
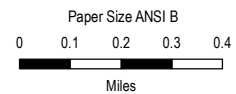




Legend
 Study Area



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

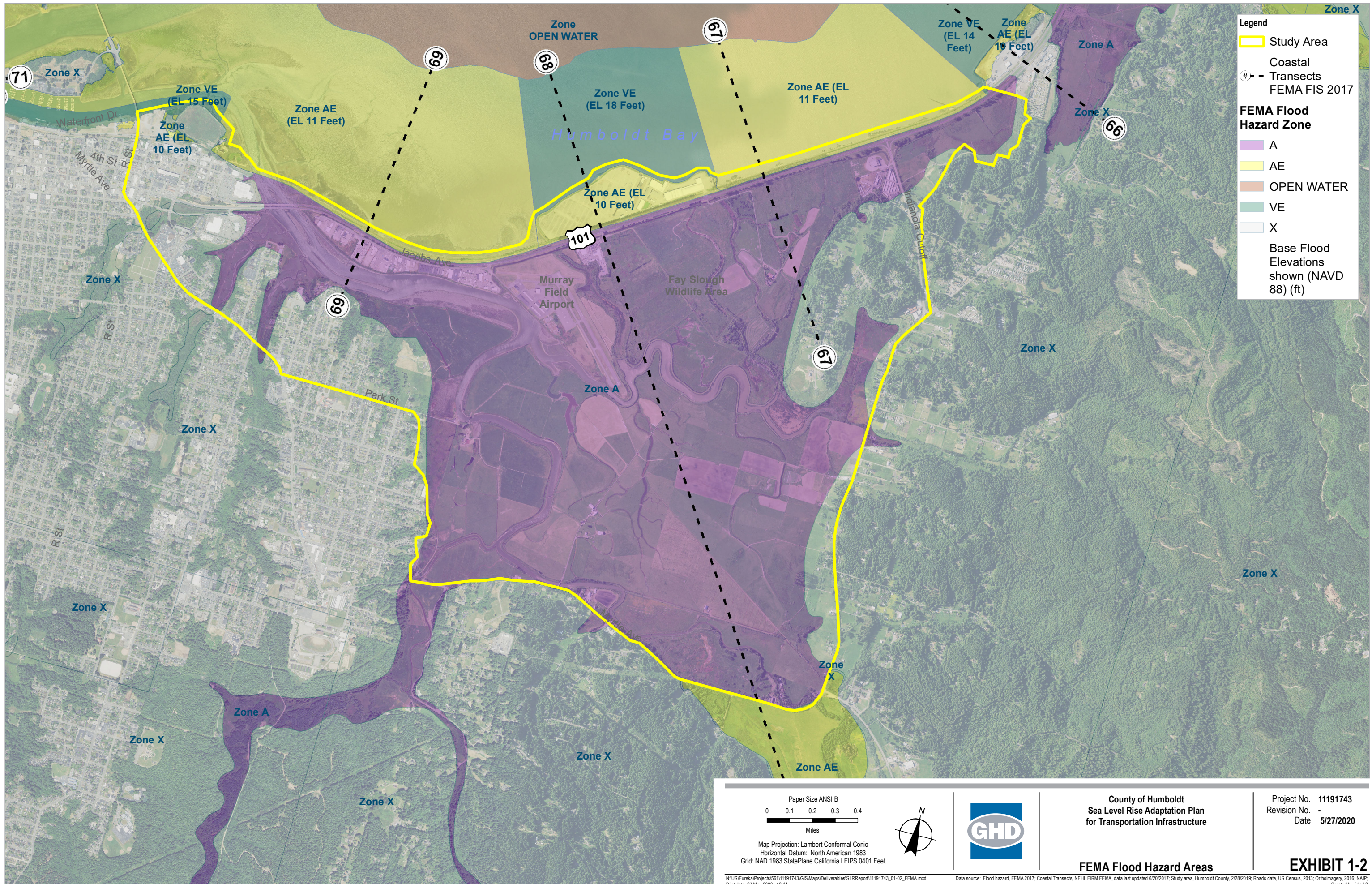
Project No. 11191743
 Revision No. -
 Date 5/27/2020

Study Area

EXHIBIT 1-1

N:\US\Eureka\Projects\56111191743\GIS\Maps\Deliverables\SLRReport\11191743_01-01_StudyArea.mxd
 Print date: 27 May 2020 - 12:09

Data source: Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIP. Created by: jclark2



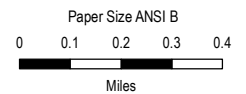
Legend

- Study Area
- Coastal
- Transects
- FEMA FIS 2017

FEMA Flood Hazard Zone

- A
- AE
- OPEN WATER
- VE
- X

Base Flood Elevations shown (NAVD 88) (ft)



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



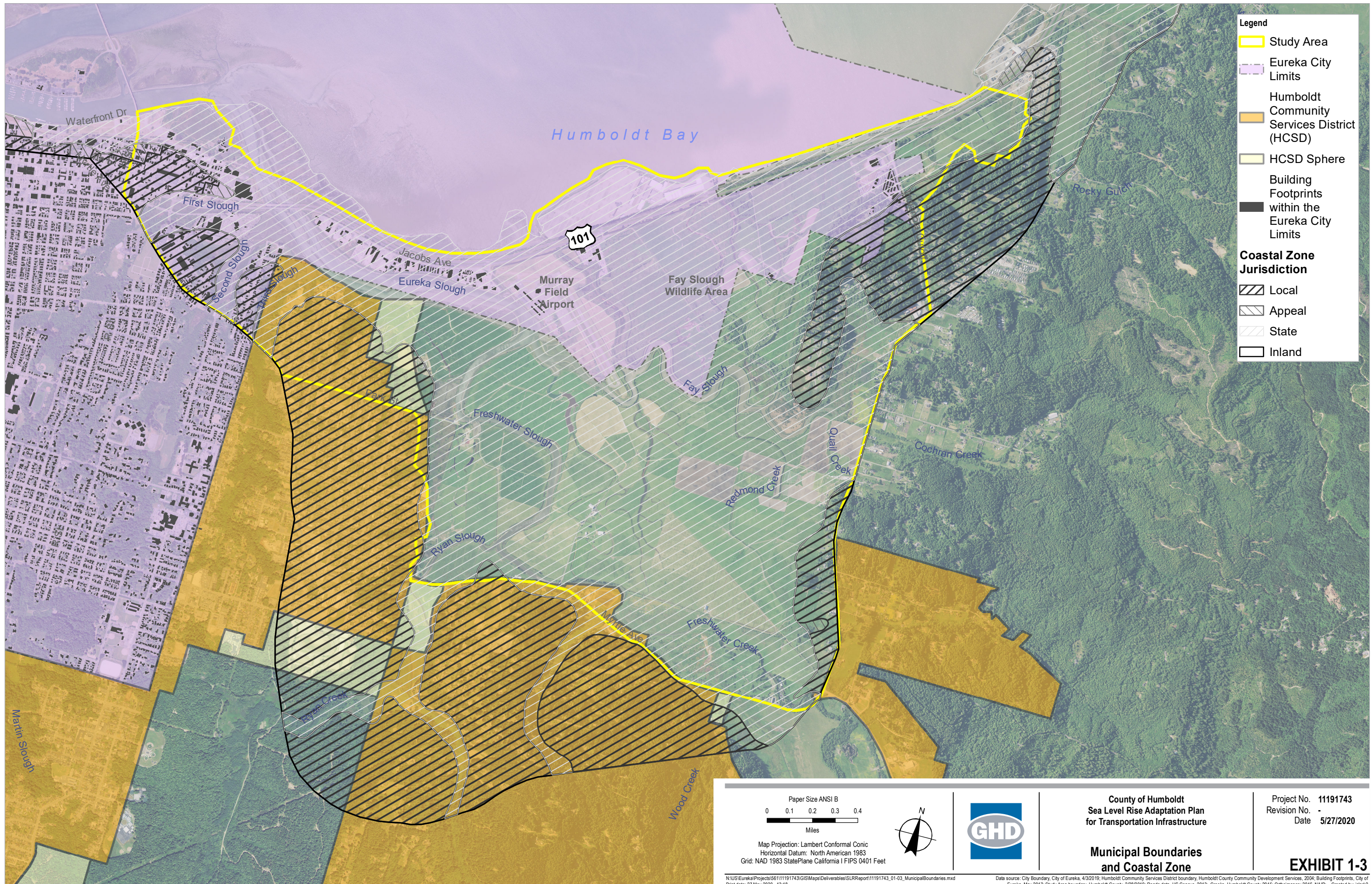
County of Humboldt
 Sea Level Rise Adaptation Plan
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Project No. 11191743
 Revision No. -
 Date 5/27/2020

FEMA Flood Hazard Areas

EXHIBIT 1-2

N:\US\Eureka\Projects\56111191743\GIS\Maps\Deliverables\SLR\Report\11191743_01-02_FEMA.mxd Data source: Flood hazard, FEMA 2017; Coastal Transects, NFHL FIRM FEMA, data last updated 6/20/2017; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Orthomagnery, 2016; NAD: Print date: 27 May 2020 - 12:44 Created by: jdkr2

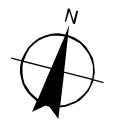
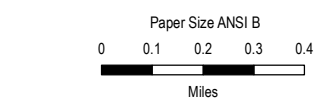


Legend

- Study Area
- Eureka City Limits
- Humboldt Community Services District (HCSD)
- HCSD Sphere
- Building Footprints within the Eureka City Limits

Coastal Zone Jurisdiction

- Local
- Appeal
- State
- Inland



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

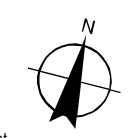
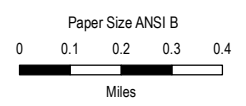
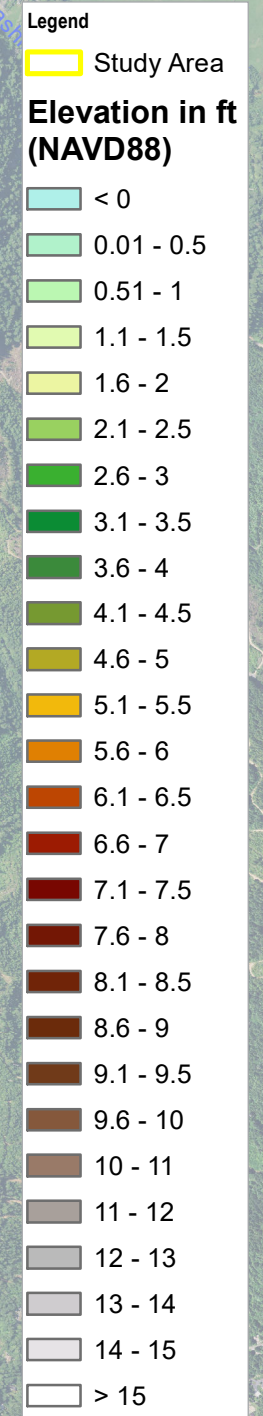
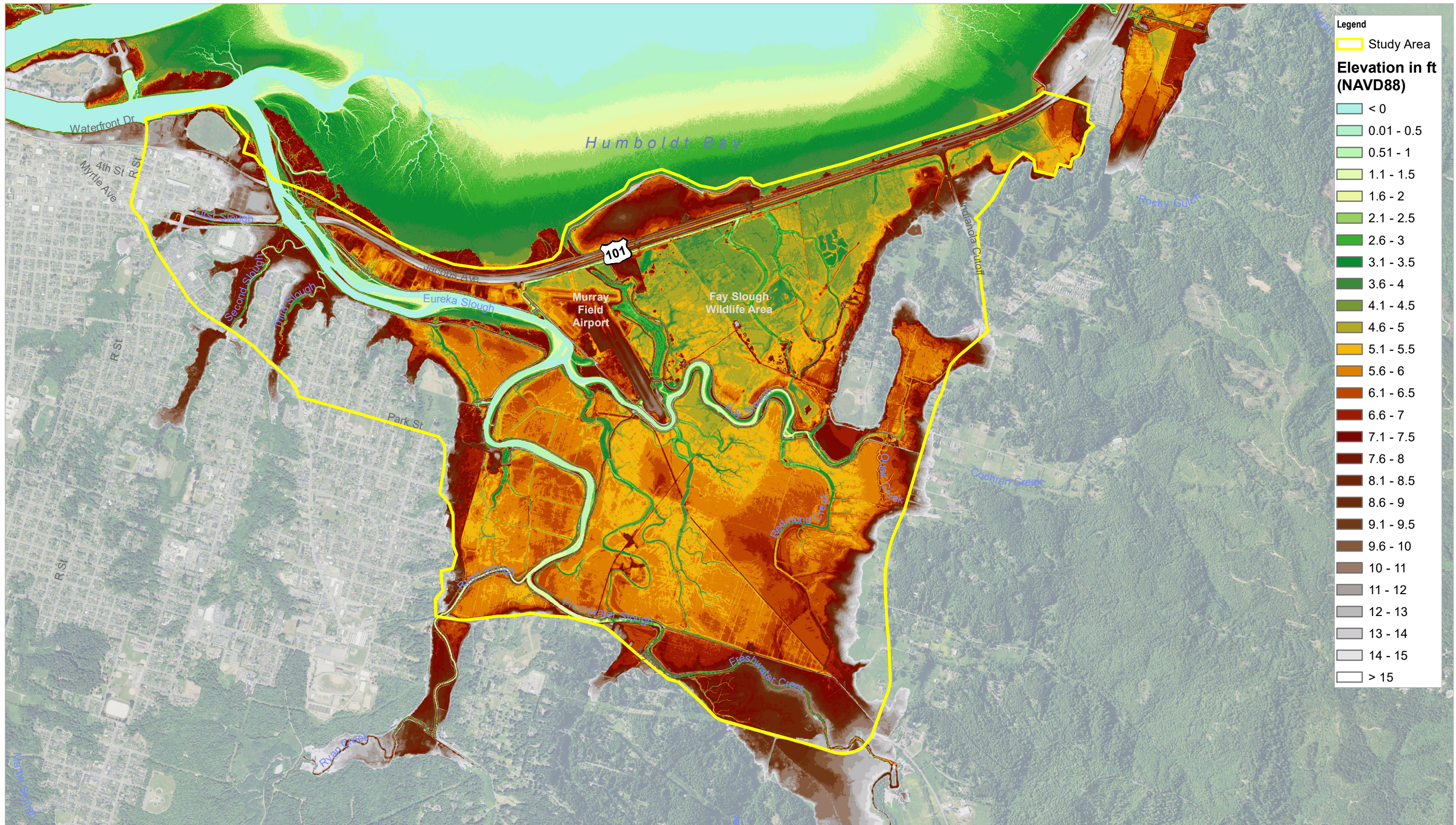
Project No. 11191743
 Revision No. -
 Date 5/27/2020

**Municipal Boundaries
 and Coastal Zone**

EXHIBIT 1-3

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 Print date: 27 May 2020 - 13:18

Data source: City Boundary, City of Eureka, 4/3/2019; Humboldt Community Services District boundary, Humboldt County Community Development Services, 2004; Building Footprints, City of Eureka, May 2017; Study Area boundary, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery 2016, NAIP; - Created by: jclark2



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
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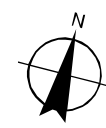
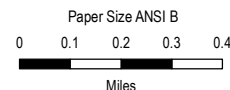
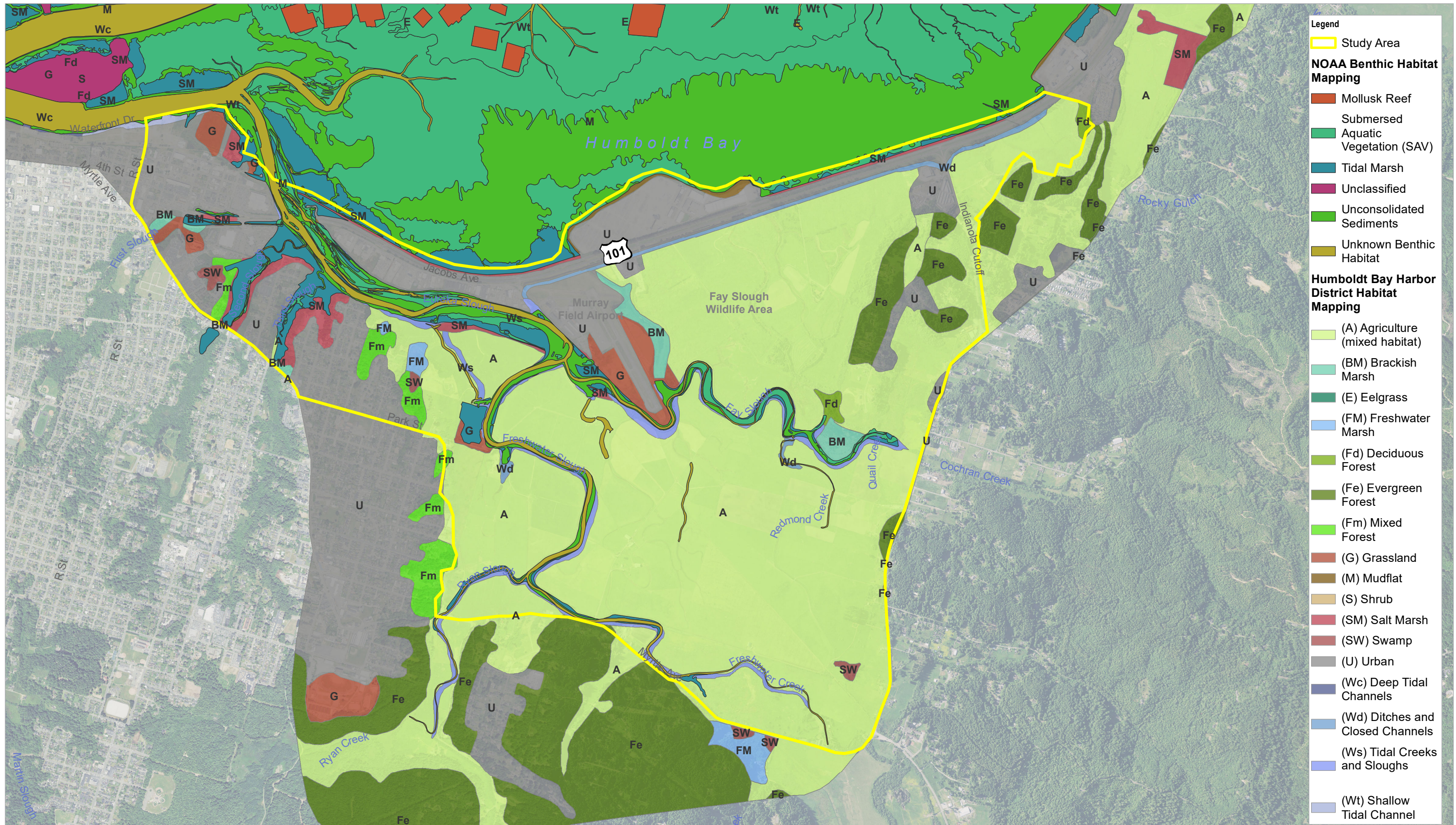


