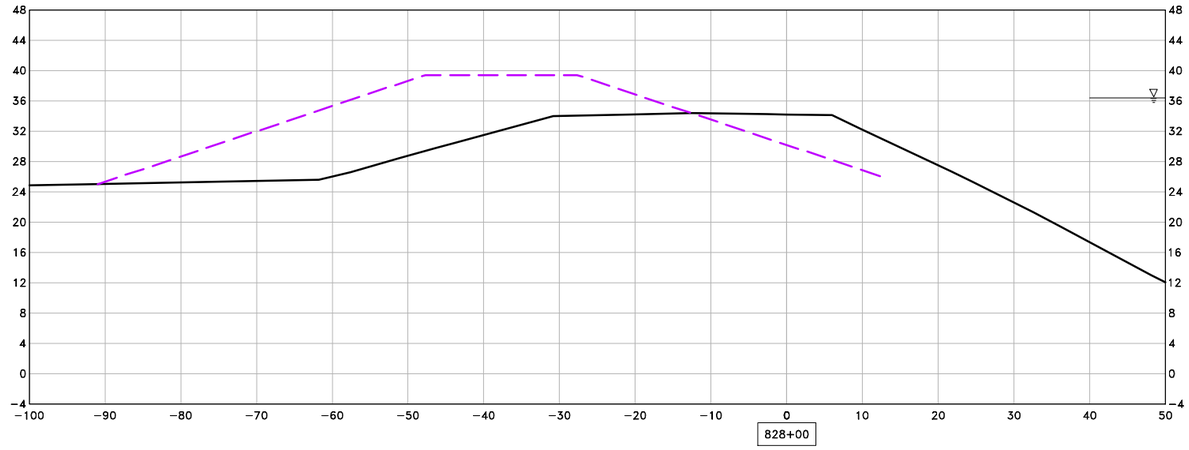
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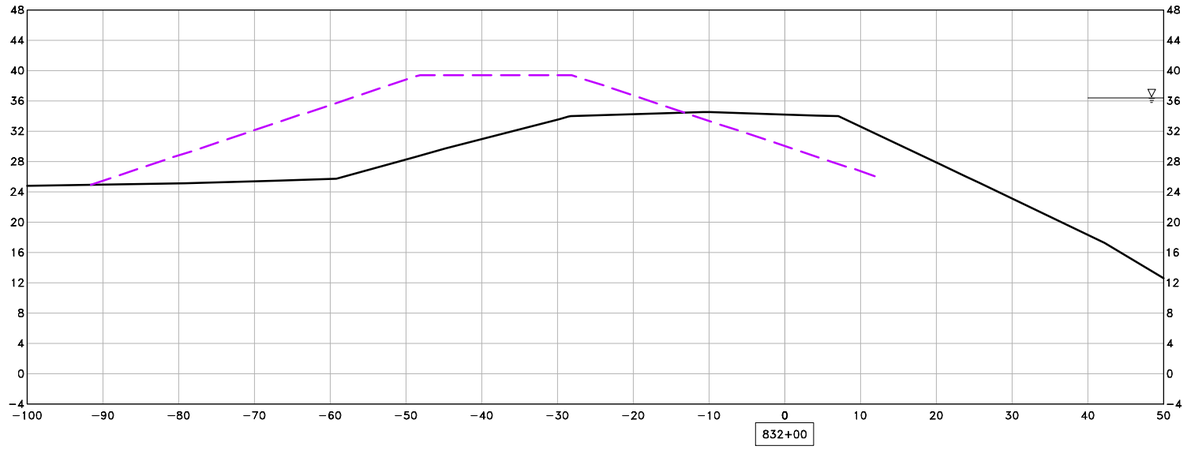
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DECEMBER 11, 2019

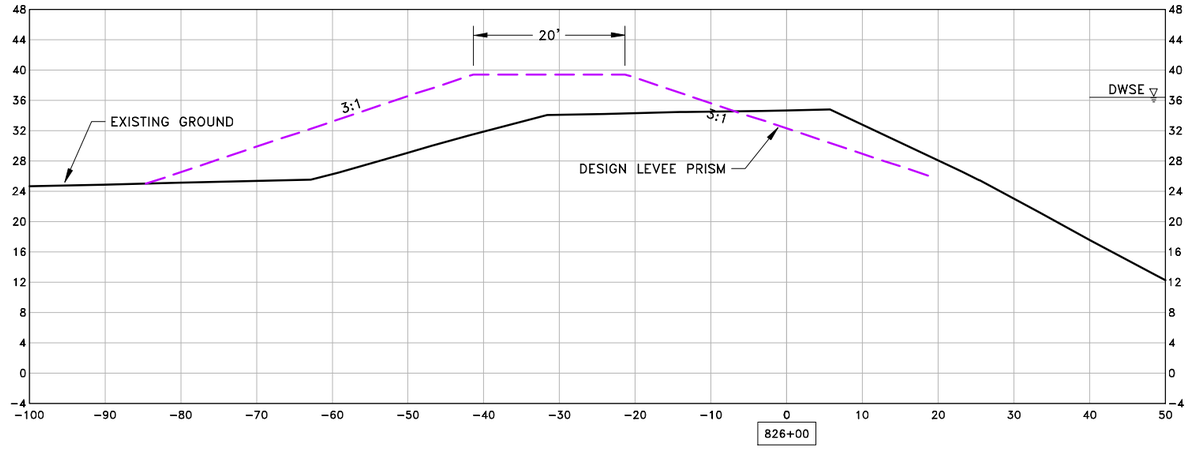
SHEET IDENTIFICATION
C1-329
SHEET 44 OF 136

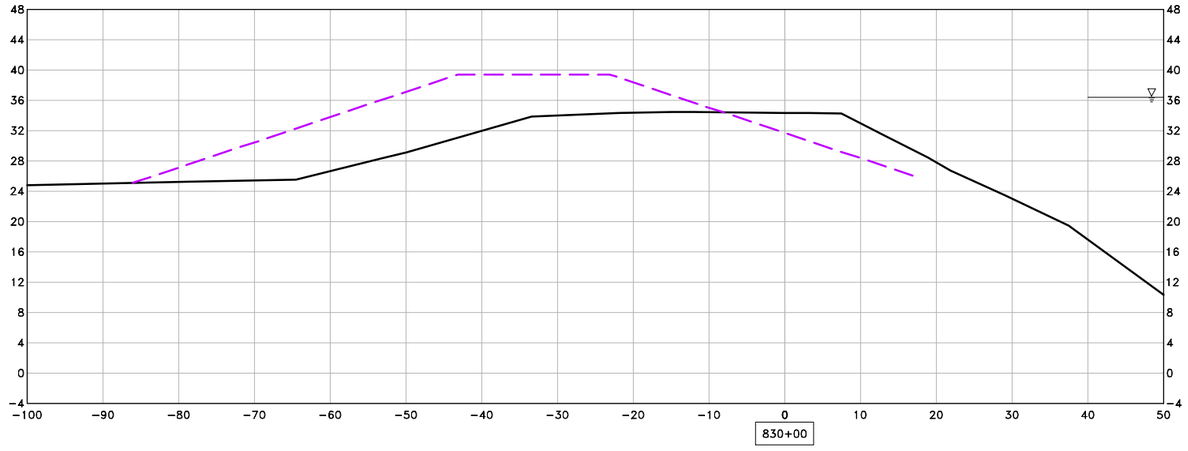
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 2:58pm









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:00pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

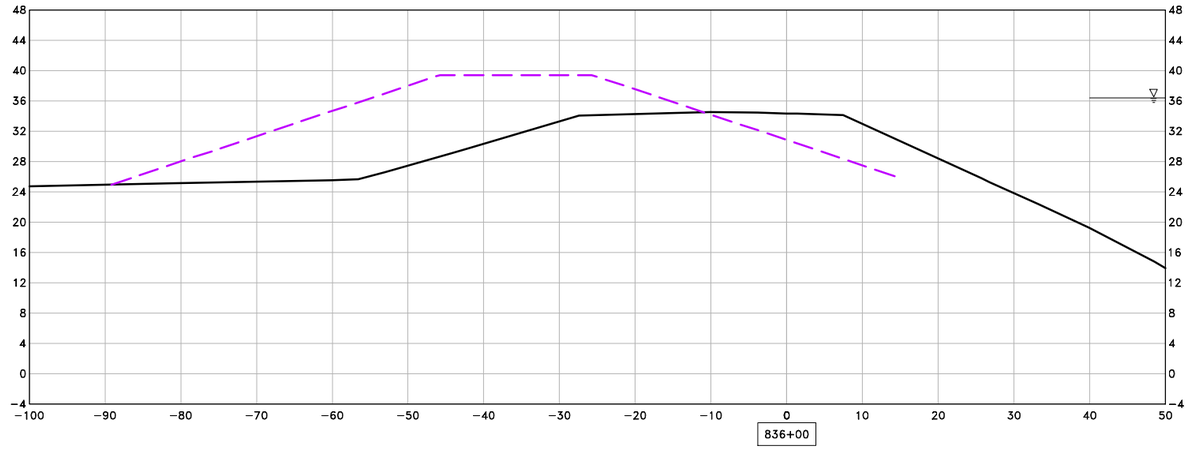
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

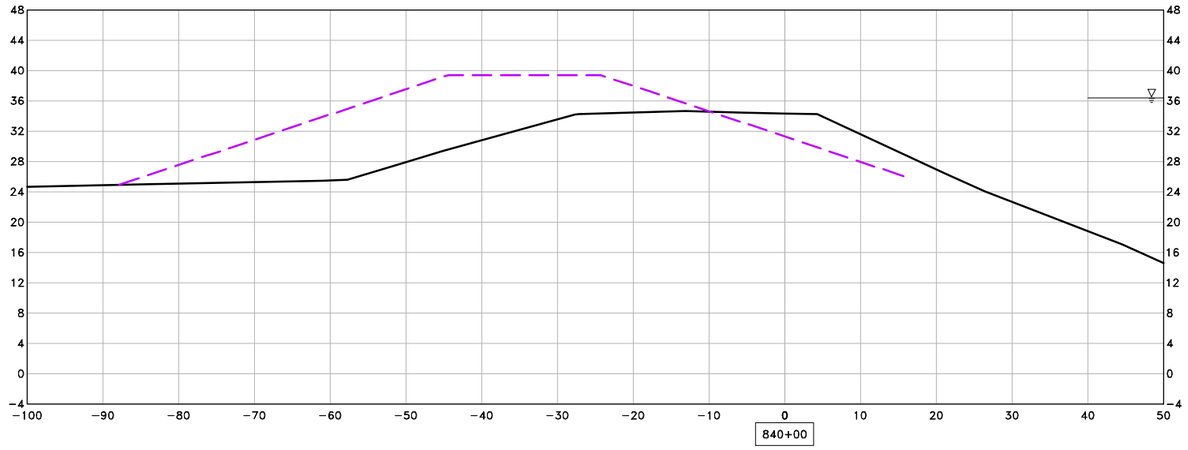
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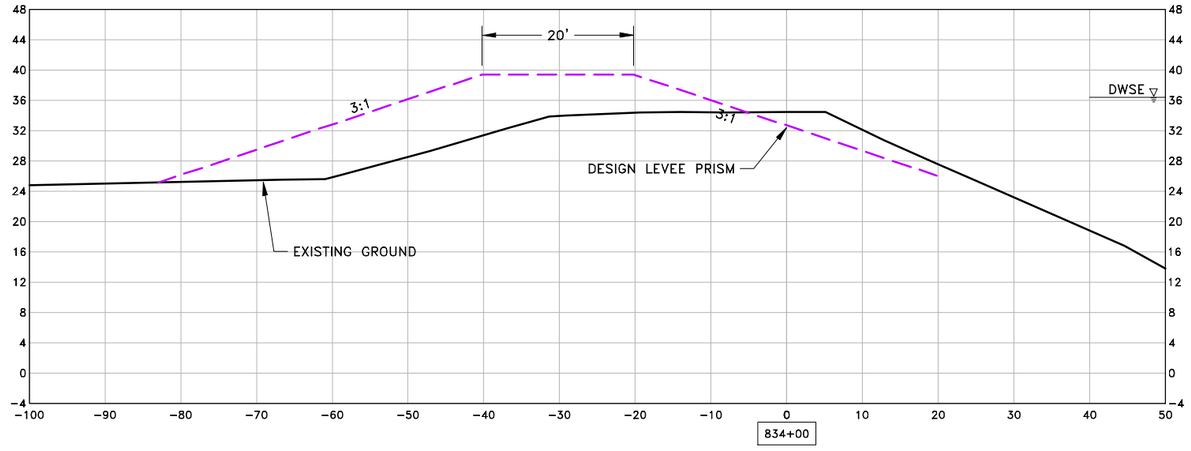
DATE
DECEMBER 11, 2019

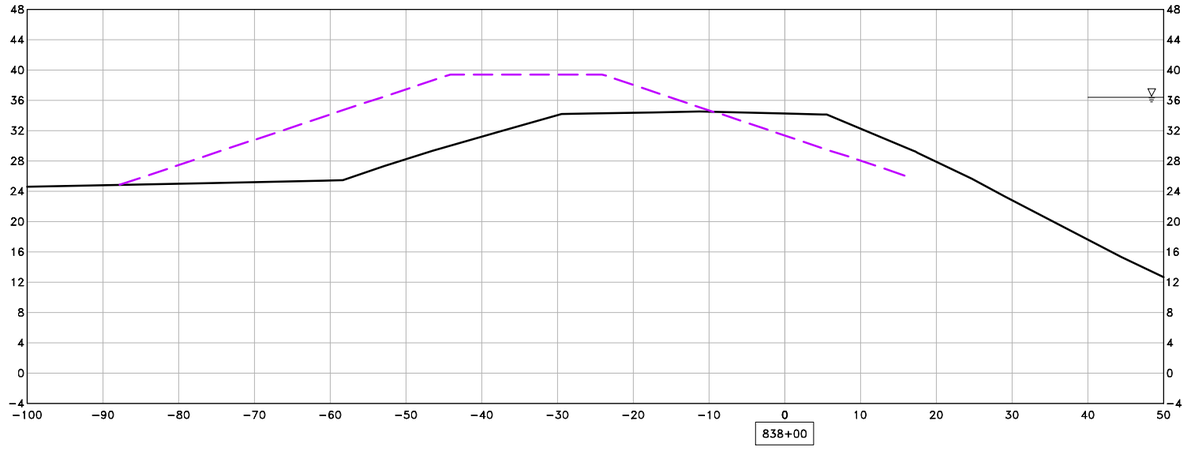
SHEET IDENTIFICATION
C1-330
SHEET 45 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:02pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

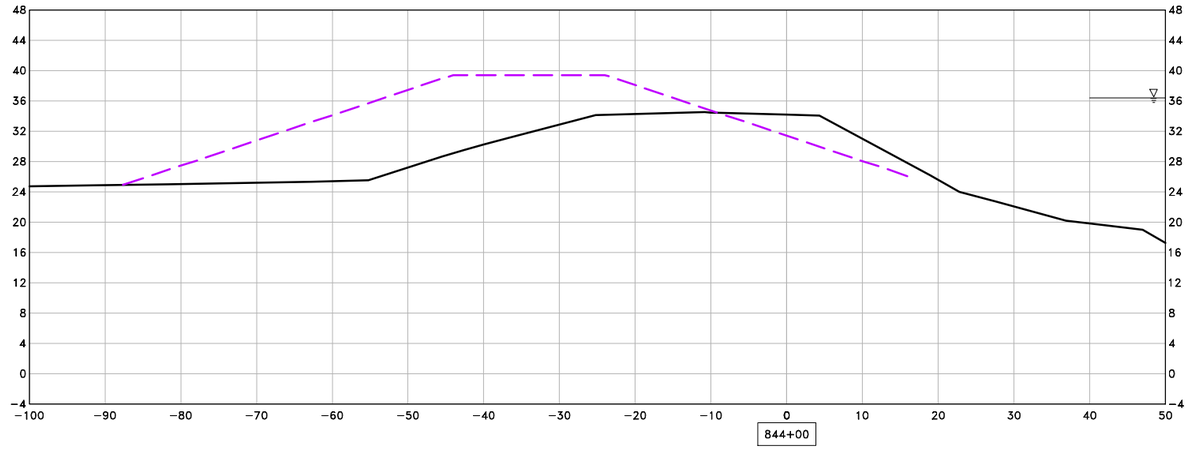
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

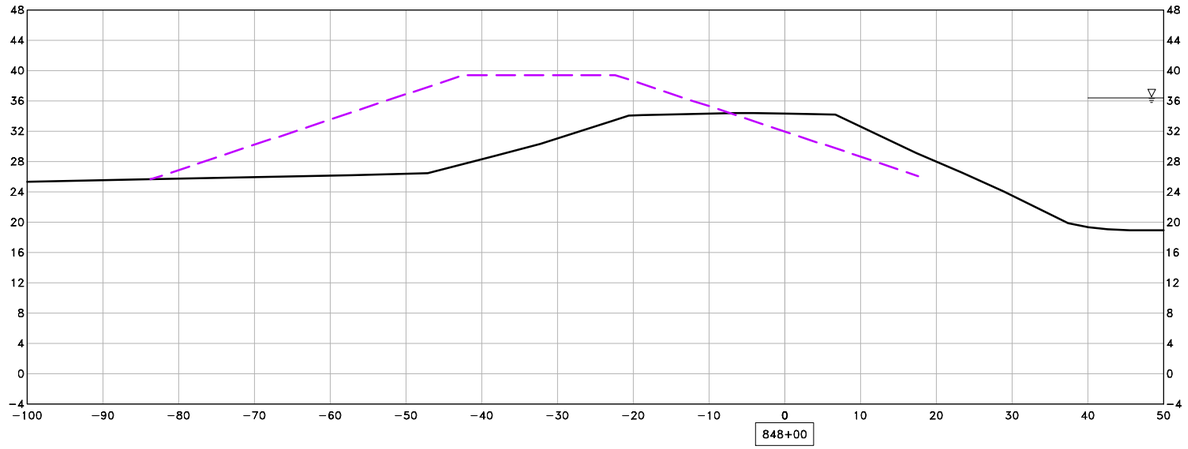
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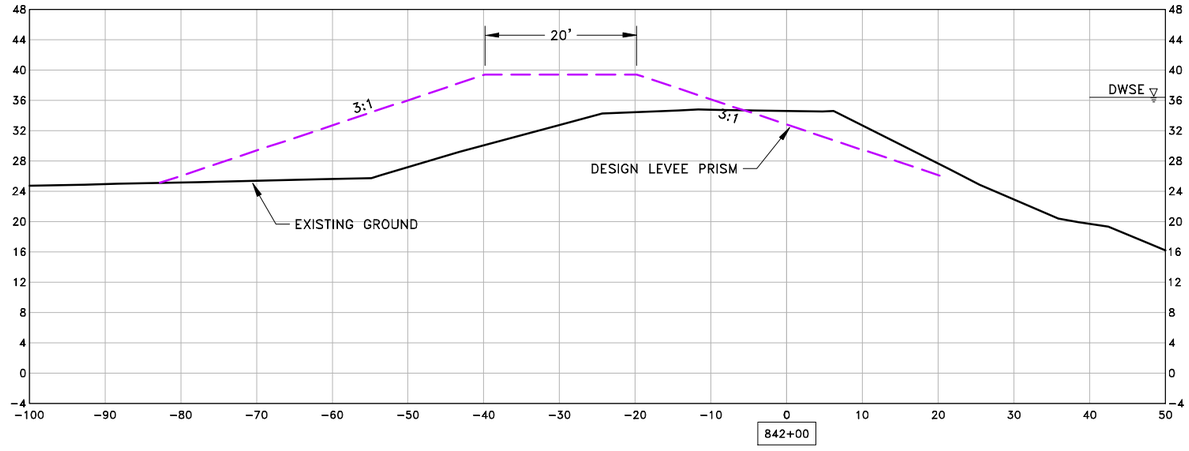
DATE
DECEMBER 11, 2019

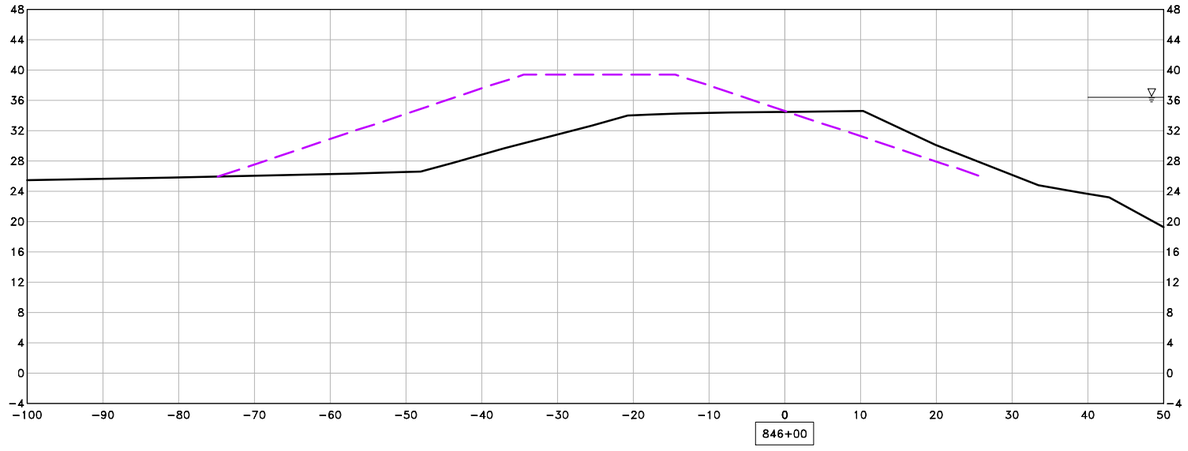
SHEET IDENTIFICATION
C1-331
SHEET 46 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:03pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

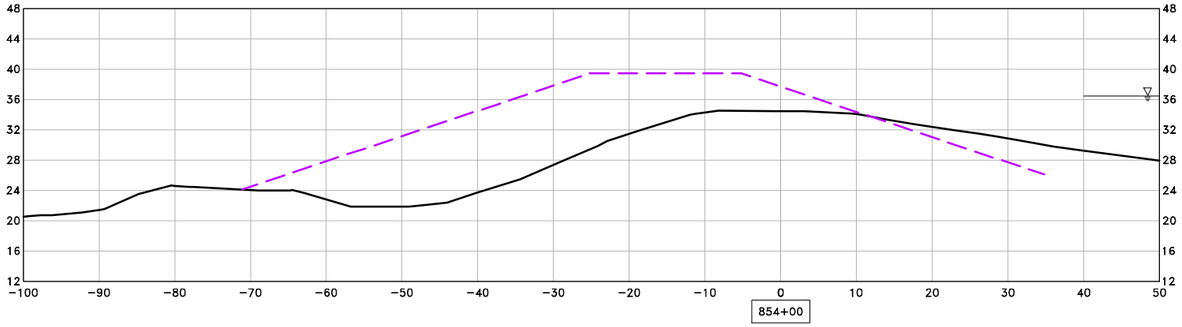
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

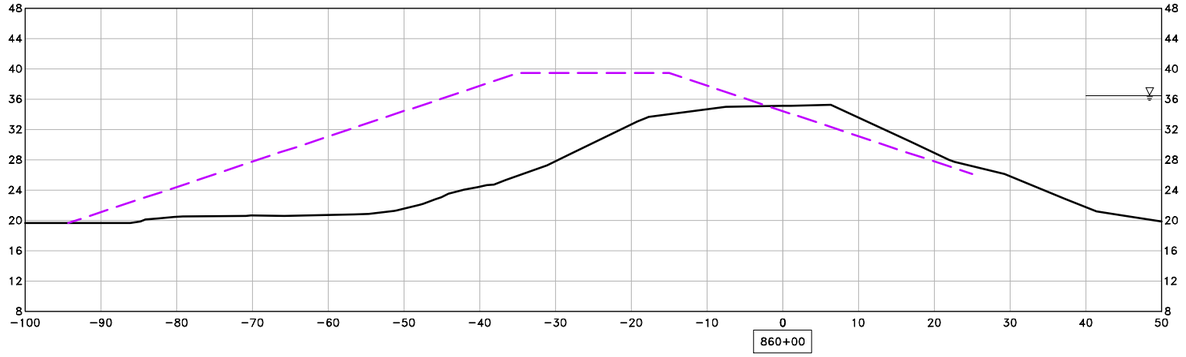
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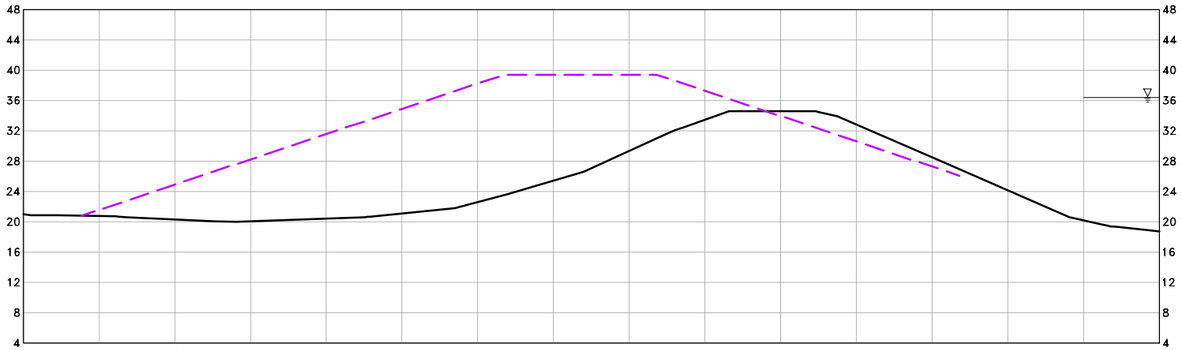
DATE
DECEMBER 11, 2019

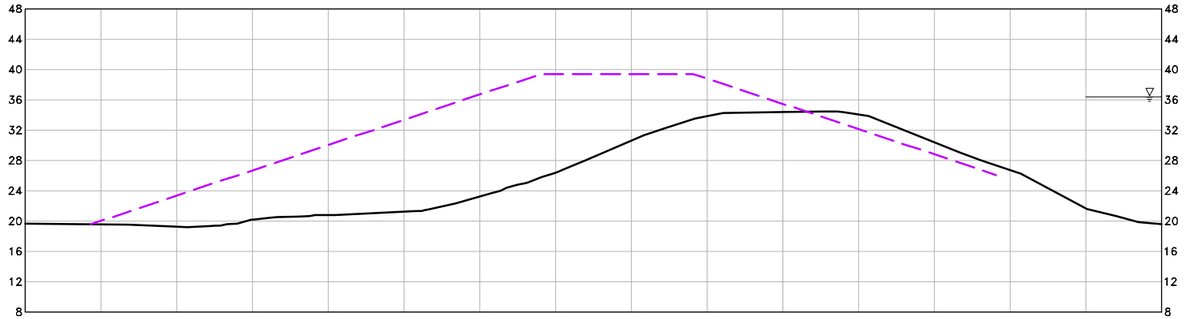
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C1-332
SHEET 47 OF 136

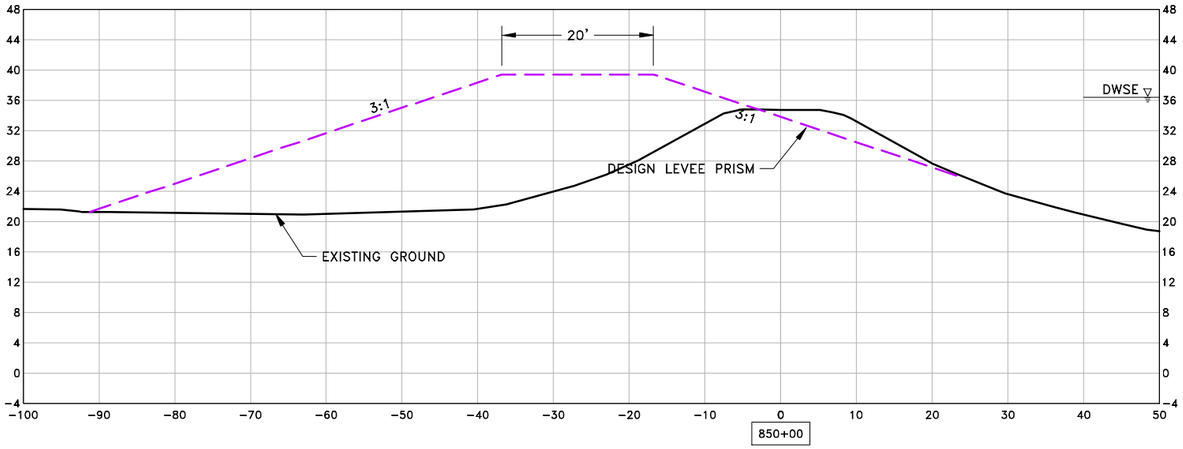
KSN PROJECT FILE NO.
2255-0050

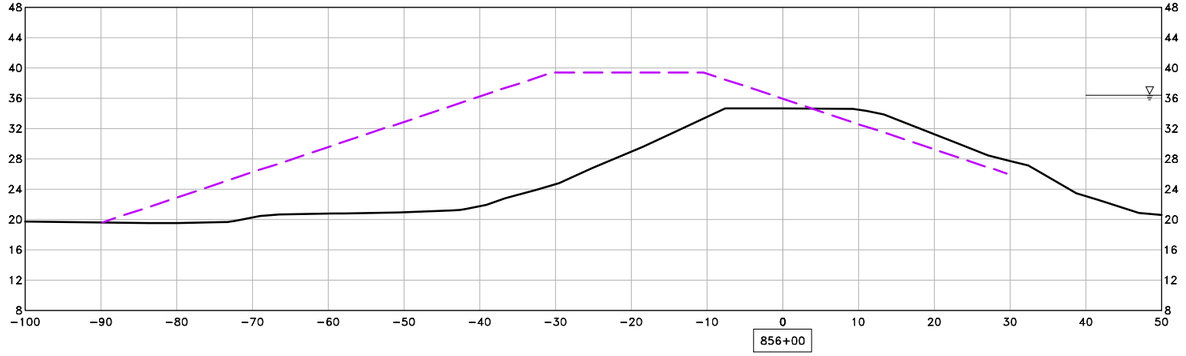












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PLOT DATE: Dec 11, 2019 - 3:05pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

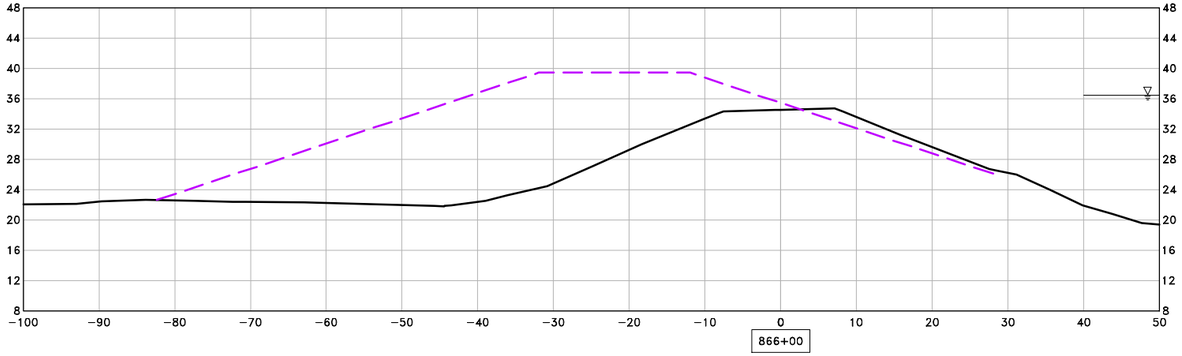
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

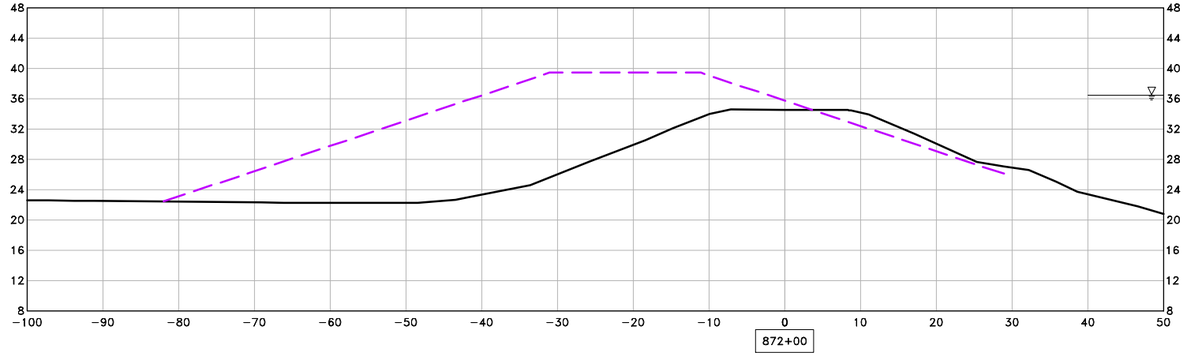
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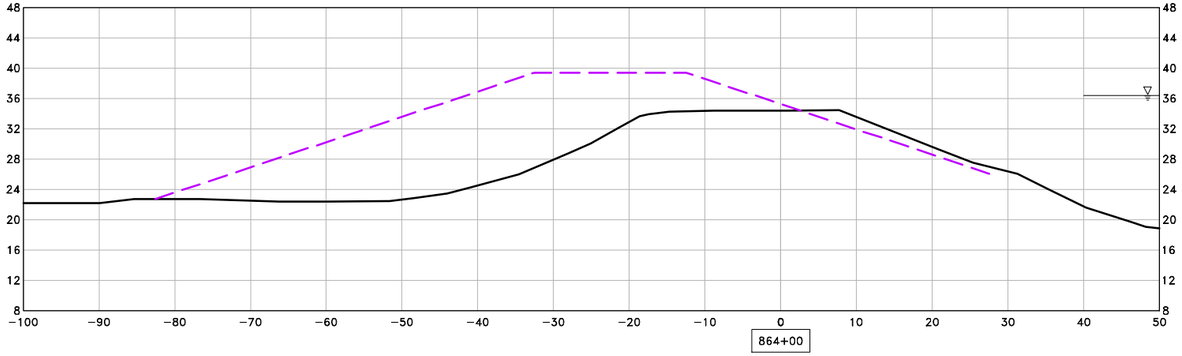
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DECEMBER 11, 2019

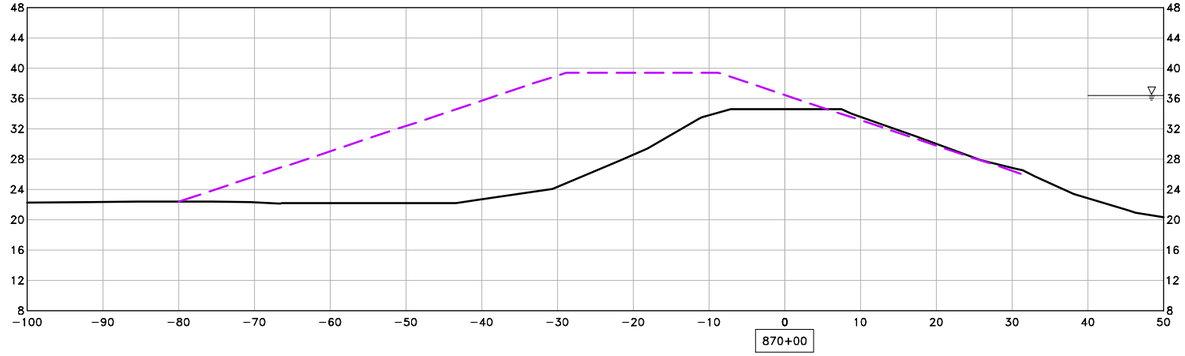
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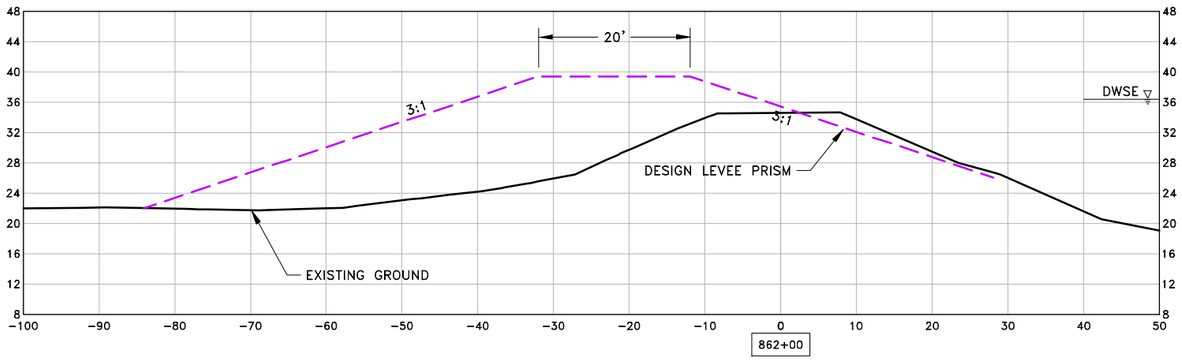
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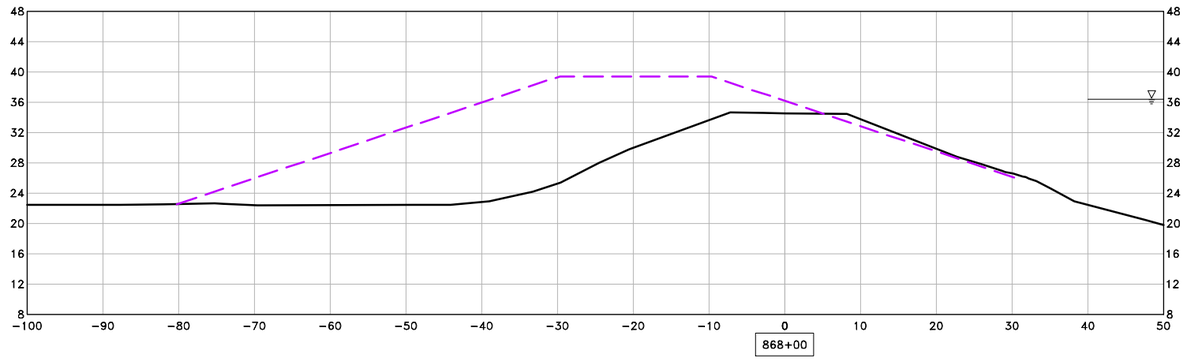












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PLOT DATE: Dec 11, 2019 - 3:07pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

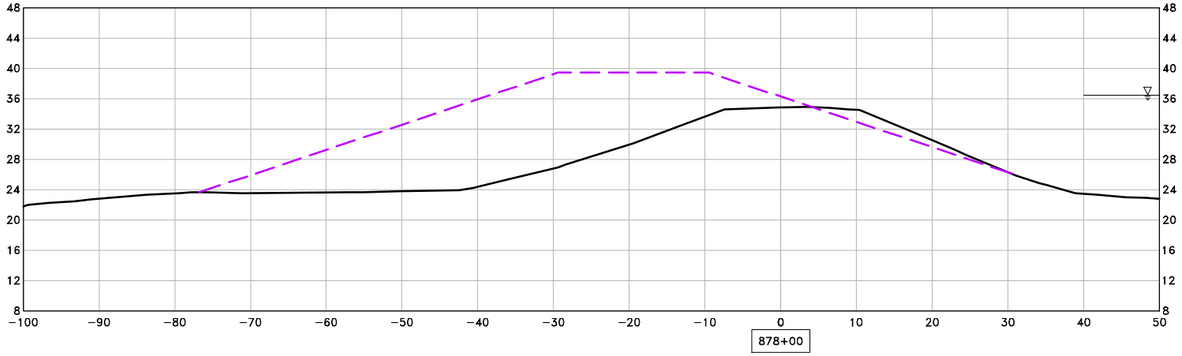
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

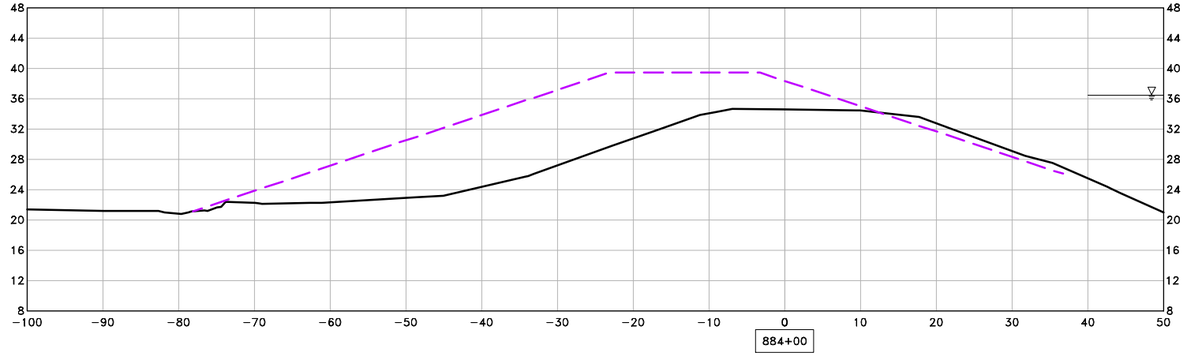
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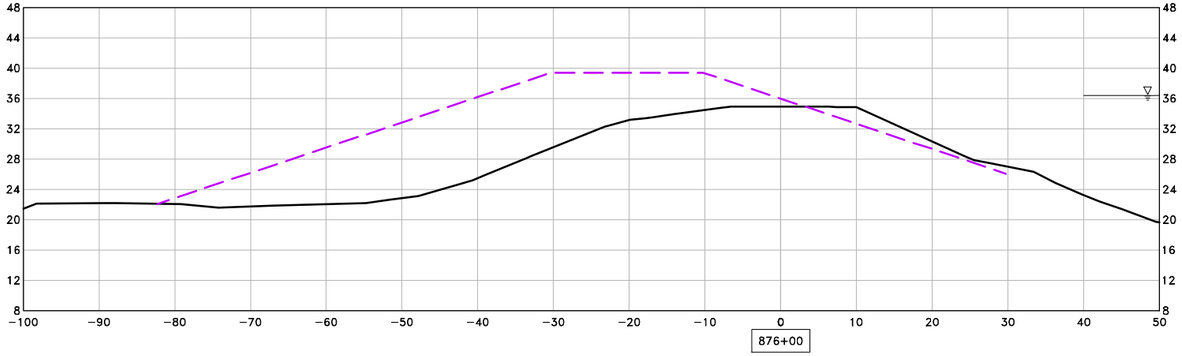
DATE DECEMBER 11, 2019

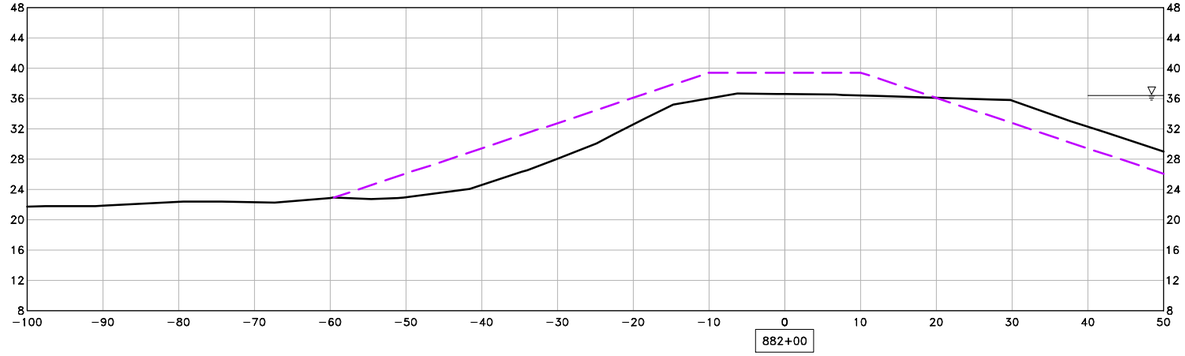
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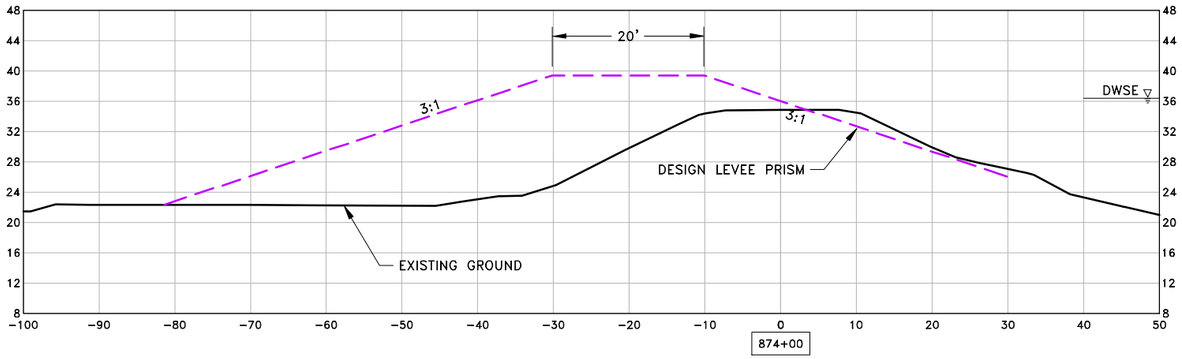
KSN PROJECT FILE NO. 2255-0050

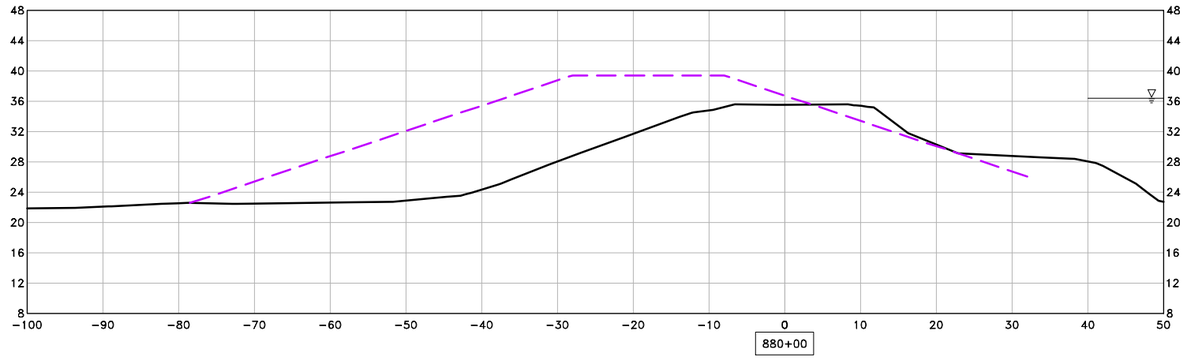












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PLOT DATE: Dec 11, 2019 - 3:09pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

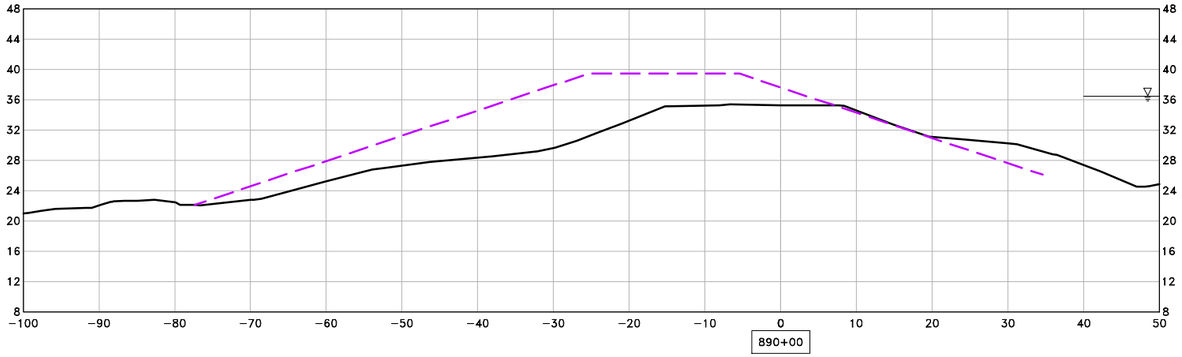
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

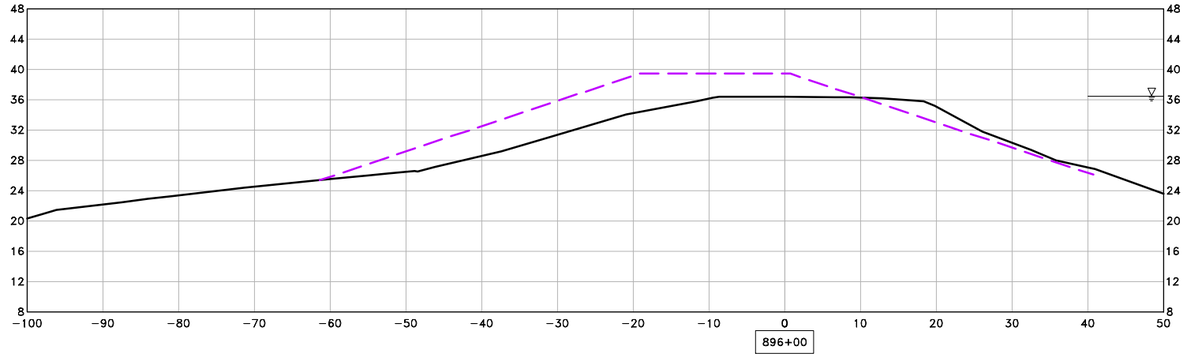
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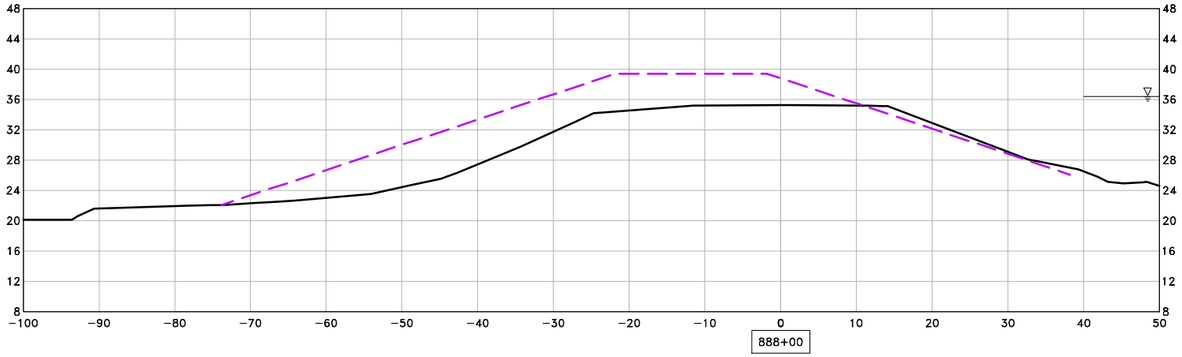
DATE
DECEMBER 11, 2019

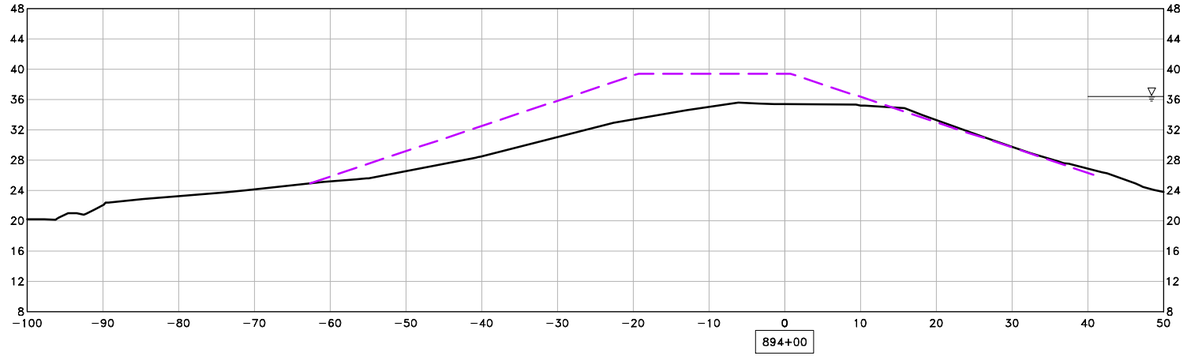
SHEET IDENTIFICATION
C1-335
SHEET 50 OF 136

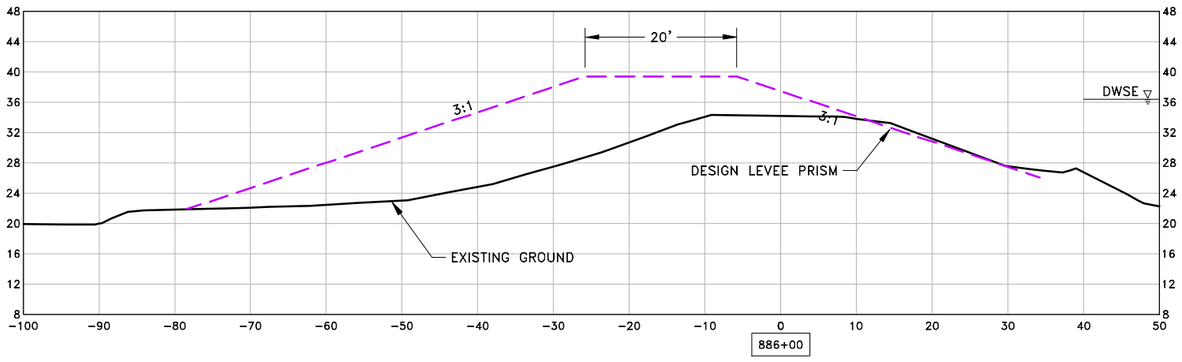
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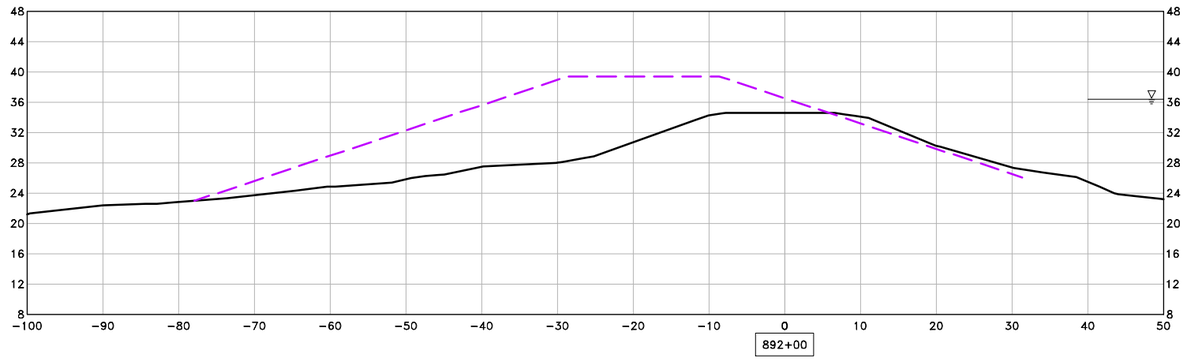












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:11pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

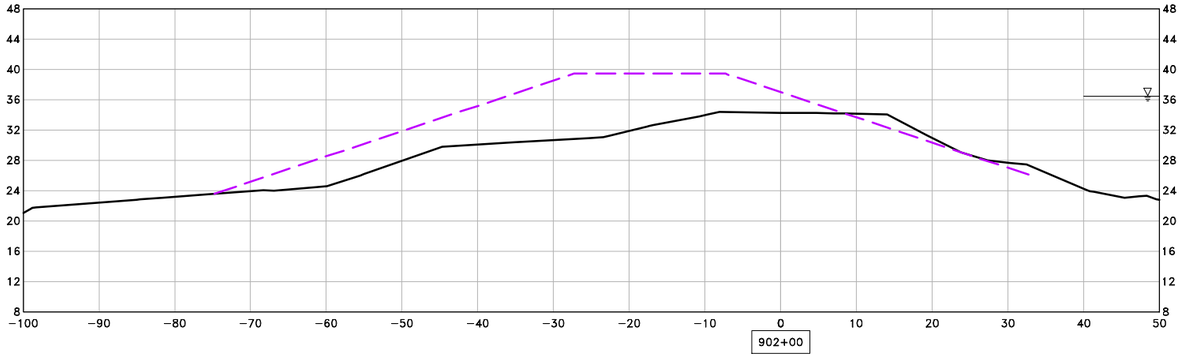
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

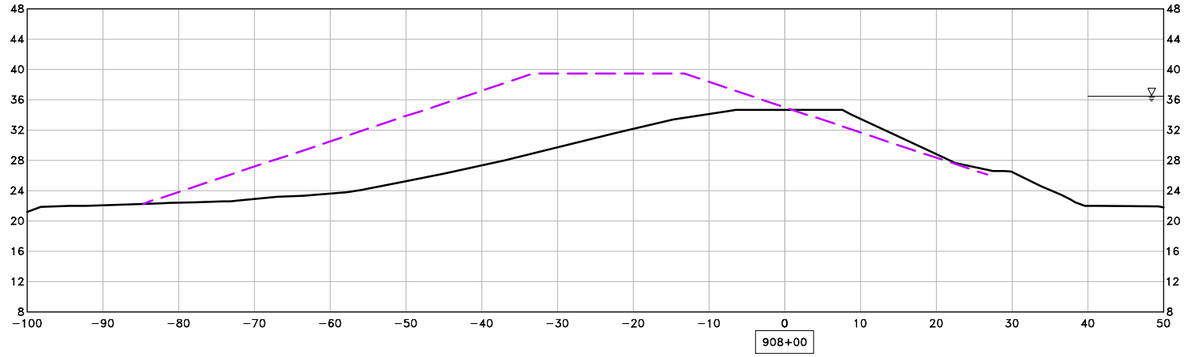
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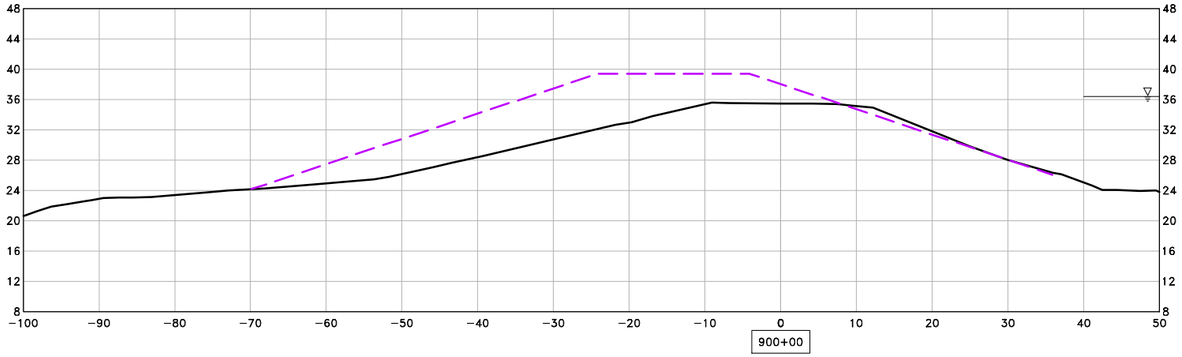
DATE
DECEMBER 11, 2019

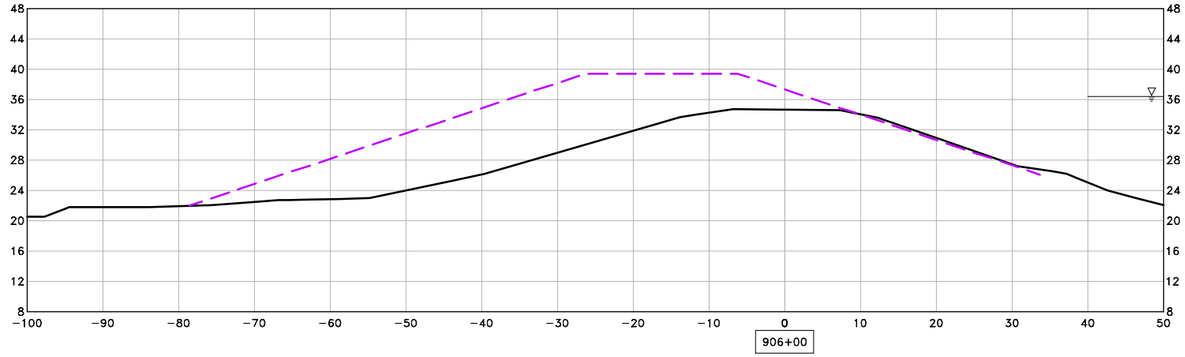
SHEET IDENTIFICATION
C1-336
SHEET 51 OF 136

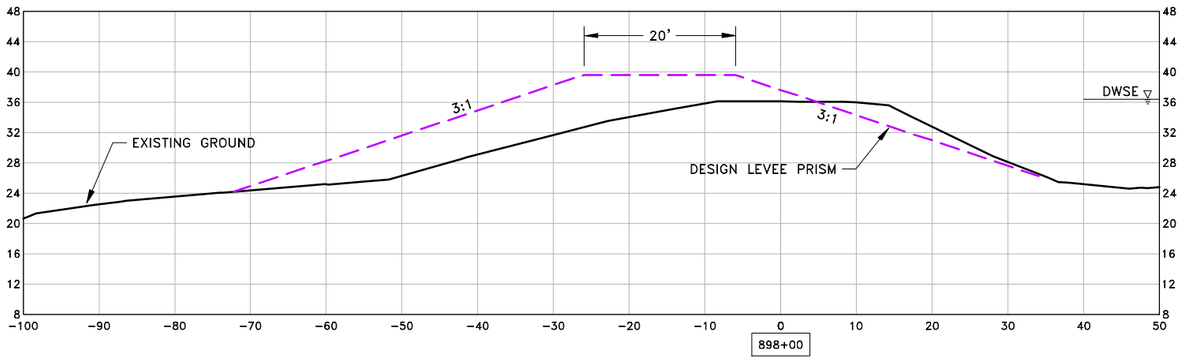
KSN PROJECT FILE NO.
2255-0050

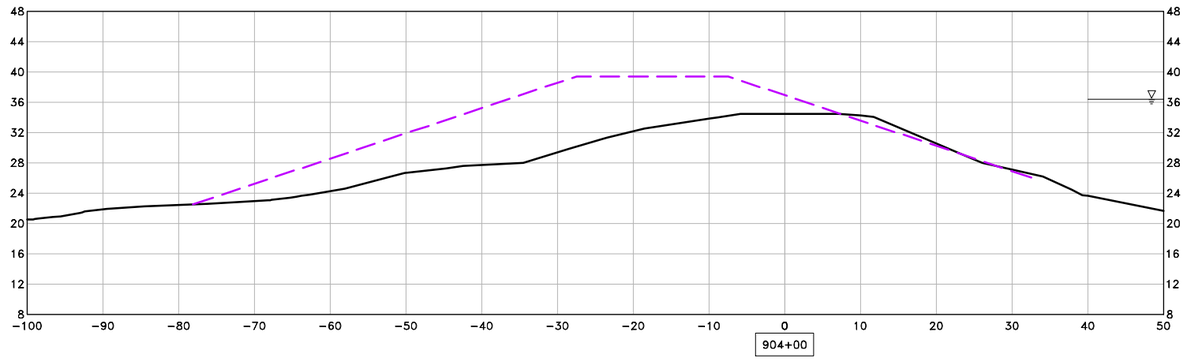












NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

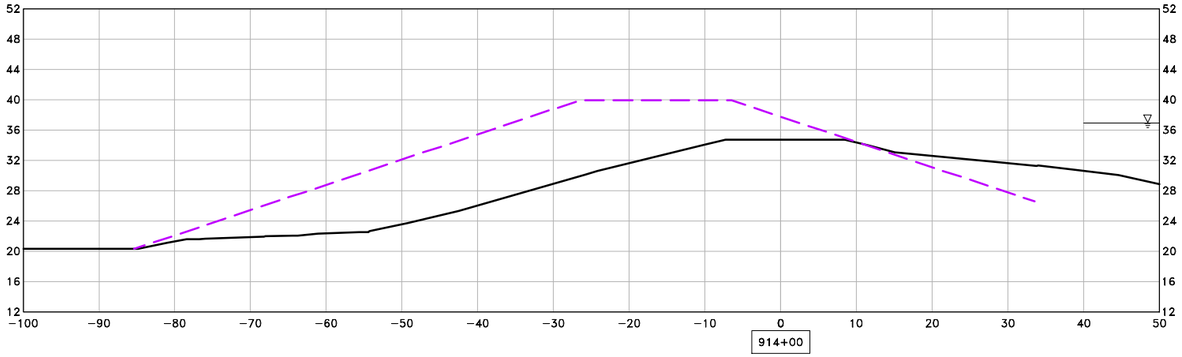
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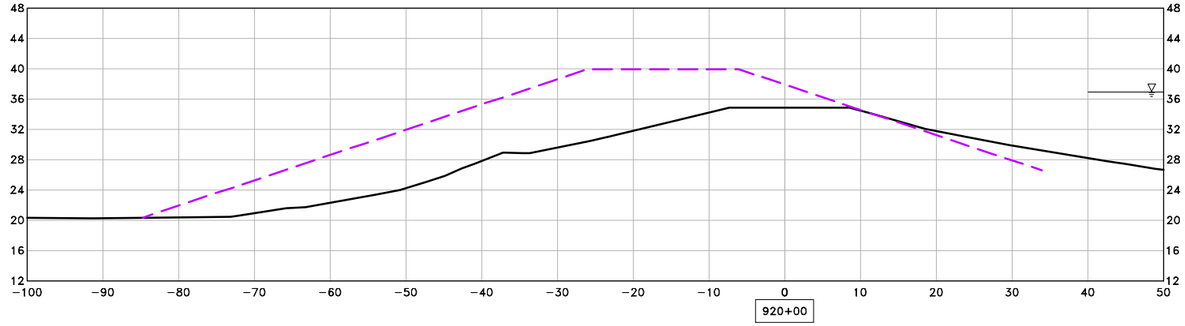
DATE
DECEMBER 11, 2019

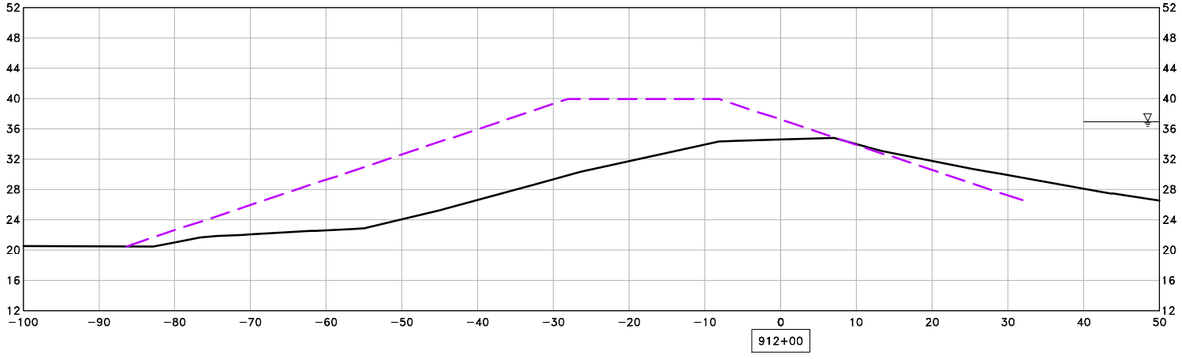
SHEET IDENTIFICATION
C1-337
SHEET 52 OF 136

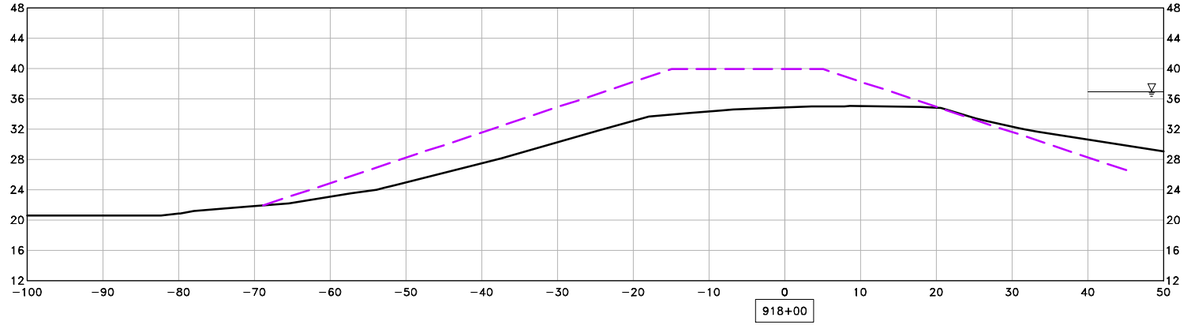
KSN PROJECT FILE NO.
2255-0050

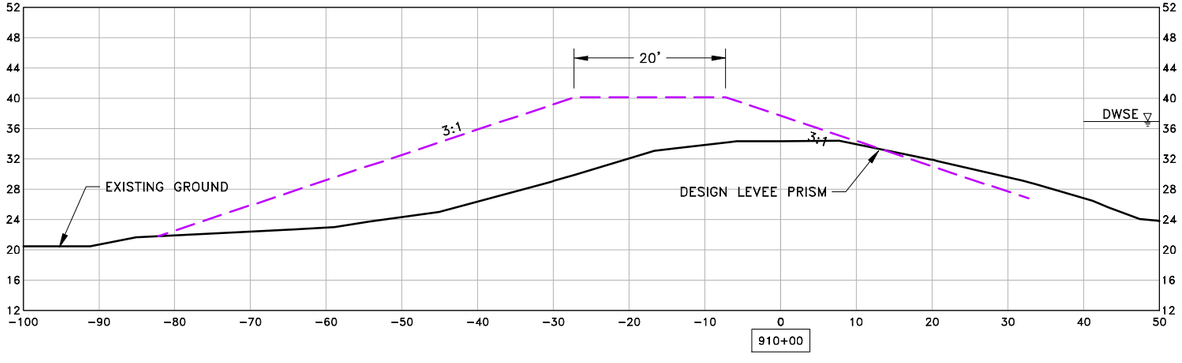
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PLOT DATE: Dec 11, 2019 - 3:12pm

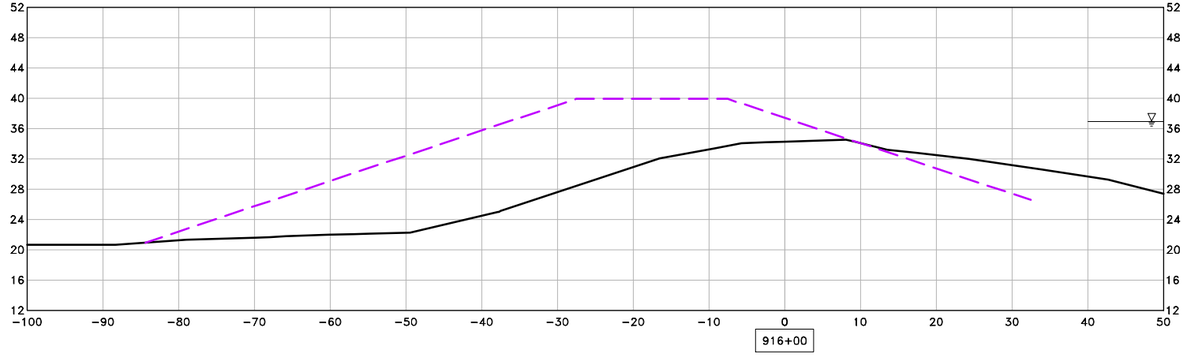












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:14pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

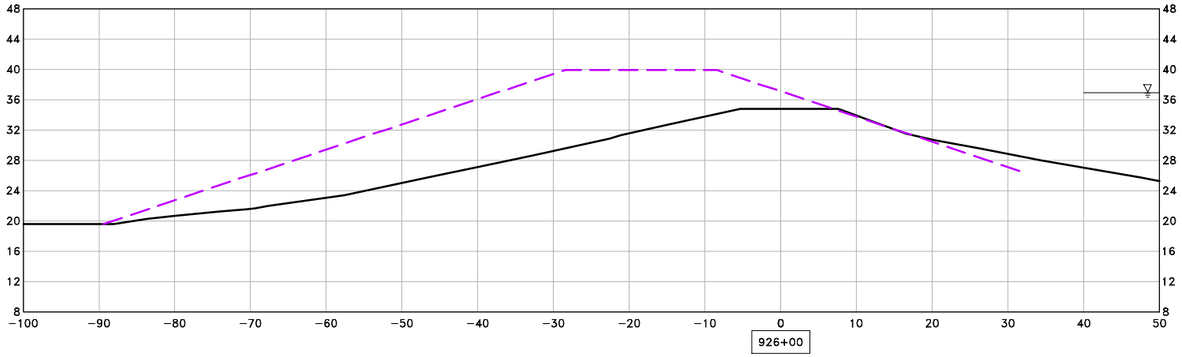
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

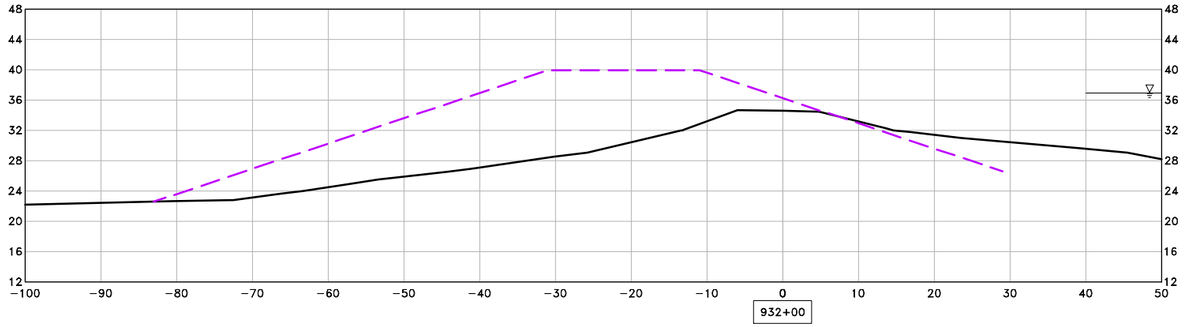
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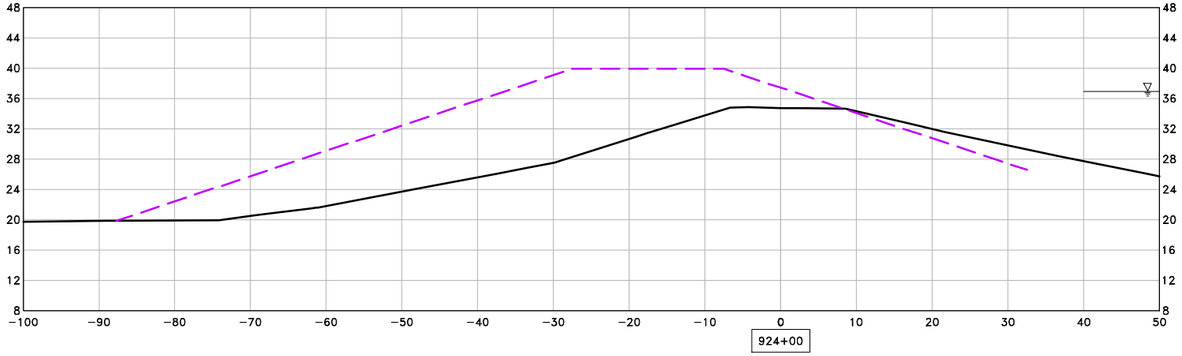
DATE
DECEMBER 11, 2019

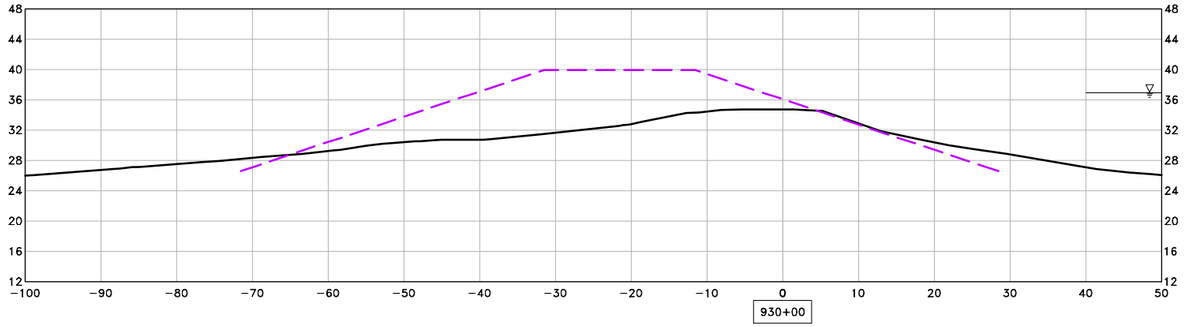
SHEET IDENTIFICATION
C1-338
SHEET 53 OF 136

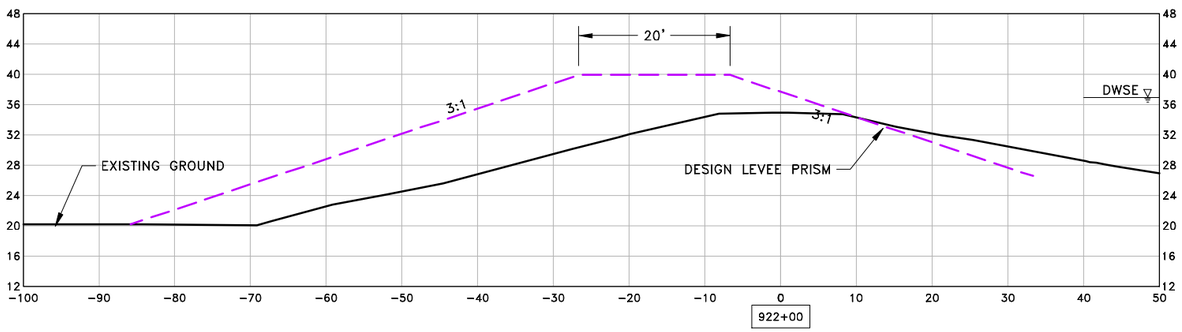
KSN PROJECT FILE NO.
2255-0050

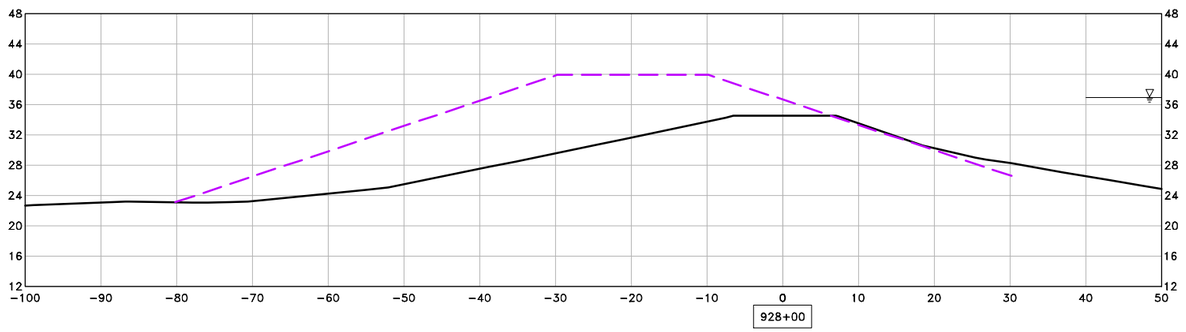












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:16pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

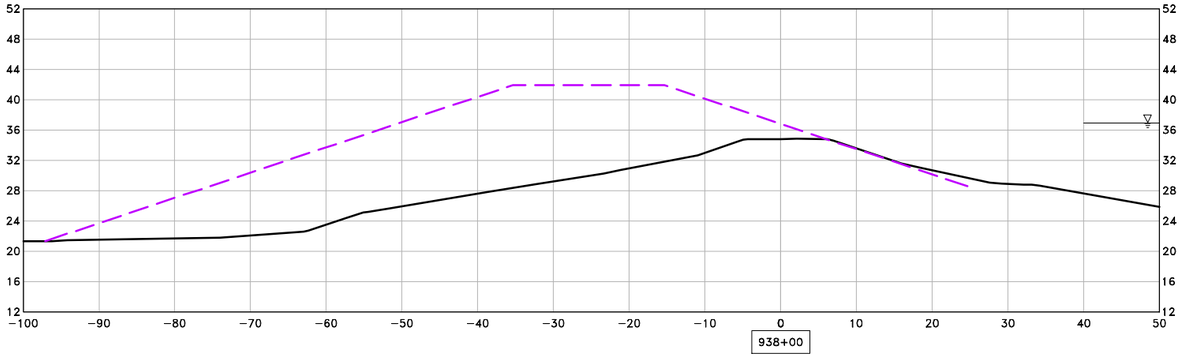
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

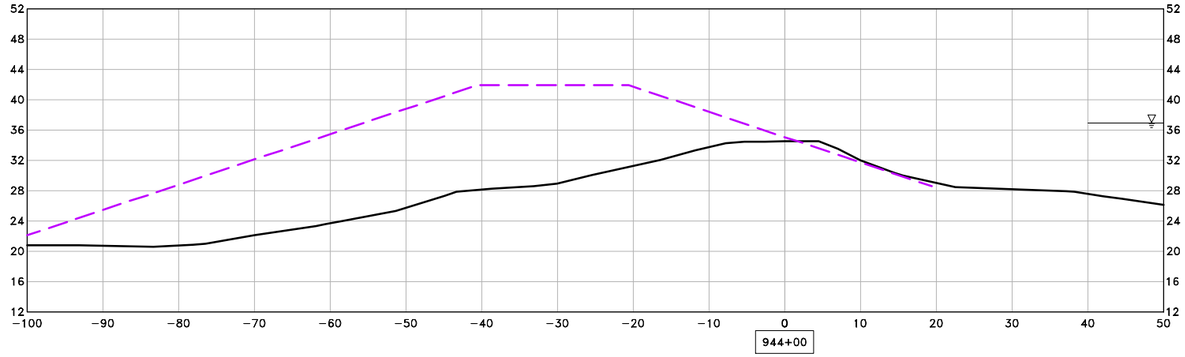
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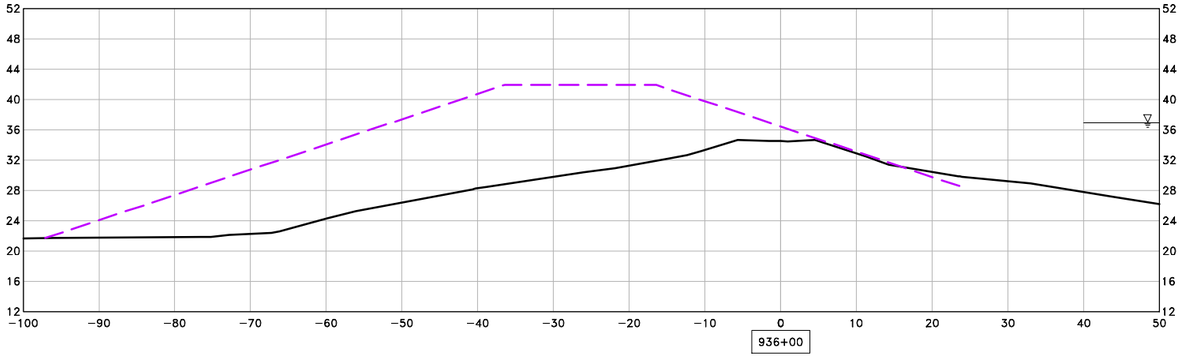
DATE
DECEMBER 11, 2019

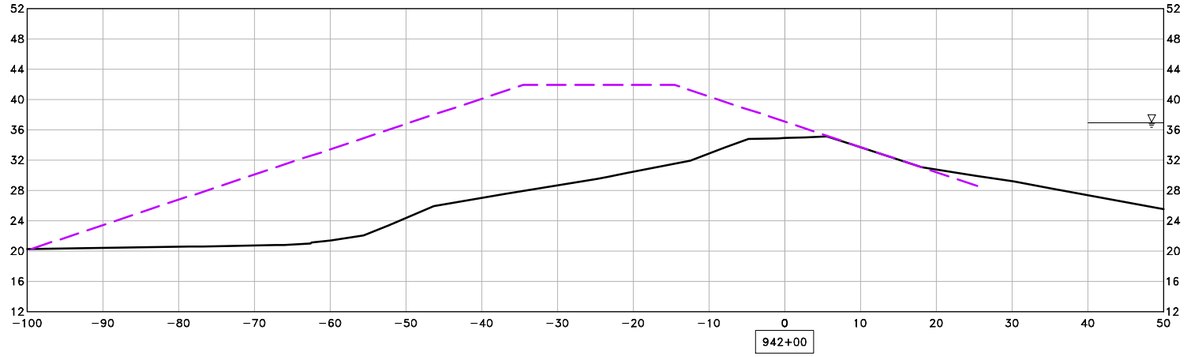
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C1-339
SHEET 54 OF 136

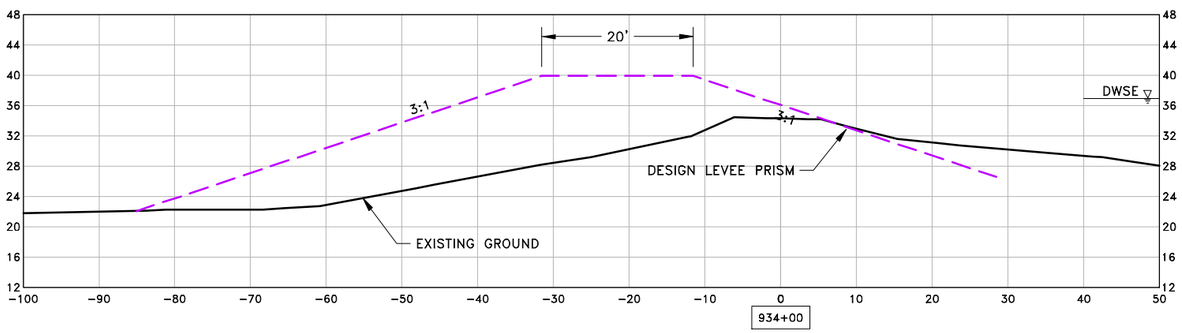
KSN PROJECT FILE NO.
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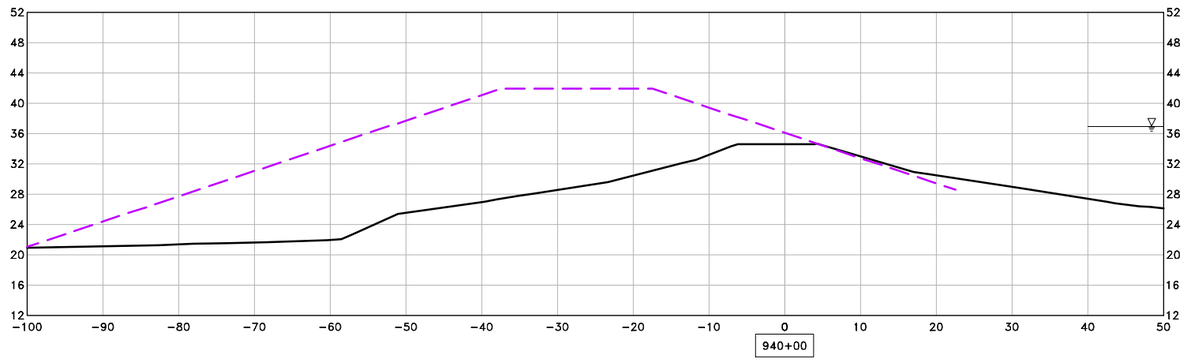












NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

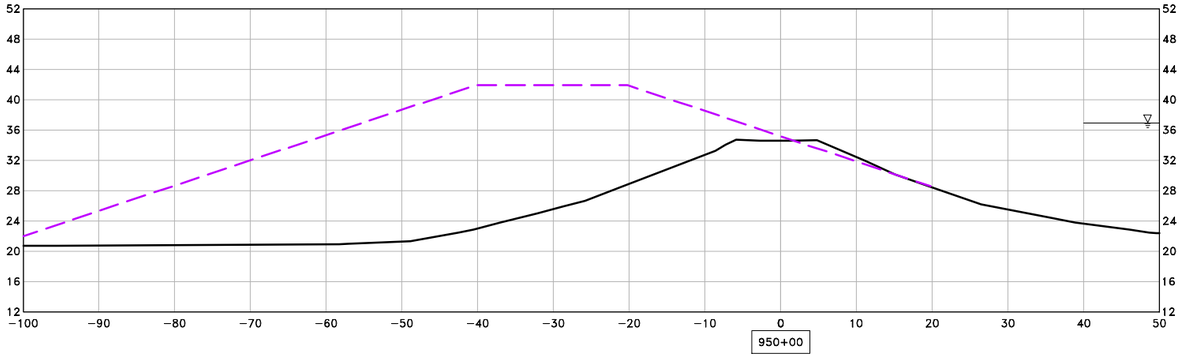
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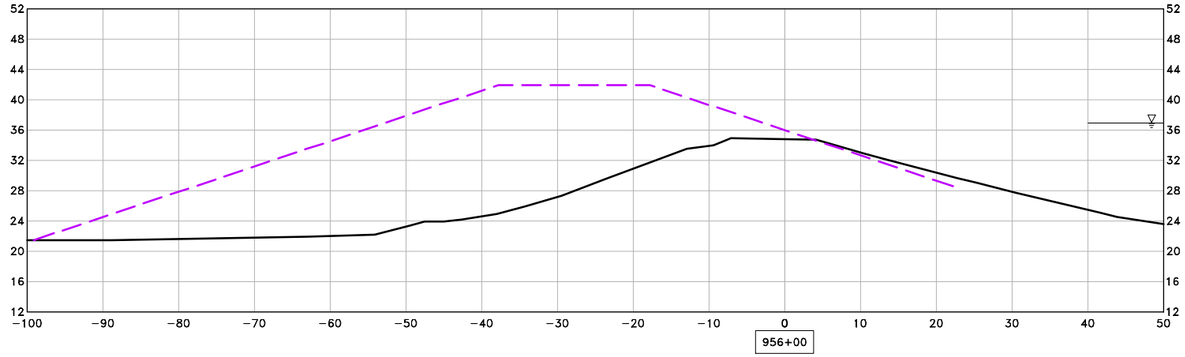
DATE
DECEMBER 11, 2019

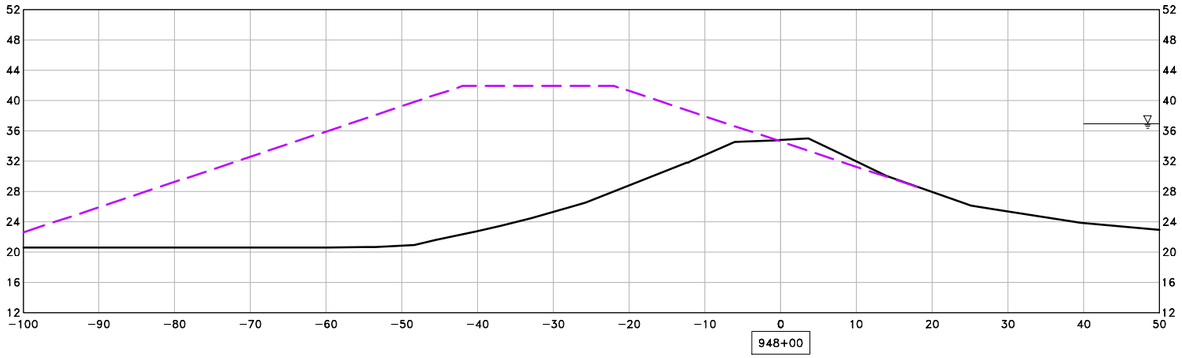
SHEET IDENTIFICATION
C1-340
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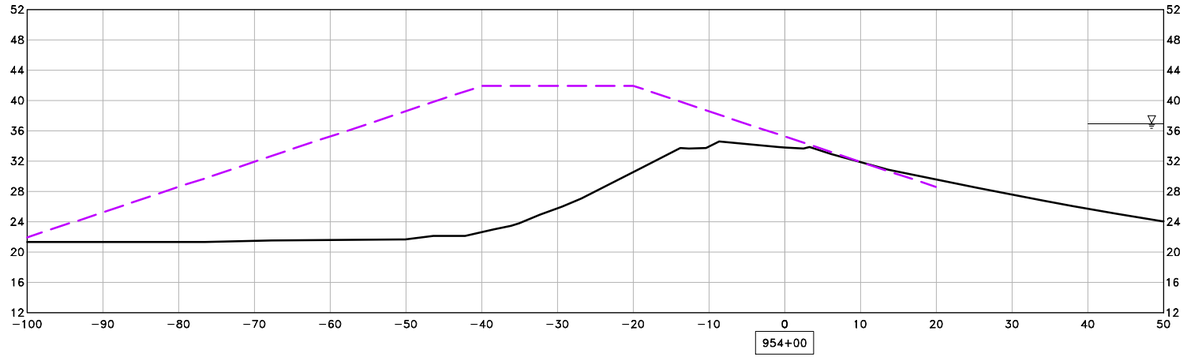
KSN PROJECT FILE NO.
2255-0050

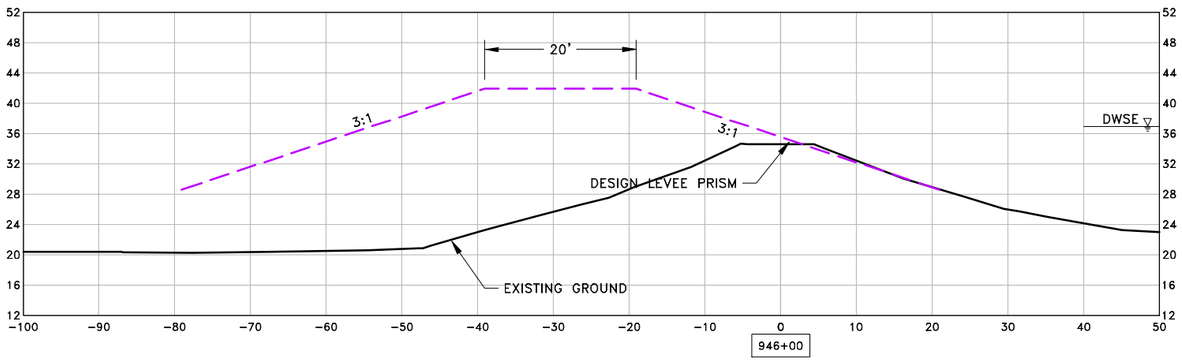
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PLOT DATE: Dec 11, 2019 - 3:18pm

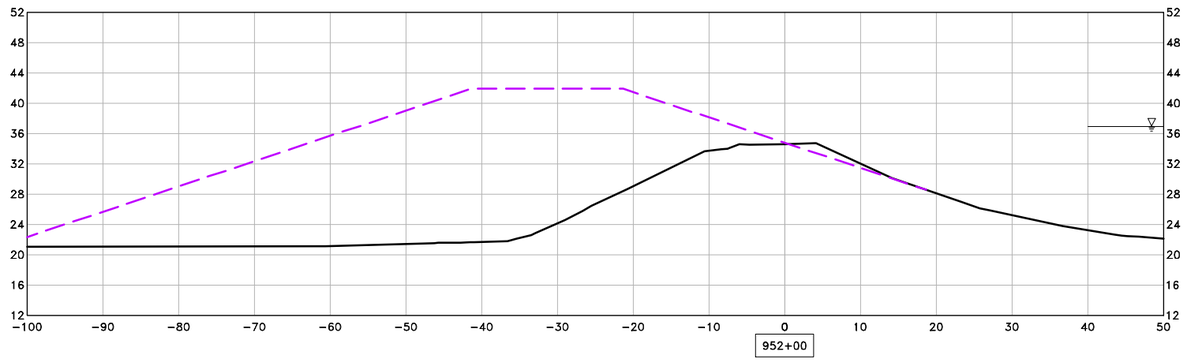












NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

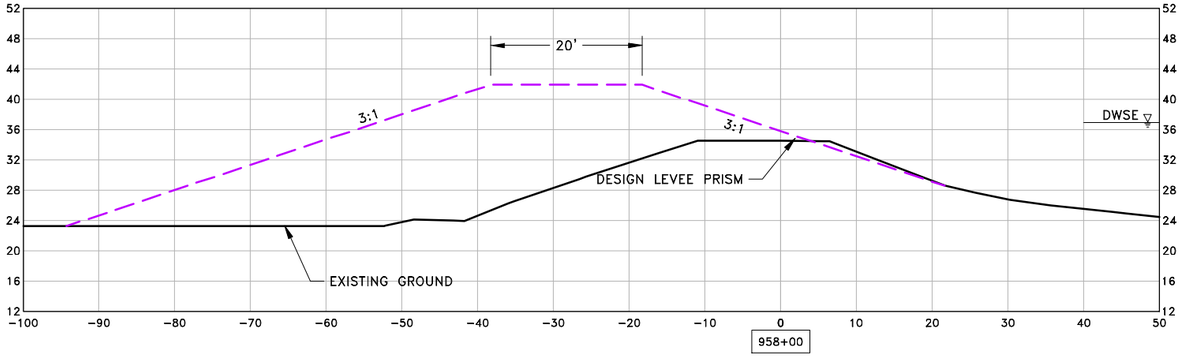
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DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C1-341
SHEET 56 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:20pm



NORTH ORIENTATION

PROJECT ENGINEER

PRELIMMARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

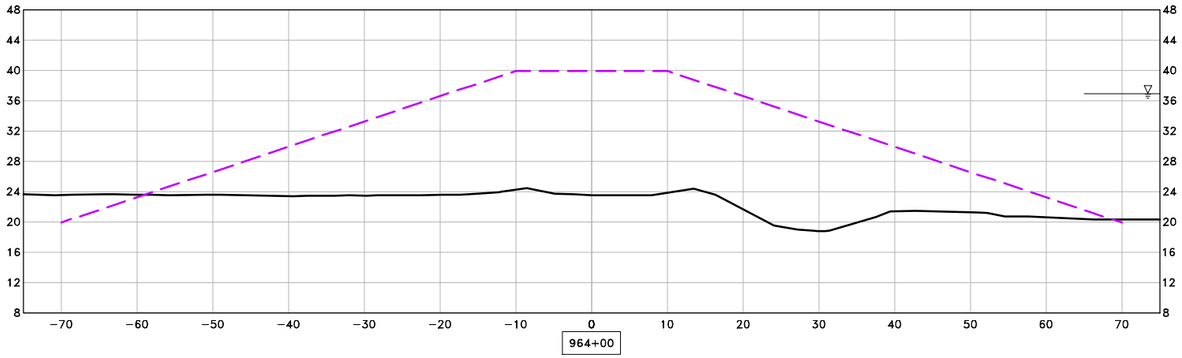
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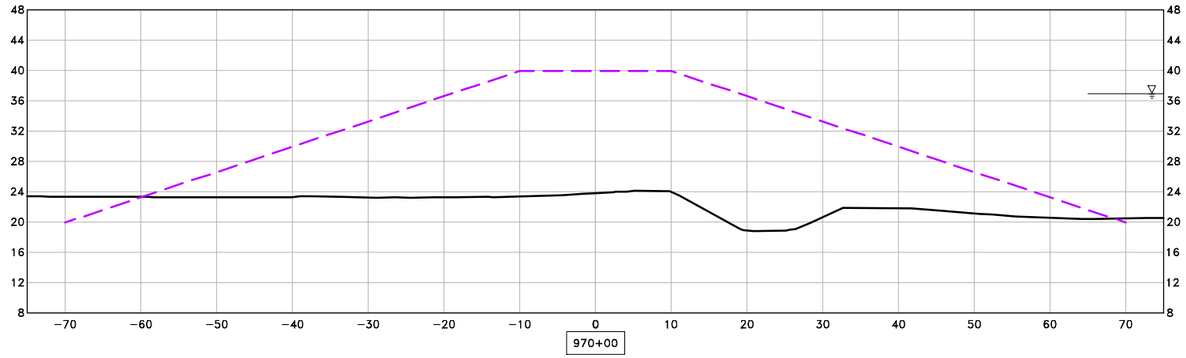
DATE
DECEMBER 11, 2019

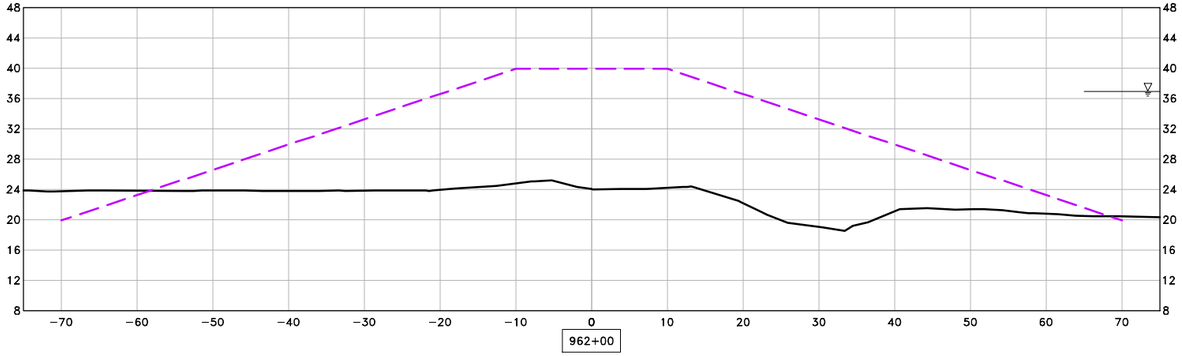
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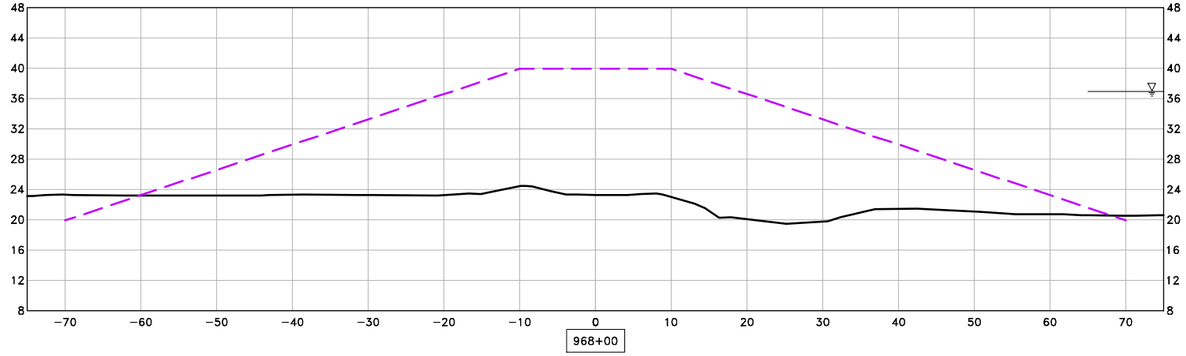
KSN PROJECT FILE NO.
2255-0050

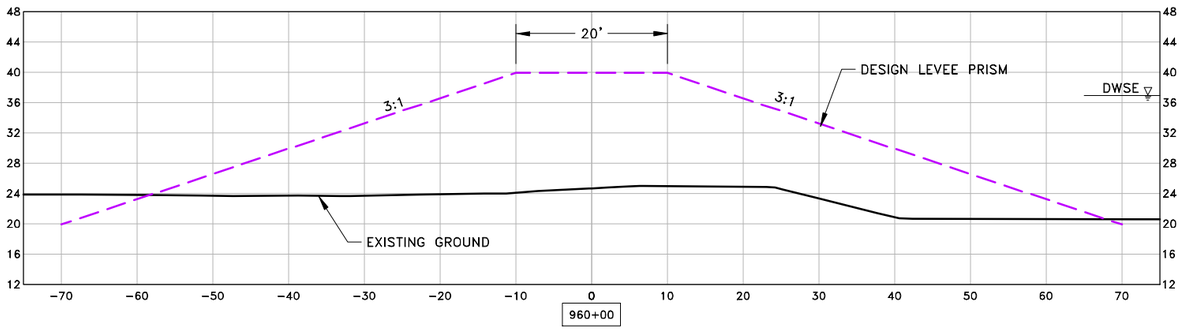
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PLOT DATE: Dec 11, 2019 - 3:22pm

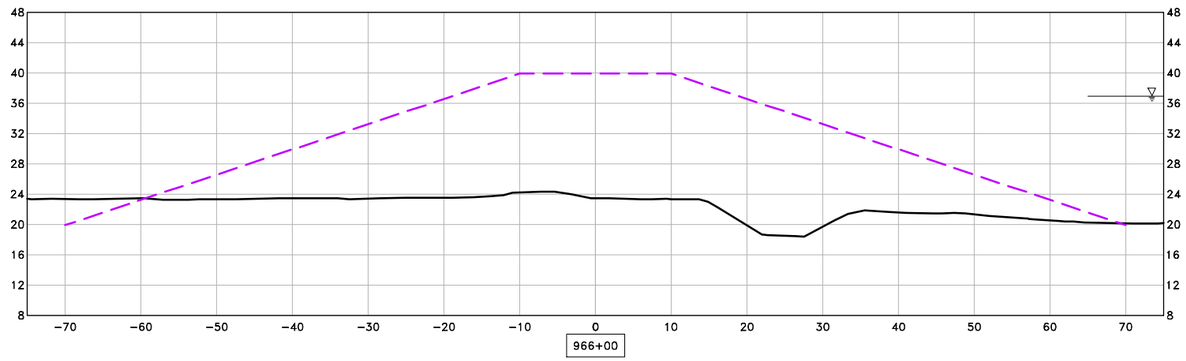












NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

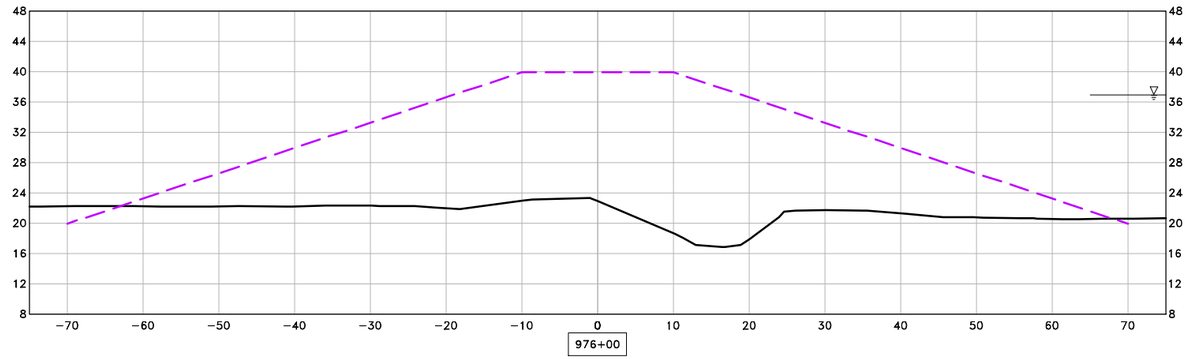
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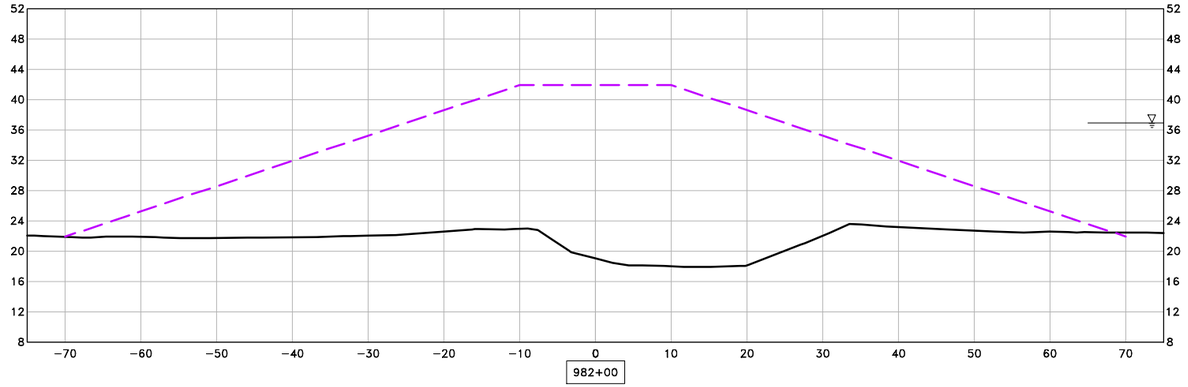
DATE
DECEMBER 11, 2019

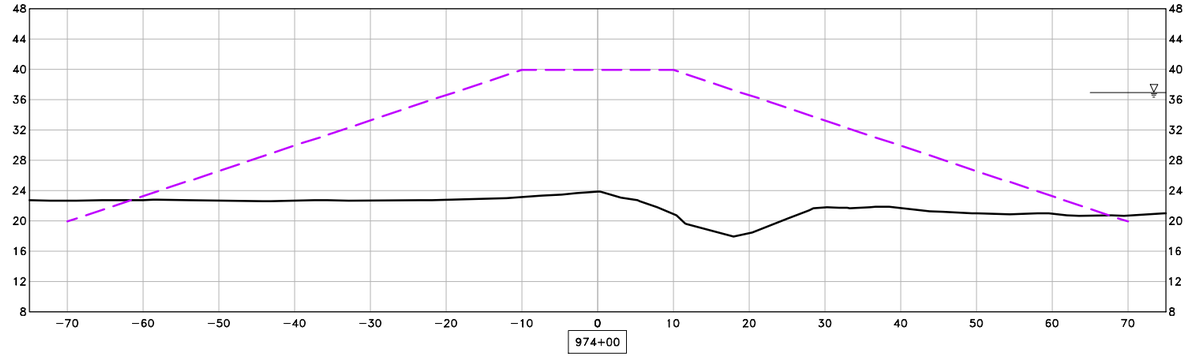
SHEET IDENTIFICATION
C1-343
SHEET 58 OF 136

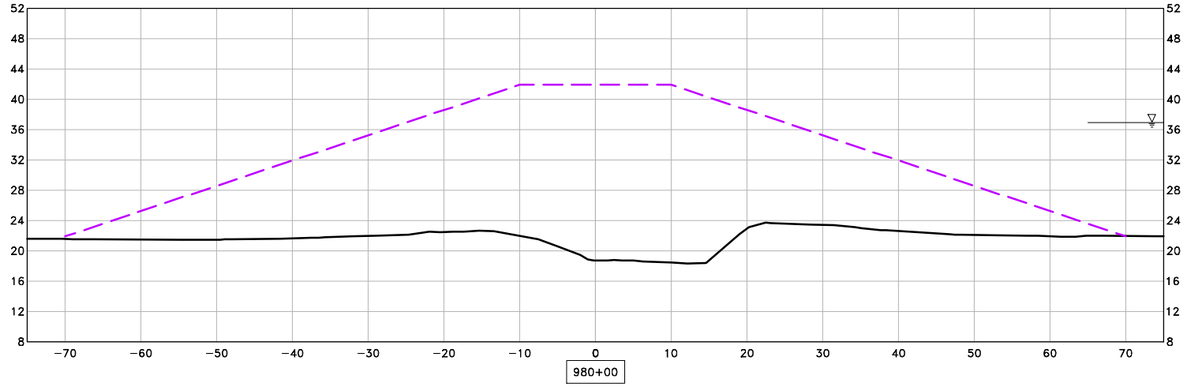
KSN PROJECT FILE NO.
2255-0050

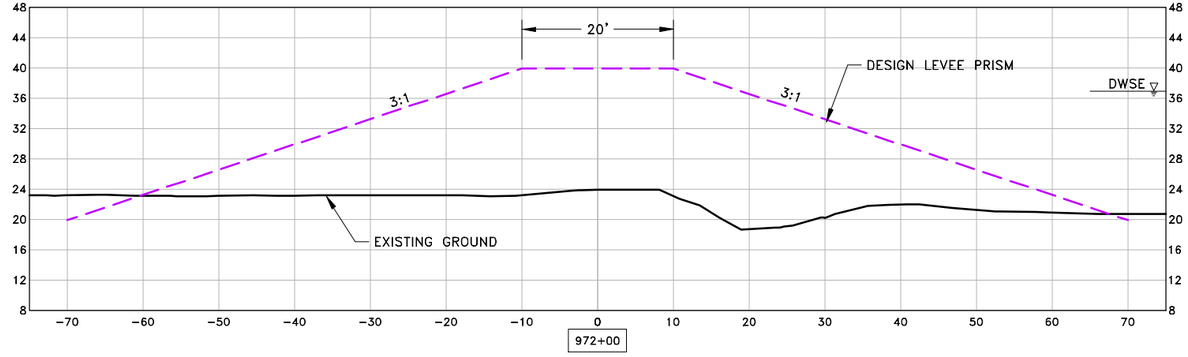
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PLOT DATE: Dec 11, 2019 - 3:23pm

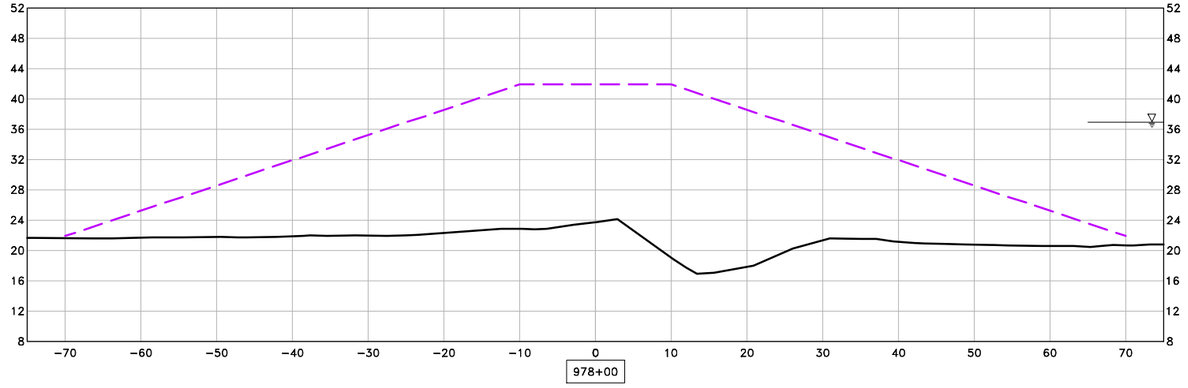












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:25pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

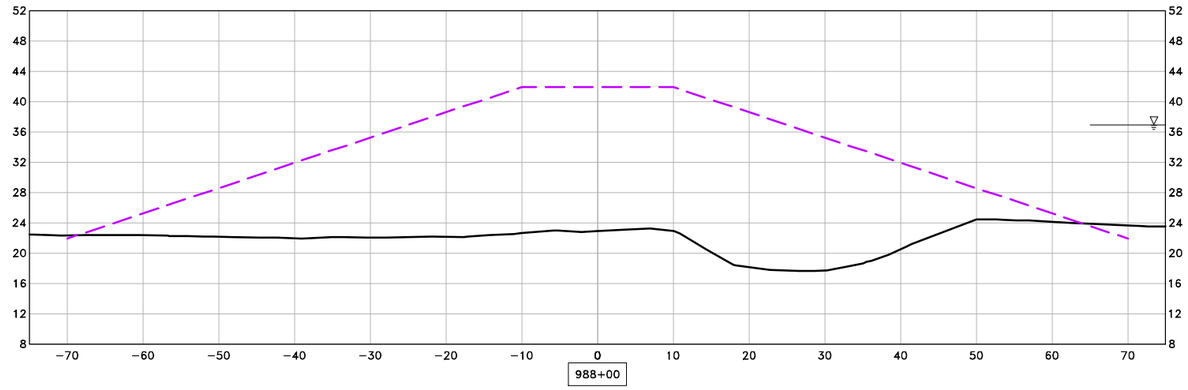
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

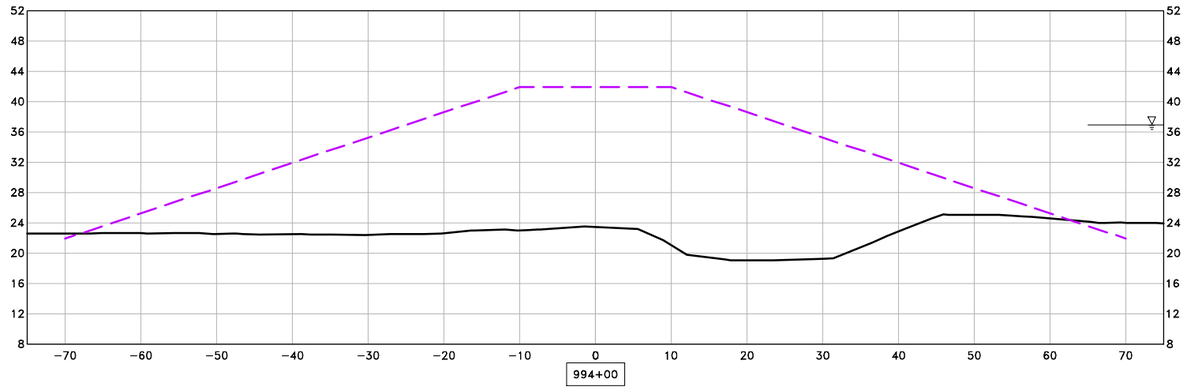
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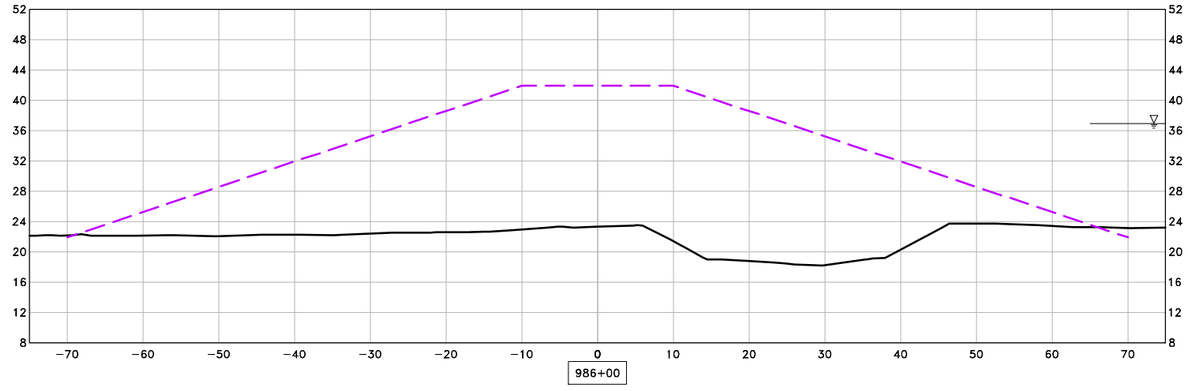
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DECEMBER 11, 2019

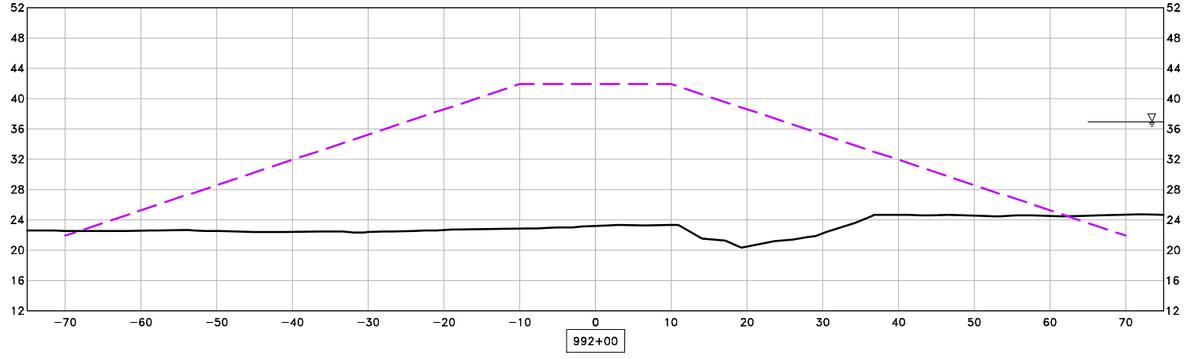
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C1-344
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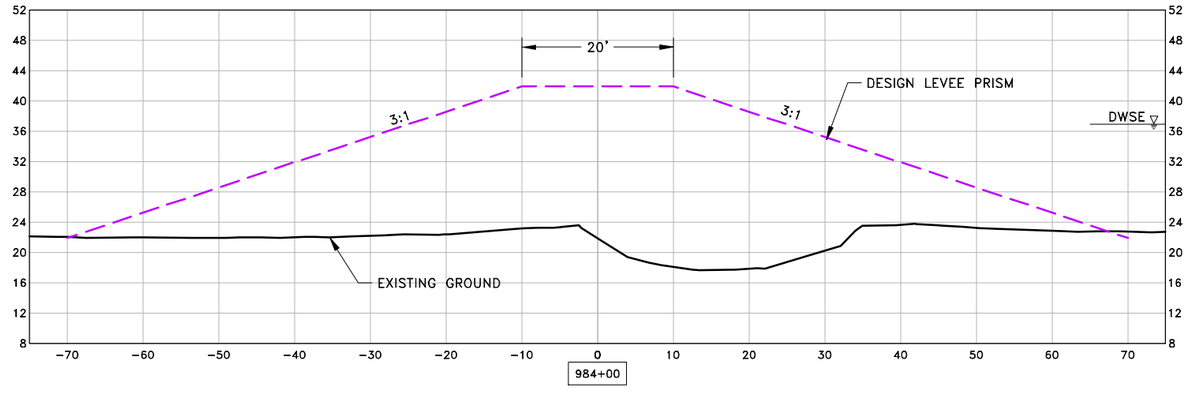
KSN PROJECT FILE NO.
2255-0050

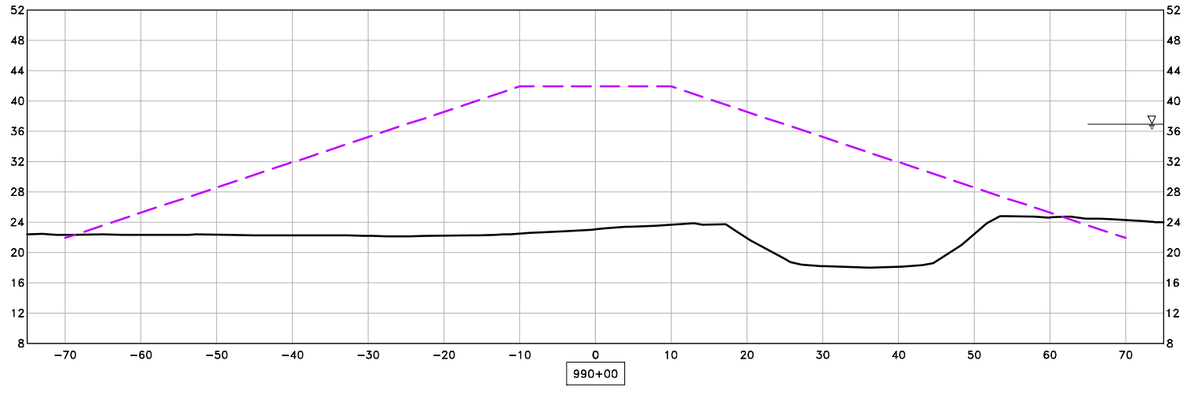












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PLOT DATE: Dec 11, 2019 - 3:27pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
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ORIGINAL DRAWING SCALE
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SAN JOAQUIN COUNTY, CALIFORNIA

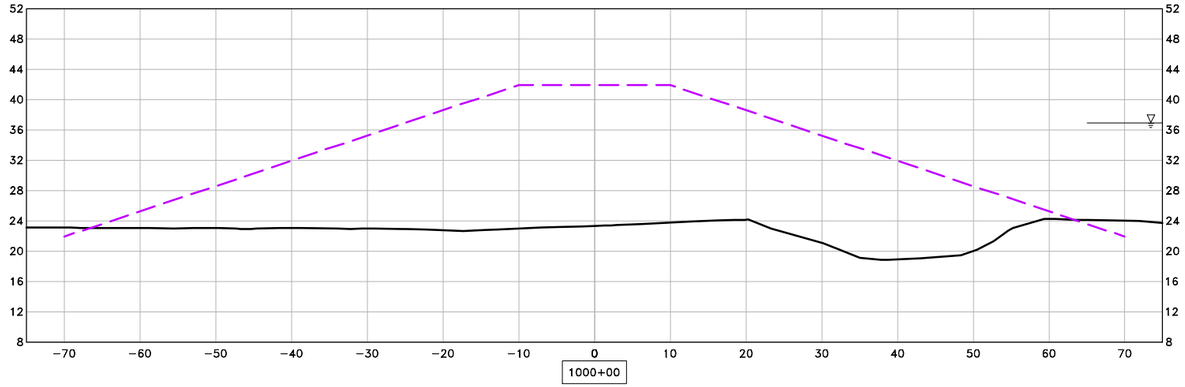
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

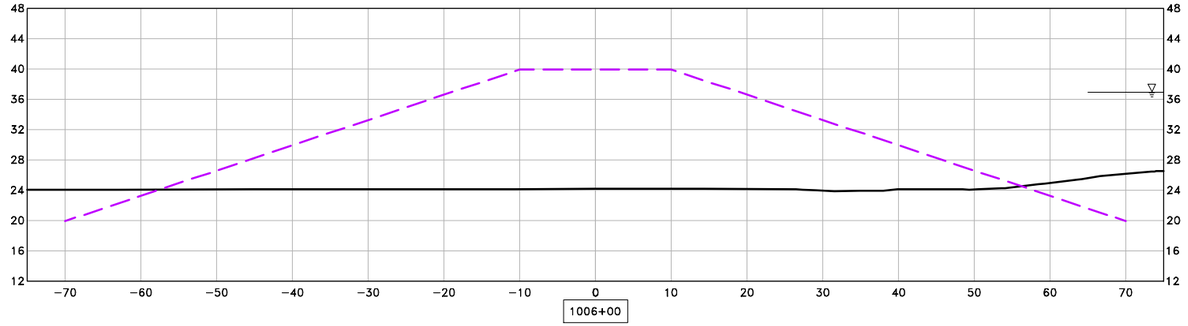
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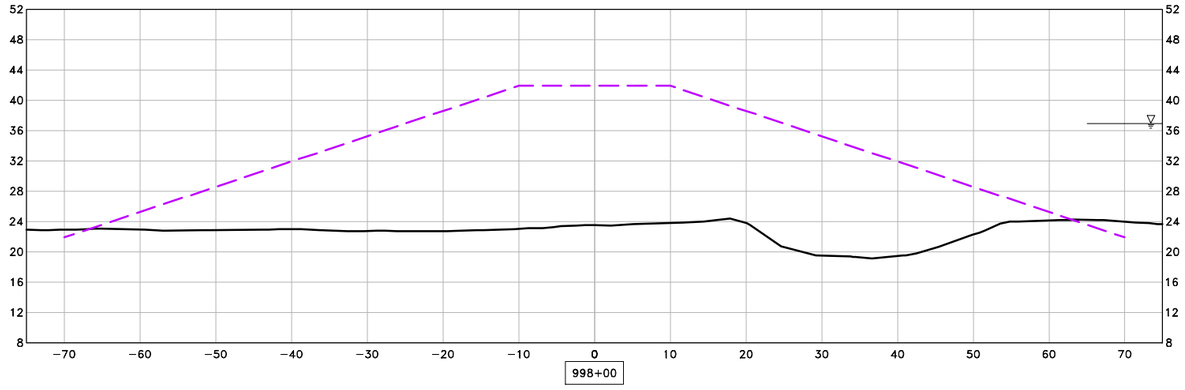
DATE
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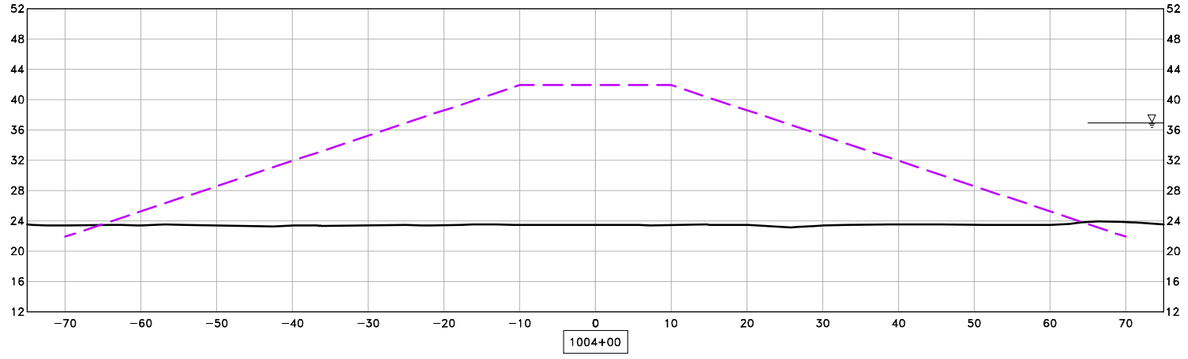
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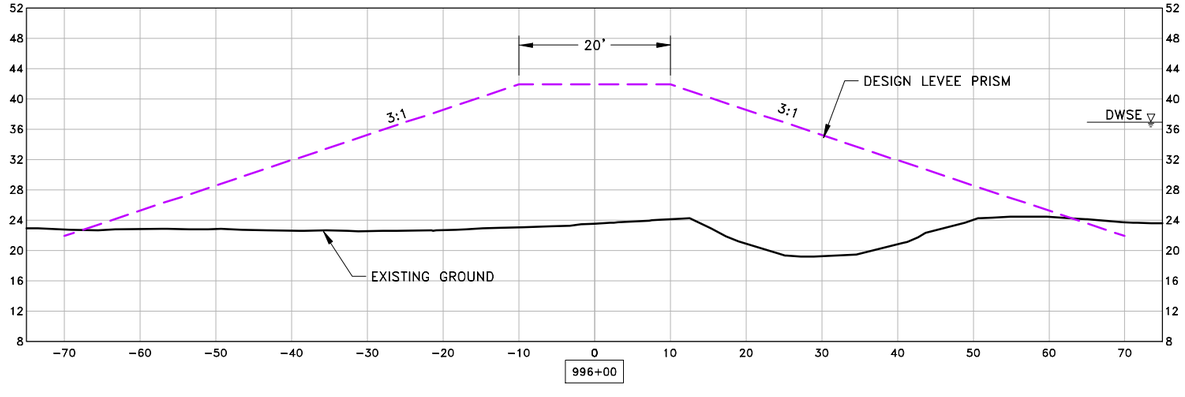
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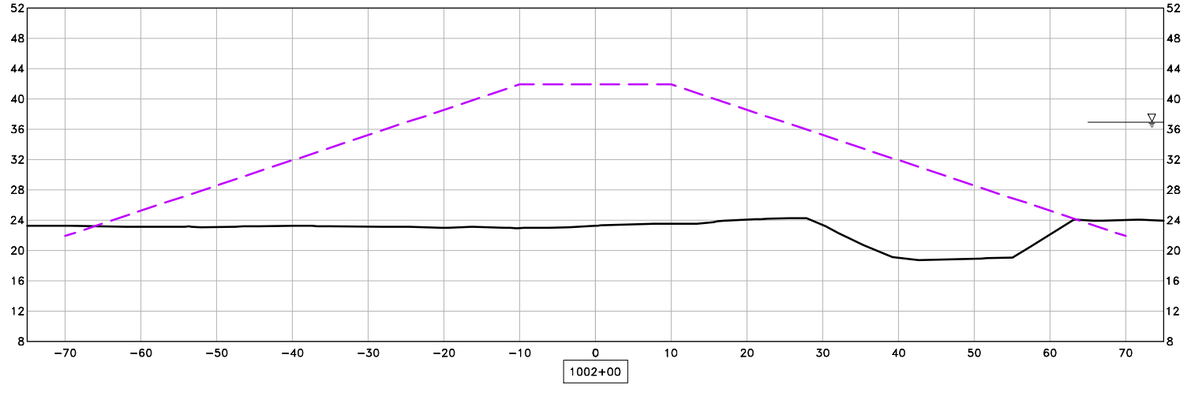












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NORTH ORIENTATION

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DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
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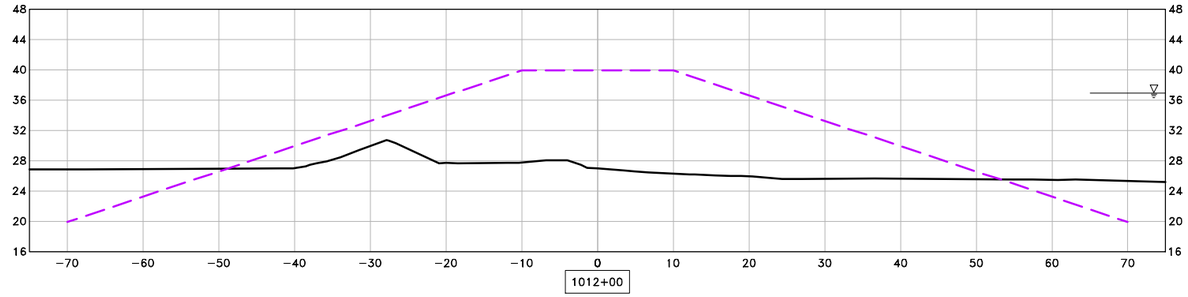
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

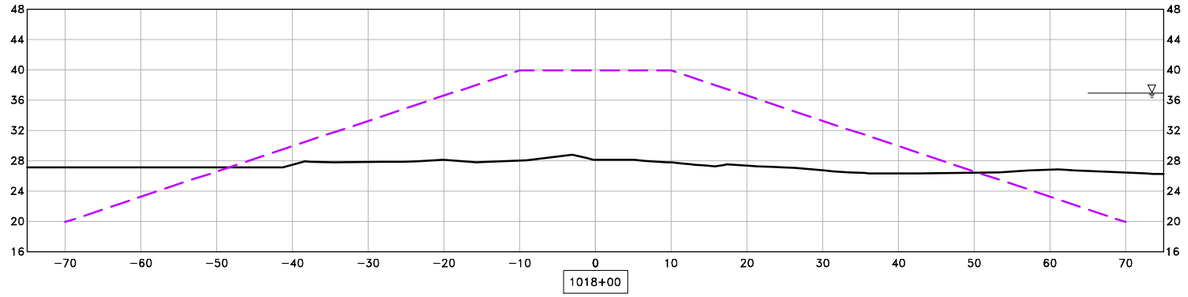
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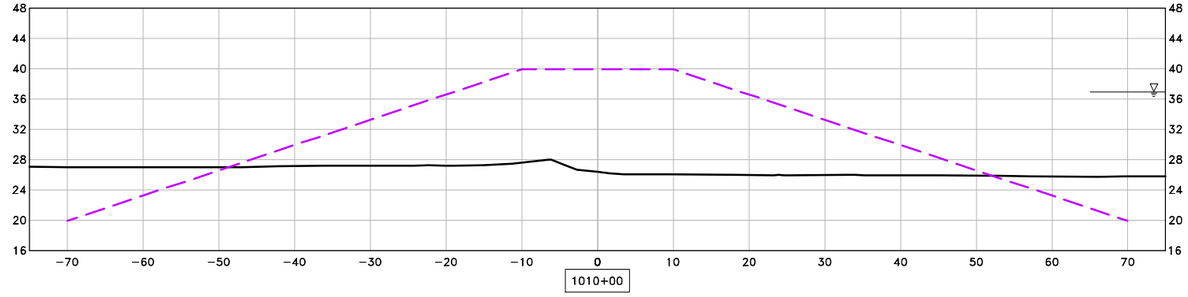
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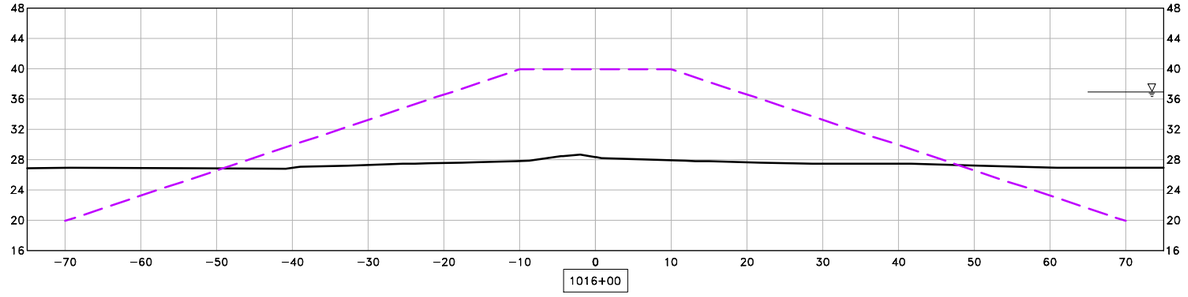
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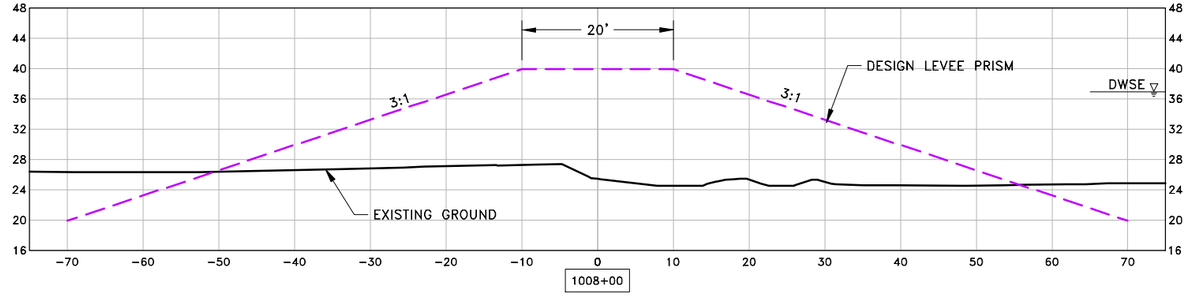
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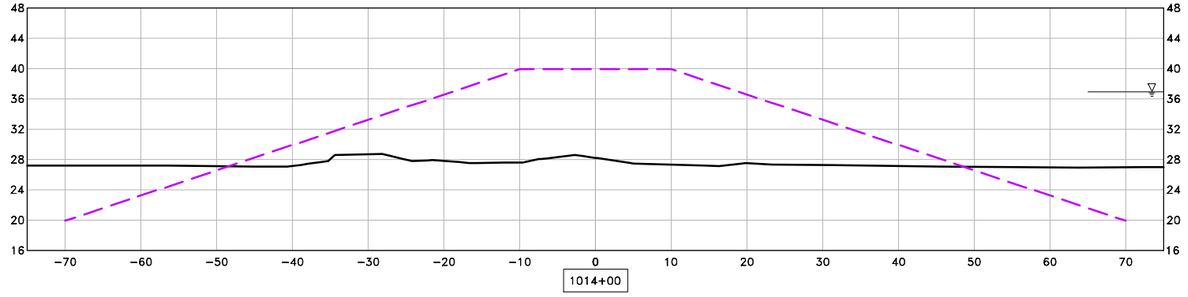












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CHECK BY	CHN
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VERTICAL DATUM	NAVD88

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

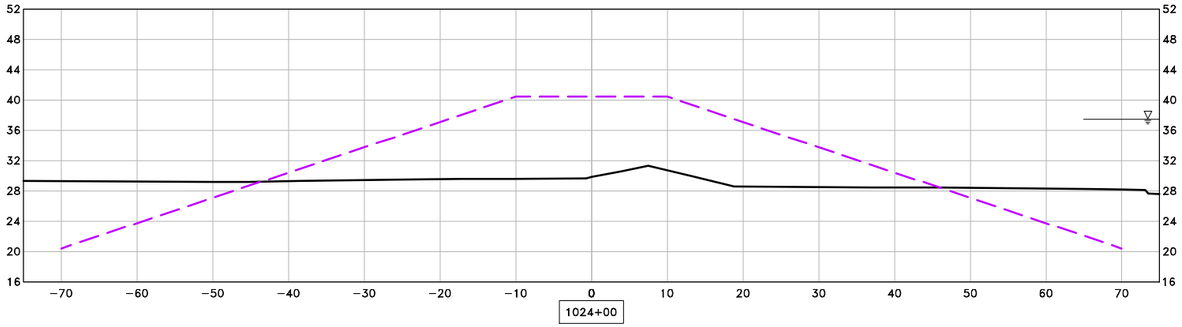
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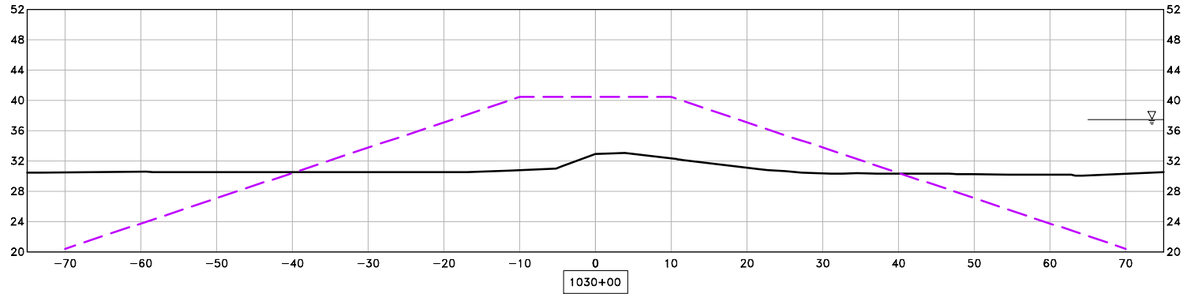
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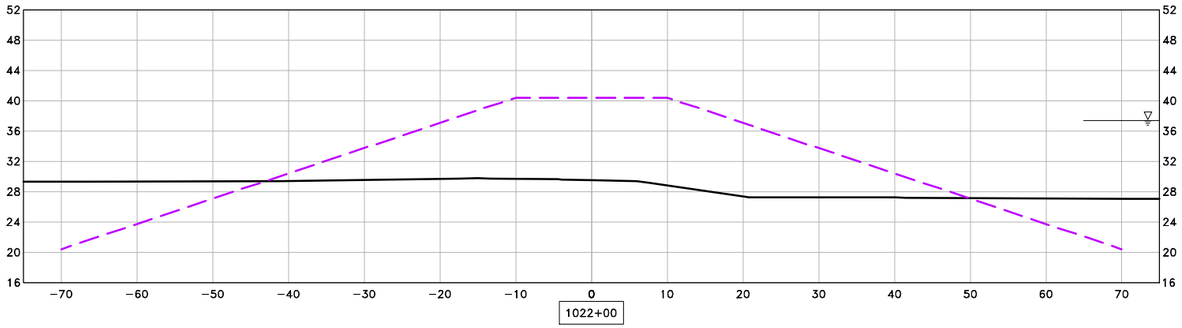
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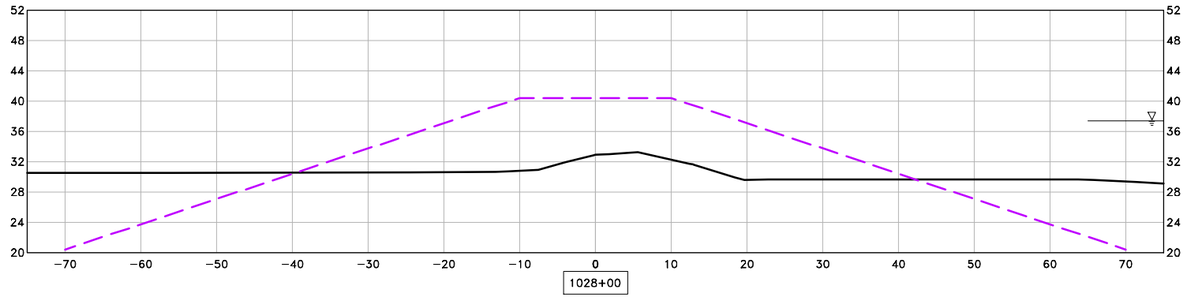
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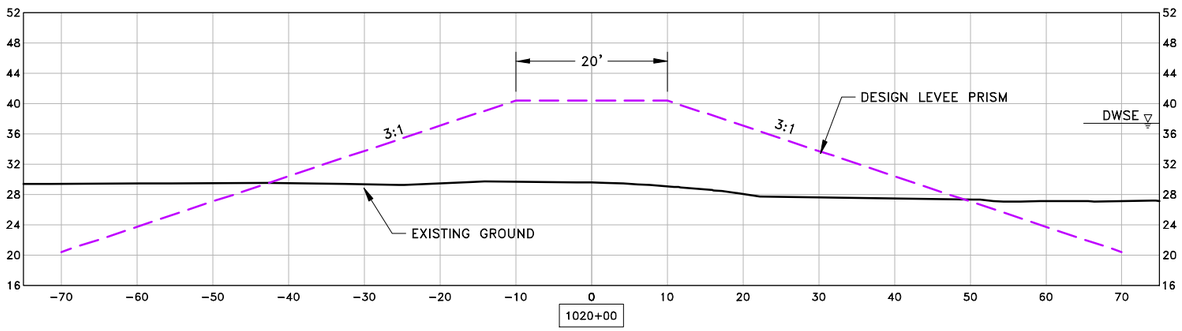
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PLOT DATE: Dec 11, 2019 - 3:31pm

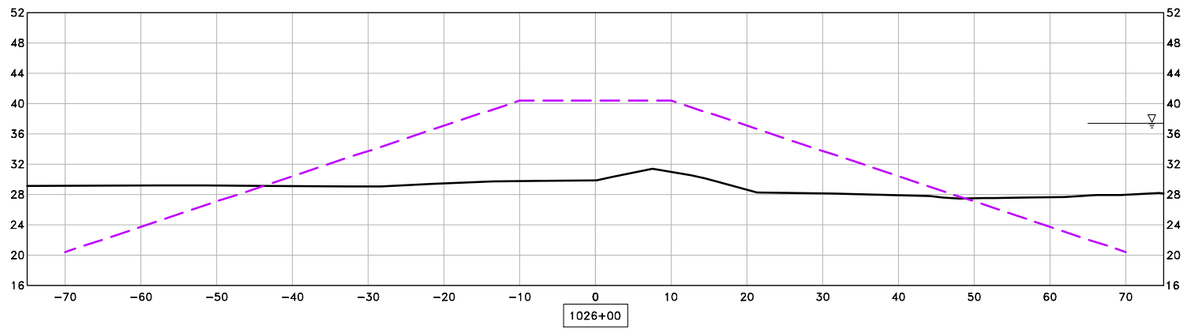












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NORTH ORIENTATION

PROJECT ENGINEER

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NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

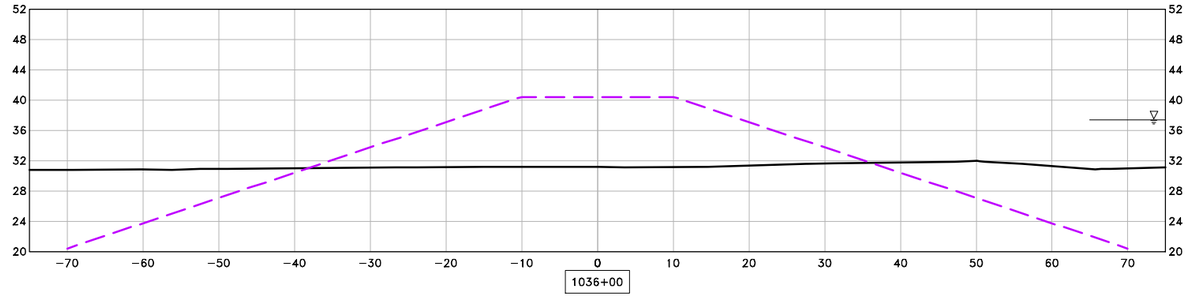
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

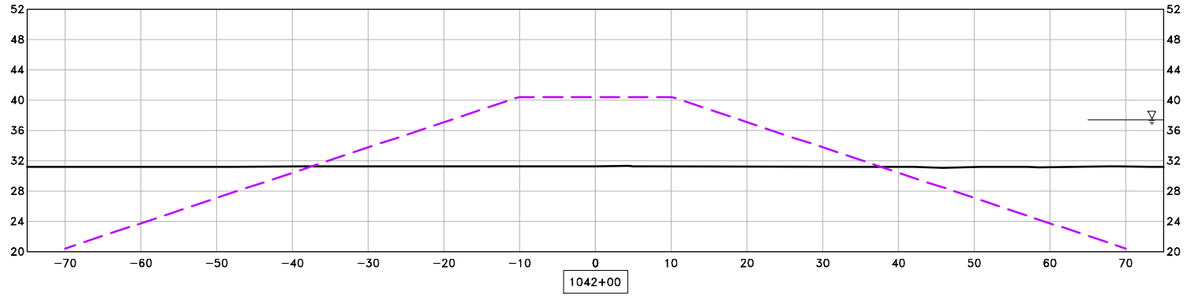
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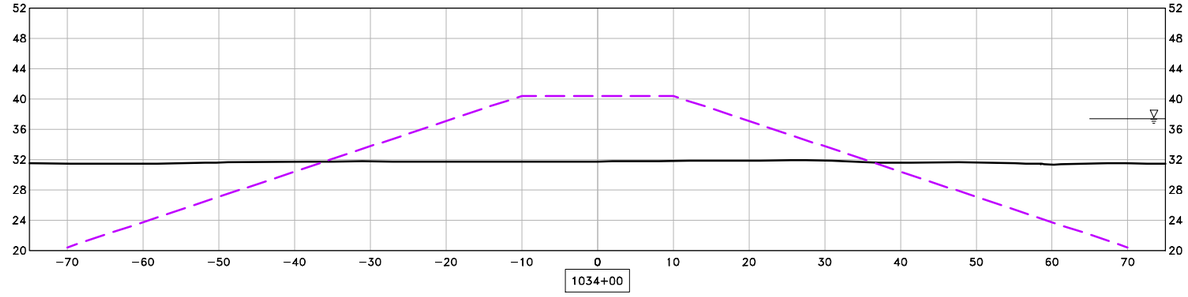
DATE
DECEMBER 11, 2019

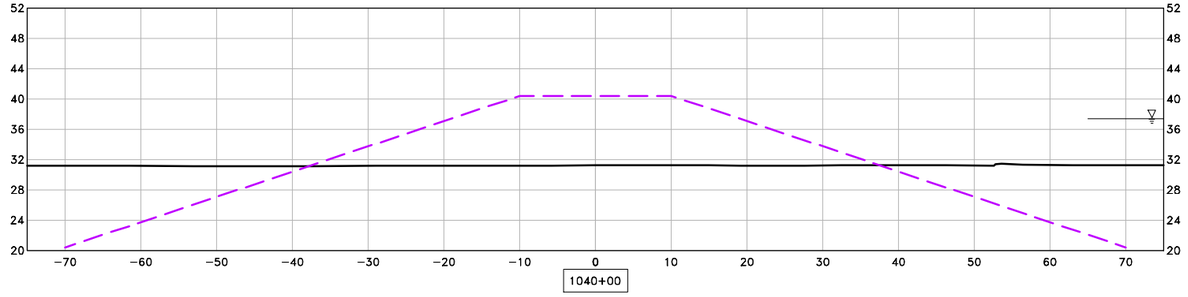
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C1-348
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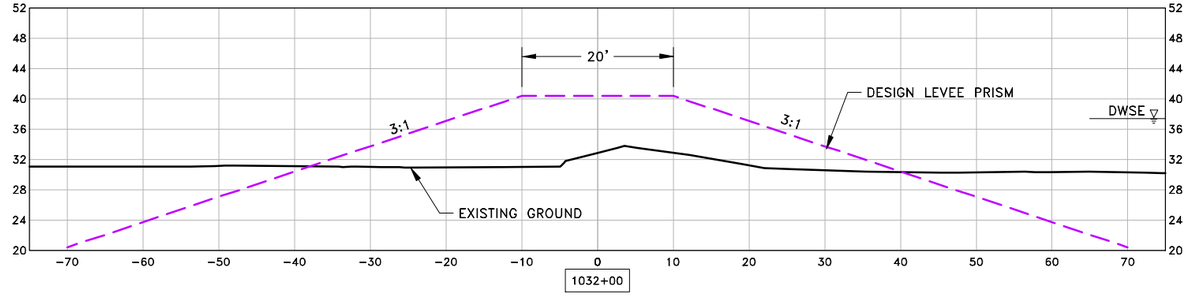
KSN PROJECT FILE NO.
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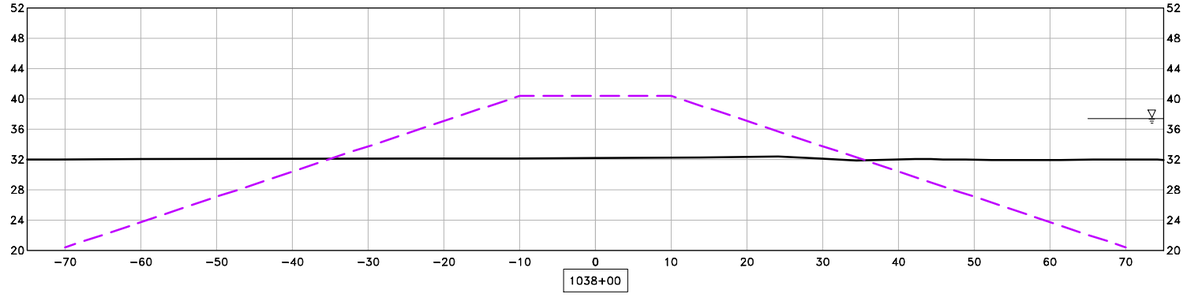












NORTH ORIENTATION

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VERTICAL DATUM NAVD88

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

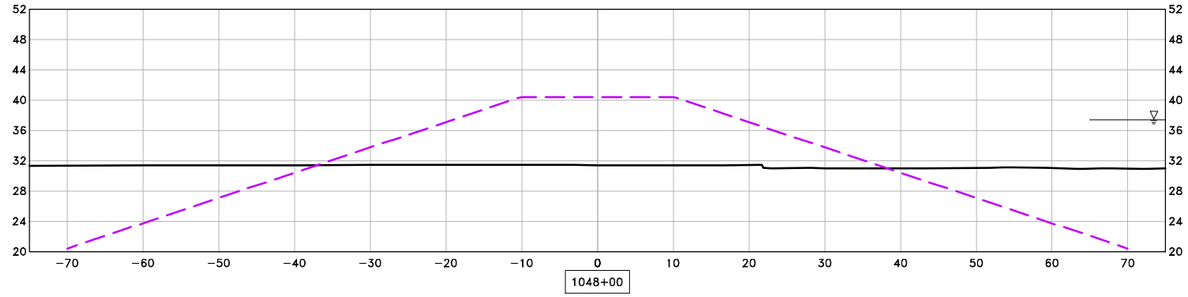
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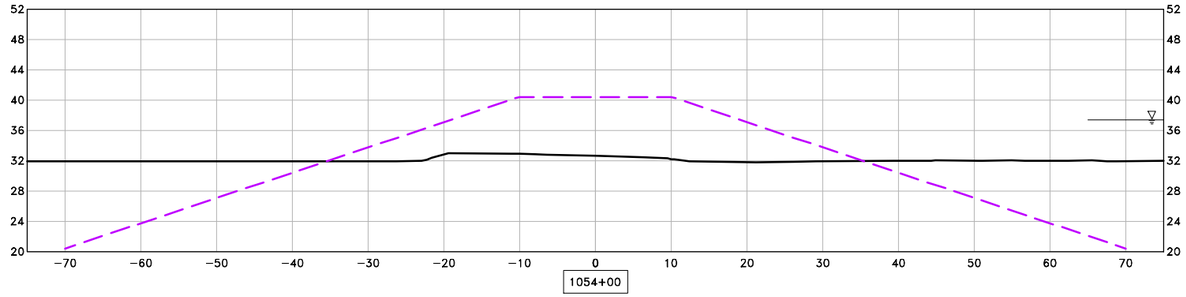
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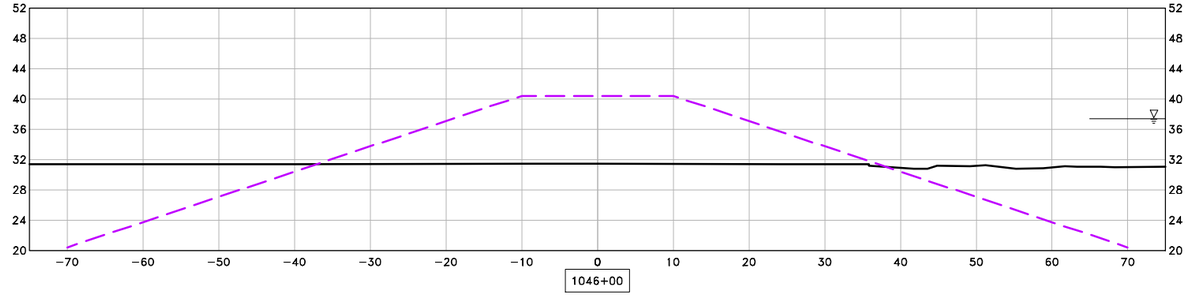
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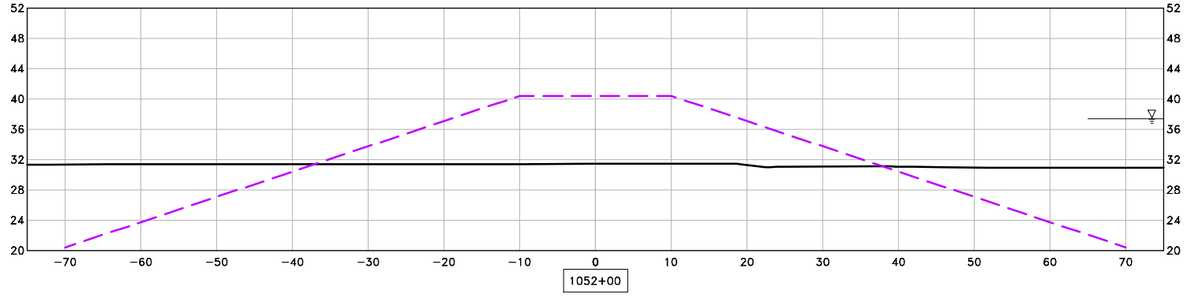
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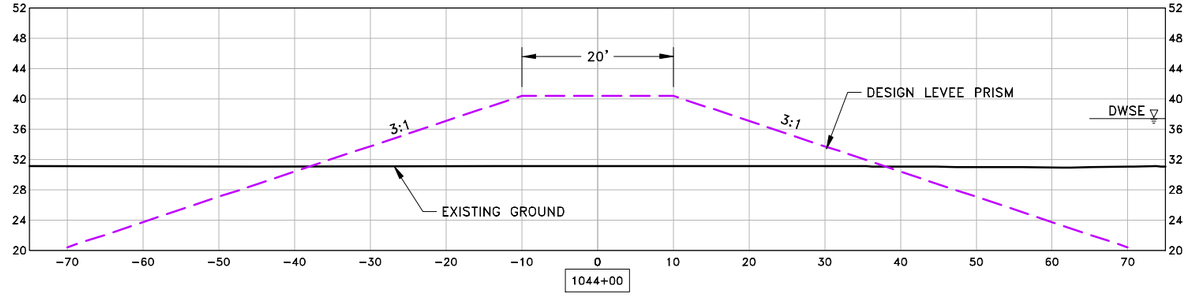
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PLOT DATE: Dec 11, 2019 - 3:34pm

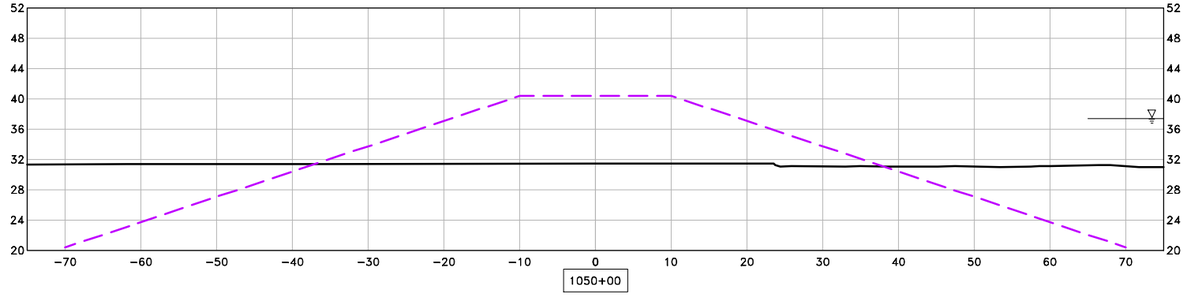












NORTH ORIENTATION

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CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

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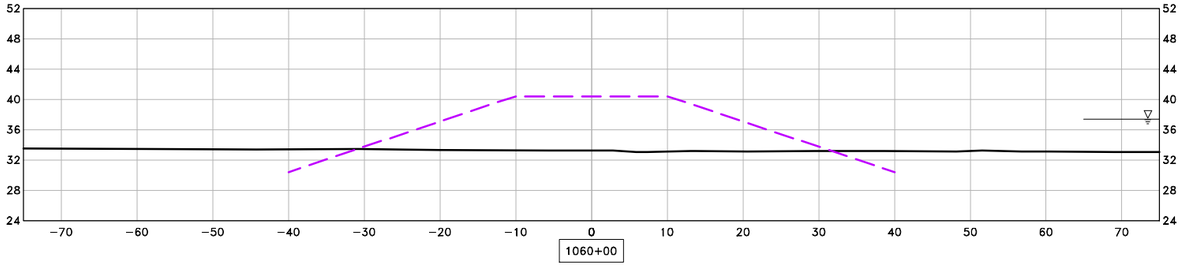
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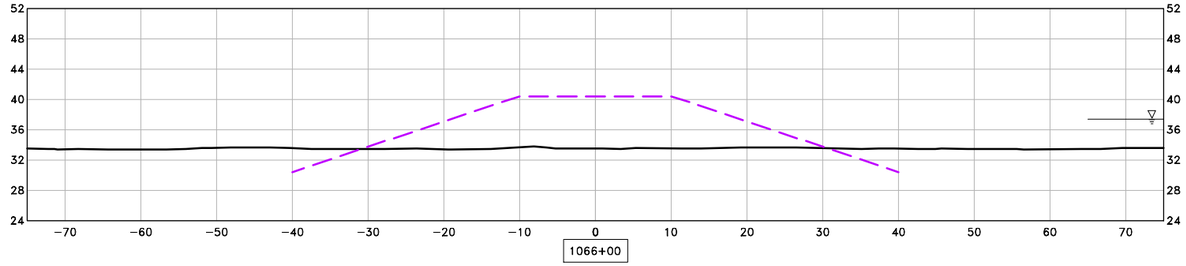
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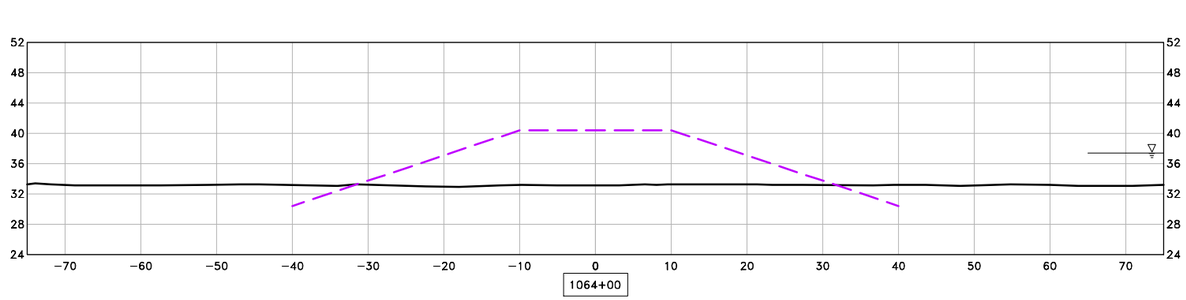
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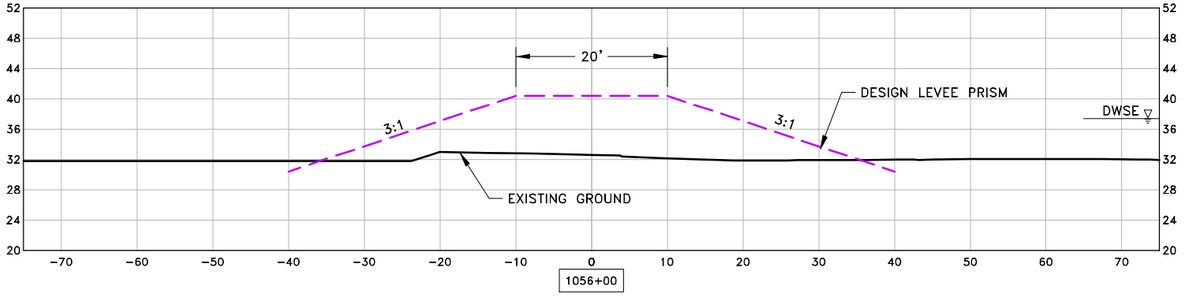
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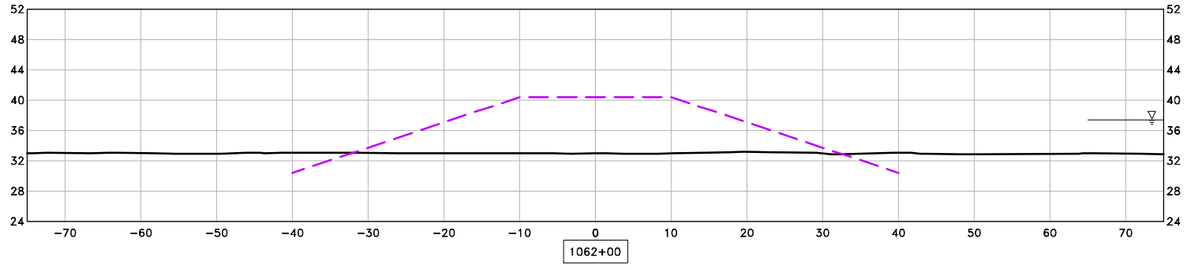
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PLOT DATE: Dec 11, 2019 - 3:36pm











NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

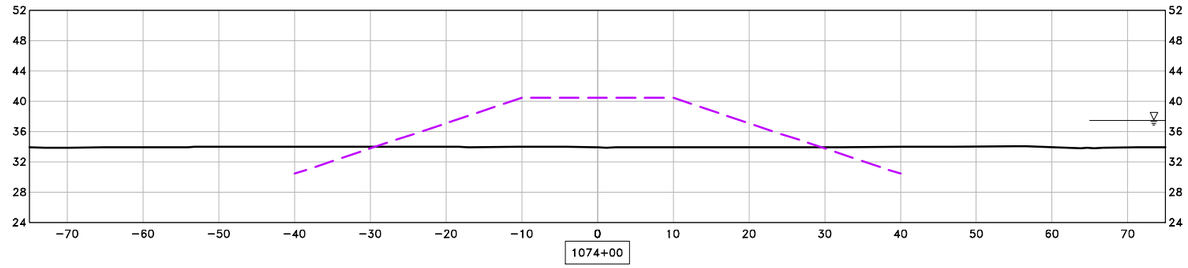
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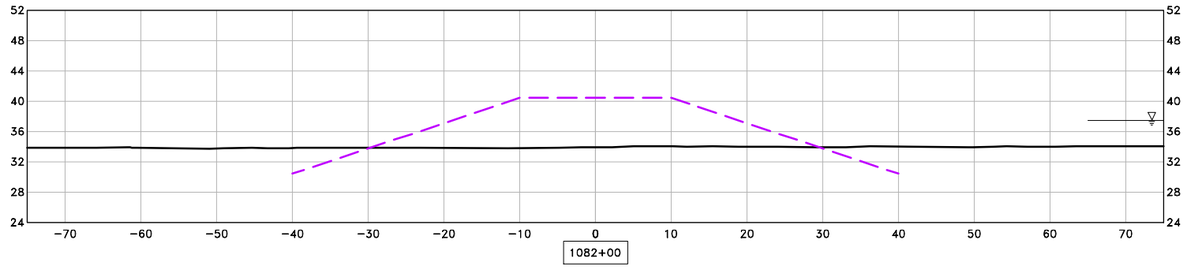
DATE
DECEMBER 11, 2019

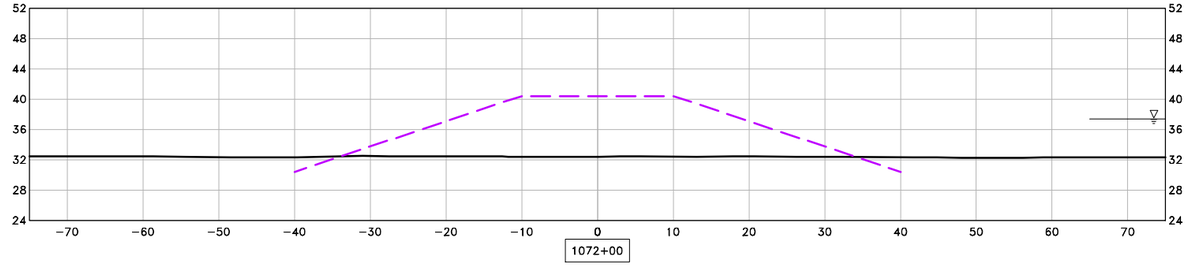
SHEET IDENTIFICATION
C1-351
SHEET 66 OF 136

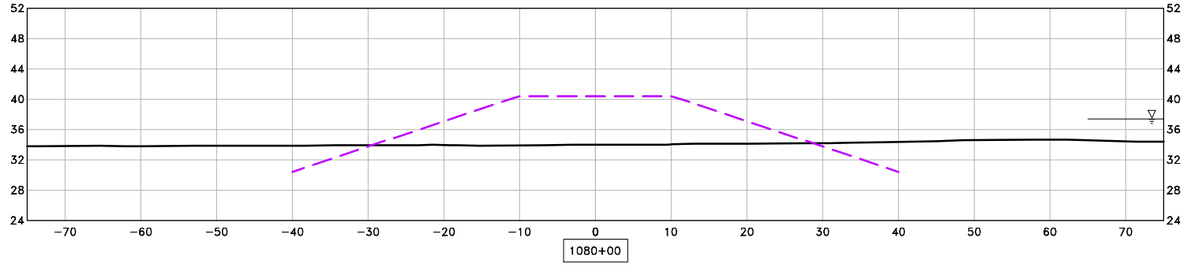
KSN PROJECT FILE NO.
2255-0050

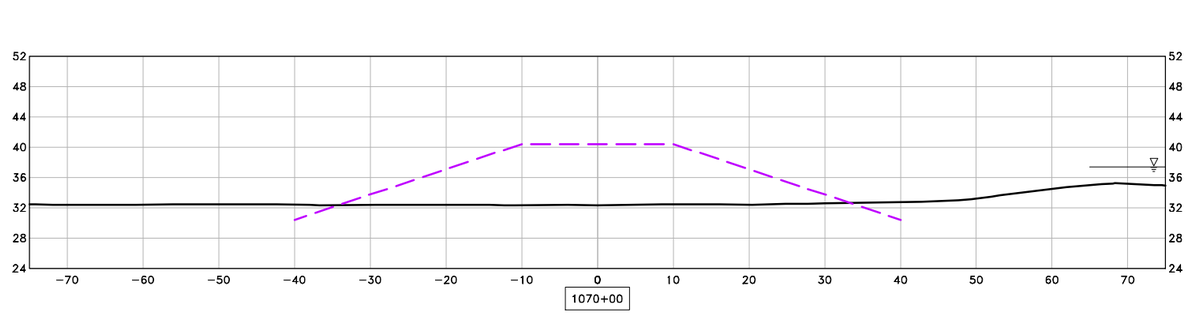
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PLOT DATE: Dec 11, 2019 - 3:38pm

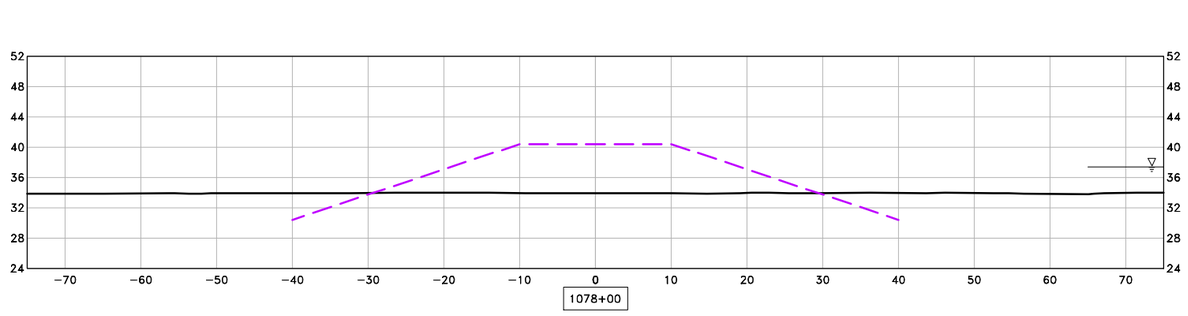


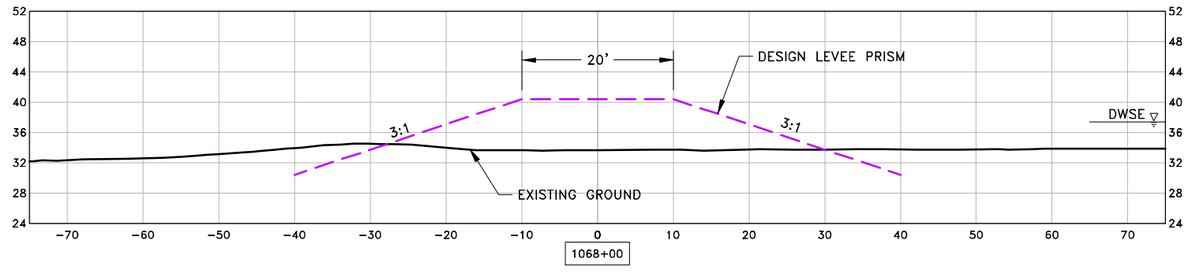


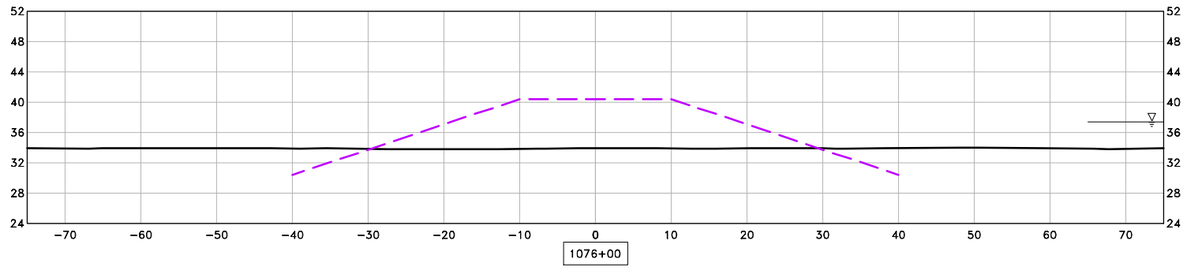












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:40pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

