



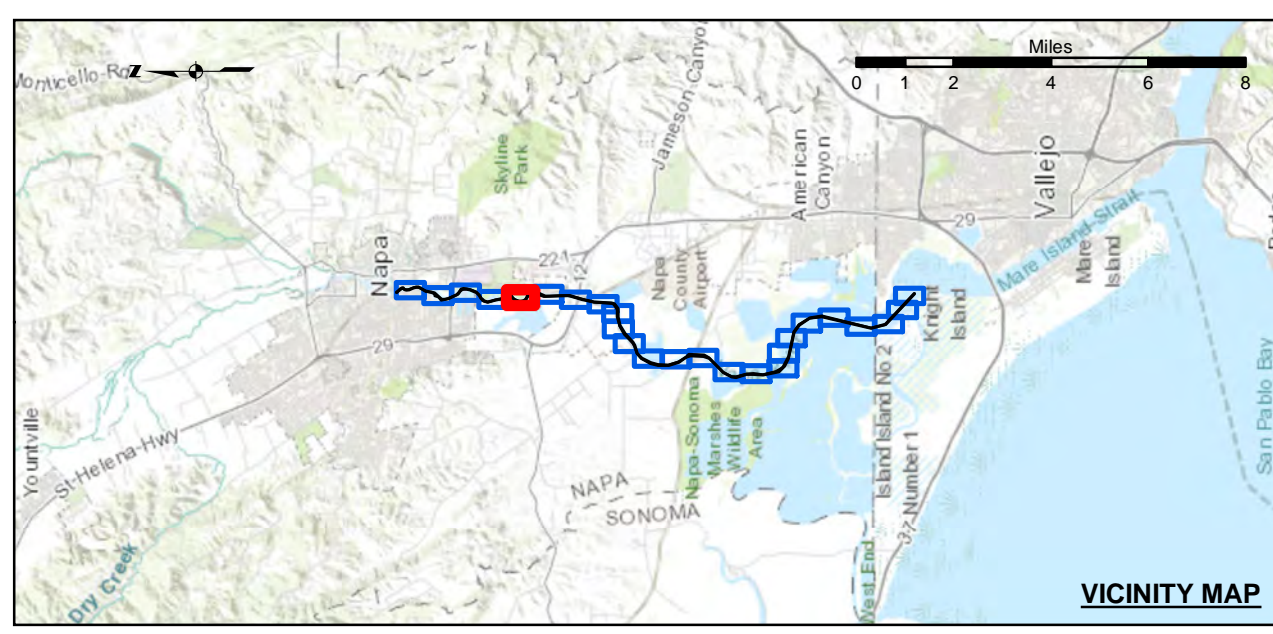
**US Army Corps of Engineers**  
 San Francisco District  
 450 Market Street  
 San Francisco, CA 94102

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Prepared Under the Direction of <b>JOHN D. CUNNINGHAM</b> LT Colonel, C.E. District Engineer	Chart Date: Jul 24, 2019
Subject: Hydro Survey Team Leader	Designed by: PDT
Recommended by: Chief, Hydro Survey Section	Plotted by: PDT
Approved by: Chief, Construction Branch	Checked by: PDT
	Drawn by: PDT

CALIFORNIA  
**NAPA RIVER  
 LOWER CHANNEL  
 CONDITION SURVEY**  
 10 JULY 2019

**Sheet  
 Reference  
 Number**  
**5 of 25**

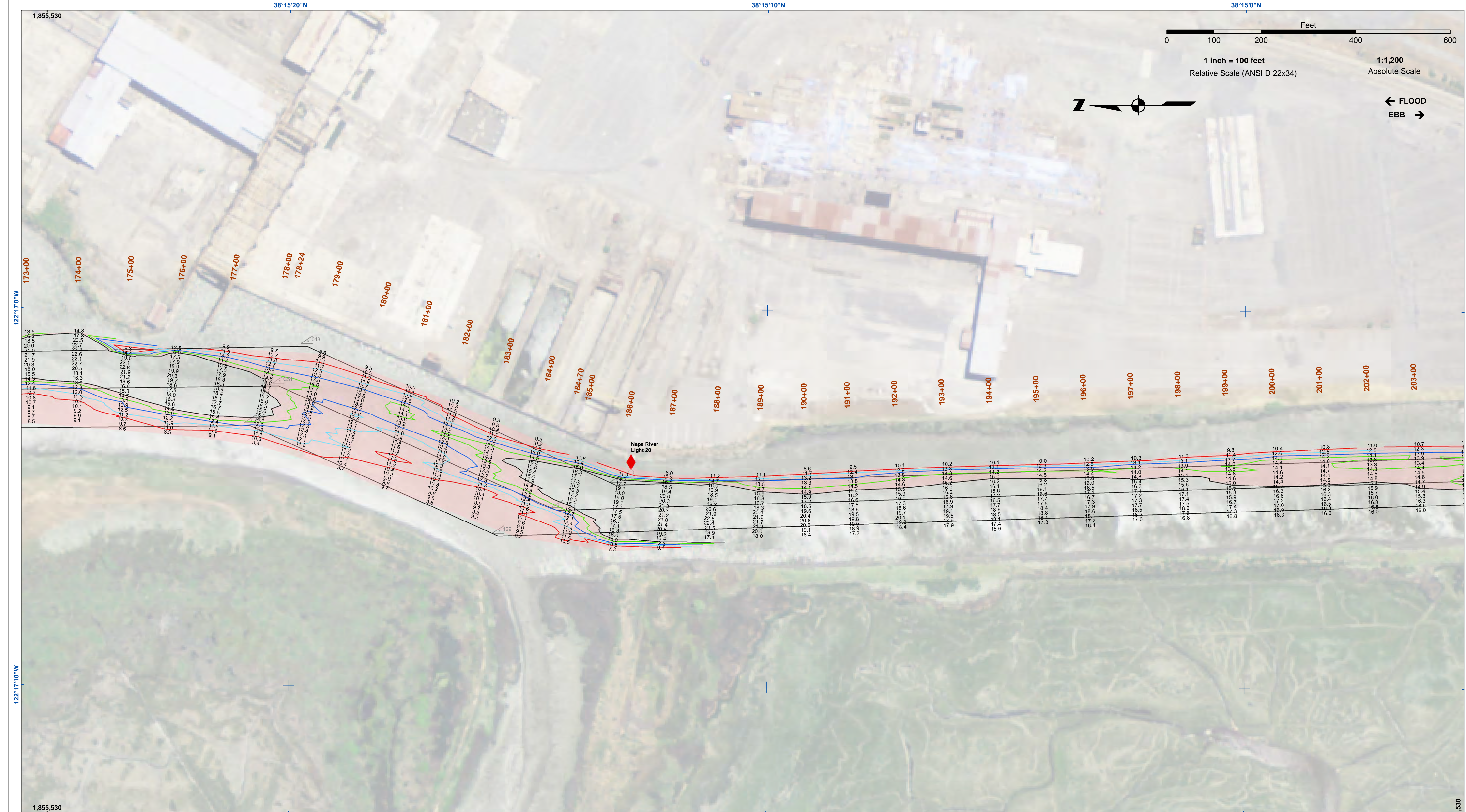


Federal Navigation Channel	Contours
Shoaling Area	-15
Placement Area	-14
Anchorage Area	-13
Wreck Area	-12
Submerged Wreck	-11
Angle Point	
Beacon, General	
Obstruction Point	
Navigation Buoy	
Navigation Buoy	
Shoalest Sounding*	