County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

Project No. 11191743
 Revision No. -
 Date 5/27/2020

Ground Elevation

EXHIBIT 2-1



Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



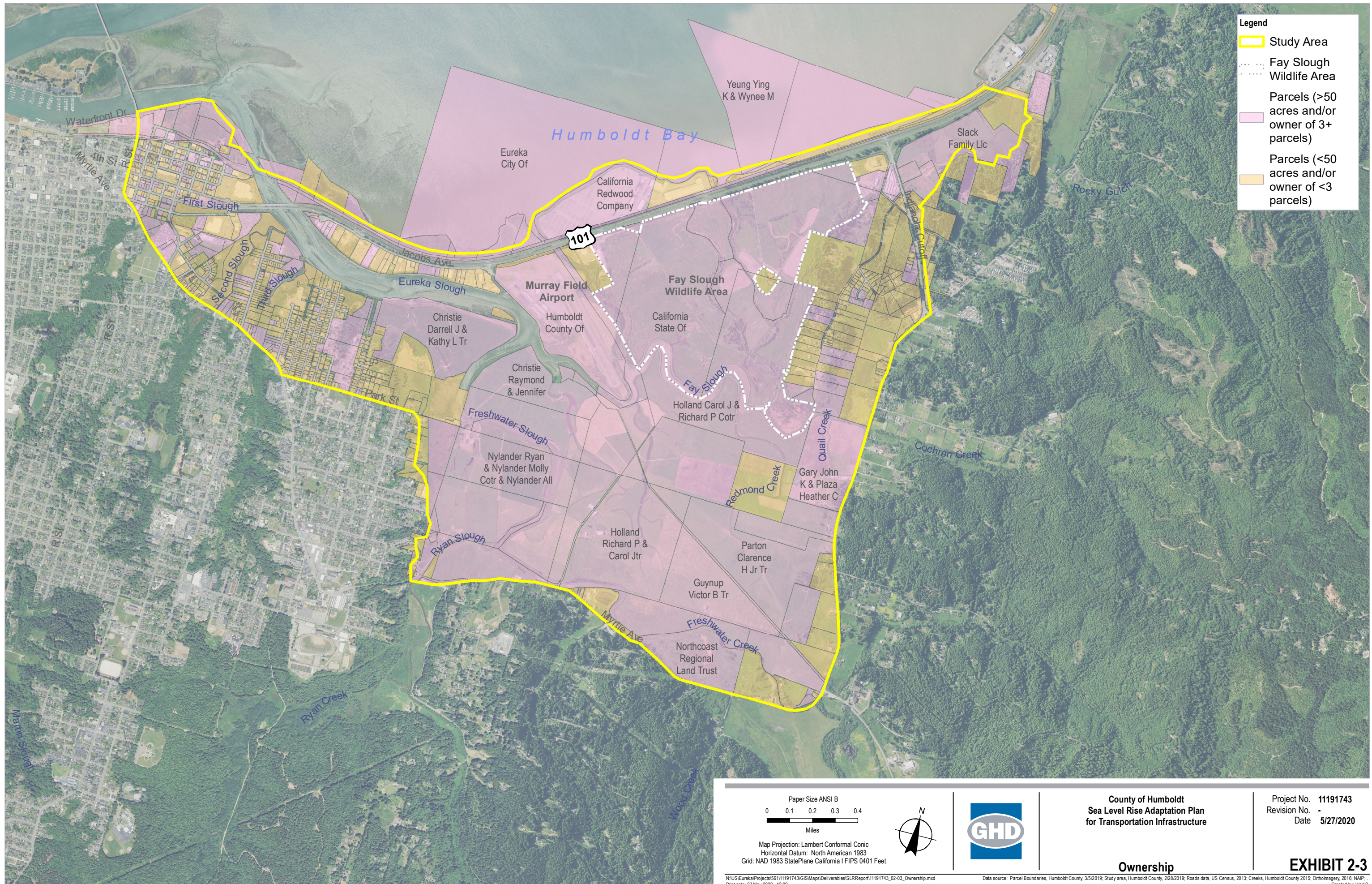
County of Humboldt
Sea Level Rise Adaptation Plan
for Transportation Infrastructure

Project No. 11191743
Revision No. -
Date 5/27/2020

Habitat

EXHIBIT 2-2

N:\US\Eureka\Projects\6611191743\GIS\Maps\Deliverables\SLRReport\11191743_02-02_Habitat.mxd Print date: 27 May 2020 - 12:07 Data source: Humboldt Bay California Benthic Habitats, NOAA's Ocean Service, Coastal Services Center (CSC), 2009; Habitat types, Humboldt Bay Harbor District, 1980; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthomage, 2016; NAIP... Created by: jclark2

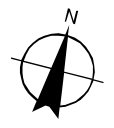


Legend

- Study Area
- Fay Slough Wildlife Area
- Parcels (>50 acres and/or owner of 3+ parcels)
- Parcels (<50 acres and/or owner of <3 parcels)

Paper Size ANSI B
 0 0.1 0.2 0.3 0.4
 Miles

Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



County of Humboldt
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for Transportation Infrastructure

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Ownership

EXHIBIT 2-3

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 Print date: 27 May 2020 - 12:09
 Data source: Parcel Boundaries, Humboldt County, 3/5/2019; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIP; -
 Created by: jclark2



Legend

- Study Area
- Shoreline Structure Type**
- Boat Ramp
- Bridge Abutment
- Bulwark
- Cliff/Bluff
- Dike
- Fill
- Fortified
- None
- Railroad
- Road
- Tidegate
- Streams

<p>Paper Size ANSI B</p> <p>0 0.1 0.2 0.3 0.4</p> <p>Miles</p> <p>Map Projection: Lambert Conformal Conic Horizontal Datum: North American 1983 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet</p>			<p>County of Humboldt Sea Level Rise Adaptation Plan for Transportation Infrastructure</p>	<p>Project No. 11191743 Revision No. - Date 5/27/2020</p>
<p>Shoreline Structure Type</p>			<p>EXHIBIT 2-4</p>	

N:\US\Eureka\Projects\66111191743\GIS\Maps\Deliverables\SLRReport\11191743_02-04_ShorelineStructure.mxd Print date: 27 May 2020 - 12:07 Data source: Shoreline Cover Type, Humboldt Bay Shoreline Inventory Mapping and Sea Level Rise Vulnerability Assessment, January 2013; Humboldt County, 2/28/2019; Roads data, US Census; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIIP - Created by: plark2



Legend

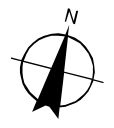
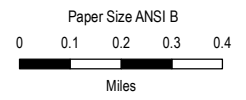
- Study Area
- Shoreline Cover Type**
- Asphalt; Concrete
- Exposed
- Rock; Rock/Concrete
- Vegetated
- Wood
- Streams

<p style="text-align: center;">Paper Size ANSI B</p> <p style="text-align: center;">0 0.1 0.2 0.3 0.4</p> <p style="text-align: center;">Miles</p> <p style="font-size: small;">Map Projection: Lambert Conformal Conic Horizontal Datum: North American 1983 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet</p>			<p>County of Humboldt Sea Level Rise Adaptation Plan for Transportation Infrastructure</p>	<p>Project No. 11191743 Revision No. - Date 5/27/2020</p>
<p>Shoreline Cover Type</p>			<p>EXHIBIT 2-5</p>	

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 Print date: 27 May 2020 - 12:10
 Data source: Shoreline Cover Type, Humboldt Bay Shoreline Inventory Mapping and Sea Level Rise Vulnerability Assessment, January 2013; Humboldt County, 2/28/2019; Roads data, US Census; Creeks, Humboldt County 2015; Orthoimagery, 2016; NADIP - Created by: plark2



- Legend**
- Study Area
 - Streams
- Shoreline Elevation**
- 13.2 - 4
 - 4.01 - 5
 - 5.01 - 6
 - 6.01 - 7
 - 7.01 - 8
 - 8.01 - 9
 - 9.01 - 10
 - 10.01 - 11
 - 11.01 - 12
 - 12.01 - 13
 - 13.01 - 14
 - 14.01 - 15
 - 15.01 - 16
 - 16.01 - 17
 - 17.01 - 18
 - 18.01 - 19
 - 19.01 - 20
 - 20.01 - 22.94



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



County of Humboldt
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for Transportation Infrastructure

Project No. 11191743
 Revision No. -
 Date 5/27/2020

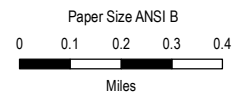
Shoreline Elevations

EXHIBIT 2-6

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 Print date: 27 May 2020 - 12:13
 Data source: Shoreline Elevation, NOAA, 2014; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIP; -
 Created by: jclark2



- Legend**
- Study Area
 - Boat Launch
 - Bus Stop
 - Redwood Transit System (Bus Route)
 - Eureka Transit System (Bus Route)
 - Bike Route
 - Proposed Bike Route
 - Highway
 - Roadway



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

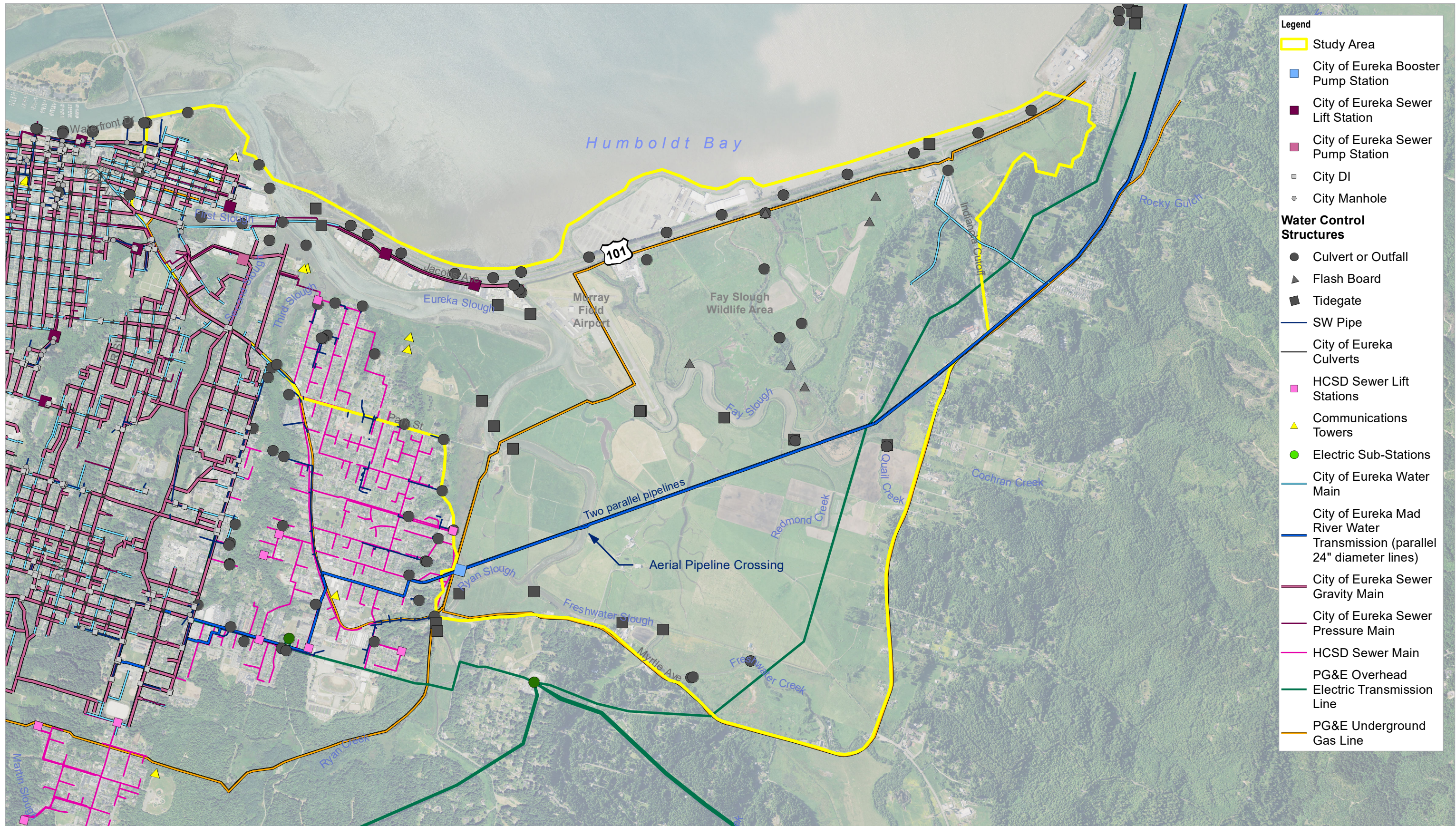


County of Humboldt
Sea Level Rise Adaptation Plan
for Transportation Infrastructure

Project No. 11191743
 Revision No. -
 Date 6/5/2020

Transportation Facilities

EXHIBIT 2-7



- Legend**
- Study Area
 - City of Eureka Booster Pump Station
 - City of Eureka Sewer Lift Station
 - City of Eureka Sewer Pump Station
 - City DI
 - City Manhole
- Water Control Structures**
- Culvert or Outfall
 - ▲ Flash Board
 - Tidegate
 - SW Pipe
 - City of Eureka Culverts
 - HCSD Sewer Lift Stations
 - ▲ Communications Towers
 - Electric Sub-Stations
 - City of Eureka Water Main
 - City of Eureka Mad River Water Transmission (parallel 24" diameter lines)
 - City of Eureka Sewer Gravity Main
 - City of Eureka Sewer Pressure Main
 - HCSD Sewer Main
 - PG&E Overhead Electric Transmission Line
 - PG&E Underground Gas Line

Paper Size ANSI B
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 Miles

Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



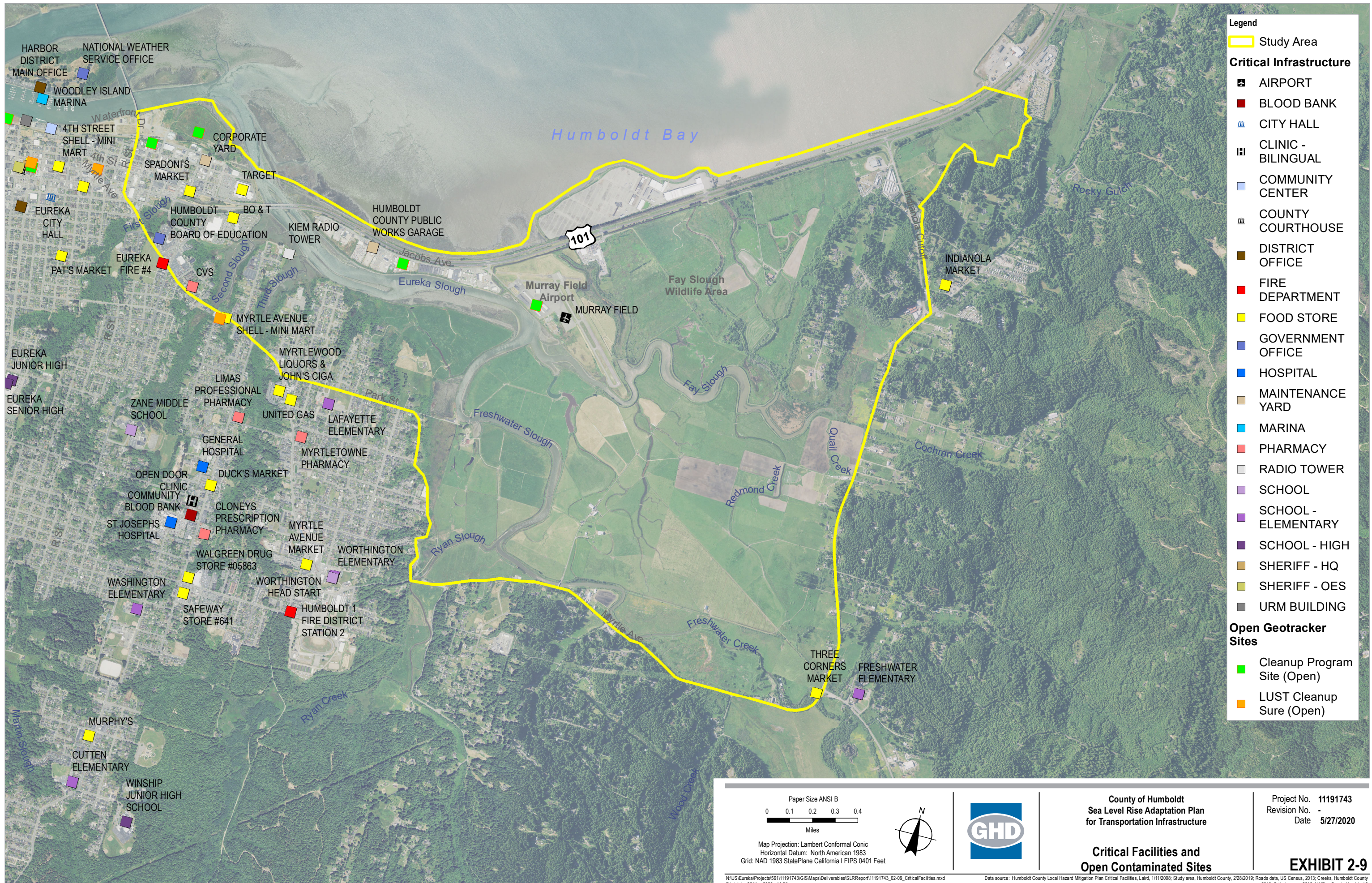
**County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure**

Project No. 11191743
 Revision No. -
 Date 5/27/2020

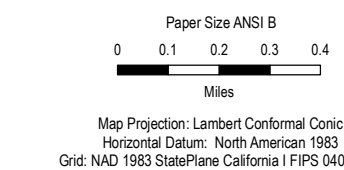
Utilities

EXHIBIT 2-8

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 Print date: 27 May 2020 - 14:07



- Legend**
- Study Area
- Critical Infrastructure**
- AIRPORT
 - BLOOD BANK
 - CITY HALL
 - CLINIC - BILINGUAL
 - COMMUNITY CENTER
 - COUNTY COURTHOUSE
 - DISTRICT OFFICE
 - FIRE DEPARTMENT
 - FOOD STORE
 - GOVERNMENT OFFICE
 - HOSPITAL
 - MAINTENANCE YARD
 - MARINA
 - PHARMACY
 - RADIO TOWER
 - SCHOOL
 - SCHOOL - ELEMENTARY
 - SCHOOL - HIGH
 - SHERIFF - HQ
 - SHERIFF - OES
 - URM BUILDING
- Open Geotracker Sites**
- Cleanup Program Site (Open)
 - LUST Cleanup Sure (Open)



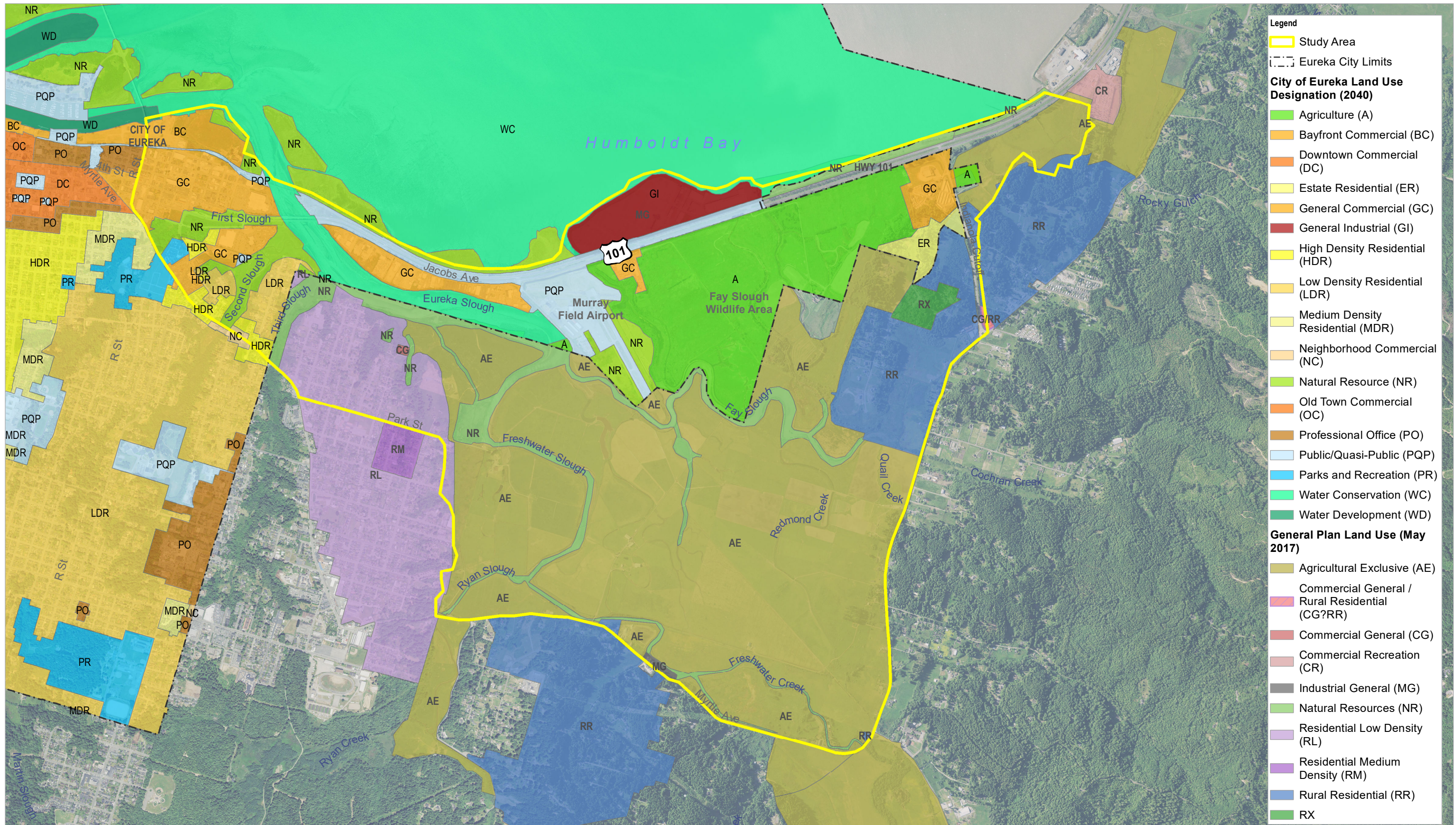
County of Humboldt
 Sea Level Rise Adaptation Plan
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Project No. 11191743
 Revision No. -
 Date 5/27/2020