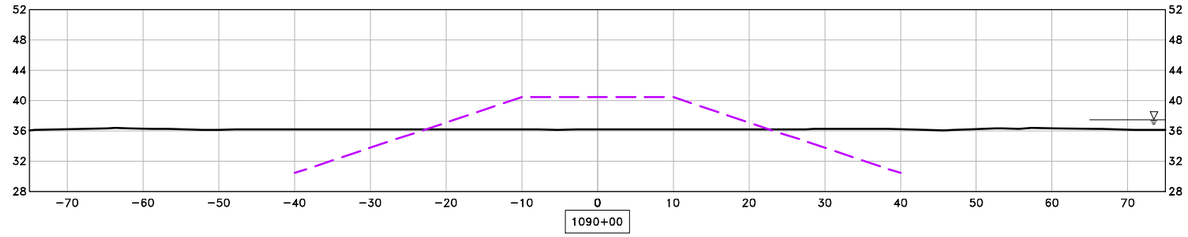
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

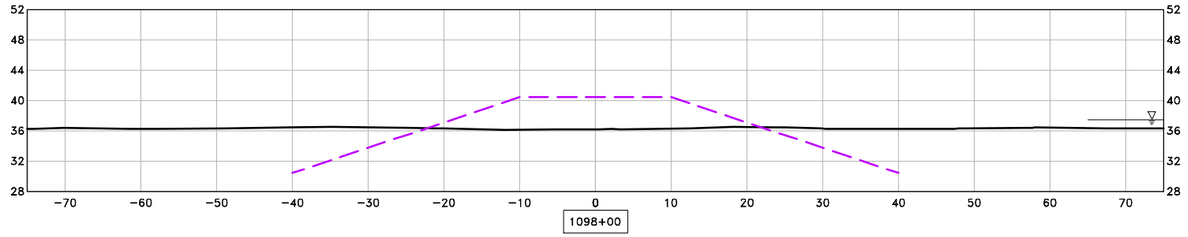
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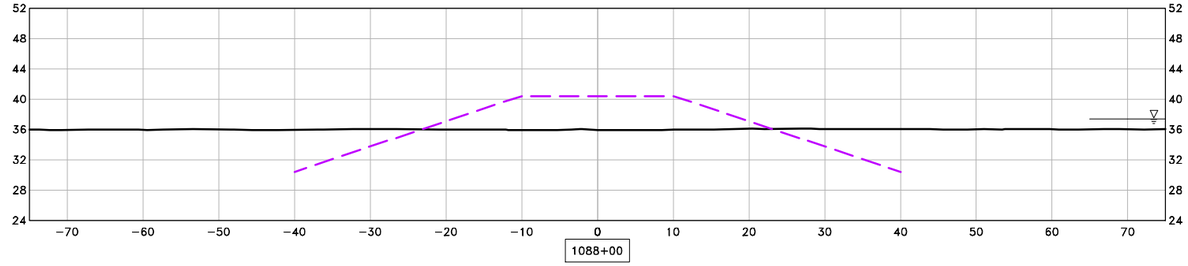
DATE
DECEMBER 11, 2019

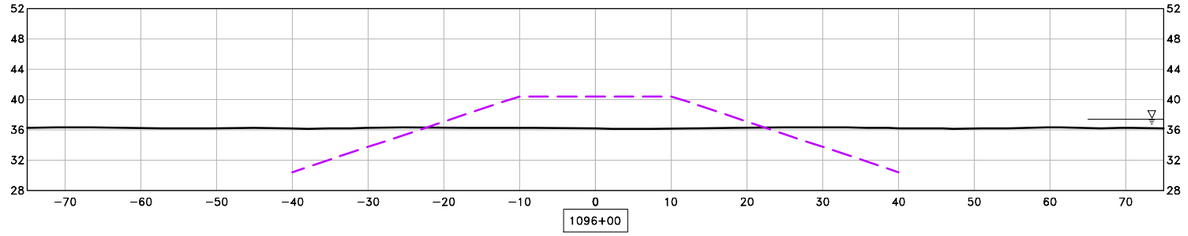
SHEET IDENTIFICATION
C1-352
SHEET 67 OF 136

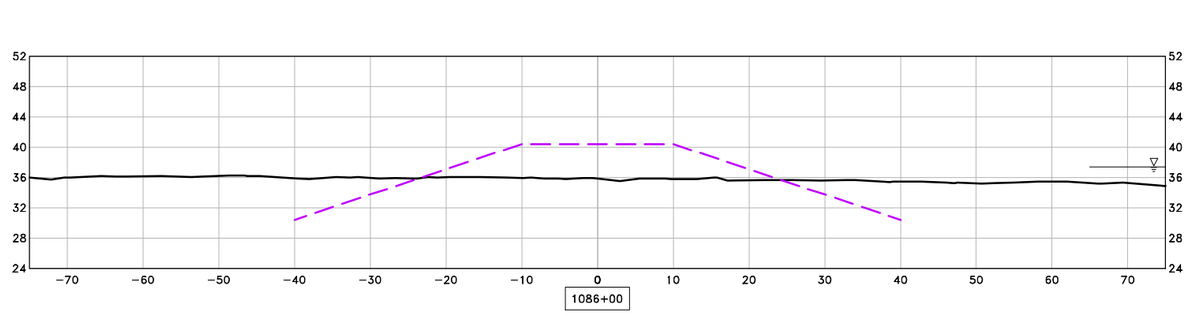
KSN PROJECT FILE NO.
2255-0050

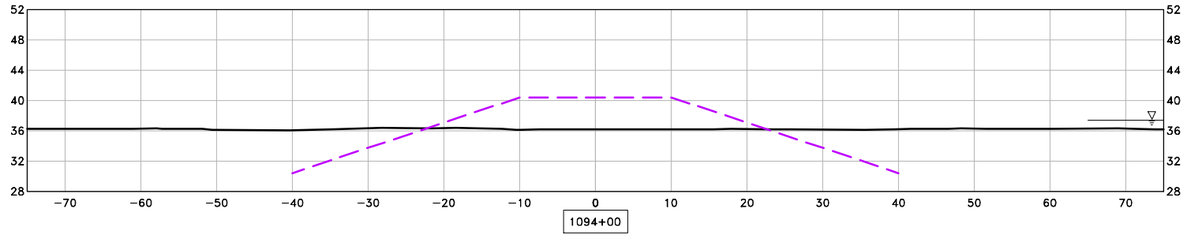


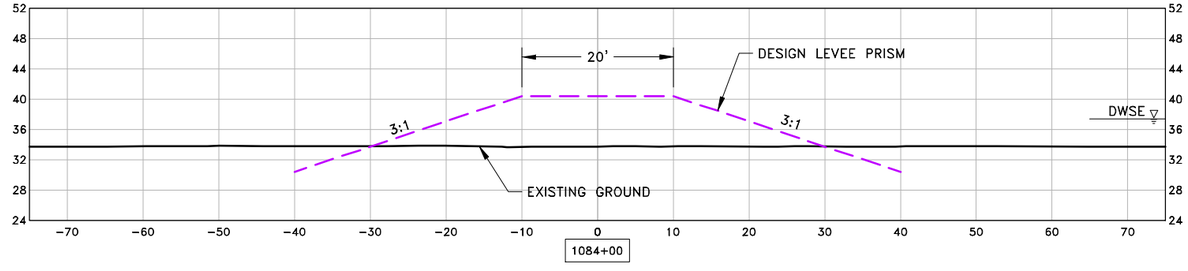


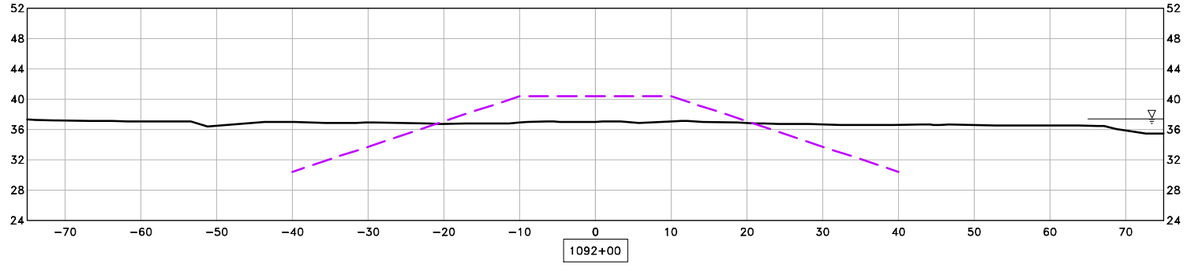












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:41pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

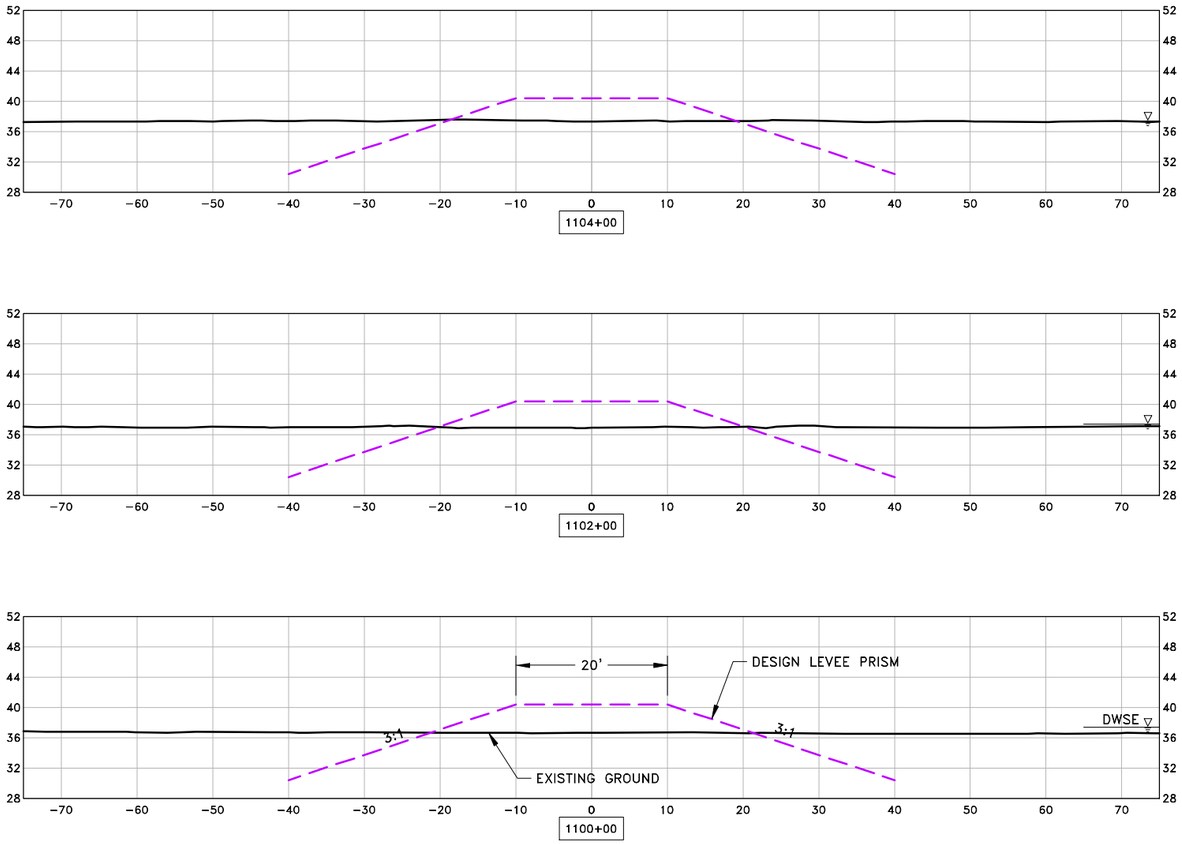
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

STA1084+00 TO STA 1100+00

DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C1-353
SHEET 68 OF 136

KSN PROJECT FILE NO.
2255-0050



FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C1-301.dwg
PLOT DATE: Dec 11, 2019 - 3:43pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

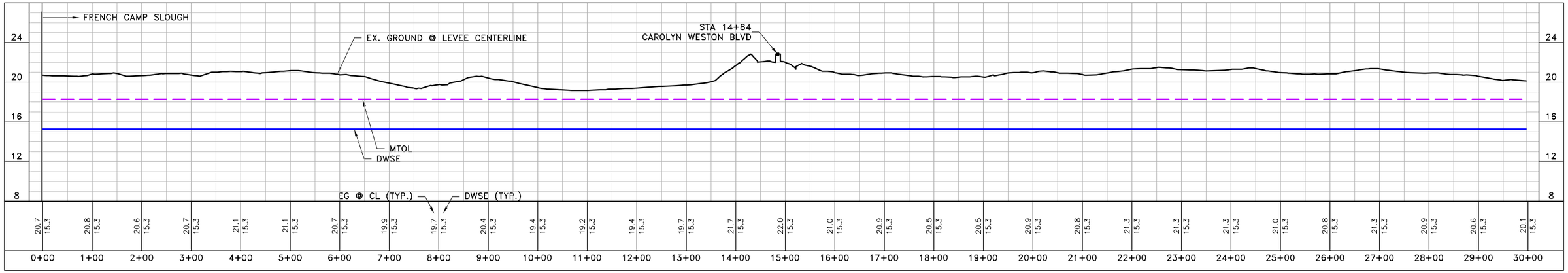
ROW AND SLURRY WALL CONSTRUCTION SECTION VIEW

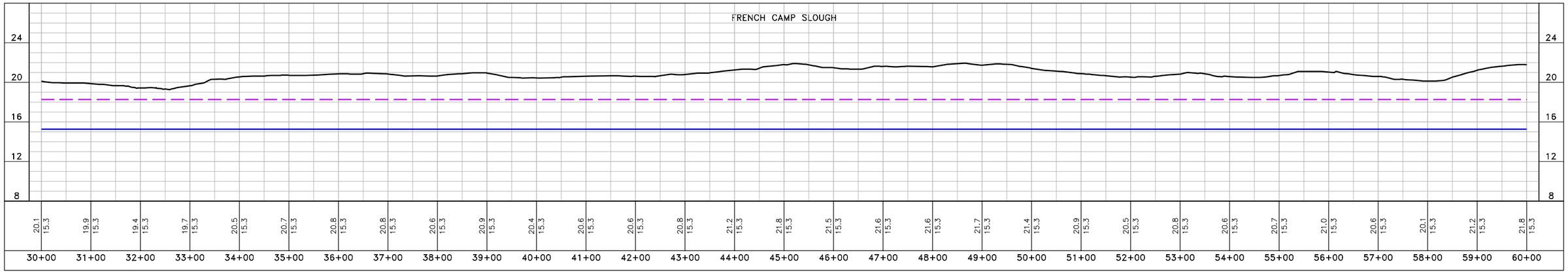
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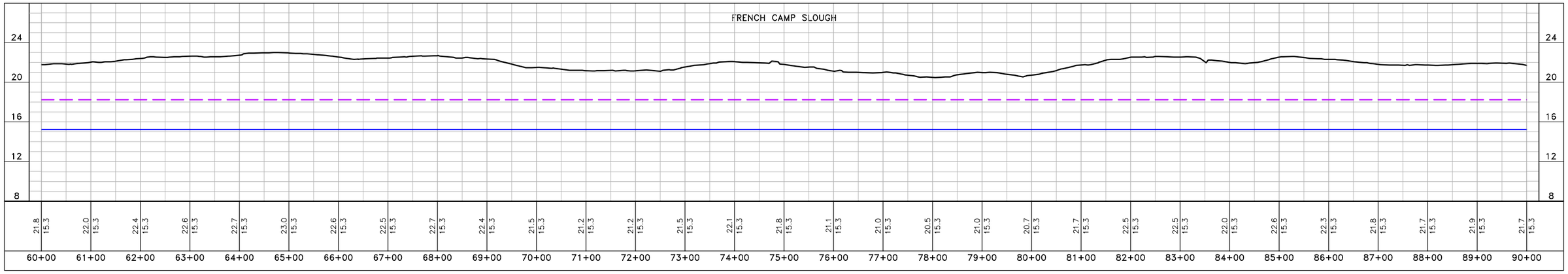
DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C1-354
SHEET 69 OF 136

KSN PROJECT FILE NO.
2255-0050







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN PROFILE VIEW

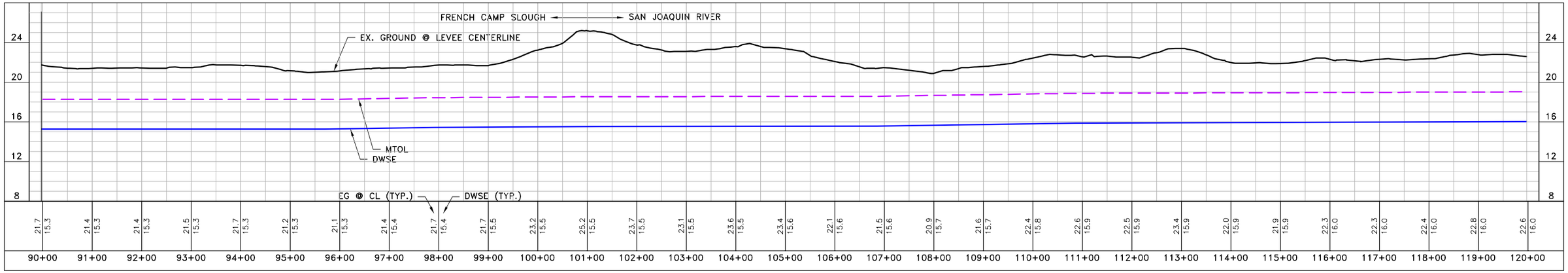
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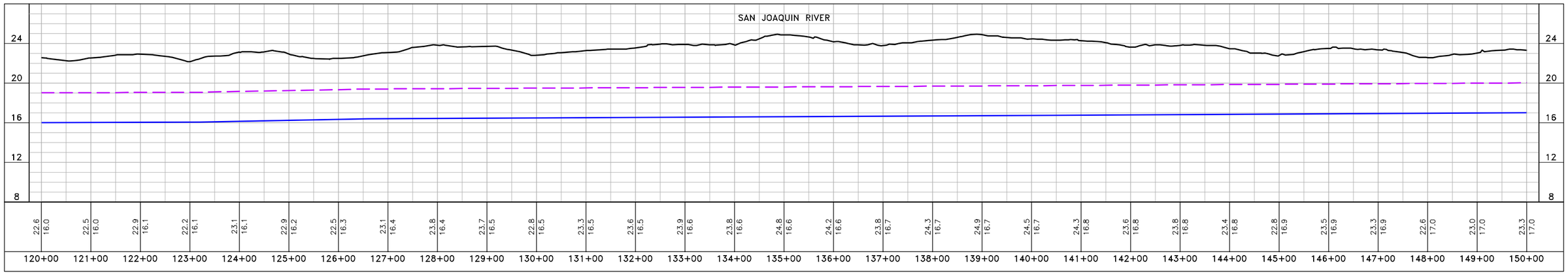
DATE
DECEMBER 11, 2019

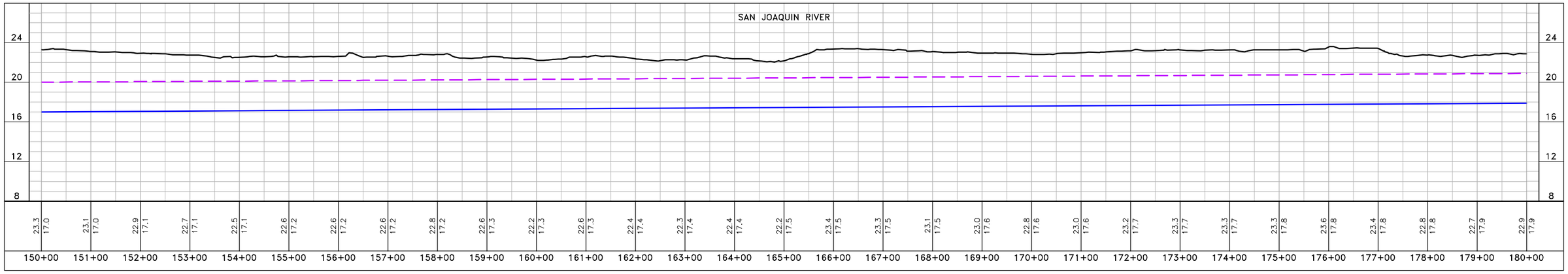
SHEET IDENTIFICATION
C2-201
SHEET 69 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:43pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

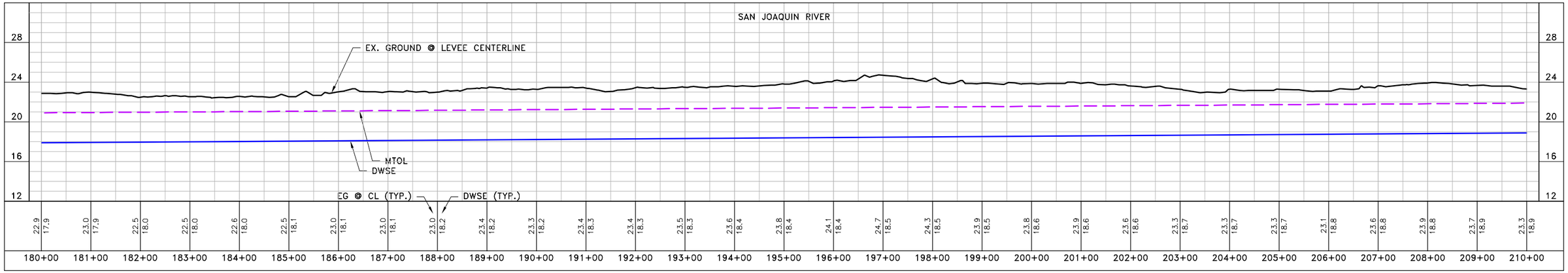
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Stockton, CA 95203
209-946-0268
1550 Harbor Drive, Suite 212
West Sacramento, CA 95691
916-403-5900

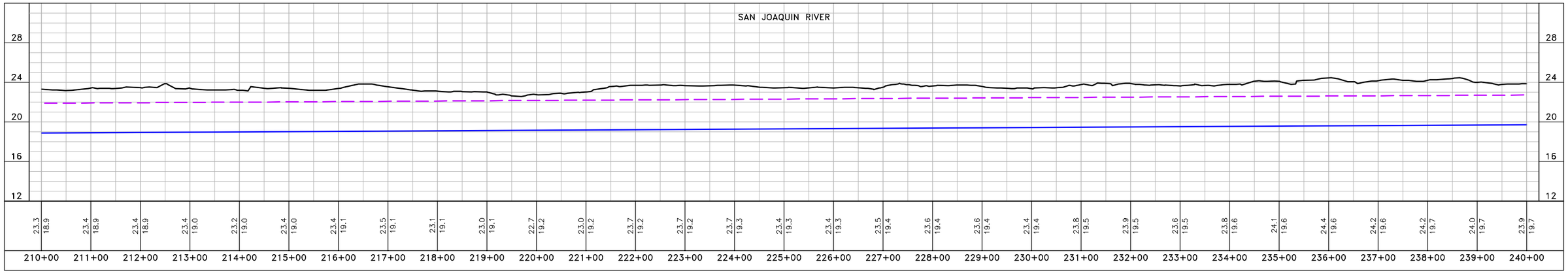
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

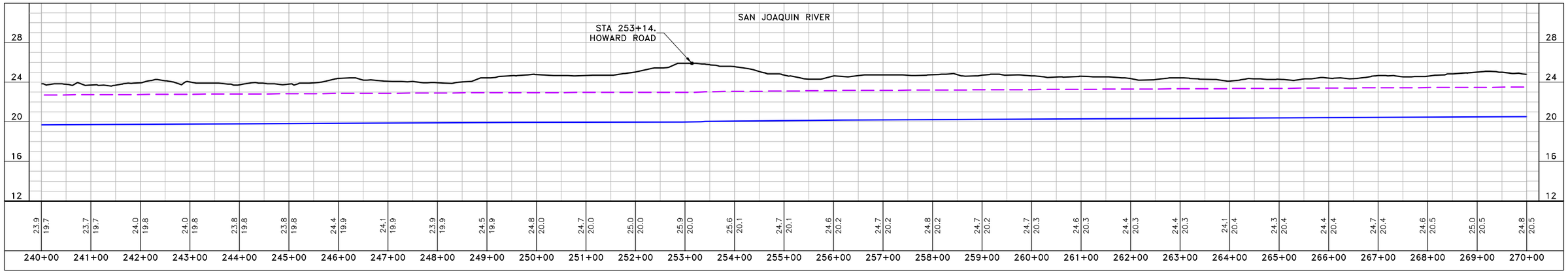
ALL OTHER LEVEE DESIGN
PROFILE VIEW
STA 90+00 TO 180+00

DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C2-202
SHEET 70 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:43pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN PROFILE VIEW

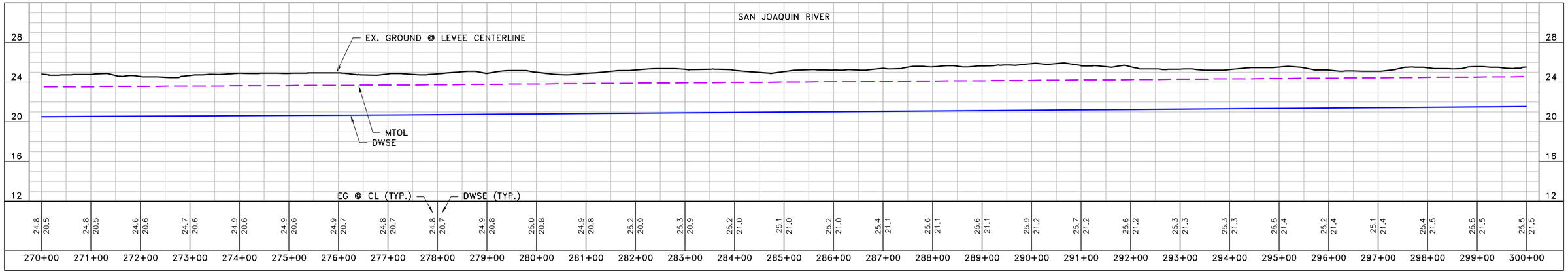
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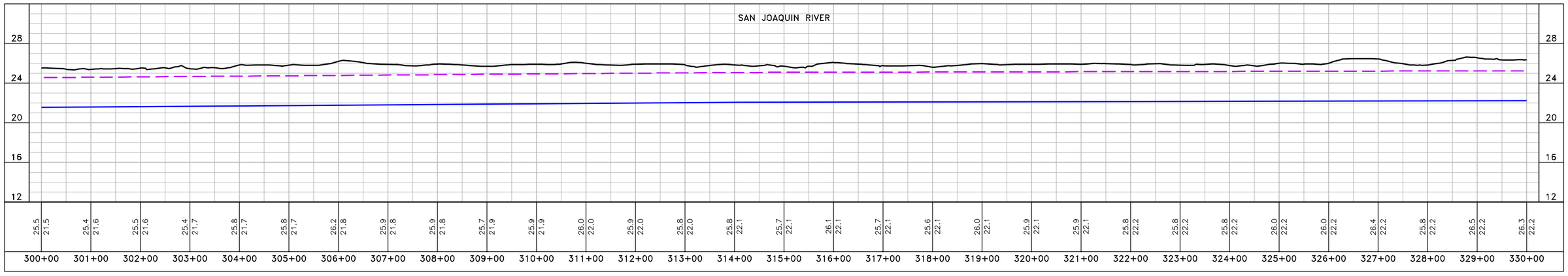
DATE
DECEMBER 11, 2019

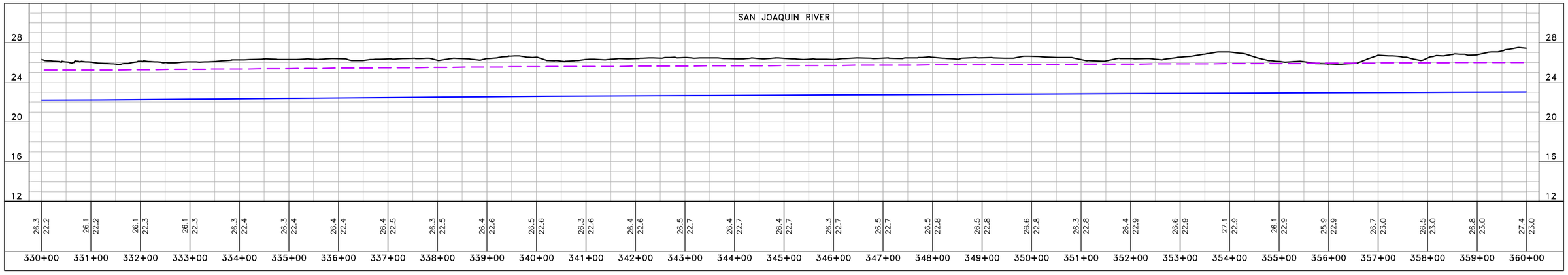
SHEET IDENTIFICATION
C2-203
SHEET 71 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:44pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN PROFILE VIEW

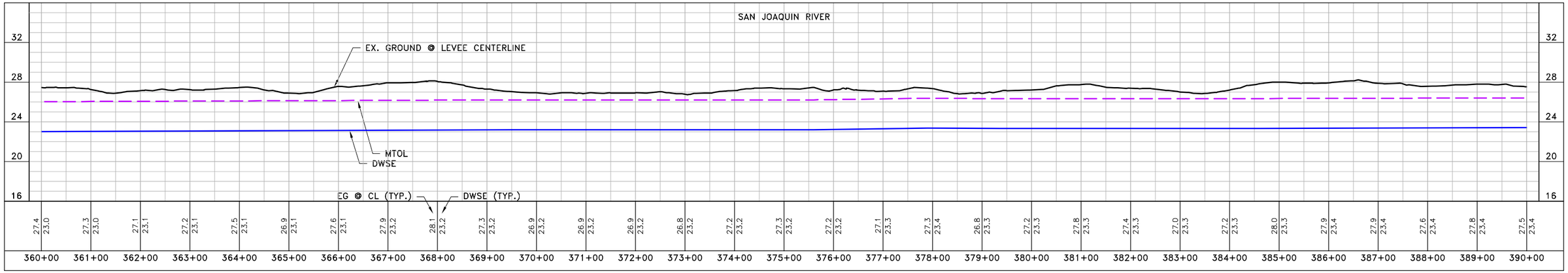
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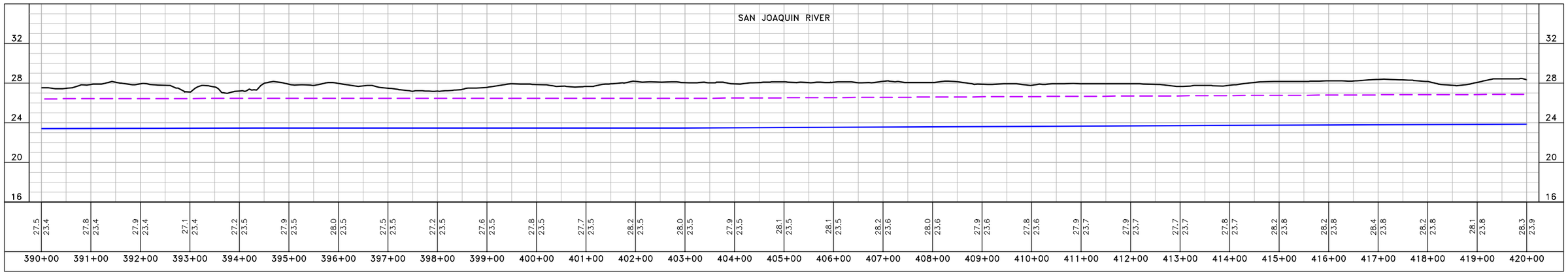
DATE
DECEMBER 11, 2019

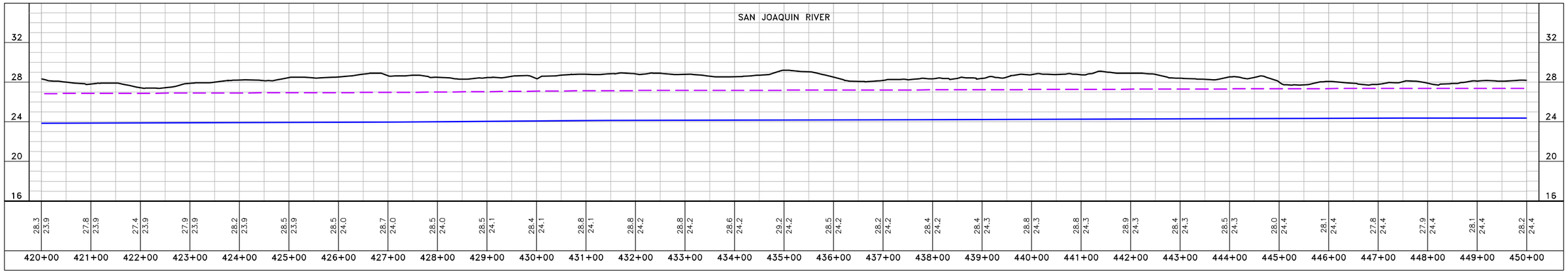
SHEET IDENTIFICATION
C2-204
SHEET 72 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:44pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

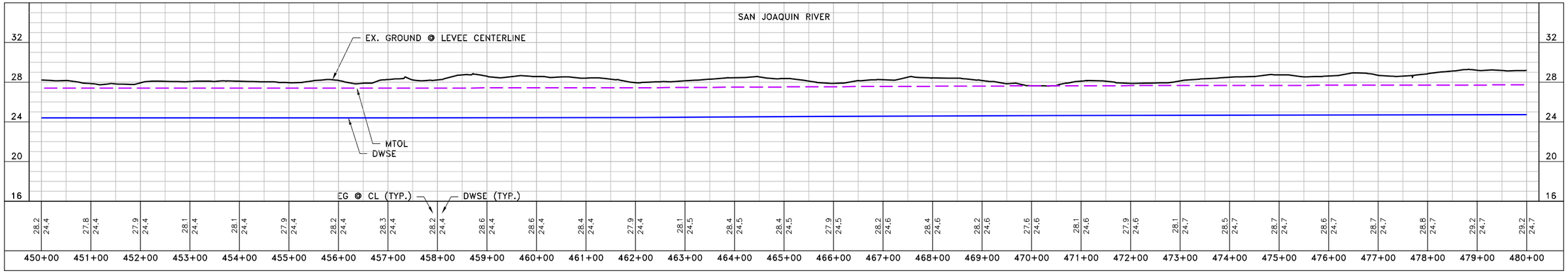
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Stockton, CA 95203
209-946-0268
1550 Harbor Drive, Suite 212
West Sacramento, CA 95691
916-403-5900

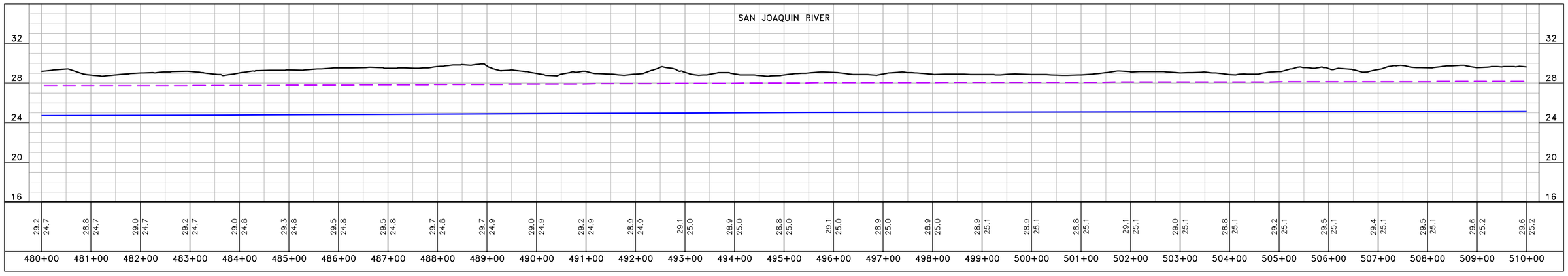
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

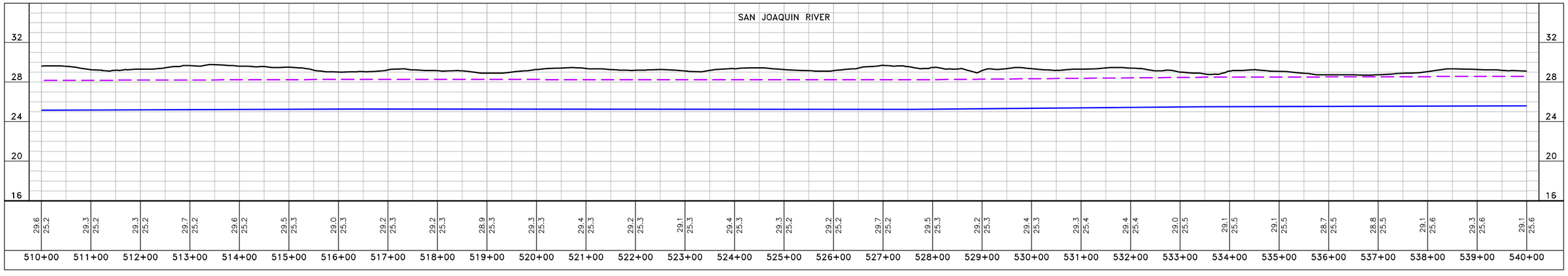
ALL OTHER LEVEE DESIGN
PROFILE VIEW
STA 360+00 TO 450+00

DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C2-205
SHEET 73 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:45pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

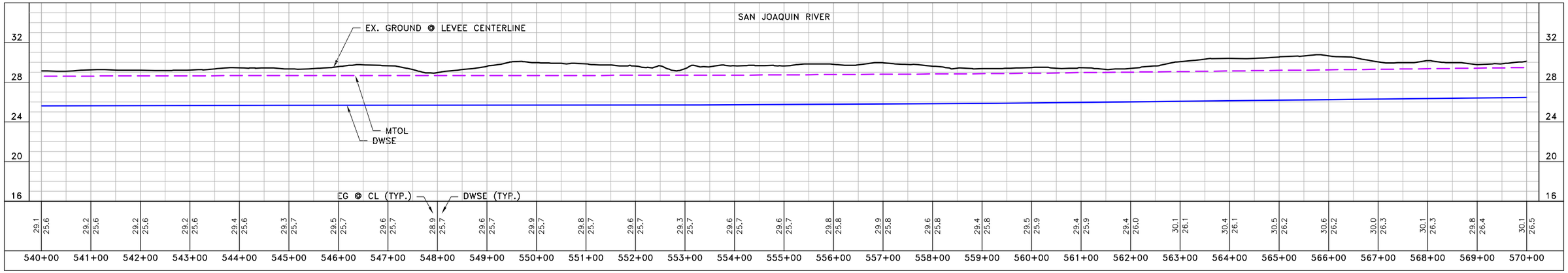
KSN inc. KJELDSEN SINNOCK NEUDECK
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Stockton, CA 95203
209-946-0268
1550 Harbor Drive, Suite 212
West Sacramento, CA 95691
916-403-5900

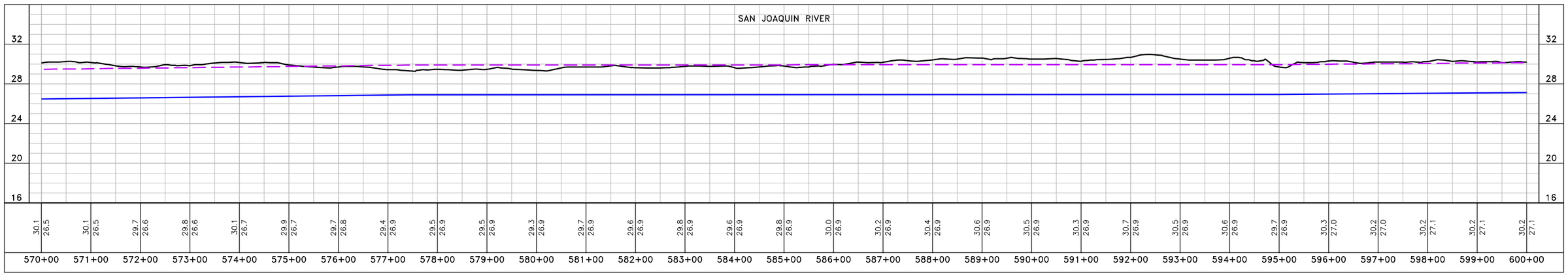
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

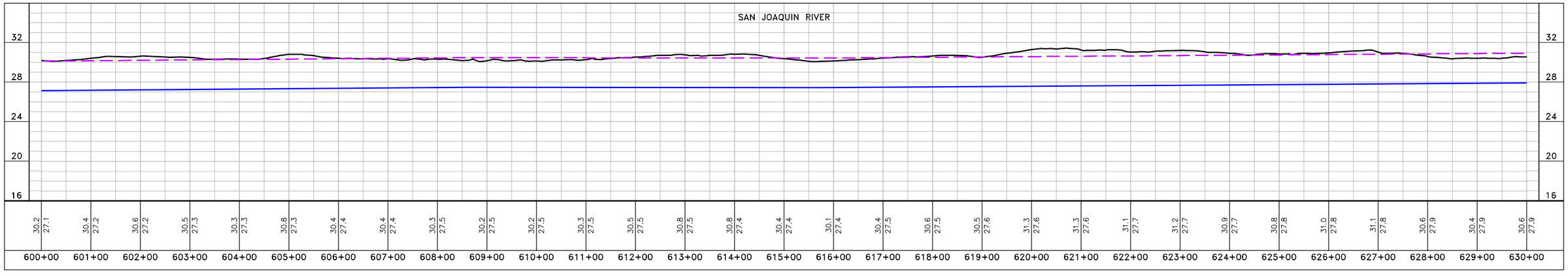
ALL OTHER LEVEE DESIGN
PROFILE VIEW
STA 450+00 TO 540+00

DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C2-206
SHEET 74 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:45pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN PROFILE VIEW

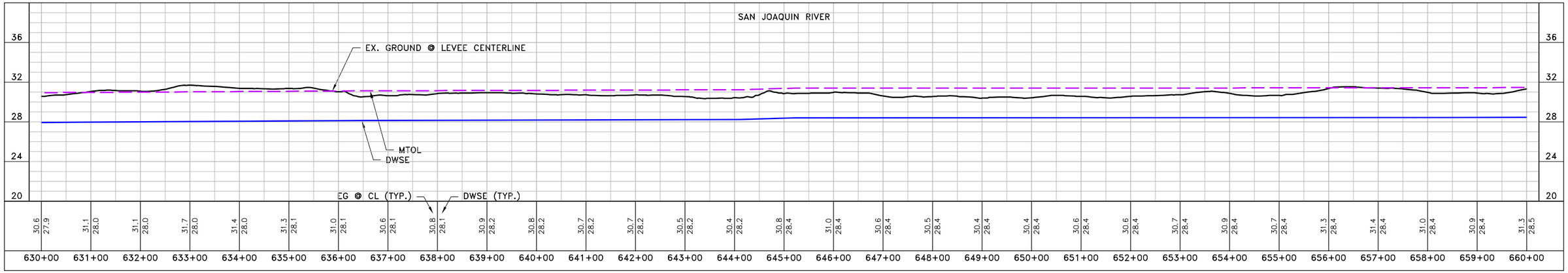
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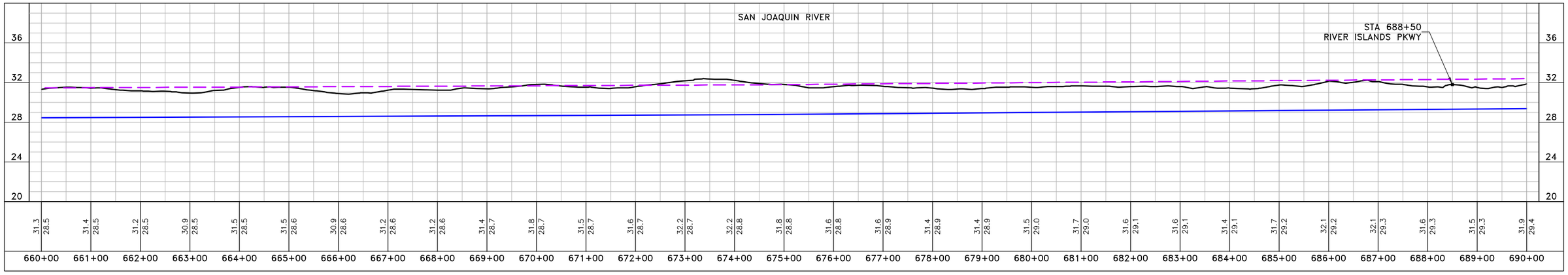
DATE
DECEMBER 11, 2019

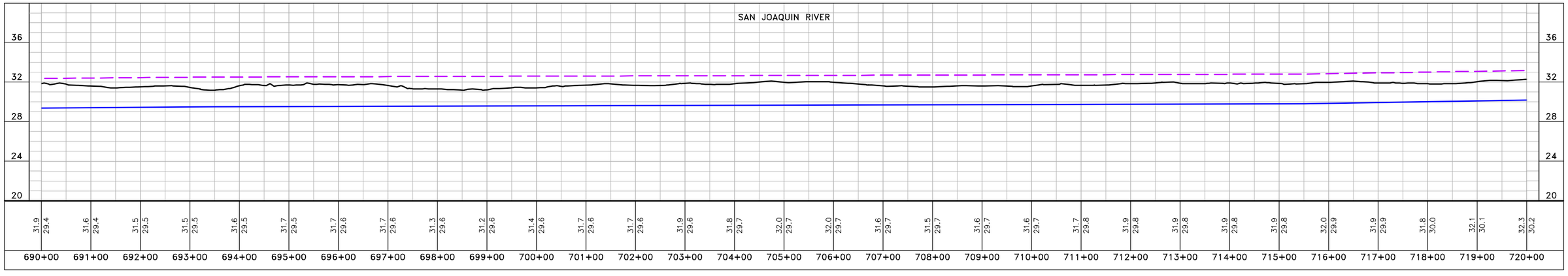
SHEET IDENTIFICATION
C2-207
SHEET 75 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:46pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

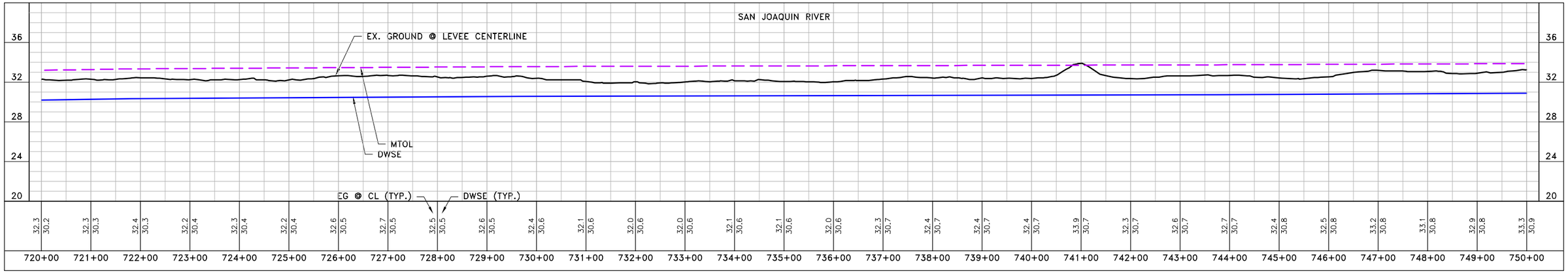
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West Sacramento, CA 95691
916-403-5900

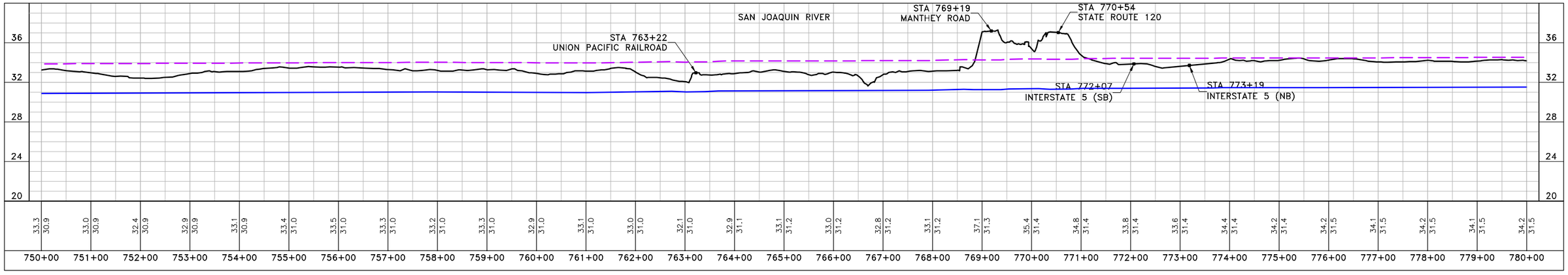
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ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

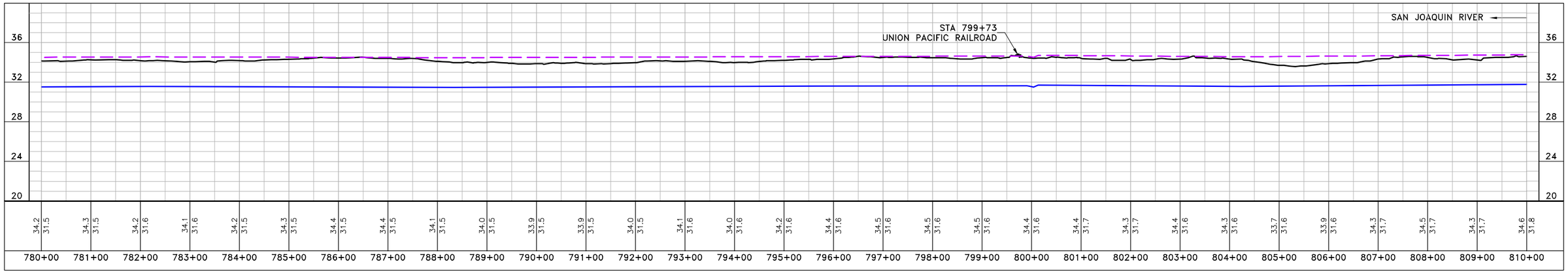
ALL OTHER LEVEE DESIGN
PROFILE VIEW
STA 630+00 TO 720+00

DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C2-208
SHEET 76 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:46pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN PROFILE VIEW

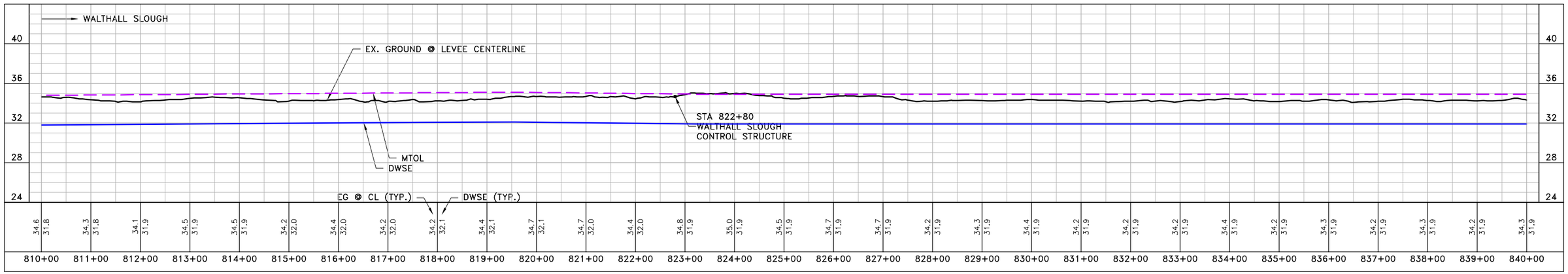
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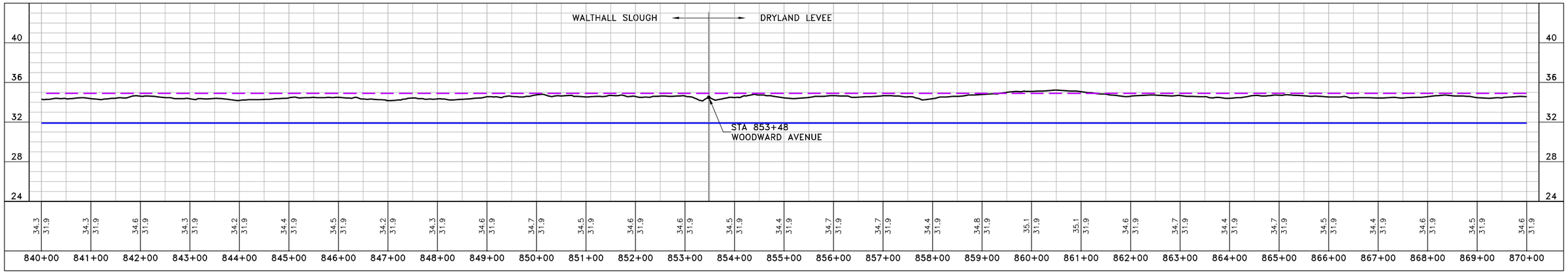
DATE
DECEMBER 11, 2019

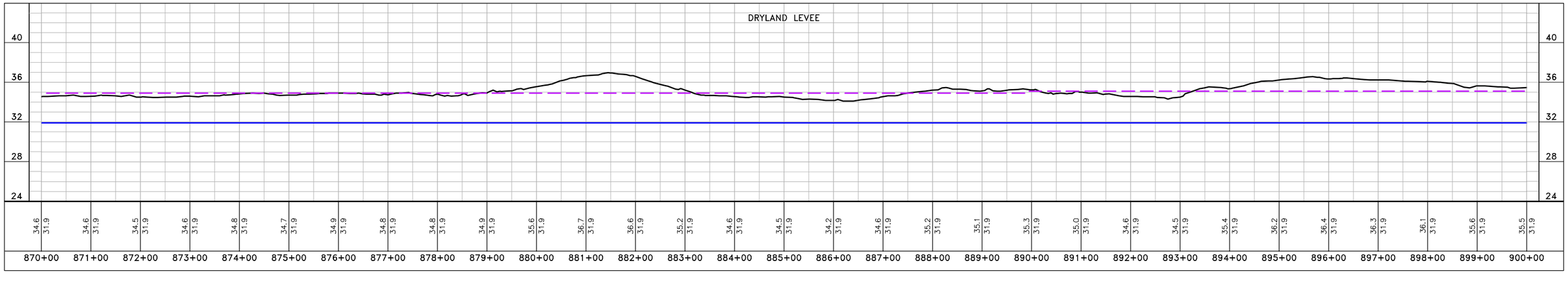
SHEET IDENTIFICATION
C2-209
SHEET 77 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:47pm







N

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

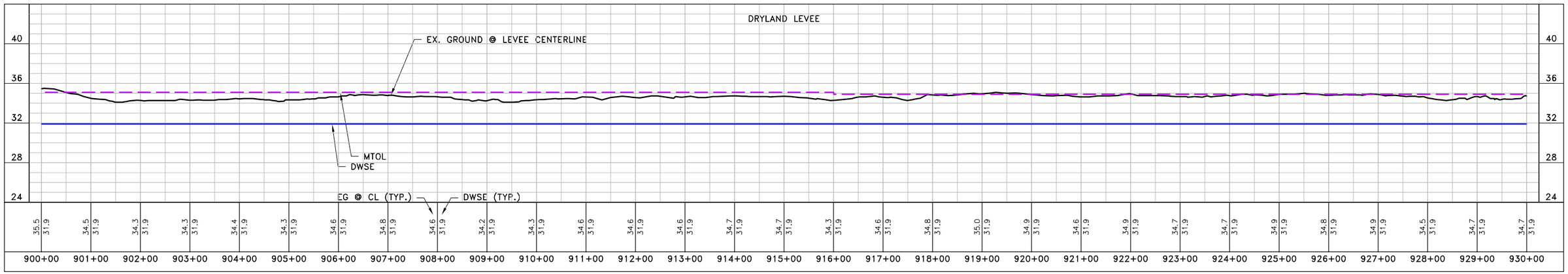
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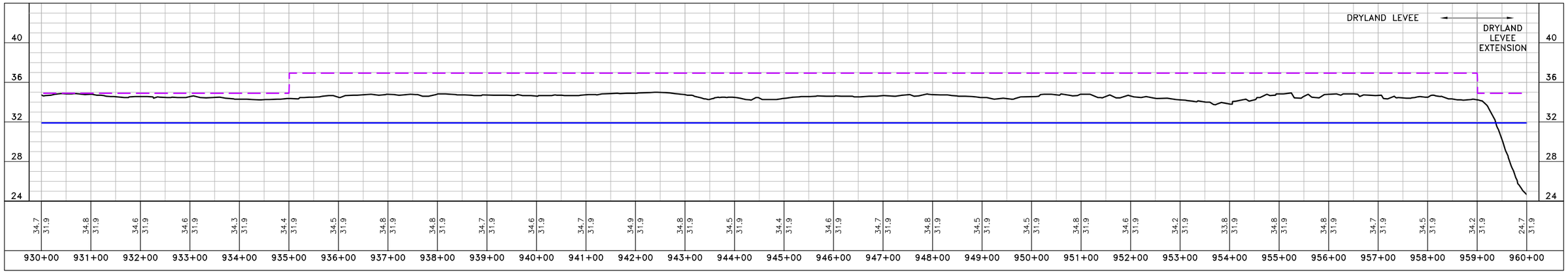
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

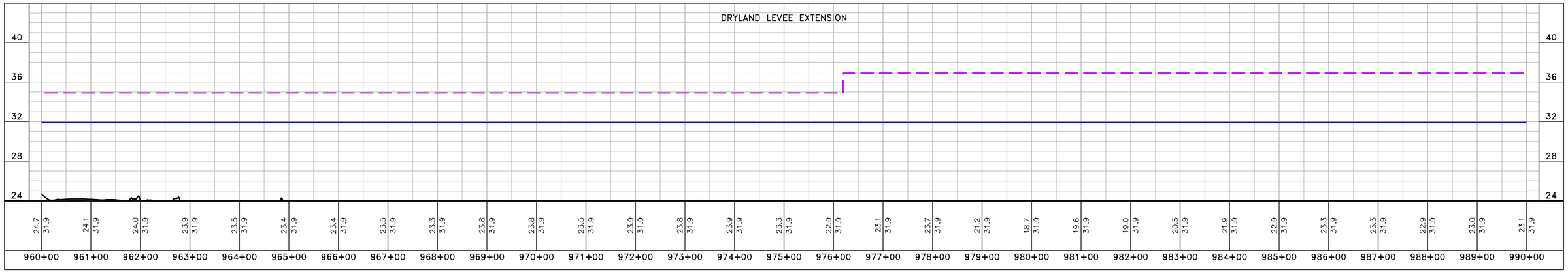
ALL OTHER LEVEE DESIGN
PROFILE VIEW
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DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C2-210
SHEET 78 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:48pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

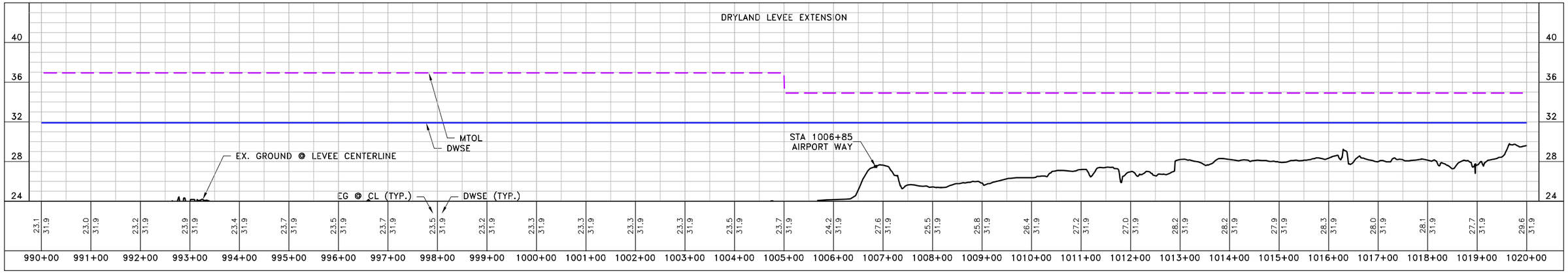
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Stockton, CA 95203
209-946-0268
1550 Harbor Drive, Suite 212
West Sacramento, CA 95691
916-403-5900

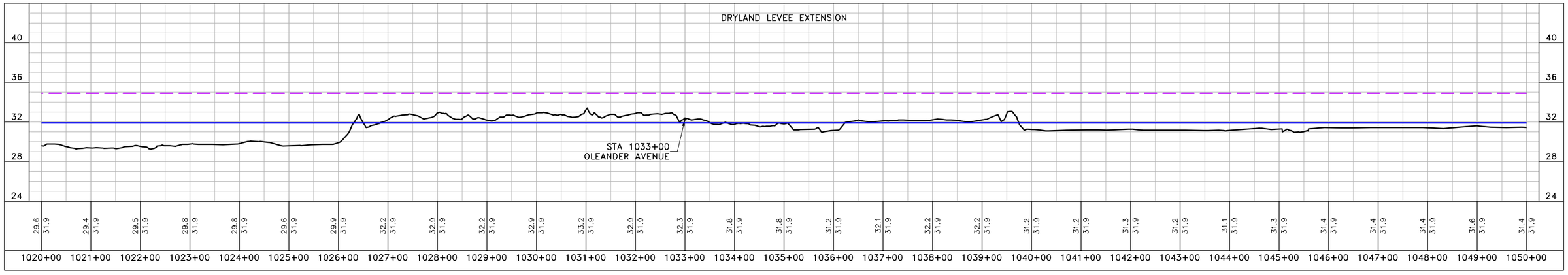
SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

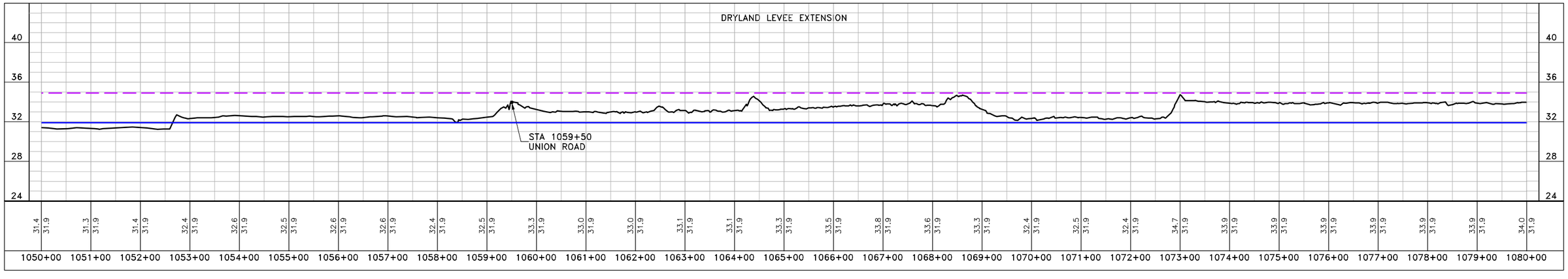
ALL OTHER LEVEE DESIGN
PROFILE VIEW
STA 900+00 TO 990+00

DATE
DECEMBER 11, 2019
SHEET IDENTIFICATION
C2-211
SHEET 79 OF 136
KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:48pm







NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'
ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN PROFILE VIEW

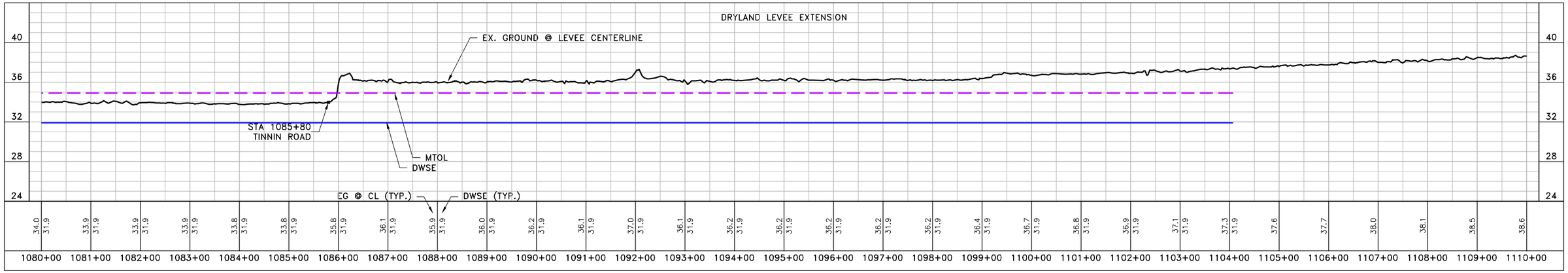
STA 990+00 TO 1080+00

DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C2-212
SHEET 80 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:49pm



FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-201.dwg
PLOT DATE: Dec 11, 2019 - 3:49pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
VERT: 1" = 5'
HORZ: 1" = 100'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

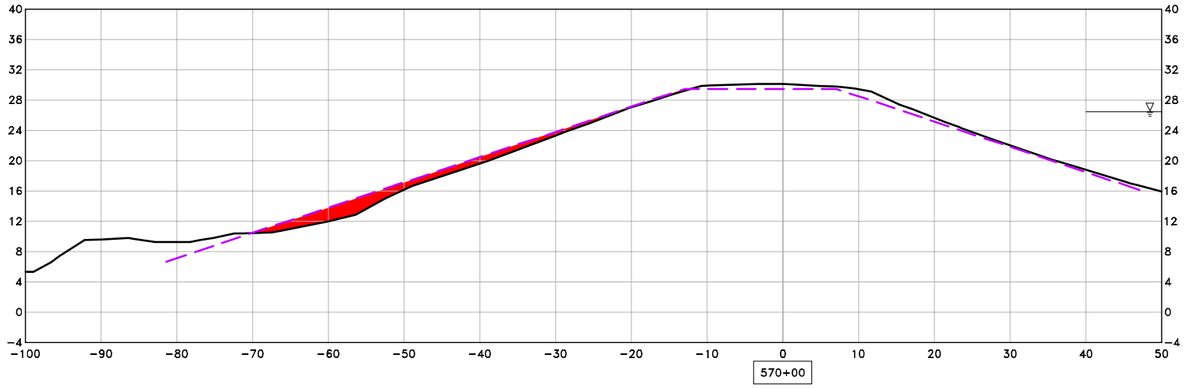
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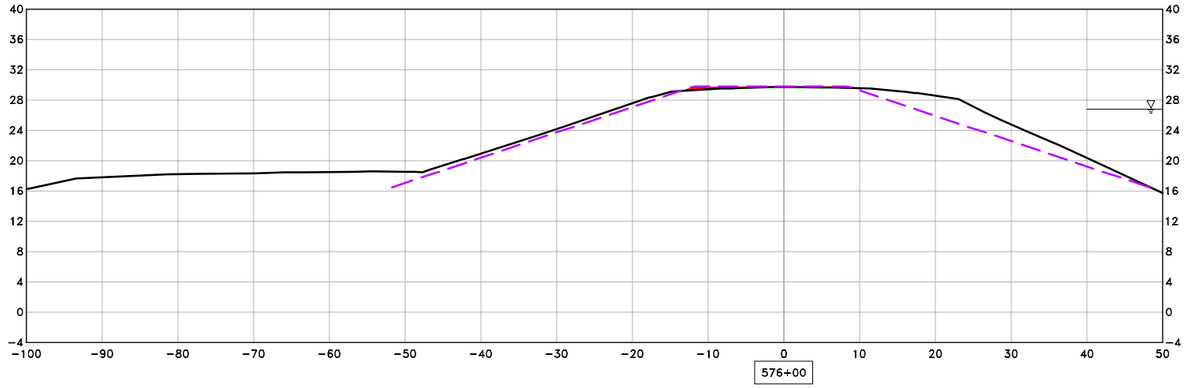
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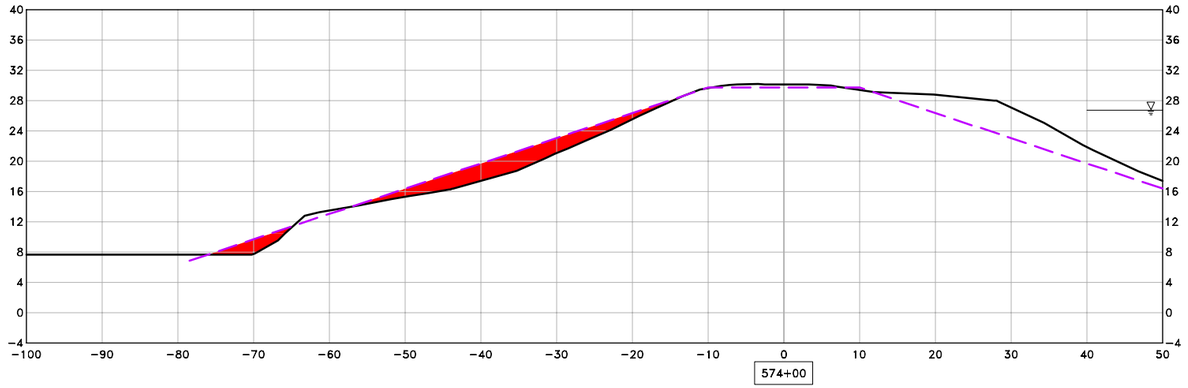
DATE
DECEMBER 11, 2019

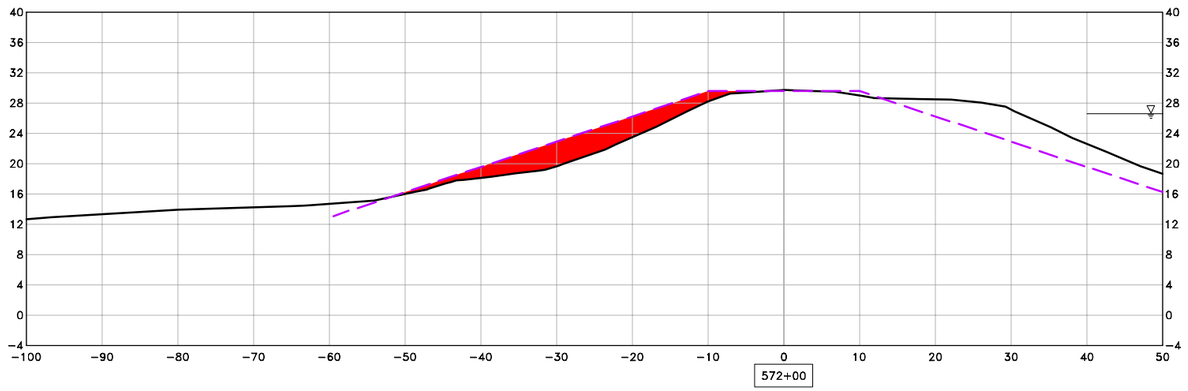
SHEET IDENTIFICATION
C2-213
SHEET 81 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 3:55pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

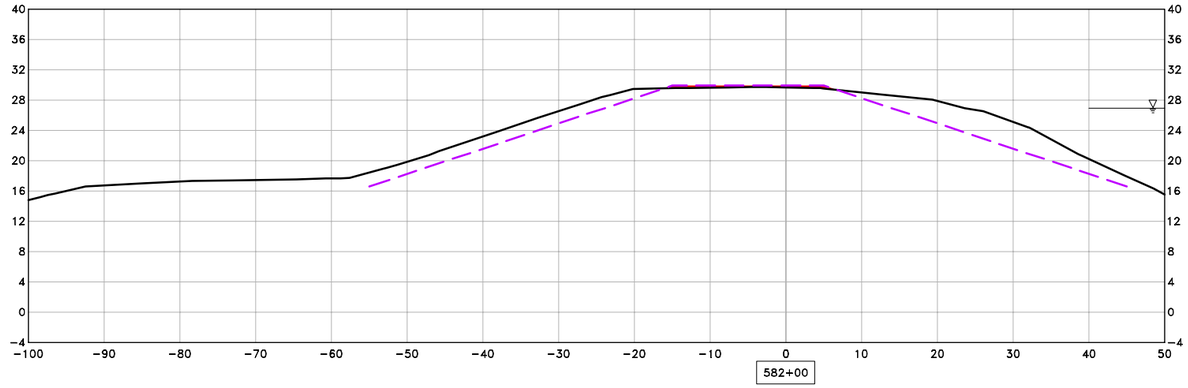
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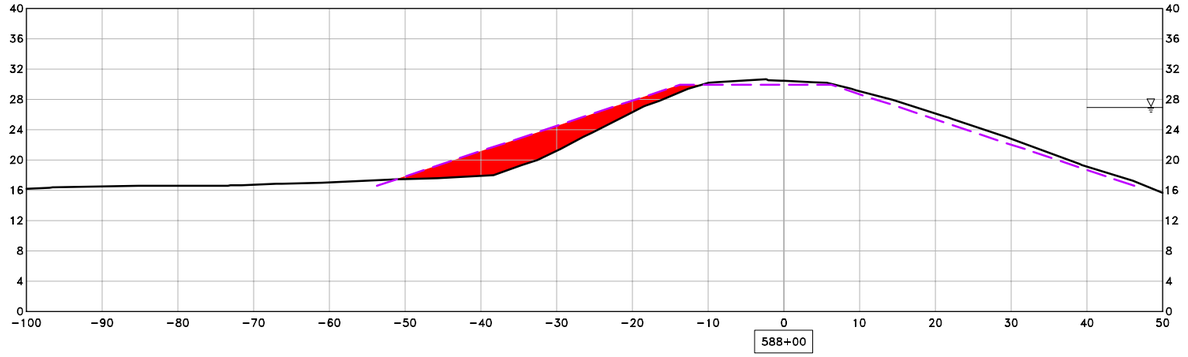
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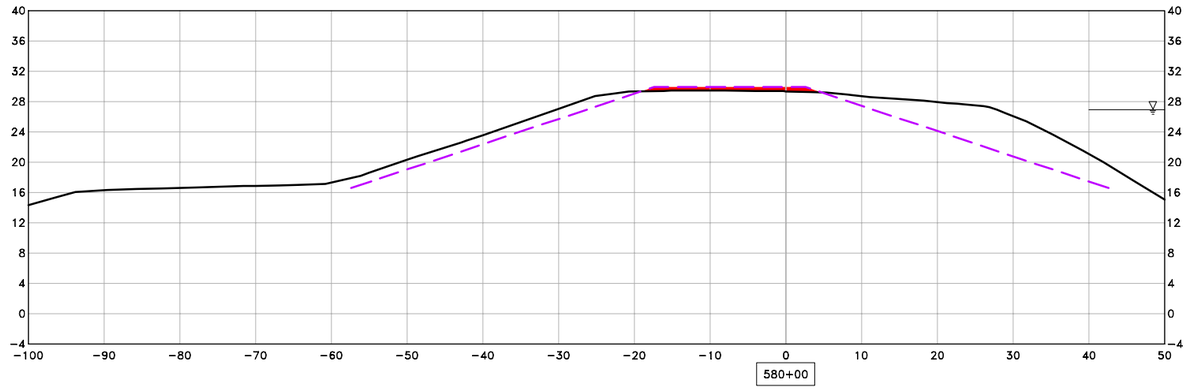
DATE
DECEMBER 11, 2019

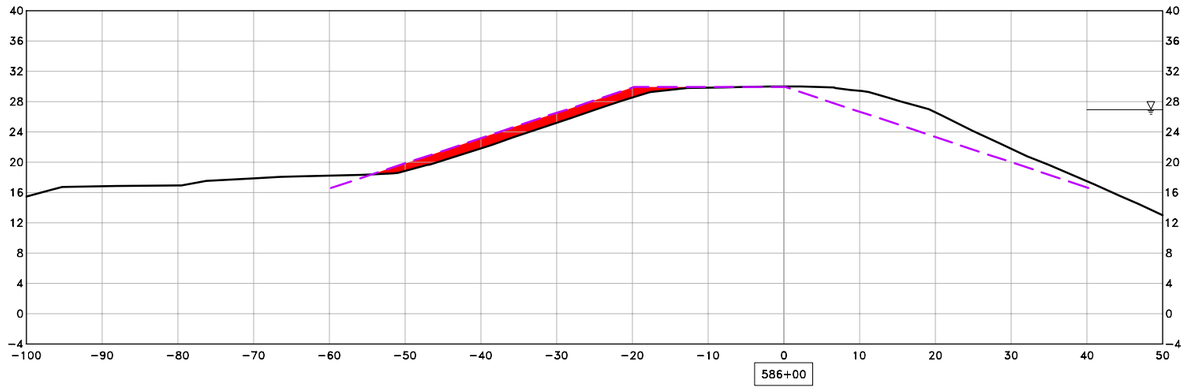
SHEET IDENTIFICATION
C2-301
SHEET 83 OF 136

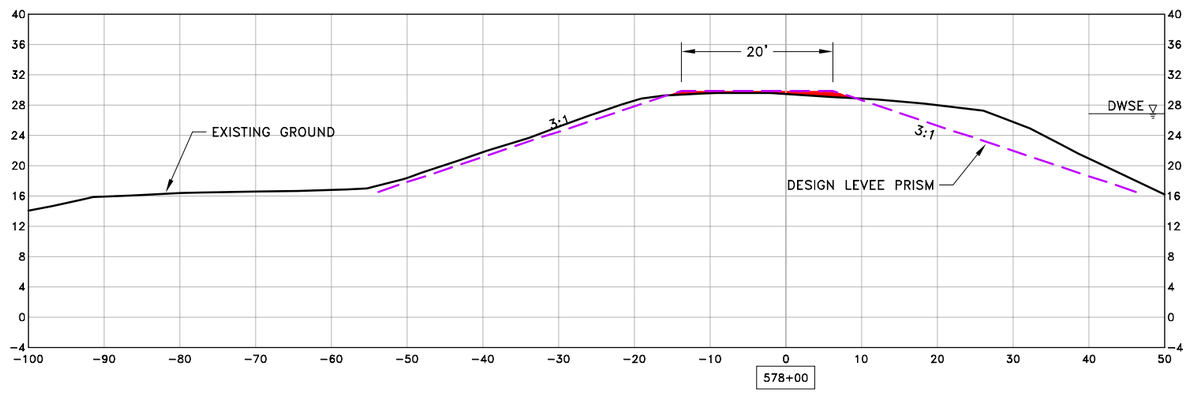
KSN PROJECT FILE NO.
2255-0050

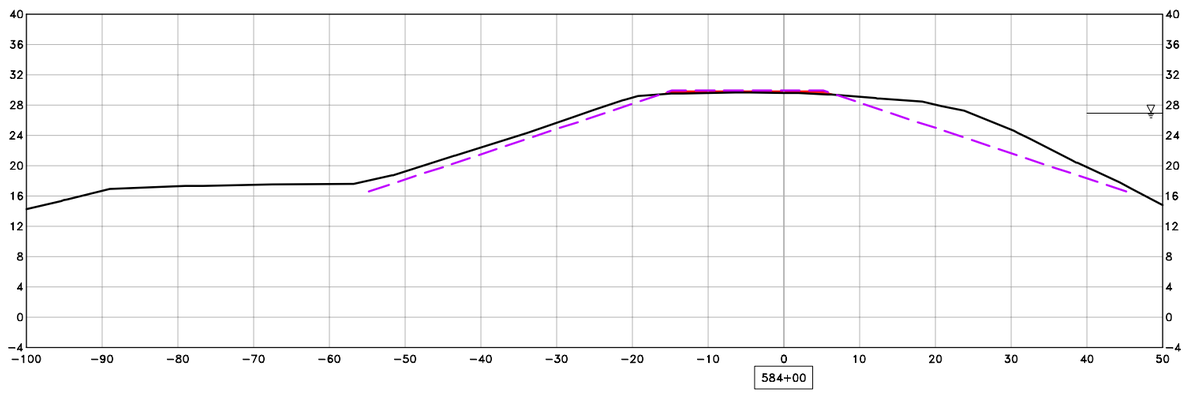












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PLOT DATE: Dec 11, 2019 - 3:56pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

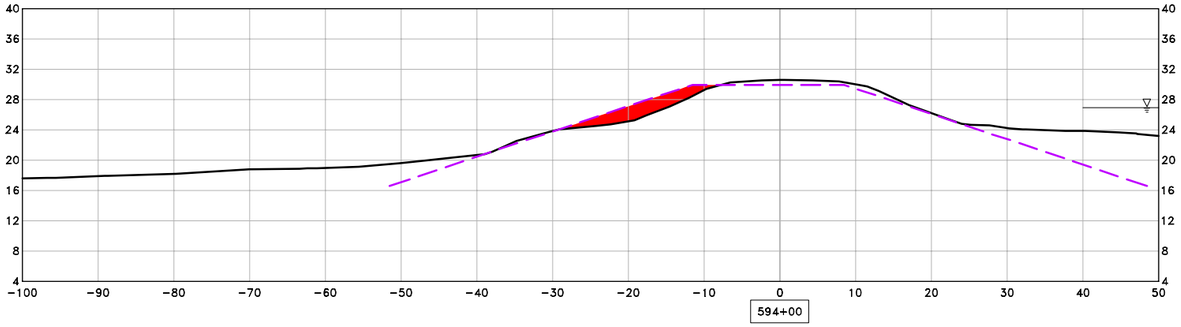
ALL OTHER LEVEE DESIGN SECTION VIEW

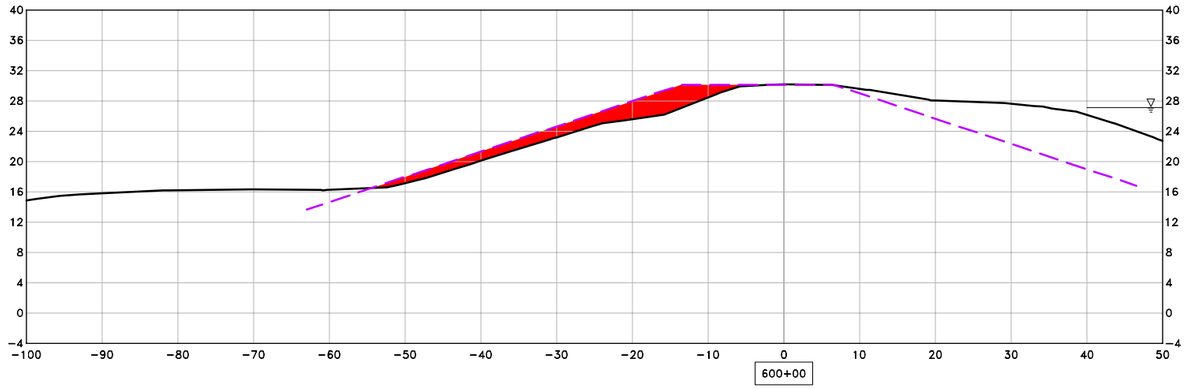
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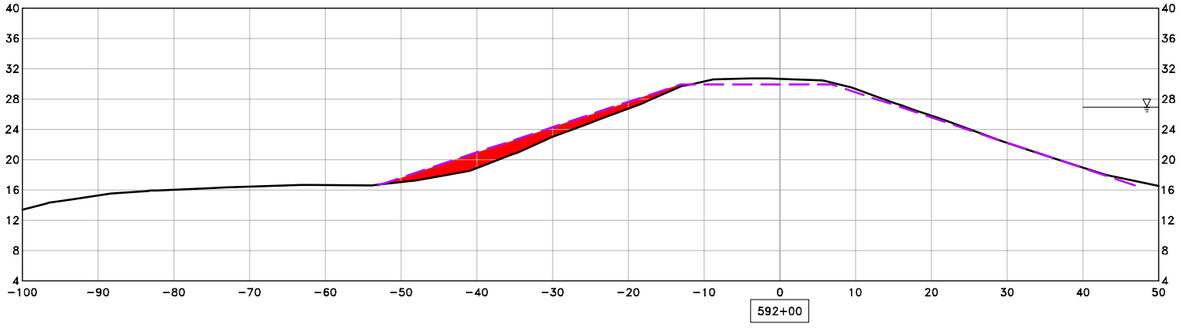
DATE
DECEMBER 11, 2019

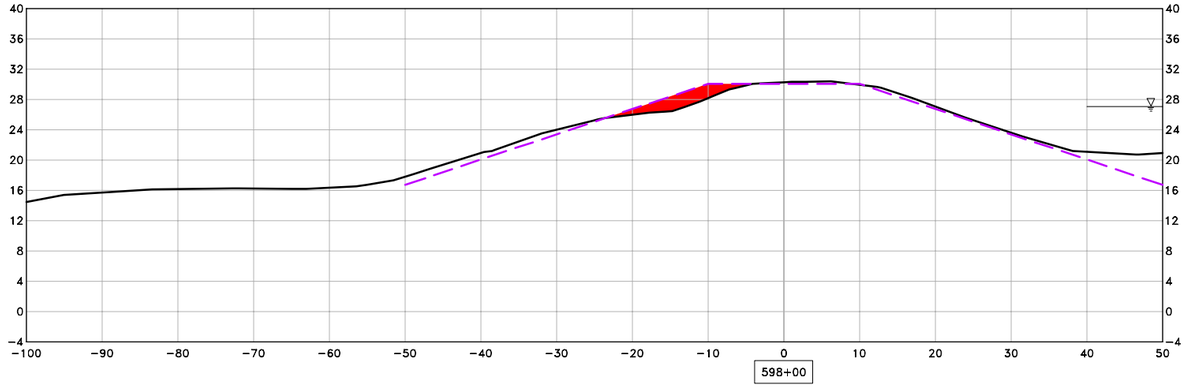
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C2-302
SHEET 84 OF 136

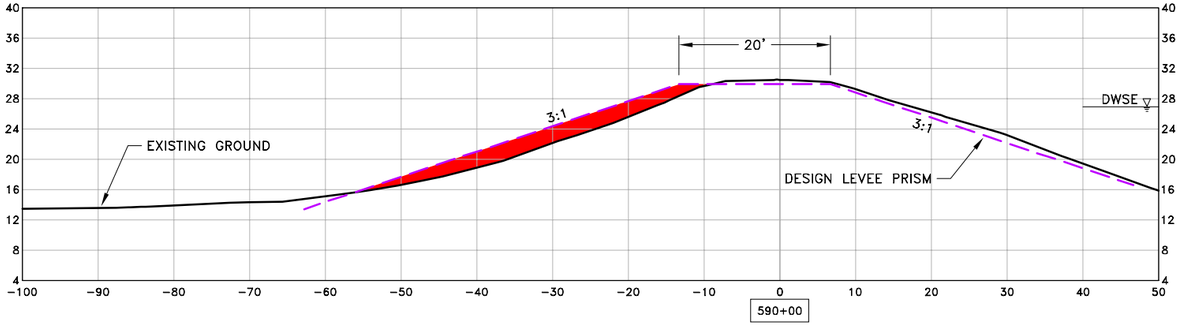
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2255-0050

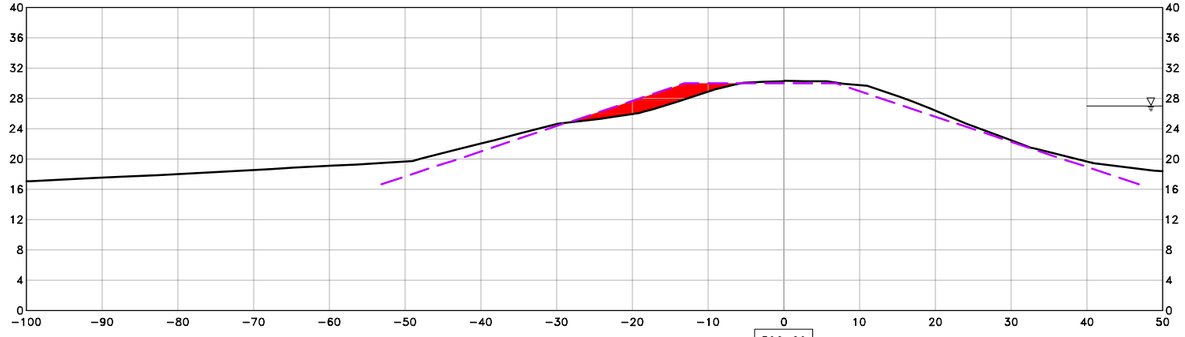












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SJAFCA - MOSSDALE TRACT AREA
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SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