**NOTES:**  
 HORIZONTAL COORDINATE SYSTEM:  
 NORTH AMERICAN DATUM OF 1983 (NAD83), PROJECTED TO THE STATE PLANE COORDINATE SYSTEM (SPCS), CALIFORNIA ZONE II. DISTANCE UNITS IN U.S. SURVEY FEET.  
 VERTICAL DATUM:  
 SOUNDINGS ARE SHOWN IN FEET AND INDICATE DEPTHS BELOW MEAN LOWER LOW WATER.  
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 \*SHOALEST SOUNDING PER QUARTER PER REACH

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 VERTICAL CONTROLS:  
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 176+00 TO 224+00 - NAPA01 - 2.652m MLLW, -29.111m WGS-84 - USACE - RTK BASE STATION WGS-84 ELEVATION FROM OPUS SOLUTION MLLW ELEV. CALCULATED FROM TRANSECT 11 AND NRFP4 USING RTK OBSERVATIONS PID PENDING.  
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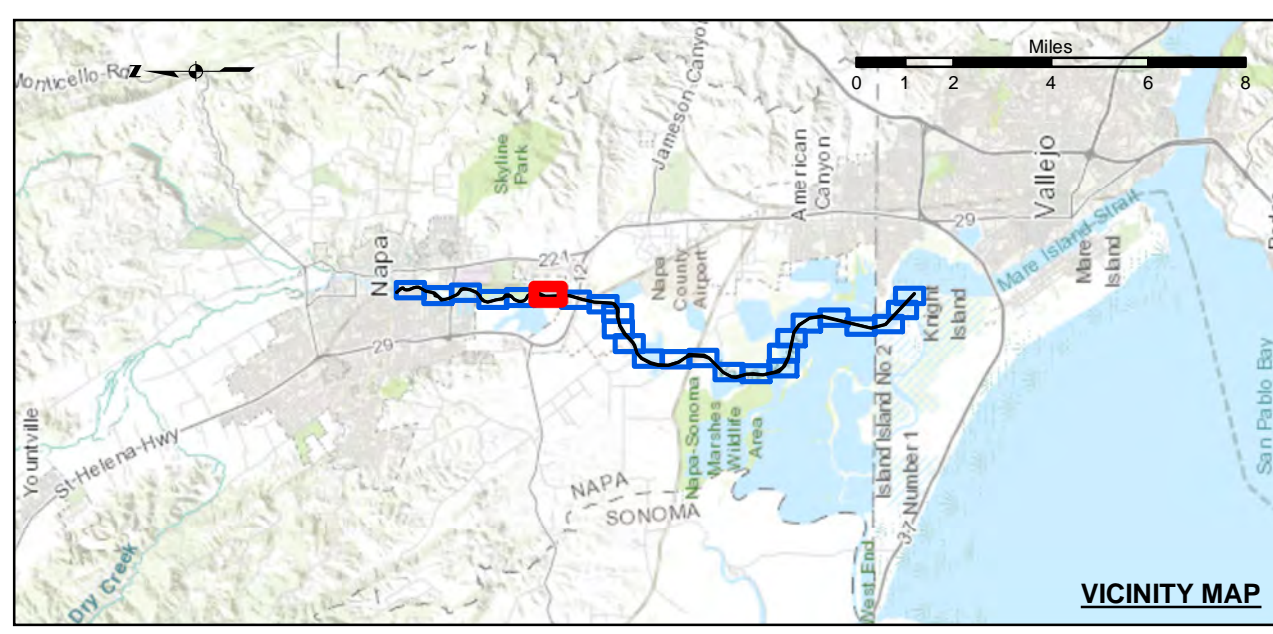
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Plotted by:	PDT
Checked by:	PDT
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CALIFORNIA  
**NAPA RIVER LOWER CHANNEL CONDITION SURVEY**  
 10 JULY 2019

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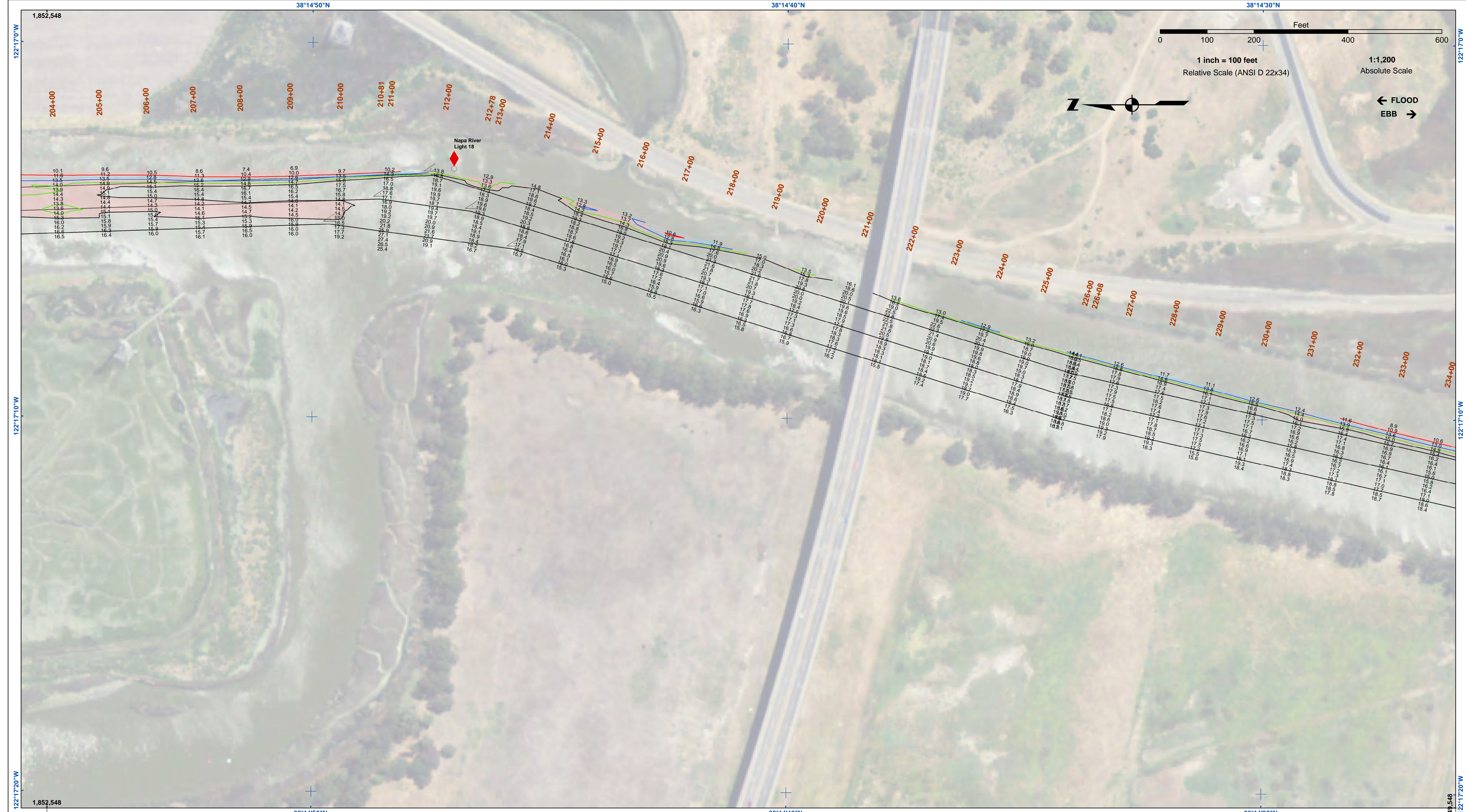