**Critical Facilities and
 Open Contaminated Sites**

EXHIBIT 2-9

N:\US\Eureka\Projects\56111191743\GIS\Maps\Deliverables\SLRReport\11191743_02-09_CriticalFacilities.mxd
 Print date: 27 May 2020 - 14:25
 Data source: Humboldt County Local Hazard Mitigation Plan Critical Facilities, Laird, 1/11/2008; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIP. - Created by: jdark2



- Legend**
- Study Area
 - Eureka City Limits
- City of Eureka Land Use Designation (2040)**
- Agriculture (A)
 - Bayfront Commercial (BC)
 - Downtown Commercial (DC)
 - Estate Residential (ER)
 - General Commercial (GC)
 - General Industrial (GI)
 - High Density Residential (HDR)
 - Low Density Residential (LDR)
 - Medium Density Residential (MDR)
 - Neighborhood Commercial (NC)
 - Natural Resource (NR)
 - Old Town Commercial (OC)
 - Professional Office (PO)
 - Public/Quasi-Public (PQP)
 - Parks and Recreation (PR)
 - Water Conservation (WC)
 - Water Development (WD)
- General Plan Land Use (May 2017)**
- Agricultural Exclusive (AE)
 - Commercial General / Rural Residential (CG?RR)
 - Commercial General (CG)
 - Commercial Recreation (CR)
 - Industrial General (MG)
 - Natural Resources (NR)
 - Residential Low Density (RL)
 - Residential Medium Density (RM)
 - Rural Residential (RR)
 - RX

Paper Size ANSI B

Miles

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

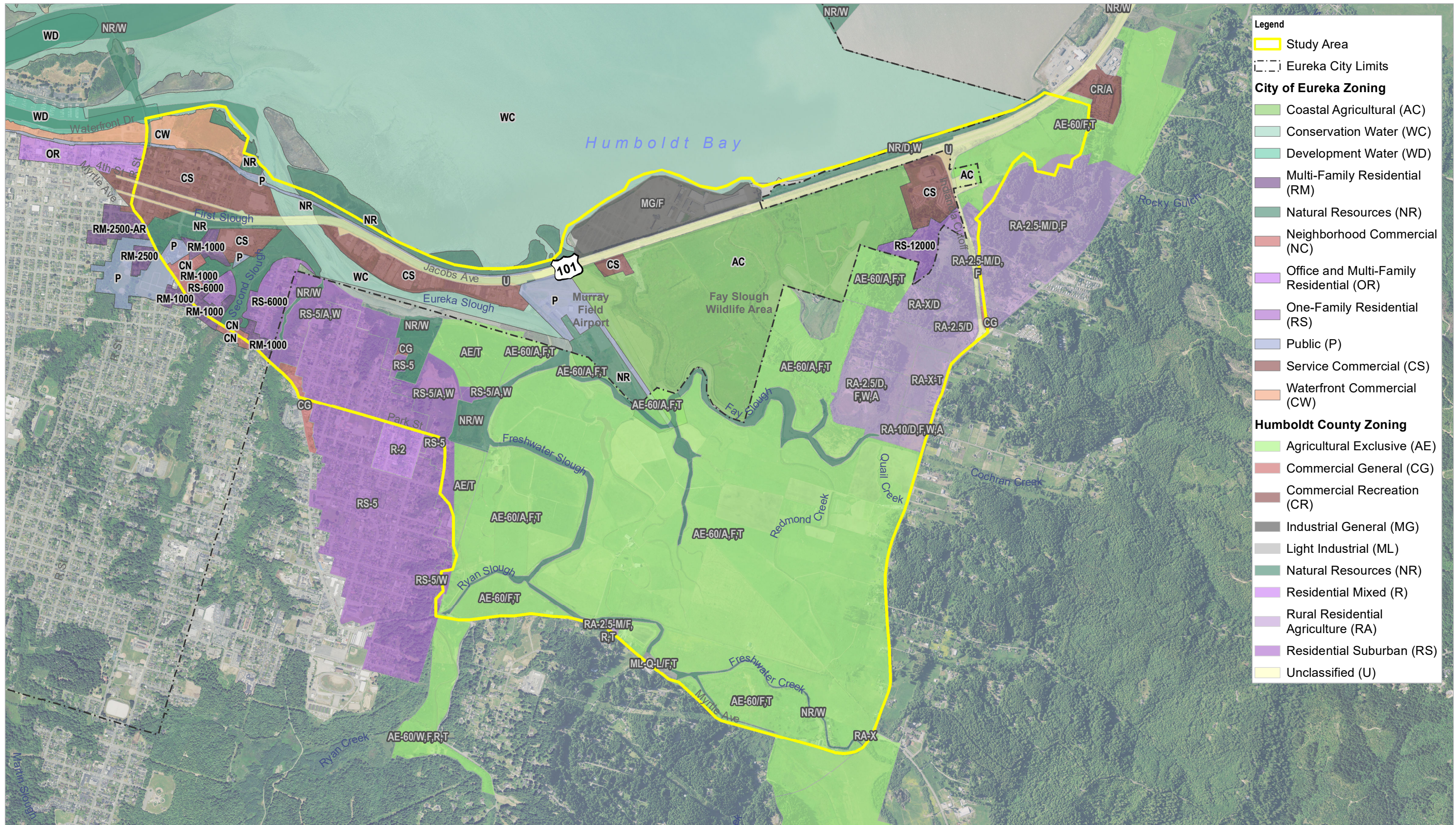
County of Humboldt
Sea Level Rise Adaptation Plan
for Transportation Infrastructure

Project No. 11191743
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Date 5/27/2020

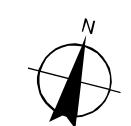
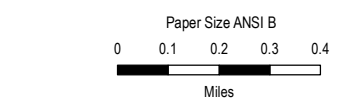
Land Use

EXHIBIT 2-10

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Print date: 27 May 2020 - 12:38
Data source: Land Use, Humboldt County, May 2017; Land Use, City of Eureka, April 2019; City Boundary, City of Eureka, 4/3/2019; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIP - Created by: jlar2



- Legend**
- Study Area
 - Eureka City Limits
- City of Eureka Zoning**
- Coastal Agricultural (AC)
 - Conservation Water (WC)
 - Development Water (WD)
 - Multi-Family Residential (RM)
 - Natural Resources (NR)
 - Neighborhood Commercial (NC)
 - Office and Multi-Family Residential (OR)
 - One-Family Residential (RS)
 - Public (P)
 - Service Commercial (CS)
 - Waterfront Commercial (CW)
- Humboldt County Zoning**
- Agricultural Exclusive (AE)
 - Commercial General (CG)
 - Commercial Recreation (CR)
 - Industrial General (MG)
 - Light Industrial (ML)
 - Natural Resources (NR)
 - Residential Mixed (R)
 - Rural Residential Agriculture (RA)
 - Residential Suburban (RS)
 - Unclassified (U)



County of Humboldt
Sea Level Rise Adaptation Plan
for Transportation Infrastructure

Project No. 11191743
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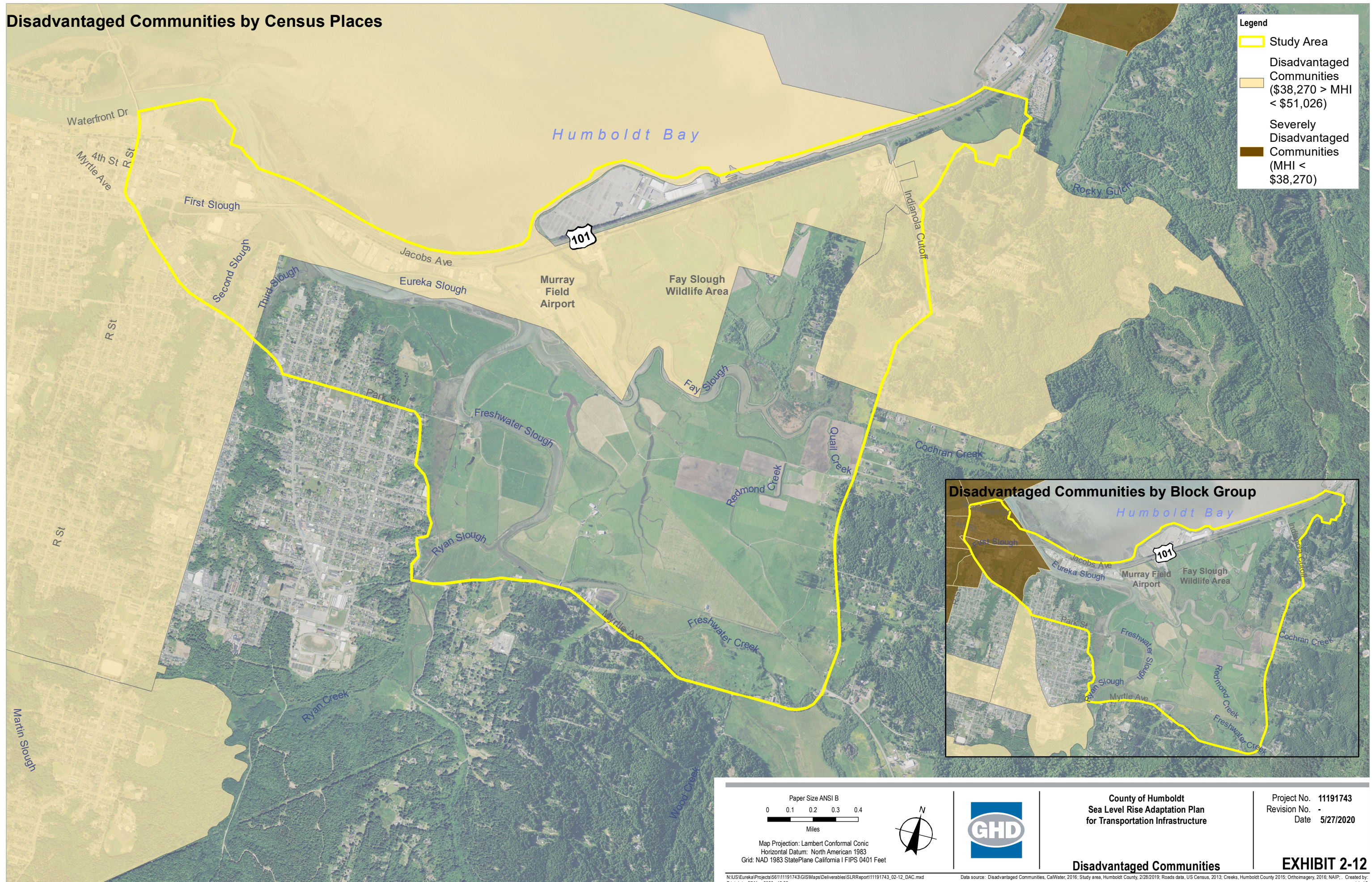
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Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

Zoning

EXHIBIT 2-11

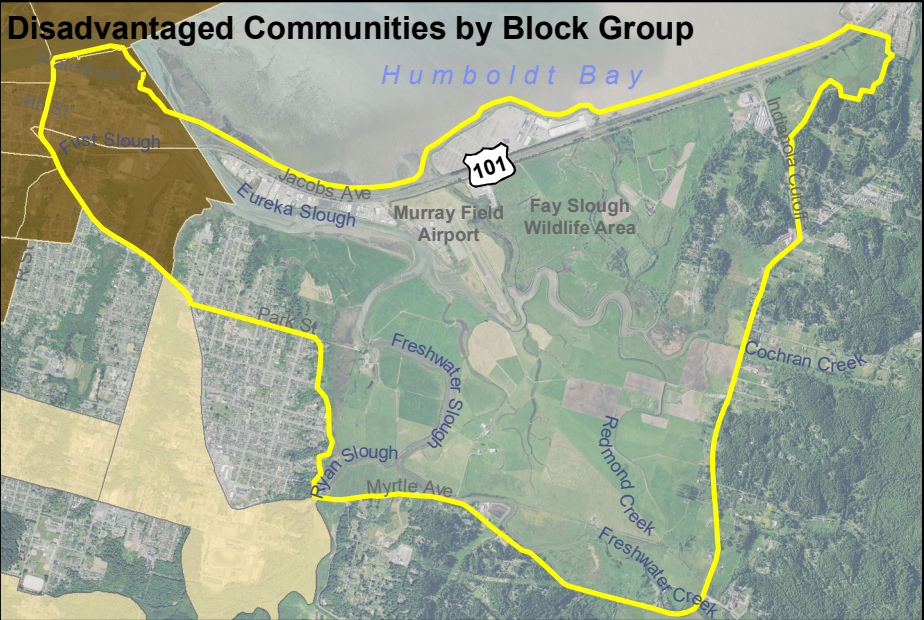
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Print date: 27 May 2020 - 13:46
Data source: Zoning, City of Eureka, 8/22/2016; Zoning, County of Humboldt, 10/3/2017; City Boundary, City of Eureka, 4/3/2019; Coastal Zone boundary, Humboldt County, 2015; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthomageary, 2016; NAIP. Created by: jclark2

Disadvantaged Communities by Census Places



Legend

- Study Area
- Disadvantaged Communities (\$38,270 > MHI < \$51,026)
- Severely Disadvantaged Communities (MHI < \$38,270)



Paper Size ANSI B
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 Miles

Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



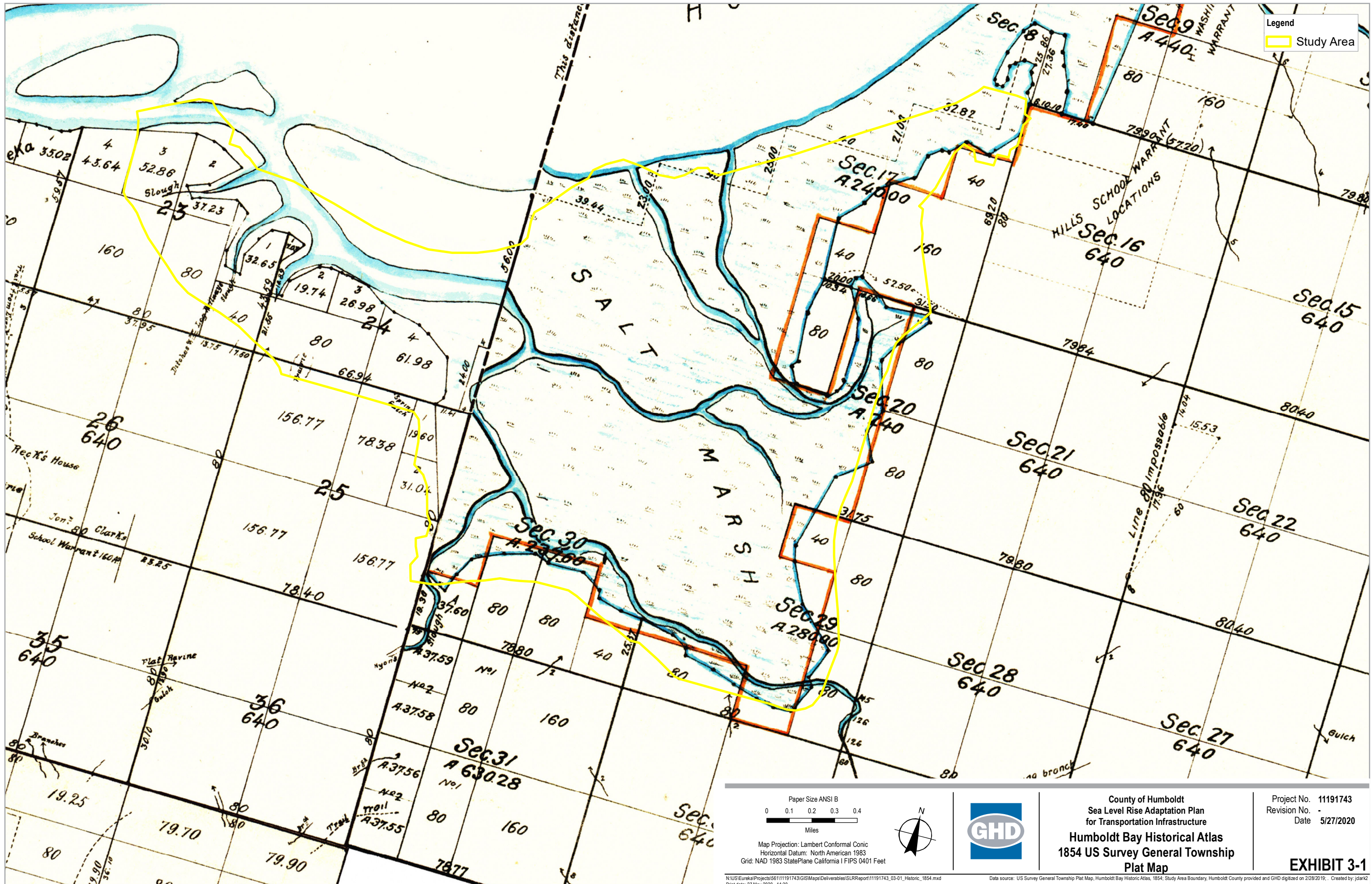
County of Humboldt
 Sea Level Rise Adaptation Plan
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 Revision No. -
 Date 5/27/2020

Disadvantaged Communities

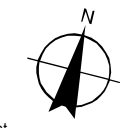
EXHIBIT 2-12

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Legend
 Study Area

Paper Size ANSI B
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 Miles
 Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet




County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure
Humboldt Bay Historical Atlas
 1854 US Survey General Township
 Plat Map

Project No. 11191743
 Revision No. -
 Date 5/27/2020

EXHIBIT 3-1

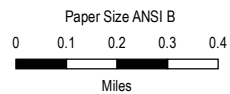
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 Print date: 27 May 2020 - 14:30
 Data source: US Survey General Township Plat Map, Humboldt Bay Historic Atlas, 1854; Study Area Boundary, Humboldt County provided and GHD digitized on 2/28/2019. Created by: jclark2



Legend
 Study Area

Square Miles of Area	9
Miles of Shore Line	24
Miles of Meanders	12
Miles of Creeks	7
Miles of Roads	4