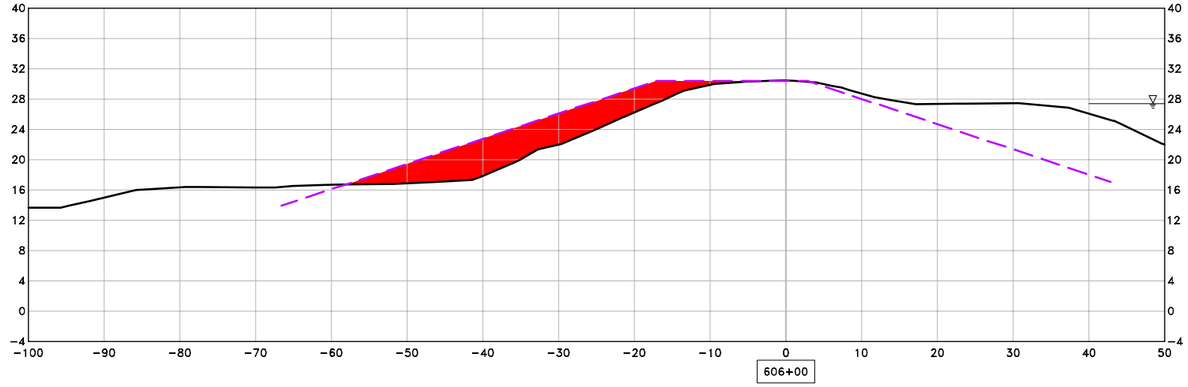
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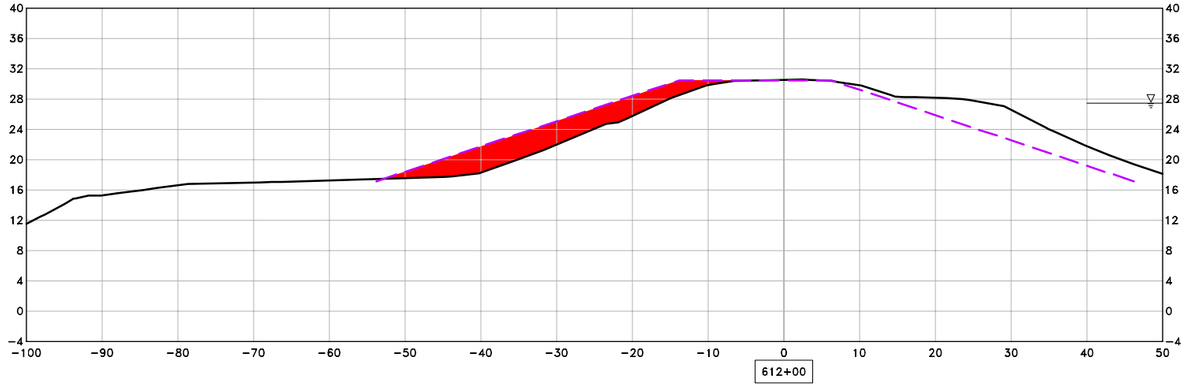
DATE
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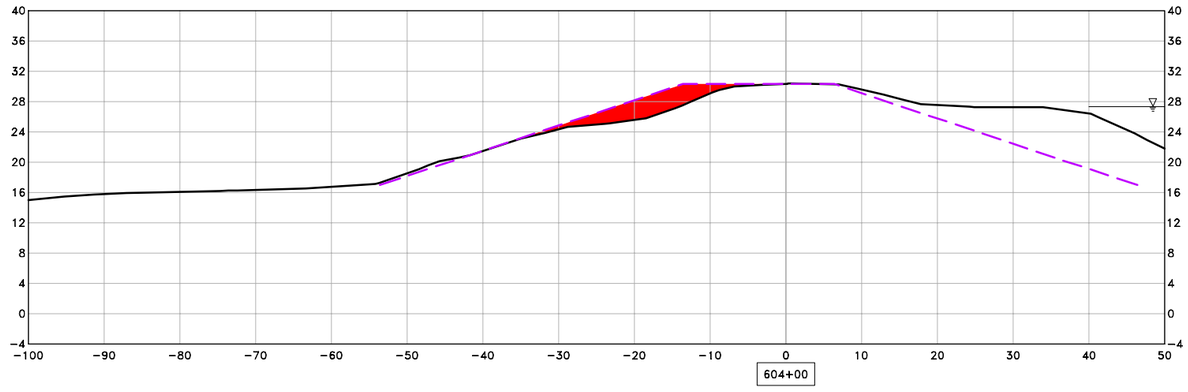
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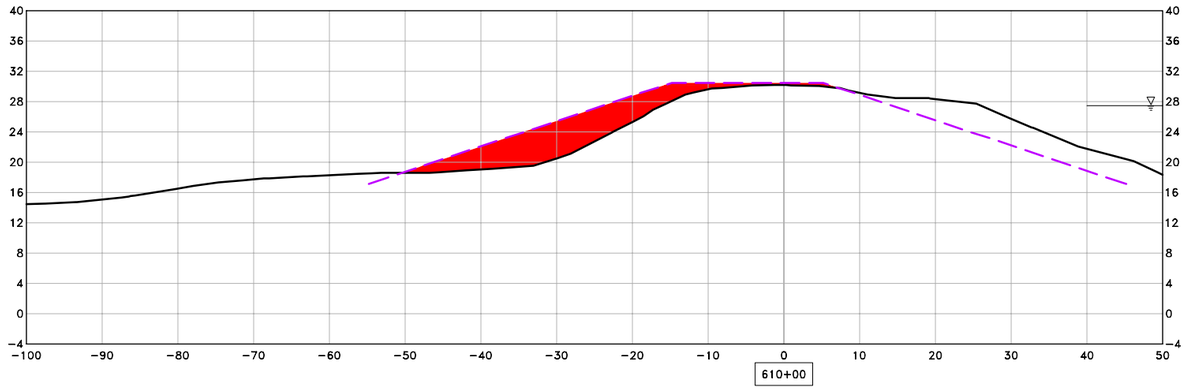
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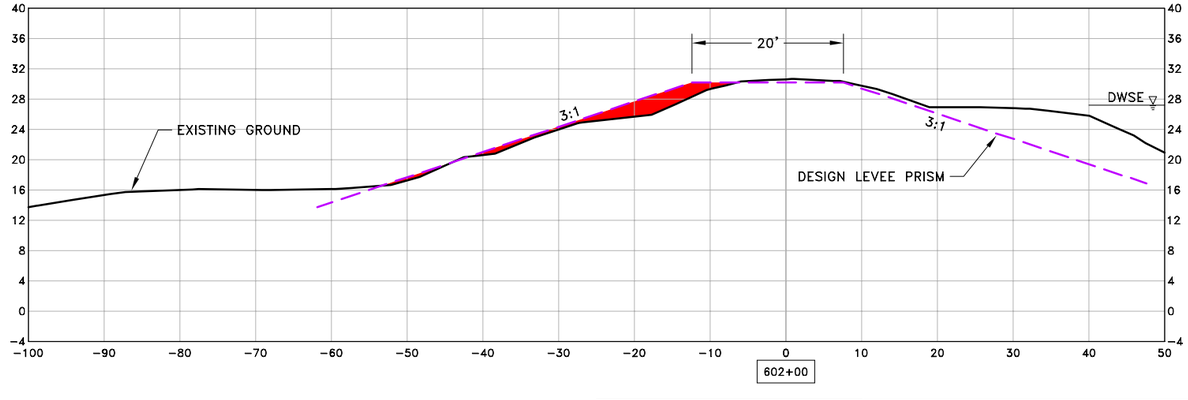
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PLOT DATE: Dec 11, 2019 - 3:56pm

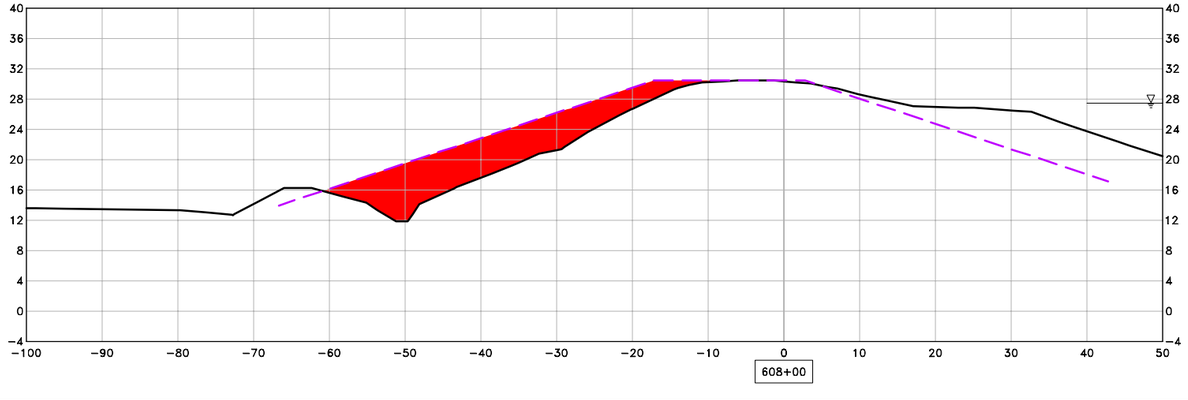












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NORTH ORIENTATION

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VERTICAL DATUM NAVD88

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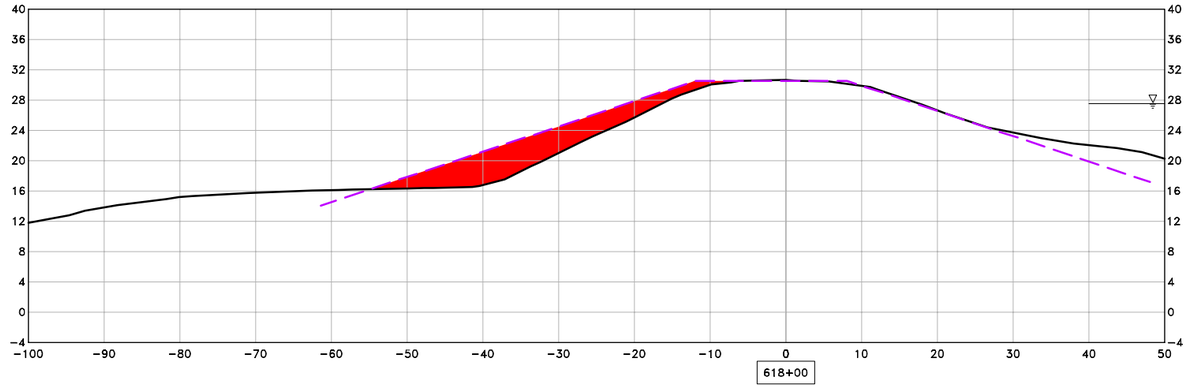
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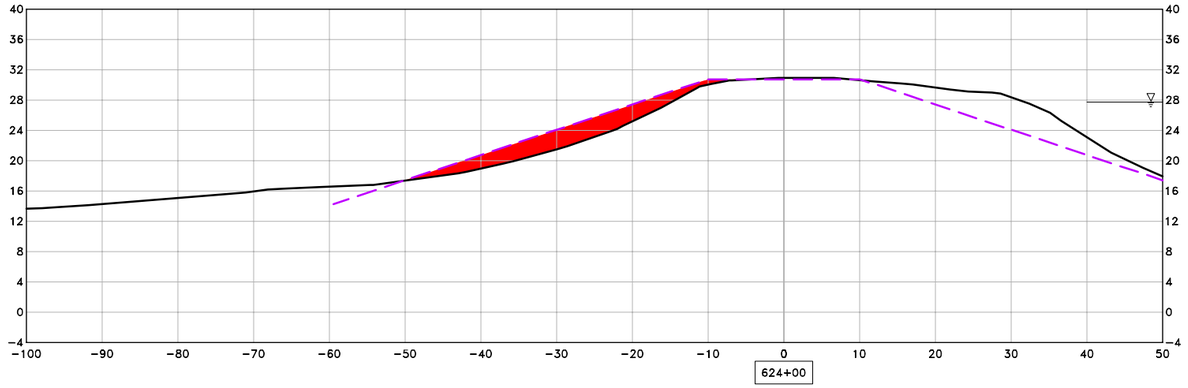
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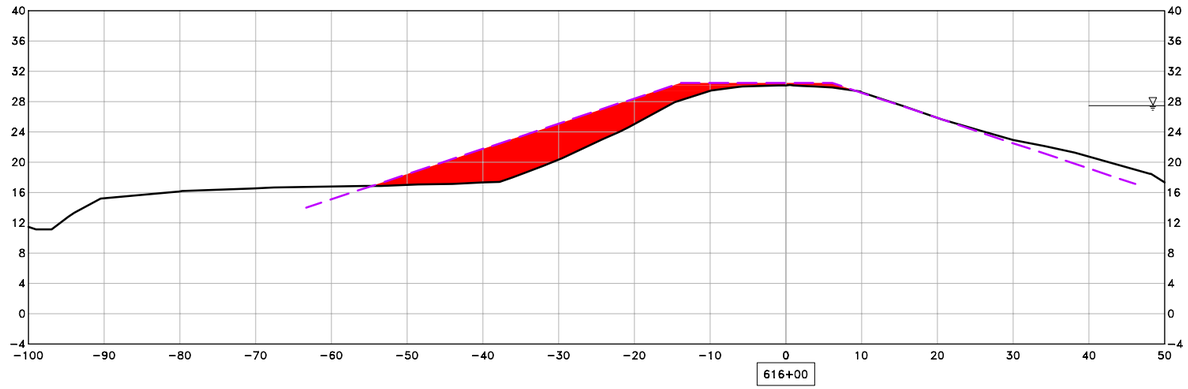
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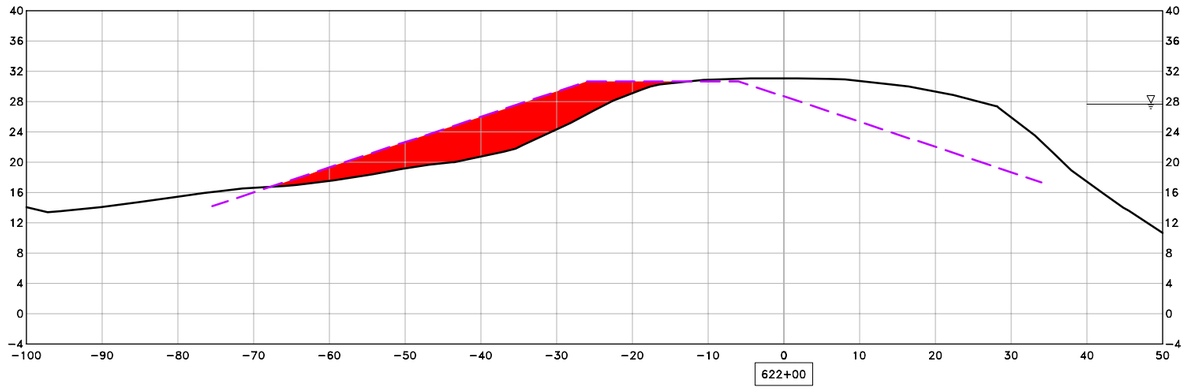
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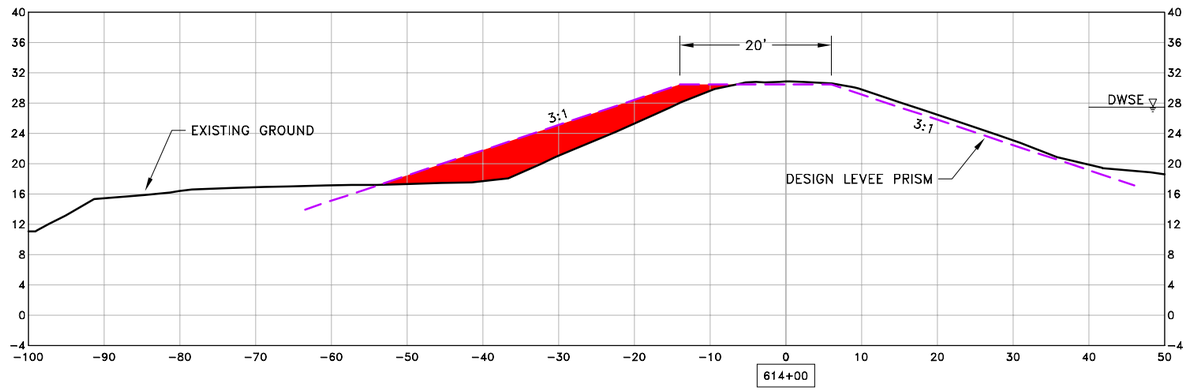
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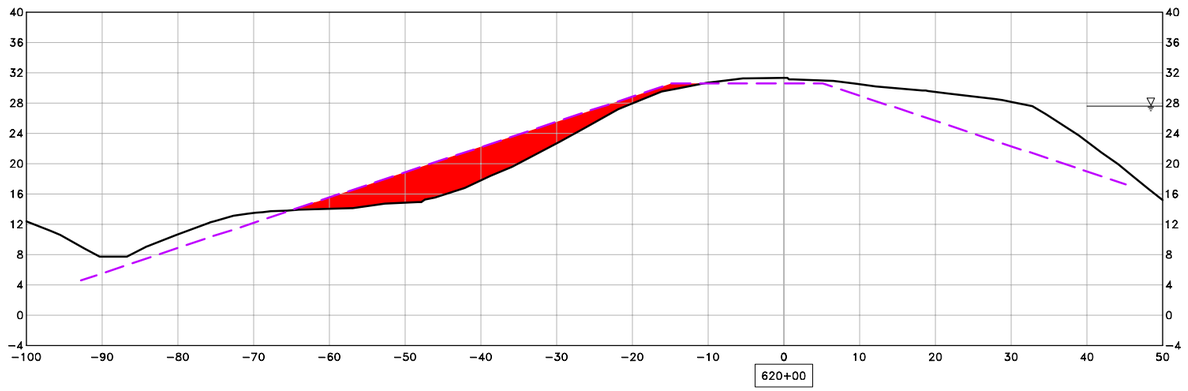












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VERTICAL DATUM NAVD88

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SAN JOAQUIN COUNTY, CALIFORNIA

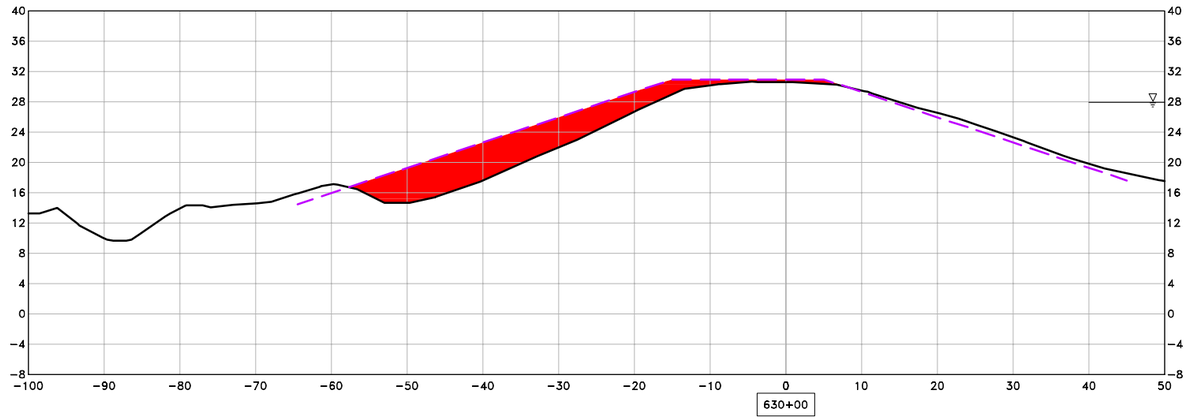
ALL OTHER LEVEE DESIGN SECTION VIEW

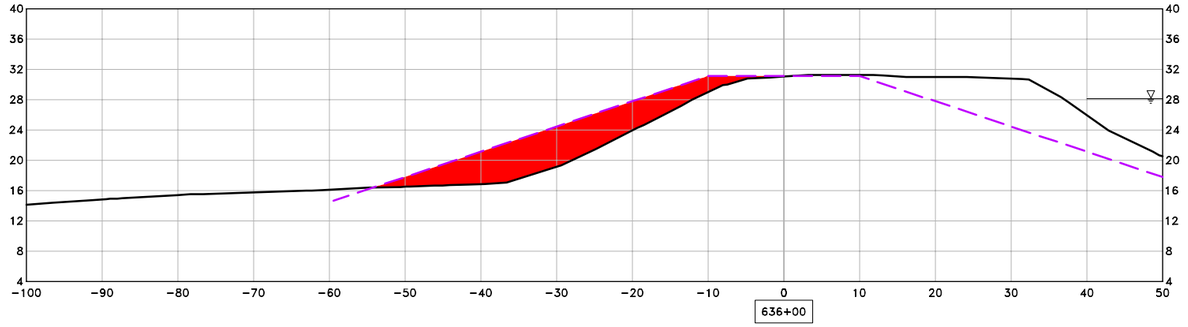
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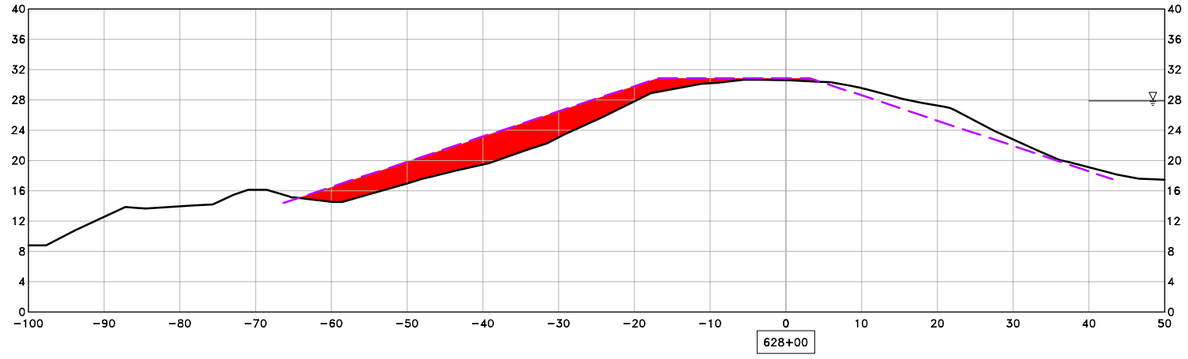
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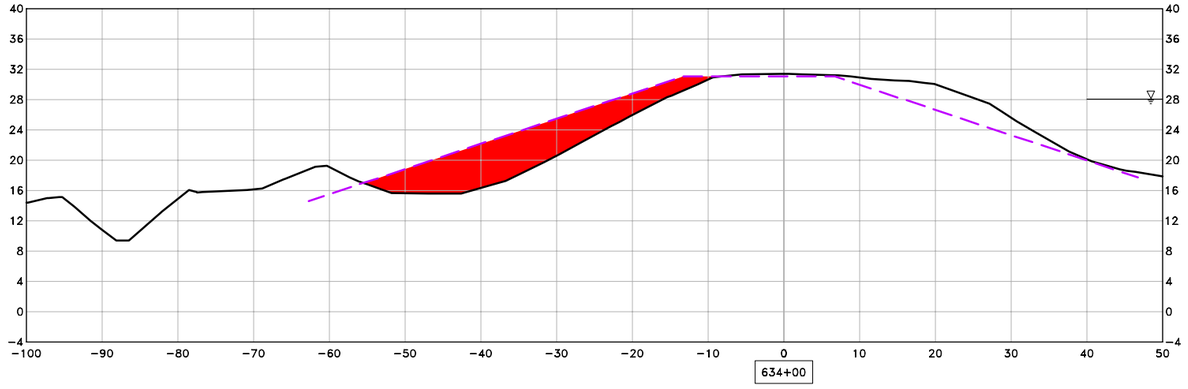
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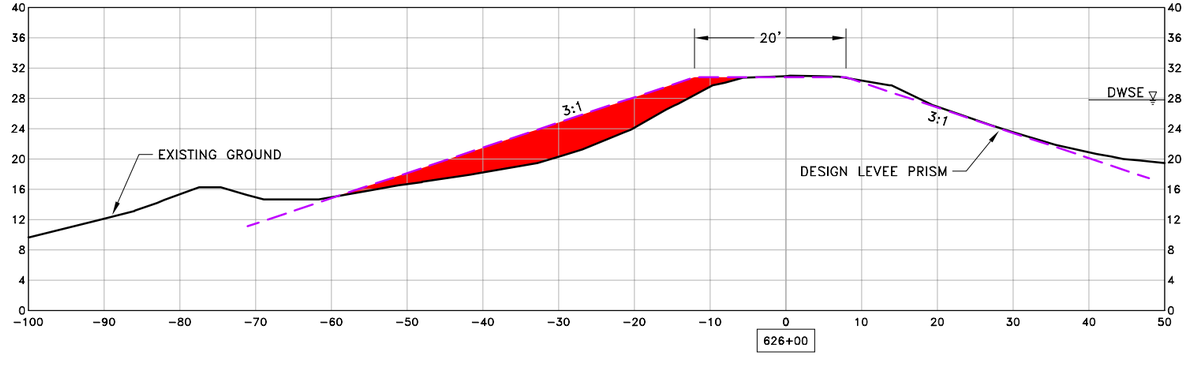
KSN PROJECT FILE NO.
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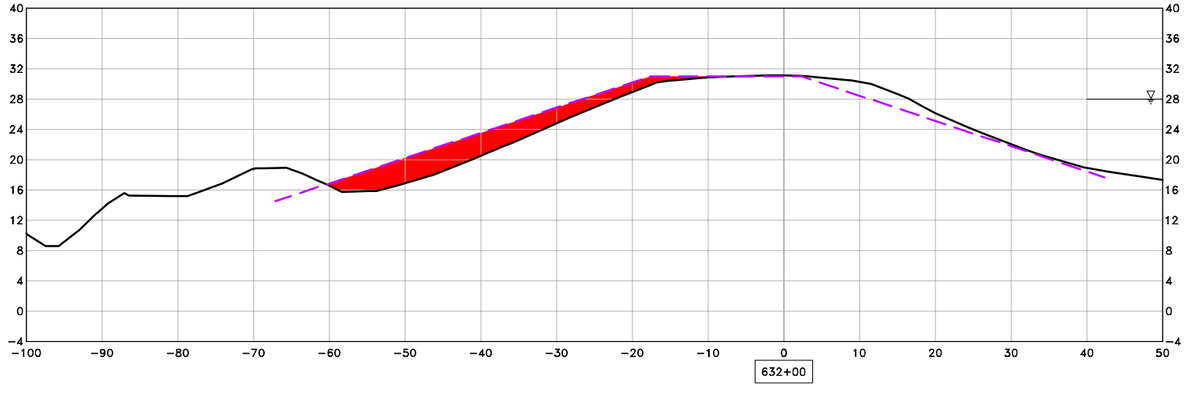












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NORTH ORIENTATION

PROJECT ENGINEER

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HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
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ORIGINAL DRAWING SCALE
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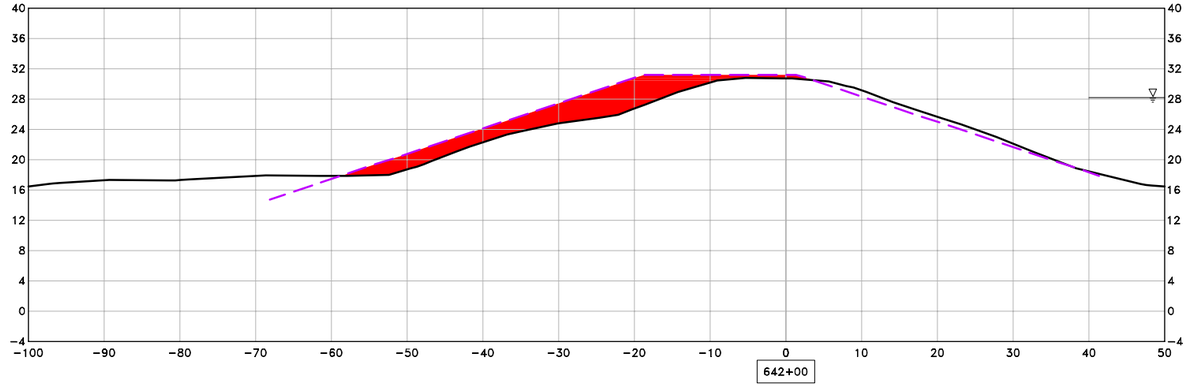
ALL OTHER LEVEE DESIGN SECTION VIEW

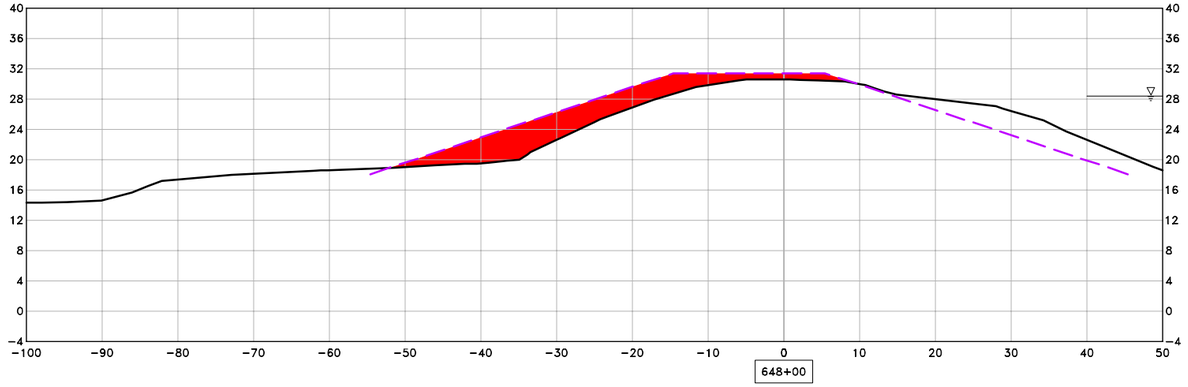
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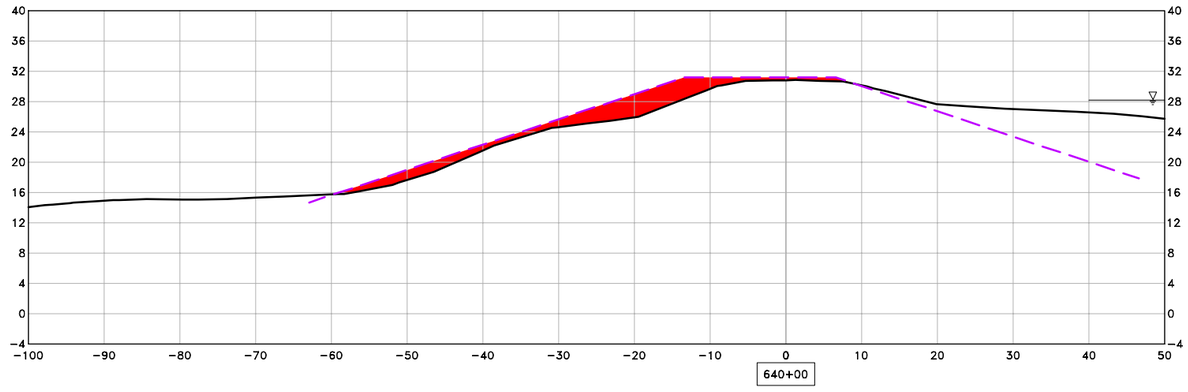
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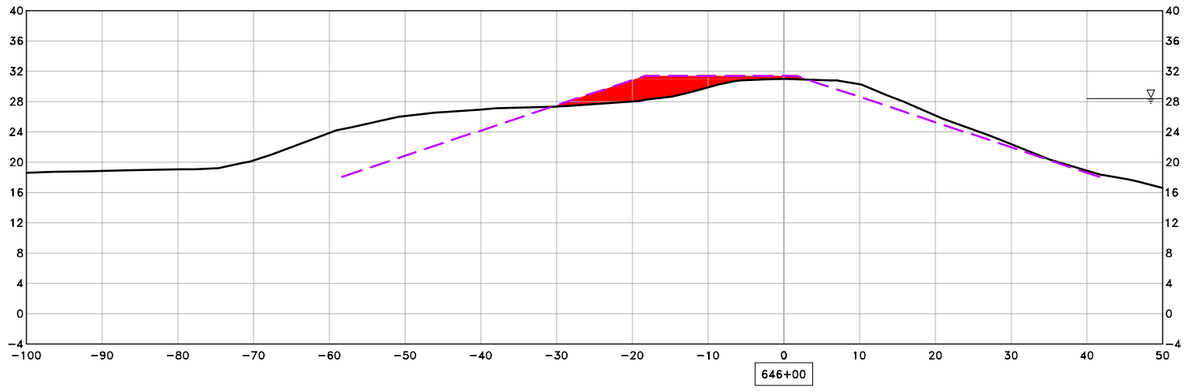
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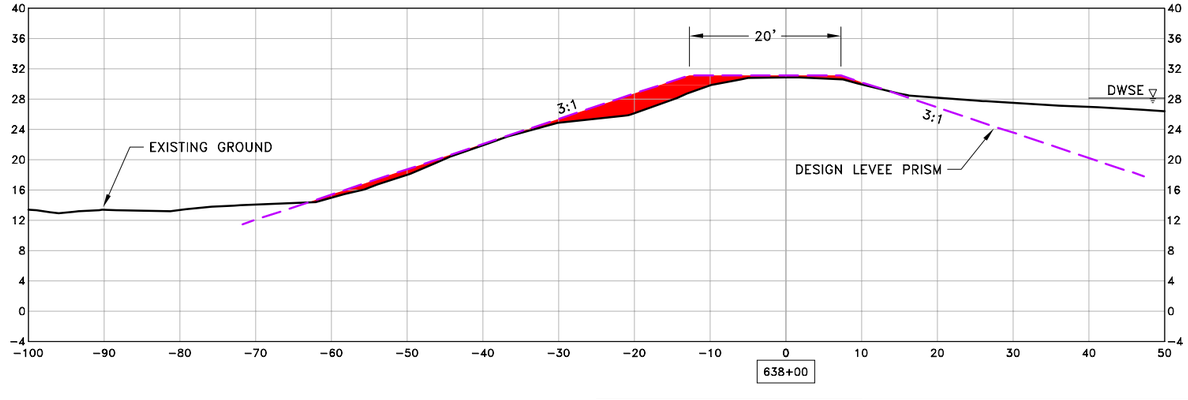
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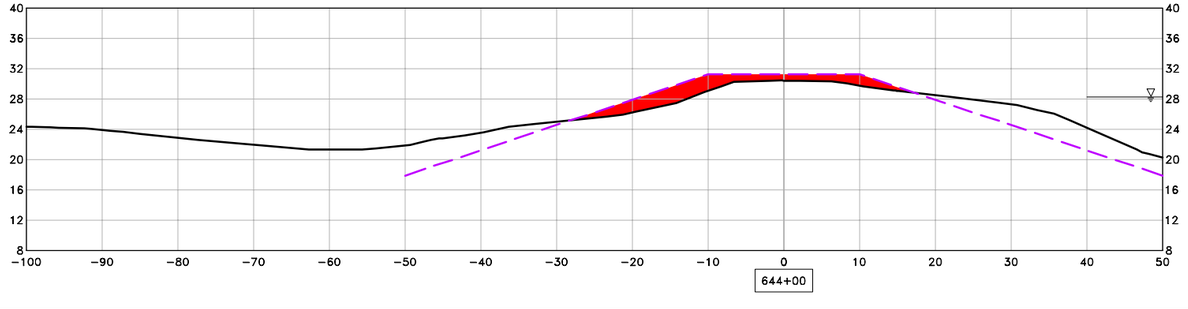












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NORTH ORIENTATION

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

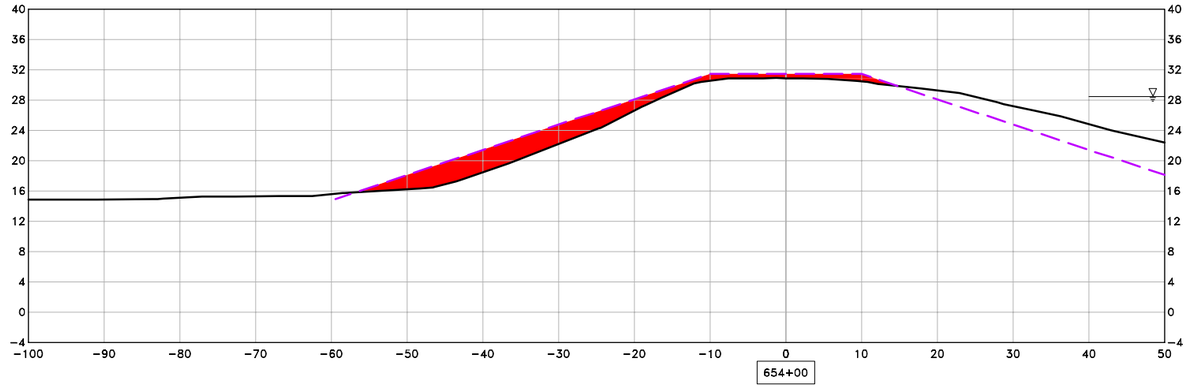
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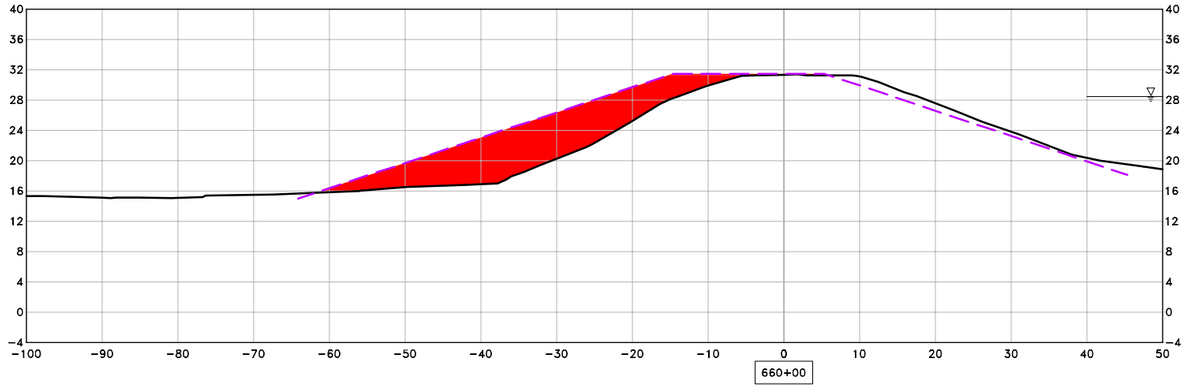
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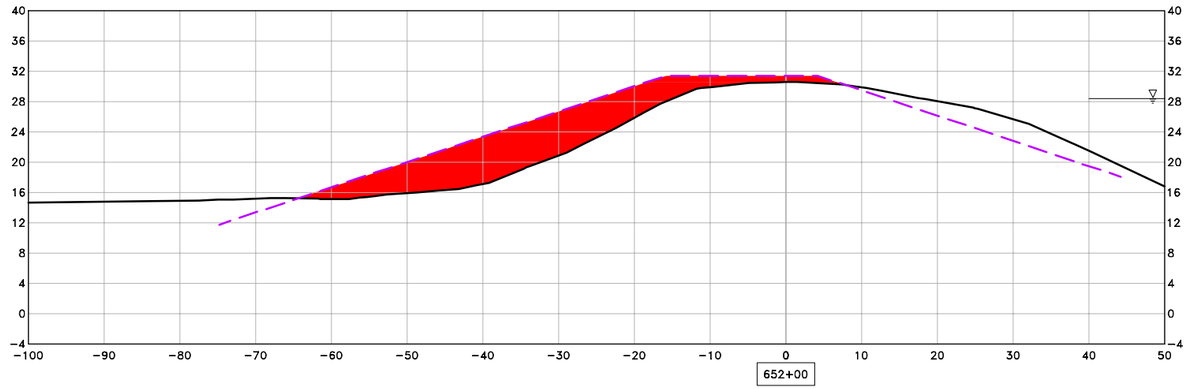
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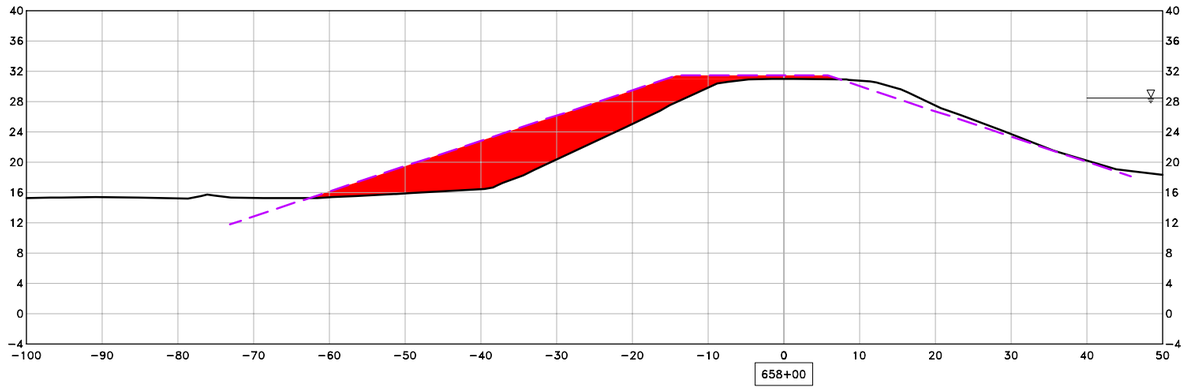
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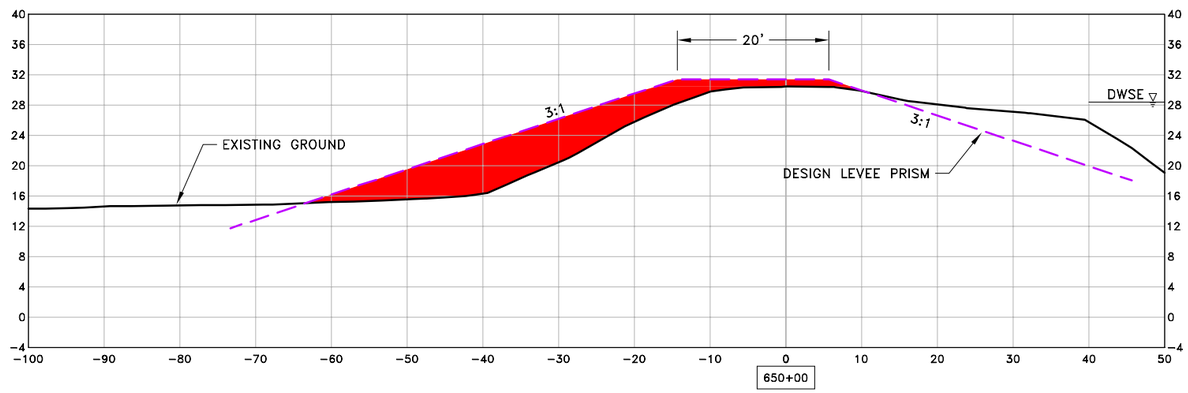
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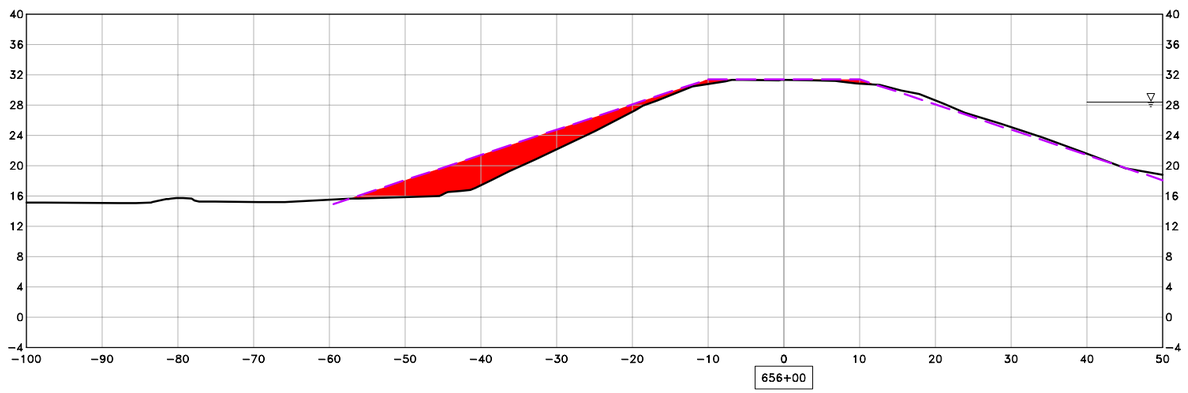












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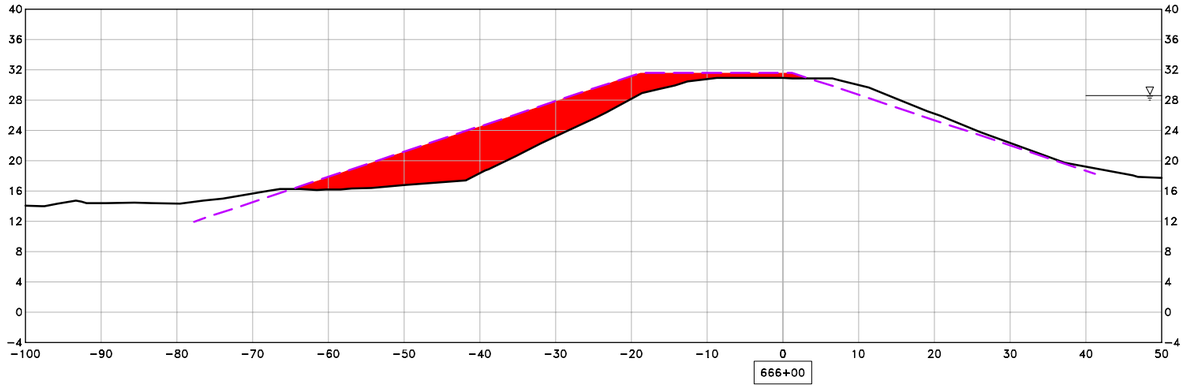
ALL OTHER LEVEE DESIGN SECTION VIEW

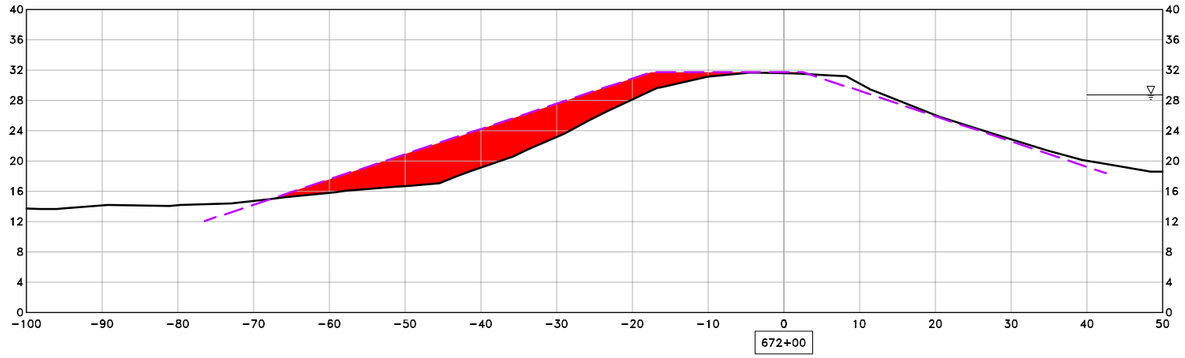
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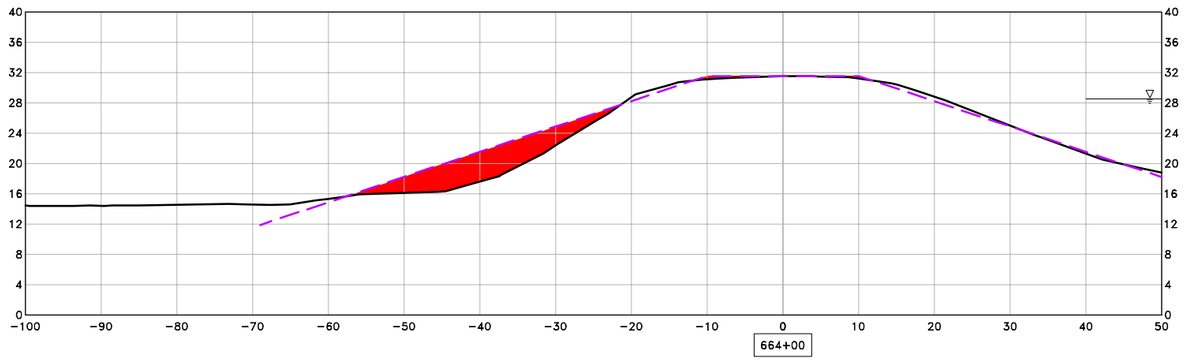
DATE
DECEMBER 11, 2019

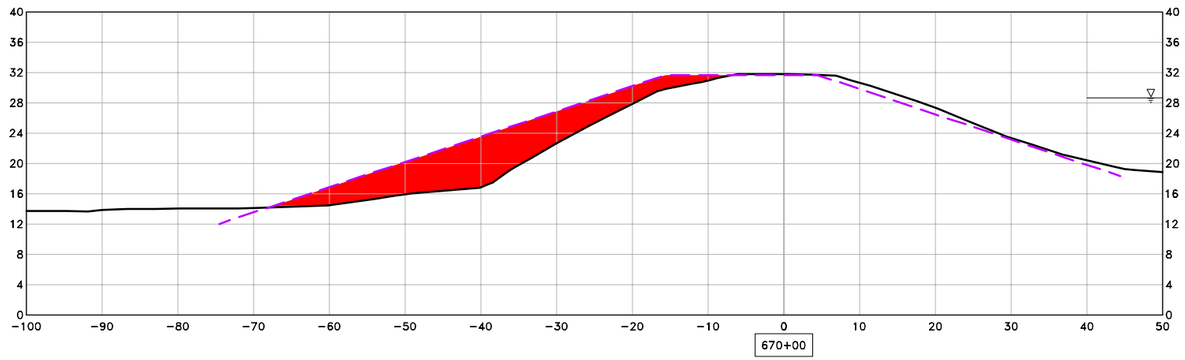
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C2-308
SHEET 90 OF 136

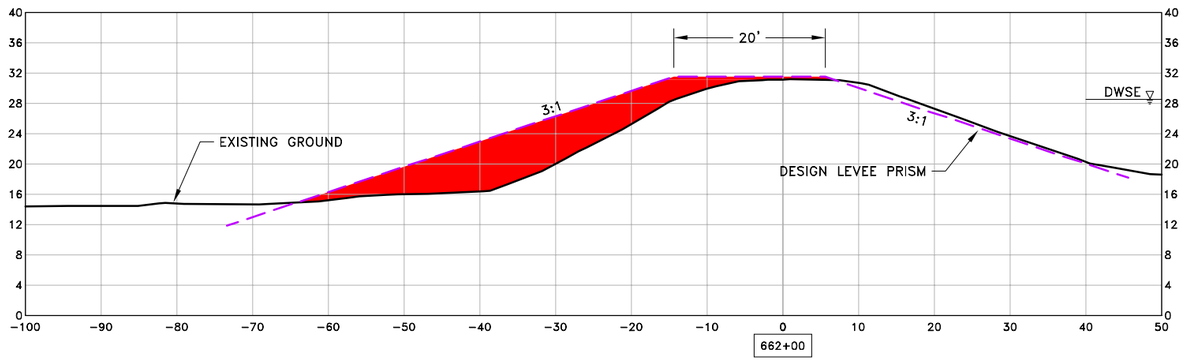
KSN PROJECT FILE NO.
2255-0050

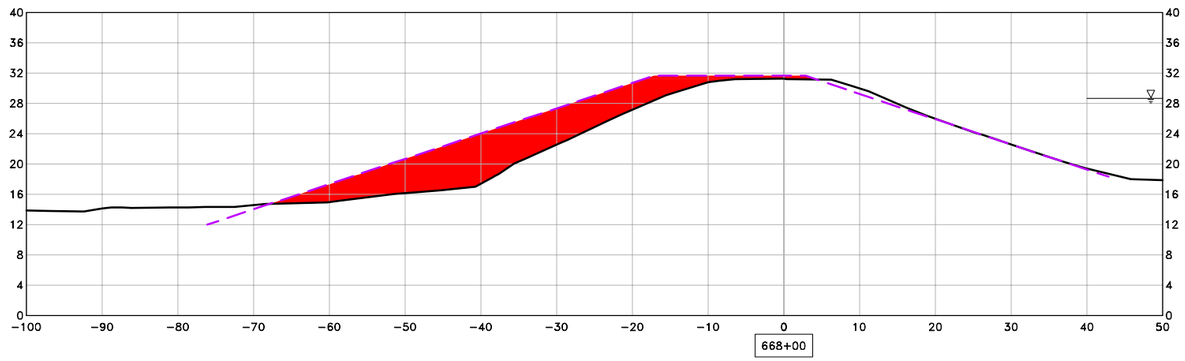












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 3:59pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

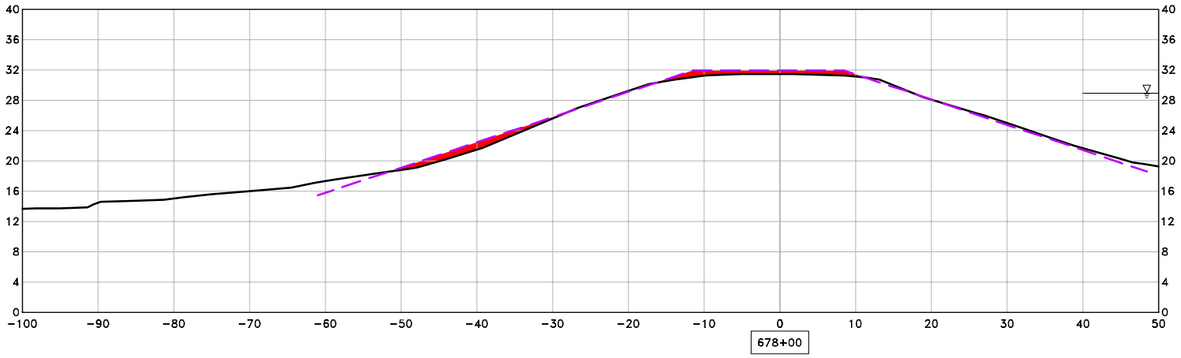
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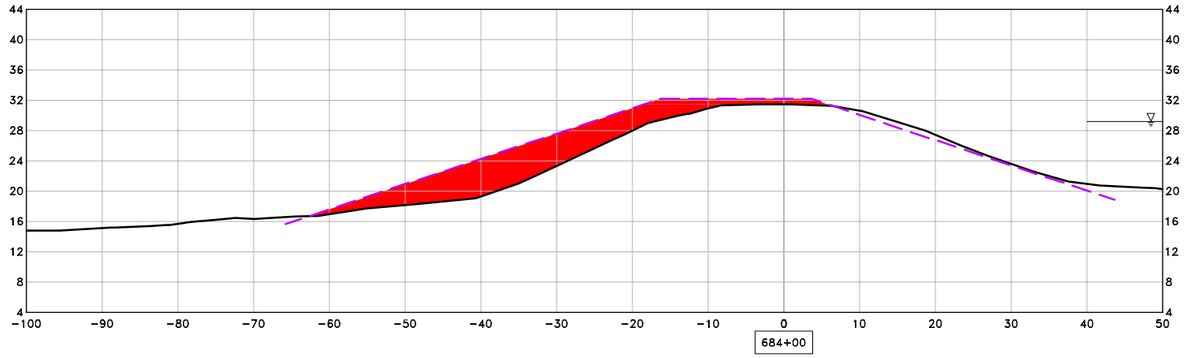
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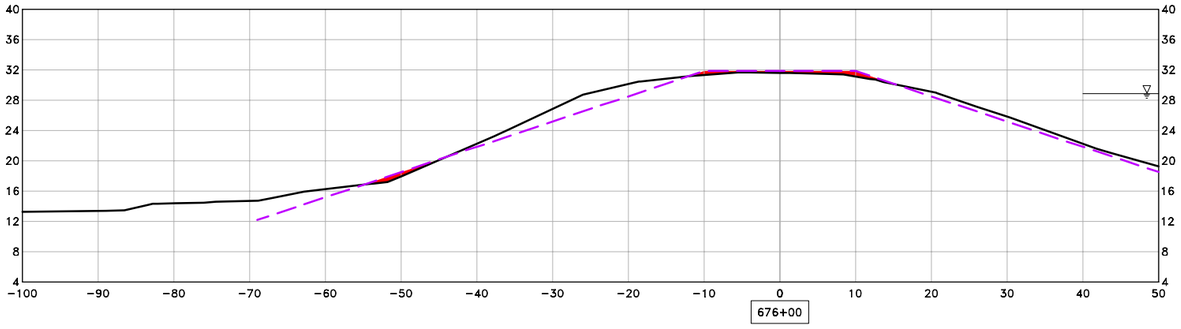
DATE
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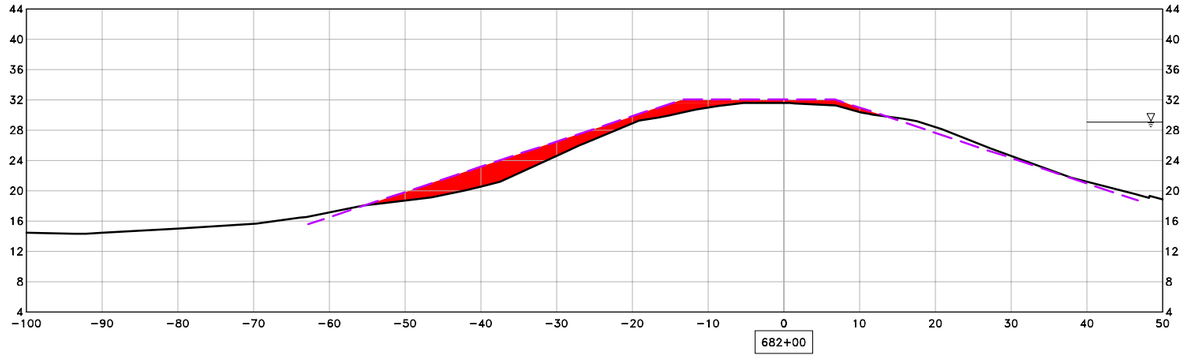
SHEET IDENTIFICATION
C2-309
SHEET 91 OF 136

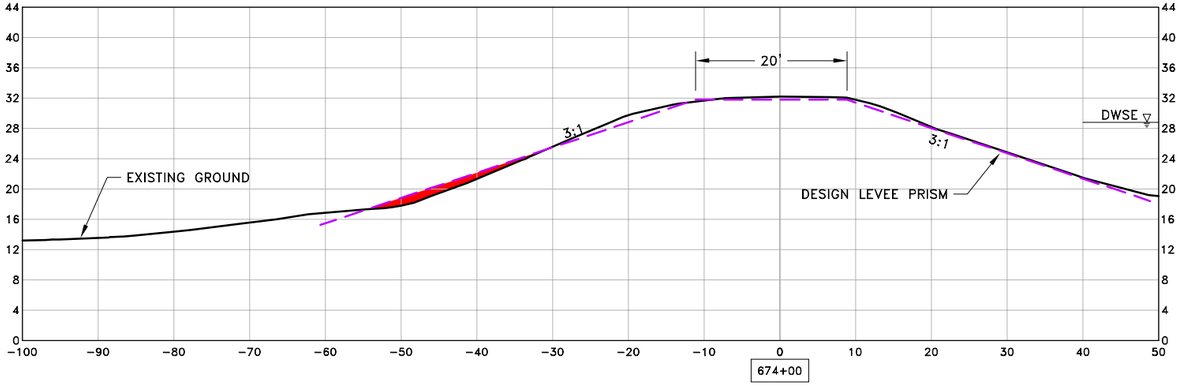
KSN PROJECT FILE NO.
2255-0050

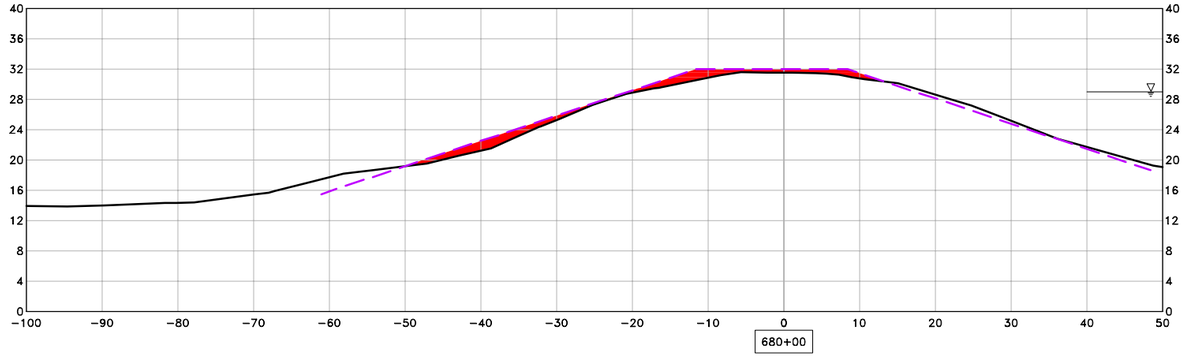












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NORTH ORIENTATION

PROJECT ENGINEER

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NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
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ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

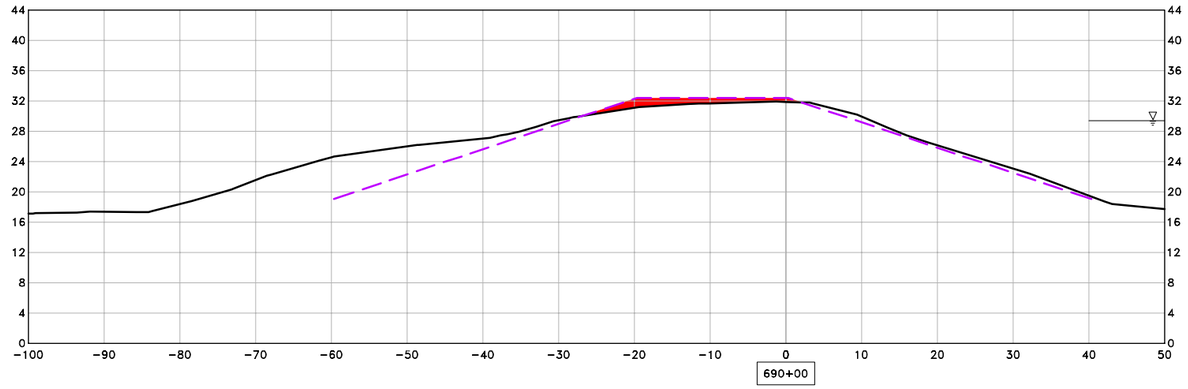
ALL OTHER LEVEE DESIGN SECTION VIEW

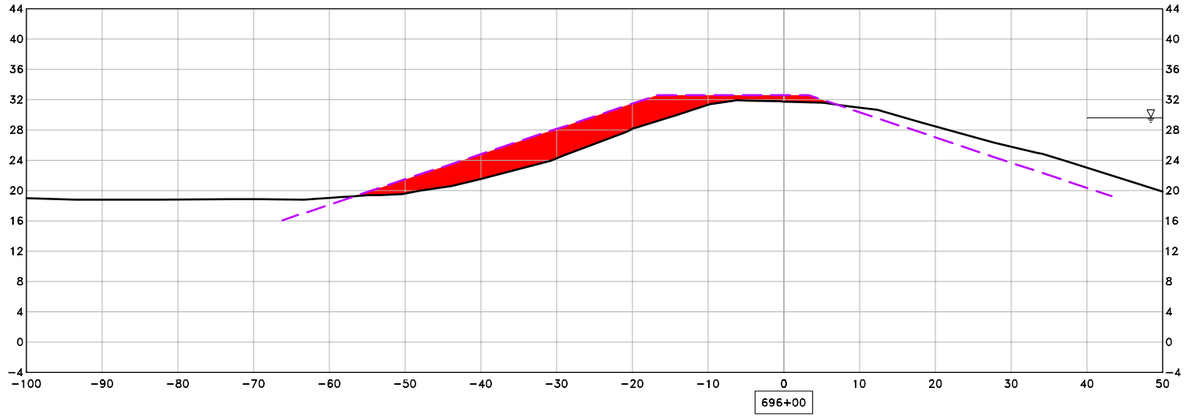
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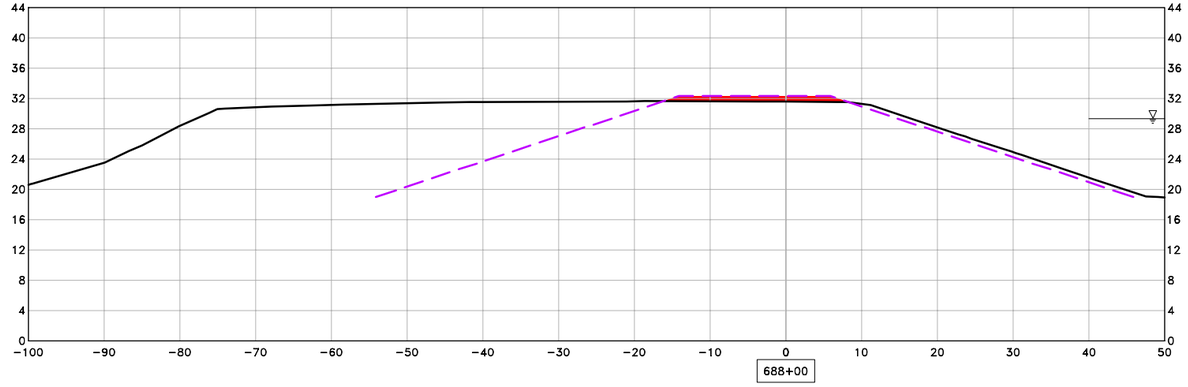
DATE
DECEMBER 11, 2019

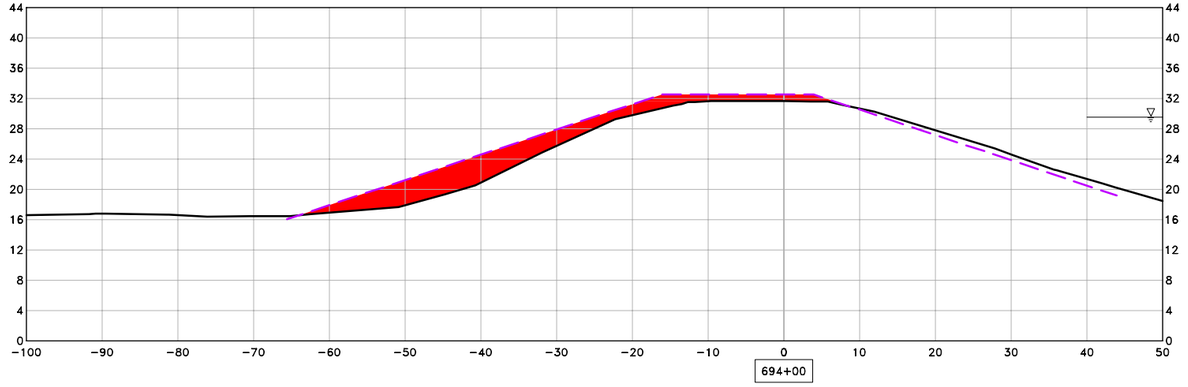
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C2-310
SHEET 92 OF 136

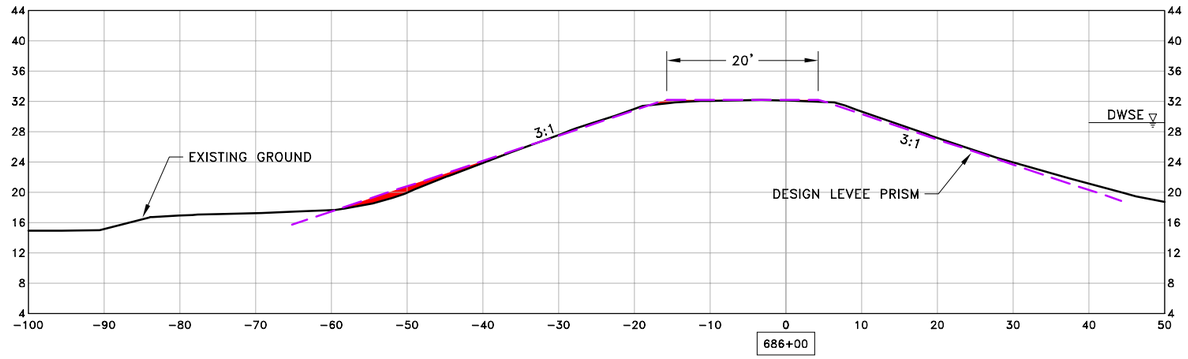
KSN PROJECT FILE NO.
2255-0050

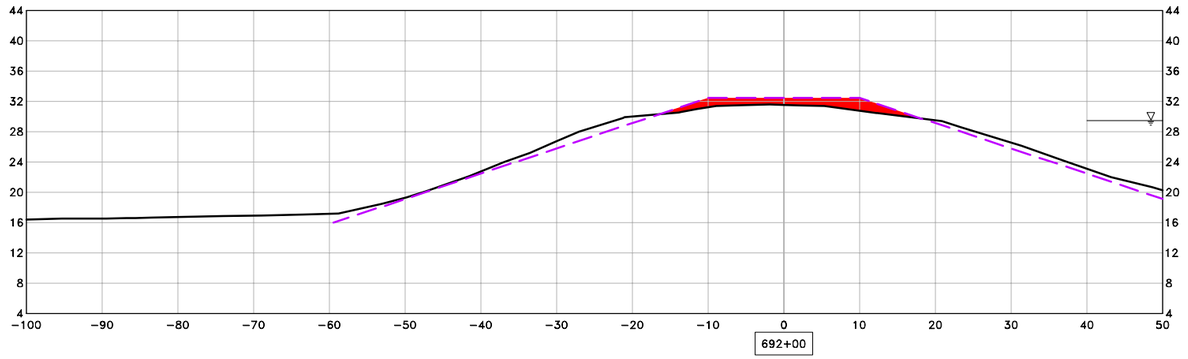












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NORTH ORIENTATION

PROJECT ENGINEER

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DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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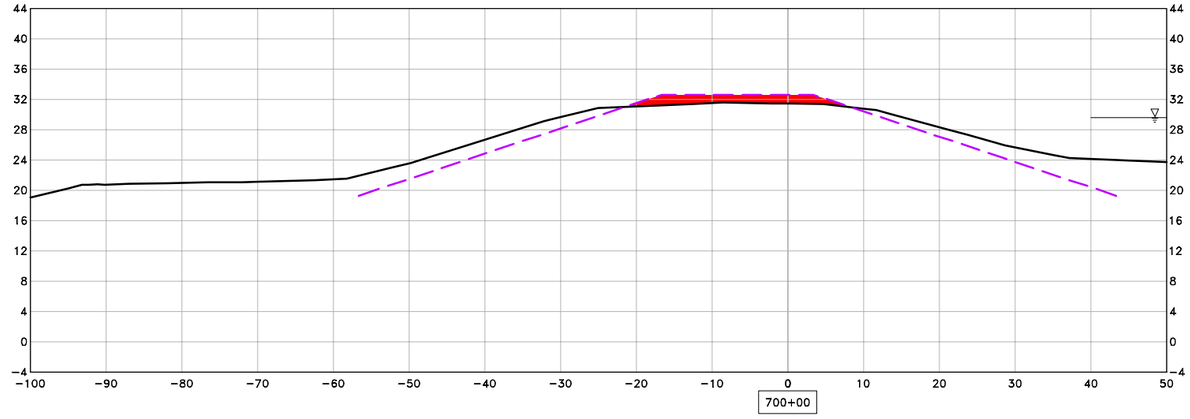
ALL OTHER LEVEE DESIGN SECTION VIEW

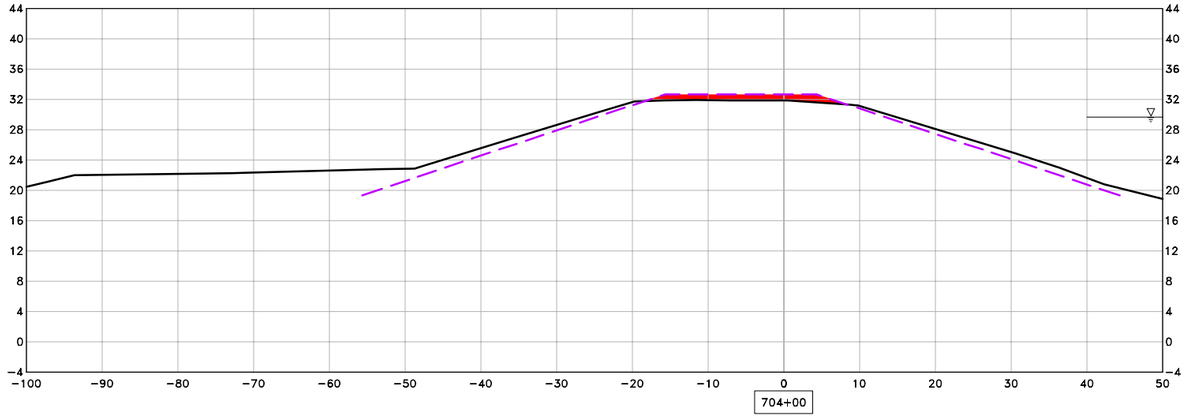
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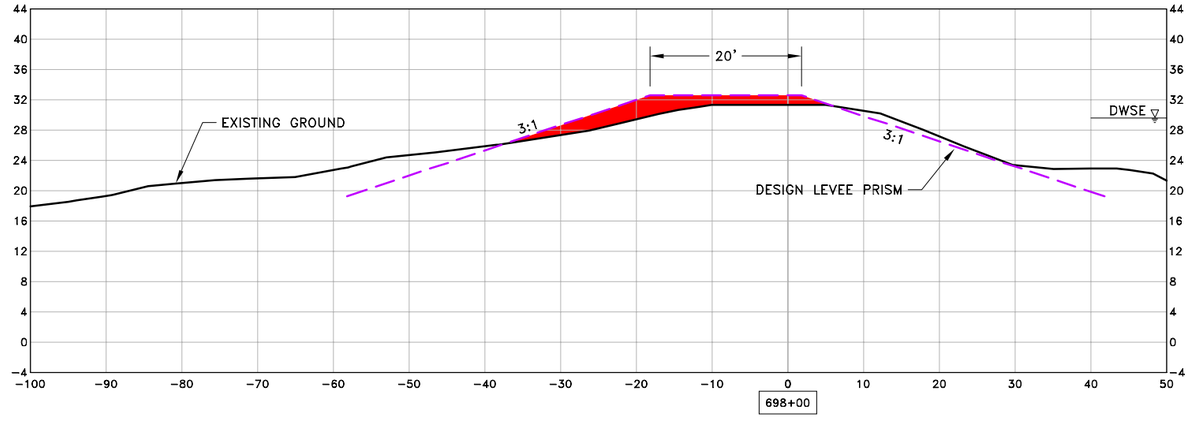
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DECEMBER 11, 2019

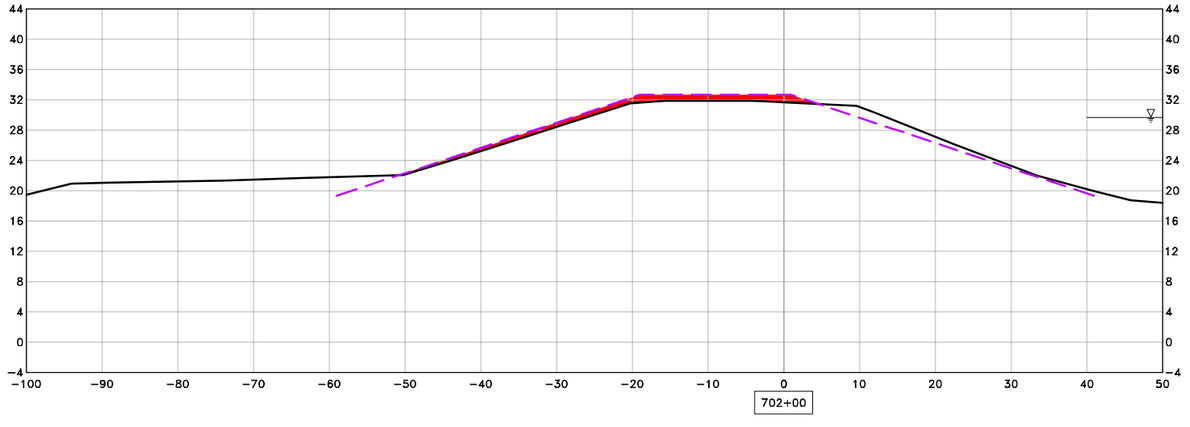
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C2-311
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KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:00pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

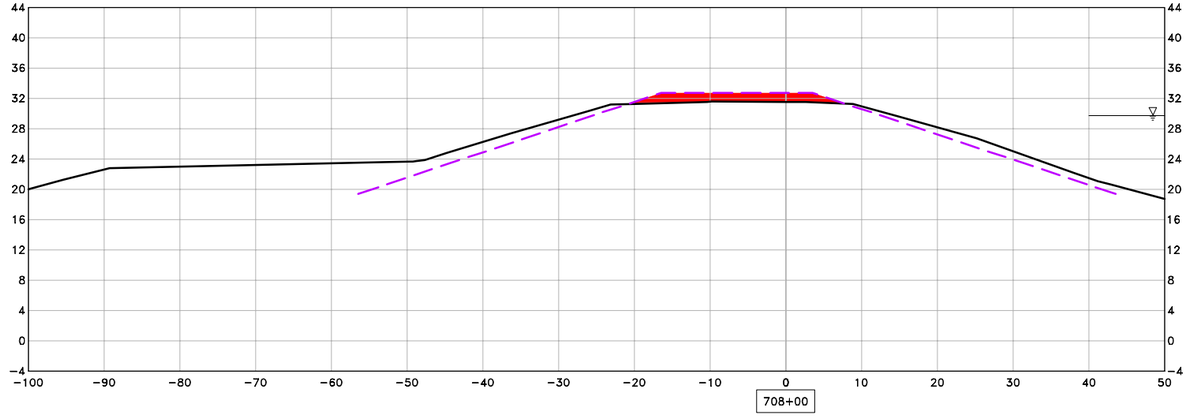
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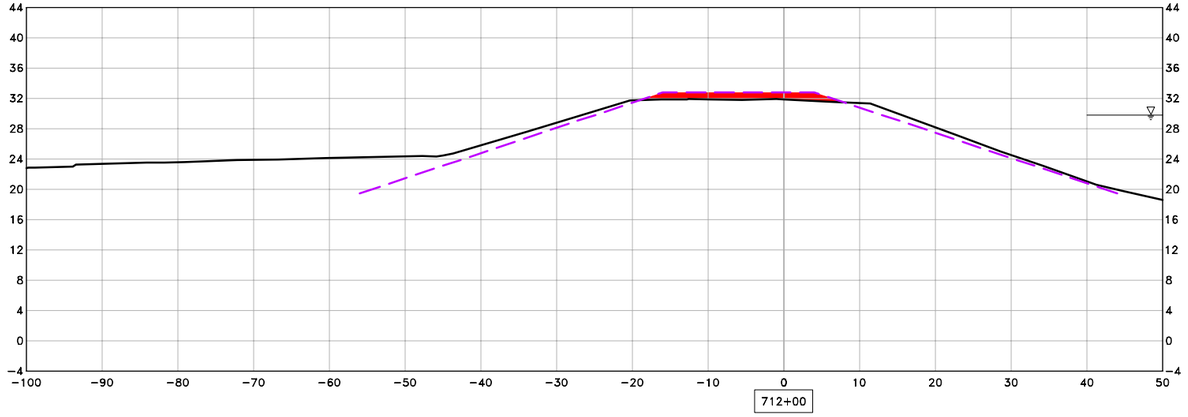
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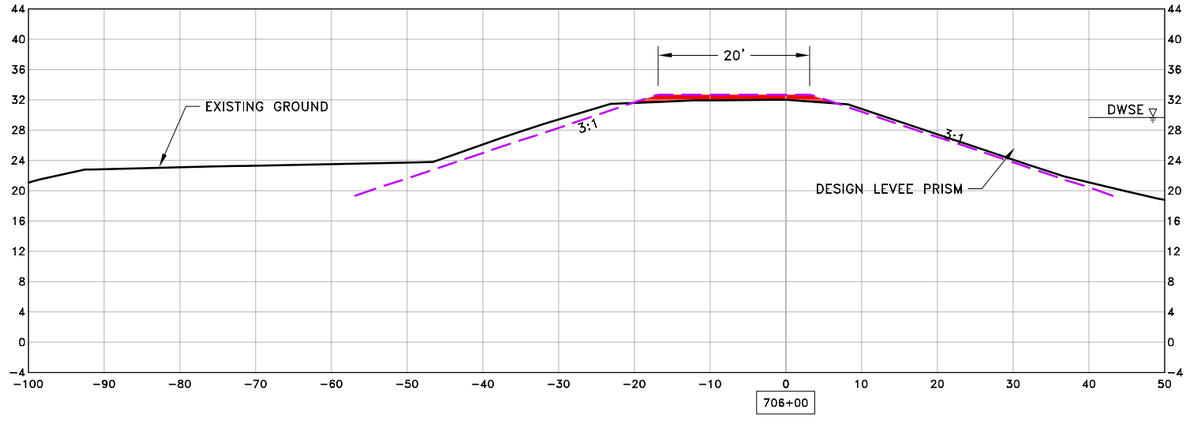
DATE
DECEMBER 11, 2019

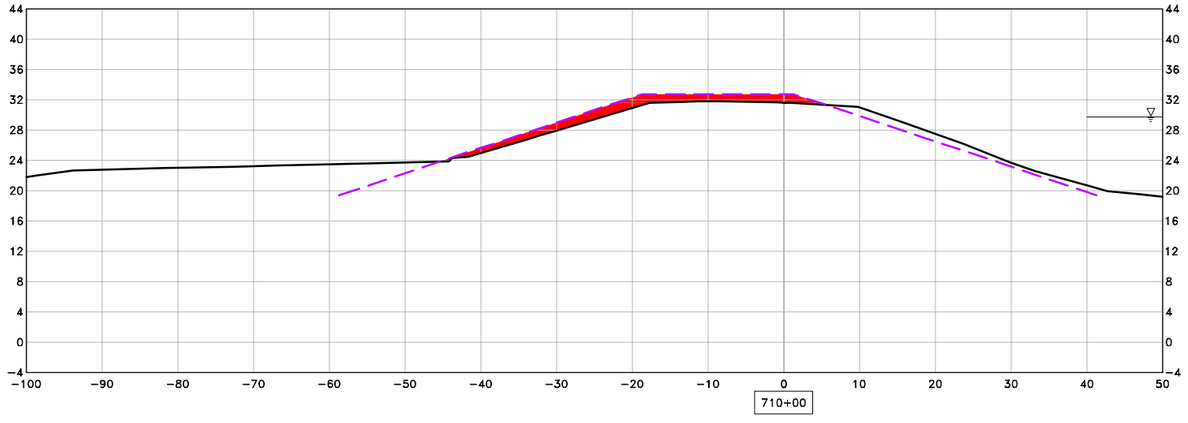
SHEET IDENTIFICATION
C2-312
SHEET 94 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:00pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

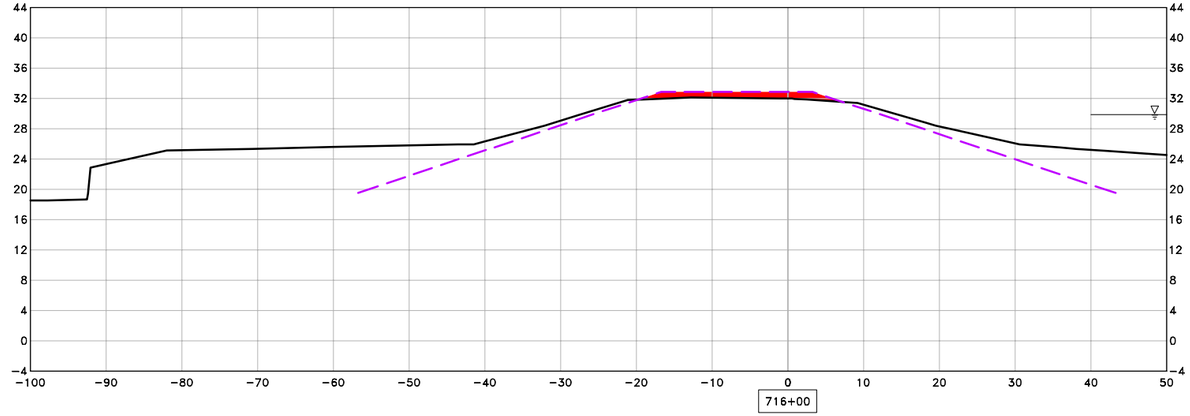
ALL OTHER LEVEE DESIGN SECTION VIEW

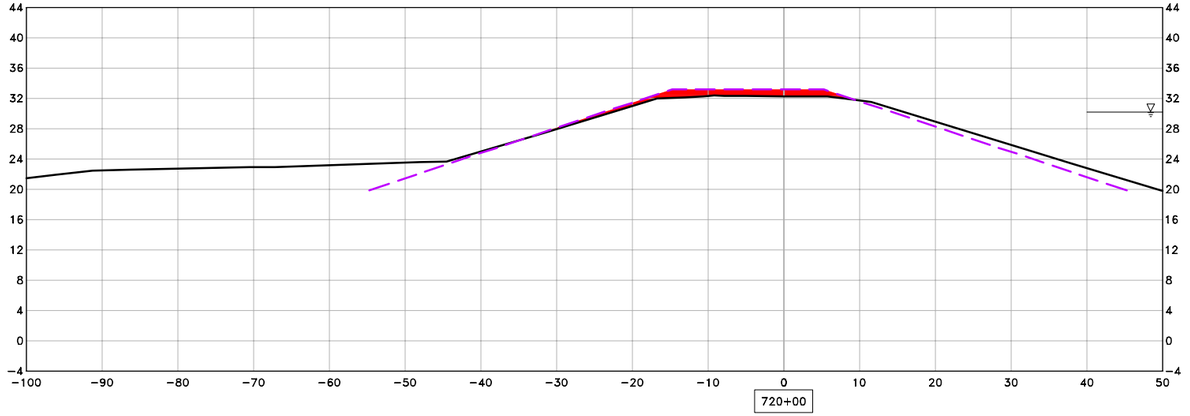
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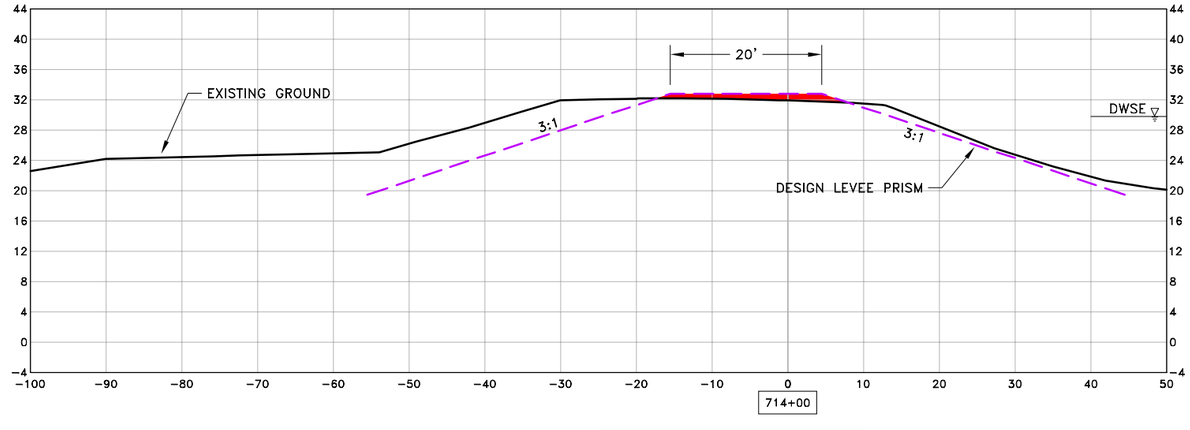
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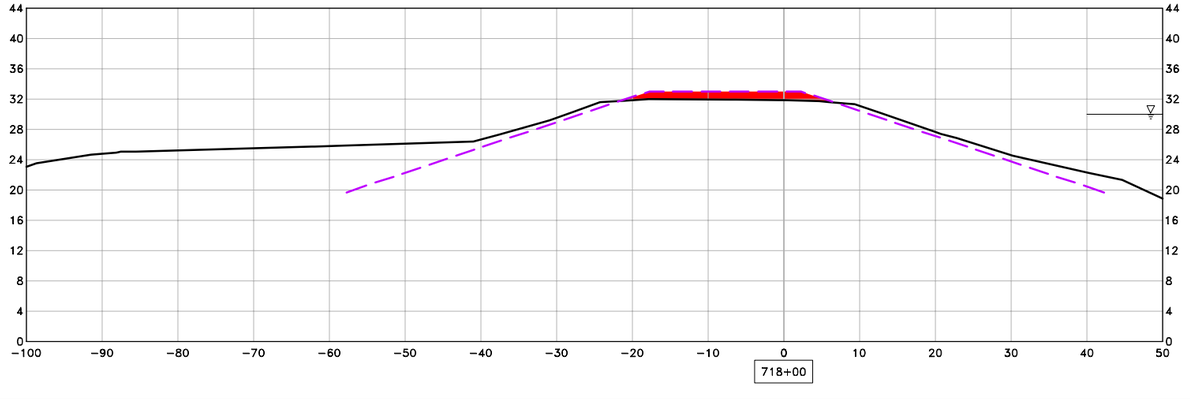
SHEET IDENTIFICATION C2-313
SHEET 95 OF 136