Federal Navigation Channel	Beacon, General	Contours
Shoaling Area	Obstruction Point	-15
Placement Area	Navigation Buoy	-13
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Wreck Area	Shoalest Sounding*	-11
Submerged Wreck		
Angle Point		

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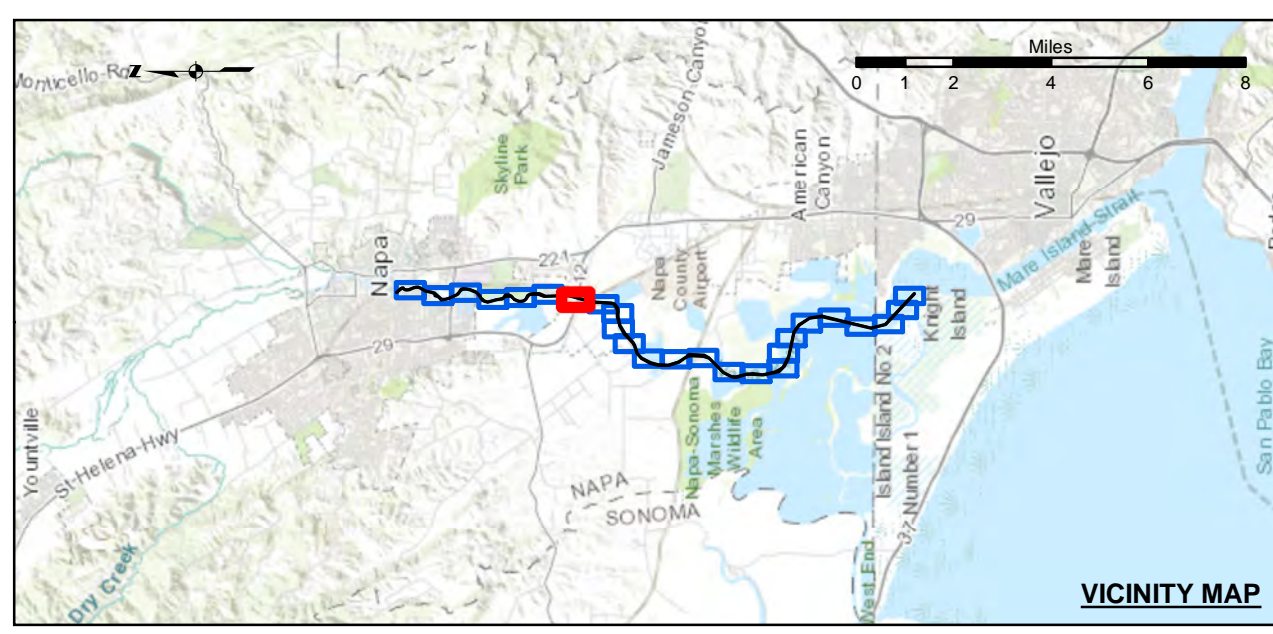
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CALIFORNIA  
 NAPA COUNTY  
**NAPA RIVER LOWER CHANNEL CONDITION SURVEY**  
 10 JULY 2019

**Sheet Number**  
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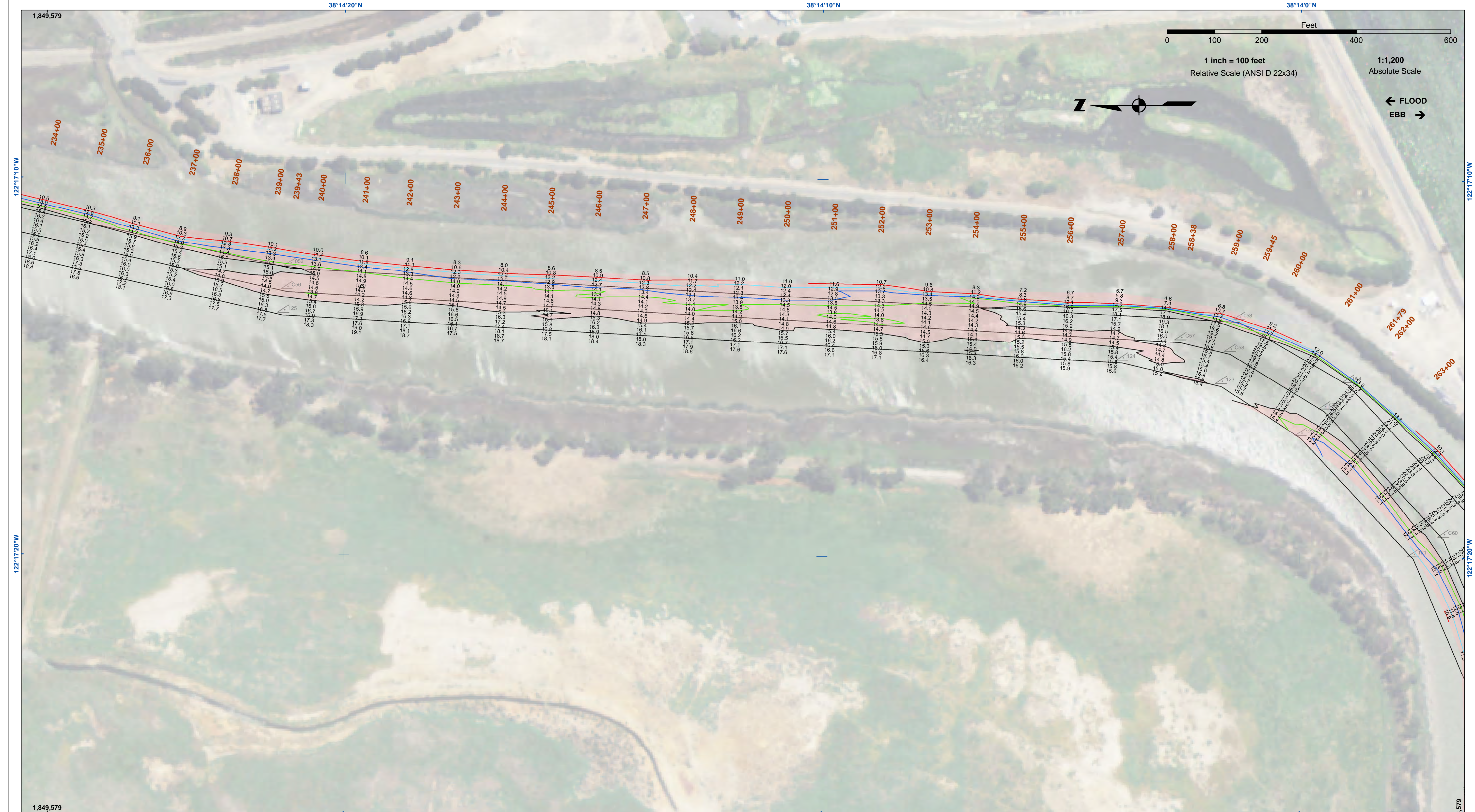


Federal Navigation Channel	Beacon, General	-15
Shoaling Area	Obstruction Point	-14
Placement Area	Navigation Buoy	-13
Anchorage Area	Navigation Buoy	-12
Wreck Area	Shoalest Sounding*	-11
Submerged Wreck		
Angle Point		