Square Miles of Area	11
Miles of Shore Line	8
Miles of Spurs	34
Miles of Roads	8



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

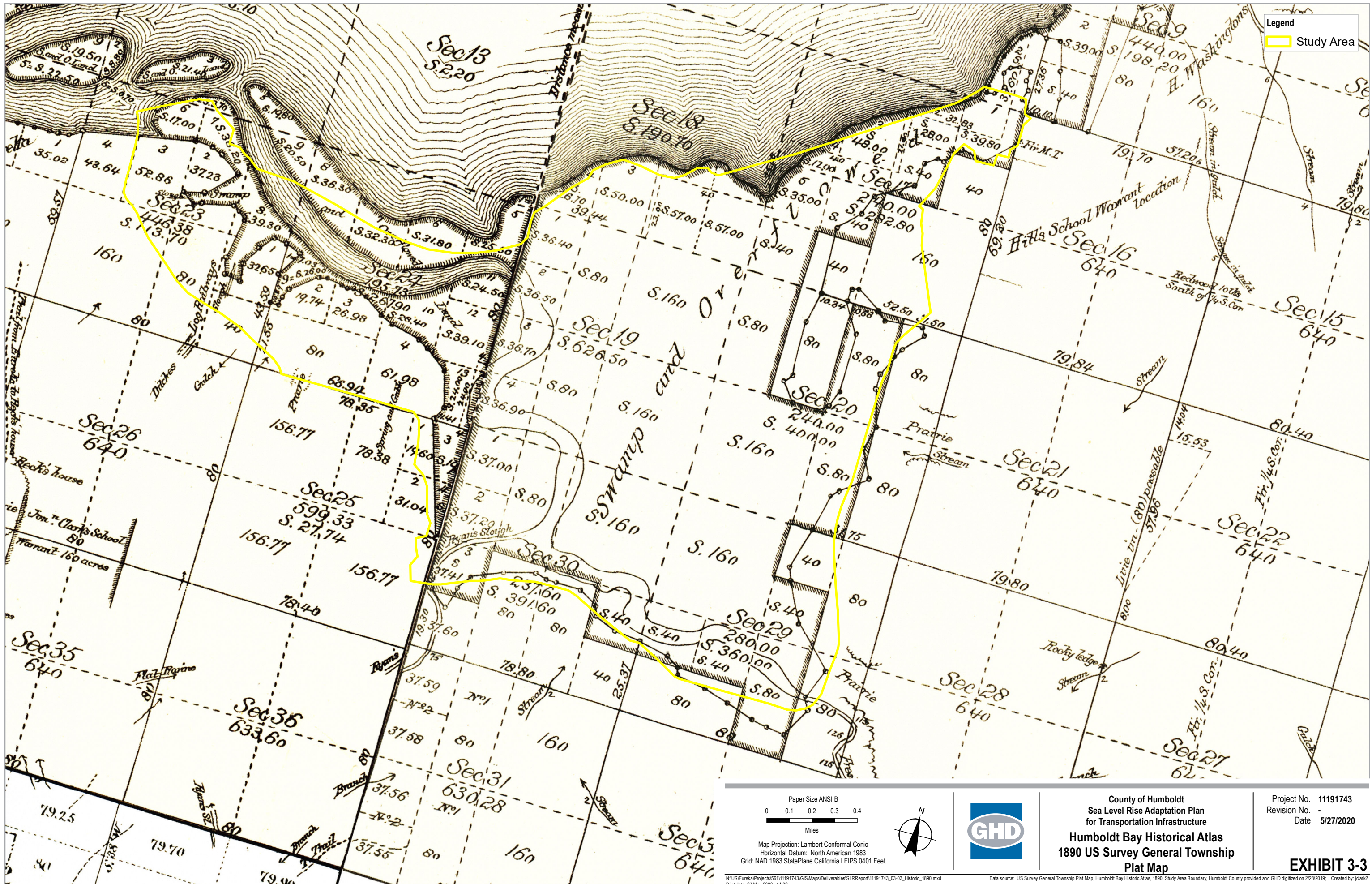


County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

Humboldt Bay Historical Atlas
 1870 US Coast Survey

Project No. 11191743
 Revision No. -
 Date 5/27/2020

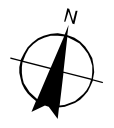
EXHIBIT 3-2



Legend
 Study Area

Paper Size ANSI B
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Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

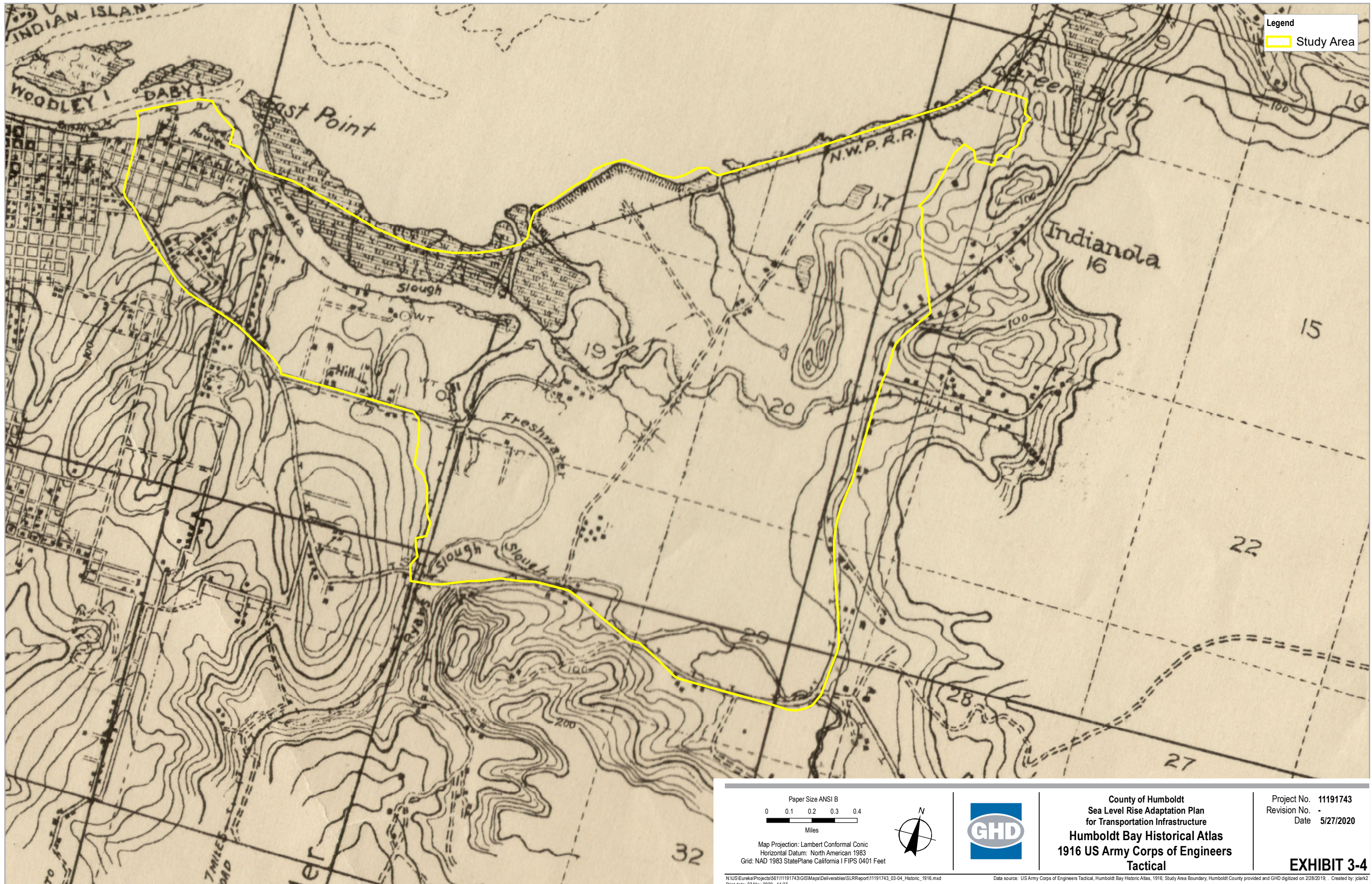



County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure
Humboldt Bay Historical Atlas
1890 US Survey General Township
Plat Map

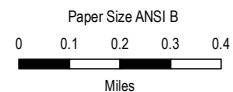
Project No. 11191743
 Revision No. -
 Date 5/27/2020

EXHIBIT 3-3

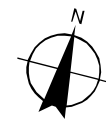
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 Print date: 27 May 2020 - 14:32
 Data source: US Survey General Township Plat Map, Humboldt Bay Historic Atlas, 1890, Study Area Boundary, Humboldt County provided and GHD digitized on 2/28/2019. Created by: jclark2



Legend
 Study Area



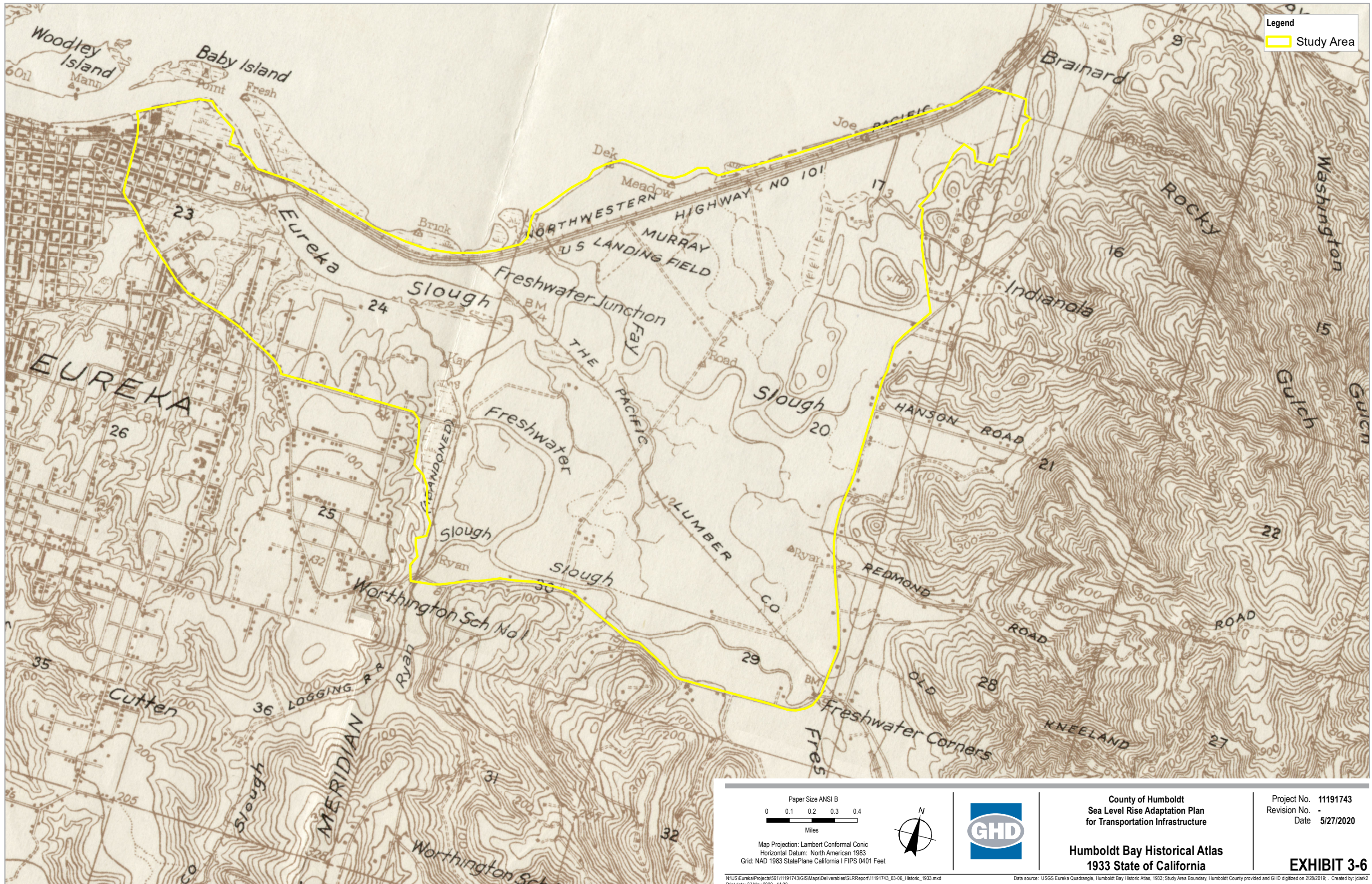
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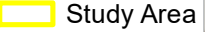


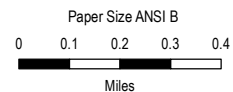
County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure
Humboldt Bay Historical Atlas
 1916 US Army Corps of Engineers
 Tactical

Project No. 11191743
 Revision No. -
 Date 5/27/2020

EXHIBIT 3-4



Legend
 Study Area



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

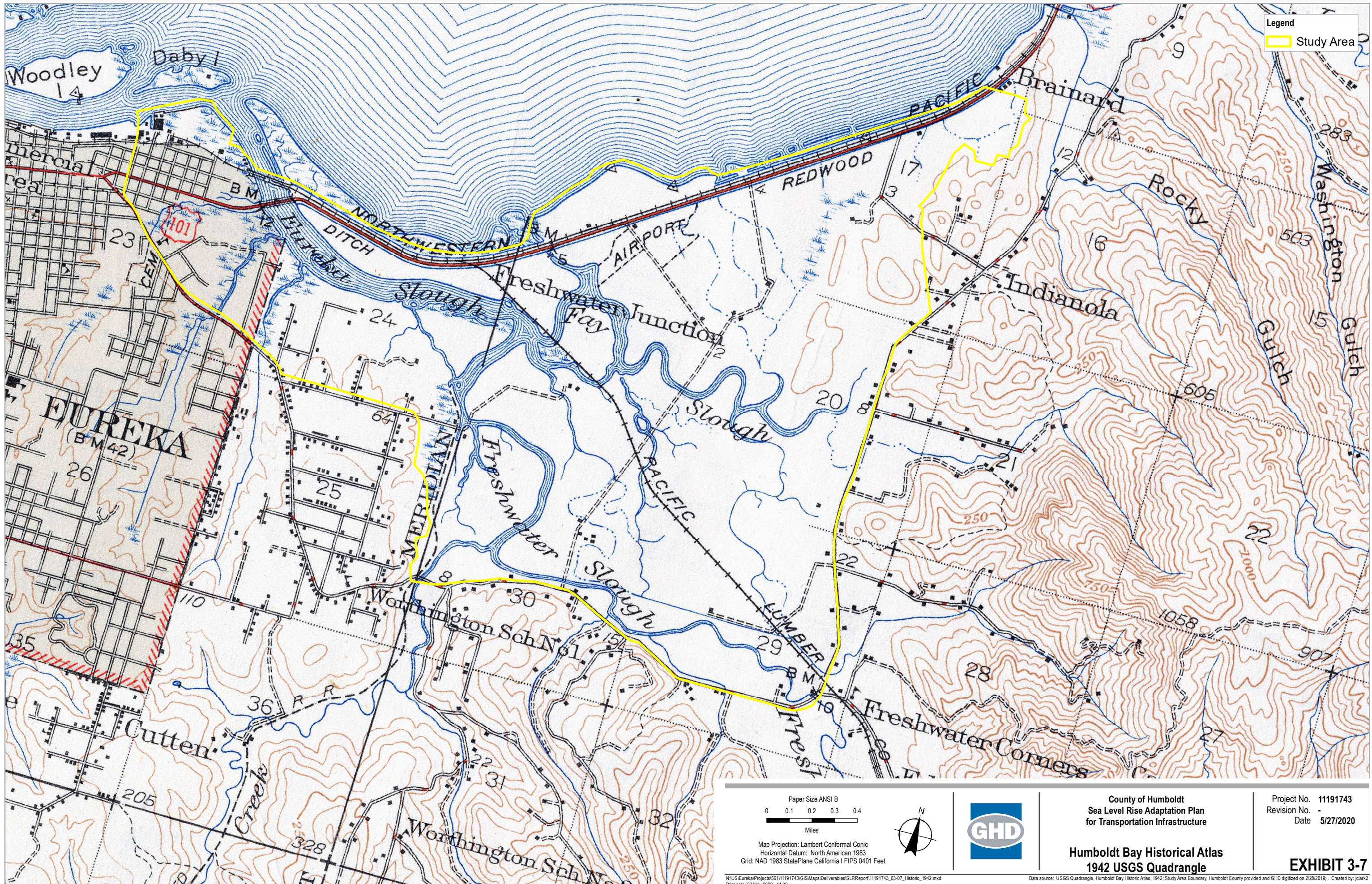


County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

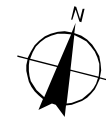
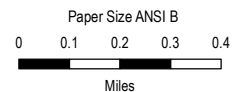
Project No. 11191743
 Revision No. -
 Date 5/27/2020

Humboldt Bay Historical Atlas
 1933 State of California

EXHIBIT 3-6



Legend
 Study Area



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

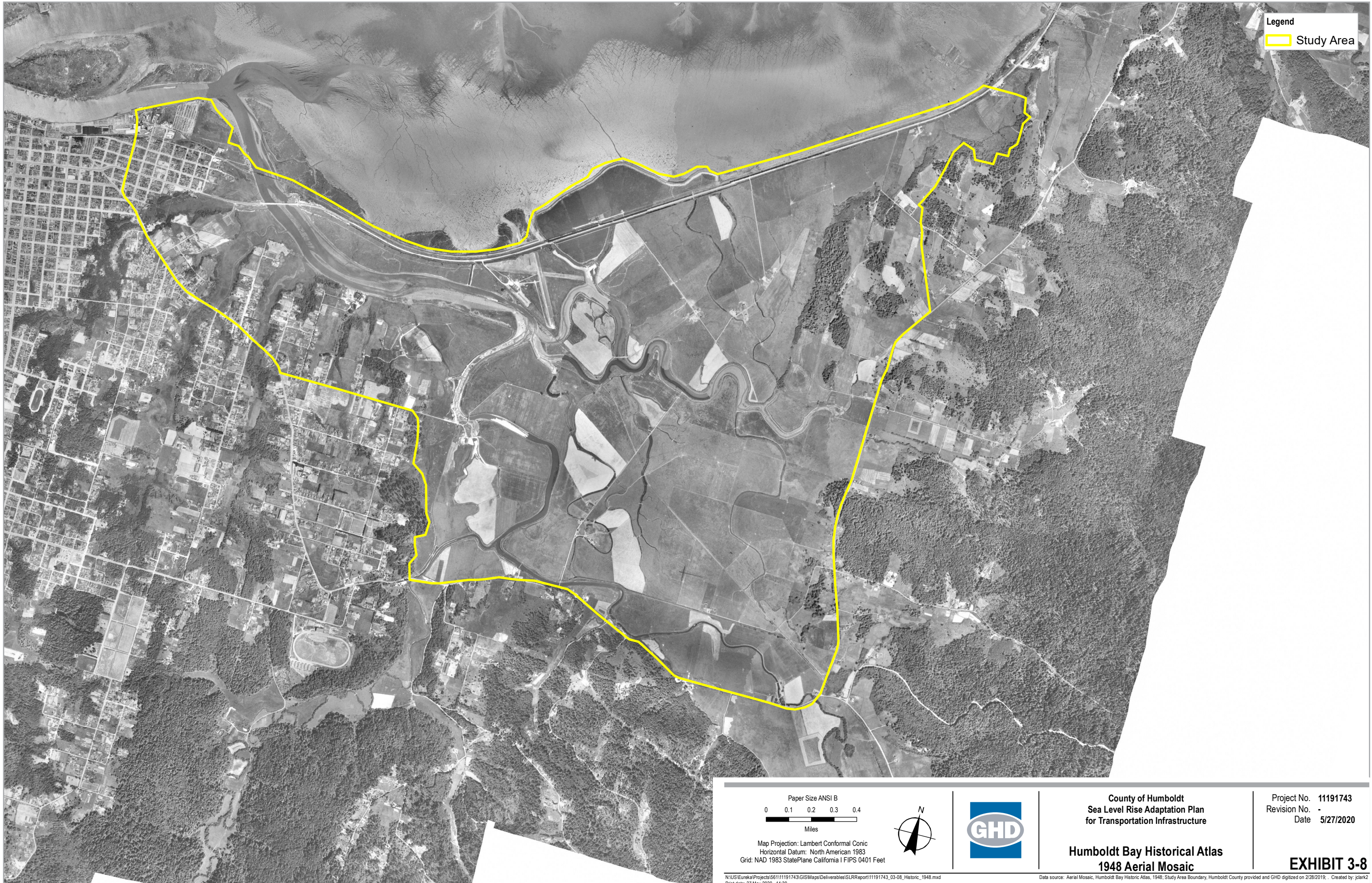


County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

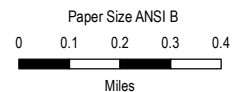
Project No. 11191743
 Revision No. -
 Date 5/27/2020