KSN PROJECT FILE NO. 2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:01pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

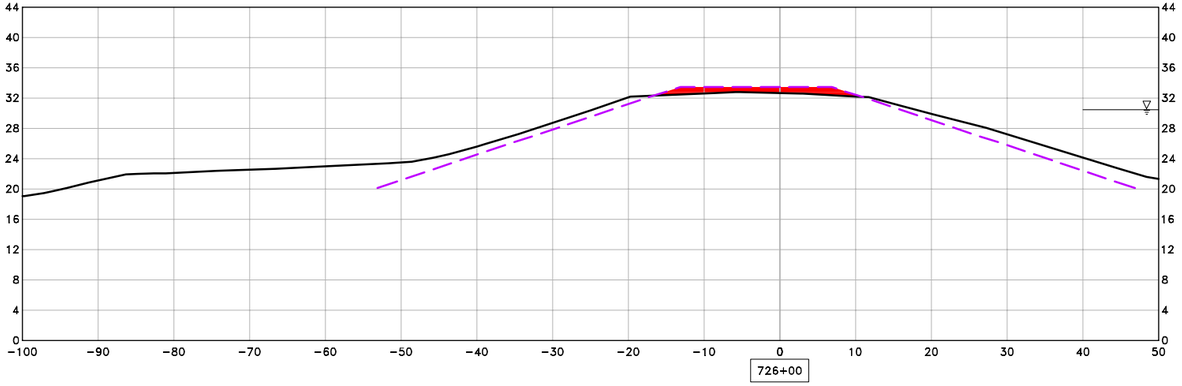
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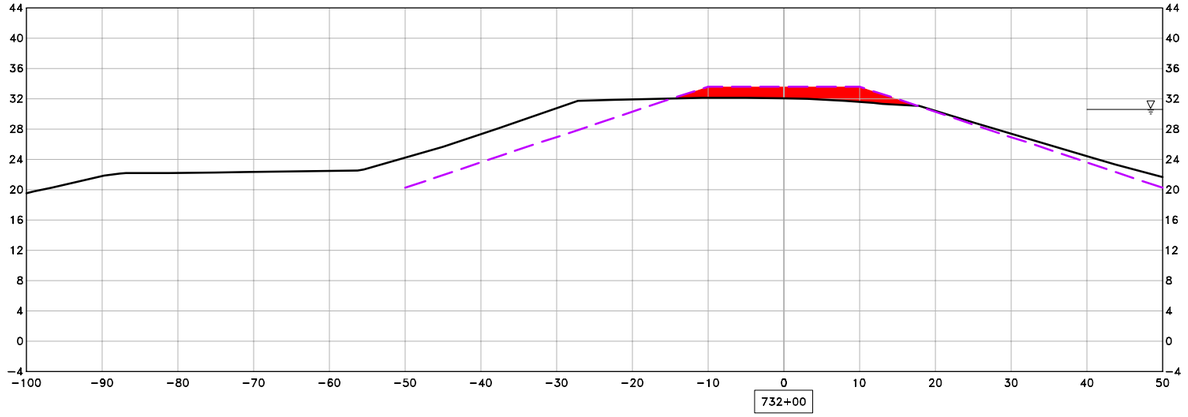
DATE DECEMBER 11, 2019

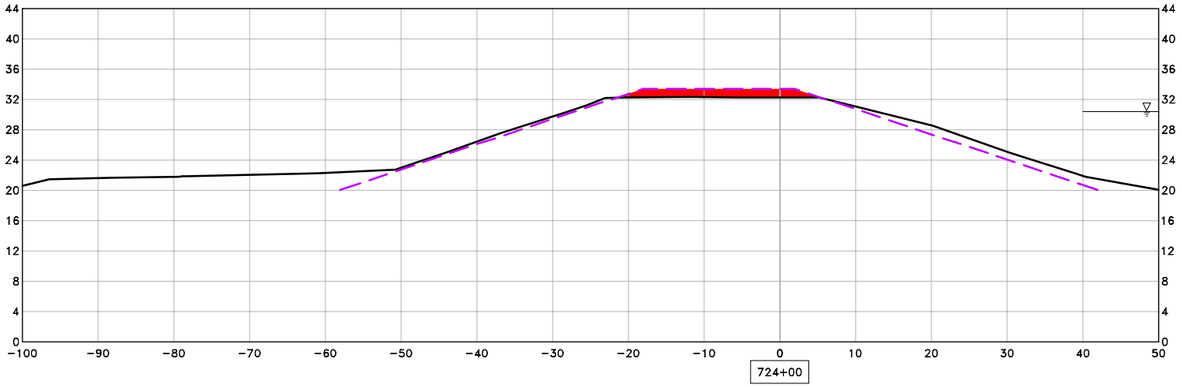
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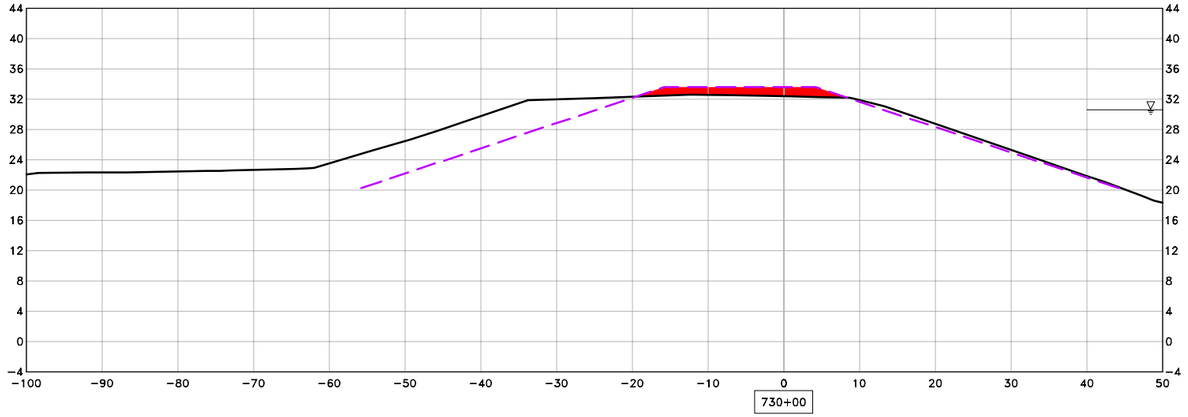
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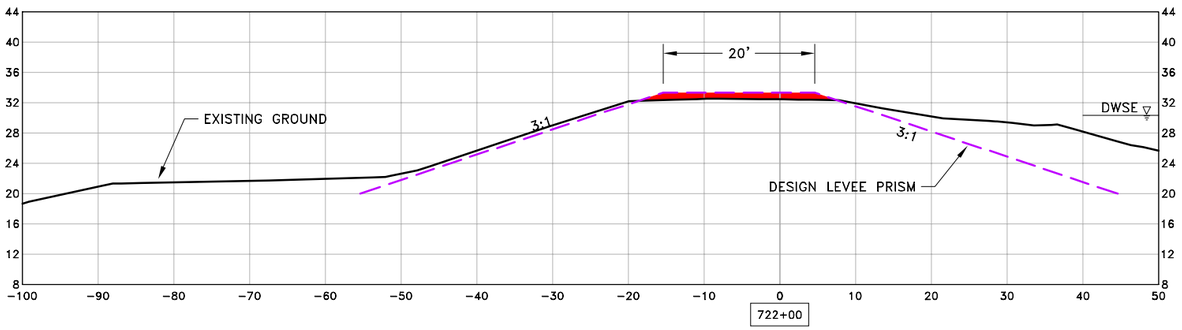
KSN PROJECT FILE NO. 2255-0050

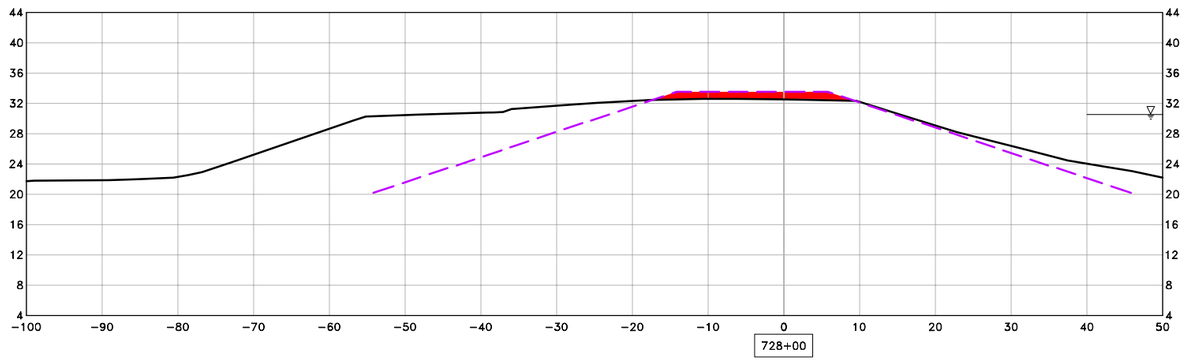












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NORTH ORIENTATION

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DRAWING SCALE 1" = 10'

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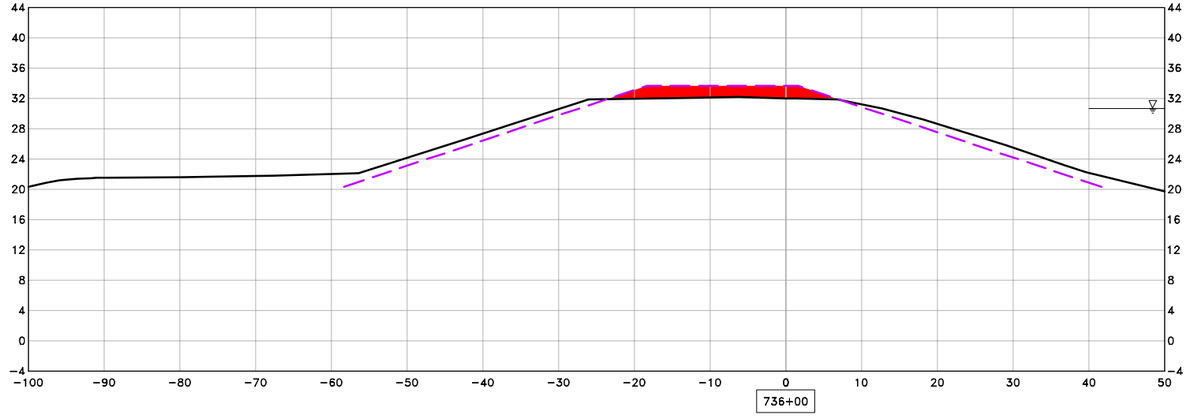
ALL OTHER LEVEE DESIGN SECTION VIEW

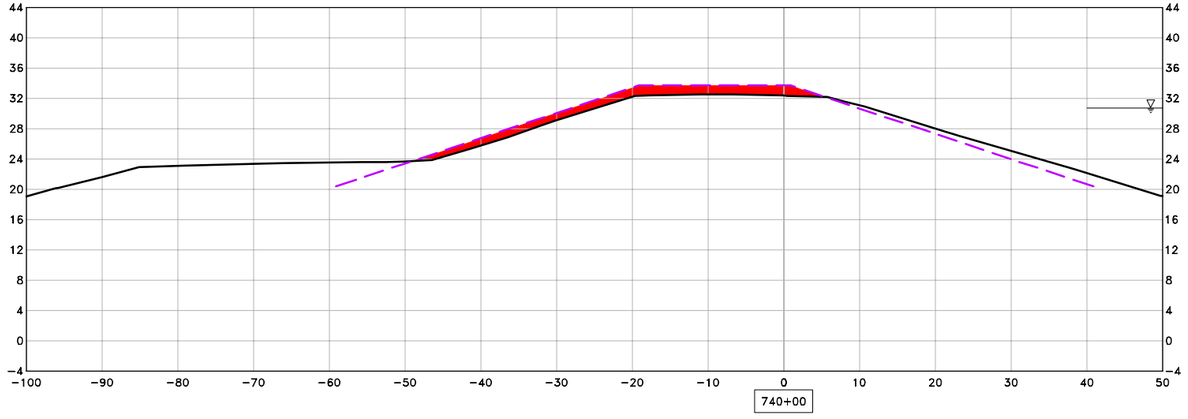
STA 722+00 TO STA 734+00

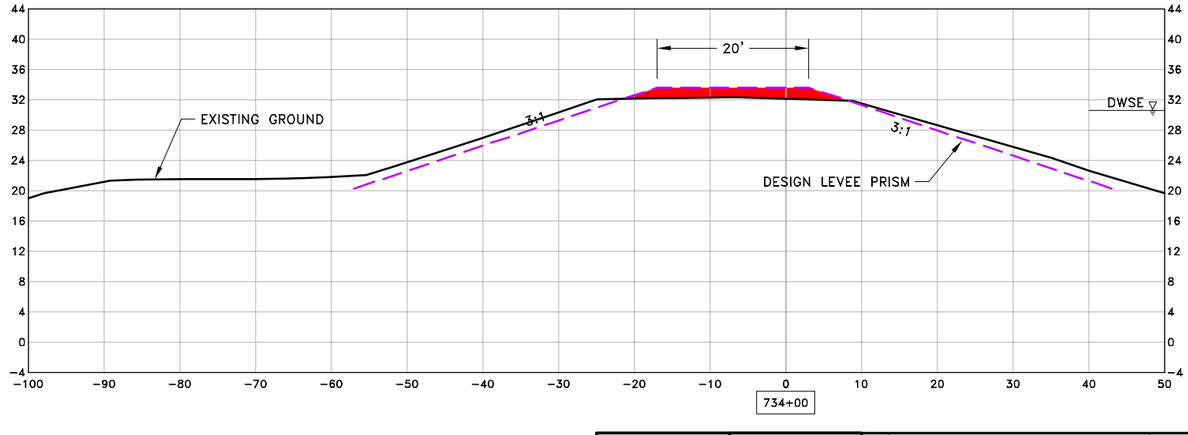
DATE
DECEMBER 11, 2019

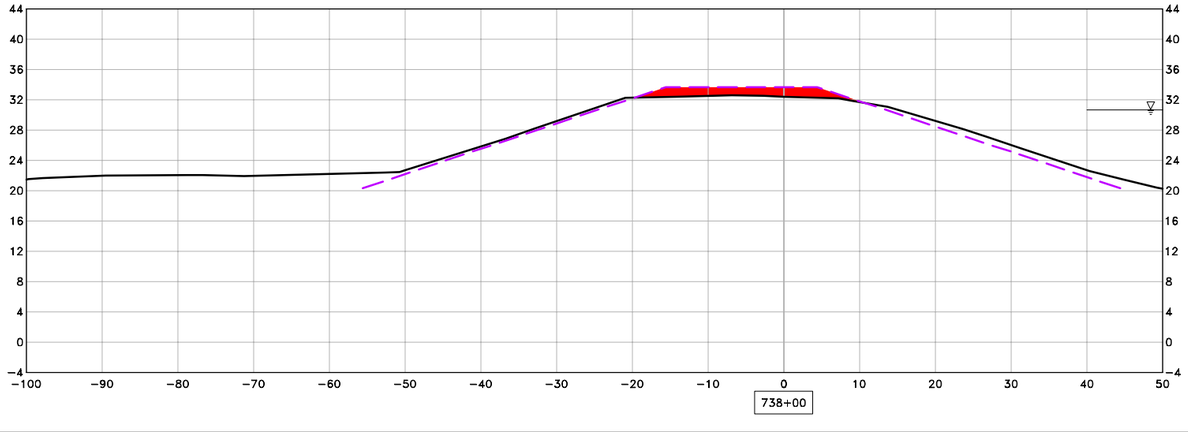
SHEET IDENTIFICATION
C2-315
SHEET 97 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:02pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

KJELDSEN SINNOCK NEUDECK
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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

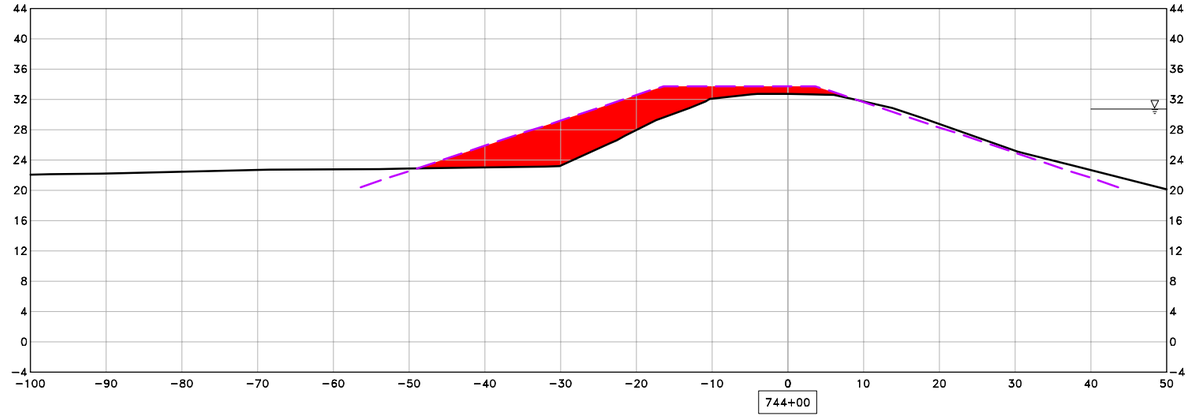
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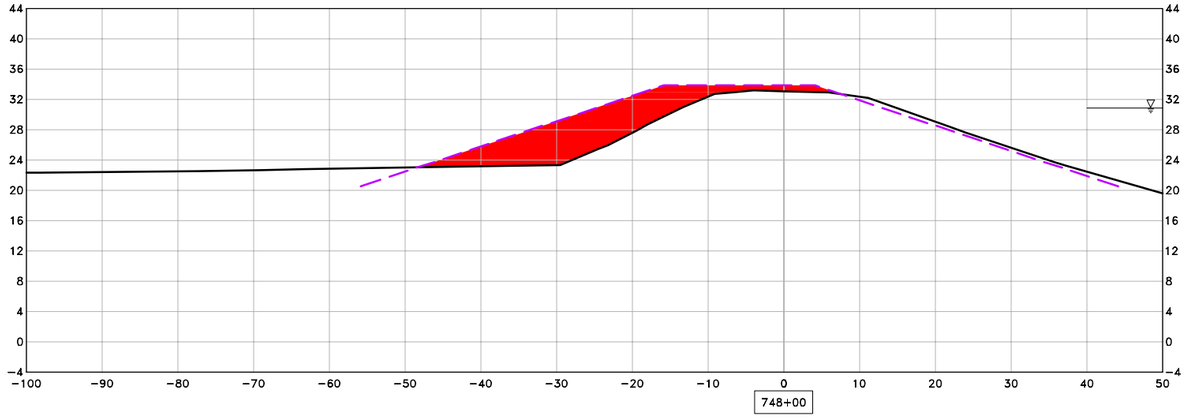
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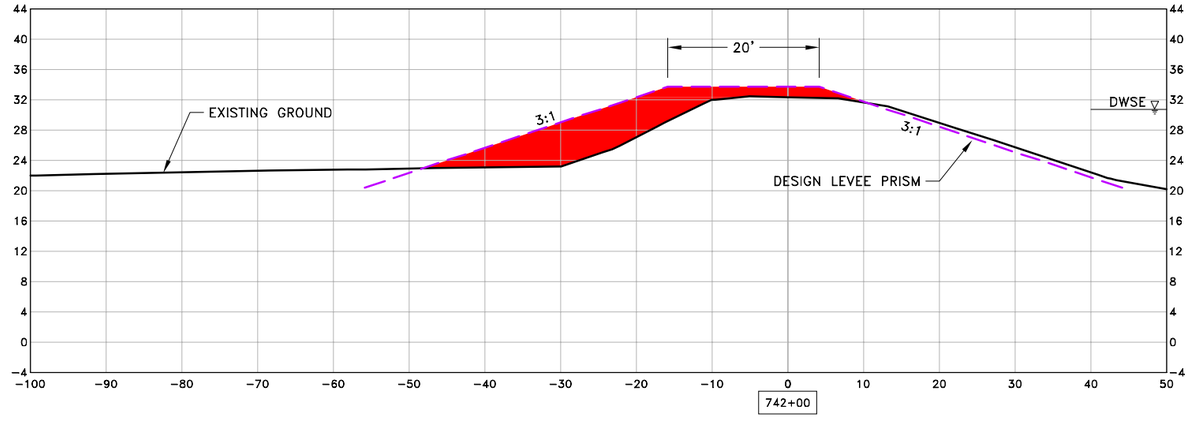
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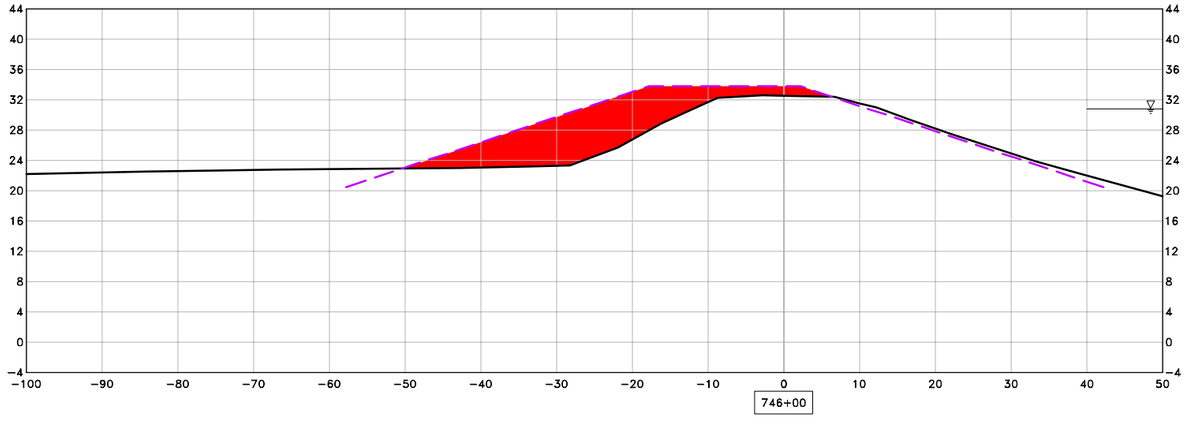
SHEET 98 OF 136

KSN PROJECT FILE NO. 2255-0050









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SJAFCA - MOSSDALE TRACT AREA
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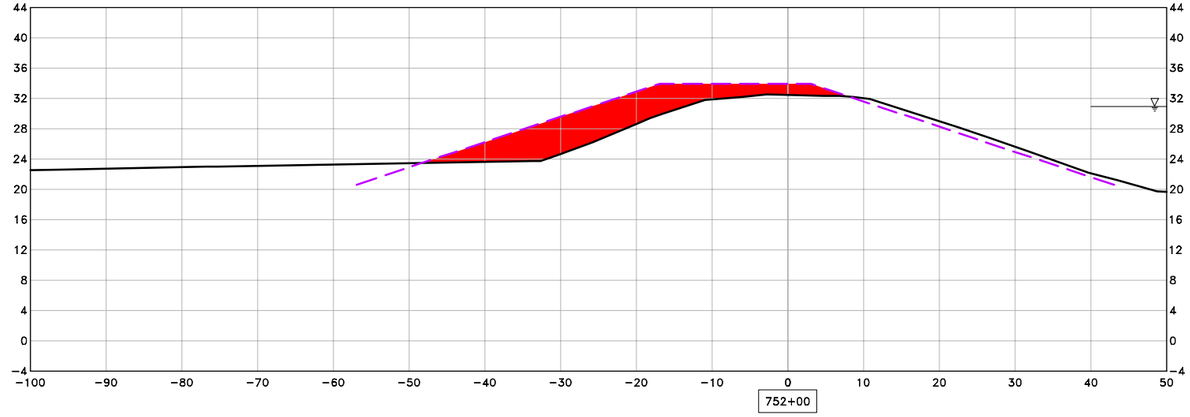
ALL OTHER LEVEE DESIGN SECTION VIEW

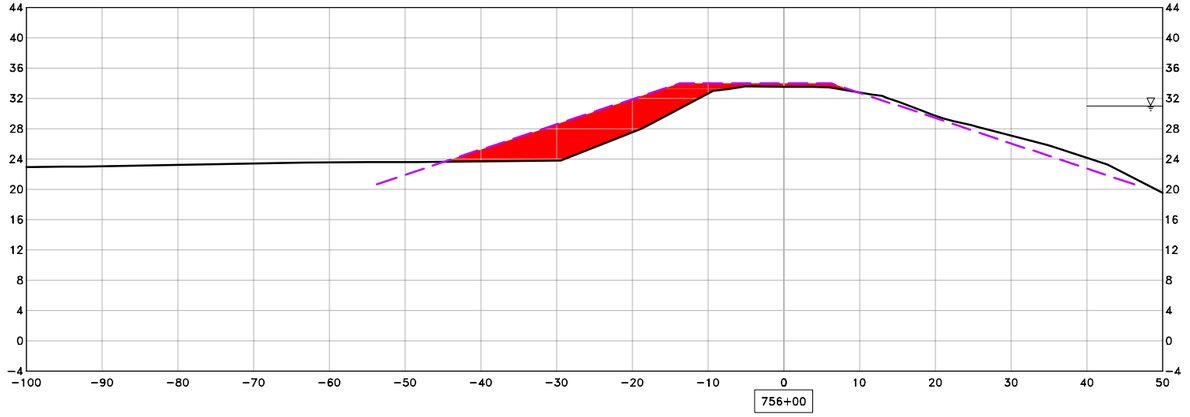
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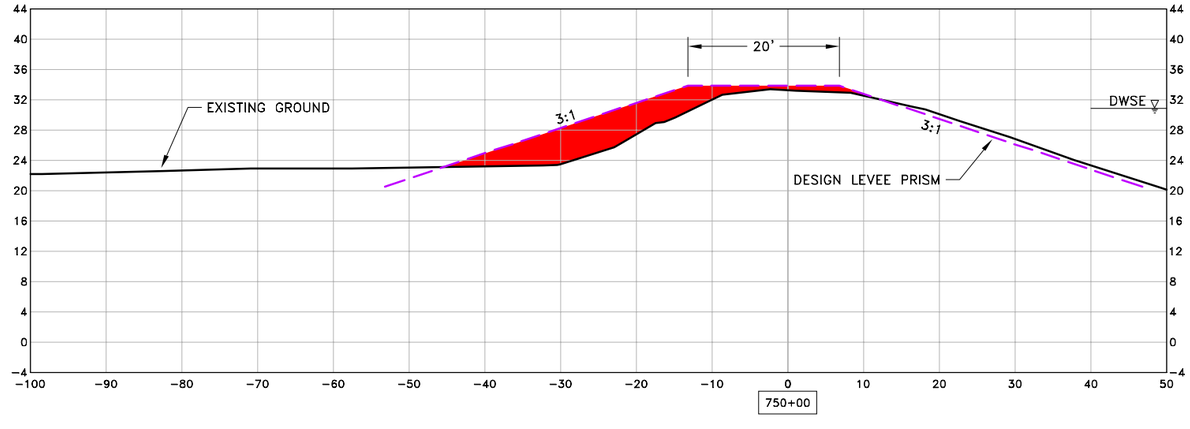
DATE DECEMBER 11, 2019

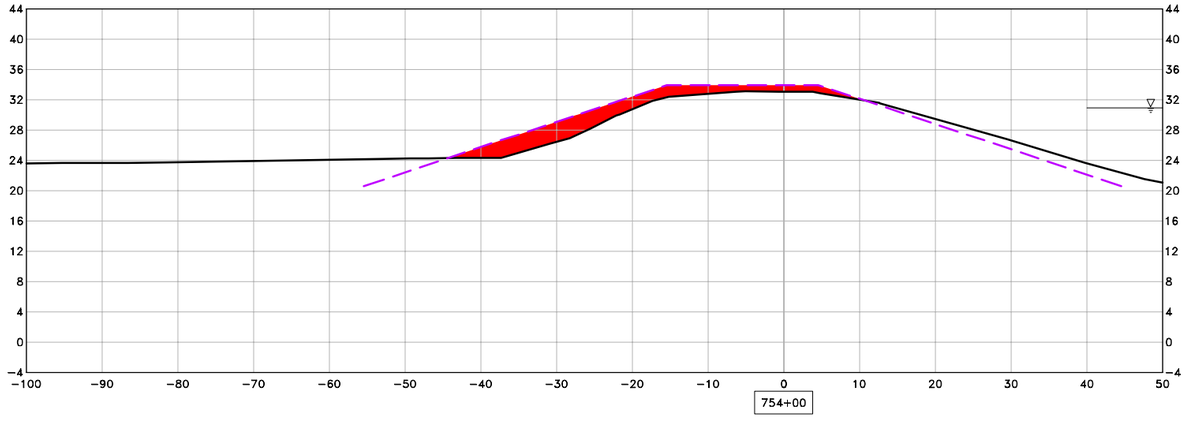
SHEET IDENTIFICATION C2-317
SHEET 99 OF 136

KSN PROJECT FILE NO. 2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:03pm

NORTH ORIENTATION

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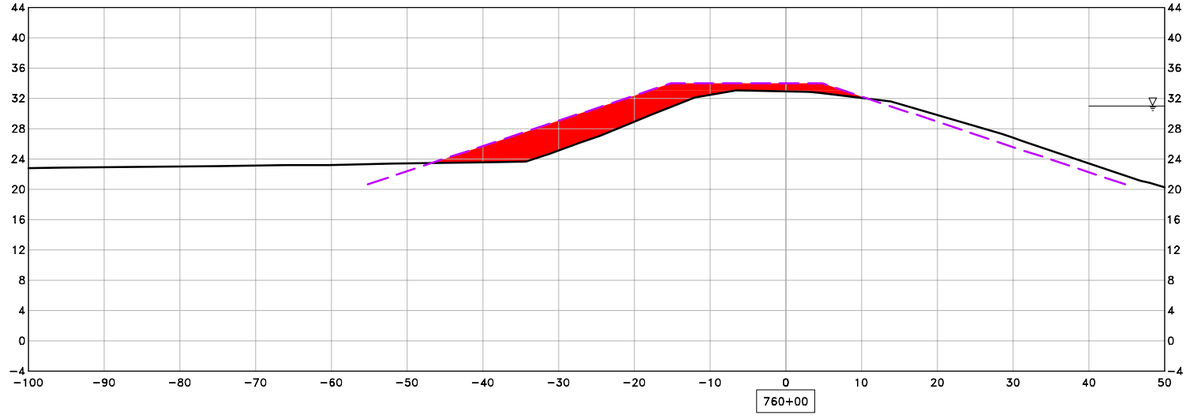
ALL OTHER LEVEE DESIGN SECTION VIEW

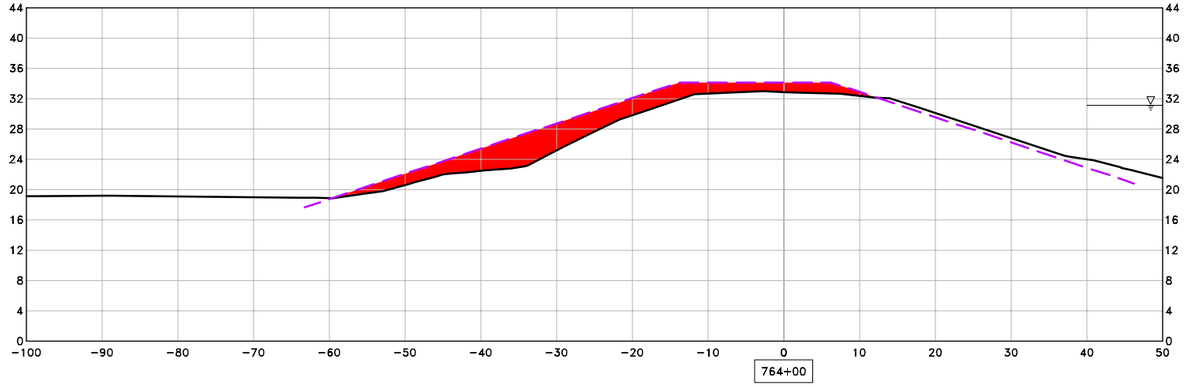
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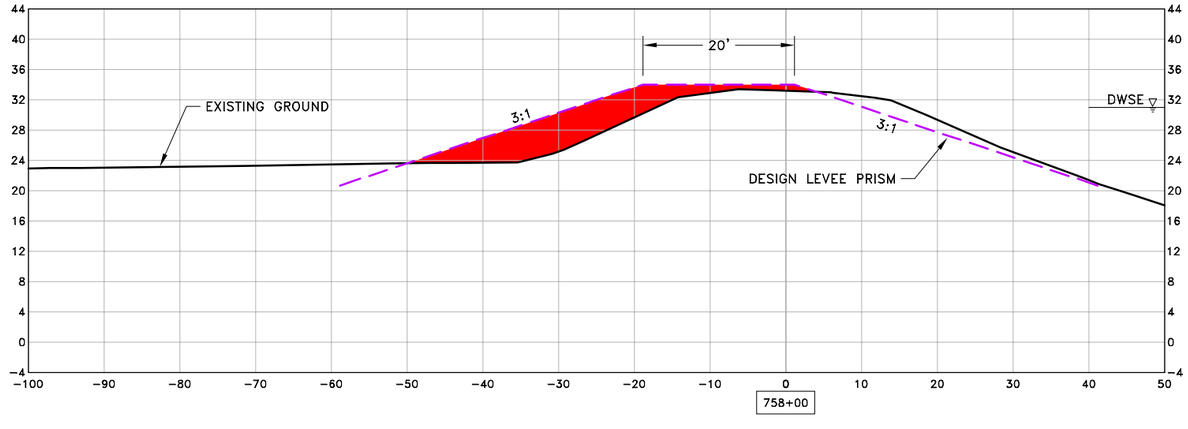
DATE DECEMBER 11, 2019

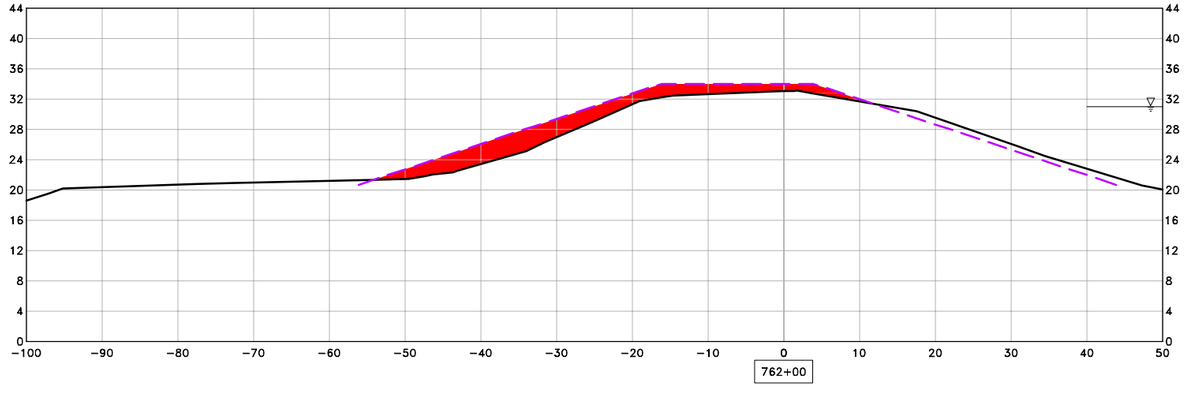
SHEET IDENTIFICATION C2-318
SHEET 100 OF 136

KSN PROJECT FILE NO. 2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:03pm

NORTH ORIENTATION

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CHECK BY CHN
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VERTICAL DATUM NAVD88

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SJAFCA - MOSSDALE TRACT AREA
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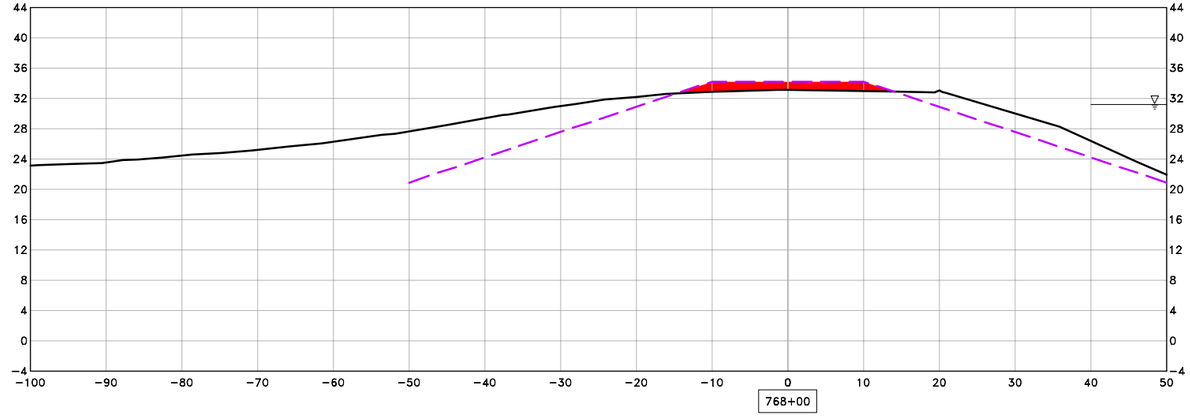
ALL OTHER LEVEE DESIGN SECTION VIEW

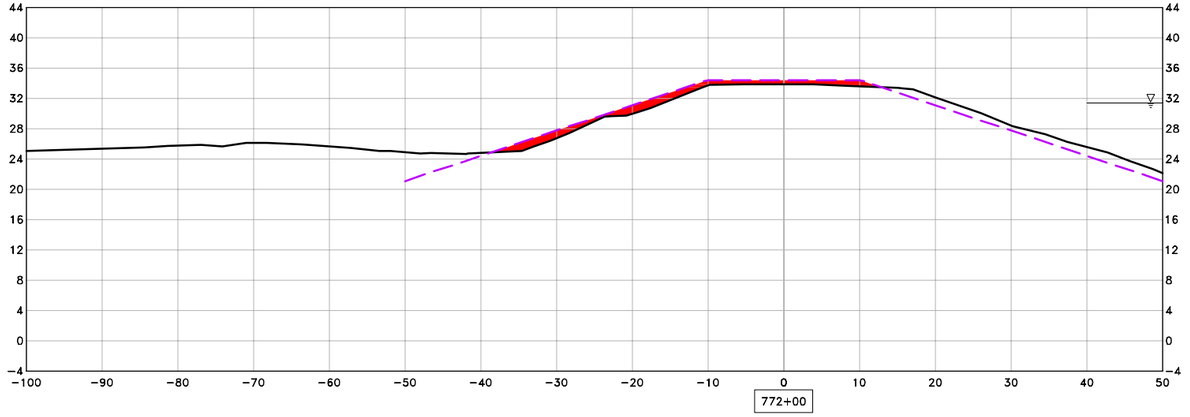
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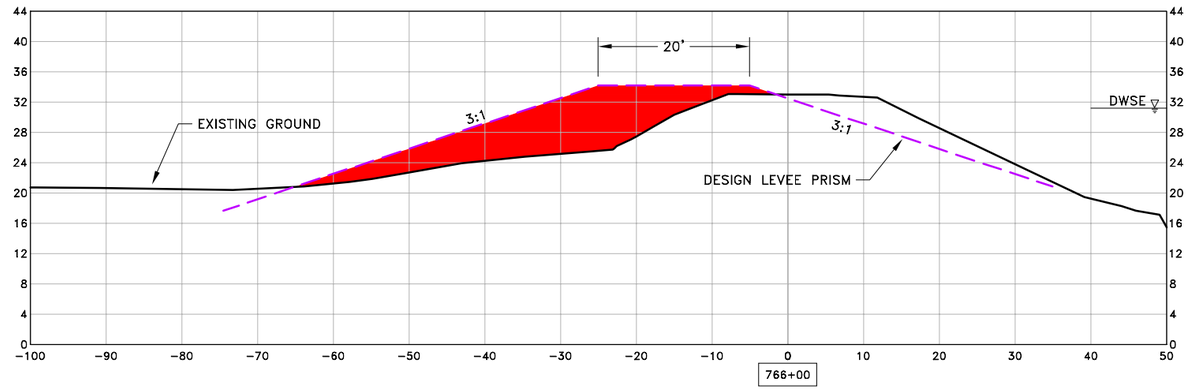
DATE DECEMBER 11, 2019

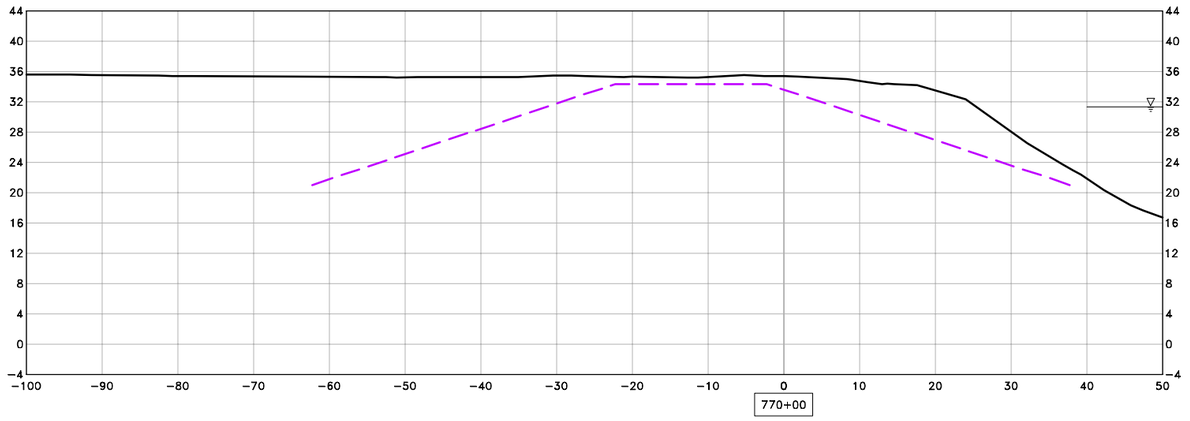
SHEET IDENTIFICATION C2-319
SHEET 101 OF 136

KSN PROJECT FILE NO. 2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
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NORTH ORIENTATION

PROJECT ENGINEER

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CHECK BY CHN
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VERTICAL DATUM NAVD88

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ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
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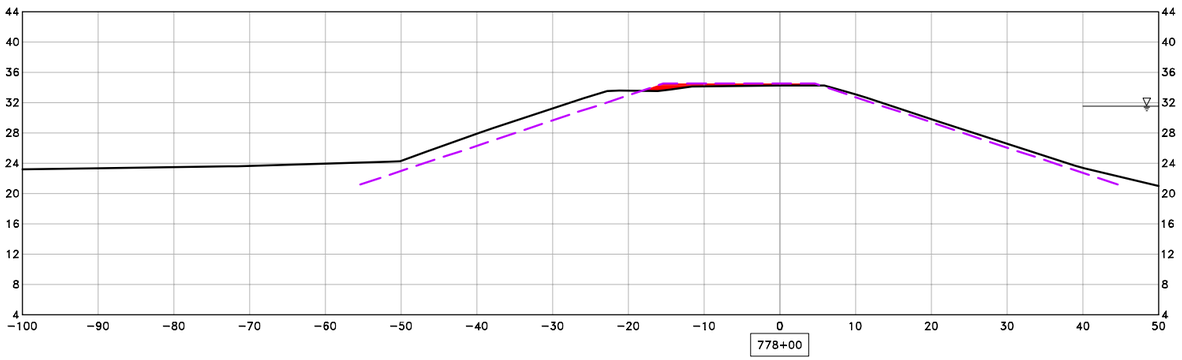
ALL OTHER LEVEE DESIGN SECTION VIEW

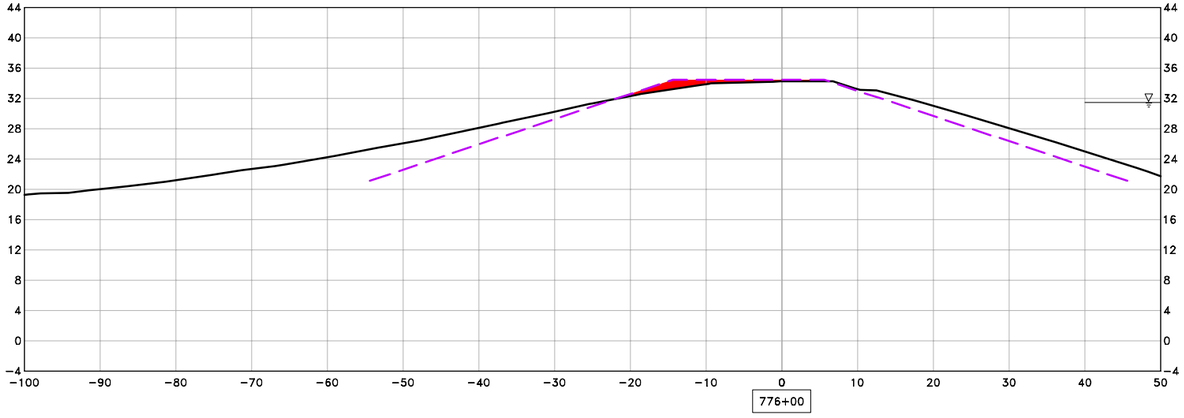
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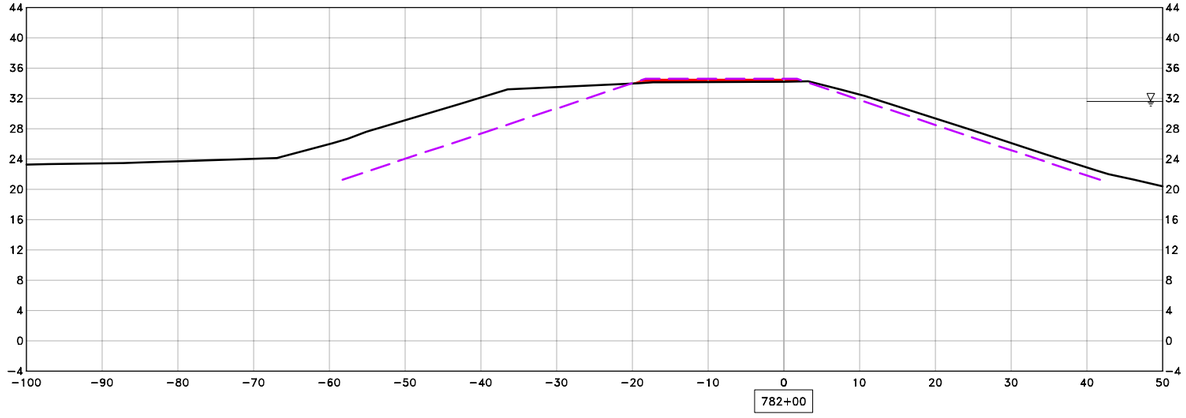
DATE
DECEMBER 11, 2019

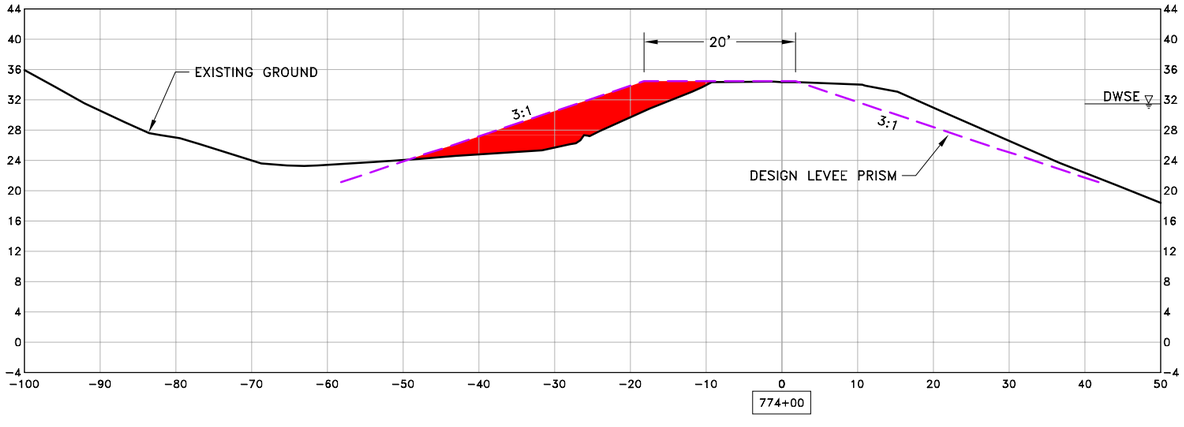
SHEET IDENTIFICATION
C2-320
SHEET 102 OF 136

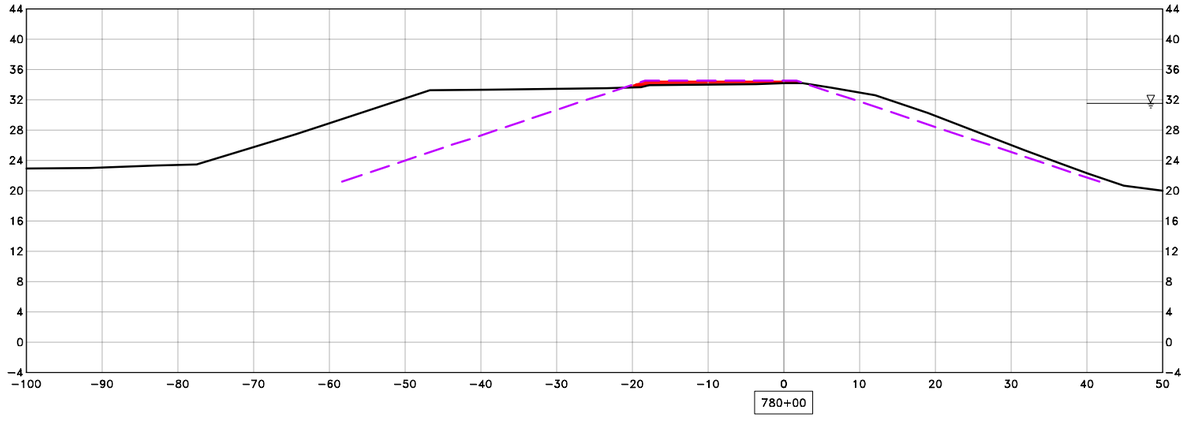
KSN PROJECT FILE NO.
2255-0050











FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:04pm

NORTH ORIENTATION

PROJECT ENGINEER

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NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

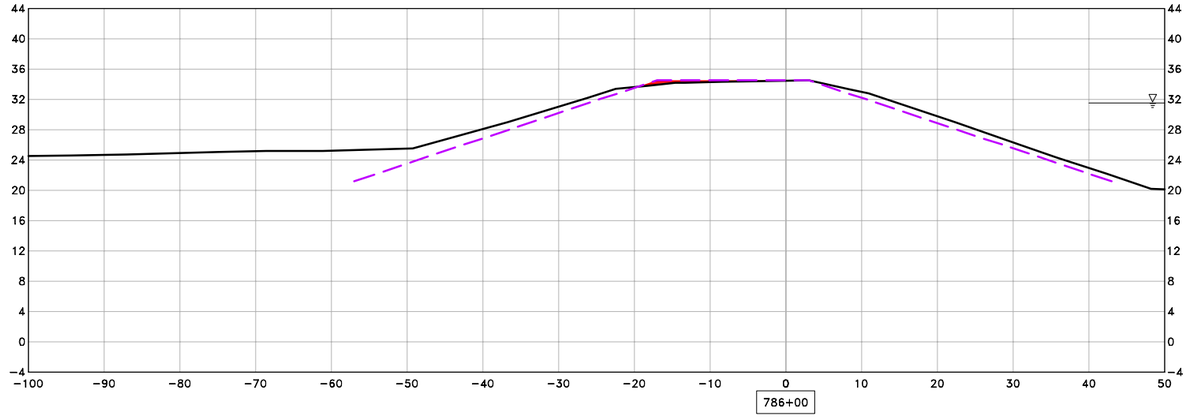
ALL OTHER LEVEE DESIGN SECTION VIEW

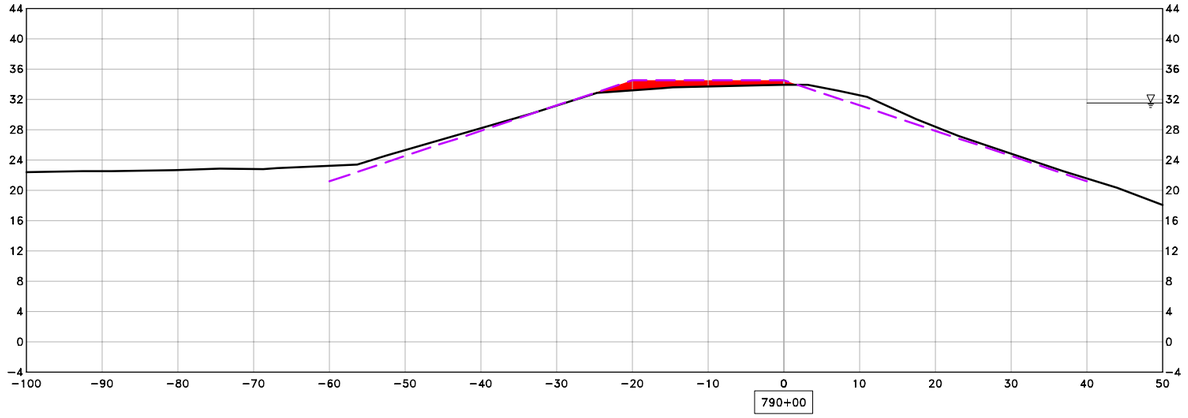
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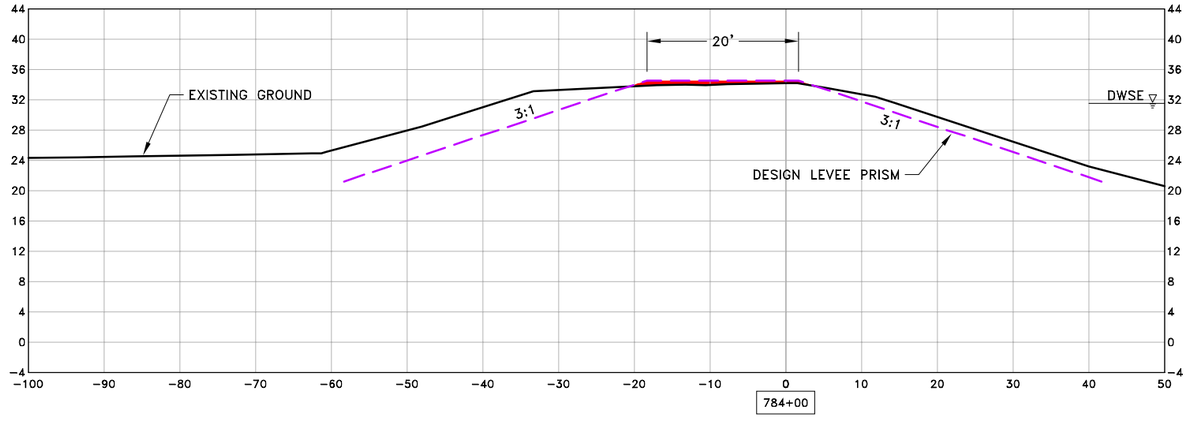
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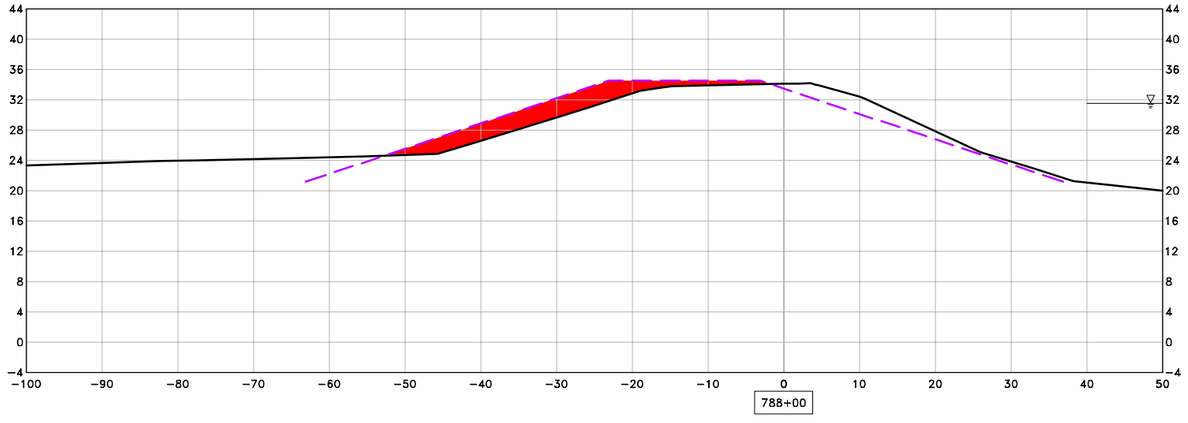
SHEET IDENTIFICATION C2-321
SHEET 103 OF 136

KSN PROJECT FILE NO. 2255-0050









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NORTH ORIENTATION

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SJAFCA - MOSSDALE TRACT AREA
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ALL OTHER LEVEE DESIGN SECTION VIEW

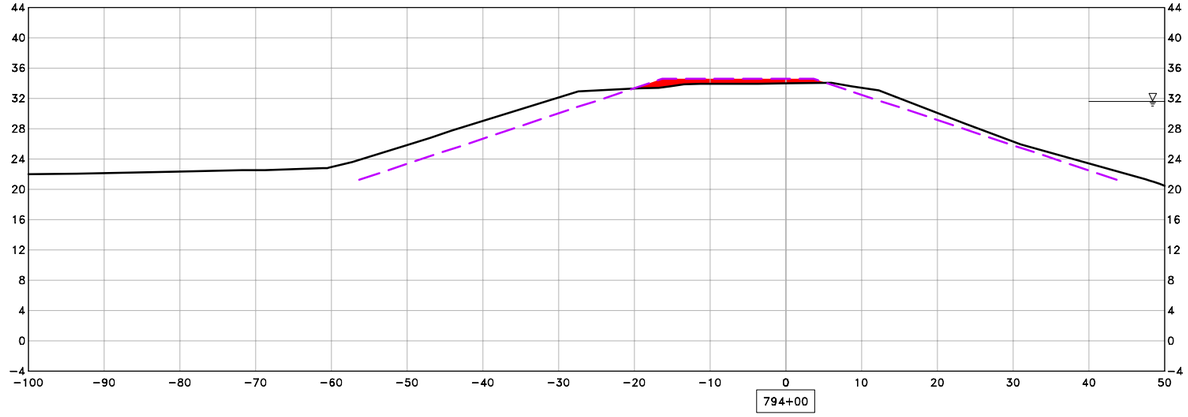
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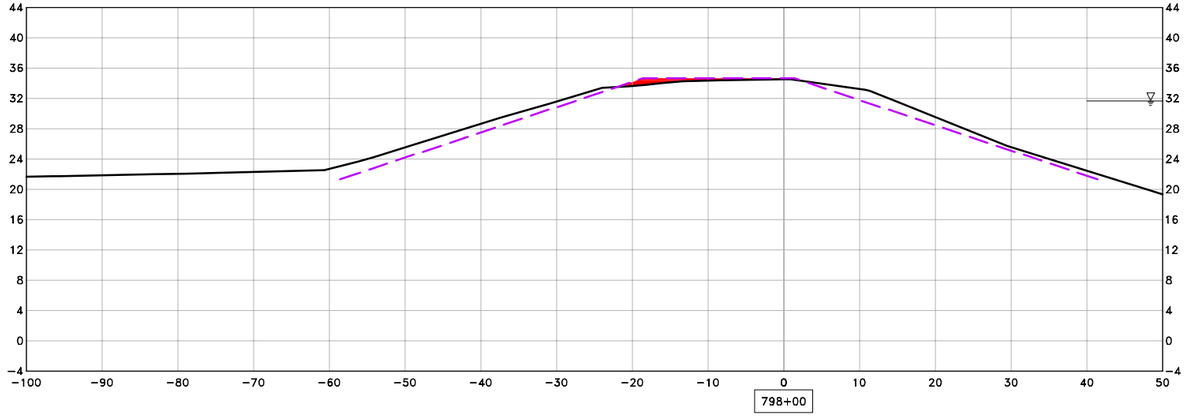
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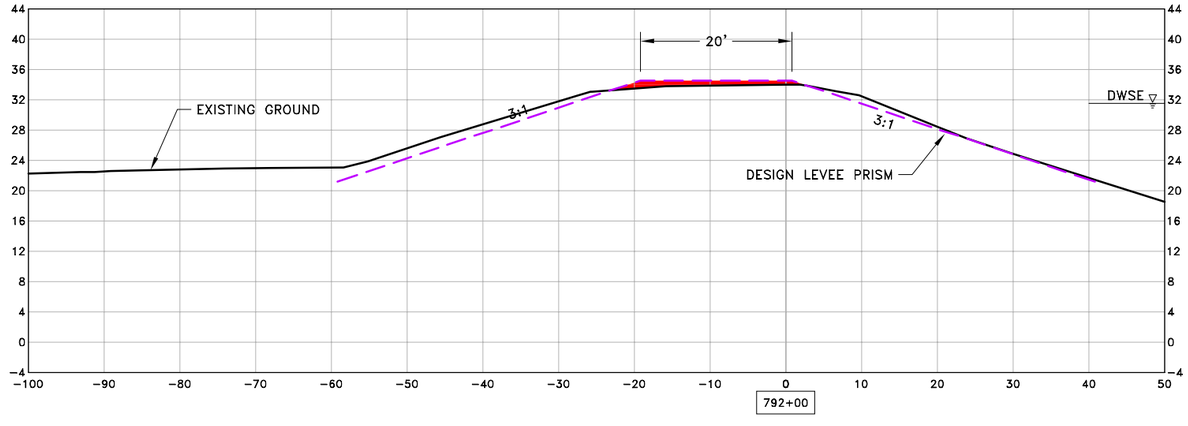
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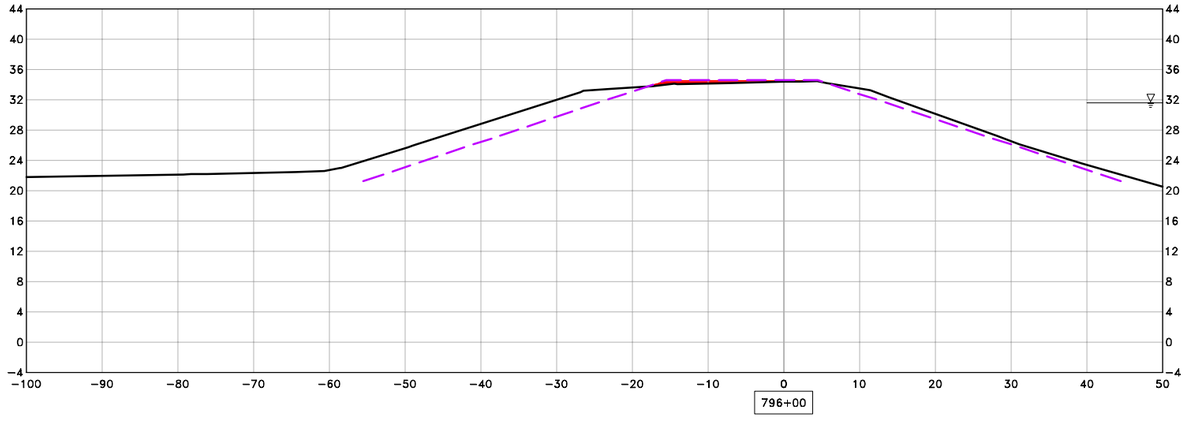
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KSN PROJECT FILE NO. 2255-0050









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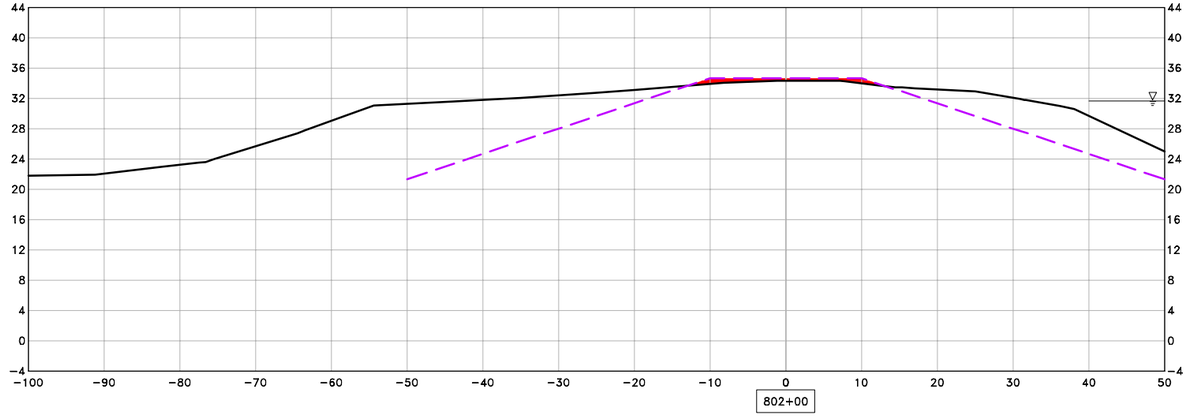
ALL OTHER LEVEE DESIGN SECTION VIEW

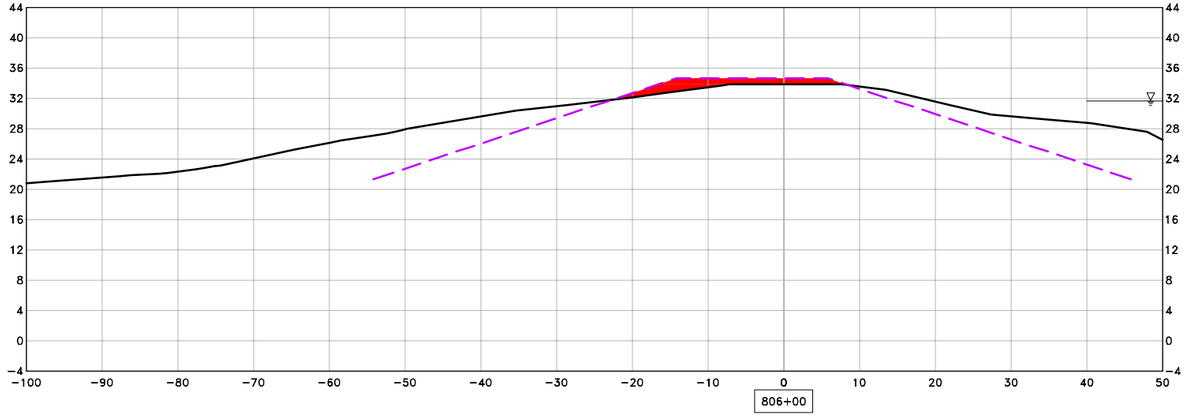
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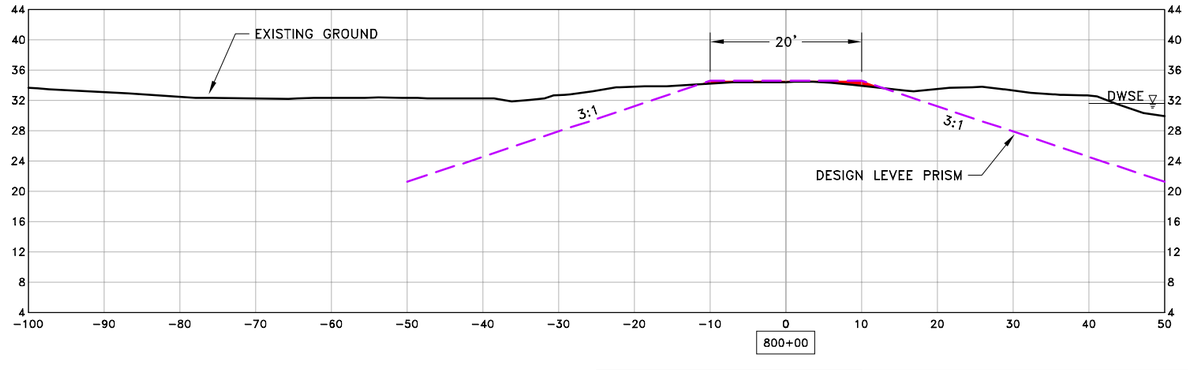
DATE
DECEMBER 11, 2019

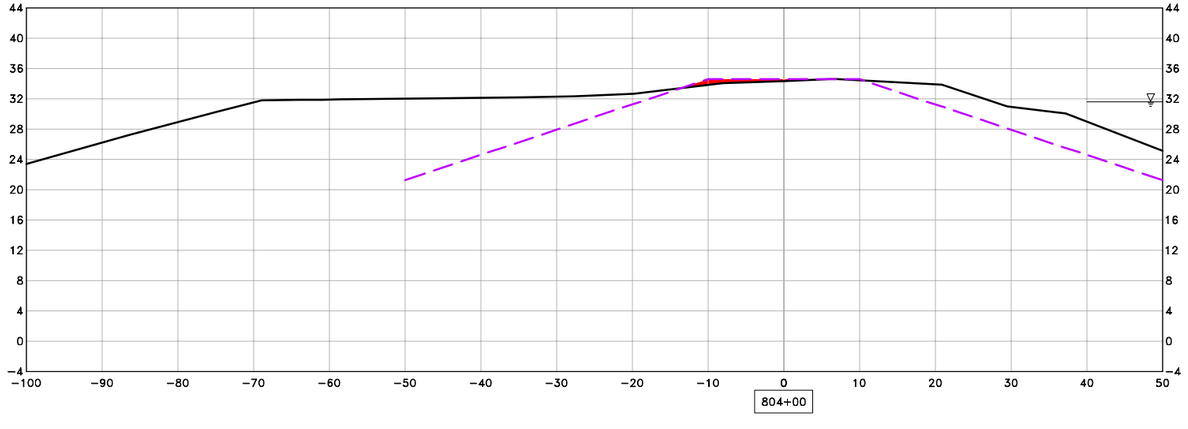
SHEET IDENTIFICATION
C2-323
SHEET 105 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
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NORTH ORIENTATION

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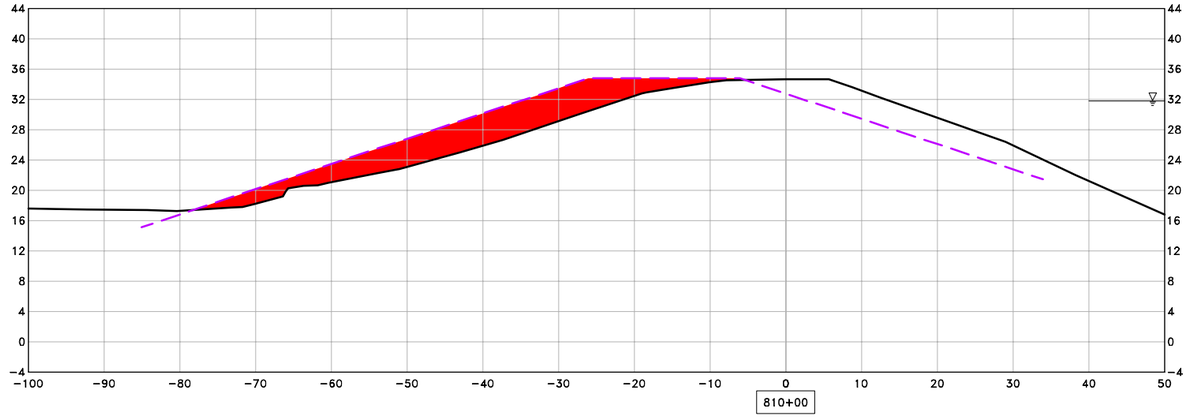
ALL OTHER LEVEE DESIGN SECTION VIEW

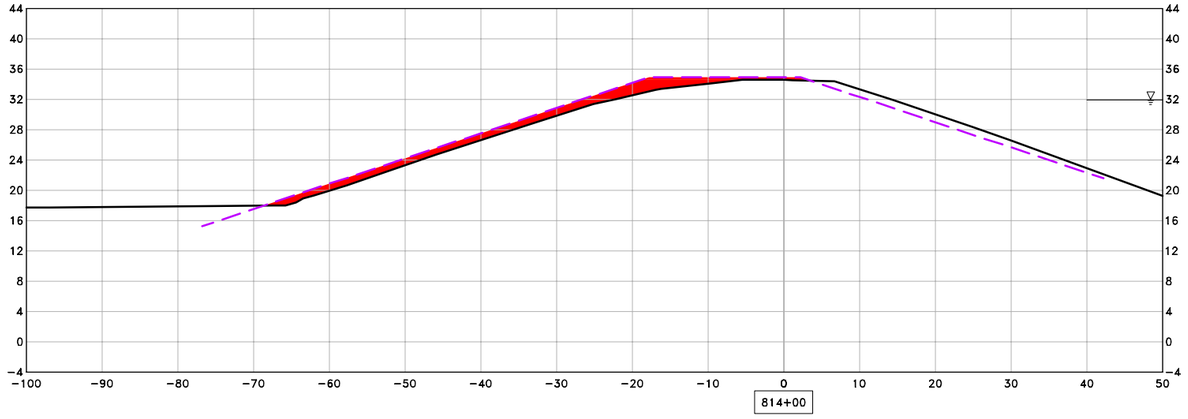
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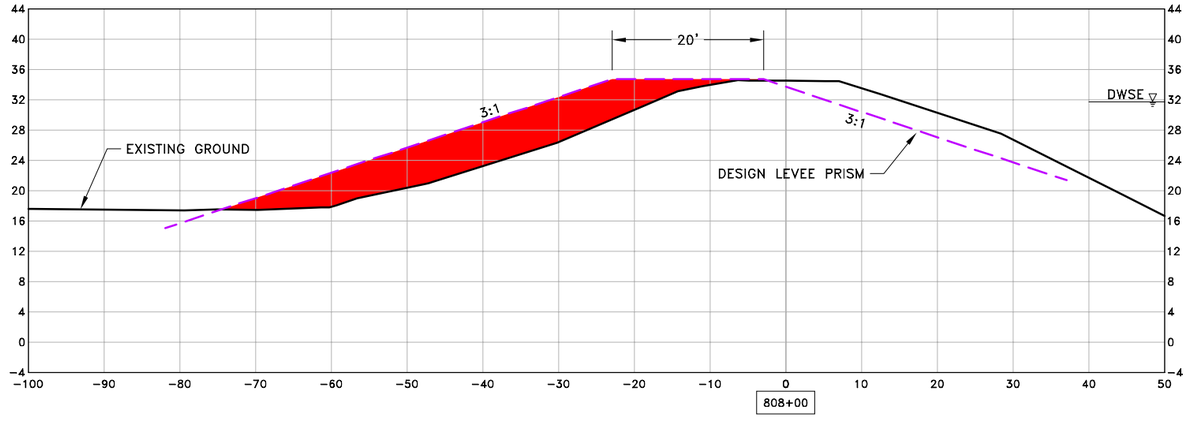
DATE
DECEMBER 11, 2019

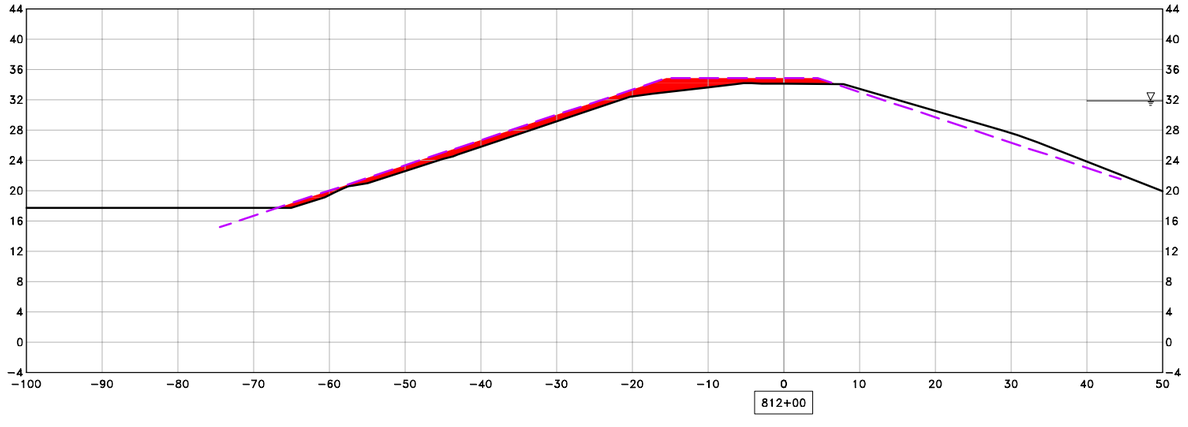
SHEET IDENTIFICATION
C2-324
SHEET 106 OF 136

KSN PROJECT FILE NO.
2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:06pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

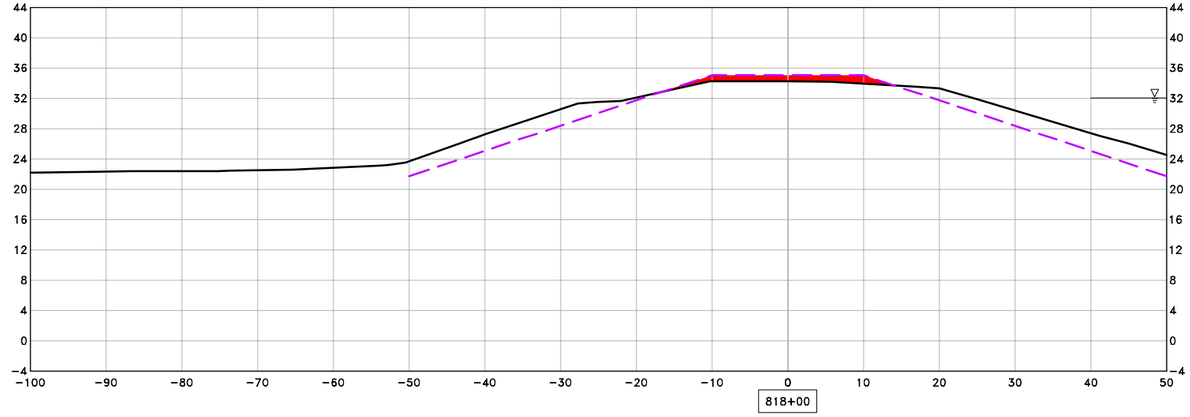
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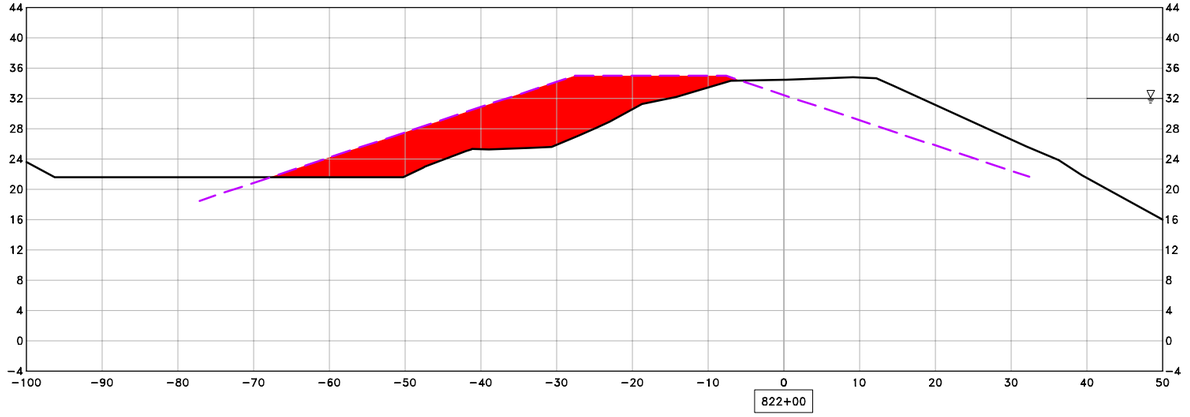
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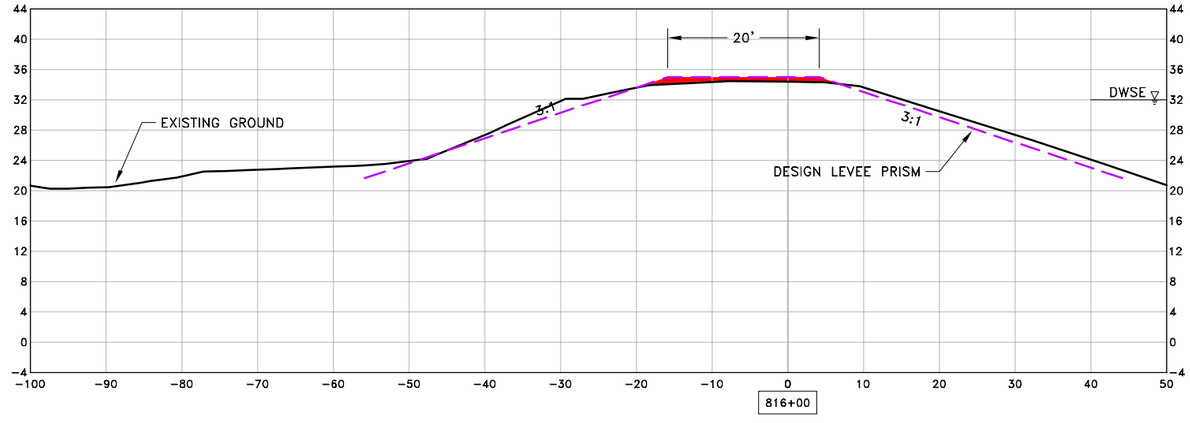
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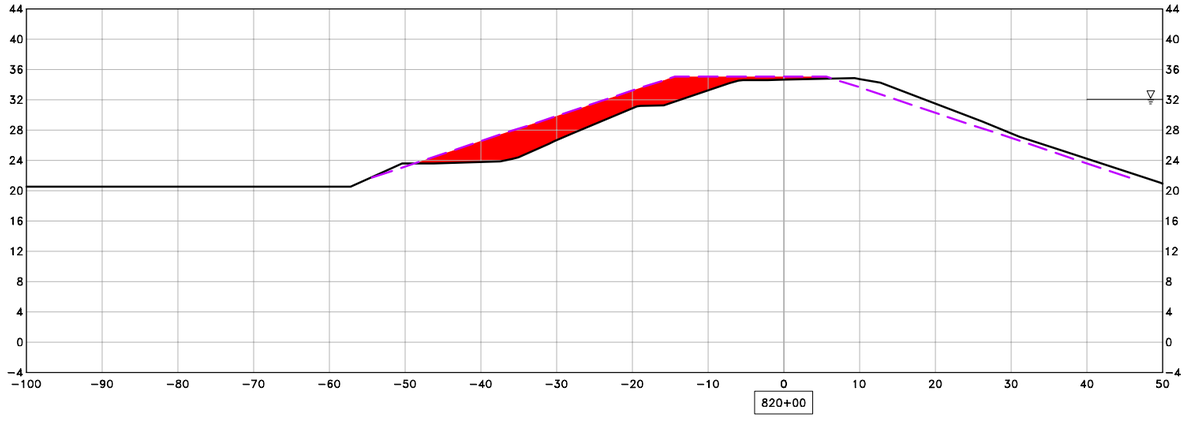
SHEET 107 OF 136