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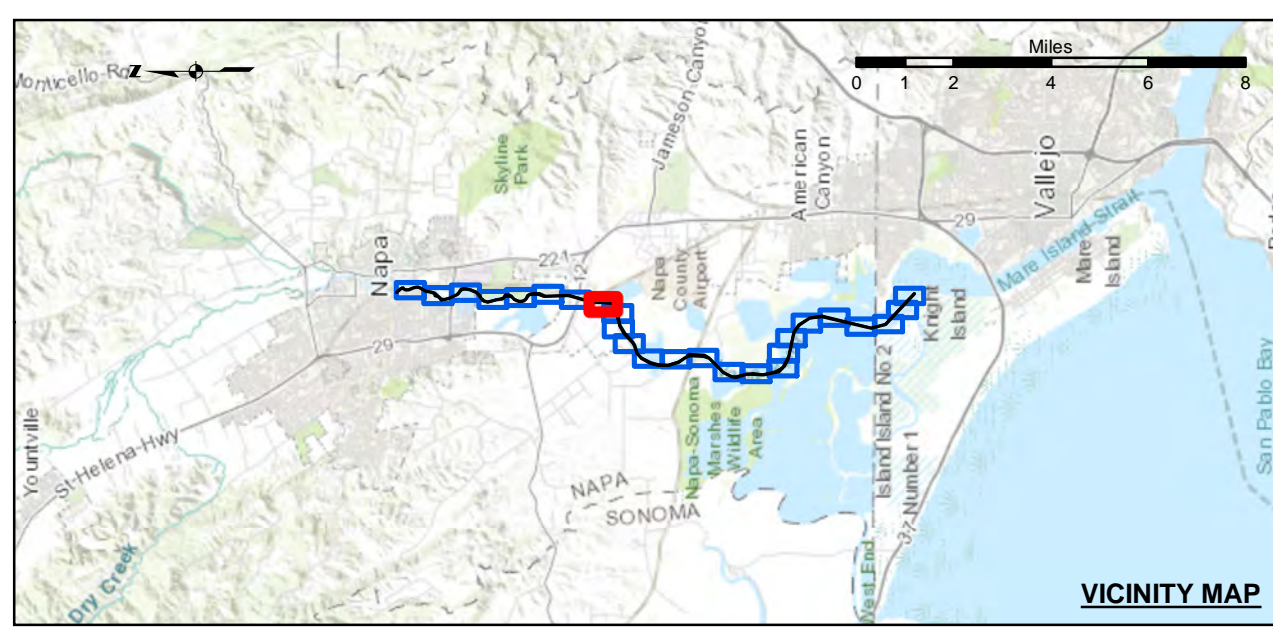
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CALIFORNIA  
 NAPA COUNTY  
**NAPA RIVER  
 LOWER CHANNEL  
 CONDITION SURVEY**  
 10 JULY 2019

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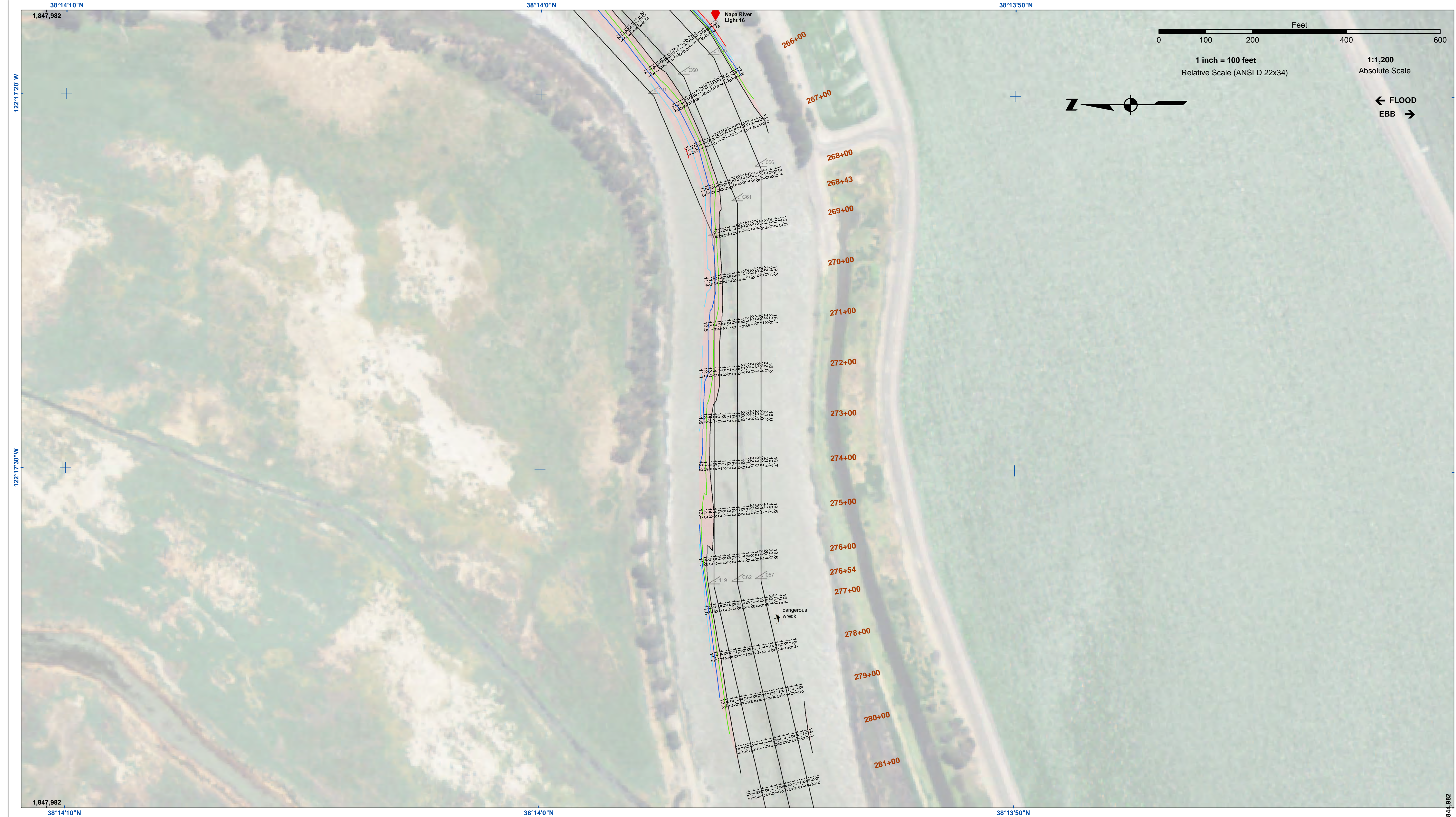