Humboldt Bay Historical Atlas
 1942 USGS Quadrangle

EXHIBIT 3-7



Legend
Study Area



Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet




County of Humboldt
Sea Level Rise Adaptation Plan
for Transportation Infrastructure

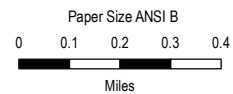
Humboldt Bay Historical Atlas
1948 Aerial Mosaic

Project No. 11191743
Revision No. -
Date 5/27/2020

EXHIBIT 3-8



Legend
 Study Area



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet




County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

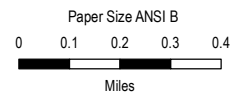
Humboldt Bay Historical Atlas
 1954 Aerial Mosaic

Project No. 11191743
 Revision No. -
 Date 5/27/2020

EXHIBIT 3-9



Legend
 Study Area



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

Humboldt Bay Historical Atlas
 1958 Aerial Mosaic

Project No. 11191743
 Revision No. -
 Date 5/27/2020

EXHIBIT 3-10




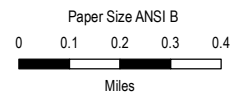
Legend
 Study Area

TABLE OF AREA
 1876

Square Miles of Area	9
Miles of Slope Line	24
Miles of Mainline	12
Miles of Creeks	4
Miles of Roads	7

TABLE OF AREA
 1876

Square Miles of Area	11
Miles of Slope Line	34
Miles of Mainline	18
Miles of Creeks	6
Miles of Roads	10



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

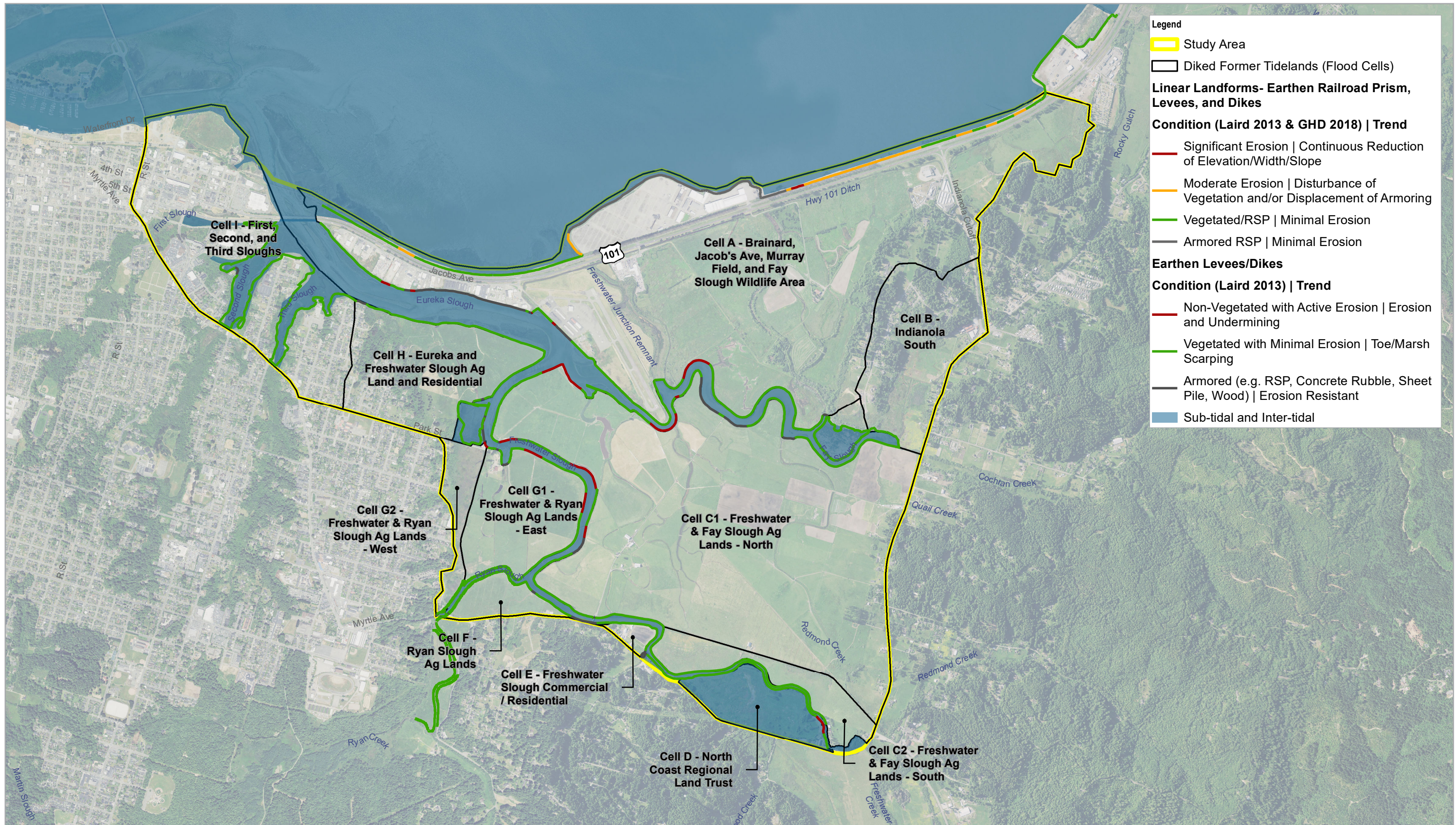
County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure
Humboldt Bay Historical Atlas
 1870 US Coast Survey
 2016 NAIP Imagery

Project No. 11191743
 Revision No. -
 Date 5/27/2020

EXHIBIT 3-11

N:\US\Eureka\Projects\66111191743\GIS\Maps\Deliverables\SLR\Report\11191743_03-11_Historic_1870_WithImagery.mxd
 Print date: 27 May 2020 - 14:47

Data source: US Coast Survey, Humboldt Bay Historic Atlas, 1870; Study Area Boundary, Humboldt County provided and GHD digitized on 2/28/2019; Created by: jclark2



Legend

- Study Area
- Diked Former Tidelands (Flood Cells)

Linear Landforms- Earthen Railroad Prism, Levees, and Dikes

Condition (Laird 2013 & GHD 2018) | Trend

- Significant Erosion | Continuous Reduction of Elevation/Width/Slope
- Moderate Erosion | Disturbance of Vegetation and/or Displacement of Armoring
- Vegetated/RSP | Minimal Erosion
- Armored RSP | Minimal Erosion

Earthen Levees/Dikes

Condition (Laird 2013) | Trend

- Non-Vegetated with Active Erosion | Erosion and Undermining
- Vegetated with Minimal Erosion | Toe/Marsh Scarping
- Armored (e.g. RSP, Concrete Rubble, Sheet Pile, Wood) | Erosion Resistant
- Sub-tidal and Inter-tidal

Paper Size ANSI B

Miles

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

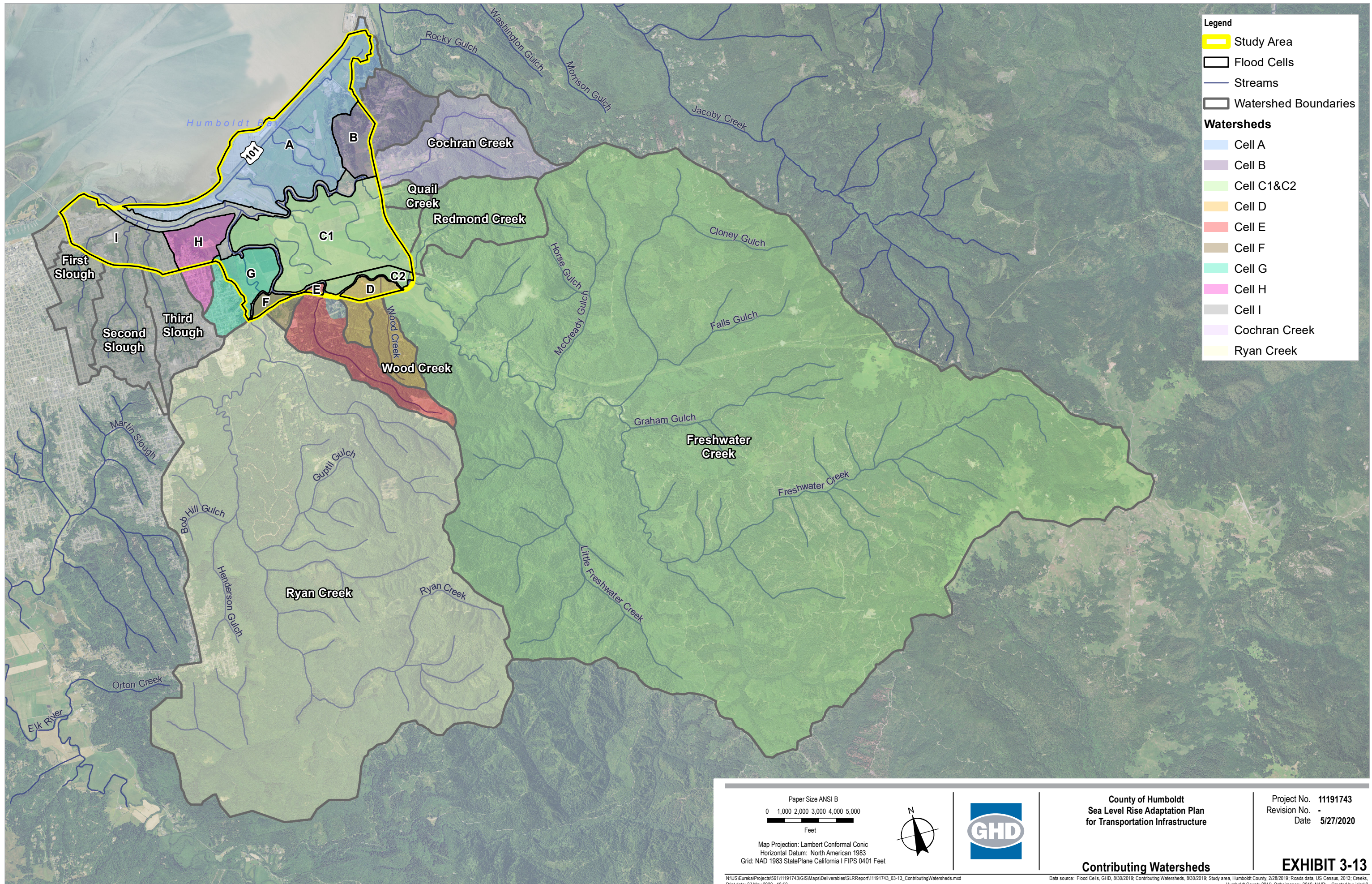
County of Humboldt
Sea Level Rise Adaptation Plan
for Transportation Infrastructure

Project No. 11191743
Revision No. -
Date 6/1/2020

Geomorphic Units

EXHIBIT 3-12

N:\US\Eureka\Projects\6611191743\GIS\Maps\Deliverables\SLR\Report\11191743_03-12_GeomorphicUnits_RevA.mxd Data source: Flood Cells, GHD, 9/04/2019; US Coast Survey, Humboldt Bay Historic Atlas, 1870; Study Area Boundary, Humboldt County provided and GHD digitized on 2/28/2019; Created by: jclark2 Print date: 01 Jun 2020 - 10:14



Legend

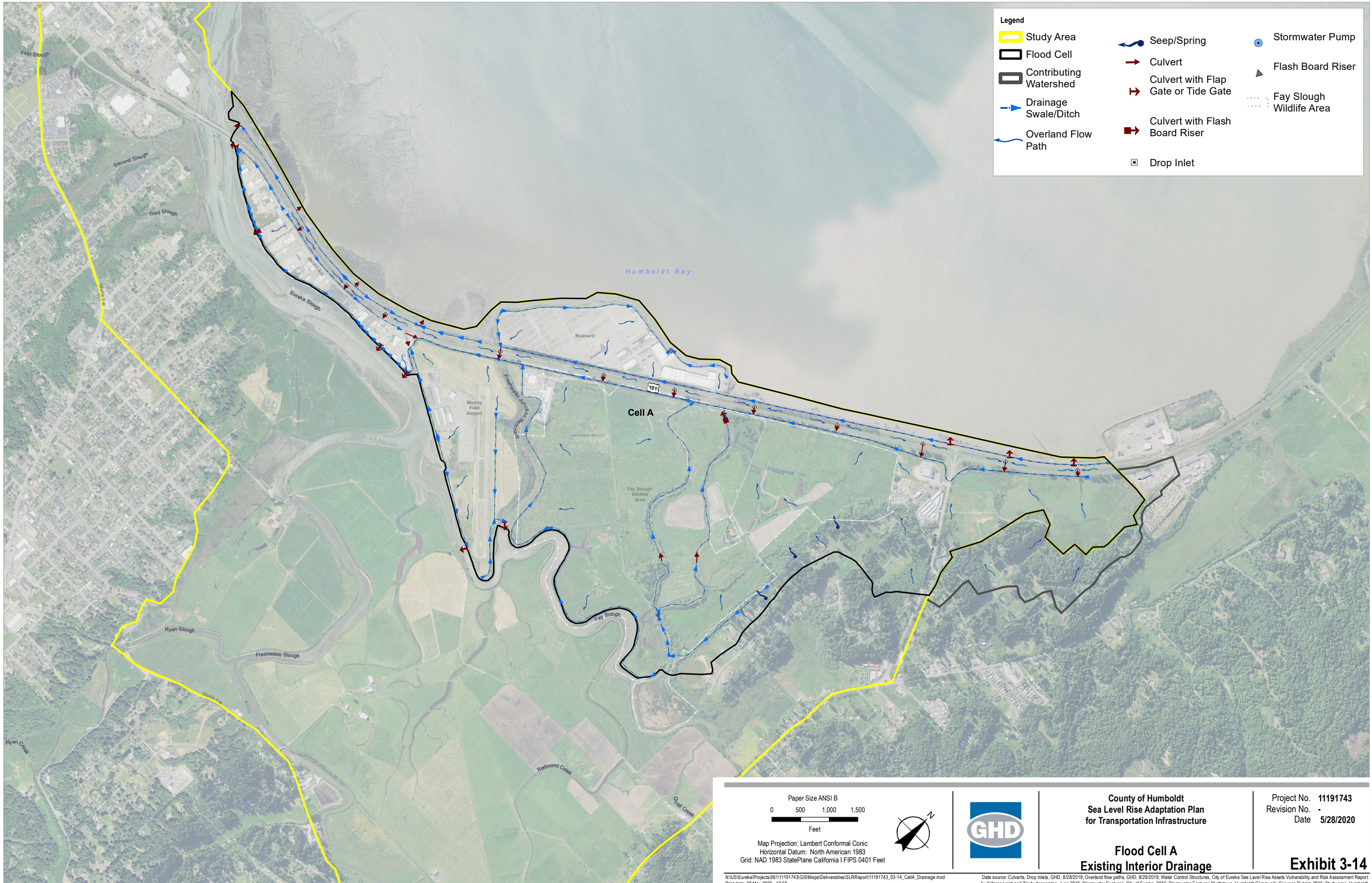
- Study Area
- Flood Cells
- Streams
- Watershed Boundaries

Watersheds

- Cell A
- Cell B
- Cell C1&C2
- Cell D
- Cell E
- Cell F
- Cell G
- Cell H
- Cell I
- Cochran Creek
- Ryan Creek

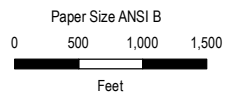
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<p>Contributing Watersheds</p>			<p>EXHIBIT 3-13</p>	

N:\US\Eureka\Projects\6611191743\GIS\Maps\Deliverables\SLR\Report\11191743_03-13_ContributingWatersheds.mxd Print date: 27 May 2020 - 16:50 Data source: Flood Cells, GHD, 8/30/2019; Contributing Watersheds, 8/30/2019; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIP: - Created by: jclark2



Legend

Study Area	Seep/Spring	Stormwater Pump
Flood Cell	Culvert	Flash Board Riser
Contributing Watershed	Culvert with Flap Gate or Tide Gate	Fay Slough Wildlife Area
Drainage Swale/Ditch	Culvert with Flash Board Riser	
Overland Flow Path	Drop Inlet	



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



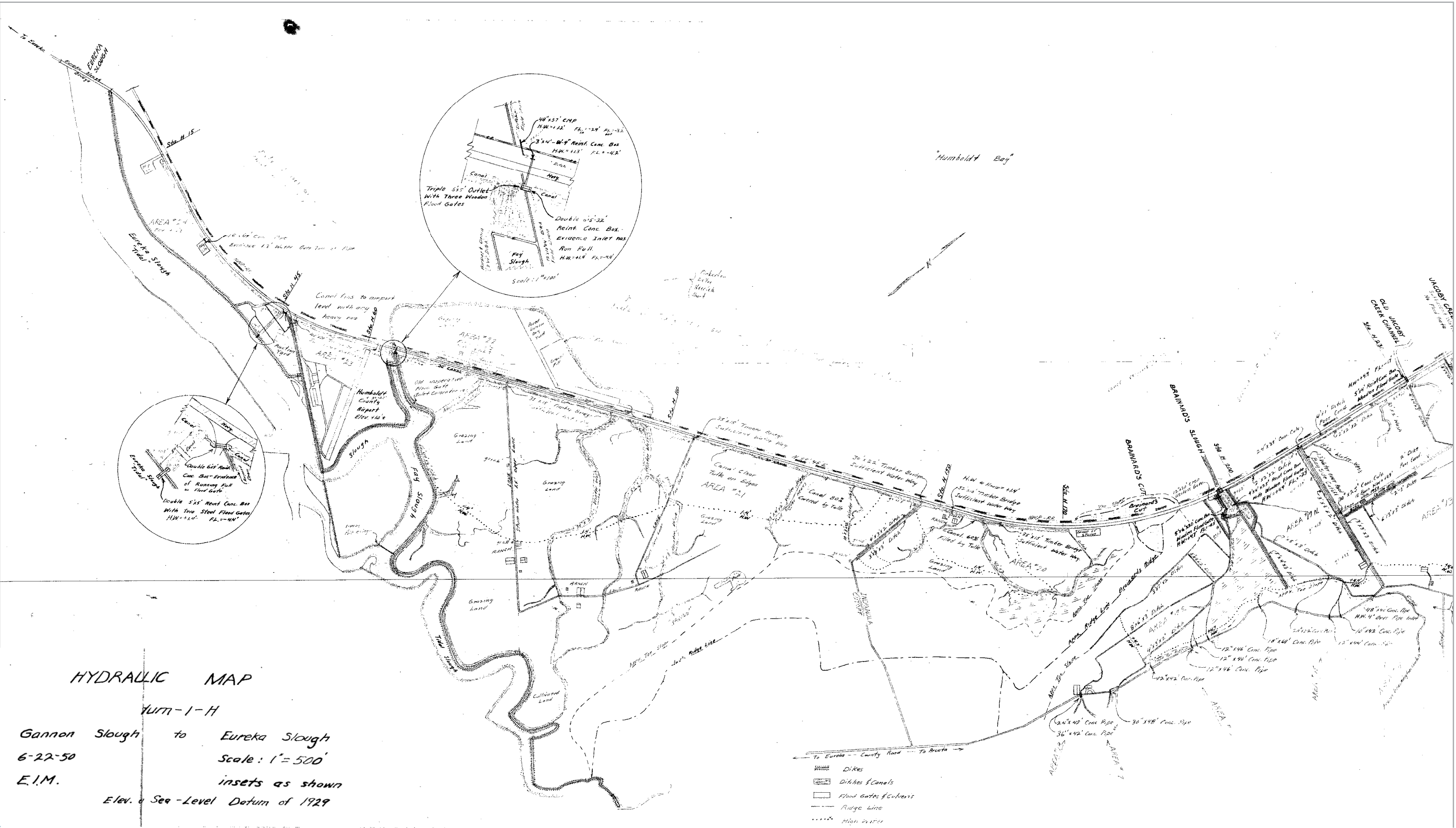
County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