KSN PROJECT FILE NO. 2255-0050









FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
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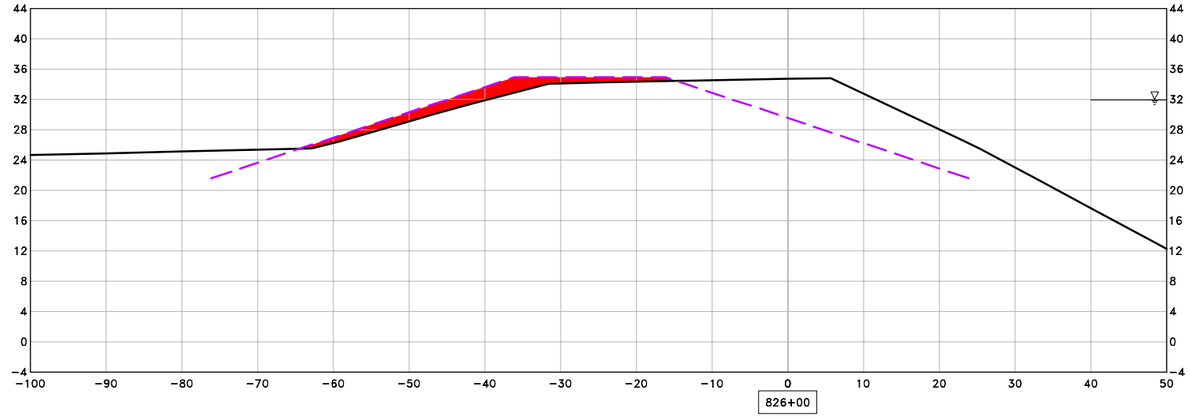
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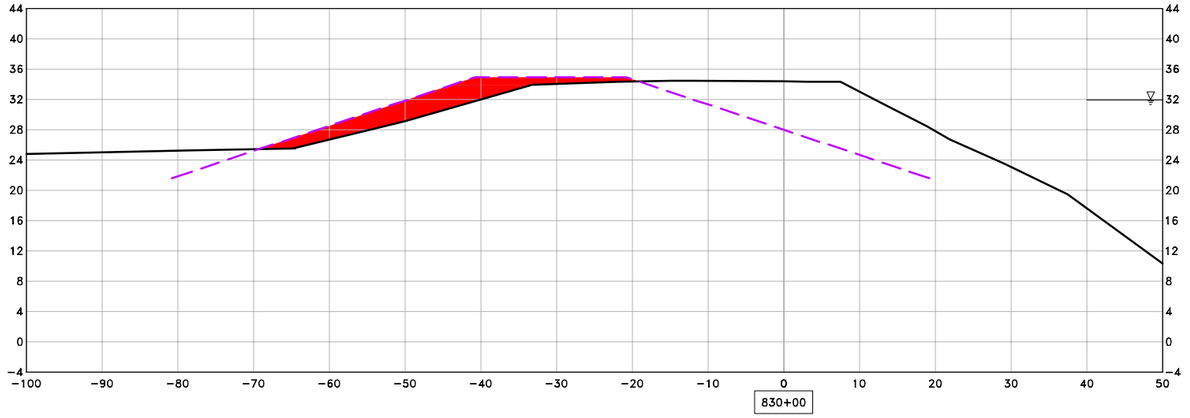
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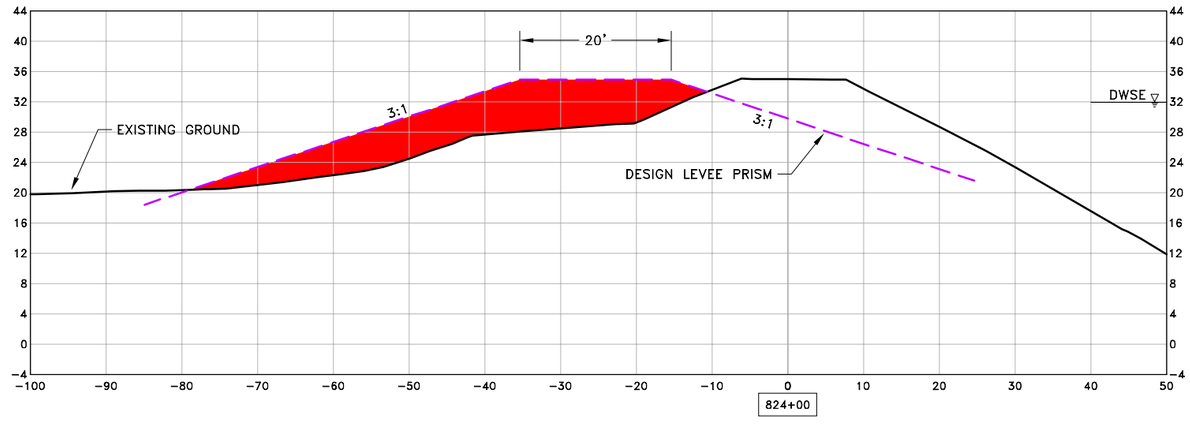
DATE
DECEMBER 11, 2019

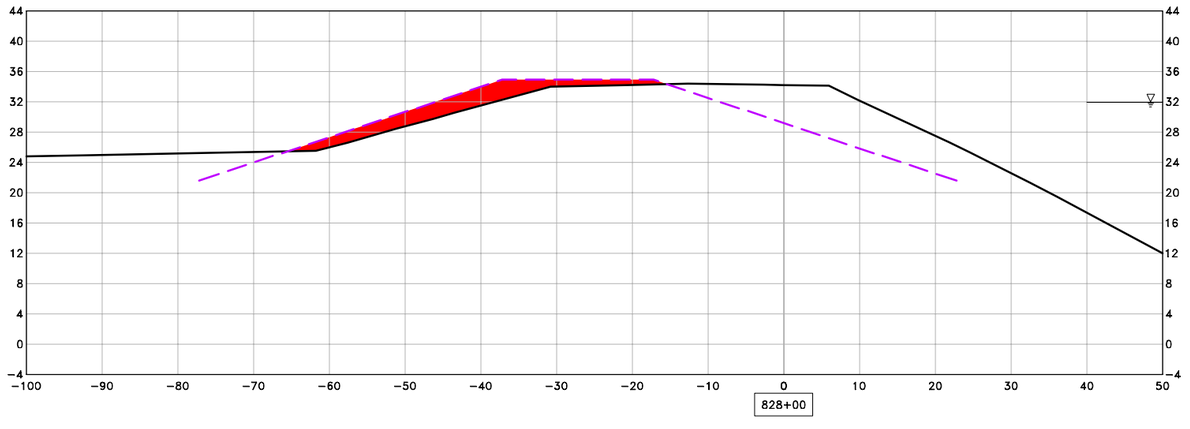
SHEET IDENTIFICATION
C2-326
SHEET 108 OF 136

KSN PROJECT FILE NO.
2255-0050









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NORTH ORIENTATION

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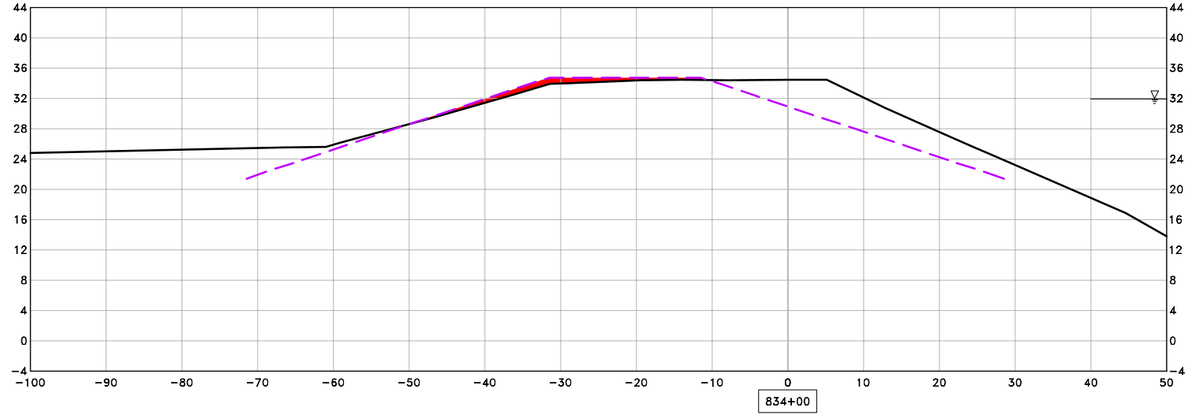
ALL OTHER LEVEE DESIGN SECTION VIEW

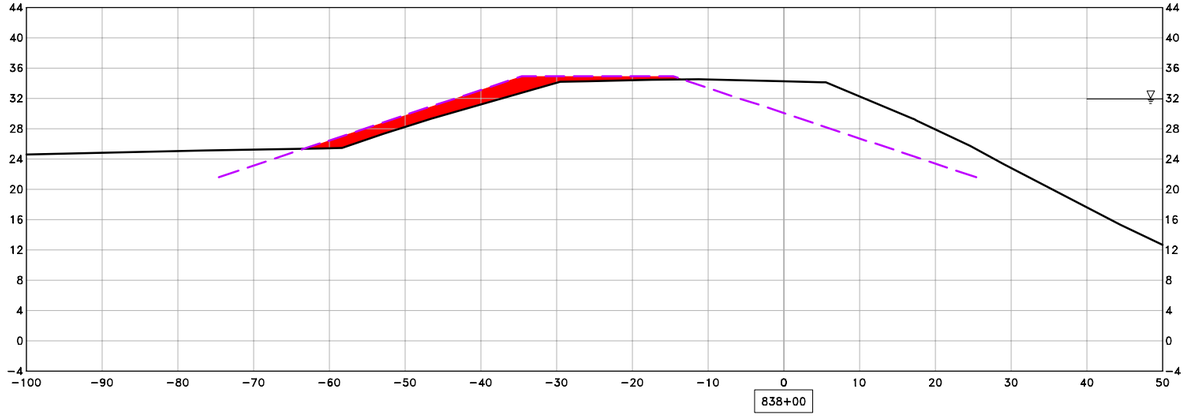
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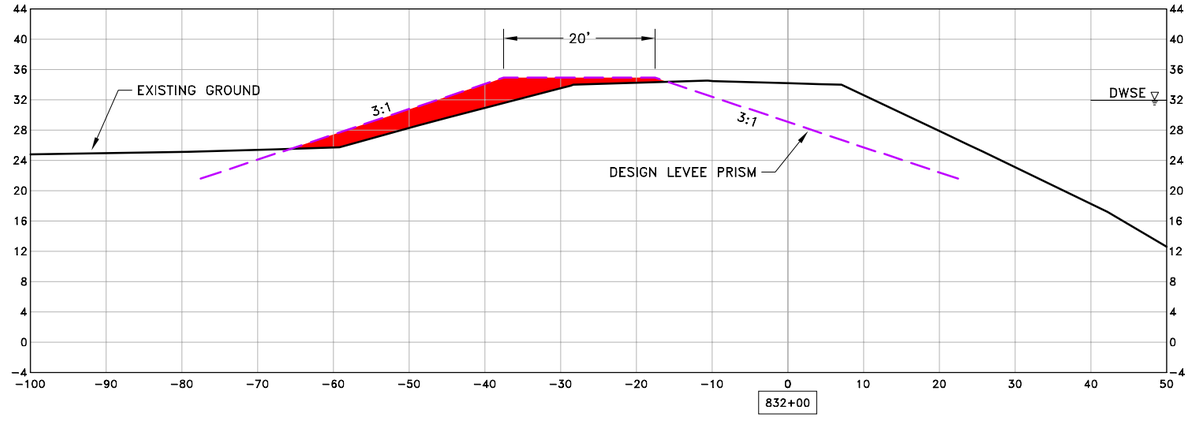
DATE DECEMBER 11, 2019

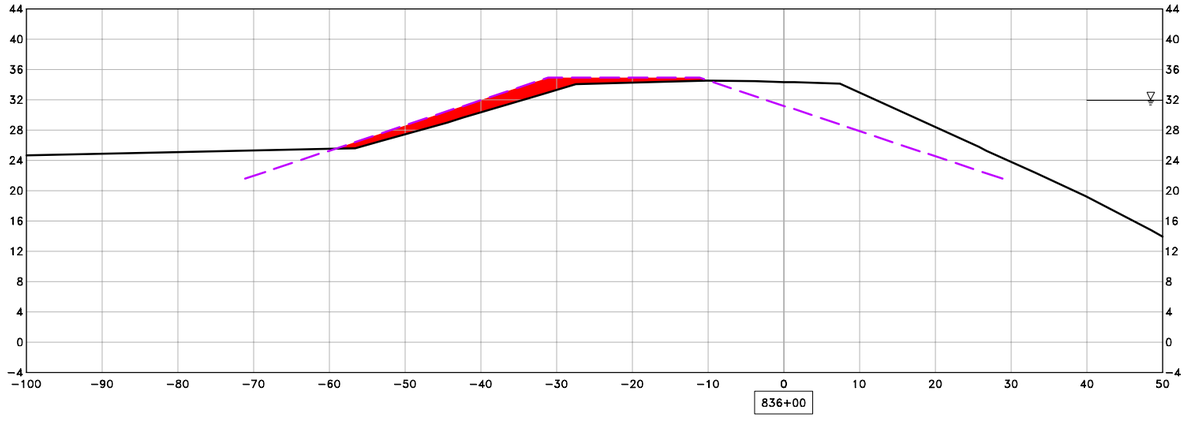
SHEET IDENTIFICATION C2-327
SHEET 109 OF 136

KSN PROJECT FILE NO. 2255-0050









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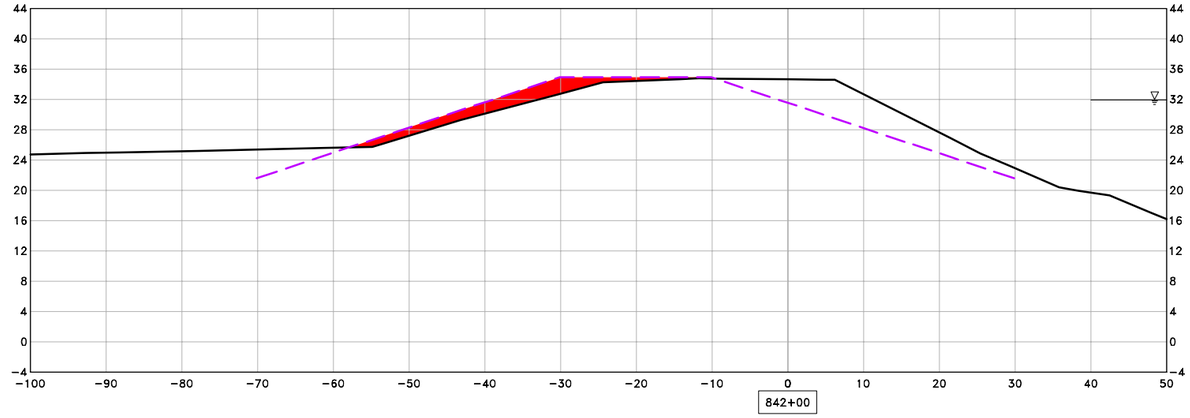
ALL OTHER LEVEE DESIGN SECTION VIEW

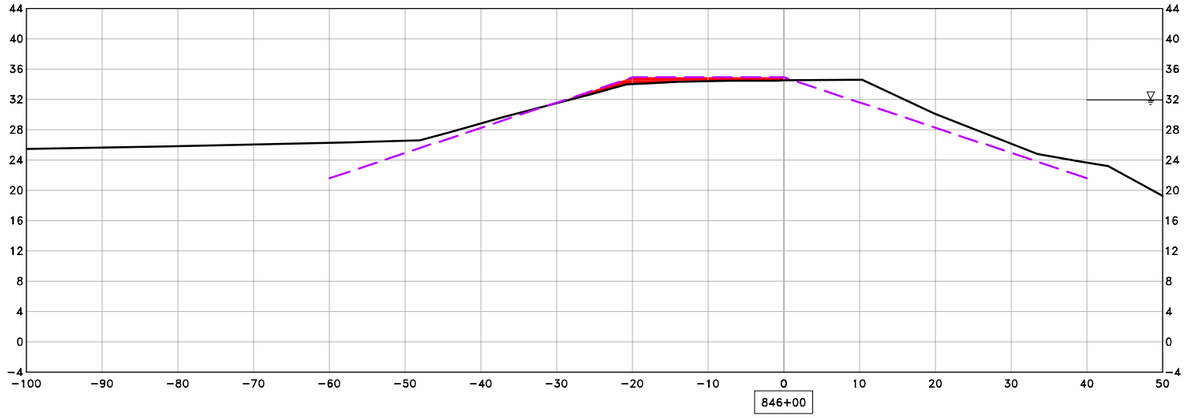
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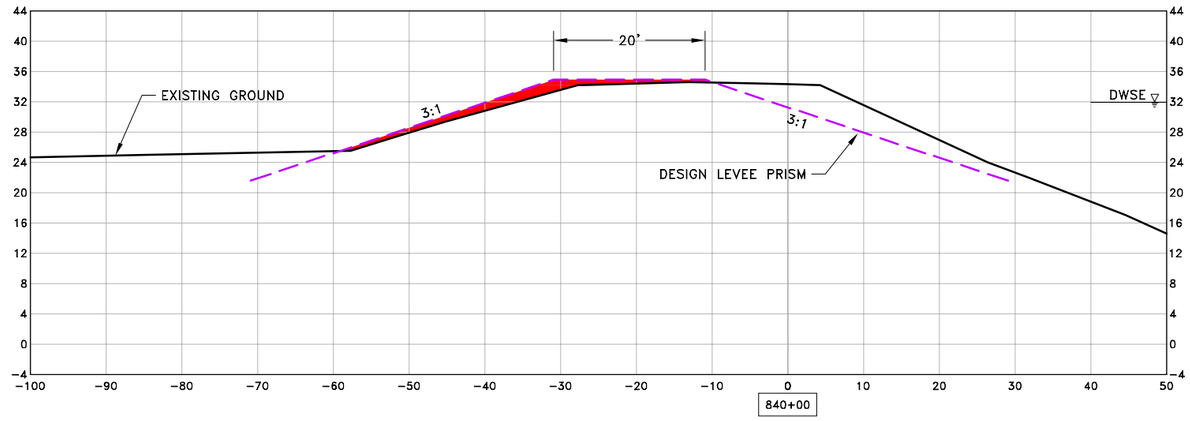
DATE
DECEMBER 11, 2019

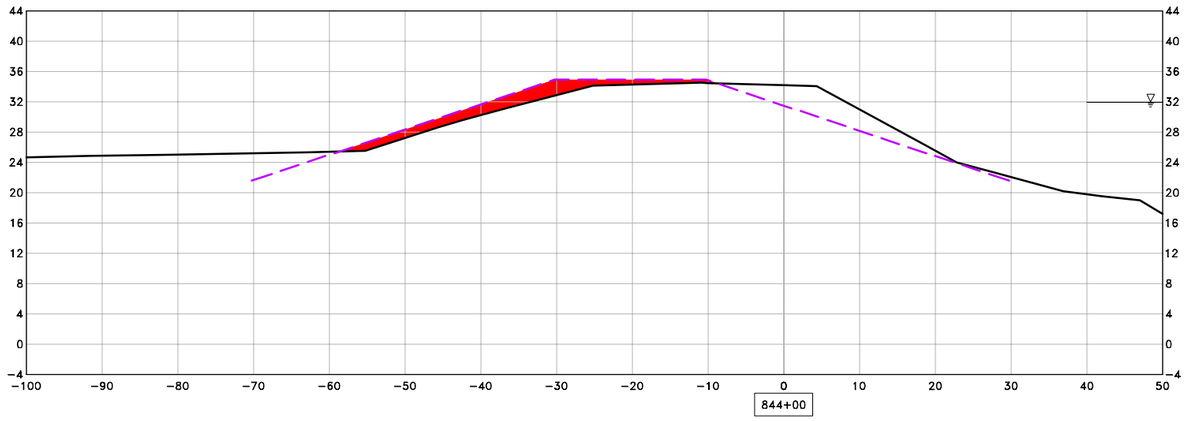
SHEET IDENTIFICATION
C2-328
SHEET 110 OF 136

KSN PROJECT FILE NO.
2255-0050









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NORTH ORIENTATION

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VERTICAL DATUM NAVD88

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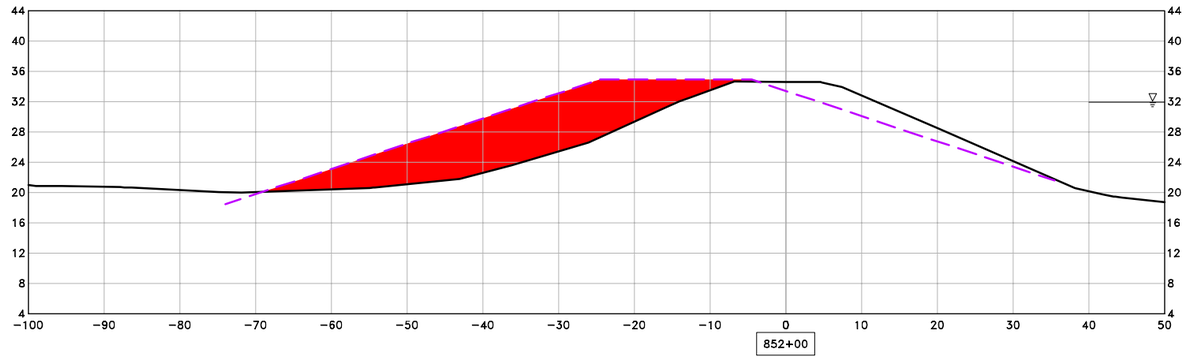
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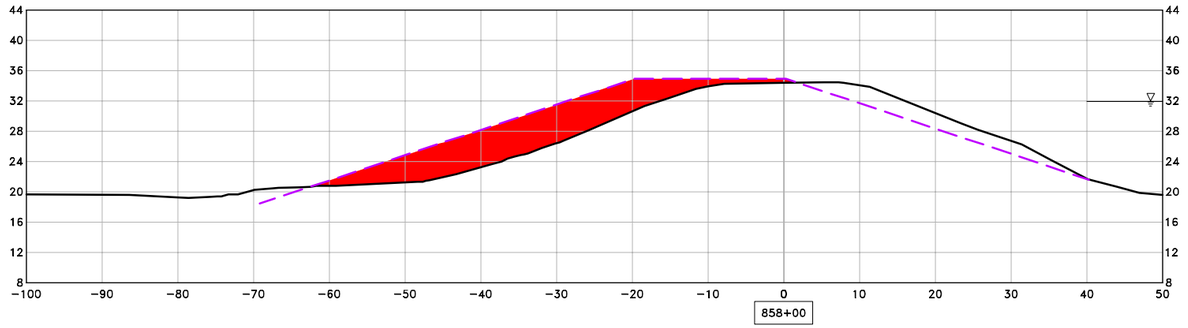
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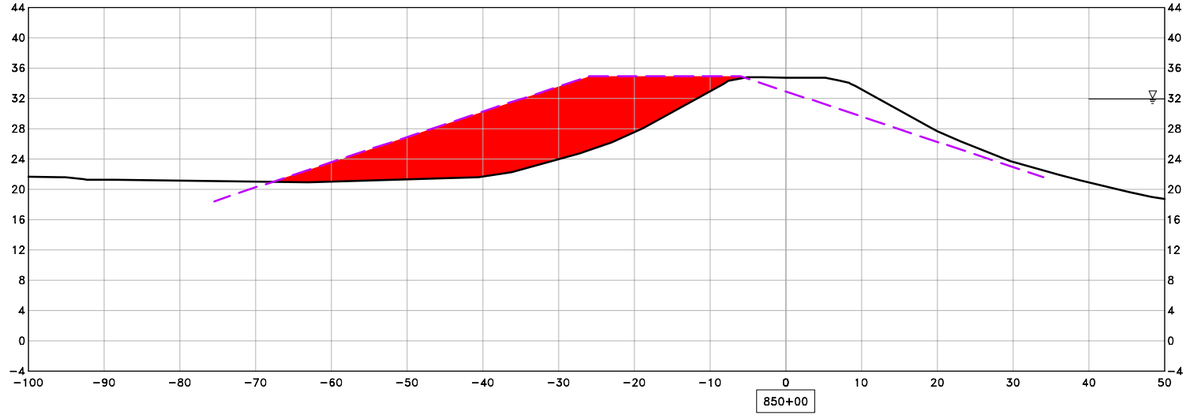
DATE
DECEMBER 11, 2019

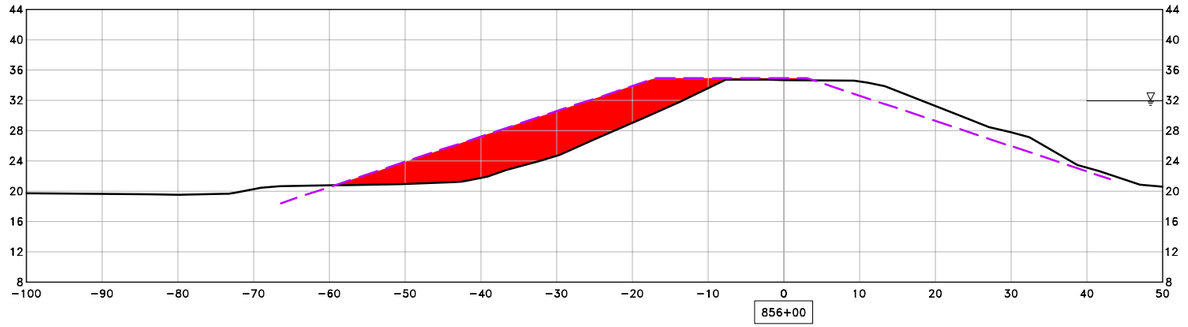
SHEET IDENTIFICATION
C2-329
SHEET 111 OF 136

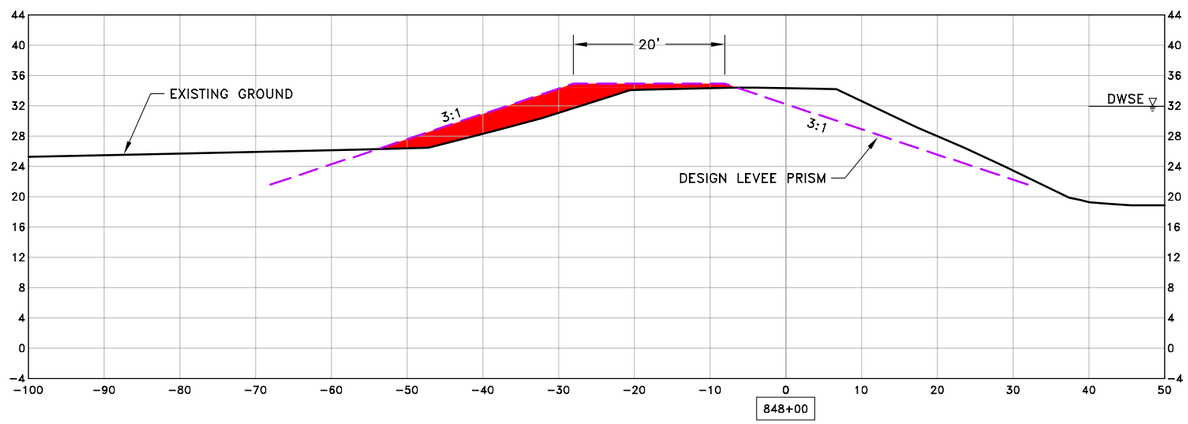
KSN PROJECT FILE NO.
2255-0050

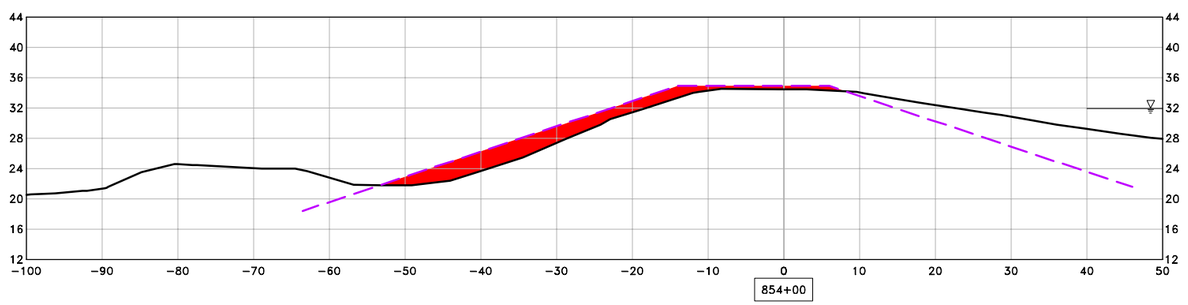












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NORTH ORIENTATION

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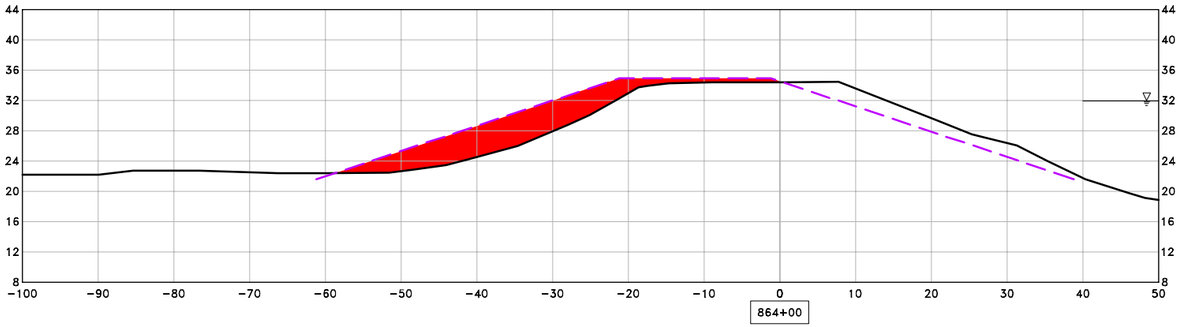
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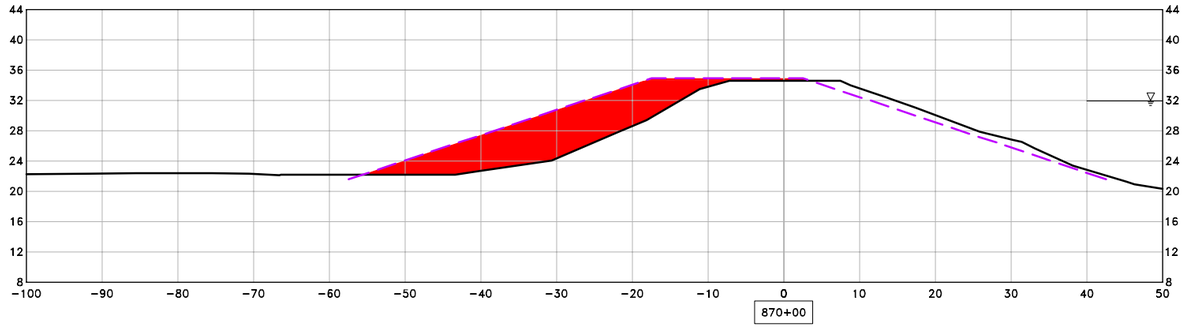
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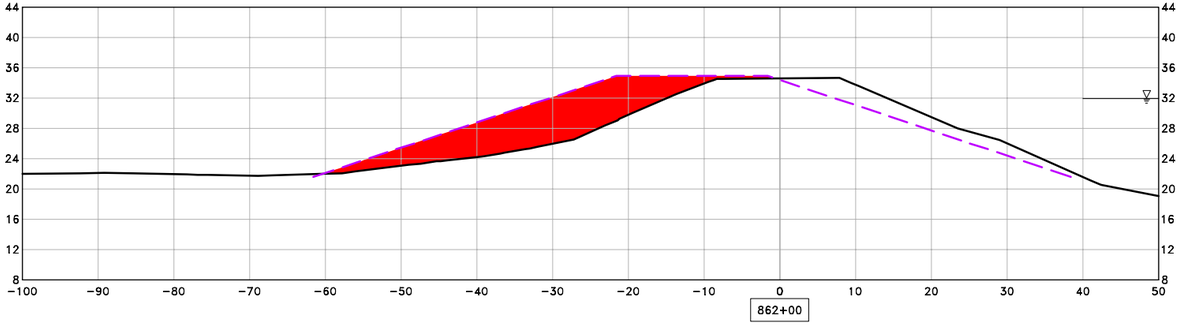
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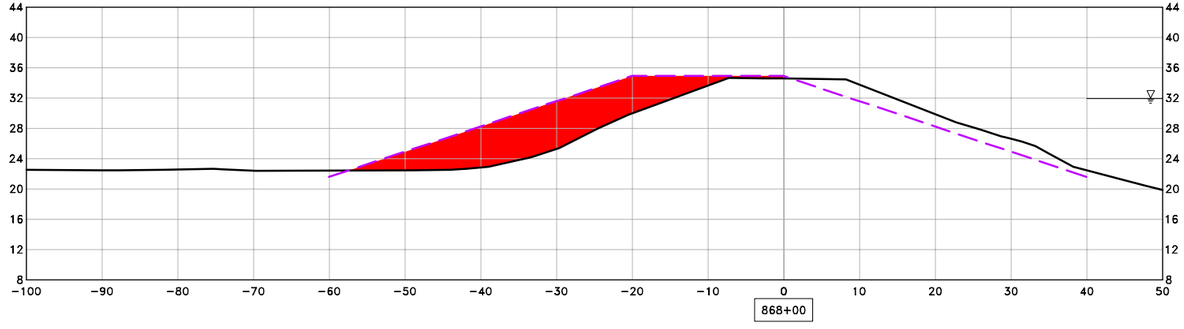
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C2-330
SHEET 112 OF 136

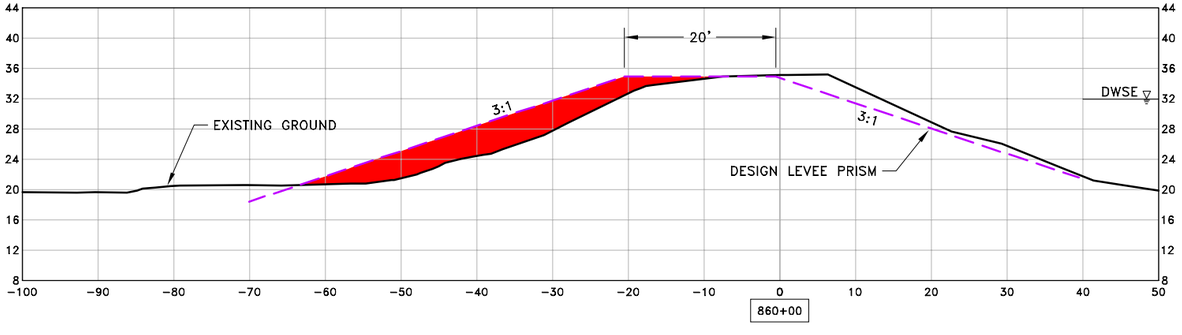
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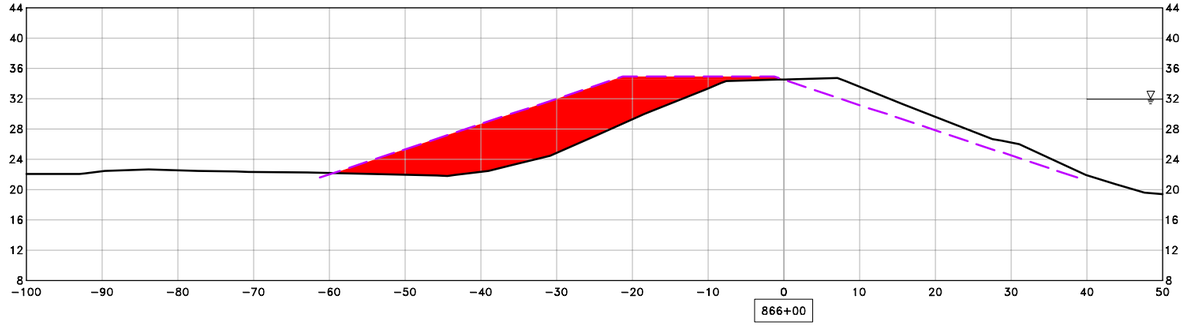












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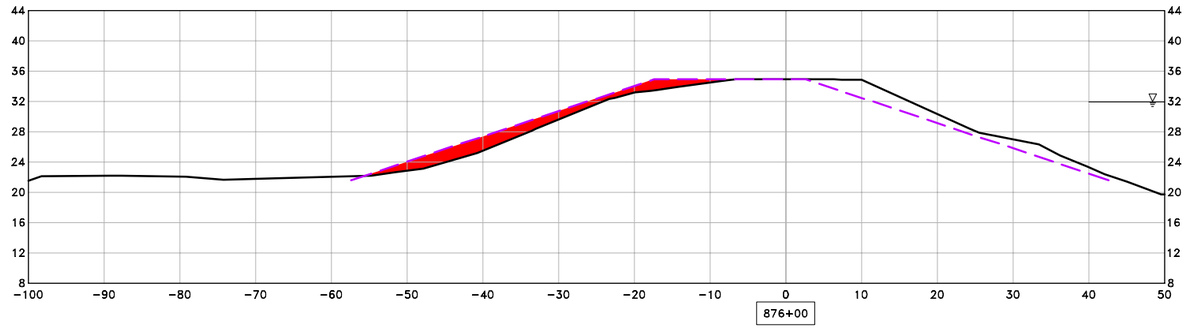
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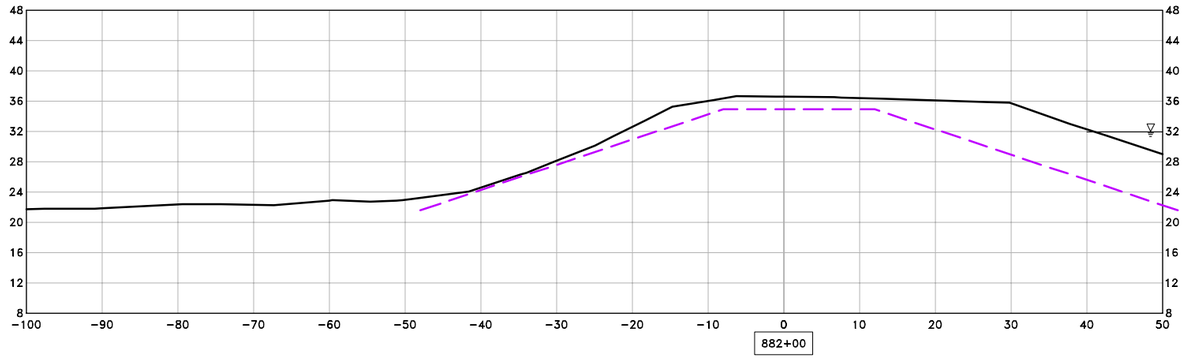
DATE
DECEMBER 11, 2019

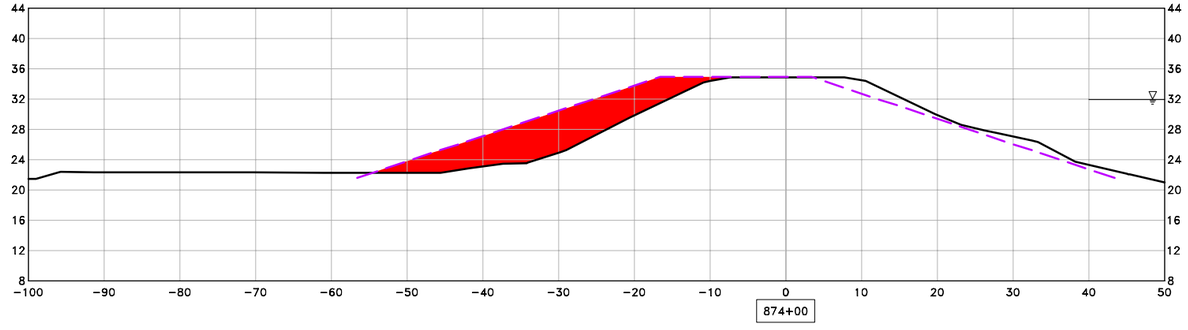
SHEET IDENTIFICATION
C2-331
SHEET 113 OF 136

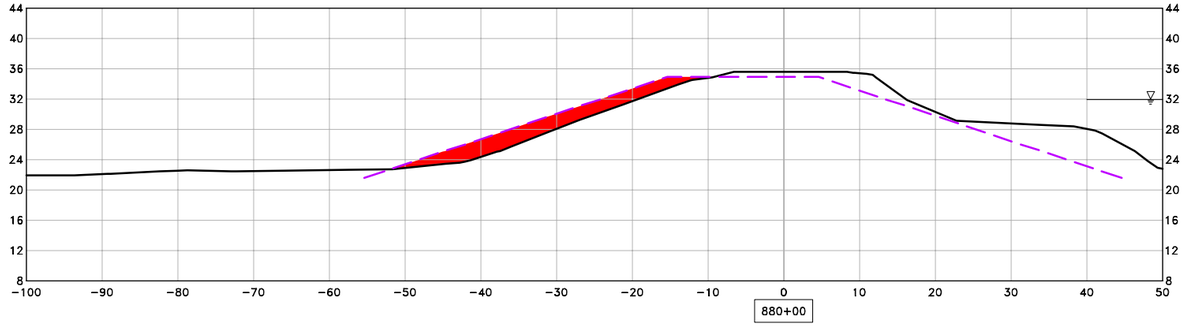
KSN PROJECT FILE NO.
2255-0050

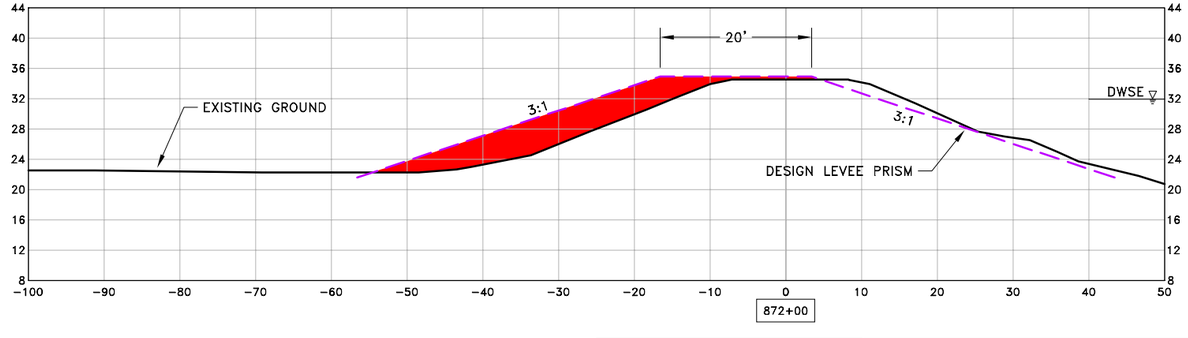
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PLOT DATE: Dec 11, 2019 - 4:09pm

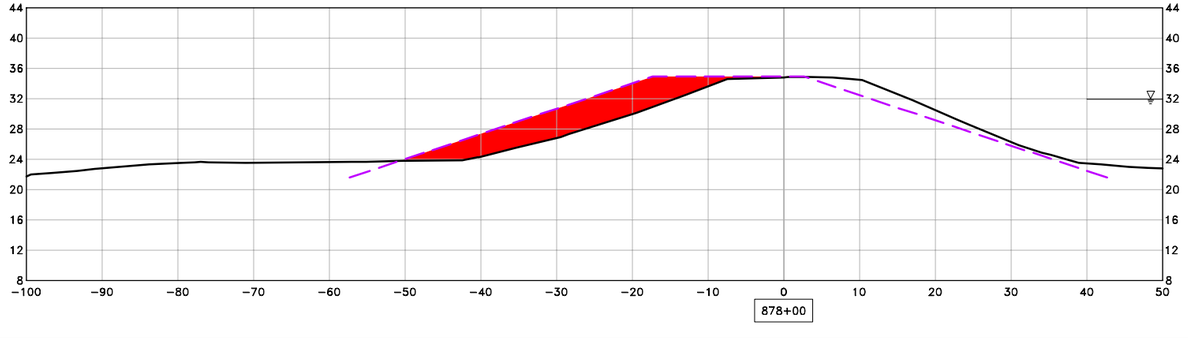












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916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

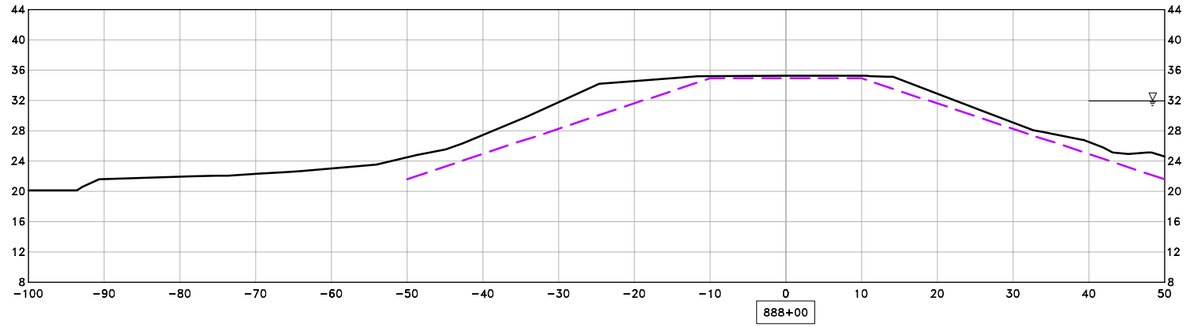
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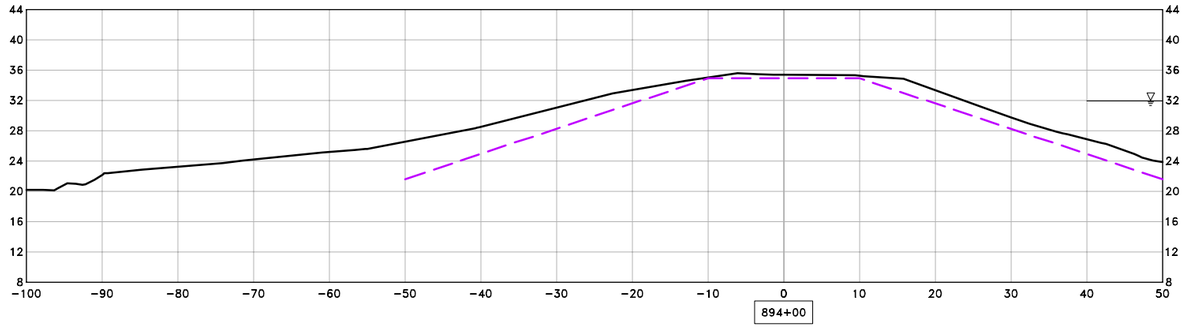
DATE
DECEMBER 11, 2019

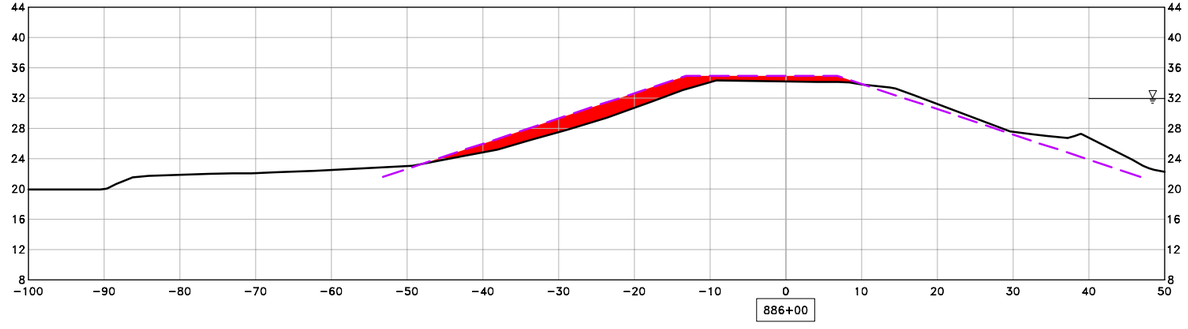
SHEET IDENTIFICATION
C2-332
SHEET 114 OF 136

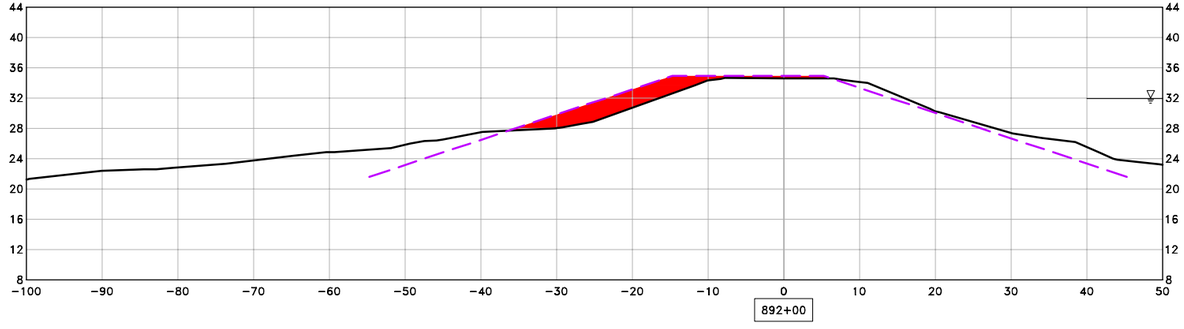
KSN PROJECT FILE NO.
2255-0050

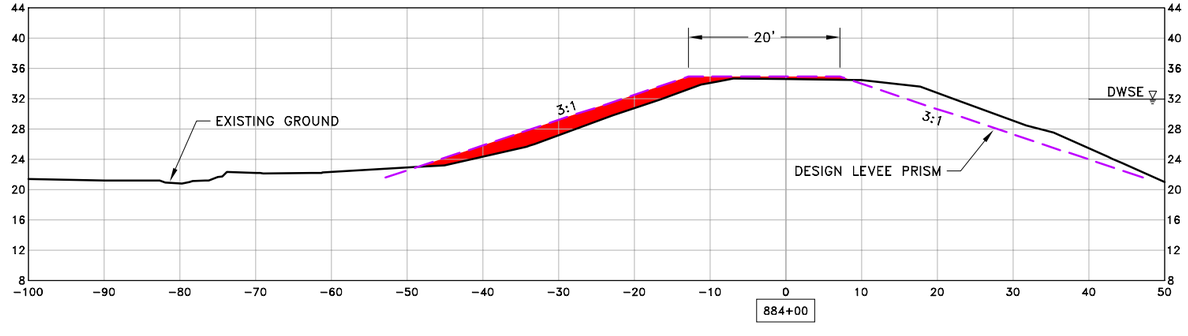
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PLOT DATE: Dec 11, 2019 - 4:09pm

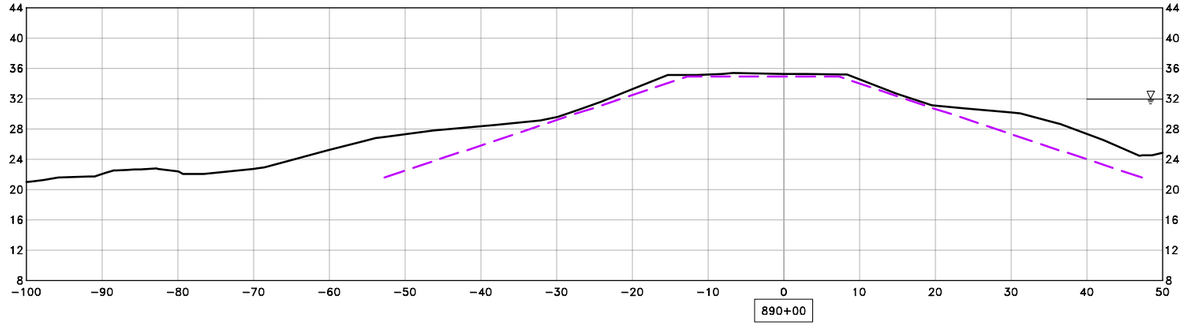












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:10pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

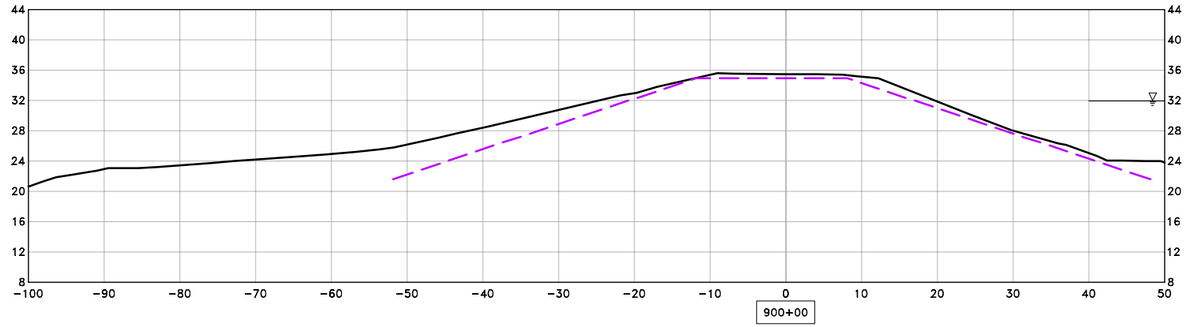
ALL OTHER LEVEE DESIGN SECTION VIEW

STA 884+00 TO STA 896+00

DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C2-333
SHEET 115 OF 136

KSN PROJECT FILE NO.
2255-0050



NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
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SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

STA 896+00 TO STA 908+00

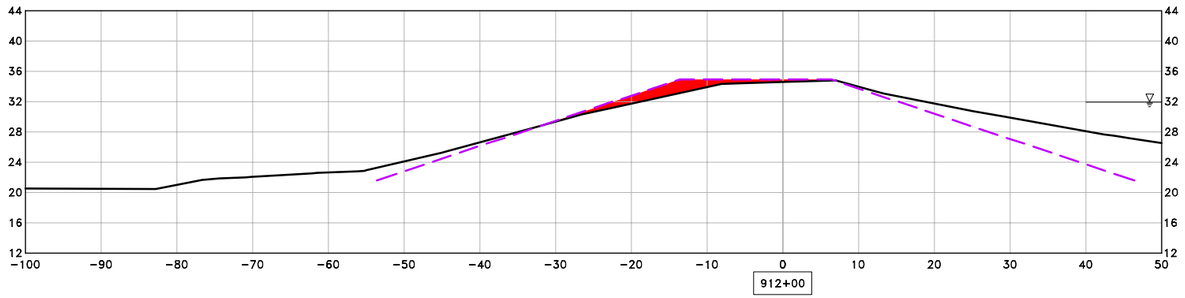
DATE DECEMBER 11, 2019

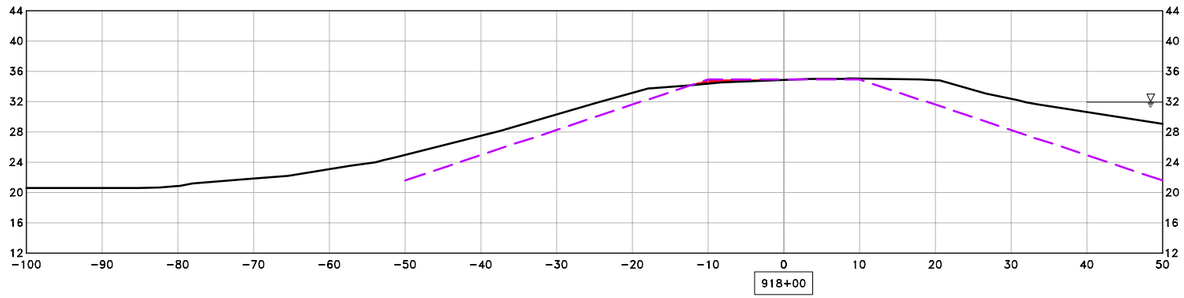
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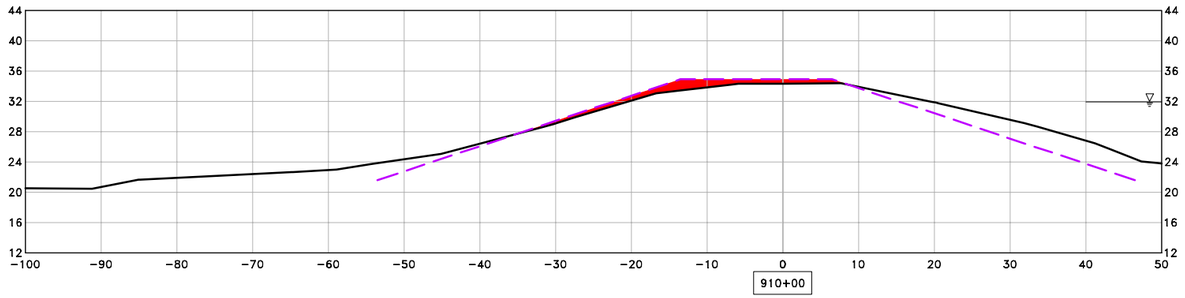
SHEET 116 OF 136

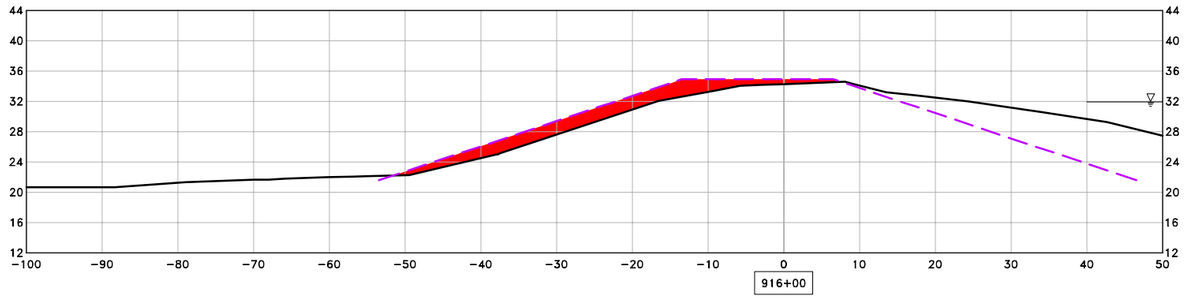
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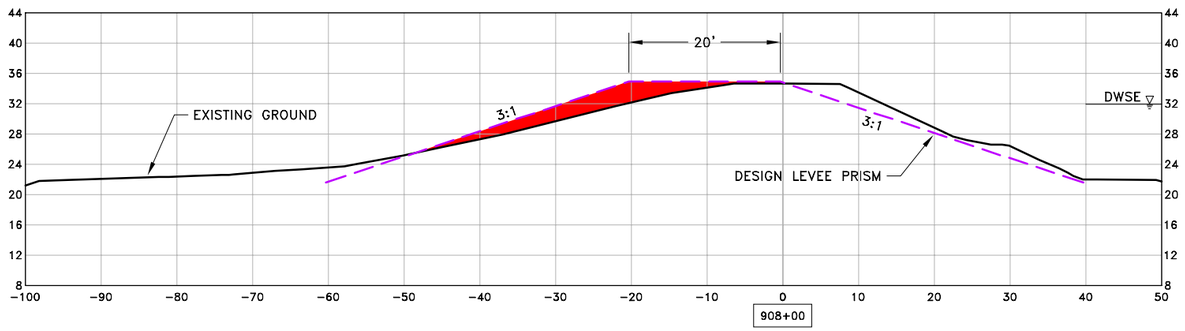
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PLOT DATE: Dec 11, 2019 - 4:10pm

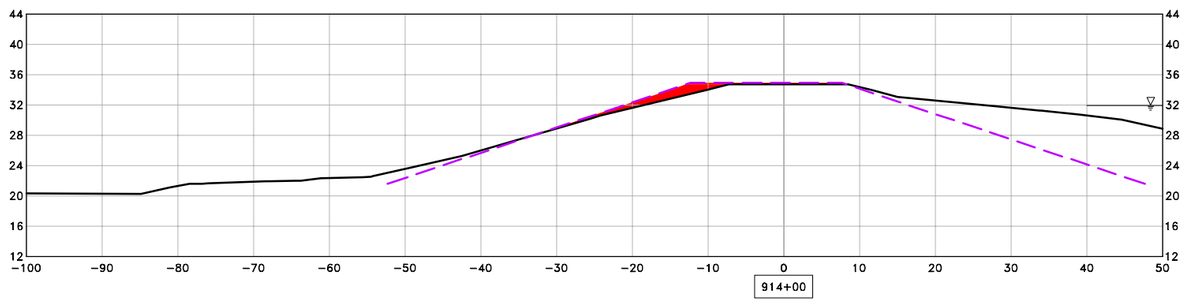












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:11pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
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SAN JOAQUIN COUNTY, CALIFORNIA

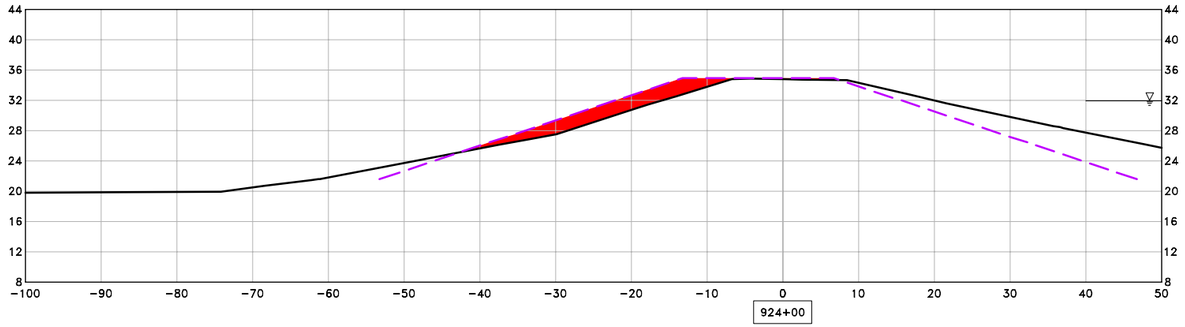
ALL OTHER LEVEE DESIGN SECTION VIEW

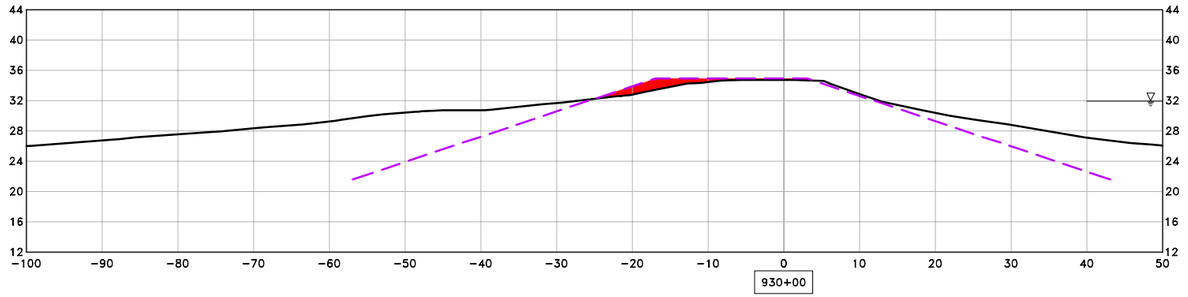
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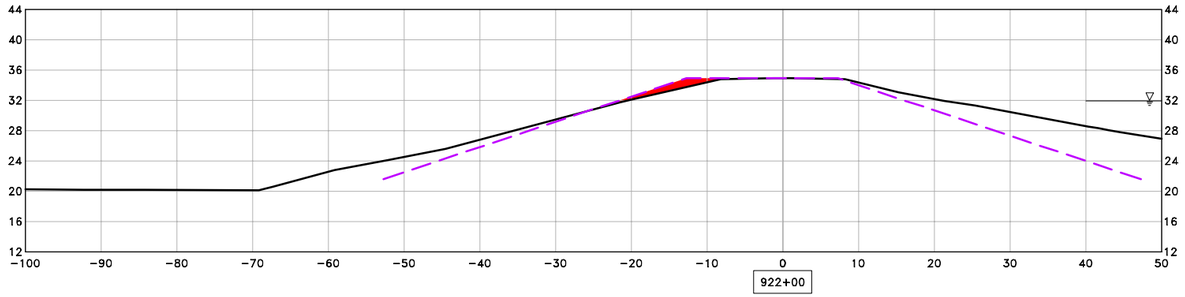
DATE
DECEMBER 11, 2019

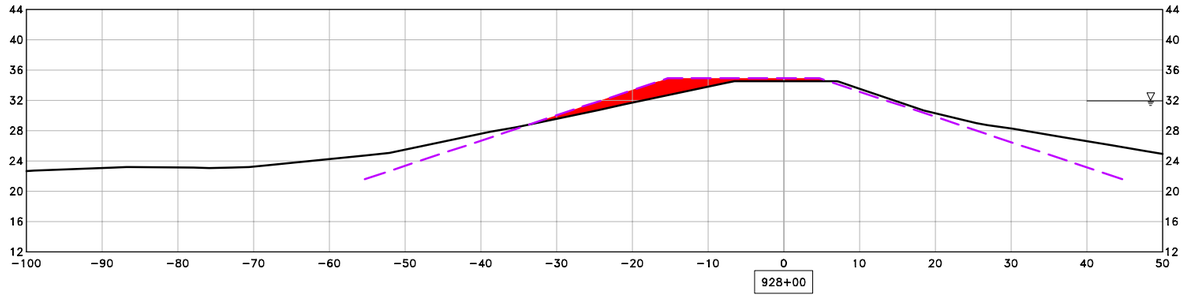
SHEET IDENTIFICATION
C2-335
SHEET 117 OF 136

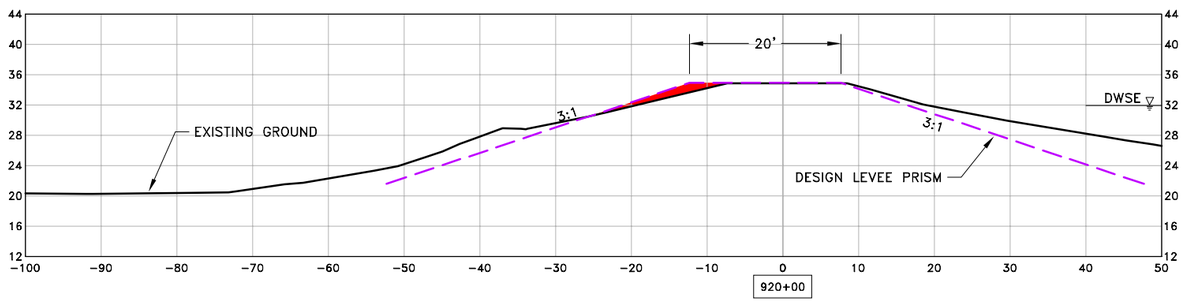
KSN PROJECT FILE NO.
2255-0050

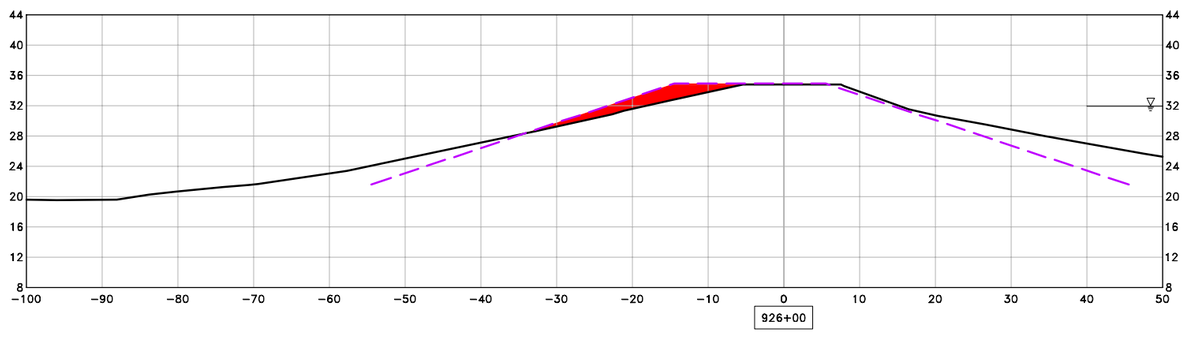












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PLOT DATE: Dec 11, 2019 - 4:11pm

NORTH ORIENTATION

PROJECT ENGINEER

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NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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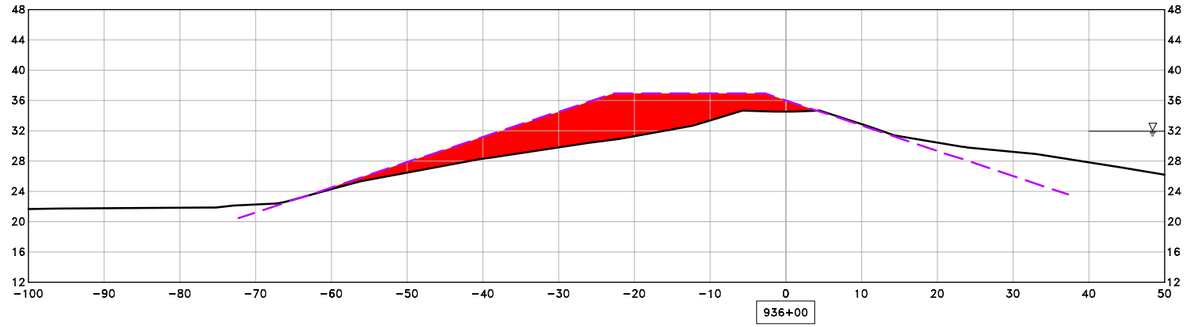
ALL OTHER LEVEE DESIGN SECTION VIEW

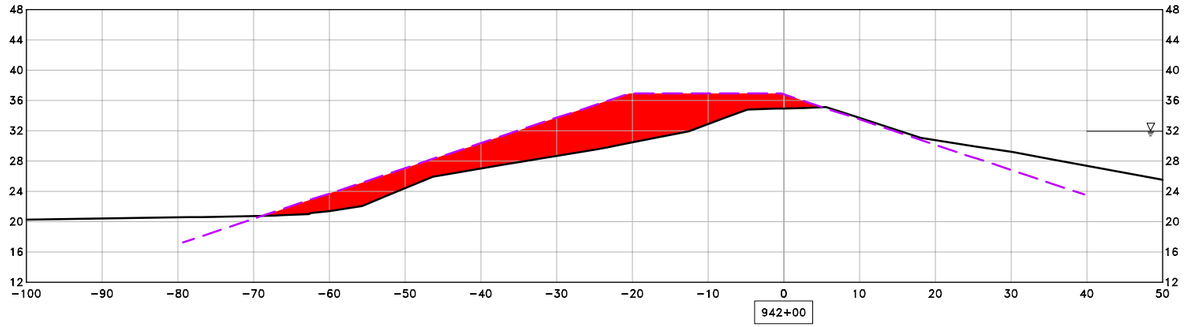
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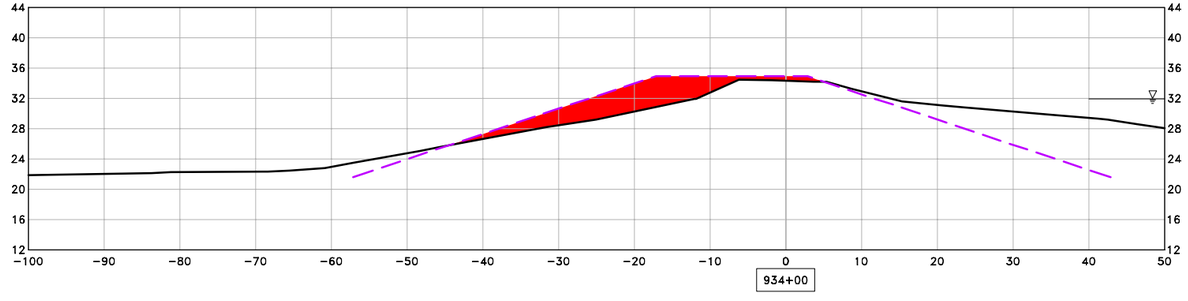
DATE
DECEMBER 11, 2019

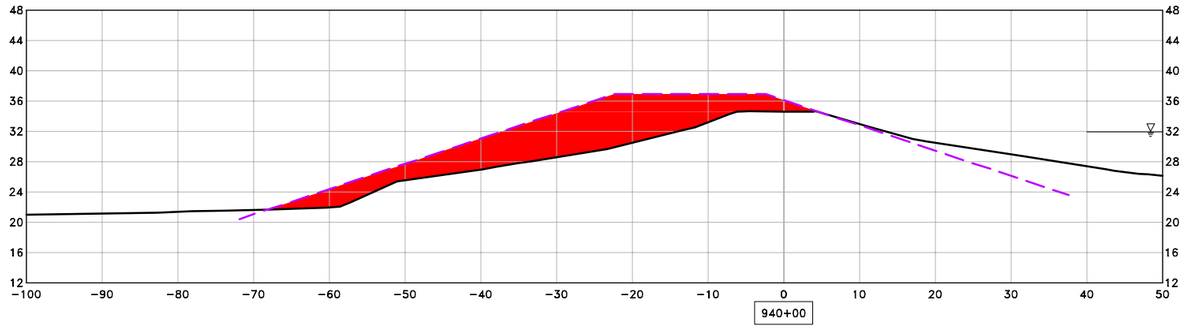
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C2-336
SHEET 118 OF 136

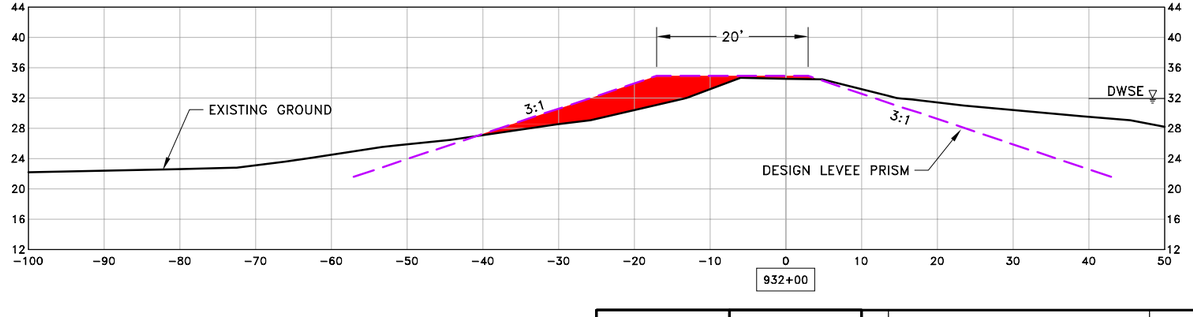
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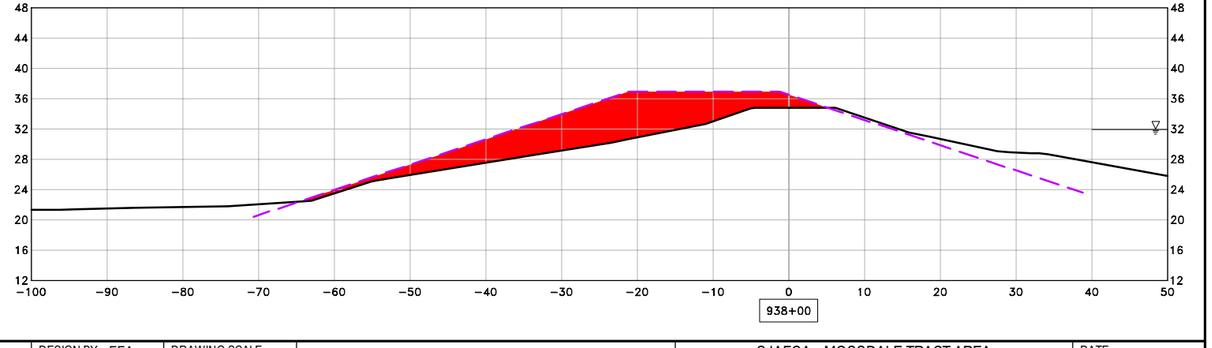












NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

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DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

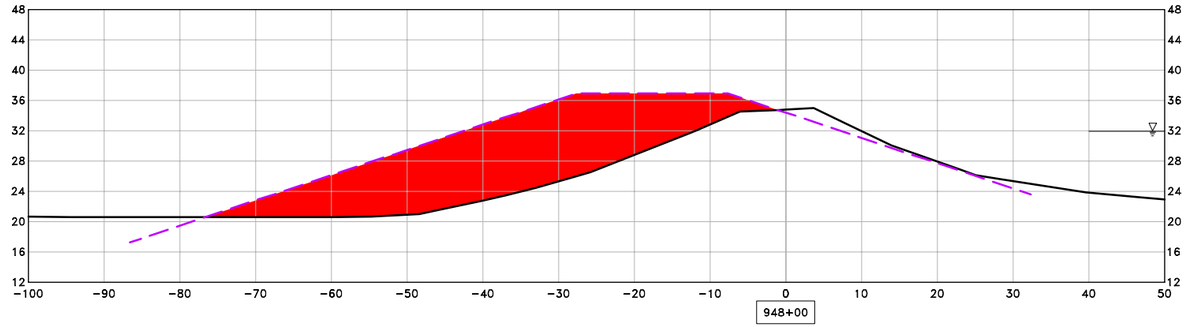
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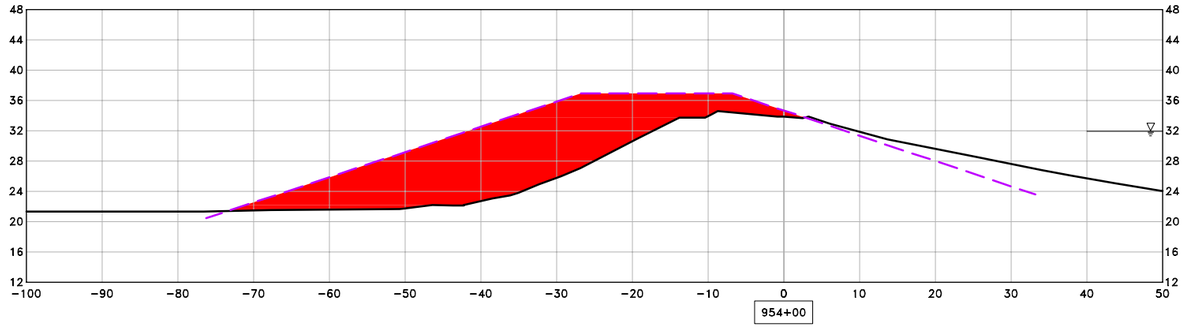
DATE
DECEMBER 11, 2019

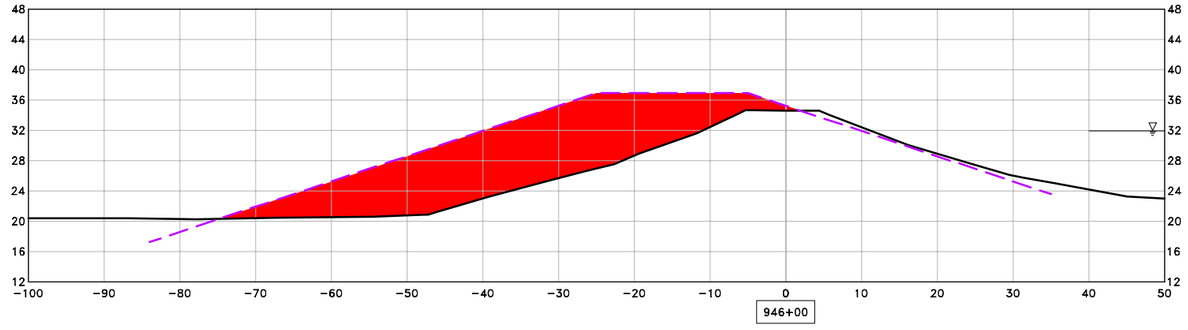
SHEET IDENTIFICATION
C2-337
SHEET 119 OF 136

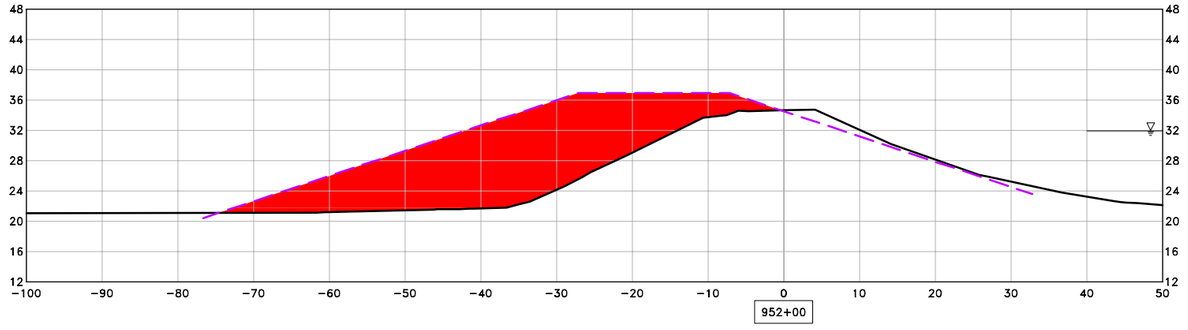
KSN PROJECT FILE NO.
2255-0050

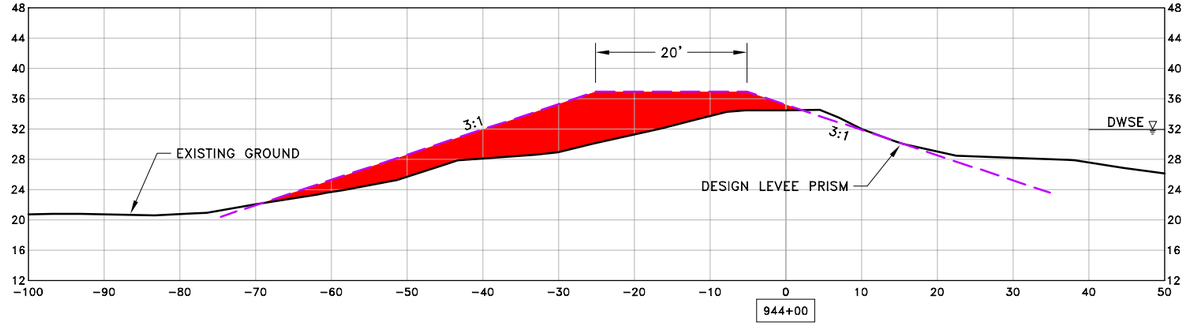
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PLOT DATE: Dec 11, 2019 - 4:12pm

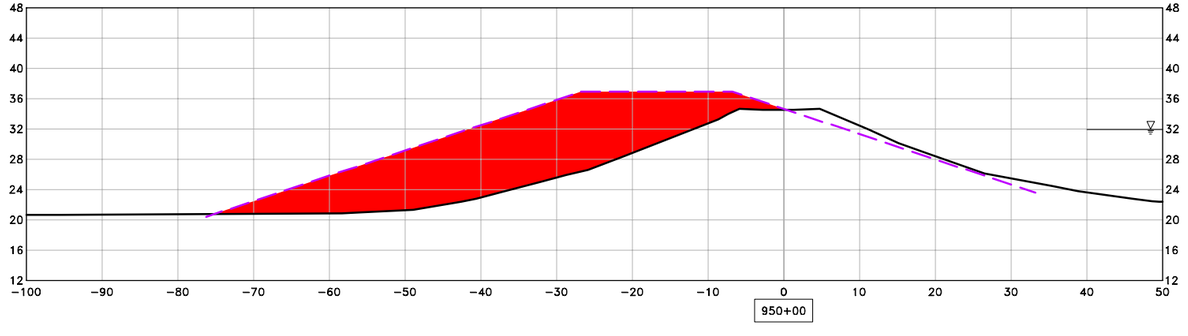












FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:12pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
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SAN JOAQUIN COUNTY, CALIFORNIA

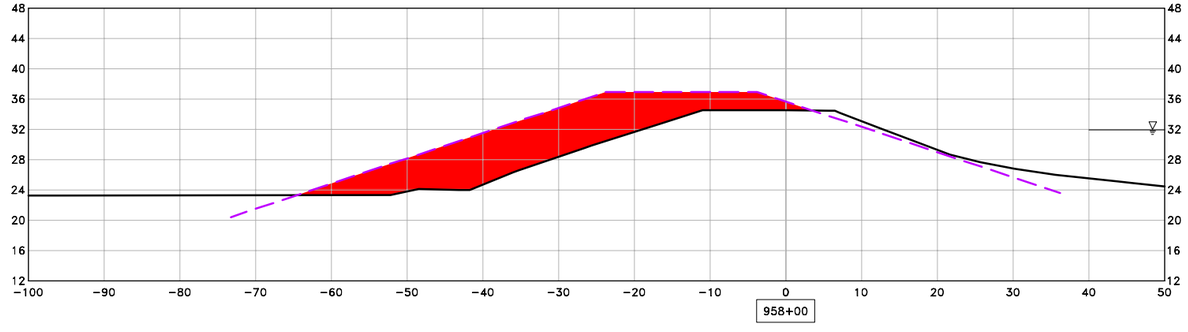
ALL OTHER LEVEE DESIGN SECTION VIEW

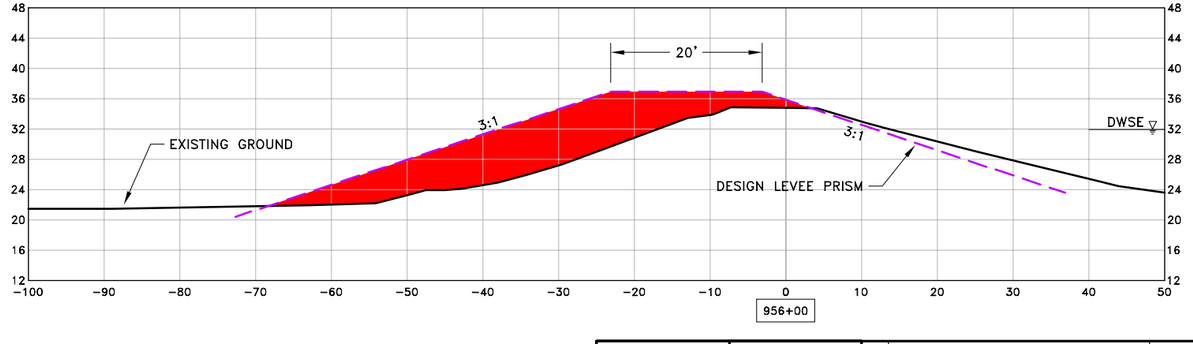
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DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C2-338
SHEET 120 OF 136

KSN PROJECT FILE NO.
2255-0050





FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:13pm

NORTH ORIENTATION

PROJECT ENGINEER

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NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

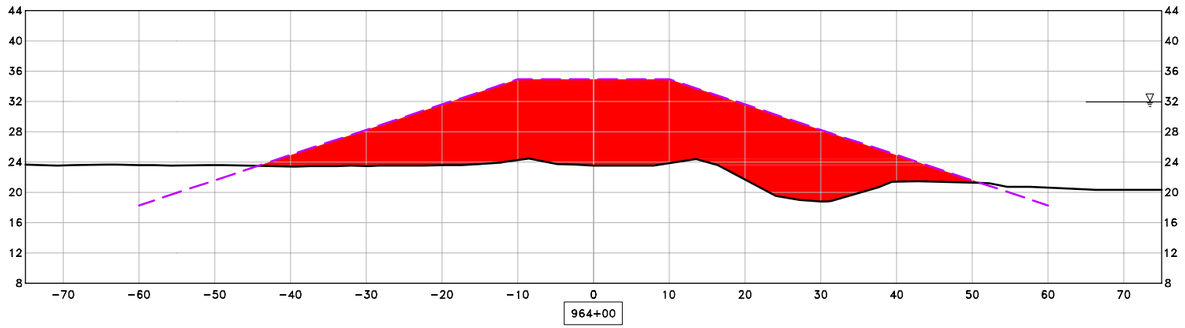
ALL OTHER LEVEE DESIGN SECTION VIEW

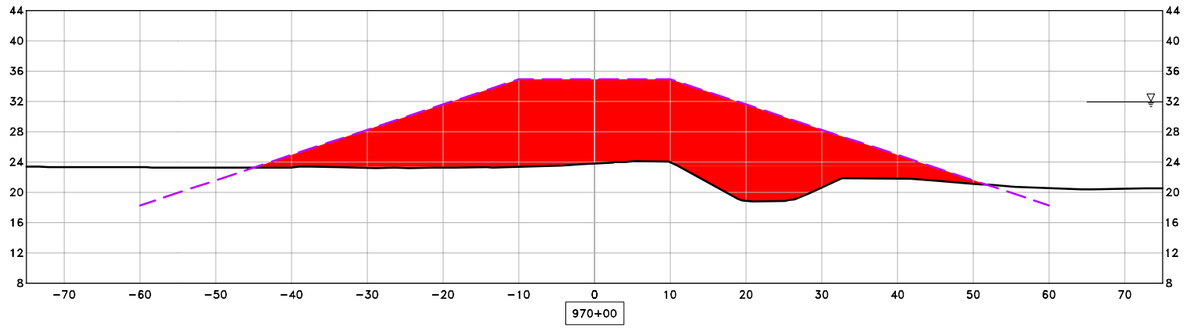
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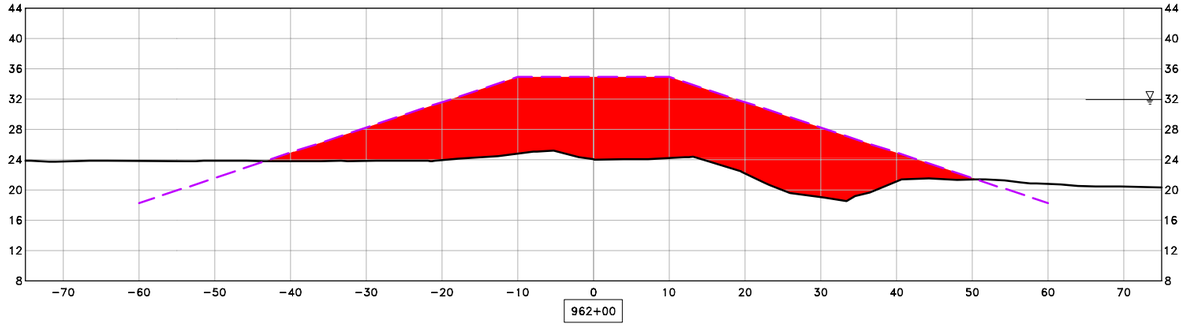
DATE
DECEMBER 11, 2019