Federal Navigation Channel	Shoaling Area	Beacon, General	-15
Placement Area	Obstruction Point	Navigation Buoy	-14
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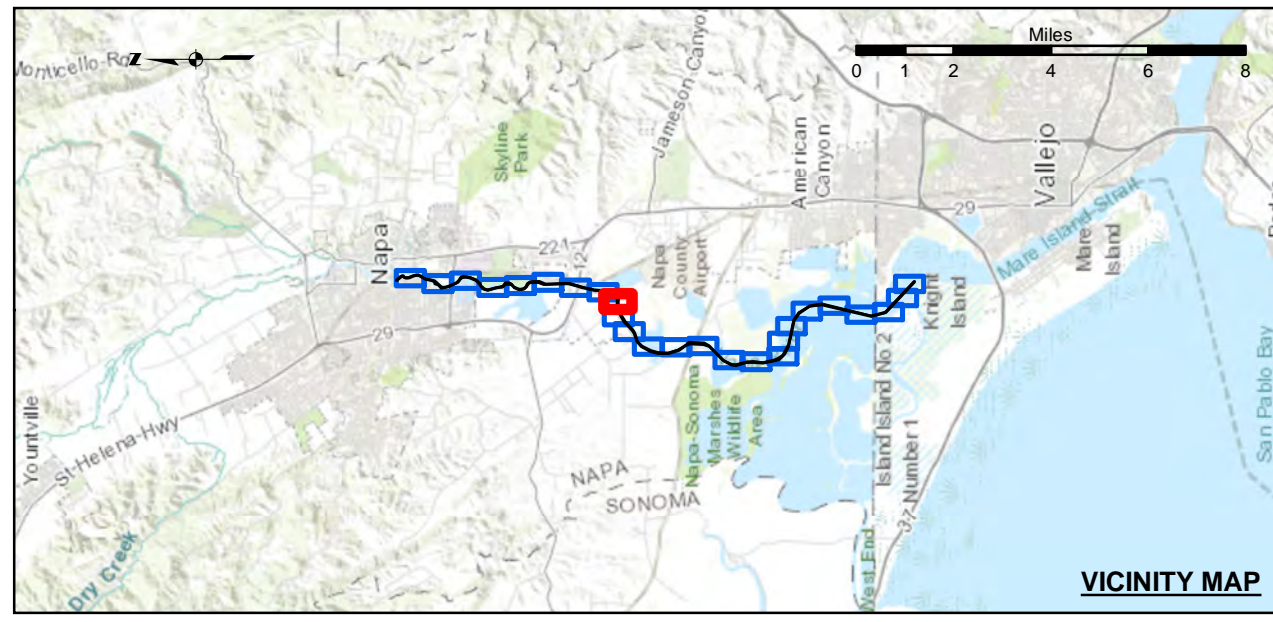


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CALIFORNIA  
 NAPA COUNTY  
**NAPA RIVER LOWER CHANNEL CONDITION SURVEY**  
 10 JULY 2019