Project No. 11191743
 Revision No. -
 Date 5/28/2020

Flood Cell A
Existing Interior Drainage

Exhibit 3-14

NIUS\Eureka\Projects\66111191743\GIS\Maps\Deliverables\SLRReport\11191743_03-14_CellA_Drainage.mxd
 Print date: 28 May 2020 - 17:58
 Data source: Culverts, Drop Inlets, GHD, 8/28/2019; Overland flow paths, GHD, 8/29/2019; Water Control Structures, City of Eureka Sea Level Rise Assets Vulnerability and Risk Assessment Report by Aldaron Laird and Trinity Associates, June 2016; Stormwater Features, City of Eureka, 2016; Stormwater Features Myrtlelawn, Humboldt Community Services District, 2015; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIP. Created by: jclark2



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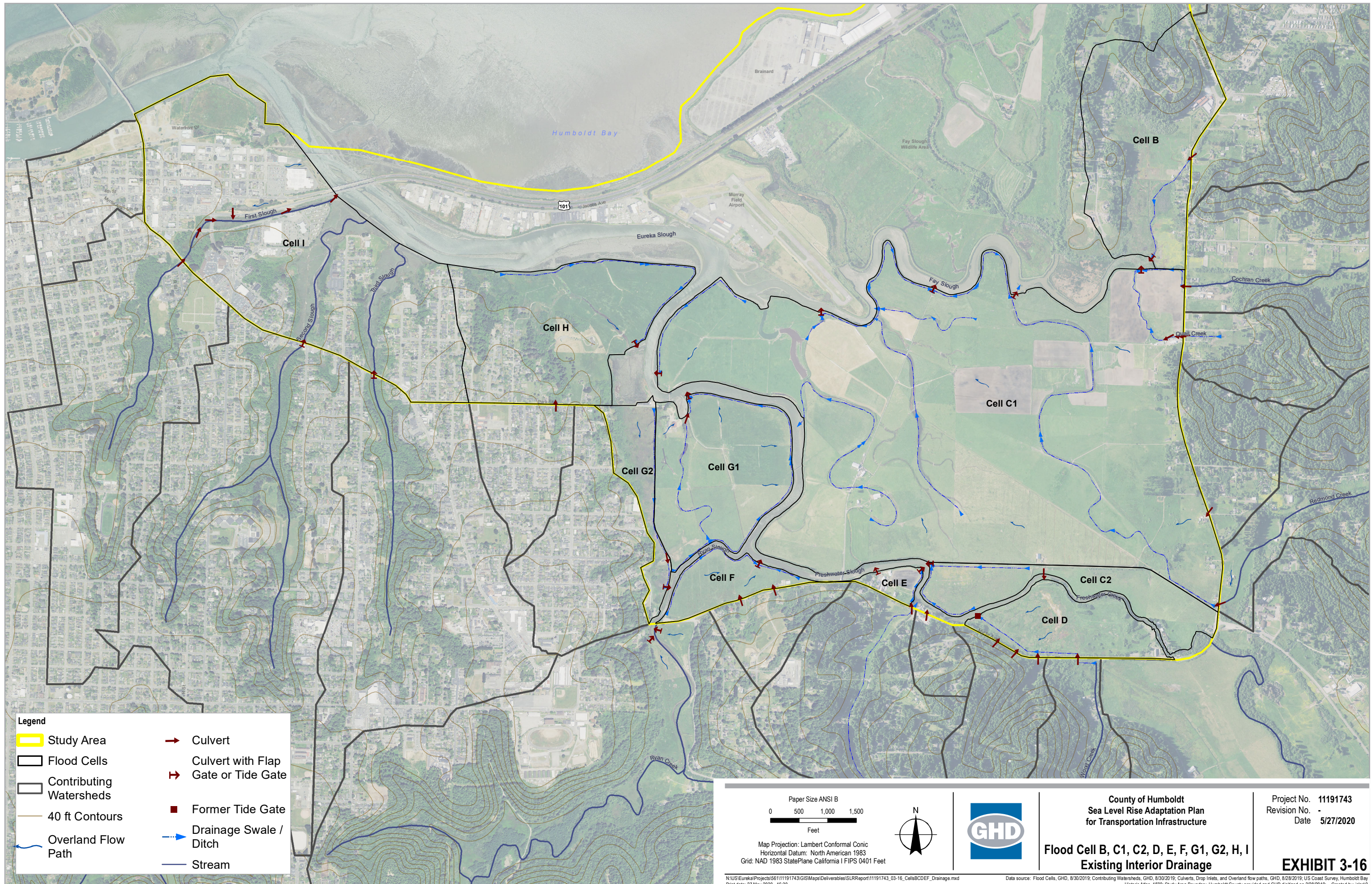


County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

CalTrans Hydraulic Map
 June 22, 1950

Project No. 11191743
 Revision No. -
 Date 5/27/2020

EXHIBIT 3-15



- Legend**
- Study Area
 - Flood Cells
 - Contributing Watersheds
 - 40 ft Contours
 - Overland Flow Path
 - Culvert
 - Culvert with Flap Gate or Tide Gate
 - Former Tide Gate
 - Drainage Swale / Ditch
 - Stream

Paper Size ANSI B
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Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



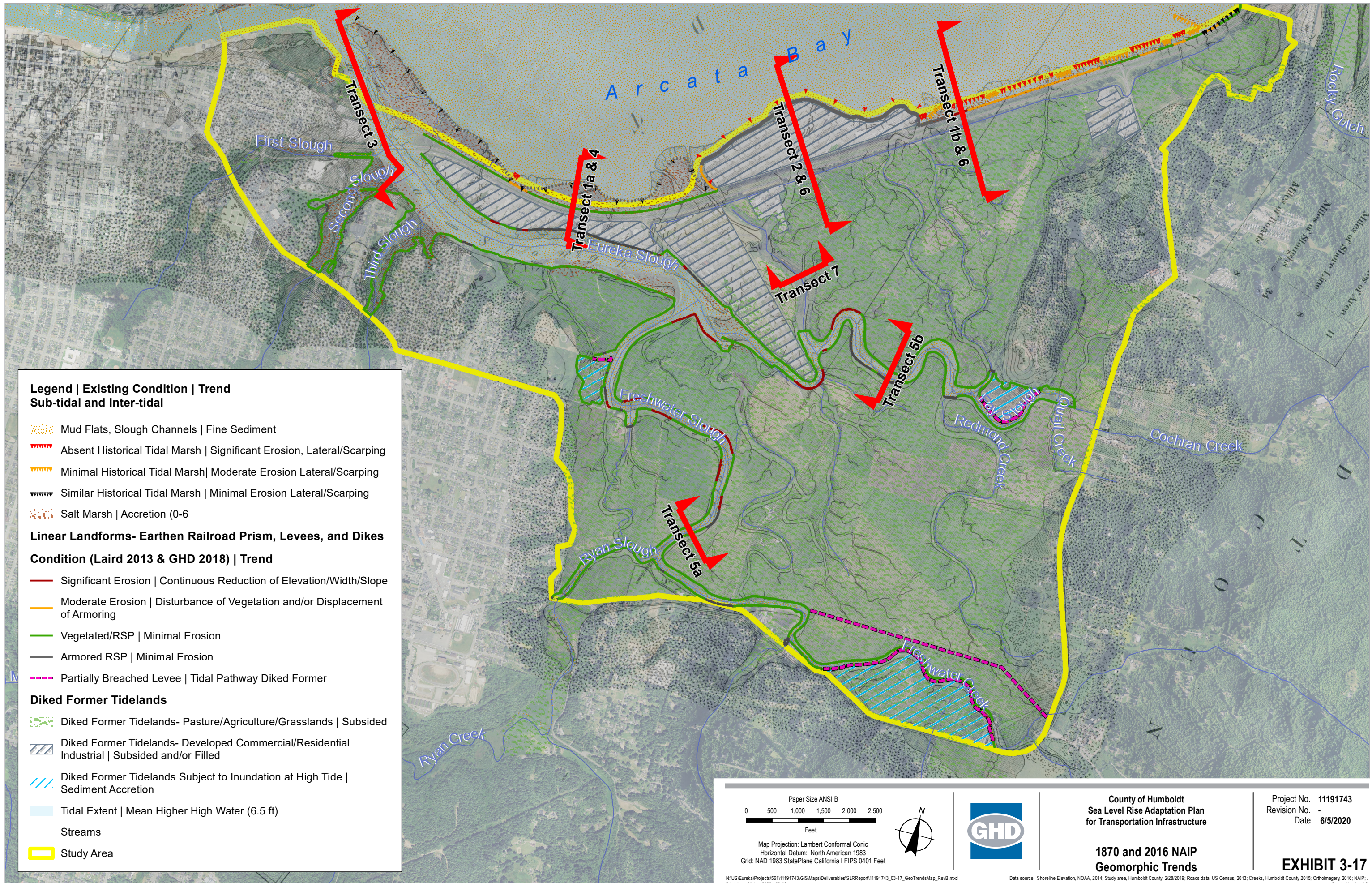
County of Humboldt
Sea Level Rise Adaptation Plan
for Transportation Infrastructure

Flood Cell B, C1, C2, D, E, F, G1, G2, H, I
Existing Interior Drainage

Project No. 11191743
 Revision No. -
 Date 5/27/2020

EXHIBIT 3-16

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Legend | Existing Condition | Trend
Sub-tidal and Inter-tidal

- Mud Flats, Slough Channels | Fine Sediment
- Absent Historical Tidal Marsh | Significant Erosion, Lateral/Scarping
- Minimal Historical Tidal Marsh | Moderate Erosion Lateral/Scarping
- Similar Historical Tidal Marsh | Minimal Erosion Lateral/Scarping
- Salt Marsh | Accretion (0-6)

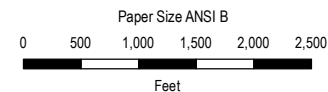
Linear Landforms- Earthen Railroad Prism, Levees, and Dikes

Condition (Laird 2013 & GHD 2018) | Trend

- Significant Erosion | Continuous Reduction of Elevation/Width/Slope
- Moderate Erosion | Disturbance of Vegetation and/or Displacement of Armoring
- Vegetated/RSP | Minimal Erosion
- Armored RSP | Minimal Erosion
- Partially Breached Levee | Tidal Pathway Diked Former

Diked Former Tidelands

- Diked Former Tidelands- Pasture/Agriculture/Grasslands | Subsided
- Diked Former Tidelands- Developed Commercial/Residential Industrial | Subsided and/or Filled
- Diked Former Tidelands Subject to Inundation at High Tide | Sediment Accretion
- Tidal Extent | Mean Higher High Water (6.5 ft)
- Streams
- Study Area



Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
 Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



County of Humboldt
 Sea Level Rise Adaptation Plan
 for Transportation Infrastructure

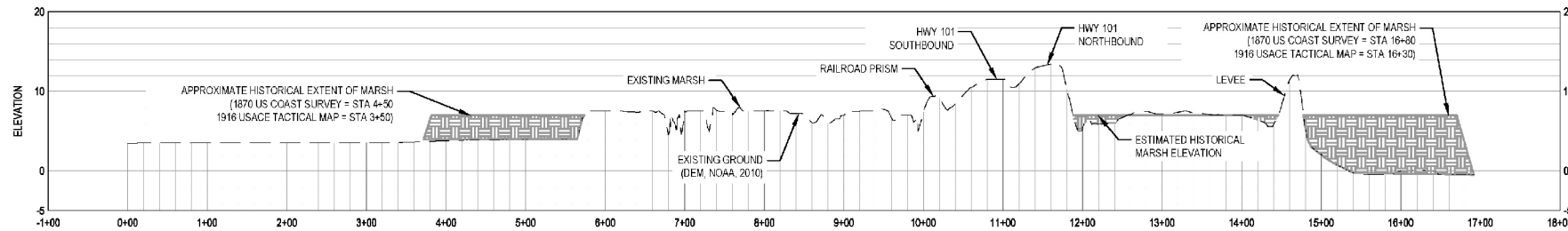
Project No. 11191743
 Revision No. -
 Date 6/5/2020

**1870 and 2016 NAIP
 Geomorphic Trends**

EXHIBIT 3-17

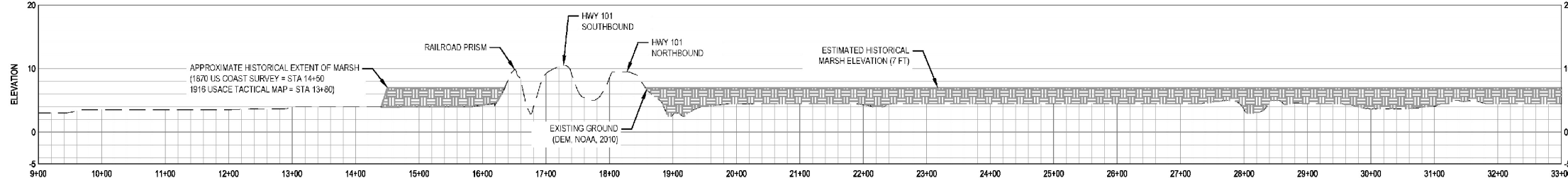
1. Bayshore Typical (Bay->Marginal Flats / Marsh-> Railway->Lowlands->Highway 101->Backshore), Developed Backshore

1a. Marsh > 30' Width, Armored Backshore



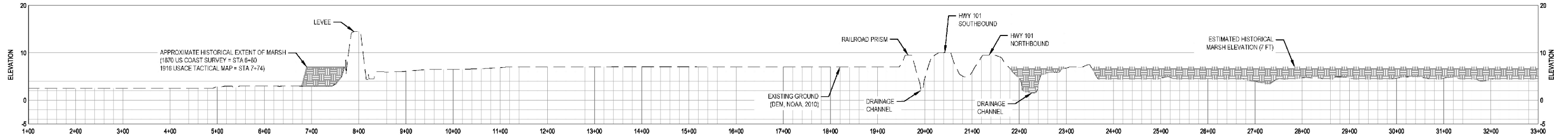
4. Eureka Slough Channel Typical (Tidal Slough-> Flats / Marsh->Informal Levee-> Backshore at Jacobs Avenue)

1b. Marsh < 30' Width, Armored Backshore



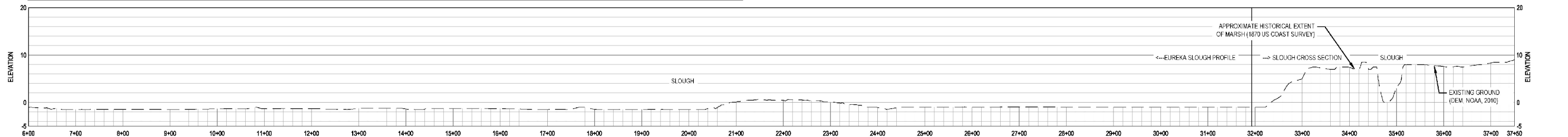
6. Managed Channel Typical- Landside of Highway 101

2. Bayshore Buffered with Development (i.e Brainard)

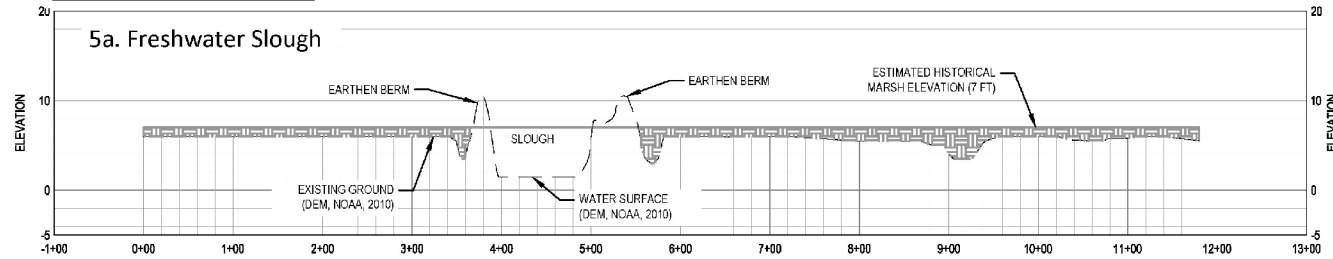


6. Managed Channel Typical- Landside of Highway 101

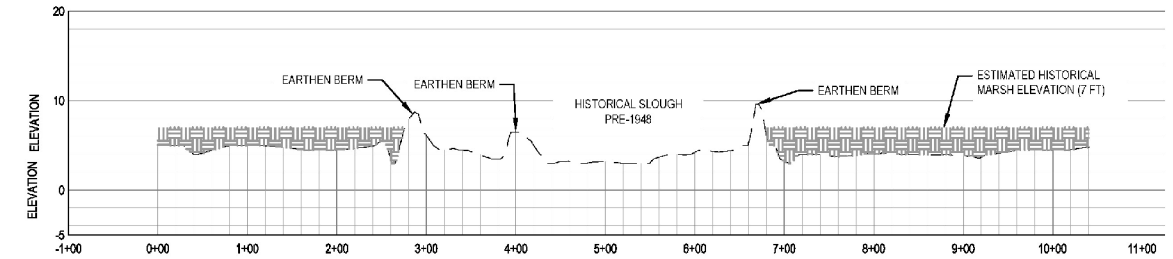
3. Eureka Slough Mouth (Centered at Slough Channel and Bending to Neighborhood Between Second Slough and Third Slough)



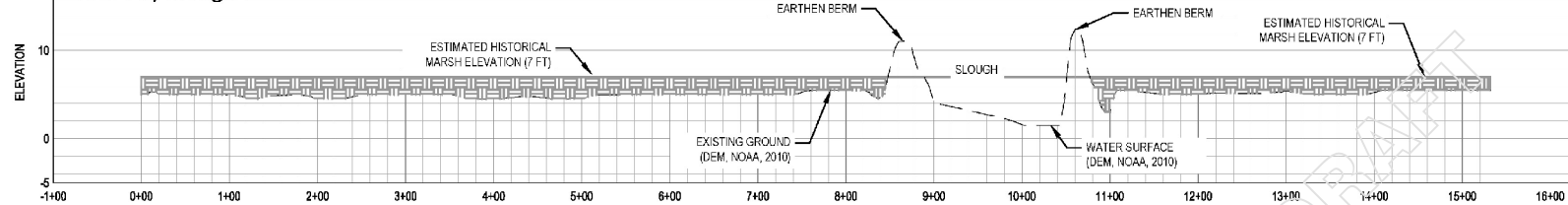
5. Creek Channel Typical



7. Managed Channel (Historical Slough, Near Airport)



5b. Fay Slough

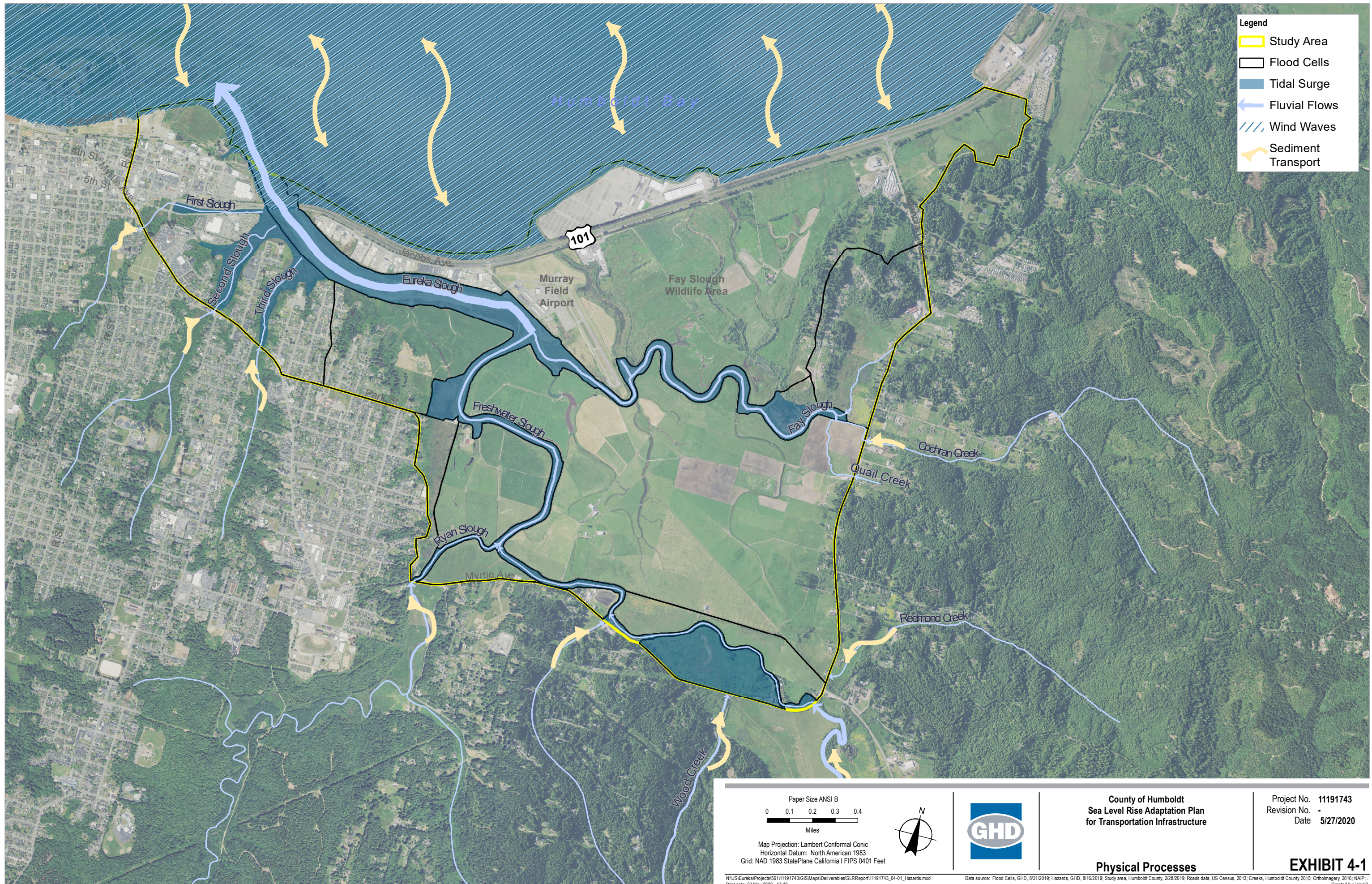


County of Humboldt
Sea Level Rise Adaptation Plan
for Transportation Infrastructure