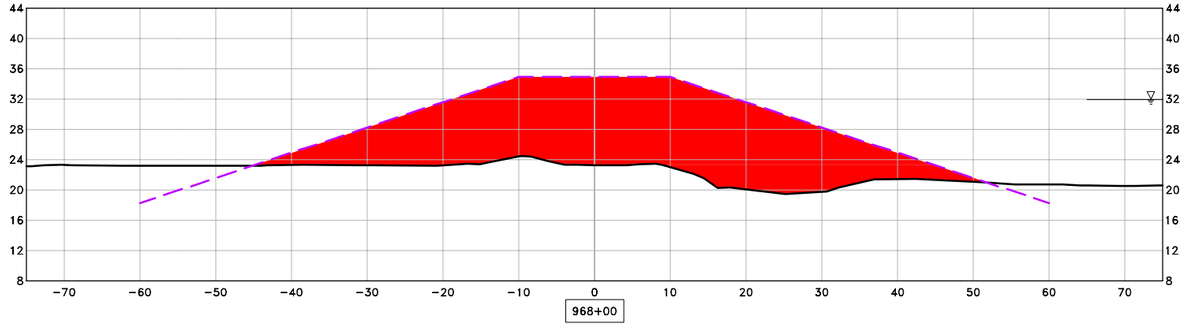
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C2-339
SHEET 121 OF 136

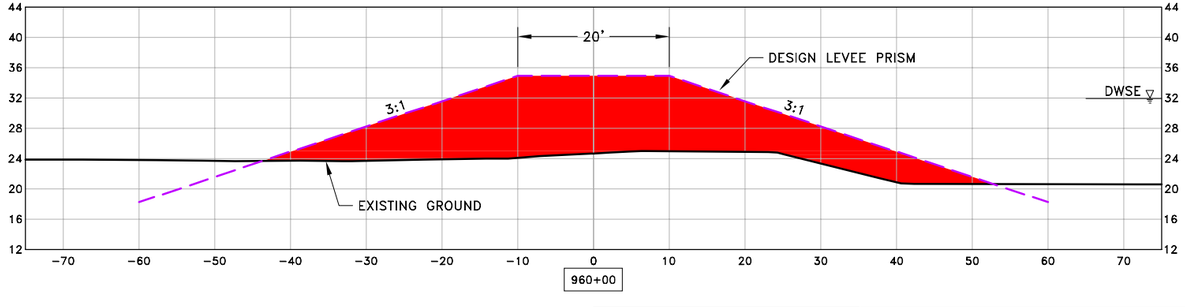
KSN PROJECT FILE NO.
2255-0050

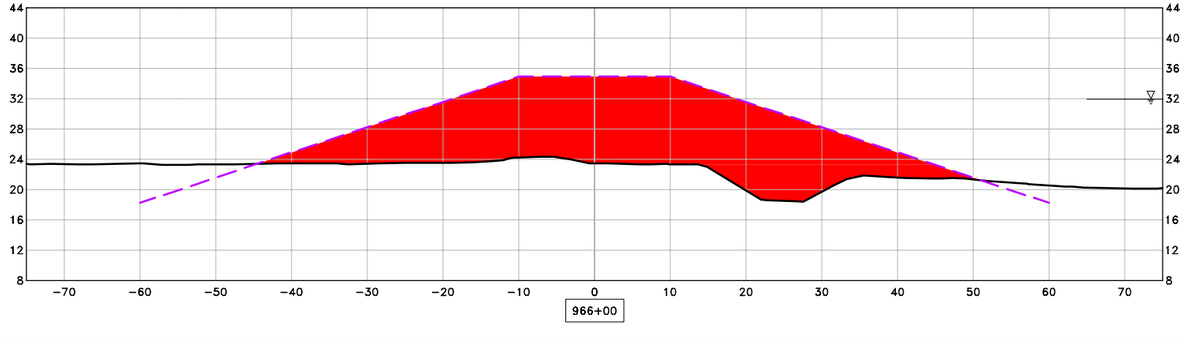












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PLOT DATE: Dec 11, 2019 - 4:13pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'
ORIGINAL DRAWING SCALE
0 ½" 1"

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West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

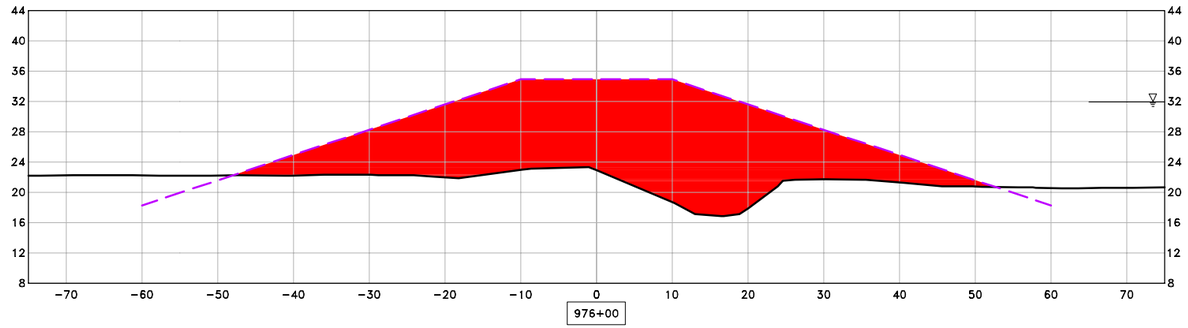
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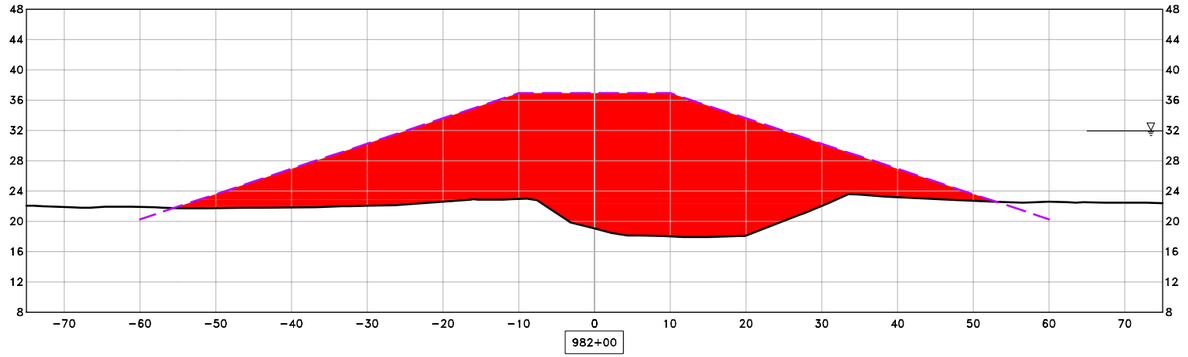
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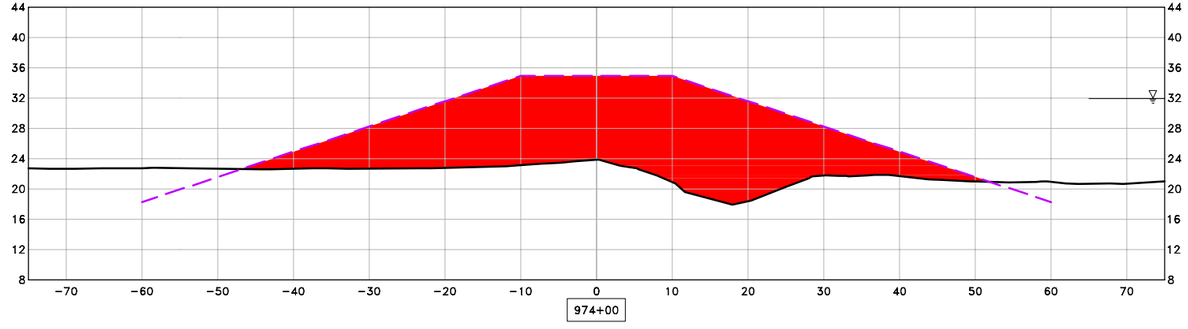
DATE
DECEMBER 11, 2019

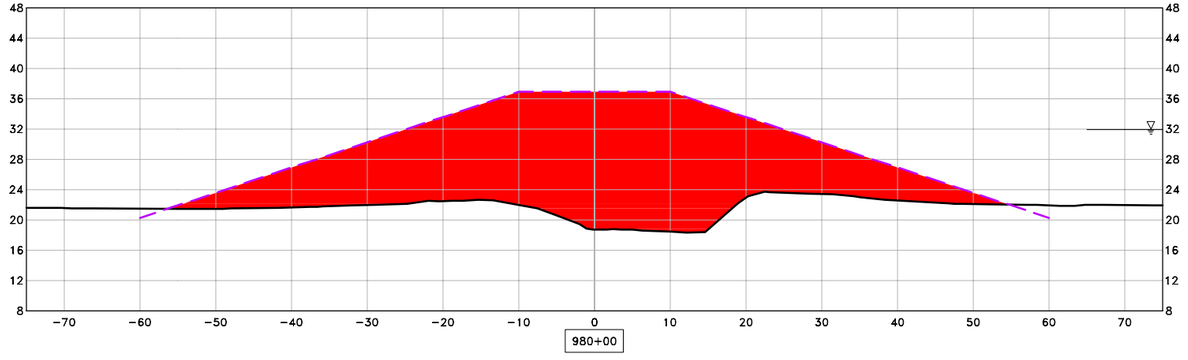
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C2-340
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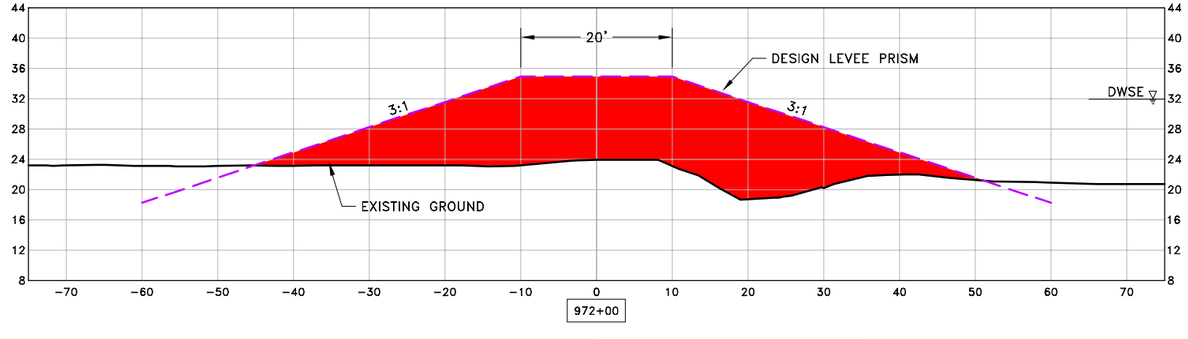
KSN PROJECT FILE NO.
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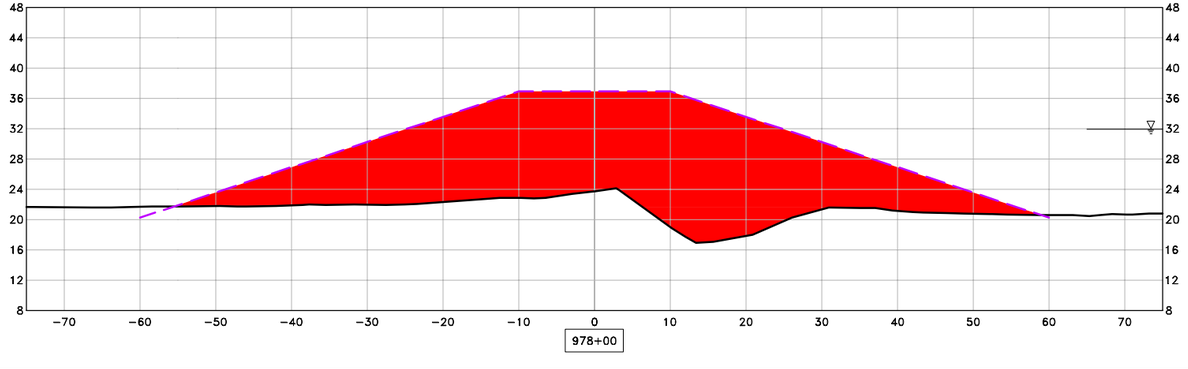












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PLOT DATE: Dec 11, 2019 - 4:14pm

NORTH ORIENTATION

PROJECT ENGINEER

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CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

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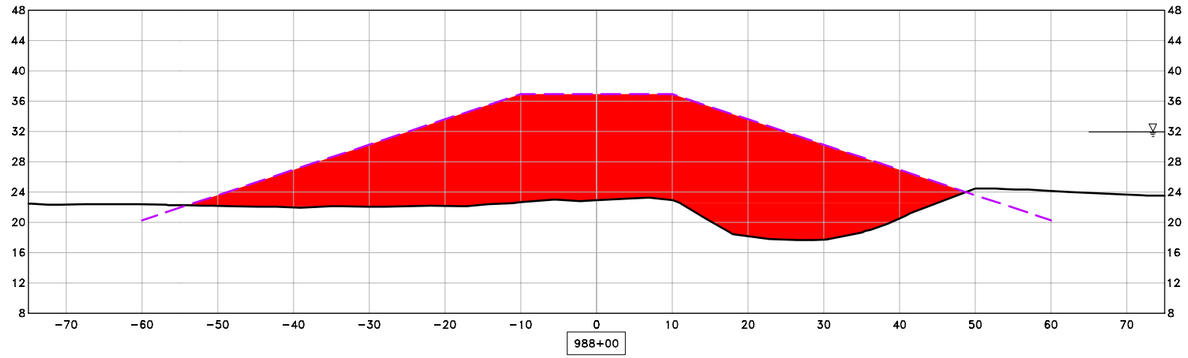
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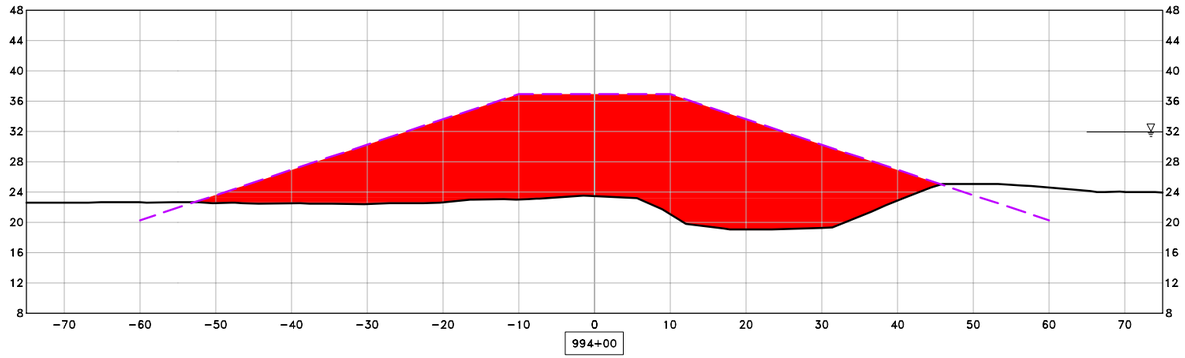
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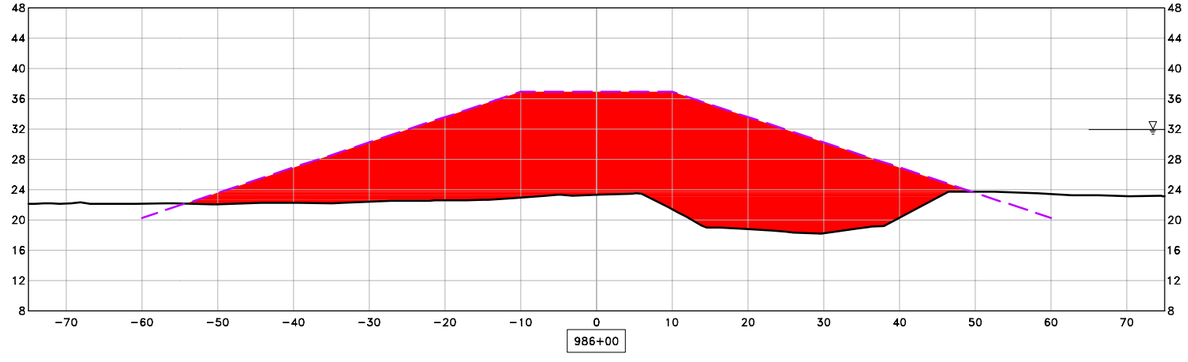
DATE
DECEMBER 11, 2019

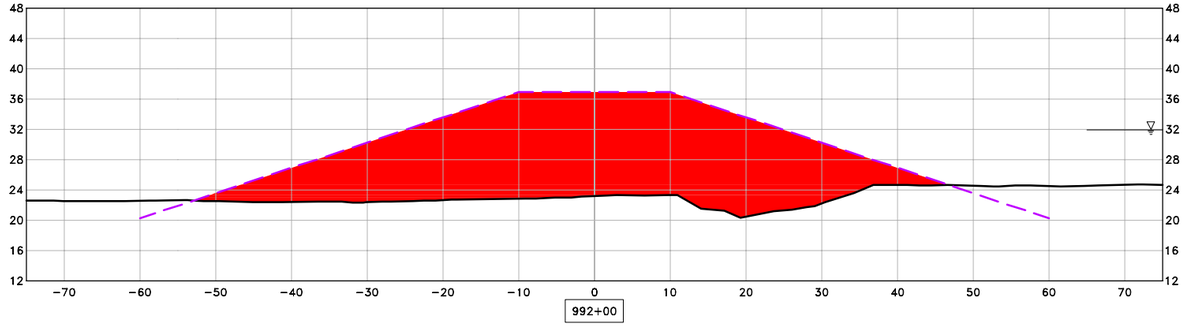
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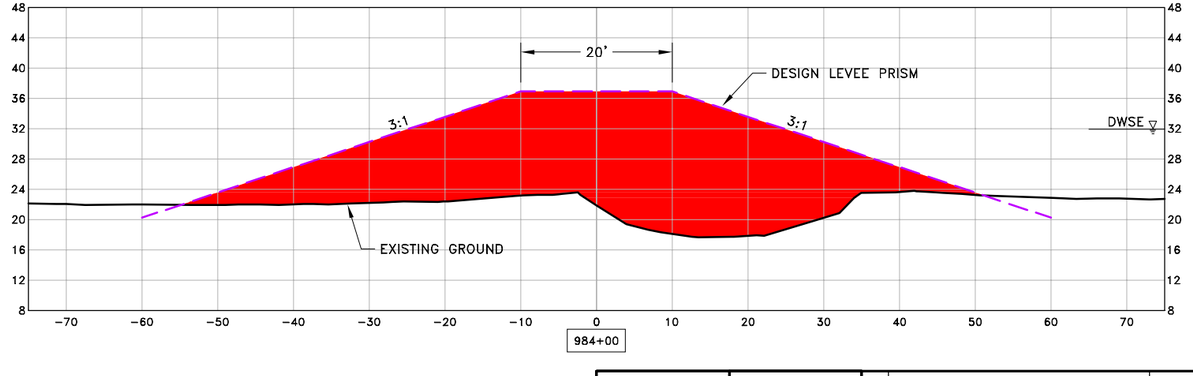
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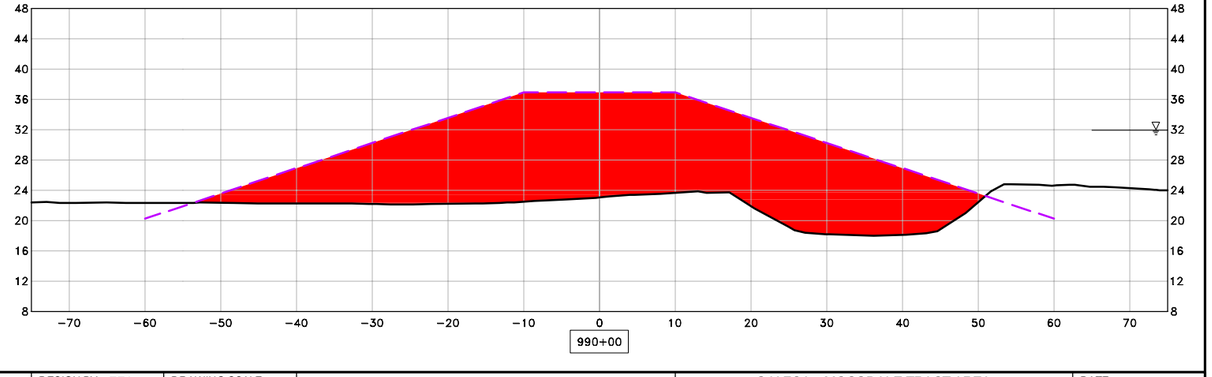












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NORTH ORIENTATION

PROJECT ENGINEER

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NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
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CHECK BY CHN
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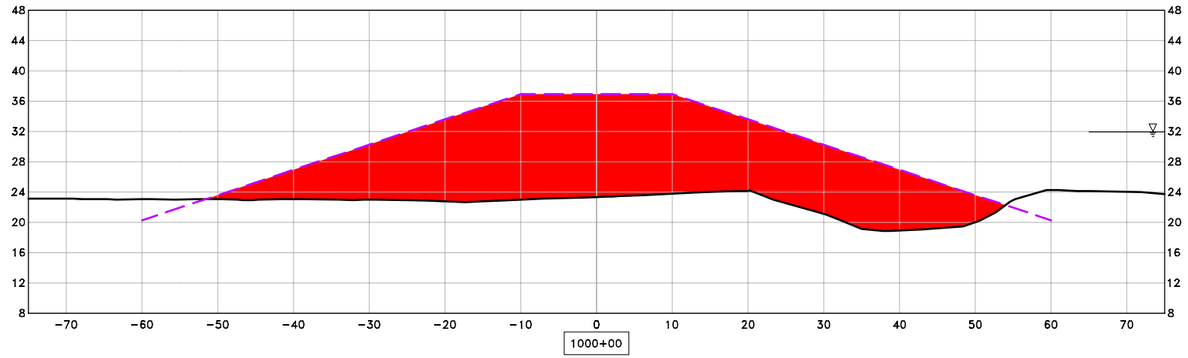
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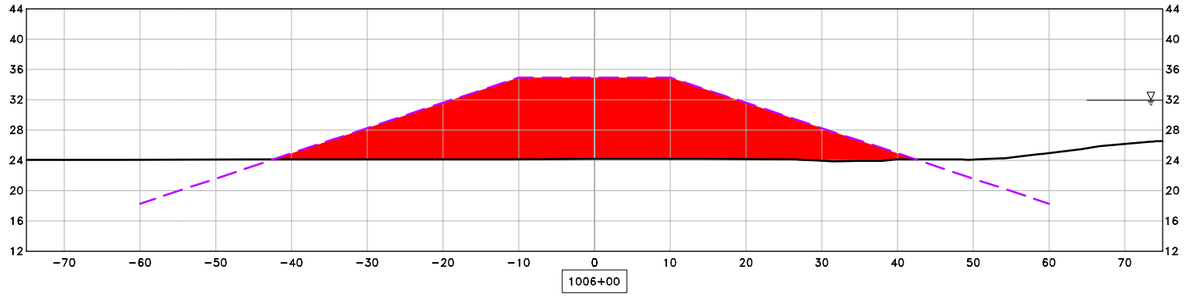
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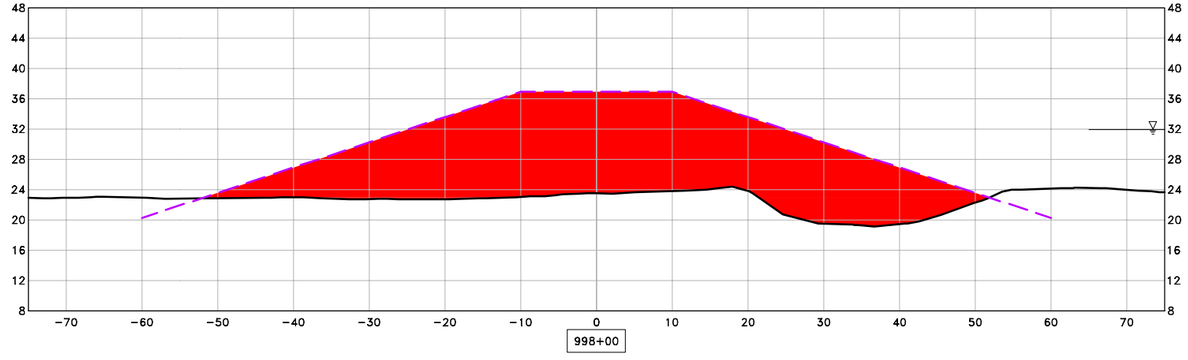
DATE
DECEMBER 11, 2019

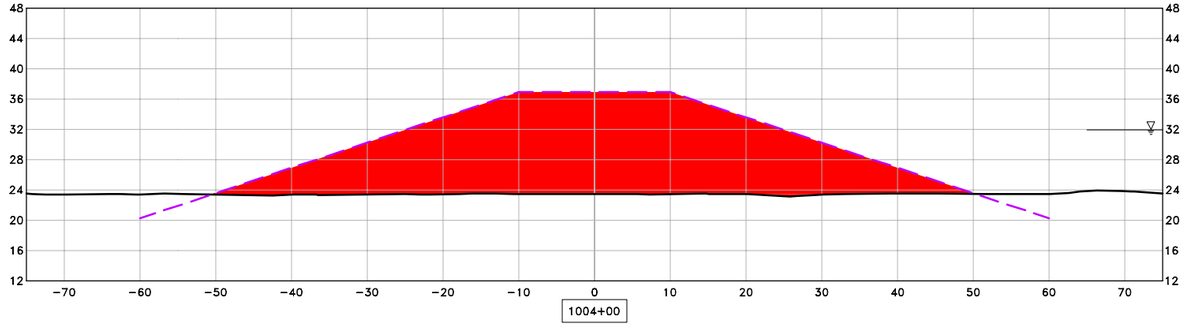
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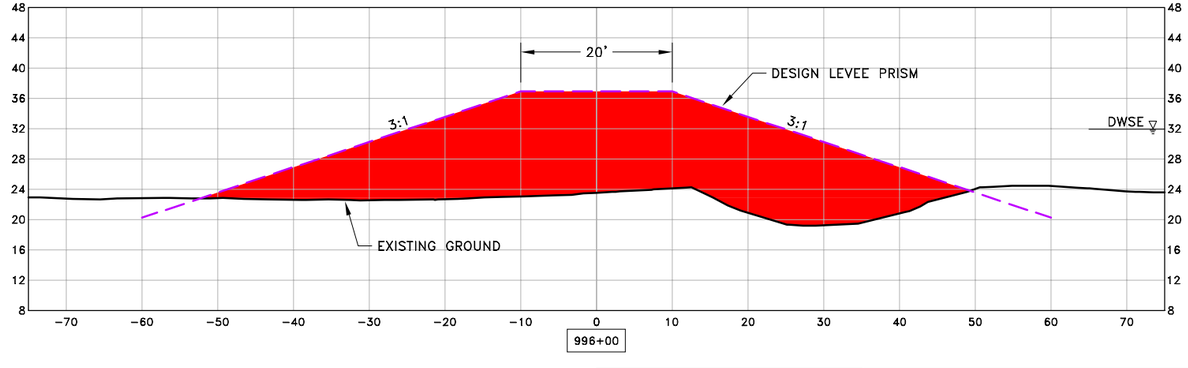
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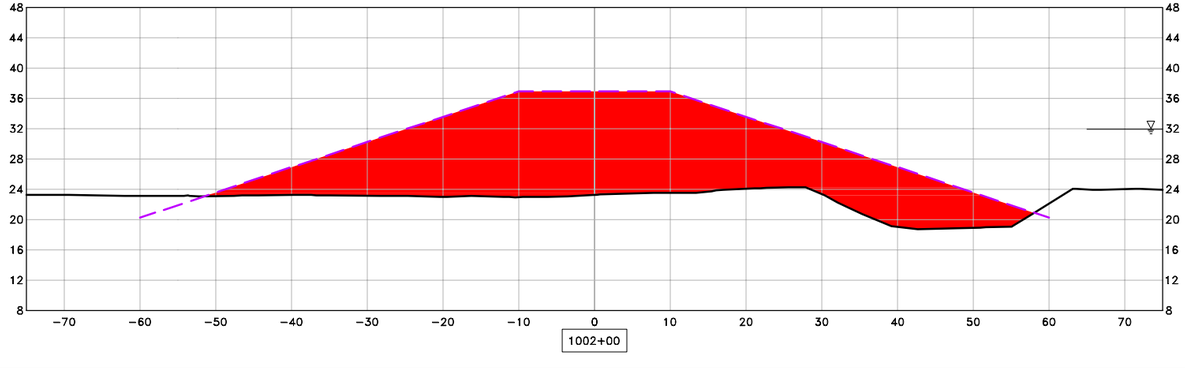












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PLOT DATE: Dec 11, 2019 - 4:15pm

NORTH ORIENTATION

PROJECT ENGINEER

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CHECK BY CHN
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VERTICAL DATUM NAVD88

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ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

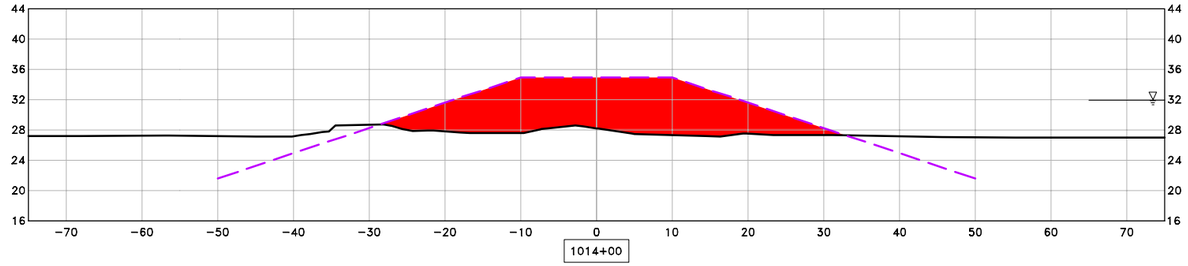
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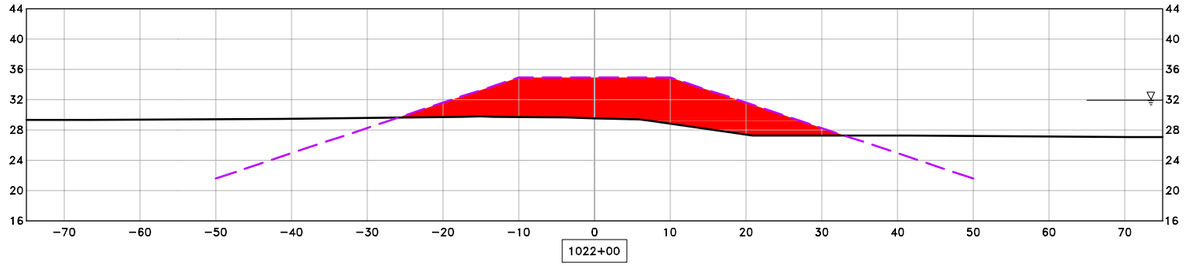
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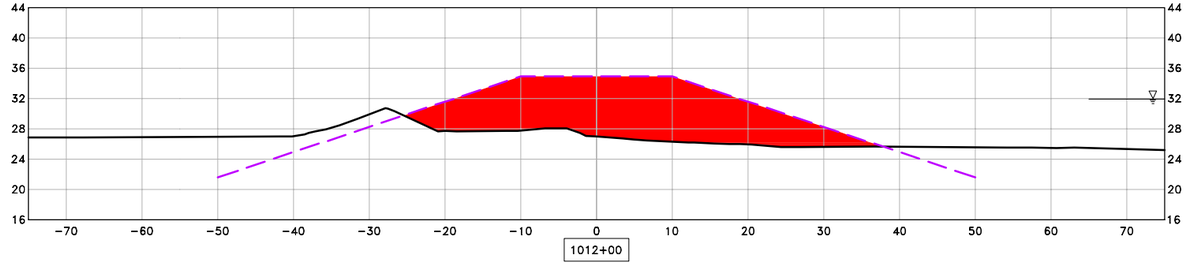
DATE
DECEMBER 11, 2019

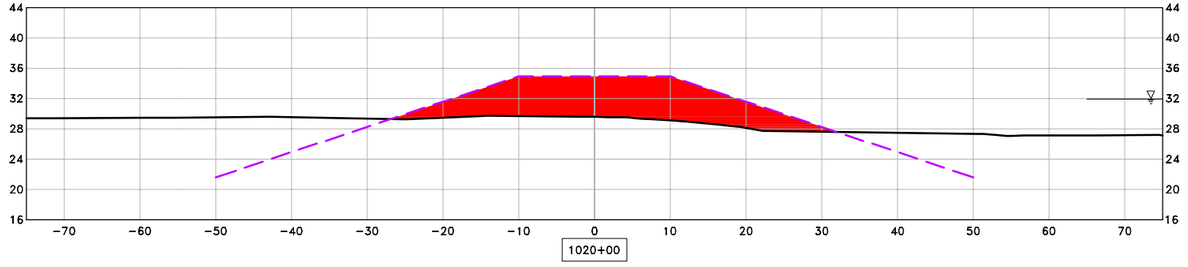
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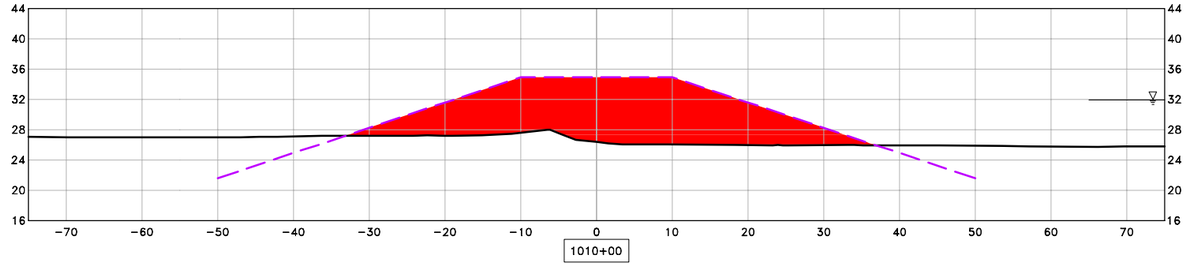
KSN PROJECT FILE NO.
2255-0050

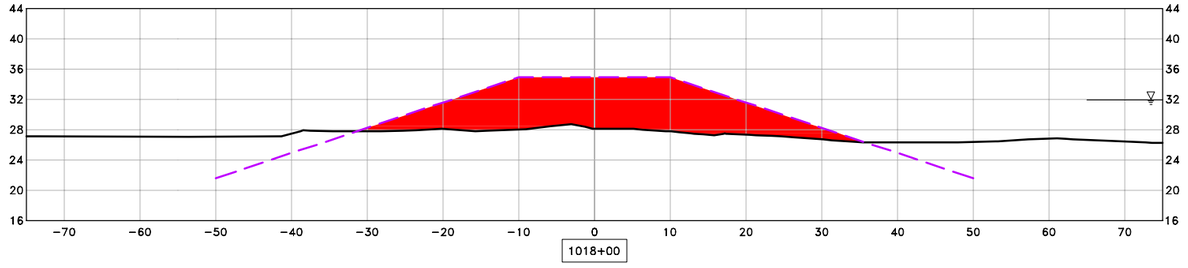


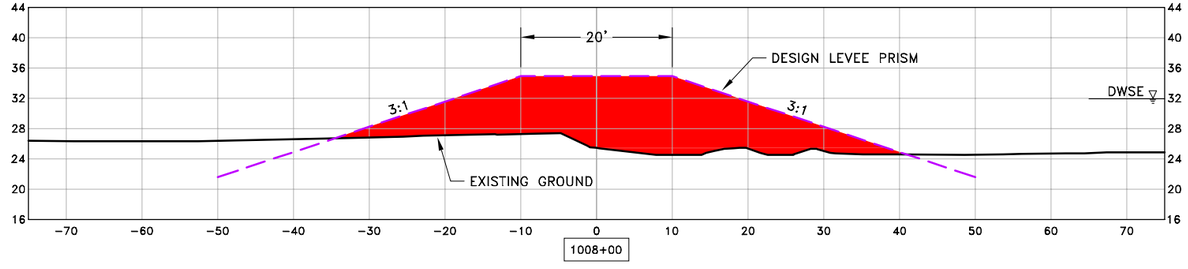


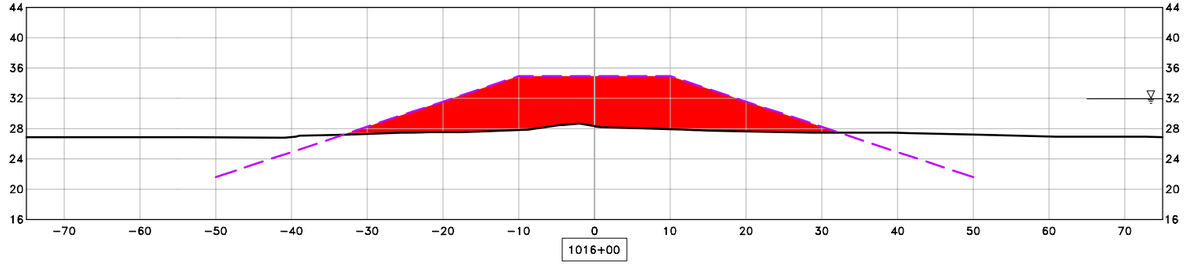












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PLOT DATE: Dec 11, 2019 - 4:15pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

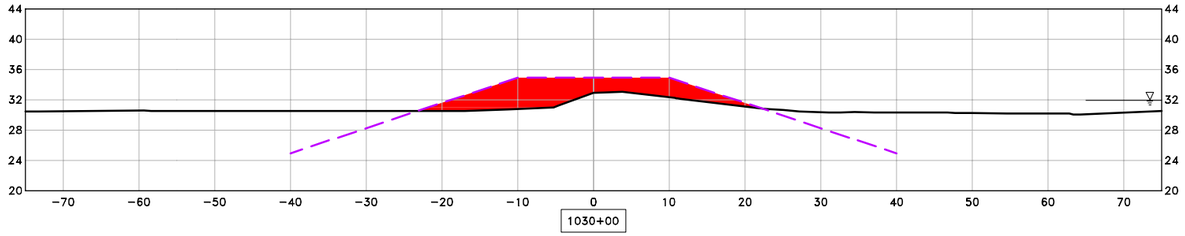
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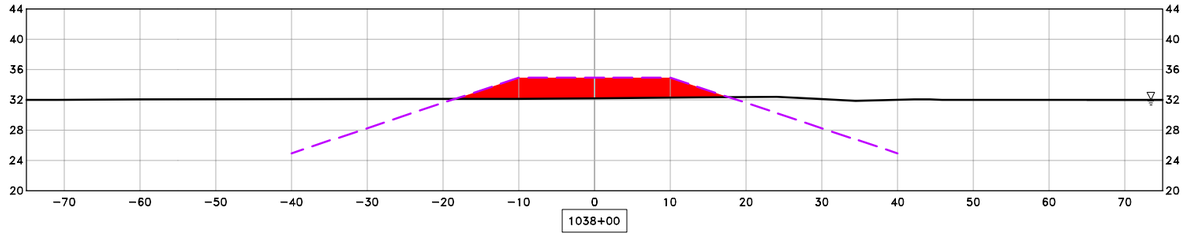
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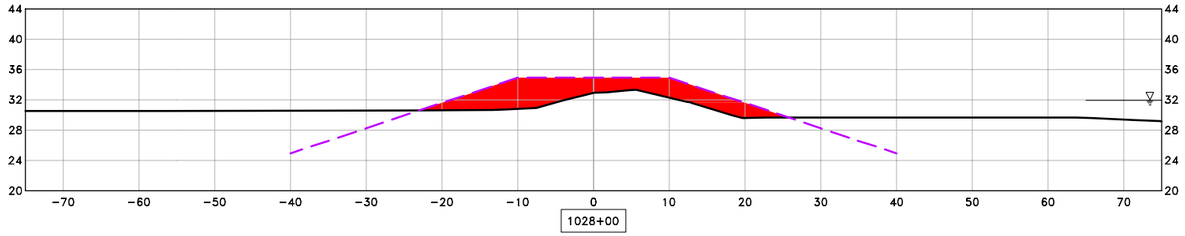
DATE
DECEMBER 11, 2019

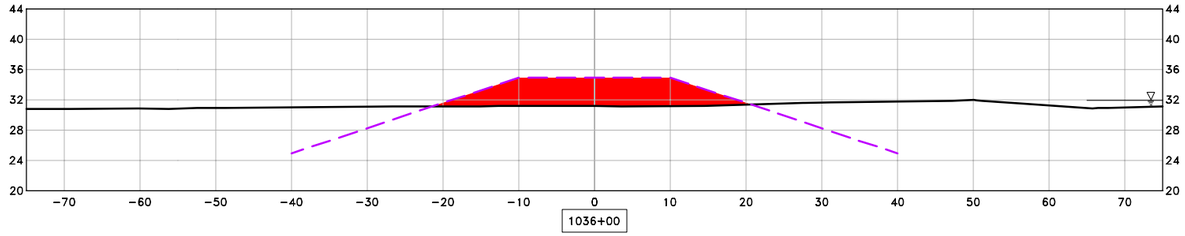
SHEET IDENTIFICATION
C2-344
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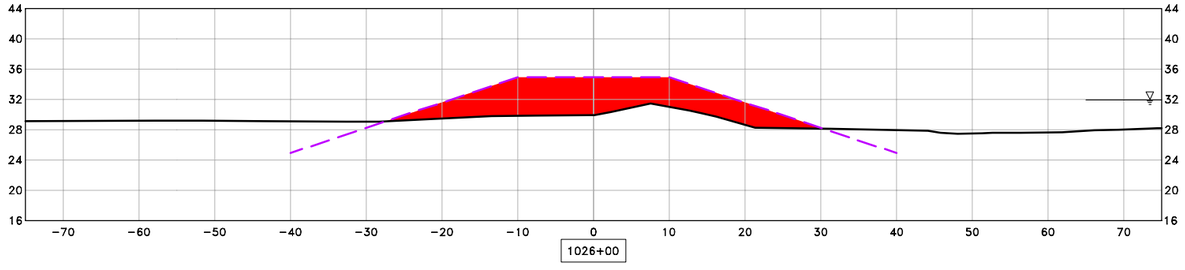
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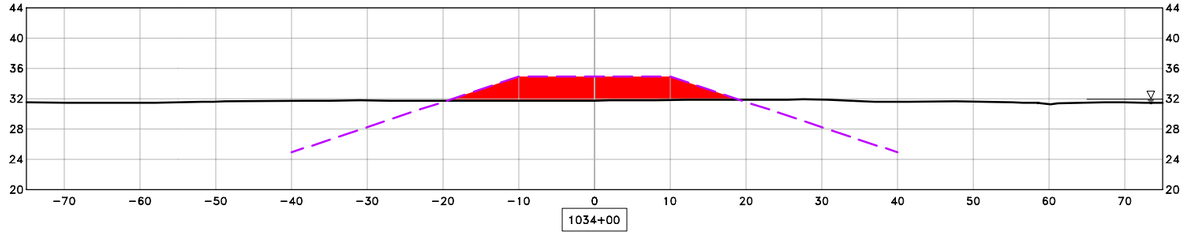


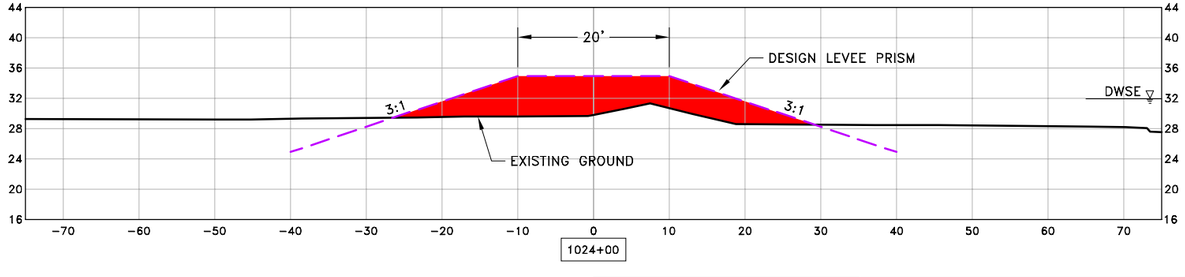


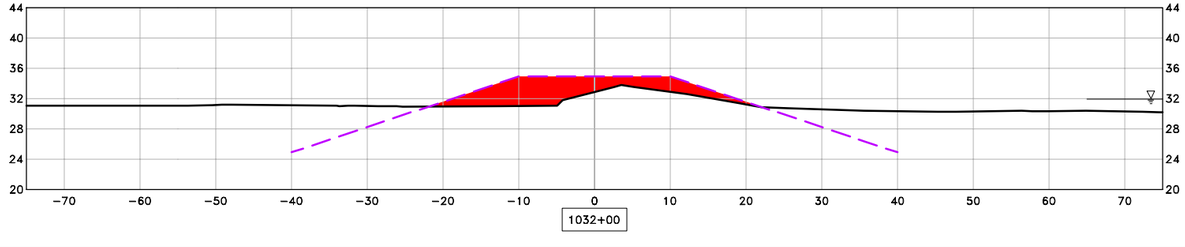












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PLOT DATE: Dec 11, 2019 - 4:16pm

NORTH ORIENTATION

PROJECT ENGINEER

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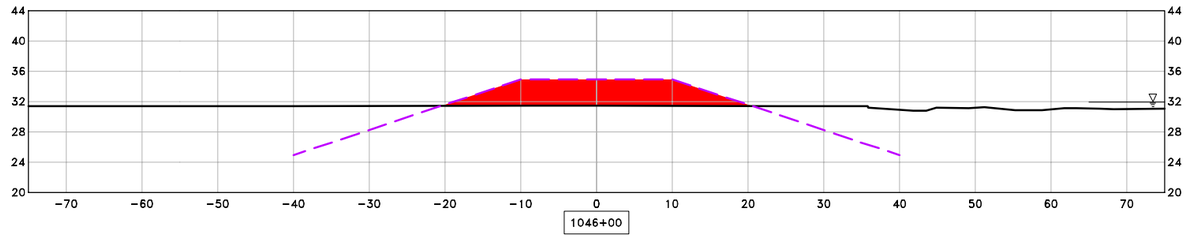
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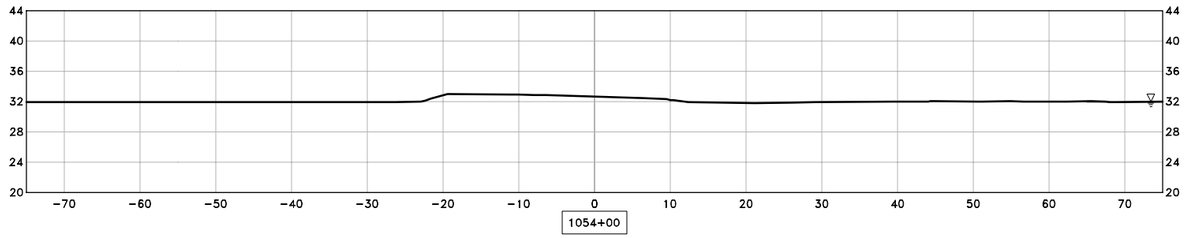
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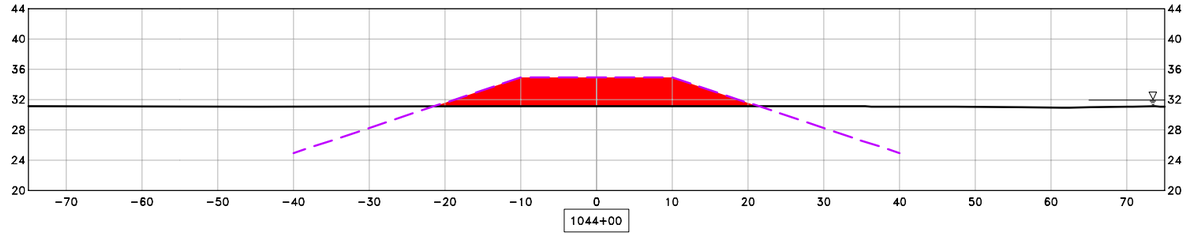
DATE
DECEMBER 11, 2019

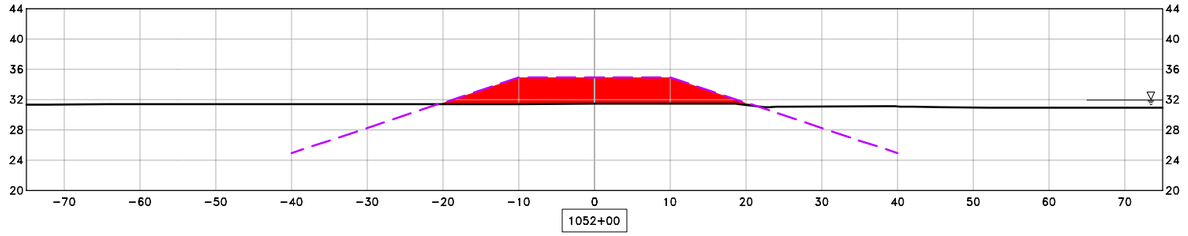
SHEET IDENTIFICATION
C2-345
SHEET 127 OF 136

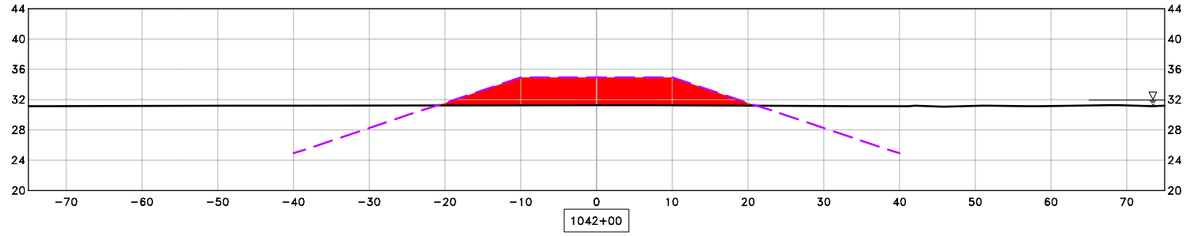
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2255-0050

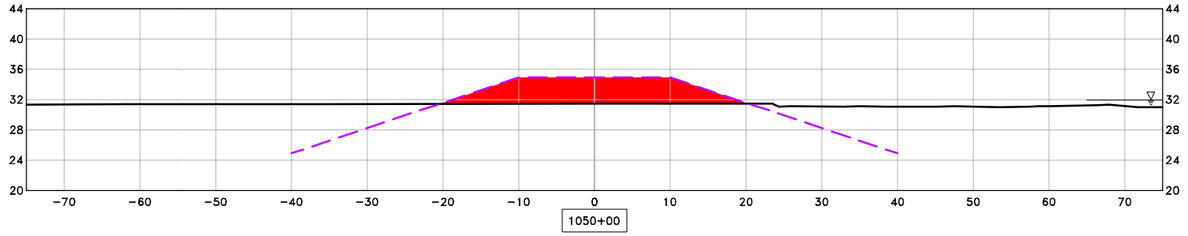


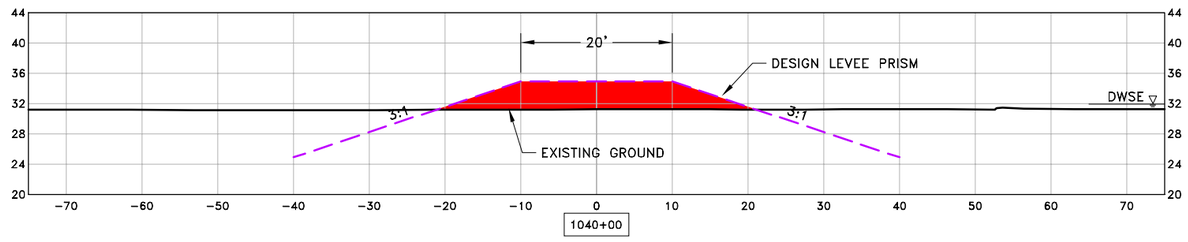


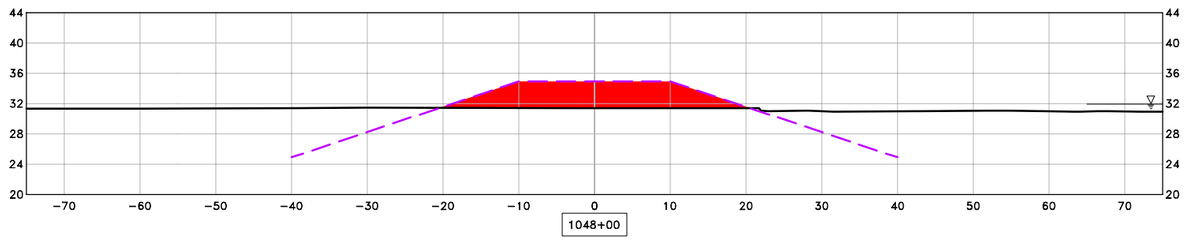












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PLOT DATE: Dec 11, 2019 - 4:16pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

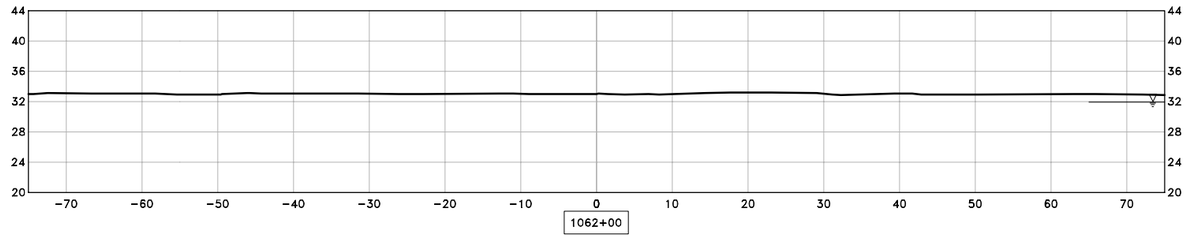
ALL OTHER LEVEE DESIGN SECTION VIEW

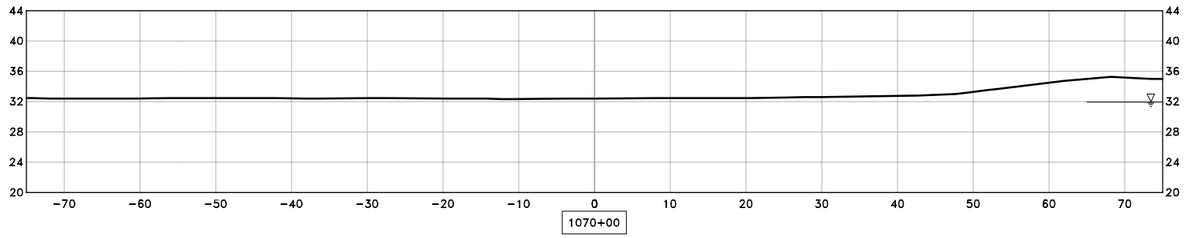
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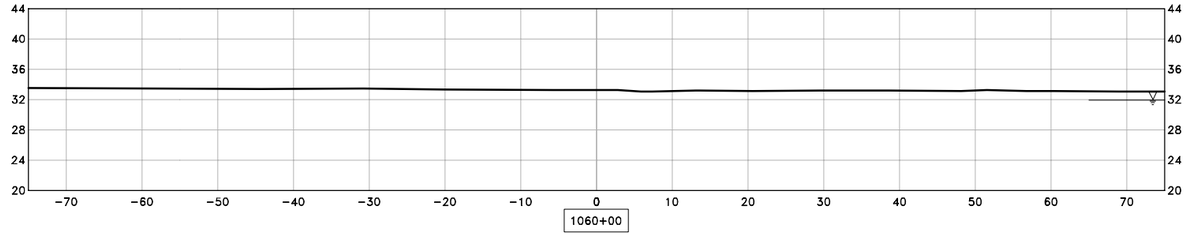
DATE
DECEMBER 11, 2019

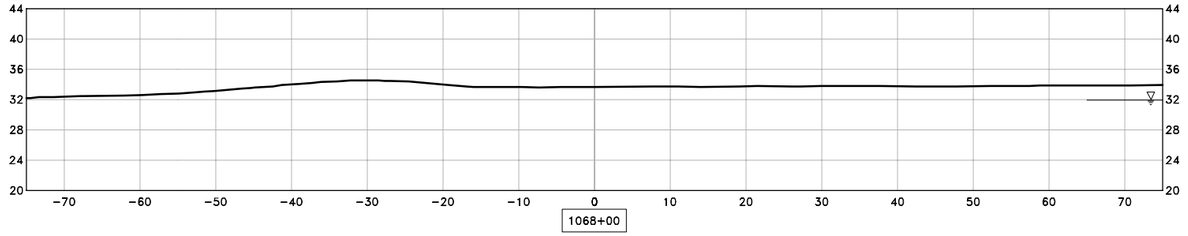
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C2-346
SHEET 128 OF 136

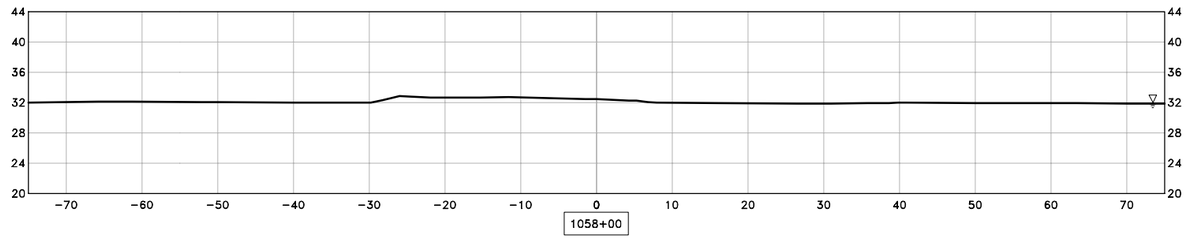
KSN PROJECT FILE NO.
2255-0050

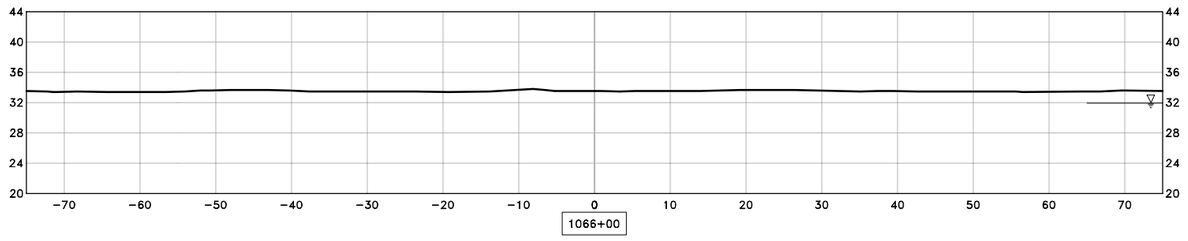


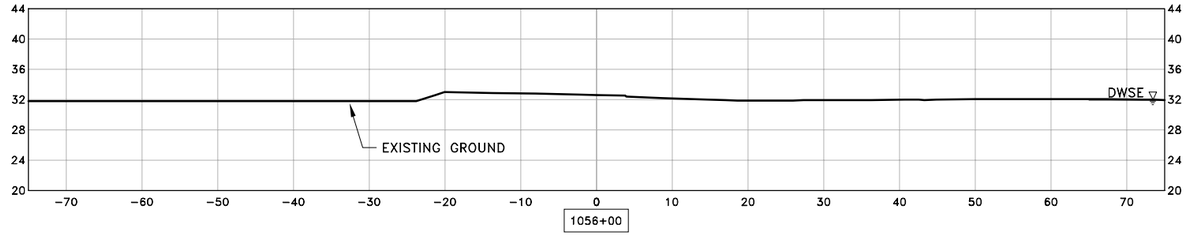


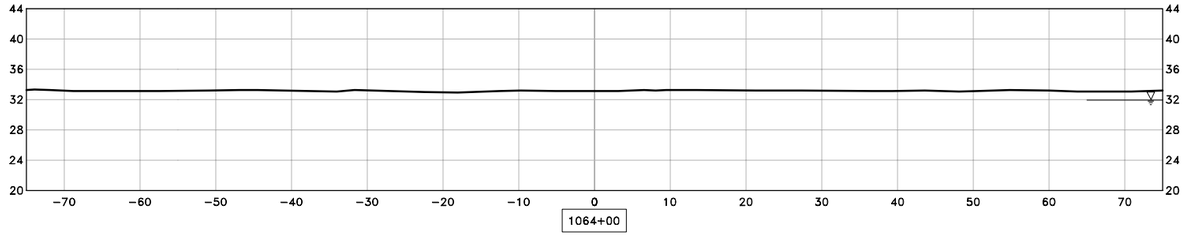












NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

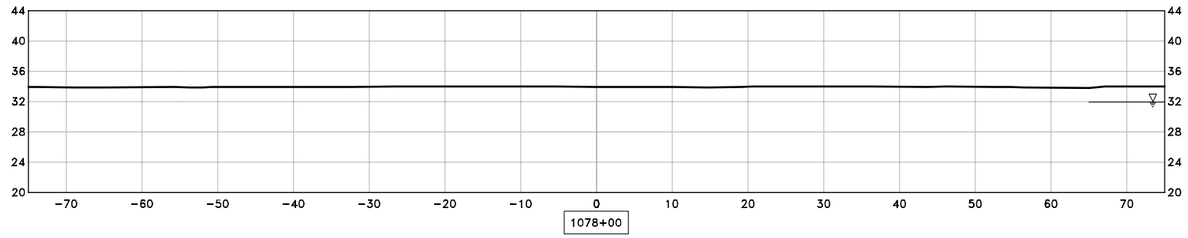
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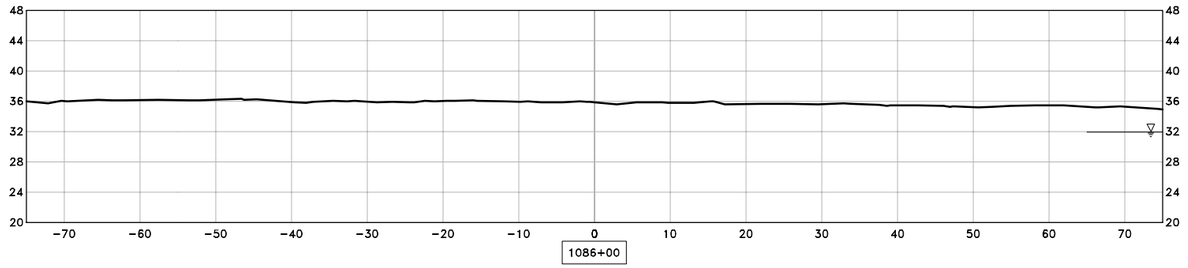
DATE
DECEMBER 11, 2019

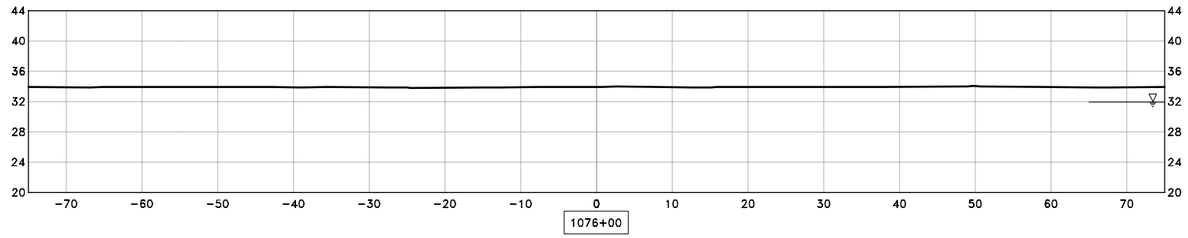
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C2-347
SHEET 129 OF 136

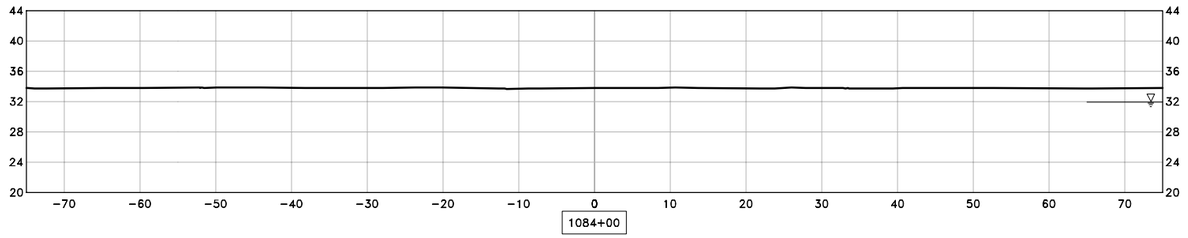
KSN PROJECT FILE NO.
2255-0050

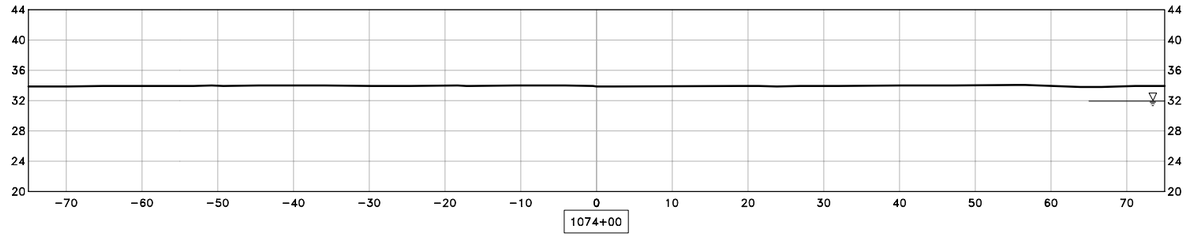
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PLOT DATE: Dec 11, 2019 - 4:17pm

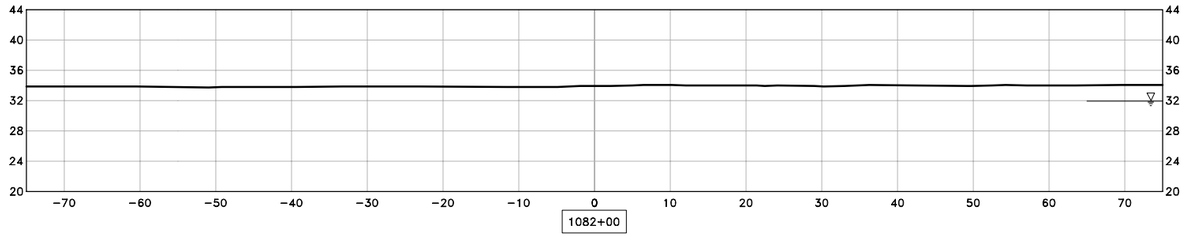


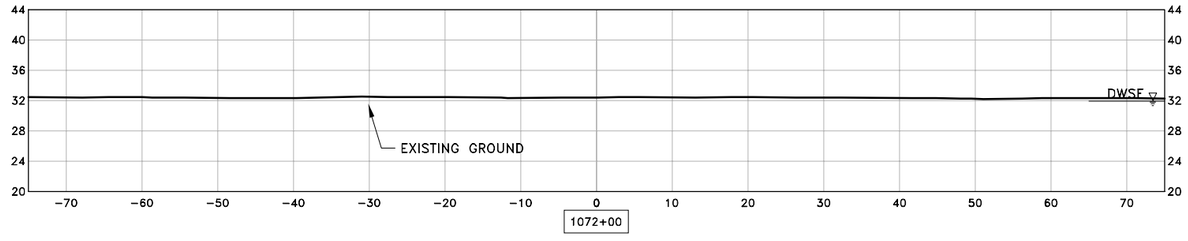


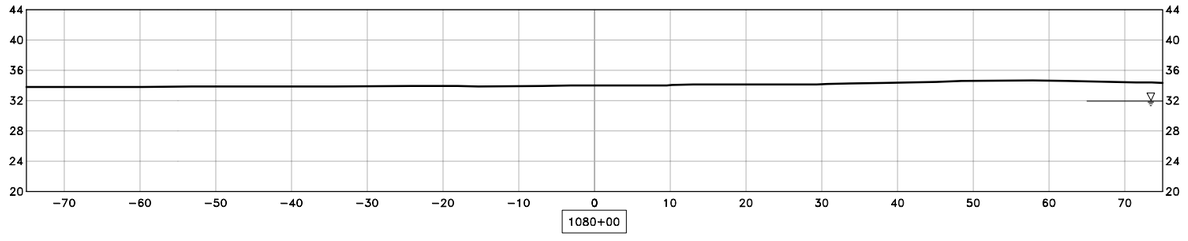












NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

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DESIGN BY	EEA
DRAWN BY	EEA
CHECK BY	CHN
HORIZONTAL DATUM	CCS83, ZONE 3
VERTICAL DATUM	NAVD88

DRAWING SCALE
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ORIGINAL DRAWING SCALE
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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

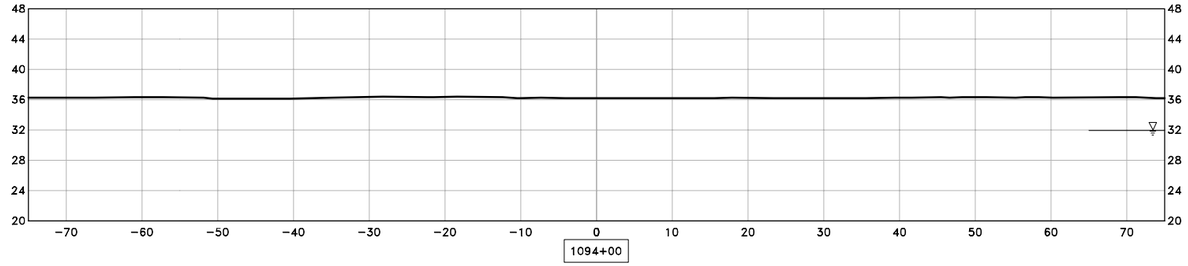
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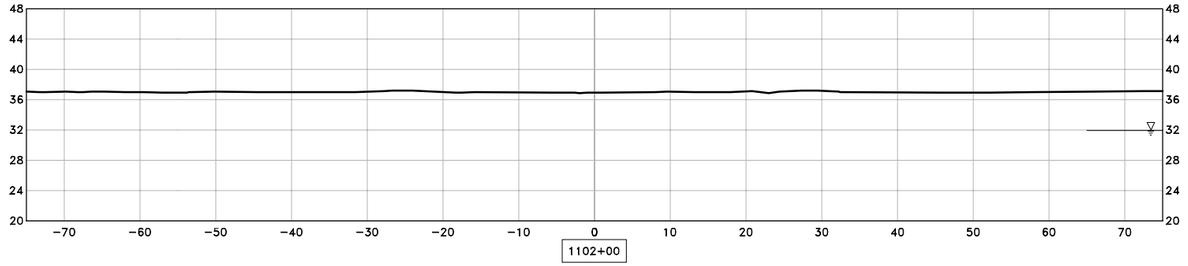
DATE
DECEMBER 11, 2019

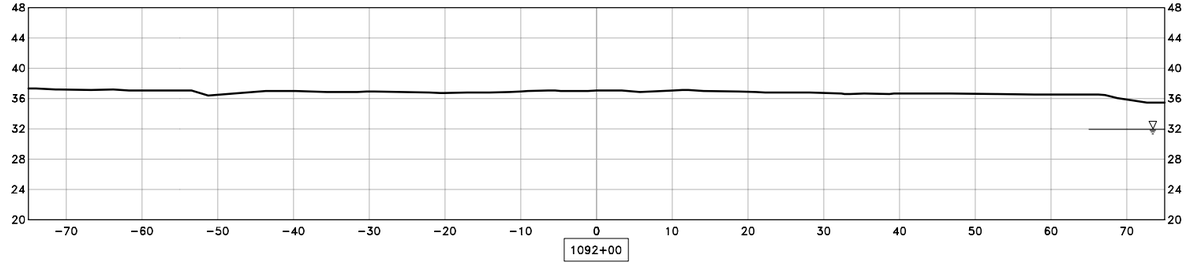
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C2-348
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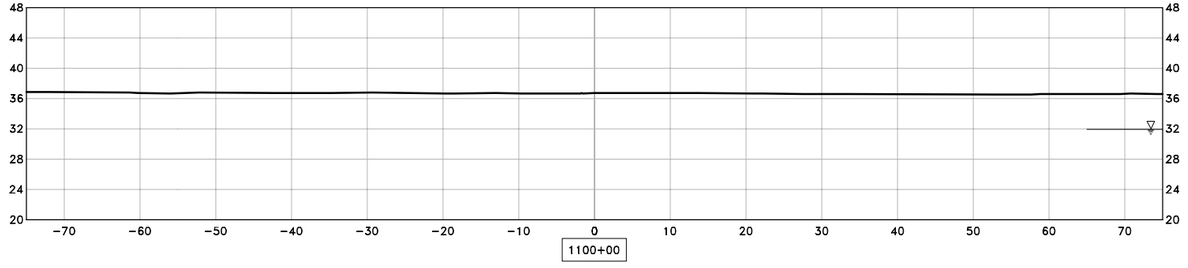
KSN PROJECT FILE NO.
2255-0050

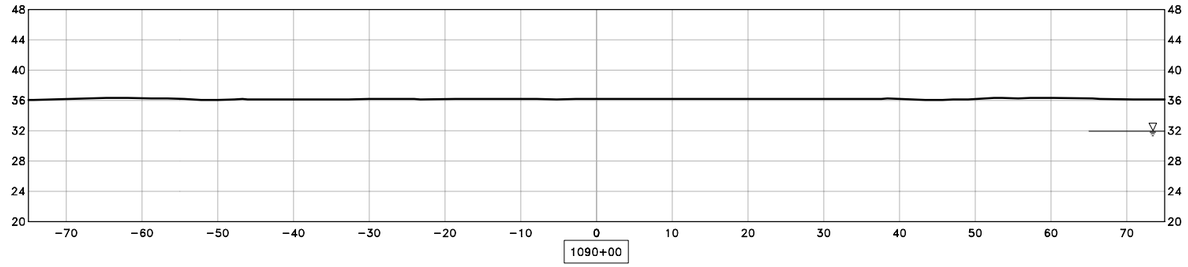
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PLOT DATE: Dec 11, 2019 - 4:17pm

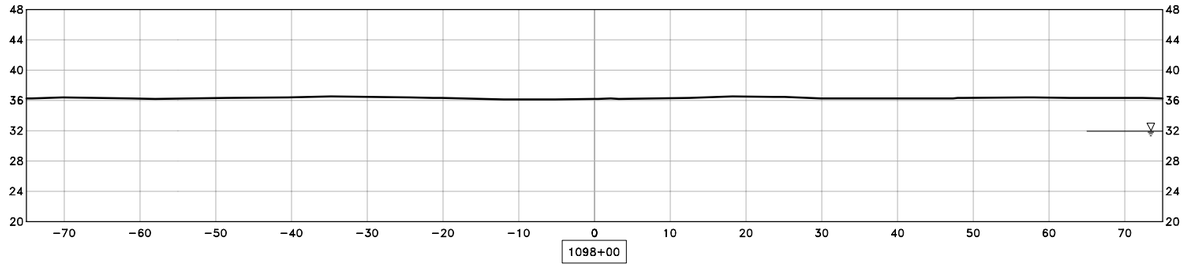


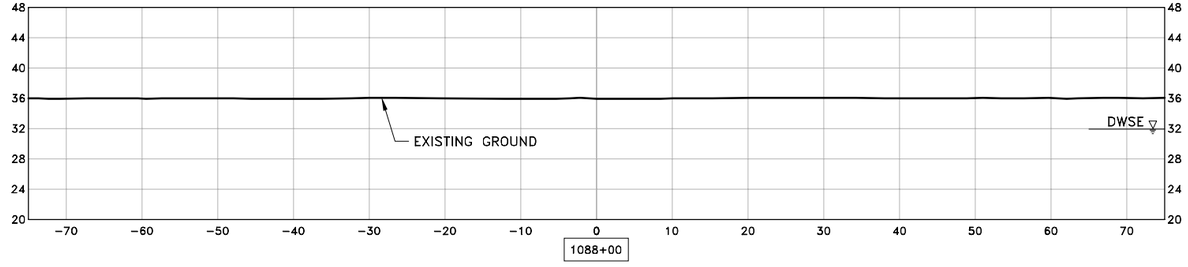


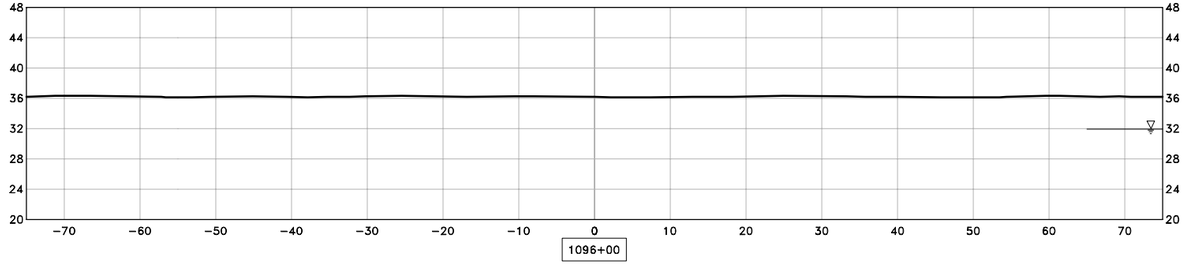












NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 10'

ORIGINAL DRAWING SCALE
0 ½" 1"

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ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

STA 1088+00 TO STA 1104+00

DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C2-349
SHEET 131 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:18pm

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

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CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE 1" = 10'

ORIGINAL DRAWING SCALE 0 ½" 1"

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ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

ALL OTHER LEVEE DESIGN SECTION VIEW

STA 1104+00 TO STA 1104+20

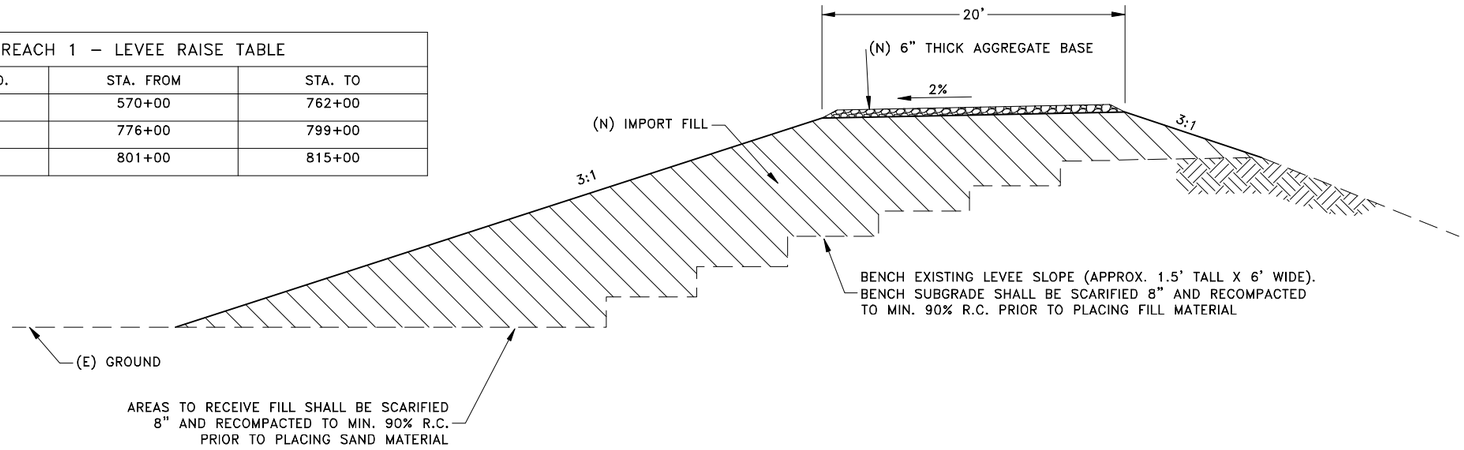
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SHEET IDENTIFICATION
C2-350
SHEET 132 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C2-301.dwg
PLOT DATE: Dec 11, 2019 - 4:18pm

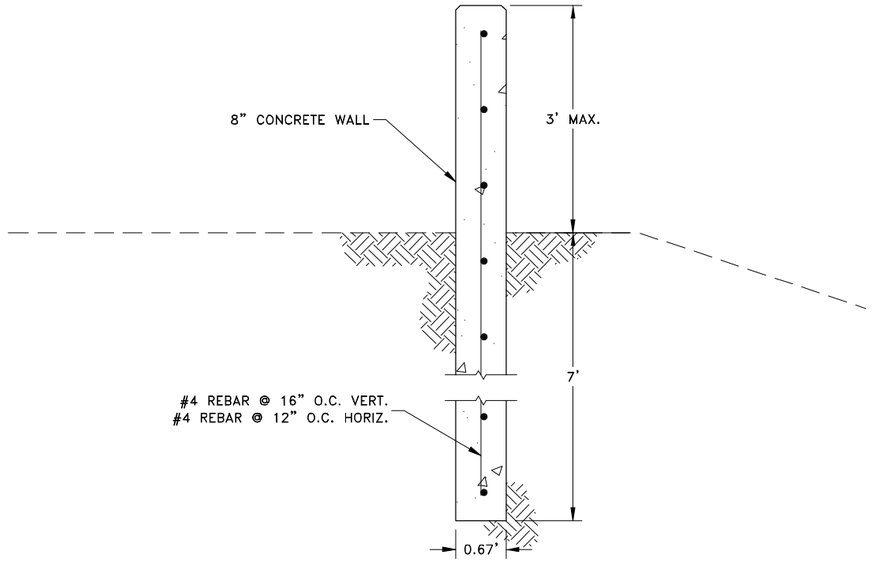
REACH 1 – LEVEE RAISE TABLE		
WORK SITE NO.	STA. FROM	STA. TO
1–1	570+00	762+00
1–3	776+00	799+00
1–5	801+00	815+00



1 LEVEE RAISE

SCALE: N.T.S.

REACH 1 – FLOODWALL TABLE		
WORK SITE NO.	STA. FROM	STA. TO
1–2	762+00	776+00
1–4	799+00	801+00
1–6	815+00	822+80



2 FLOODWALL

SCALE: N.T.S.

NORTH ORIENTATION

PROJECT ENGINEER

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DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
AS SHOWN

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

PROPOSED DESIGN DETAILS - REACH 1

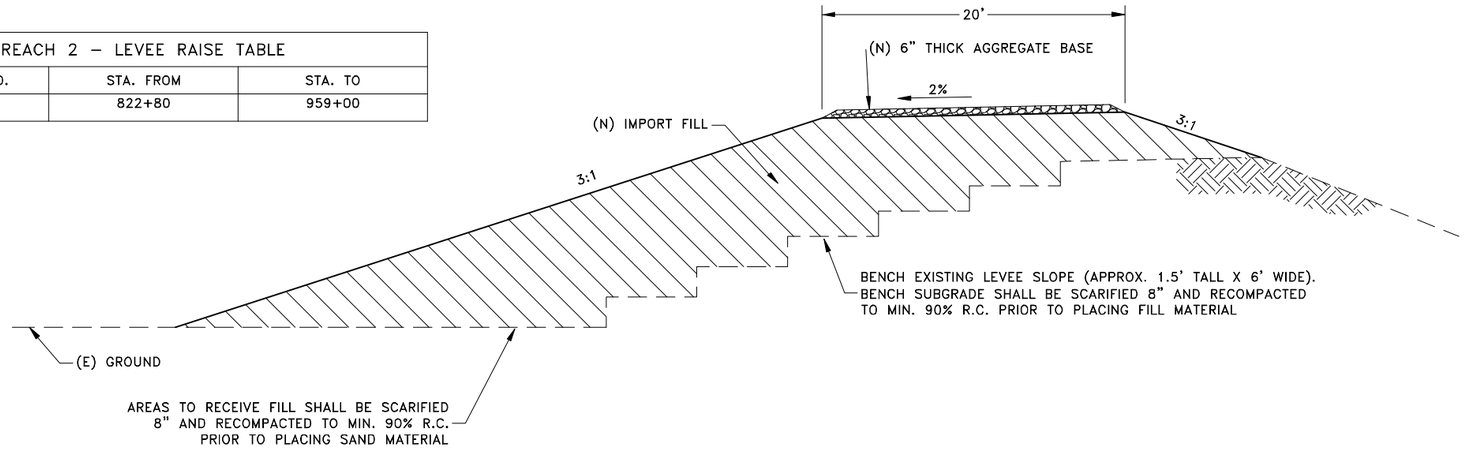
DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C-501
SHEET 133 OF 136

KSN PROJECT FILE NO.
2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C-501.dwg
PLOT DATE: Dec 11, 2019 - 4:24pm

REACH 2 – LEVEE RAISE TABLE		
WORK SITE NO.	STA. FROM	STA. TO
2–1	822+80	959+00



1 LEVEE RAISE

SCALE: N.T.S.

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C-501.dwg
PLOT DATE: Dec 11, 2019 - 4:25pm

NORTH ORIENTATION

PROJECT ENGINEER

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NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE
AS SHOWN

ORIGINAL DRAWING SCALE
0 ½" 1"

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SJAFCA - MOSSDALE TRACT AREA
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SAN JOAQUIN COUNTY, CALIFORNIA

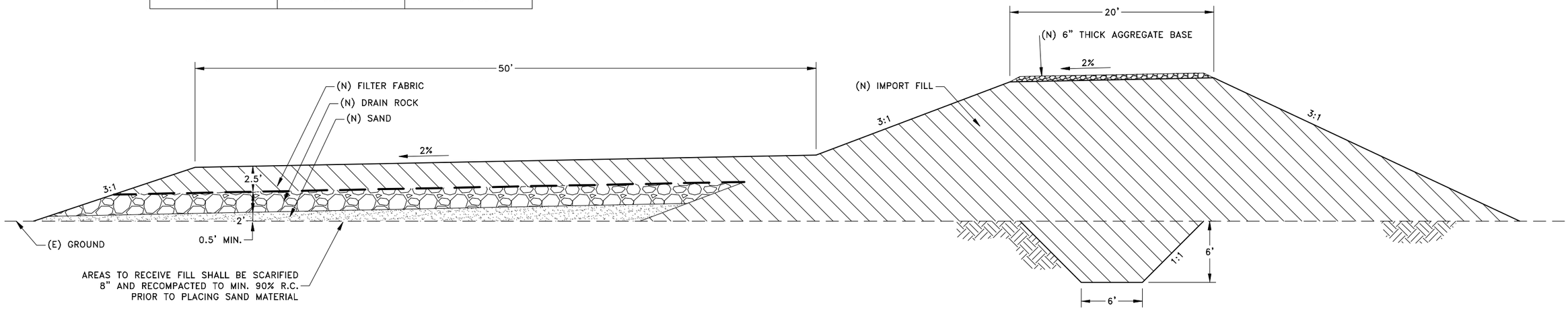
PROPOSED DESIGN DETAILS - REACH 2

DATE
DECEMBER 11, 2019

SHEET IDENTIFICATION
C-502
SHEET 134 OF 136

KSN PROJECT FILE NO.
2255-0050

REACH 3 – NEW LEVEE TABLE		
WORK SITE NO.	STA. FROM	STA. TO
3-1	959+00	1104+20



1 NEW LEVEE

SCALE: N.T.S.