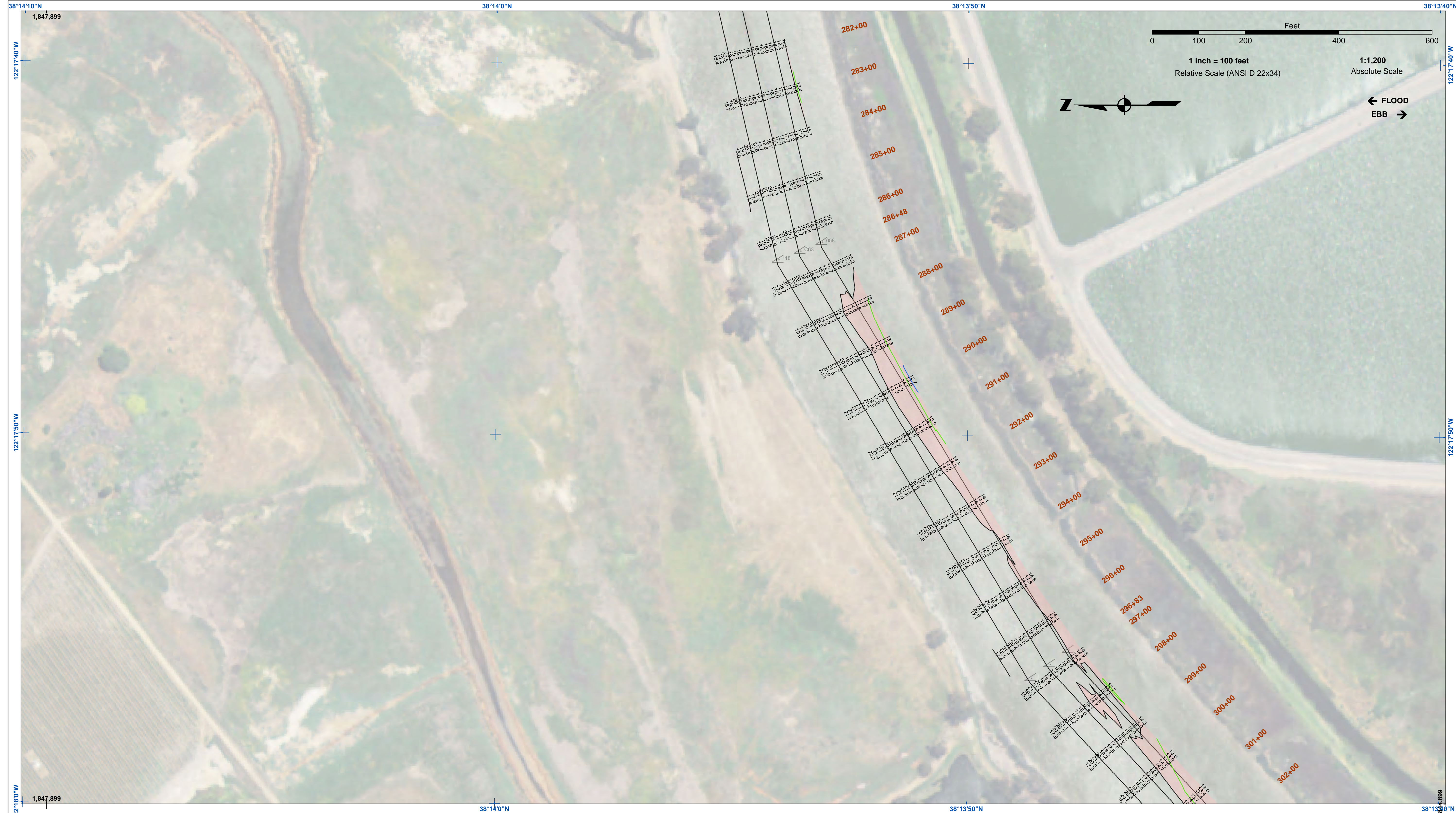
Federal Navigation Channel	Beacon, General	Contours
Shoaling Area	Obstruction Point	-15
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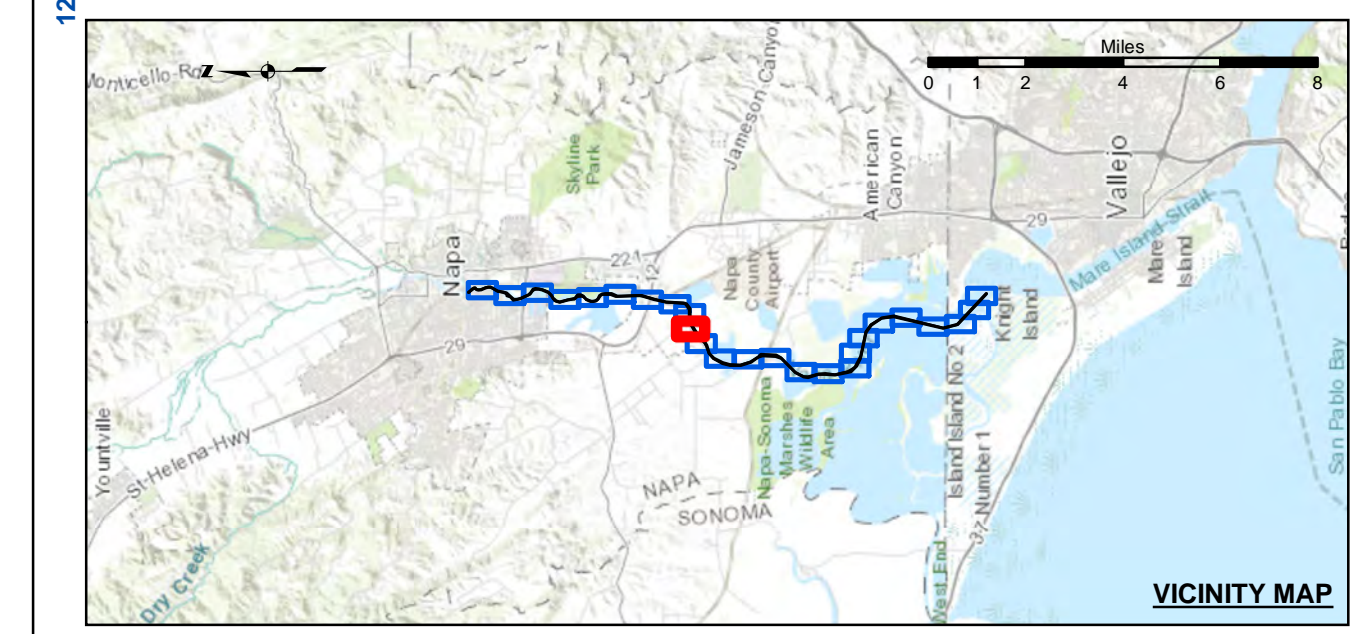
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LT COLONEL C.E. CUNNINGHAM	Jul 24, 2019
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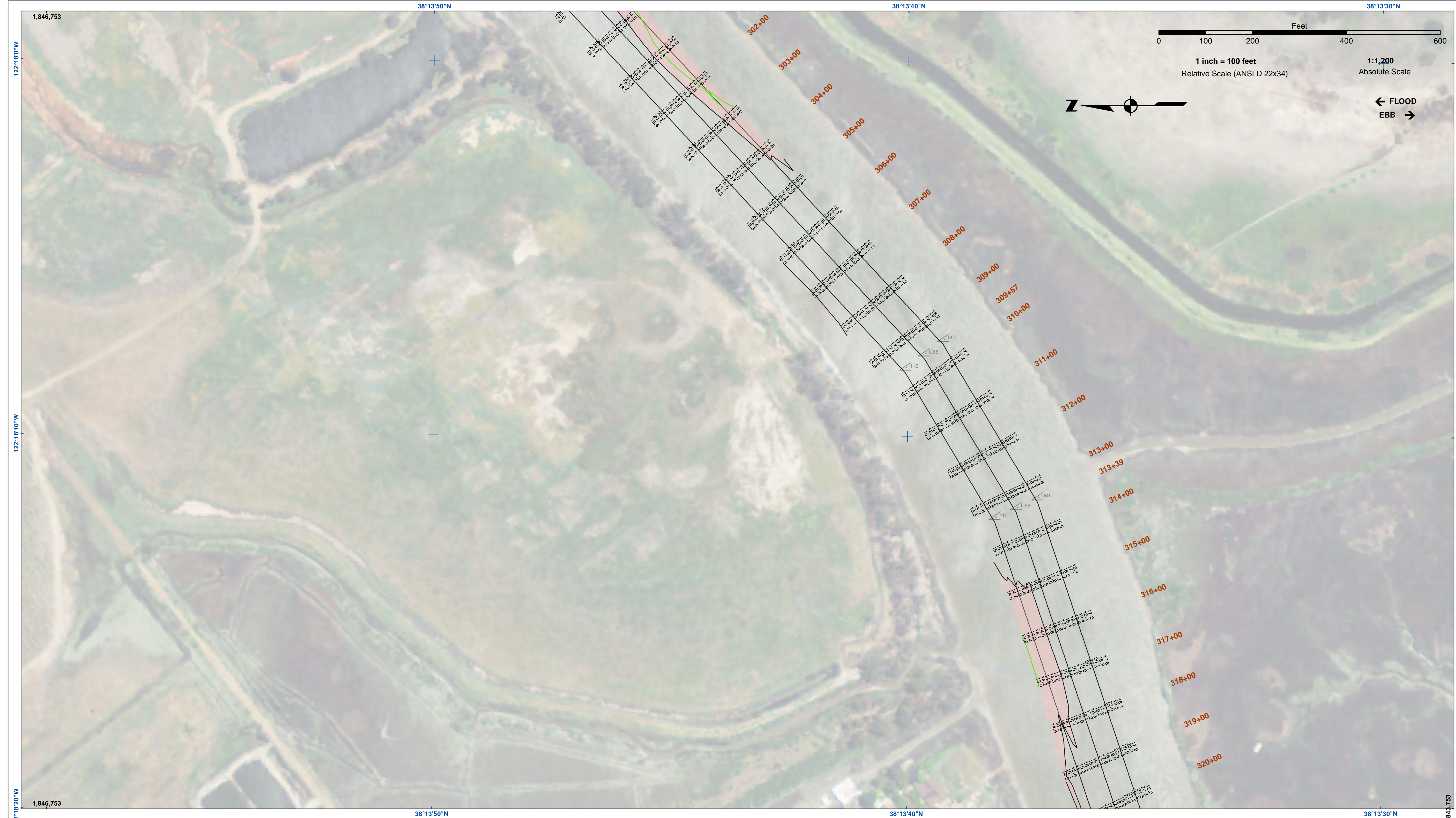


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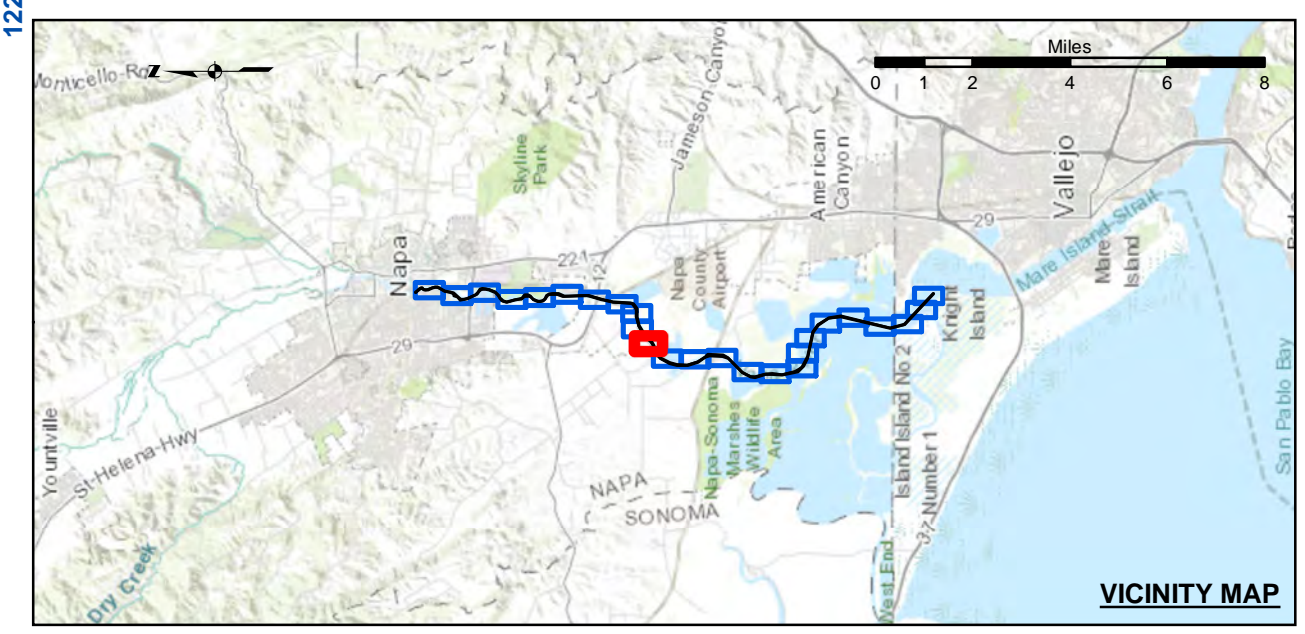