Project No. 11191743
Revision No. -
Date 5/27/2020

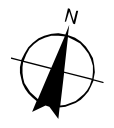
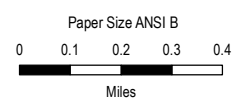
1870 and Current Topography
Geomorphic Trend Transects

EXHIBIT 3-18



Legend

- Study Area
- Flood Cells
- Tidal Surge
- Fluvial Flows
- Wind Waves
- Sediment Transport



County of Humboldt
Sea Level Rise Adaptation Plan
for Transportation Infrastructure

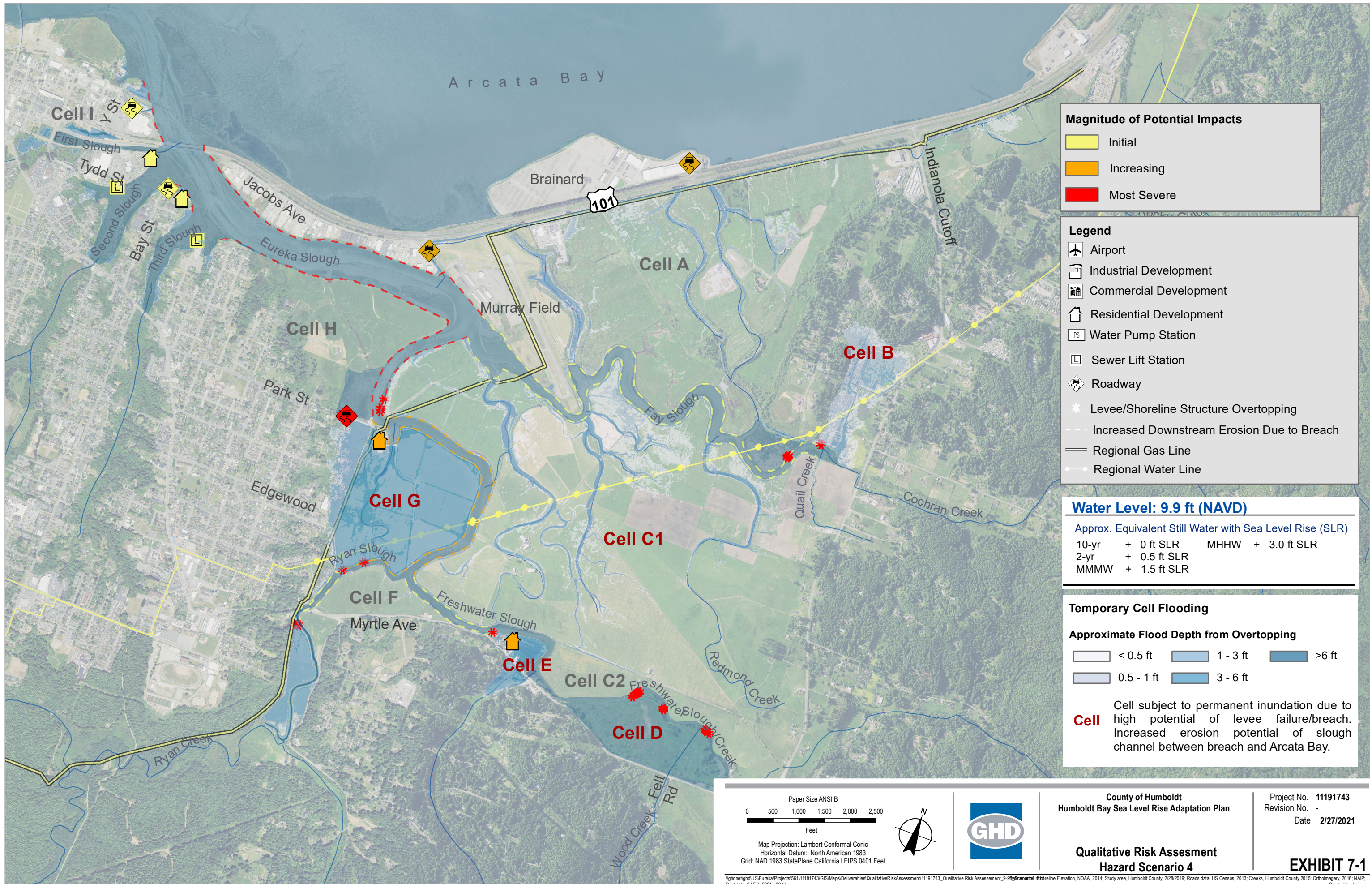
Project No. 11191743
Revision No. -
Date 5/27/2020

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

Physical Processes

EXHIBIT 4-1

N:\US\Eureka\Projects\66111191743\GIS\Maps\Deliverables\SLRReport\11191743_04-01_Hazards.mxd Print date: 27 May 2020 - 17:40 Data source: Flood Cells, GHD, 8/21/2019; Hazards, GHD, 8/16/2019; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIP; Created by: jclark2



Magnitude of Potential Impacts

- Initial
- Increasing
- Most Severe

Legend

- Airport
- Industrial Development
- Commercial Development
- Residential Development
- Water Pump Station
- Sewer Lift Station
- Roadway
- Levee/Shoreline Structure Overtopping
- Increased Downstream Erosion Due to Breach
- Regional Gas Line
- Regional Water Line

Water Level: 9.9 ft (NAVD)

Approx. Equivalent Still Water with Sea Level Rise (SLR)

10-yr	+ 0 ft SLR	MHHW	+ 3.0 ft SLR
2-yr	+ 0.5 ft SLR		
MMMW	+ 1.5 ft SLR		

Temporary Cell Flooding

Approximate Flood Depth from Overtopping

	< 0.5 ft		1 - 3 ft		>6 ft
	0.5 - 1 ft		3 - 6 ft		

Cell Cell subject to permanent inundation due to high potential of levee failure/breach. Increased erosion potential of slough channel between breach and Arcata Bay.

Paper Size ANSI B

0 500 1,000 1,500 2,000 2,500
Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

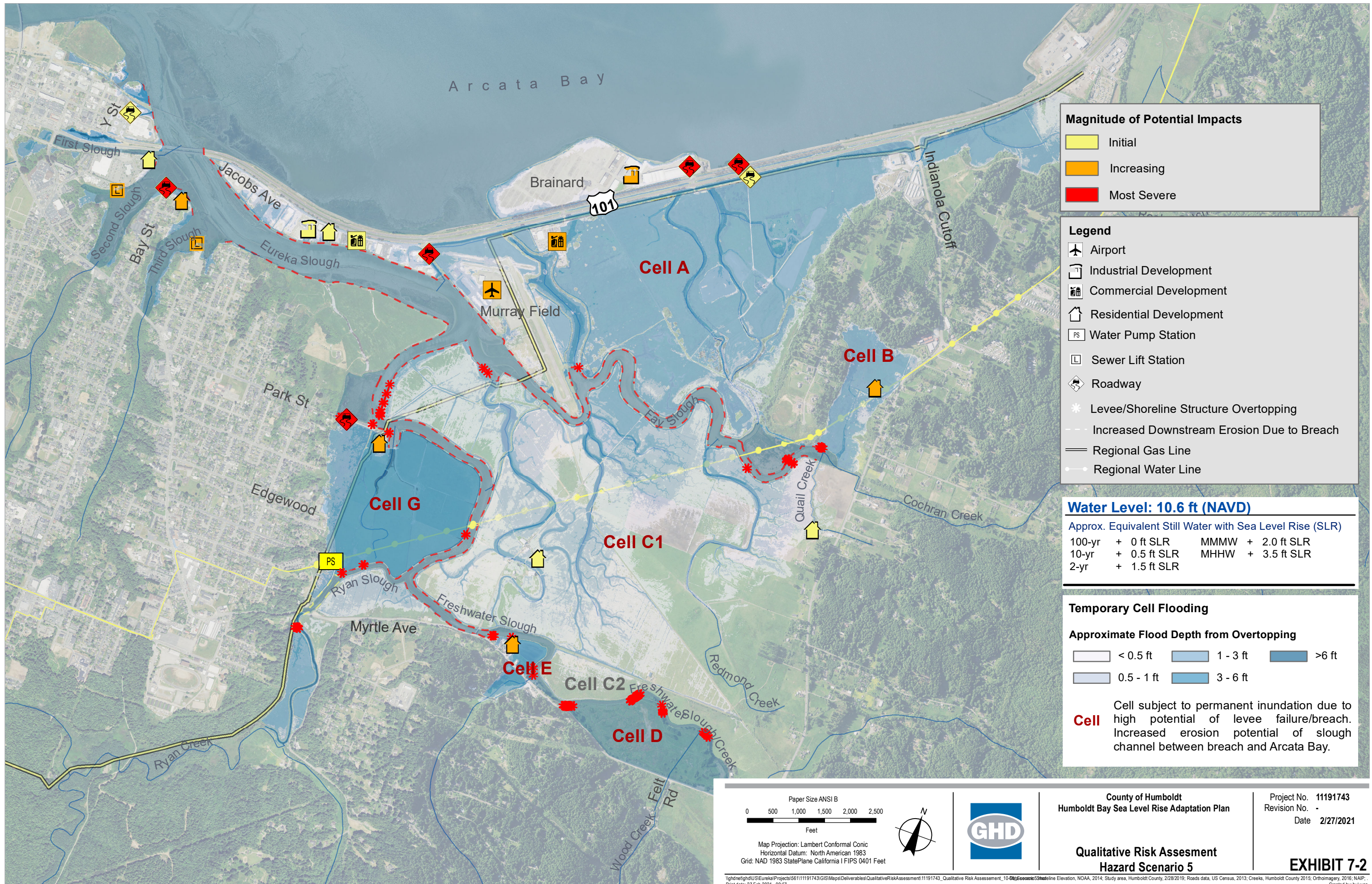
County of Humboldt
Humboldt Bay Sea Level Rise Adaptation Plan

**Qualitative Risk Assessment
Hazard Scenario 4**

Project No. 11191743
Revision No. -
Date 2/27/2021

EXHIBIT 7-1

\\ghdnet\ghd\US\Eureka\Projects\56111191743\GIS\Map\Deliverables\QualitativeRiskAssessment\11191743_Qualitative Risk Assessment_9-90-2020.aprx; Shoreline Elevation, NOAA, 2014; Study area, Humboldt County, 2/28/2019; Roads data, US Census, 2013; Creeks, Humboldt County 2015; Orthoimagery, 2016; NAIP; -
Print date: 27 Feb 2021 - 09:54



Magnitude of Potential Impacts

- Initial
- Increasing
- Most Severe

Legend

- Airport
- Industrial Development
- Commercial Development
- Residential Development
- Water Pump Station
- Sewer Lift Station
- Roadway
- Levee/Shoreline Structure Overtopping
- Increased Downstream Erosion Due to Breach
- Regional Gas Line
- Regional Water Line

Water Level: 10.6 ft (NAVD)

Approx. Equivalent Still Water with Sea Level Rise (SLR)

100-yr	+ 0 ft SLR	MMMW	+ 2.0 ft SLR
10-yr	+ 0.5 ft SLR	MHHW	+ 3.5 ft SLR
2-yr	+ 1.5 ft SLR		

Temporary Cell Flooding

Approximate Flood Depth from Overtopping

	< 0.5 ft		1 - 3 ft		>6 ft
	0.5 - 1 ft		3 - 6 ft		

Cell Cell subject to permanent inundation due to high potential of levee failure/breach. Increased erosion potential of slough channel between breach and Arcata Bay.

Paper Size ANSI B

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Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

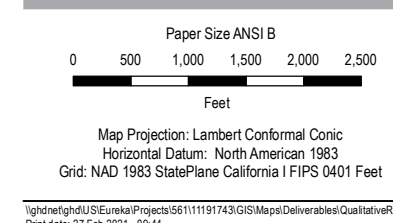
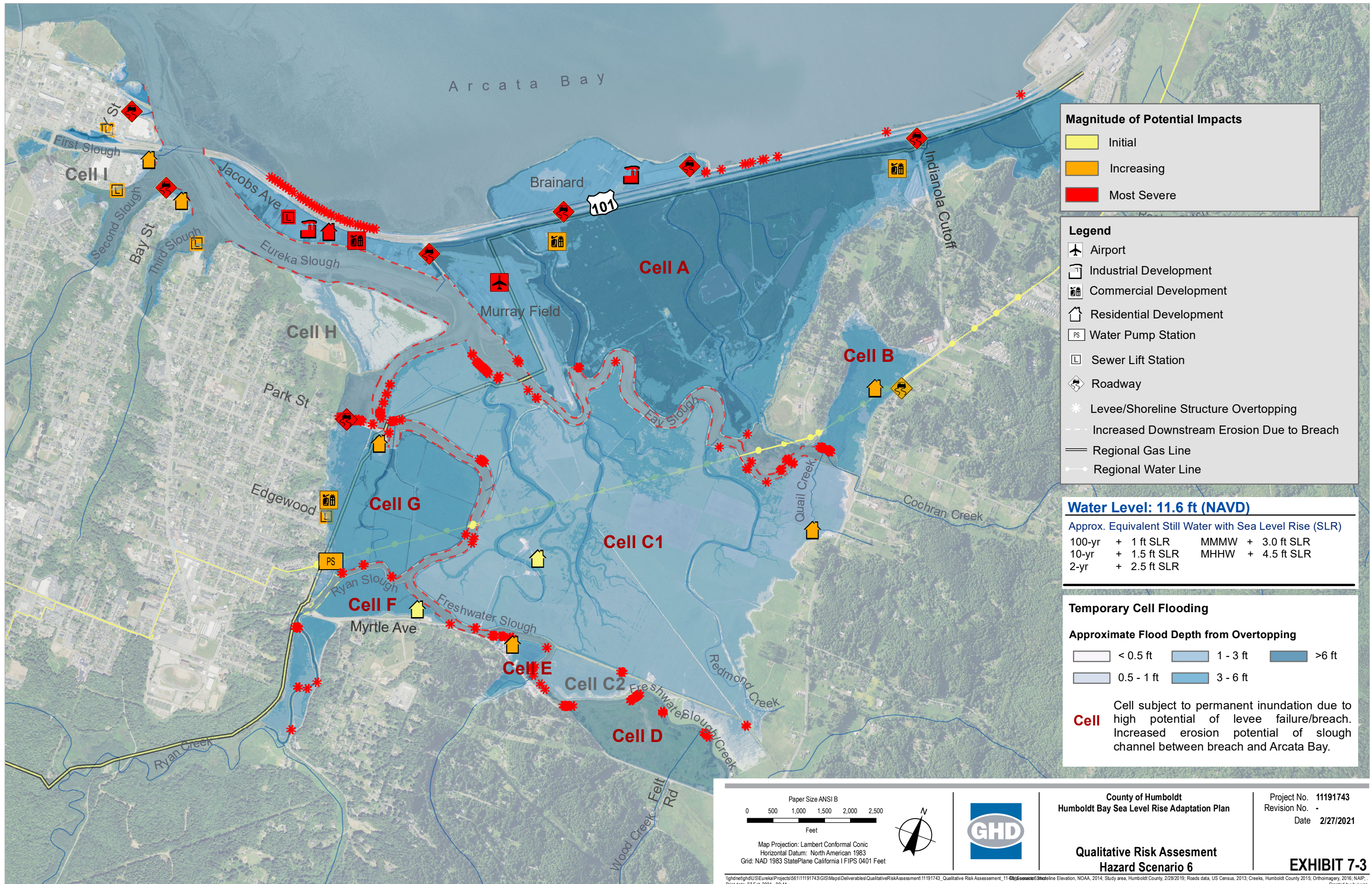
County of Humboldt
Humboldt Bay Sea Level Rise Adaptation Plan

**Qualitative Risk Assessment
Hazard Scenario 5**

Project No. 11191743
Revision No. -
Date 2/27/2021

EXHIBIT 7-2

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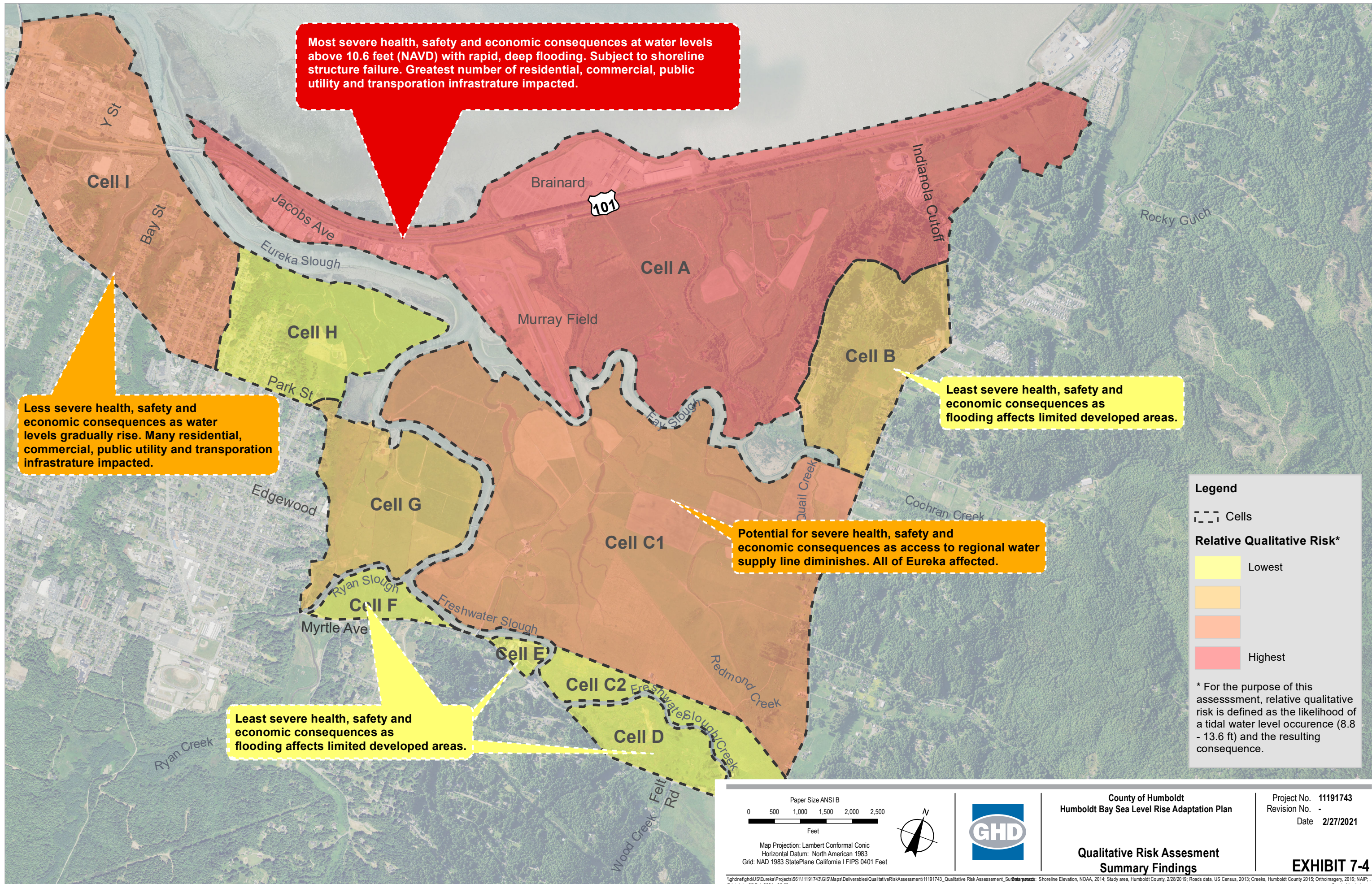
County of Humboldt
Humboldt Bay Sea Level Rise Adaptation Plan

Project No. 11191743
Revision No. -
Date 2/27/2021

**Qualitative Risk Assessment
Hazard Scenario 6**

EXHIBIT 7-3

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Print date: 27 Feb 2021 - 09:44
Created by: bviyan



Most severe health, safety and economic consequences at water levels above 10.6 feet (NAVD) with rapid, deep flooding. Subject to shoreline structure failure. Greatest number of residential, commercial, public utility and transportation infrastructure impacted.