NORTH ORIENTATION

PROJECT ENGINEER

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NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE AS SHOWN

ORIGINAL DRAWING SCALE 0 ½" 1"

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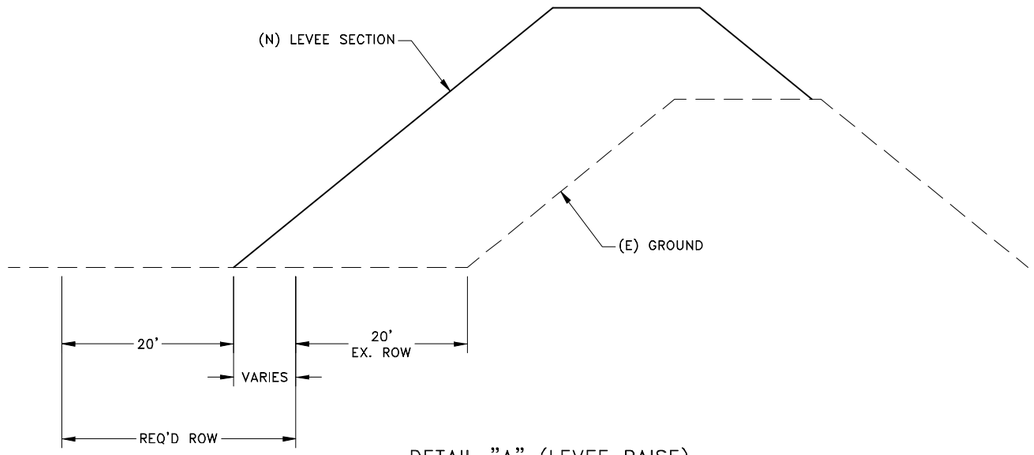
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DATE DECEMBER 11, 2019

SHEET IDENTIFICATION C-503
SHEET 135 OF 136

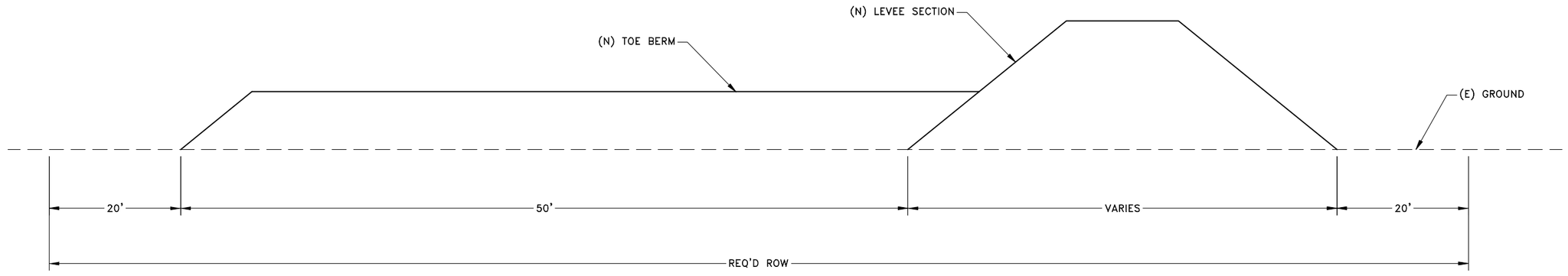
KSN PROJECT FILE NO. 2255-0050

FILE SPEC: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C-501.dwg
PLOT DATE: Dec 11, 2019 - 4:25pm



DETAIL "A" (LEVEE RAISE)

RIGHT-OF-WAY TABLE			
WORK SITE NO.	STA. FROM	STA. TO	NOTES
1-1	570+00	587+00	EXISTING TOE BERM. NO ADDITIONAL ROW CONSIDERED
1-1	587+00	698+00	REFER TO DETAIL "A"
1-1	698+00	762+00	EXISTING TOE BERM. NO ADDITIONAL ROW CONSIDERED
1-2	762+00	776+00	PROPOSED FLOODWALL. NO ADDITIONAL ROW CONSIDERED
1-3	776+00	799+00	EXISTING TOE BERM. NO ADDITIONAL ROW CONSIDERED
1-4	799+00	801+00	PROPOSED FLOODWALL. NO ADDITIONAL ROW CONSIDERED
1-5	801+00	808+00	EXISTING TOE BERM. NO ADDITIONAL ROW CONSIDERED
1-5	808+00	815+00	REFER TO DETAIL "A"
1-6	815+00	822+80	PROPOSED FLOODWALL. NO ADDITIONAL ROW CONSIDERED
2	822+80	959+00	EXISTING TOE BERM. NO ADDITIONAL ROW CONSIDERED
3	959+00	1104+20	REFER TO DETAIL "B"



DETAIL "B" (NEW LEVEE)

1 RIGHT-OF-WAY CONSIDERATIONS

SCALE: N.T.S.

NORTH ORIENTATION

PROJECT ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY EEA
DRAWN BY EEA
CHECK BY CHN
HORIZONTAL DATUM CCS83, ZONE 3
VERTICAL DATUM NAVD88

DRAWING SCALE AS SHOWN

ORIGINAL DRAWING SCALE 0 ½" 1"

KSN inc. KJELDSEN SINNOCK NEUDECK
CIVIL ENGINEERS & LAND SURVEYORS
www.ksninc.com
711 N Pershing Avenue
Stockton, CA 95203
209-946-0268
1550 Harbor Drive, Suite 212
West Sacramento, CA 95691
916-403-5900

SJAFCA - MOSSDALE TRACT AREA
ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

RIGHT-OF-WAY CONSIDERATIONS

DATE DECEMBER 11, 2019

SHEET IDENTIFICATION C-601
SHEET 136 OF 136

KSN PROJECT FILE NO. 2255-0050

FILE SPEC:: P:\2255_Lathrop_Manteca_ULDC Evaluation\0050_ULDC Climate Change Adjustment\08_Civil\400_Plans\020_CAD\Sheets\rev3_C-501.dwg
PLOT DATE: Dec 11, 2019 - 4:26pm

KJELDSEN SINNOCK NEUDECK
CIVIL ENGINEERS & LAND SURVEYORS

Stephen K. Sinnock, P.E.
Christopher H. Neudeck, P.E.
Neal T. Colwell, P.E.
Barry O'Regan, P.E.

2255-0040

TECHNICAL MEMORANDUM

December 12, 2019



Project: San Joaquin Area Flood Control Agency
Mossdale Tract Area ULDC Adjustments for Climate Change

Subject: Cost Estimate

Prepared by: Erik E. Almaas, PE

Reviewed by: Christopher H. Neudeck, PE

Introduction

Recently, detailed analyses have been performed and compared to the existing levee system conditions of Reclamation District No. 17 (RD17) in order to determine the extent of Urban Levee Design Criteria (ULDC) compliance. Documentation of the analyses in the form of a ULDC Engineer's Report was performed by a team consisting of Peterson, Brustad, Inc. (PBI), Kjeldsen, Sinnock and Neudeck, Inc. (KSN), and ENGEO, Inc.

A new evaluation by PBI for potential climate change in accordance with San Joaquin Area Flood Control Agency (SJAFCA) policy has resulted in substantial elevated levels of the 200-year Design Water Surface Elevation (DWSE) along the RD17 levee, especially at the upstream end of the RD17 boundary. Whereas the ULDC Engineer's Report determined that no freeboard deficiencies existed for present day DWSE conditions, that is no longer the case with the climate change scenario. The purpose of this technical memorandum is to prepare planning level cost estimates as needed to address any identified deficiencies resulting from an elevated DWSE from climate change.

Levee Assessment

This levee assessment covers the RD17 levee from Station 0+00 to Station 959+00. It also covers a proposed Dryland Levee Extension that is required to extend the existing Dryland Levee eastward in order to meet ULDC compliance. A summary of the levee segments that were analyzed are shown below in Table 1.

Table 1 - Summary of Analyzed Levee Segments

Levee Segment	Station From	Station To	Segment Status
French Camp Slough	0+00	101+00	Existing
San Joaquin River	101+00	822+80	Existing
Walthall Slough / Dryland Levee	822+80	959+00	Existing
Dryland Levee Extension	959+00	1104+20	Proposed

Data Sources

Existing data sources that were utilized in the levee assessment are as follows:

- Updated Freeboard Deficiency Analysis, Mossdale Tract Area ULDC Adjustments for Climate Change, prepared by KSN in 2019
- Updated Seepage Analyses for Climate Change Scenario Water Surface Elevations, prepared by ENGEO in 2018

Assumptions

Assumptions that were made in the levee assessment are as follows:

Separate Ongoing Projects

Construction is currently underway on the RD17 Levee Seepage Repair Project, and planning is currently underway on the ULDC Levee Improvements Project. Both projects include the construction of seepage berms and necessary right-of-way acquisition. For the purposes of this climate change scenario analysis, it is assumed that all required work for these two project will be completed.

Deficiency Results

Each ULDC criteria is shown below in Table 2 and is denoted as to whether a particular criteria requires further improvements based on the climate change DWSE.

Table 2 - Necessary Improvements as per ULDC Criteria

ULDC Criteria	Additional Improvements Required
7.1 Design Water Surface Elevation	
7.2 Minimum Top of Levee	X[1]
7.3 Soil Sampling, Testing, and Logging	
7.4 Slope Stability for Intermittently Loaded Levees	X[2]
7.5 Underseepage for Intermittently Loaded Levees	X[2]
7.6 Frequently Loaded Levees	
7.7 Seismic Vulnerability	
7.8 Levee Geometry	X[1]
7.9 Interfaces and Transitions	
7.10 Erosion	
7.11 Right-of-Way	X[1]
7.12 Encroachments	X[1]
7.13 Penetrations	
7.14 Floodwalls, Retaining Walls, and Closure Structures	
7.15 Animal Burrows	
7.16 Levee Vegetation	
7.17 Wind Setup and Wave Runup	

[1] Required improvements as determined in Updated Freeboard Deficiency Analysis, Mossdale Tract Area ULDC Adjustments for Climate Change, prepared by KSN in 2019.
[2] Required improvements as determined in Updated Seepage Analyses for Climate Change Scenario Water Surface Elevations, prepared by ENGEO in 2018.

ULDC Criteria	Additional Improvements Required
7.18 Security	
7.19 Sea Level Rise	
7.20 Emergency Actions	

Proposed Design

A summary of deficient levee reaches is shown below in Table 3. The deficient reaches are located at the upstream end of RD17, generally the RD17 levee upstream of Old River.

Table 3 – Summary of Deficient Reaches Needing Improvements

Project No.	Station From	Station To	Project Description
1	192+00	212+00	Widen Seepage Berm
2	312+30	339+00	Extend Cutoff Wall
3	703+00 781+00	741+30 799+50	Cutoff Wall
4	570+00	822+80	Levee Raise along San Joaquin River
5	822+80	959+00	Levee Raise along Walthall Slough / Dryland Levee
6	959+00	1104+20	Dryland Levee Extension (new levee)

The proposed design repairs for each of the six deficient reaches are described as follows:

Project 1

Project 1 consists of a reach along the San Joaquin River from Station 192+00 to Station 212+00. Prior ULDC design recommendations called for a seepage berm at this particular reach. The proposed preliminary design for Project 1 consists of widening the seepage berm an additional 30 feet.

Project 2

Project 2 consists of a reach along the San Joaquin River from Station 312+30 to Station 339+00. Prior ULDC design recommendations called for a seepage berm at this particular reach. The proposed preliminary design for Project 2 consists of extending the cutoff wall an additional 10 feet deeper.

Project 3

Project 3 consists of two reaches of the San Joaquin River from Station 703+00 to Station 741+30 and from Station 781+00 to Station 799+50. The proposed preliminary design for Project 3 consists of constructing a traditional cement/bentonite slurry cutoff wall. The work will take place within the existing levee prism; therefore, no new right-of-way acquisition is required.

Project 4

Project 4 consists of a reach along the San Joaquin River from Station 570+00 to Station 822+80. The proposed preliminary design for Project 4 involves primarily levee crown raising with some additional backslope work as needed. The majority of the levee reach includes existing or future seepage berms with related right-of-way; therefore, not a lot of new right-of-way acquisition is required. A floodwall is proposed in three locations in which it would be cost-prohibitive to construct an earthwork embankment due to the presence of major encroachments.

Project 5

Project 5 consists of the Walthall Slough / Dryland Levee from Station 822+80 to Station 959+00. The proposed preliminary design for Project 5 involves major levee raising with backslope work. The entire levee reach includes existing or future seepage berms with related right-of-way; therefore, no new right-of-way acquisition is required.

Project 6

Project 6 consists of the Dryland Levee Extension. This reach includes extending a new levee eastward from the existing Dryland Levee. The proposed preliminary design for Project 6 involves constructing a new levee prism with a 50-foot wide seepage berm. Since this reach is a brand new levee, major right-of-way acquisition is required for the full width and length of improvements.

Cost Estimate

The overall estimated cost to address levee deficiencies resulting from climate change is summarized below in Table 4.

Table 4 - Summary of Proposed Improvement Costs

Project No.	Project Name	Cost
1	Widen Seepage Berm	$1,074,000
2	Extend Cutoff Wall	$407,000
3	Cutoff Wall	$9,197,000
4	Levee Raise along San Joaquin River	$12,002,000
5	Levee Raise along Walthall Slough / Dryland Levee	$7,414,000
6	Dryland Levee Extension (new levee)	$26,493,000
	Total:	$56,587,000

A detailed breakdown of the improvement costs on a project-by-project basis is included in **EXHIBIT 1**.

EXHIBIT 1

Cost Estimate

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
MOSSDALE TRACT AREA ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS

Item	Description	Qty	Unit	Unit Price	Total
PROJECT 1					
WIDEN SEEPAGE BERM					
STA 192+00 TO STA 212+00					
Construction					
1.	Mobilization			10%	$54,400
2.	Erosion Control			3%	$16,300
3.	Clearing and Grubbing	1.4	AC	$2,000	$2,800
4.	Imported Engineered Fill	12,000	TN	$15	$180,000
5.	Drain Rock Material	8,900	TN	$30	$267,000
6.	Sand Filter Material	2,300	TN	$25	$57,500
7.	Filter Fabric	60,000	SF	$0.50	$30,000
10.	Hydroseeding	60,000	SF	$0.10	$6,000
				Subtotal:	**$614,000**
Management / Environmental / Engineering					
1.	Administration			5%	$30,700
2.	Planning			3%	$18,500
3.	Environmental and Permitting			5%	$30,700
4.	Geotechnical Engineering			2%	$12,300
5.	Surveying and Civil Engineering			10%	$61,400
6.	Construction Management and Inspection			12%	$73,700
7.	Mitigation			3%	$18,500
				Subtotal:	**$245,800**
Real Estate					
1.	Land Valuation (Agricultural)	1.4	AC	$25,000	$35,000
2.	Easement Acquisition	0	EA	$50,000	$0
				Subtotal:	**$35,000**
				SUBTOTAL:	$894,800
				CONTINGENCY (20%):	$179,000
				PROJECT TOTAL:	**$1,074,000**

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
MOSSDALE TRACT AREA ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS

Item	Description	Qty	Unit	Unit Price	Total
PROJECT 2					
EXTEND CUTOFF WALL					
STA 312+30 TO STA 339+00					
Construction					
1.	Mobilization			10%	$21,400
2.	Erosion Control			3%	$6,500
3.	Cement-Bentonite Slurry Wall	26,700	SF	$8	$213,600
				Subtotal:	**$241,500**
Management / Environmental / Engineering					
1.	Administration			5%	$12,100
2.	Planning			3%	$7,300
3.	Environmental and Permitting			5%	$12,100
4.	Geotechnical Engineering			2%	$4,900
5.	Surveying and Civil Engineering			10%	$24,200
6.	Construction Management and Inspection			12%	$29,000
7.	Mitigation			3%	$7,300
				Subtotal:	**$96,900**
Real Estate					
1.	Land Valuation (Agricultural)	0.0	AC	$25,000	$0
2.	Easement Acquisition	0	EA	$50,000	$0
				Subtotal:	**$0**
				SUBTOTAL:	$338,400
				CONTINGENCY (20%):	$67,700
				PROJECT TOTAL:	**$407,000**

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
MOSSDALE TRACT AREA ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS

Item	Description	Qty	Unit	Unit Price	Total
PROJECT 3					
CUTOFF WALL					
STA 703+00 TO STA 741+30 AND STA 781+00 TO 799+50					
Construction					
1.	Mobilization			10%	$484,500
2.	Erosion Control			3%	$145,400
3.	Degrade Existing Levee (1/3 Height)	25,900	CY	$10	$259,000
4.	Cement-Bentonite Slurry Wall	454,400	SF	$8	$3,635,200
5.	Temporary Cap (Double Handle)	10,000	CY	$10	$100,000
6.	Imported Engineered Fill	55,900	TN	$15	$838,500
7.	Tracer Wire	5,700	LF	$2	$11,400
				Subtotal:	**$5,474,000**
Management / Environmental / Engineering					
1.	Administration			5%	$273,700
2.	Planning			3%	$164,300
3.	Environmental and Permitting			5%	$273,700
4.	Geotechnical Engineering			2%	$109,500
5.	Surveying and Civil Engineering			10%	$547,400
6.	Construction Management and Inspection			12%	$656,900
7.	Mitigation			3%	$164,300
				Subtotal:	**$2,189,800**
Real Estate					
1.	Land Valuation (Agricultural)	0.0	AC	$25,000	$0
2.	Easement Acquisition	0	EA	$50,000	$0
				Subtotal:	**$0**
				SUBTOTAL:	$7,663,800
				CONTINGENCY (20%):	$1,532,800
				PROJECT TOTAL:	**$9,197,000**

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
MOSSDALE TRACT AREA ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS

Item	Description	Qty	Unit	Unit Price	Total

PROJECT 4
LEVEE RAISE - SAN JOAQUIN RIVER
STA 570+00 TO STA 822+80

Construction					
1.	Mobilization			3%	$191,800
2.	Erosion Control			3%	$191,800
3.	Clearing and Grubbing	43.6	AC	$2,000	$87,200
4.	Imported Engineered Fill	339,700	TN	$15	$5,095,500
5.	Floodwall (3' tall)	2,400	LF	$125	$300,000
6.	Class 2 Aggregate Base	18,800	TN	$25	$470,000
7.	Encroachment Modification	3	EA	$100,000	$300,000
8.	Hydroseeding	1,390,400	SF	$0.10	$139,100
				Subtotal:	**$6,775,400**
Management / Environmental / Engineering					
1.	Administration			5%	$338,800
2.	Planning			3%	$203,300
3.	Environmental and Permitting			5%	$338,800
4.	Geotechnical Engineering			2%	$135,600
5.	Surveying and Civil Engineering			10%	$677,600
6.	Construction Management and Inspection			12%	$813,100
7.	Mitigation			3%	$203,300
				Subtotal:	**$2,710,500**
Real Estate					
1.	Land Valuation (Agricultural)	8.6	AC	$25,000	$215,300
2.	Easement Acquisition	6	EA	$50,000	$300,000
				Subtotal:	**$515,300**

	SUBTOTAL:	$10,001,200
	CONTINGENCY (20%):	$2,000,300
	PROJECT TOTAL:	**$12,002,000**

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
MOSSDALE TRACT AREA ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS

Item	Description	Qty	Unit	Unit Price	Total
PROJECT 5					
LEVEE RAISE - WALTHALL SLOUGH / DRYLAND LEVEE					
STA 822+80 TO STA 959+00					
Construction					
1.	Mobilization			3%	$124,900
2.	Erosion Control			3%	$124,900
3.	Traffic Control	1	LS	$50,000	$50,000
4.	AC Pavement Repairs	20,000	SF	$10	$200,000
5.	Clearing and Grubbing	23.5	AC	$2,000	$47,000
6.	Imported Engineered Fill	229,200	TN	$15	$3,438,000
7.	Class 2 Aggregate Base	10,100	TN	$25	$252,500
8.	Encroachment Modification	1	EA	$100,000	$100,000
9.	Hydroseeding	749,100	SF	$0.10	$75,000
				Subtotal:	**$4,412,300**
Management / Environmental / Engineering					
1.	Administration			5%	$220,700
2.	Planning			3%	$132,400
3.	Environmental and Permitting			5%	$220,700
4.	Geotechnical Engineering			2%	$88,300
5.	Surveying and Civil Engineering			10%	$441,300
6.	Construction Management and Inspection			12%	$529,500
7.	Mitigation			3%	$132,400
				Subtotal:	**$1,765,300**
Real Estate					
1.	Land Valuation (Agricultural)	0.0	AC	$25,000	$0
2.	Easement Acquisition	0	EA	$50,000	$0
				Subtotal:	**$0**
				SUBTOTAL:	$6,177,600
				CONTINGENCY (20%):	$1,235,600
				PROJECT TOTAL:	**$7,414,000**

SAN JOAQUIN AREA FLOOD CONTROL AGENCY
MOSSDALE TRACT AREA ULDC ADJUSTMENTS FOR CLIMATE CHANGE
SAN JOAQUIN COUNTY, CALIFORNIA

OPINION OF PROBABLE COSTS

Item	Description	Qty	Unit	Unit Price	Total

PROJECT 6
NEW LEVEE - DRYLAND LEVEE EXTENSION
STA 959+00 TO STA 1104+20

Construction					
1.	Mobilization			3%	$398,900
2.	Erosion Control			3%	$398,900
3.	Demolish Structure	2	EA	$50,000	$100,000
4.	Traffic Control	1	LS	$100,000	$100,000
5.	AC Pavement Repairs	60,000	SF	$10	$600,000
6.	Clearing and Grubbing	61.9	AC	$5,000	$309,500
7.	Imported Engineered Fill	590,200	TN	$15	$8,853,000
8.	Drain Rock Material	68,900	TN	$30	$2,067,000
9.	Sand Filter Material	17,300	TN	$20	$346,000
10.	Filter Fabric	465,000	SF	$0.50	$232,500
11.	Class 2 Aggregate Base	6,900	TN	$25	$172,500
12.	Encroachment Modification	3	EA	$100,000	$300,000
13.	Relocate Ditch	9,300	LF	$10	$93,000
14.	Hydroseeding	1,209,000	SF	$0.10	$120,900
				Subtotal:	**$14,092,200**
Management / Environmental / Engineering					
1.	Administration			5%	$704,700
2.	Planning			3%	$422,800
3.	Environmental and Permitting			5%	$704,700
4.	Geotechnical Engineering			2%	$281,900
5.	Surveying and Civil Engineering			10%	$1,409,300
6.	Construction Management and Inspection			12%	$1,691,100
7.	Mitigation			3%	$422,800
				Subtotal:	**$5,637,300**
Real Estate					
1.	Land Valuation (Agricultural)	61.9	AC	$25,000	$1,547,500
2.	Easement Acquisition	16	EA	$50,000	$800,000
				Subtotal:	**$2,347,500**
				SUBTOTAL:	$22,077,000
				CONTINGENCY (20%):	$4,415,400
				PROJECT TOTAL:	**$26,493,000**

Appendix I

PBI Alternative 3 2040 Cost Estimate

PETERSON . BRUSTAD . INC .
ENGINEERING . CONSULTING

Cities of Lathrop and Manteca UFRR Study of RD 17 Area

Alternative 3 Cost Estimate *April 30, 2019*

Prepared by: Baron Creager, E.I.T. and Jared Meredith, P.E.

Reviewed by: Dave Peterson, P.E.

Introduction

The City of Lathrop is sponsoring an Urban Flood Risk Reduction study to explore alternatives which reduce flood risk to the Mossdale Tract Area. The purpose of this technical memorandum is to evaluate of a proposed Dryland Levee Extension, identified as a key component of "Alternative 3", and prepare a planning-level cost estimate.

Alternative 3 Secondary Levee

This feature is a proposed dryland levee beginning at Station 447+38 of the existing RD17 levee and traversing east and north, roughly following the City of Lathrop Sphere of Influence boundary.

Data Sources

Existing data sources utilized in this levee assessment include:

- LiDAR Survey, performed by Department of Water Resources (DWR) in 2007
- Draft 200-year water surface elevation profile and minimum top of levee exhibits for year 2040 climate change scenario, prepared by PBI in 2018
- ULDC Engineer's Report, prepared by PBI, KSN, and ENGEO in 2016
- Preliminary geotechnical recommendations, prepared by ENGEO in 2018

Assumptions

Assumptions that were made in this cost analysis are as follows:

Utilized Levee Geometry

In accordance with the 2016 ULDC Engineer's Report, the minimum levee geometry used in this analysis is shown below in Table 1. In addition to the ULDC requirements, the minimum geometry for a landside seepage berm was included per the preliminary geotechnical recommendations from ENGEO.

Table 1. Minimum Levee Geometry

Criteria Description	Minimum Criteria
Crown Width	20'
Waterside Levee Slope	3h:1v
Landside Levee Slope	3h:1v
Seepage Berm	4'H-50'L

Right-of-Way

For the purposes of this cost estimate, the required right-of-way acquisition includes the areas that would be necessary to meet ULDC requirements for the year 2040. The area includes the footprint for the levee prism and/or floodwall, seepage berm, and a 20-foot landside and waterside access road.

Analysis

Cross sections were developed from the topographic data provided by DWR. One cross section was created at the approximate middle of each segment of the alignment, or at a location (or locations) deemed representative of that segment. The design levee prism defined above was then applied to these cross sections to meet the MTOL. The average end area method was used to determine material quantities and complete the cost estimate. A plan and profile view of the alignment, along with cross sections and details are provided in Exhibit 1.

Proposed Design

Construction of the dryland levee will use the minimum levee geometry mentioned above to provide the required freeboard throughout. Preliminary analysis by ENGEO indicated the need for seepage berms and a segment of cutoff wall to control potential underseepage. The proposed levee design is shown in Exhibit 1.

Cost Estimate

The estimated cost to construct the proposed secondary levee is detailed in Exhibit 2 and totals approximately $29.4M.

Exhibit 1

Alternative 3 Secondary Levee Element Proposed Design

CITY OF LATHROP

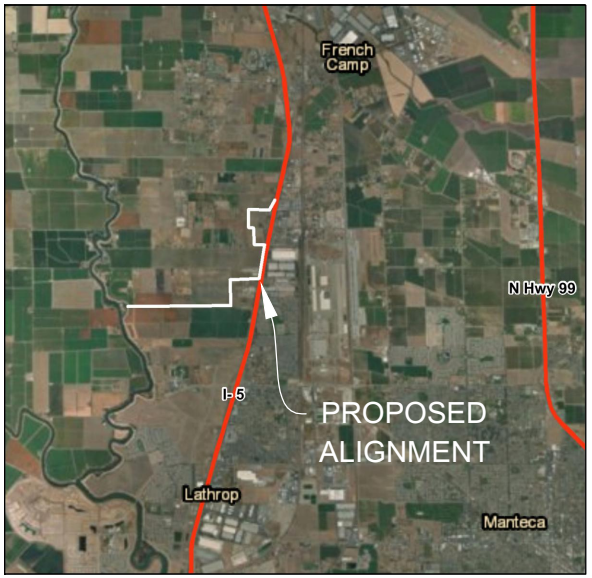
UFRR STUDY OF MOSSDALE TRACT AREA

SAN JOAQUIN COUNTY, CALIFORNIA

ALTERNATIVE 3 SECONDARY LEVEE ELEMENT

INDEX OF DRAWINGS

G1	TITLE SHEET
C1	PLAN VIEW
C2	PROFILE VIEW
C3	SECTION VIEW 1
C4	SECTION VIEW 2
D1	DETAILS





REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: MAR 2018

WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

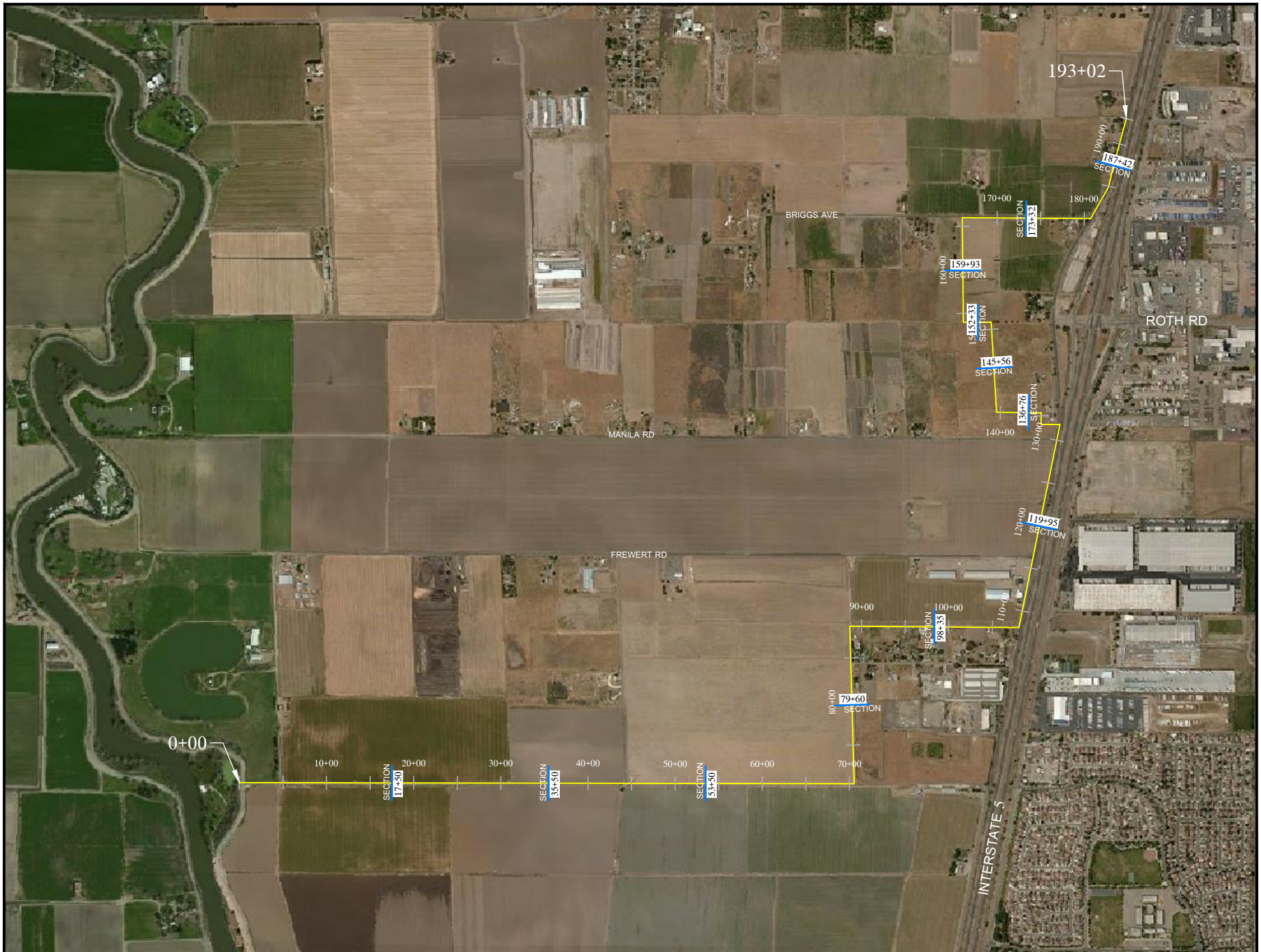
DESIGNED JM
DRAWN BMC
CHECKED DAP

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING
80 BLUE RAVINE, SUITE 80
Folsom, CA 95630
PH. 916-608-2212
Fax 916-608-2232

CITY OF LATHROP UFRR STUDY - ALTERNATIVE 3 COST ESTIMATE

CITY OF LATHROP
UFRR STUDY - ALTERNATIVE 3

SHEET G1



LEGEND

ALIGNMENT (GENERALLY FOLLOWS PL OR ROAD CL)

SECTION

N

REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: MAR 2018

WARNING

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED JM

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CHECKED DAP

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ENGINEERING . CONSULTING

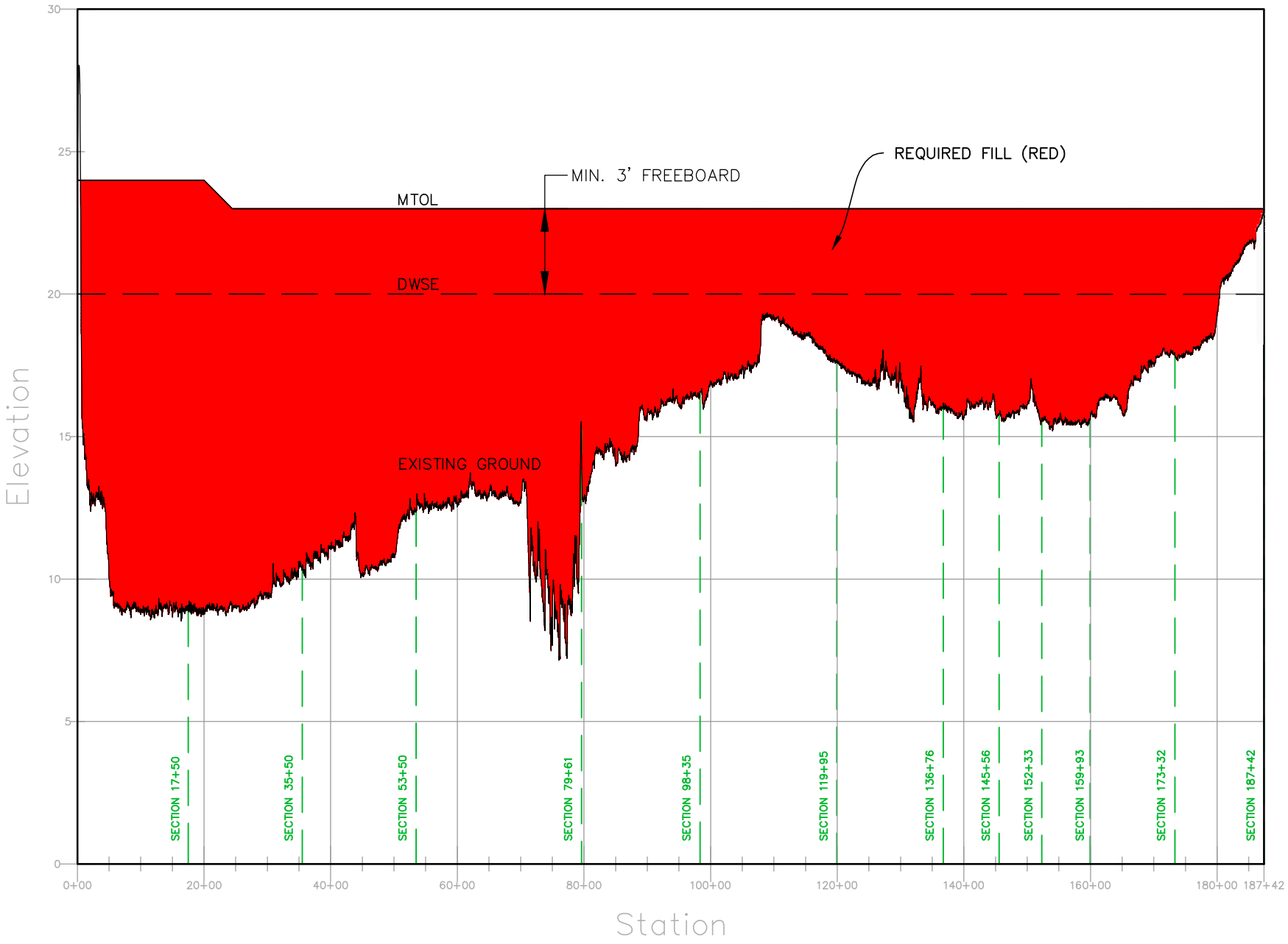
80 BLUE RAVINE, SUITE 80
Folsom, CA 95630

PH. 916-608-2212
Fax 916-608-2232

CITY OF LATHROP UFRR STUDY - ALTERNATIVE 3 COST ESTIMATE

CITY OF LATHROP
UFRR STUDY - ALTERNATIVE 3

SHEET C1



REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: MAR 2018

WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED JM
DRAWN BMC
CHECKED DAP

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING
80 BLUE RAVINE, SUITE 80
Folsom, CA 95630
PH. 916-608-2212
Fax 916-608-2232

CITY OF LATHROP UFRR STUDY - ALTERNATIVE 3 COST ESTIMATE

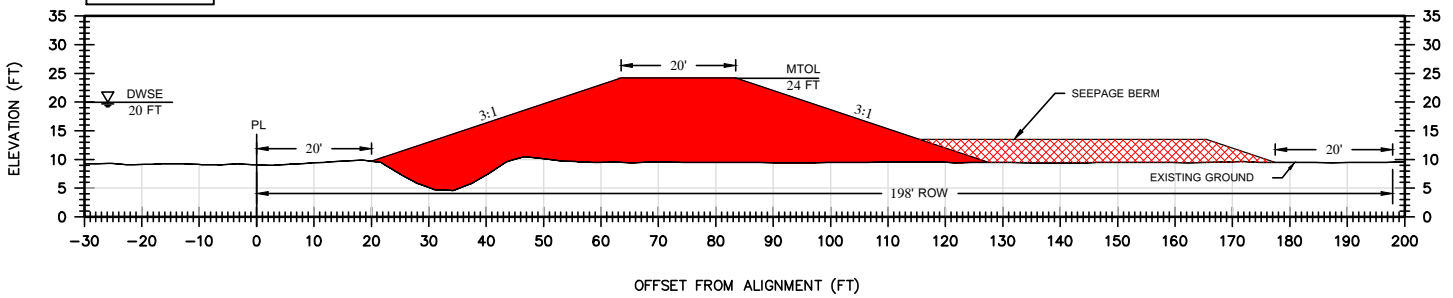
CITY OF LATHROP
UFRR STUDY - ALTERNATIVE 3

SHEET C2

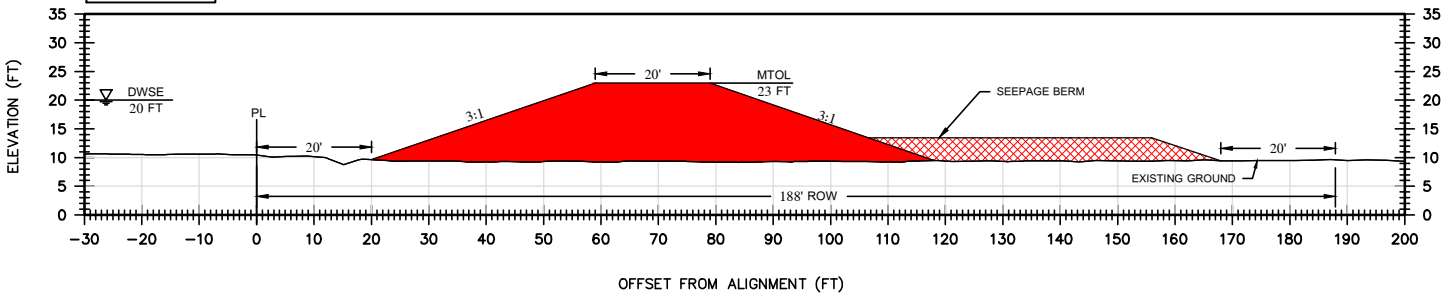
NOTES:

1. KEY TRENCH NOT SHOWN (TYP ALL SECTIONS)
2. TRANSITION CUTOFF WALL (0+00 TO 3+00) NOT SHOWN

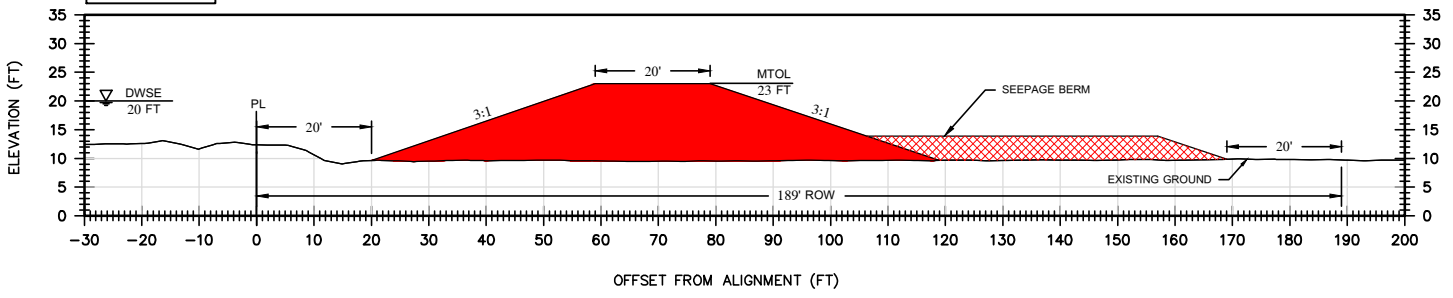
SECTION 17+50



SECTION 35+50



SECTION 53+50



REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: MAR 2018

WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

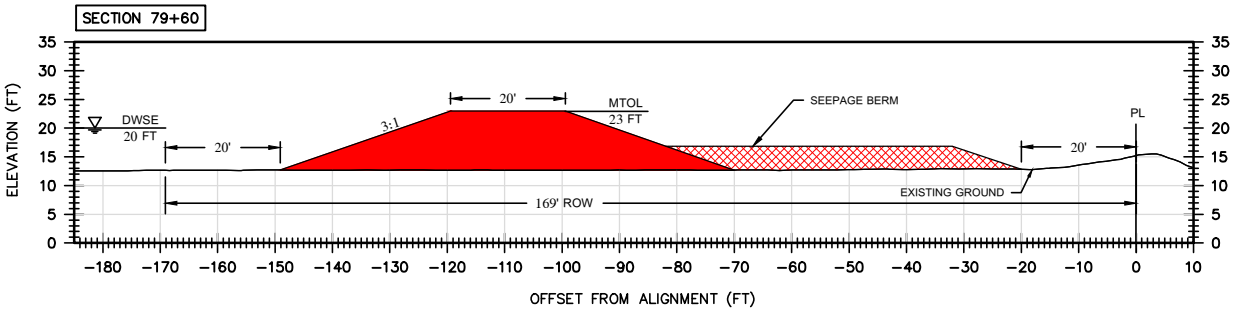
DESIGNED JM
DRAWN BMC
CHECKED DAP

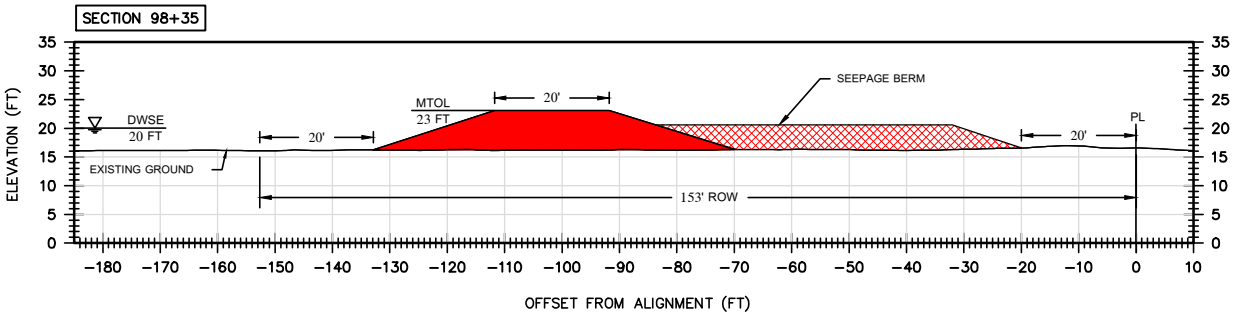
PETERSON . BRUSTAD . INC
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80 BLUE RAVINE, SUITE 80
Folsom, CA 95630
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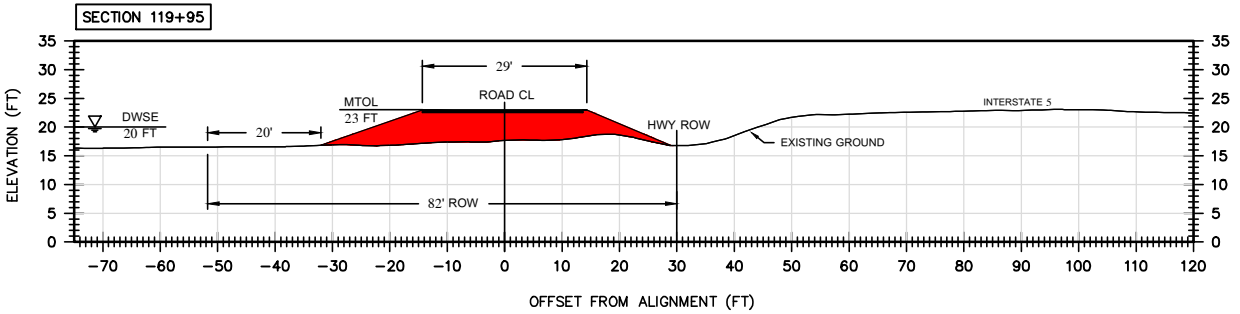
CITY OF LATHROP UFRR STUDY - ALTERNATIVE 3 COST ESTIMATE

CITY OF LATHROP
UFRR STUDY - ALTERNATIVE 3

SHEET C3







REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: MAR 2018

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED JM
DRAWN BMC
CHECKED DAP

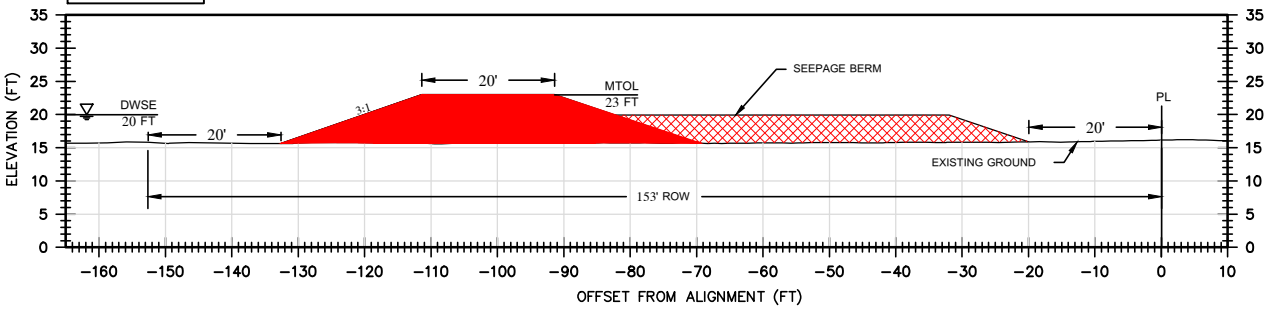
PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING
80 BLUE RAVINE, SUITE 80
Folsom, CA 95630
PH. 916-608-2212
Fax 916-608-2232

CITY OF LATHROP UFRR STUDY - ALTERNATIVE 3 COST ESTIMATE

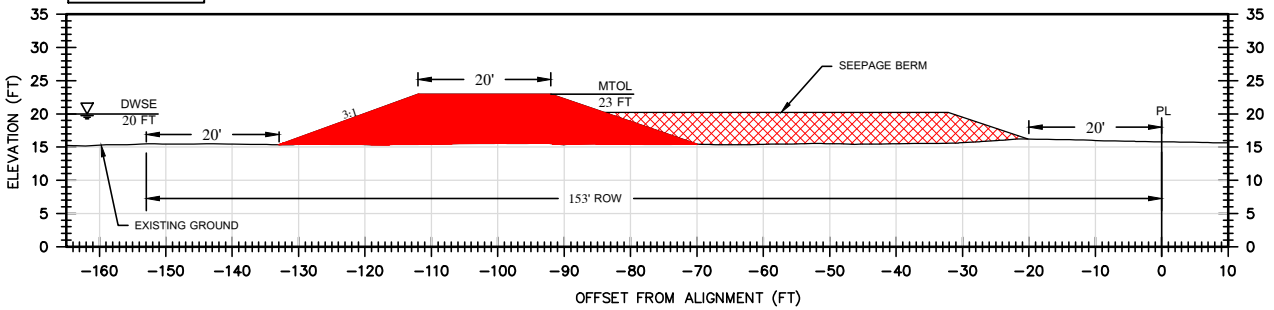
CITY OF LATHROP
UFRR STUDY - ALTERNATIVE 3

SHEET
C4

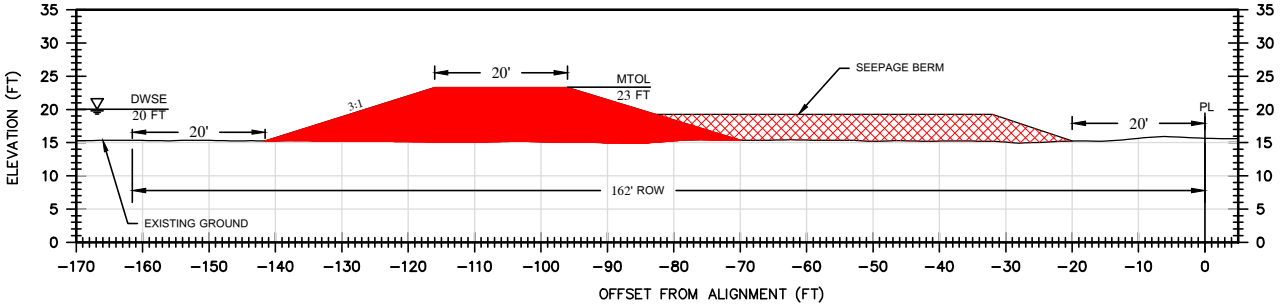
SECTION 136+76



SECTION 145+56



SECTION 152+33



REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: MAR 2018

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

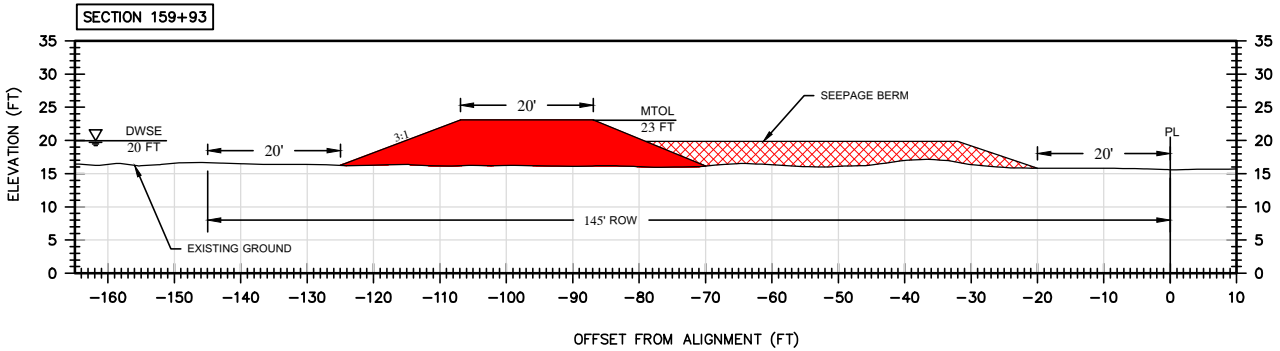
DESIGNED JM
DRAWN BMC
CHECKED DAP

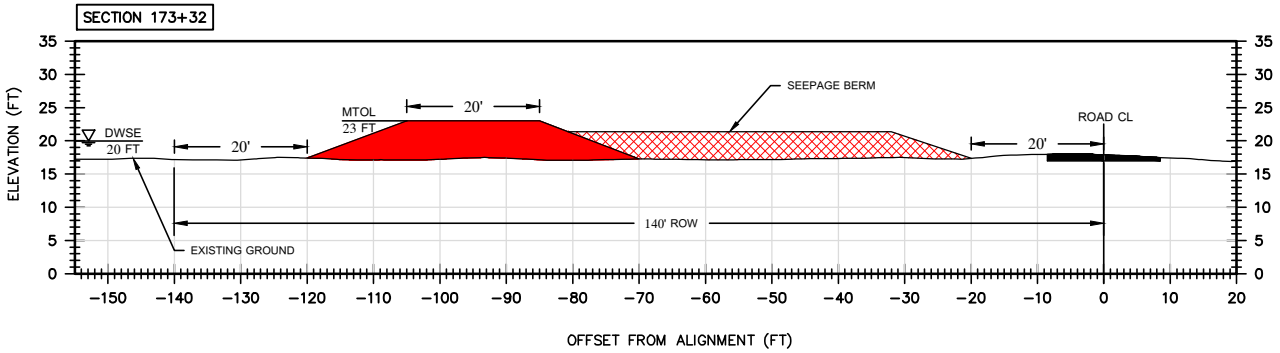
PETERSON . BRUSTAD . INC
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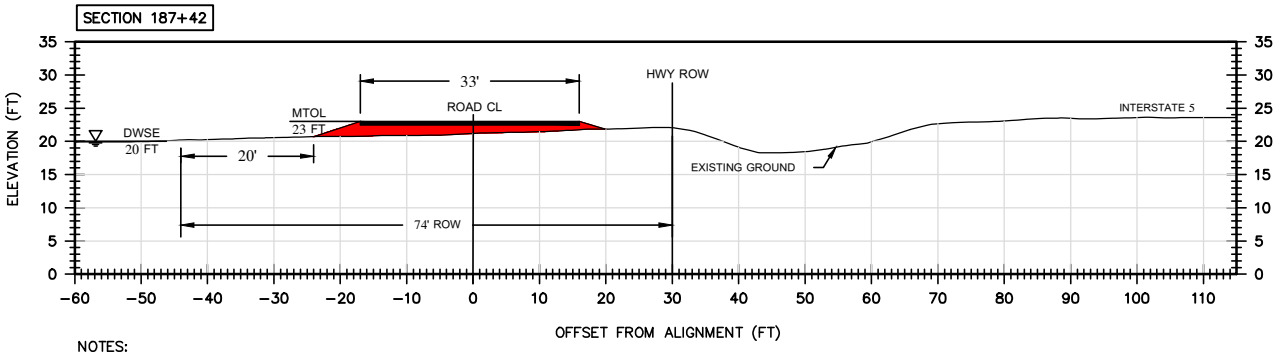
CITY OF LATHROP UFRR STUDY - ALTERNATIVE 3 COST ESTIMATE

CITY OF LATHROP
UFRR STUDY - ALTERNATIVE 3

SHEET
C5







NOTES:

1. TRANSITION TO GRADE STA. 187+42 TO STA. 193+02
2. END OF PROJECT AT STA. 193+02
3. EXISTING IMPROVEMENTS AT MTOL ELEVATION

REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: MAR 2018

WARNING: 0 1/2 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

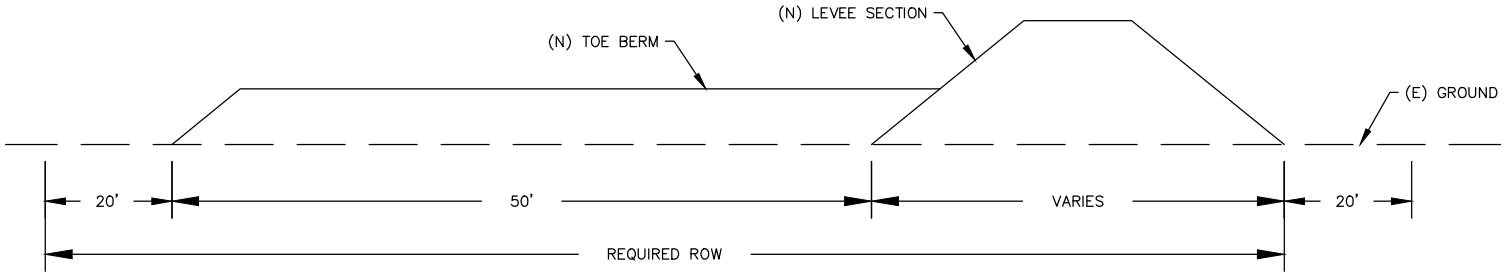
DESIGNED JM
DRAWN BMC
CHECKED DAP

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CITY OF LATHROP UFRR STUDY - ALTERNATIVE 3 COST ESTIMATE

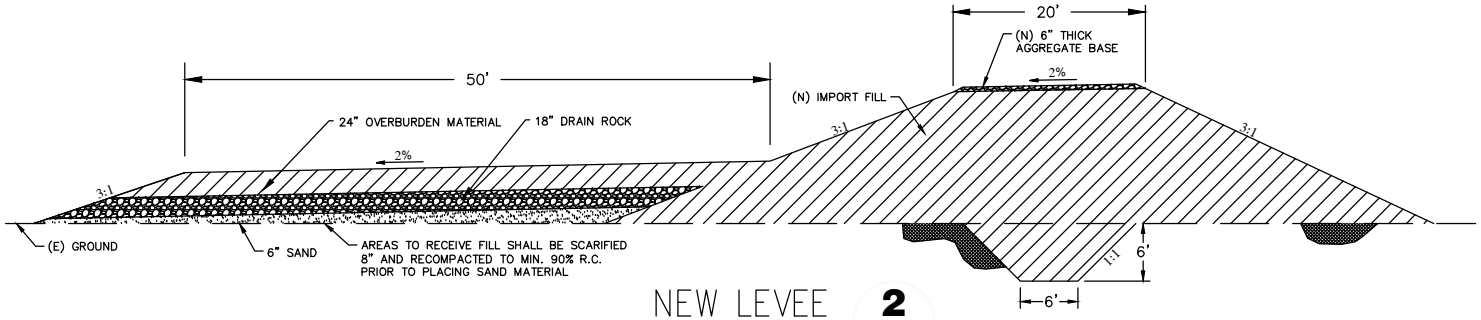
CITY OF LATHROP
UFRR STUDY - ALTERNATIVE 3

SHEET
C6



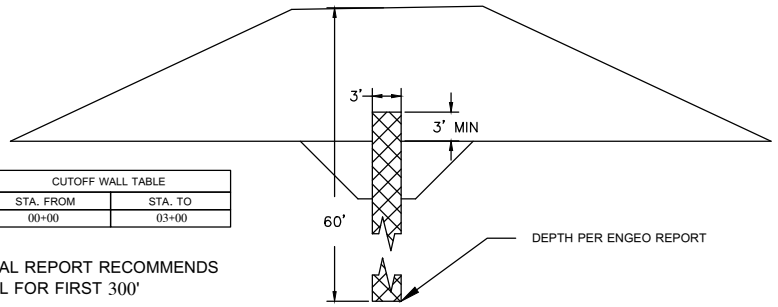
RIGHT–OF–WAY CONSIDERATIONS 1

NOT TO SCALE



NEW LEVEE 2

NOT TO SCALE



CUTOFF WALL TABLE	
STA. FROM	STA. TO
00+00	03+00

NOTE: GEOTECHNICAL REPORT RECOMMENDS CUTOFF WALL FOR FIRST 300'

CUTOFF WALL 4

NOT TO SCALE

REV	DATE	BY	DESCRIPTION

SCALE: NTS

DATE: MAR 2018

WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED JM
DRAWN BMC
CHECKED DAP

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ENGINEERING . CONSULTING
80 BLUE RAVINE, SUITE 80
Folsom, CA 95630
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CITY OF LATHROP UFRR STUDY - ALTERNATIVE 3 COST ESTIMATE

CITY OF LATHROP
UFRR STUDY - ALTERNATIVE 3

SHEET D1

Exhibit 2

Alternative 3 Cost Estimate

Construction				
Item	**Quantity**	**Unit**	**Unit Price**	**Total**
Mobilization	-	-	3%	$447,000
Erosion Control	-	-	3%	$447,000
Demolition	1	EA	$50,000	$50,000
Traffic Control	1	LS	$25,000	$25,000
AC Pavement Repairs	94,986	SF	$10	$950,000
Clearing and Grubbing	61	AC	$5,000	$303,000
Imported Engineered Fill	403,827	TN	$15	$9,190,000
Drain Rock Material	83,916	TN	$30	$2,518,000
Sand Filter Material	25,974	TN	$20	$520,000
Filter Fabric	799,200	SF	$0.50	$400,000
Cutoff Wall	13,500	SF	$9.50	$129,000
Cutoff Wall Mobilization	1	LS	$115,000	$115,000
Class 2 Aggregate Base (Asphalt Repair)	831	TN	$25	$21,000
Class 2 Aggregate Base (Levee Road)	3,731	TN	$25	$94,000
Encroachment Modification	3	EA	$100,000	$300,000
Hydroseeding	2,830,396	SF	$0.10	$284,000
			Subtotal:	**$15,793,000**

Management/Environmental/Engineering				
Item	**Quantity**	**Unit**	**Unit Price**	**Total**
Administration	-	-	5%	$790,000
Planning	-	-	3%	$474,000
Environmental and Permitting	-	-	5%	$790,000
Geotechnical Engineering	-	-	2%	$316,000
Surveying and Civil Engineering	-	-	10%	$1,580,000
Construction Management and Inspection	-	-	12%	$1,896,000
Mitigation	-	-	3%	$474,000
			Subtotal:	**$6,320,000**

Real Estate				
Item	**Quantity**	**Unit**	**Unit Price**	**Total**
Land Valuation (Agricultural)	61	AC	$25,000	$1,514,000
Easement Acquisition	18	EA	$50,000	$900,000
			Subtotal:	**$2,414,000**

Subtotal:	**$24,527,000**
Contingency (20%):	**$4,906,000**
Total:	**$29,433,000**

Exhibit 3

ENGEO Geotechnical Recommendations

Project No.
5747.005.001

March 27, 2018

Mr. David Peterson, PE
Peterson Brustad Incorporated
80 Blue Ravine Road, Suite 280
Folsom, CA 95630

Subject: Mossdale Tract
Reclamation District No. 17
San Joaquin County, California

ALTERNATIVE 3 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

Dear Mr. Peterson:

We are pleased to present the results of our preliminary geotechnical evaluation for the proposed dryland levee extension, Alternative 3, for the Reclamation District No. 17 (RD17) levee system. The purpose of this evaluation is provide preliminary recommendations with respect to seepage mitigation for the proposed alternative. We should note that our preliminary recommendations are based on mapped geological conditions and limited subsurface geotechnical data; we recommend a detailed design-level geotechnical investigation prior to final design of the project to confirm or update our preliminary findings.

BACKGROUND

Alternative 3 consists of constructing a dryland setback levee. The dryland levee would tie into the existing RD17 levee at approximately station 448+00, and extend eastward approximately 8,600 feet to tie into the existing Interstate 5 embankment. The alignment would parallel the current city limits of the City of Lathrop, between the San Joaquin River and the Interstate 5 freeway. The proposed alignment of Alternative 3 is shown on Figure 1, below.

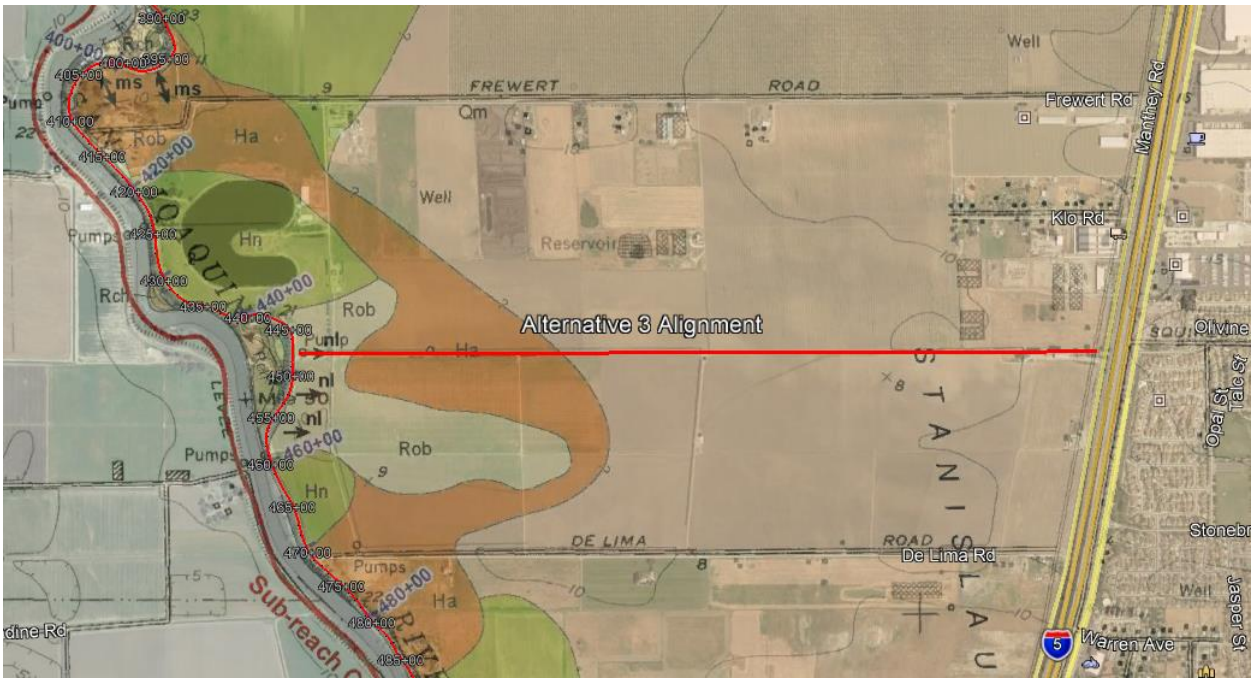
Based on our discussions with you, it is our understanding that the ponded water elevation against this dryland levee extension for a breach along the San Joaquin River north of station 448+00 would be approximately 19.6 feet, NAVD88.

REVIEW OF GEOTECHNICAL DATA

As part of our preliminary evaluation, we reviewed select topographic maps, geologic maps, geomorphological maps, and subsurface explorations from adjacent development and levee projects.

Based on the 1996 topographic maps from the US Geological Survey, the ground surface along the proposed alignment is generally flat, with elevation contours of 10 feet (NGVD29) at both the east and west ends of the alignment (5-foot contour intervals). Given a ponded water elevation of 19.6 feet, we anticipate a gross head of between 7 and 12 feet loading the levee adjusted for the NAVD88 datum, assuming a breach north of the proposed Alternative 3 alignment.

FIGURE 1: Proposed Alignment for Alternative 3 (Base Map: WLA, 2007)



According to geologic and geomorphologic maps, the western portion of the alignment is underlain by Holocene alluvial deposits and recent overbank deposits adjacent to the San Joaquin River. The Holocene alluvial deposits generally consist of stratified and interbedded sands and silts in channels, meander scroll deposits, and overbank deposits. The recent overbank deposits generally consist of sand, silt, and clay. The eastern portion of the alignment is generally underlain by the late Pleistocene Modesto Formation, which consists of interbedded layers of sand, silt, and clay (WLA, 2007).

FIGURE 2: Reviewed Exploration Locations (ENGEO, 2004/2005)



We also reviewed existing explorations adjacent to the proposed levee alignment. As part of the geotechnical study for the Central Lathrop Specific Plan, ENGEO drilled and installed a series of monitoring wells within the vicinity of the proposed dryland levee. In general, the explorations indicate the subsurface is consistent with the mapped geologic conditions. To the north of the alignment, explorations NMW-4 and NMW-5 generally consist of interbedded layers of sandy lean clay and silty sand to a depth of approximately 17 feet, underlain by relatively clean sand. Explorations MW-9 and MW-10, located to the south of the alignment, consist of approximately 5 to 7 feet of sandy silt to silty sand, underlain by lean clay extending to the 16-foot maximum depth explored. Based on our experience with projects in this vicinity, we consider it likely that this lean clay layer is underlain by relatively clean sand, which is characteristic of the Pleistocene Modesto formation in this region.

The exploration locations are shown on Figure 2, above, and the boring logs are attached to this evaluation.

PRELIMINARY RECOMMENDATIONS

Based on the anticipated gross head that would load the dryland levee in the event of a northern breach and the subsurface conditions reviewed in this preliminary seepage evaluation, we recommend underseepage deficiencies, if any, could be mitigated with a drained seepage berm. By constructing a drained seepage berm at the landside toe of a levee, a satisfactory exit gradient may be achieved at both the landside toe of the levee and the toe of the seepage berm. A drained seepage berm extends the path of exiting seepage and increases the overburden pressure at the toe of the levee, reducing the potential for negative effects of underseepage.

For preliminary estimating purposes, a drained seepage berm could have a minimum width of 50 feet, and include 6 inches of filter sand, 1½ feet of drain rock, and at least 2 feet of overburden material. Material specifications for the dryland levee prism and berm overburden material should be consistent with recommendations provided in Geotechnical Levee Practice (USACE, Sacramento District, 2008).

At the western end of the dryland levee, Alternative 3 should incorporate the planned underseepage mitigation for the existing RD17 levee adjacent to the San Joaquin River. Based on the results of the ULDC Evaluation (ENGEO, 2015), the anticipated underseepage mitigation for this portion of the RD17 levee is a fully penetrating cutoff wall. We recommend a site-specific evaluation to determine the minimum overlap between the cutoff wall and the drained seepage berm mitigations; however, without additional analysis, the cutoff wall should be extended a minimum of 300 feet into the dryland levee alignment to prevent end-around underseepage effects.

LIMITATIONS

The recommendations presented in this letter are based on our preliminary review of regional geology and limited subsurface information. Future design-level investigations, including subsurface explorations, engineering analyses for stability and seepage, and collaboration with the project team will be required once additional details are available and the project alternatives are finalized.

We strived to perform our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty is expressed or implied. There are risks of earth movement and property damages inherent in

building on or with earth materials. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our services.

If you have any questions or comments regarding this letter, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated



Cale Crawford, PE

Jonathan Boland, GE

cc/jb/dt

Attachments: References
Historical Exploration Logs

REFERENCES

Atwater, BG, 1982, Geologic Maps of the Sacramento-San Joaquin Delta, California, US Geological Survey, Miscellaneous Field Studies Map MF 1401.

ENGEO; Urban Levee Design Criteria Evaluation, Mossdale Tract, Reclamation District No. 17, San Joaquin County, California; October 30, 2015; Project No. 747.005.000.

State Water Resources Conrol Board, Title 23 – California Code of Regulations, June 2007.

US Army Corps of Engineers; Sacramento District, “Geotechnical Levee Practice”, April 11, 2008.

US Geological Survey; Lathrop Quadrangle, California-San Joaquin County, 7.5-Minute Series.

William Lettis & Associates, Inc.; Preliminary surficial mapping and geomorphic assessment, California Department of Water Resources Urban Levees, RD-17 Levees near Stockton, California; May 1, 2007.

LOG OF BORING NMW-4

ENGEO INCORPORATED

WELL INSTALLATION
N. LATHROP PROPERTIES
LATHROP, CALIFORNIA
6793.4.001.01

DATE DRILLED: July 13, 2005
HOLE DEPTH (FT): 21.5 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (FT-MSL): 8.515 ft.

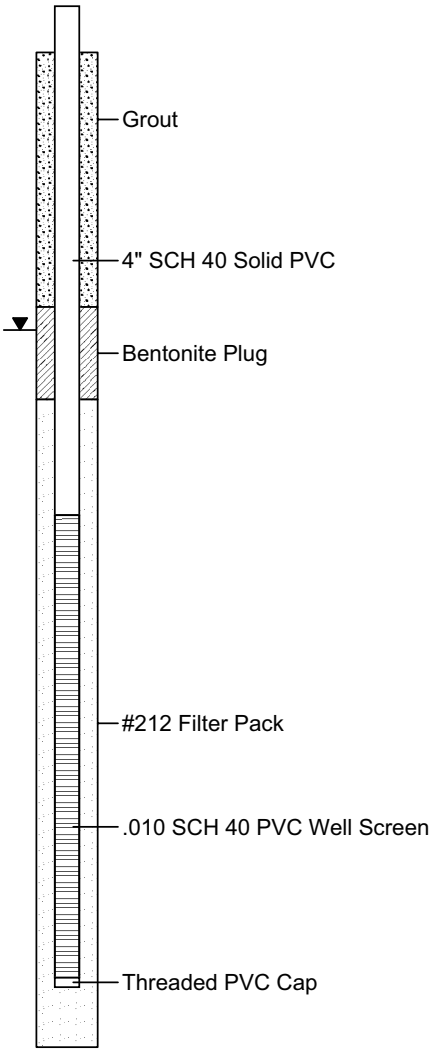
LOGGED / REVIEWED BY: Z. Crawford / D.R.H.
DRILLING CONTRACTOR: Spectrum Exploration
DRILLING METHOD: Hollow-Stem Auger
HAMMER TYPE: Automatic Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	USCS Symbol	Water Level	Blow Count / Foot	Unconfined Strength (tsf) *Field approx.
0	0		SILTY SAND (SM), with clay, grayish brown, loose to medium dense, moist, fine-grained sand.			13	
5	1		SILTY CLAY (CL), with sand, olive gray, moist to saturated, medium stiff, fine to very fine-grained sand.			7	
10	2		SILTY CLAY (CL), with sand, olive gray, stiff, saturated, fine-grained sand.			17	
15	3		SILTY SAND (SM), some clay, olive gray, medium dense, saturated, fine to very fine-grained sand.			19	
20	4		SAND (SW) with silt, grayish brown, dense, saturated, medium to fine-grained sand.			53	
25	5						
30	6						
	7						
	8						
	9						

Bottom of boring at 21.5 feet.
Static groundwater measured at 6 feet.

Bottom of well at 20 feet.

Well: NMW-4
Elev.: 11.435 feet MSL (NGVD 29)



LOG OF BORING NMW-5

ENGEO INCORPORATED

WELL INSTALLATION
N. LATHROP PROPERTIES
LATHROP, CALIFORNIA
6793.4.001.01

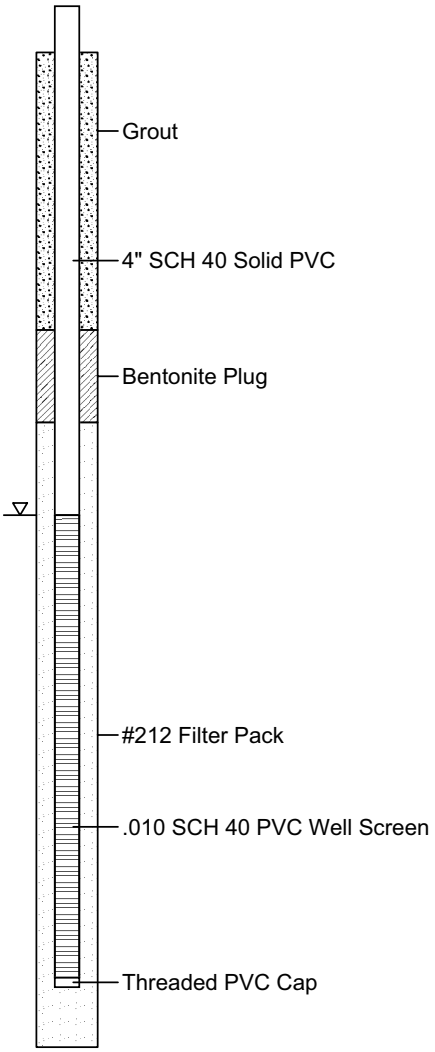
DATE DRILLED: July 13, 2005
HOLE DEPTH (FT): 21.5 ft.
HOLE DIAMETER: 8.0 in.
SURF ELEV (FT-MSL): 9.695 ft.

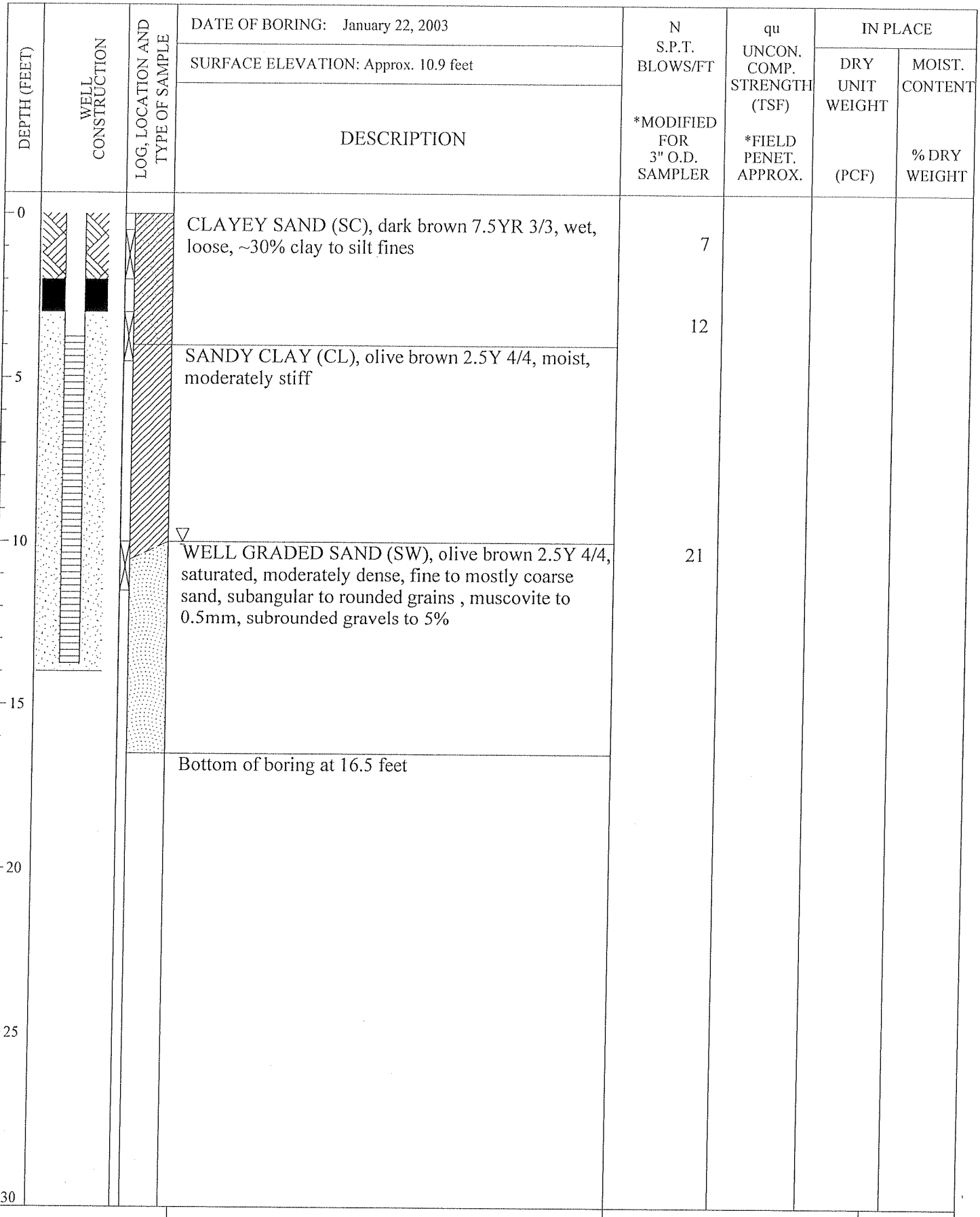
LOGGED / REVIEWED BY: Z. Crawford / D.R.H.
DRILLING CONTRACTOR: Spectrum Exploration
DRILLING METHOD: Hollow-Stem Auger
HAMMER TYPE: Automatic Hammer

Depth in Feet	Depth in Meters	Sample Type	DESCRIPTION	USCS Symbol	Water Level	Blow Count / Foot	Unconfined Strength (tsf) *Field approx.
0	0		SILTY CLAY (CL), dark brown, stiff, moist, trace sand.				
	1		CLAYEY SILTY SAND (SM), olive brown, loose to medium dense, moist to wet, fine grained sand.				
5	2					11	
			SILTY CLAY (CL), with sand, grayish olive brown, medium stiff, wet to saturated, fine to very fine-grained sand.		▽		
10	3					7	
	4		SILTY SAND (SM), gray and reddish brown, dense, saturated, fine-grained sand.				
15	5					42	
			SAND (SP) with silt, olive brown, medium dense to dense, saturated, fine-grained sand.				
20	6					33	
	7						
25	8						
30	9						

Bottom of boring at 21.5 feet.
Groundwater encountered at 10 feet during drilling.

Bottom of well at 20 feet.





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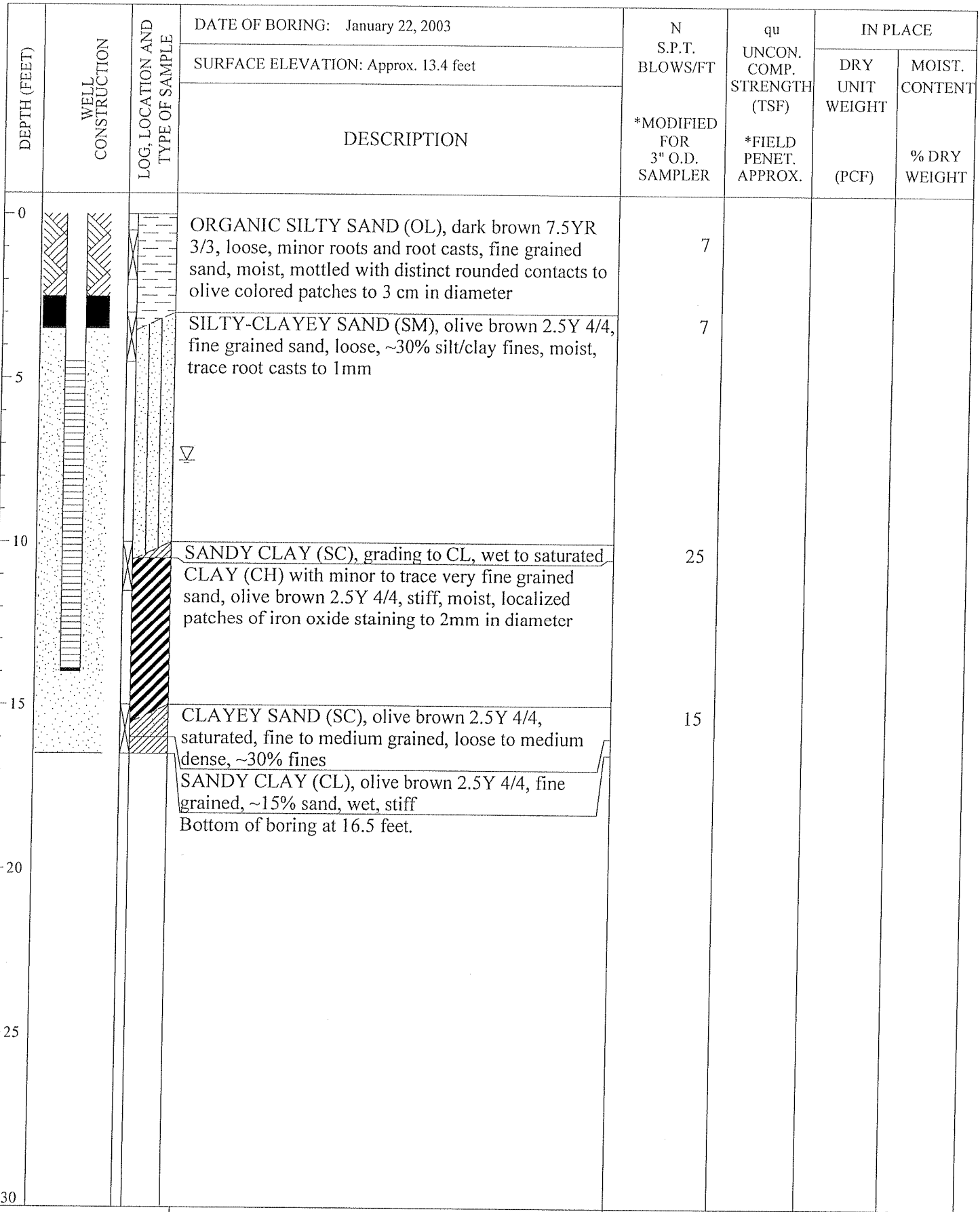
ROBINSON PROPERTY

LATHROP, CA

WELL NO.: MW-1

DATE: December 2003

FIGURE NO. MW-1



ENGEO INCORPORATED

ROBINSON PROPERTY

LATHROP, CA

WELL NO.: MW-2

DATE: December 2003

FIGURE NO. MW-2

5747.002.01 ROBINSON PROPERTY.GPJ 12/18/03

DATE OF BORING: November 17, 2003

SURFACE ELEVATION: Approx. 8 feet (2 meters)

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DESCRIPTION	BLOWS/FT.	qu UNCON STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0		1A		SANDY SILT (ML), dark brown, soft, moist, non to low plasticity, fine-grained sand.				
		1B			4			
	1			SILTY SAND (SM), dark brown and olive gray mottled, loose, moist, fine-grained sand.				
5				No recovery from sampler.				
	2				19			
				CLAYEY SAND (SC), brown, moist to wet, loose ▽ (Logged from cuttings)				
10	3			CLAY WITH SILT (CL), olive brown, stiff, wet.				
					11			
	4			Grades to clayey silt with interbedded clayey sand.				
15								
	5				12			
				Bottom of boring at approximately 16 1/2 feet. Groundwater encountered at 8 feet during drilling.				
20	6							
	7							
25								
	8							
	9							
30								

ENGEO INCORPORATED
EXCELLENT SERVICE SINCE 1971

LATHROP PARK

LATHROP, CALIFORNIA

BORING NO.: MW-9

LOGGED BY: J. Ollerton

PROJ. NO.: 5747.5.002.02

CHECKED BY

FIGURE NO. A9

ENGEO_BORELOG 5747500302_LATHROPPARK.GPJ 10/24/05

DATE OF BORING: November 17, 2003

SURFACE ELEVATION: Approx. 9 feet (3 meters)

DEPTH (FEET)	DEPTH (METERS)	SAMPLE NUMBER	LOG, LOCATION AND TYPE OF SAMPLE	DESCRIPTION	BLOWS/FT.	qu UNCON STRENGTH (TSF) *FIELD PENET. APPROX.	IN PLACE DRY UNIT WEIGHT (PCF)	IN PLACE MOIST. CONTENT % DRY WEIGHT
0				SANDY SILT (ML), brown to dark brown, soft, damp to moist, fine-grained sand.				
5	1	1A 1B		SANDY CLAY (CL), light olive brown, very stiff, moist, low to medium plasticity, fine-grained sand.	33			
10	2 3	2A 2B		▽ Grades to Clay with Sand, olive brown mottling, with minor fine- to medium-grained sand lenses.	23			
15	4 5	3		Grades to Clay with Sand with interbedded clayey sand.	22			
20	6			Bottom of boring at approximately 16 feet. Bail water clearing up at approximately 10 gallons. Groundwater at 10 feet after boring was completed.				
25	7 8							
30	9							

ENGEO INCORPORATED
EXCELLENT SERVICE SINCE 1971

LATHROP PARK

LATHROP, CALIFORNIA

BORING NO.: MW-10

LOGGED BY: J. Ollerton

PROJ. NO.: 5747.5.002.02

CHECKED BY

FIGURE NO. A10

ENGEO_BORELOG_5747500302_LATHROPPARK.GPJ 10/24/05