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Prepared Under the Direction of <b>JOHN D. CUNNINGHAM</b> LT Colonel, C.E. District Engineer	Chart Date: Jul 24, 2019
Submittal: Hydro Survey Team Leader	Designed by: PDT
Recommendation: Chief, Hydro Survey Section	Plotted by: PDT
Approval: Chief, Construction Branch	Checked by: PDT
	Drawn by: PDT

CALIFORNIA  
**NAPA RIVER  
 LOWER CHANNEL  
 CONDITION SURVEY**  
 10 JULY 2019



Federal Navigation Channel	Shoaling Area	Placement Area	Anchorage Area	Wreck Area	Submerged Wreck	Angle Point	Beacon, General	Obstruction Point	Navigation Buoy	Navigation Buoy	Shoalest Sounding*

**Contours**

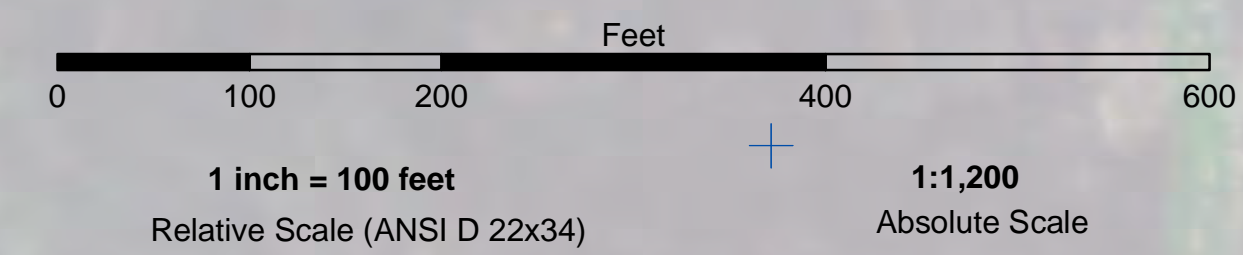
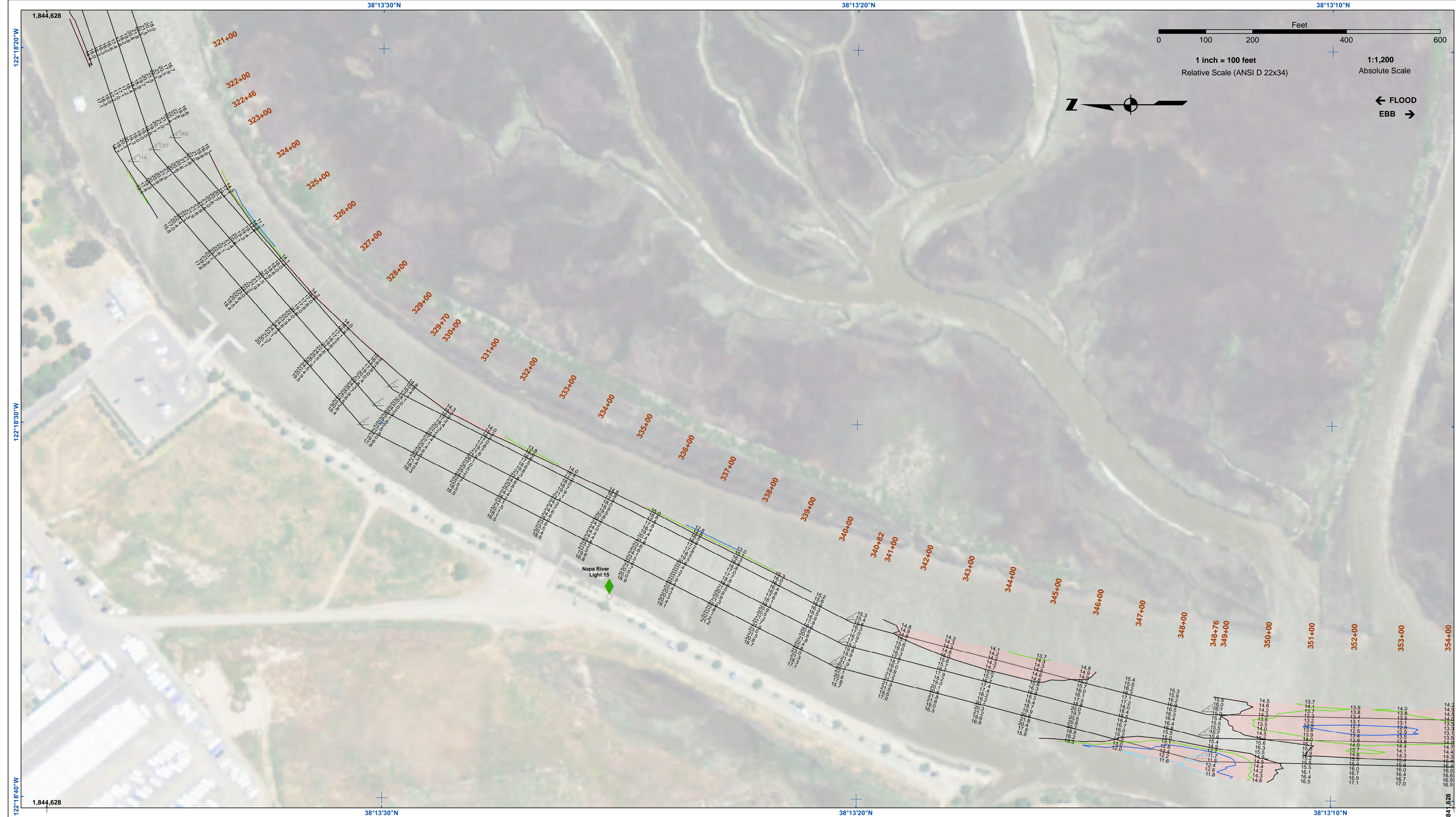
- 15
- 14
- 13
- 12
- 11