Less severe health, safety and economic consequences as water levels gradually rise. Many residential, commercial, public utility and transportation infrastructure impacted.

Least severe health, safety and economic consequences as flooding affects limited developed areas.

Potential for severe health, safety and economic consequences as access to regional water supply line diminishes. All of Eureka affected.

Least severe health, safety and economic consequences as flooding affects limited developed areas.

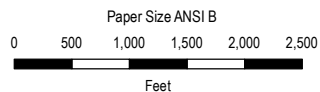
Legend

--- Cells

Relative Qualitative Risk*

- Lowest
- Medium
- Highest

* For the purpose of this assessment, relative qualitative risk is defined as the likelihood of a tidal water level occurrence (8.8 - 13.6 ft) and the resulting consequence.



Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



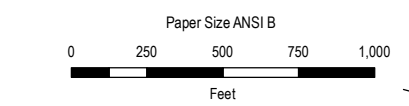
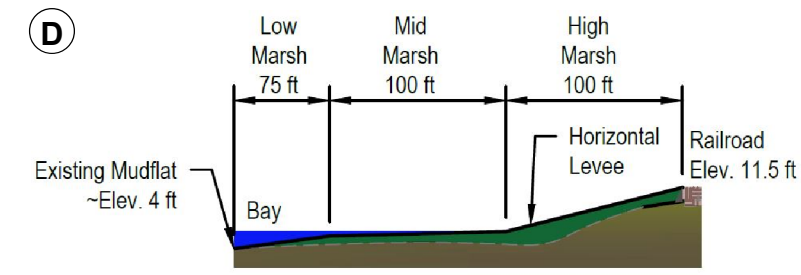
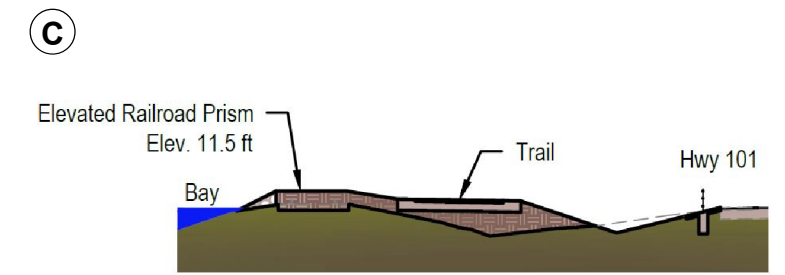
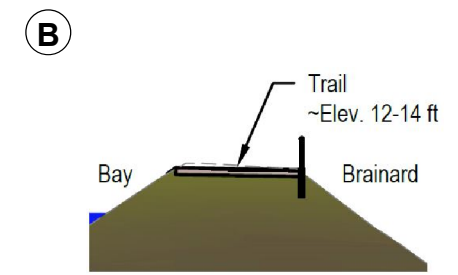
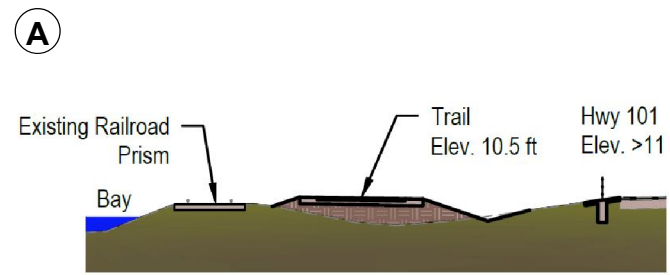
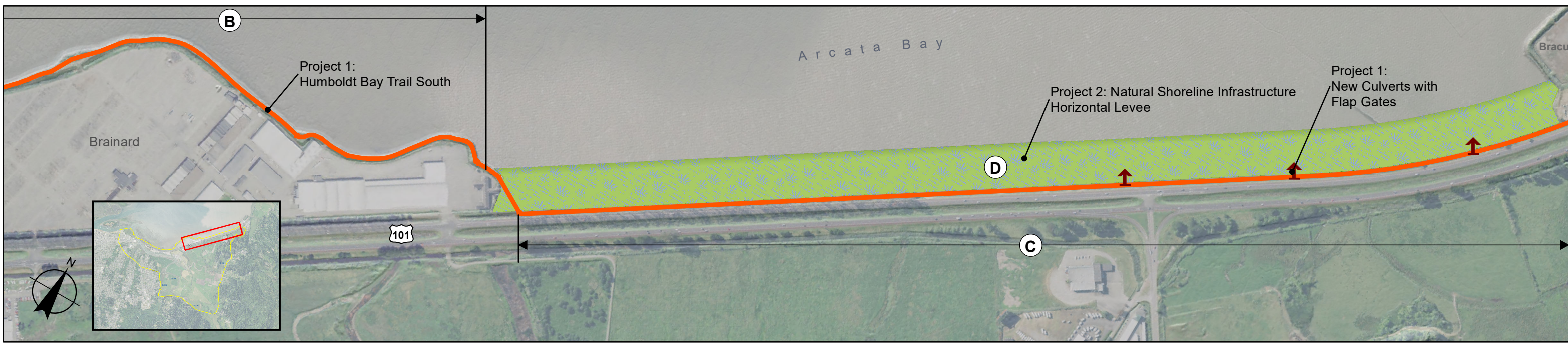
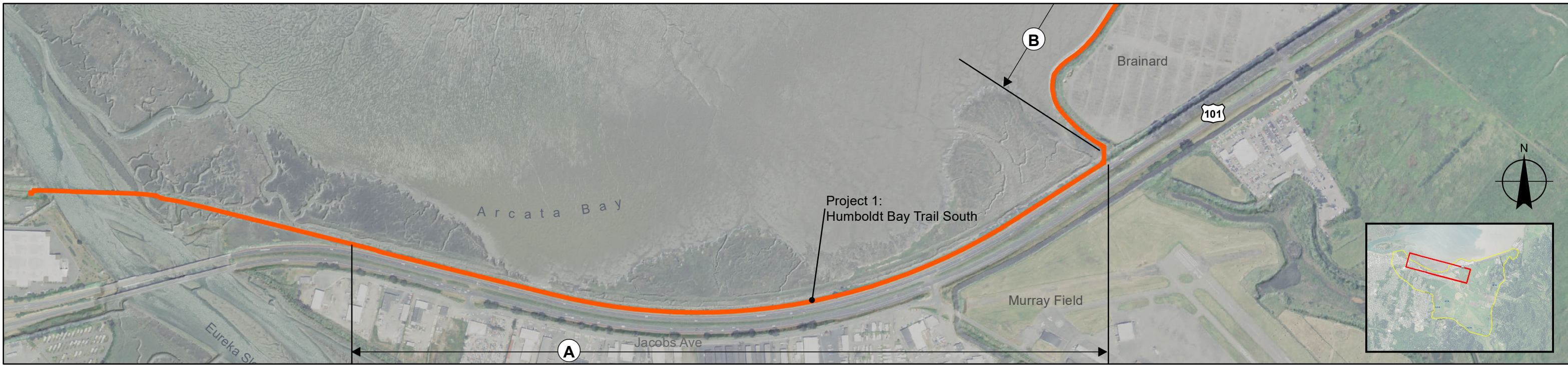
County of Humboldt
Humboldt Bay Sea Level Rise Adaptation Plan

Project No. 11191743
Revision No. -
Date 2/27/2021

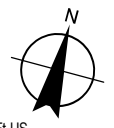
Qualitative Risk Assessment
Summary Findings

EXHIBIT 7-4

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Map Projection: Lambert Conformal Conic
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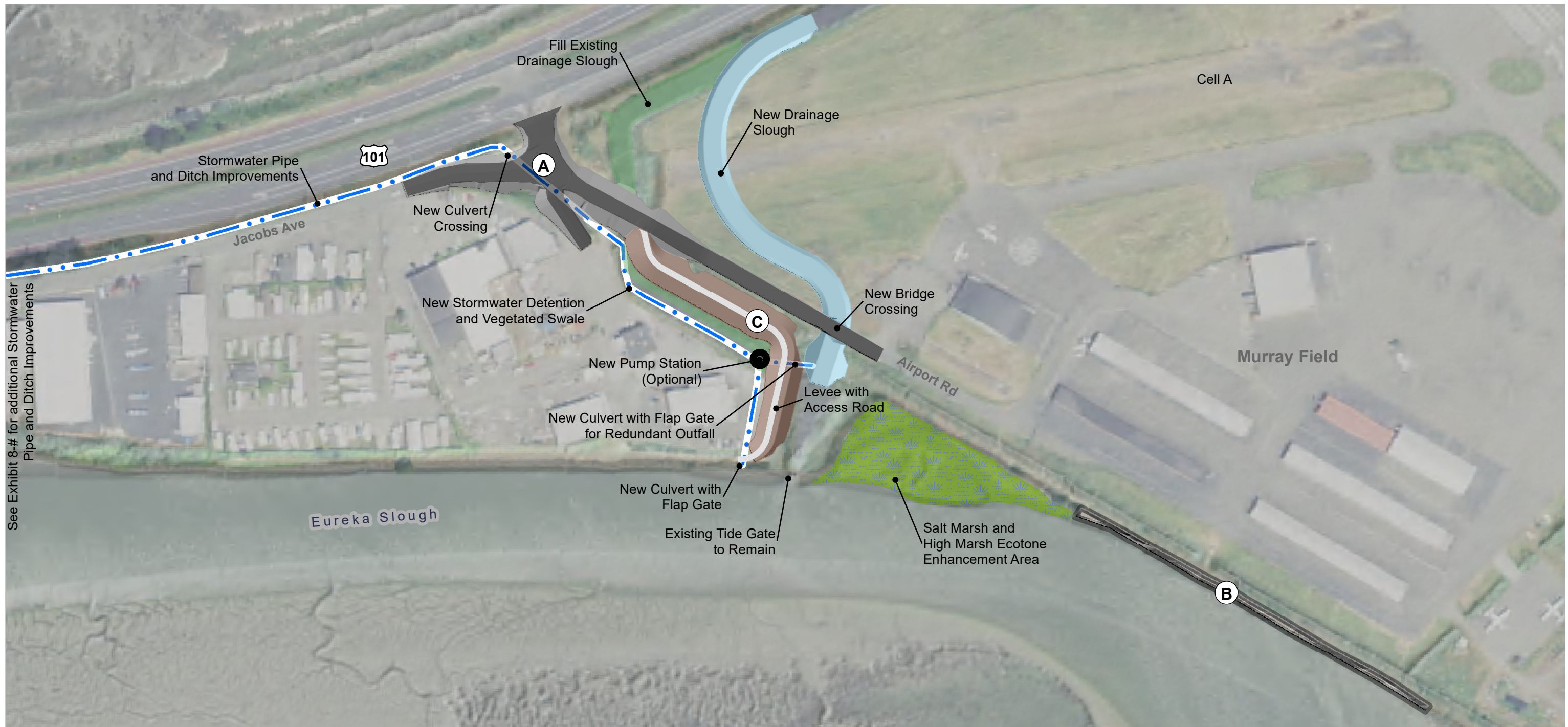
County of Humboldt
Humboldt Bay Sea Level Rise Adaptation Plan

Project 1: Humboldt Bay Trail South
Project 2: Natural Shoreline Infrastructure

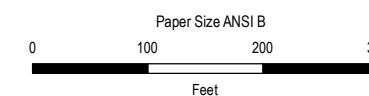
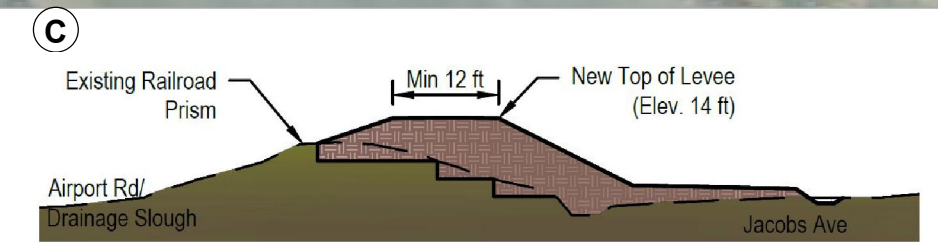
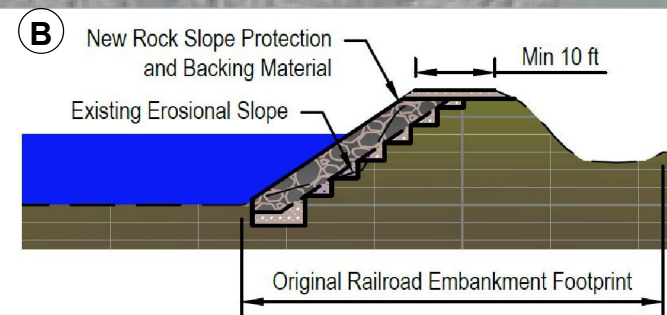
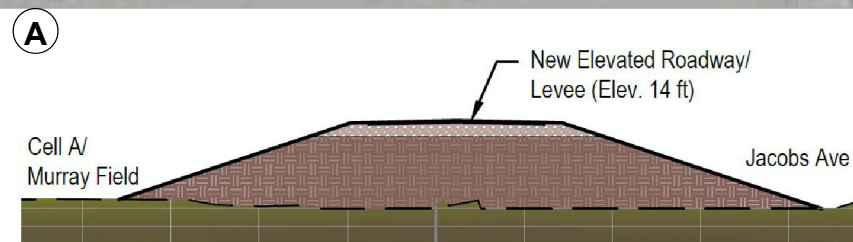
Project No. 11191743
Revision No. -
Date 2/28/2021

EXHIBIT 8-1

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Created by: bviuyan



See Exhibit 8-# for additional Stormwater Pipe and Ditch Improvements



Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



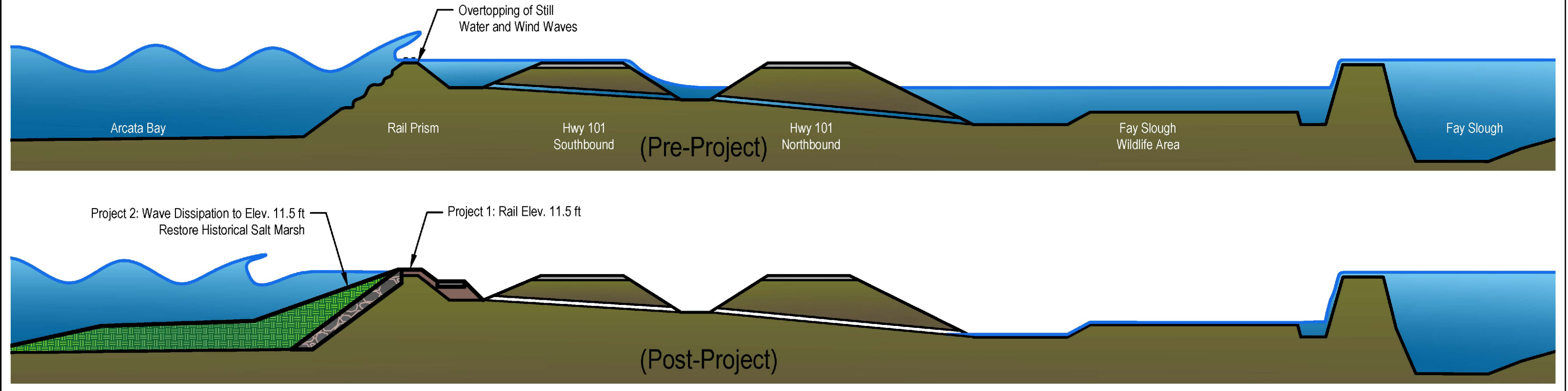
County of Humboldt
Humboldt Bay Sea Level Rise Adaptation Plan

Project No. 11191743
Revision No. -
Date 2/28/2021

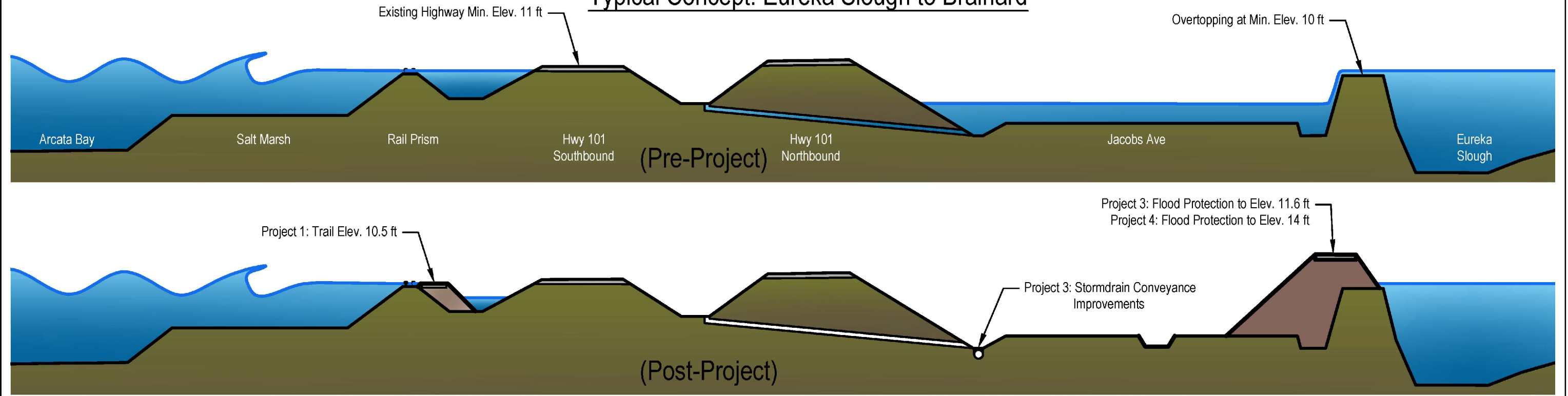
Project 3:
Jacobs Avenue Flood Resiliency

EXHIBIT 8-2

Typical Concept: Brainard to Bracut



Typical Concept: Eureka Slough to Brainard



Paper Size ANSI B

Not to Scale

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet



County of Humboldt
Humboldt Bay Sea Level Rise Adaptation Plan

Project No. 11191743
Revision No. -
Date 3/3/2021

Summary of Project Benefits

EXHIBIT 8-4