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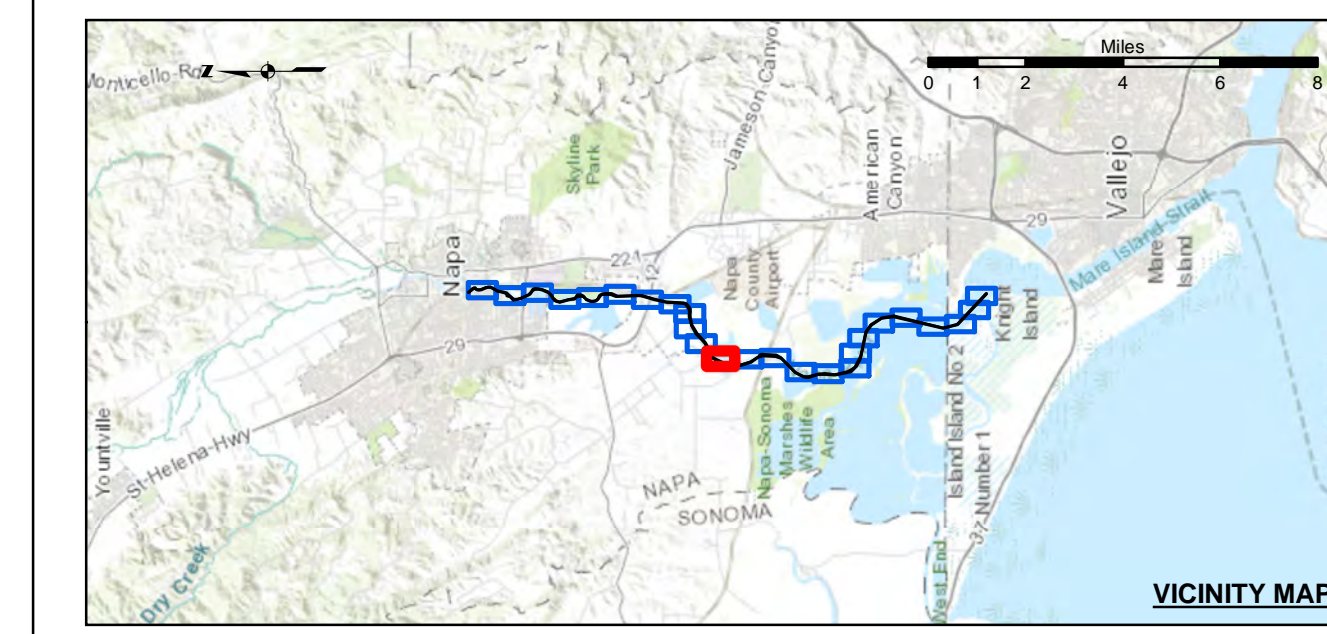
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**Sheet  
 Reference  
 Number**  
**11 of 25**





← FLOOD  
EBB →



	Federal Navigation Channel		Beacon, General		<b>Contours</b>
	Shoaling Area		Obstruction Point		-15
	Placement Area		Navigation Buoy		-14
	Anchorage Area		Navigation Buoy		-13
	Wreck Area		Navigation Buoy		-12
	Submerged Wreck		Shoalest Sounding*		-11
	Angle Point				

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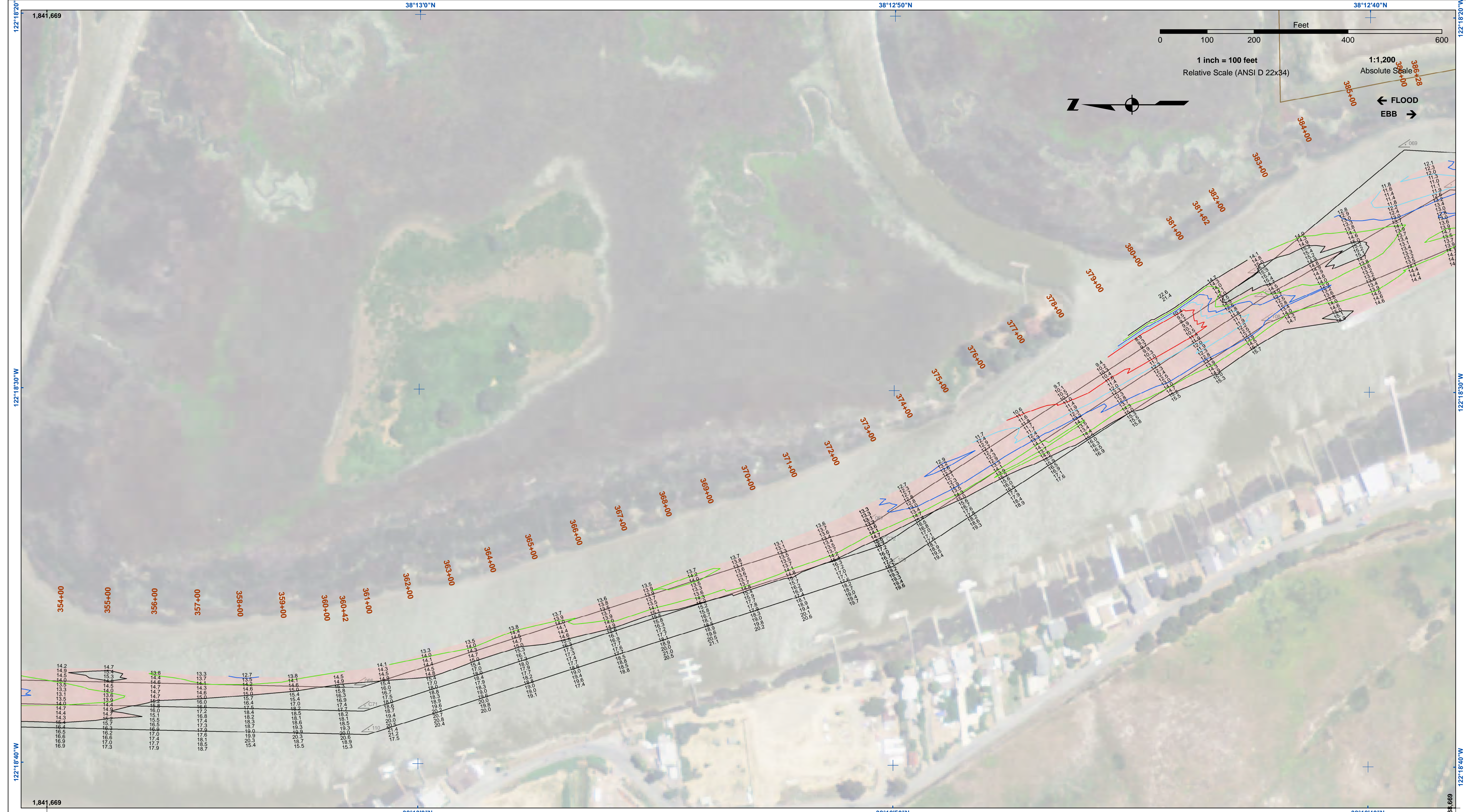
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Prepared Under the Direction of:	John D. Cunningham	Chart Date:	Jul 24, 2019
Surveyed By:	PDT	Designed by:	PDT
Plotted By:	PDT	Checked By:	PDT
Recommended:	Chief, Hydro Survey Section	Drawn by:	PDT
Approved:	Chief, Construction Branch		

CALIFORNIA  
**NAPA RIVER LOWER CHANNEL CONDITION SURVEY**  
 10 JULY 2019





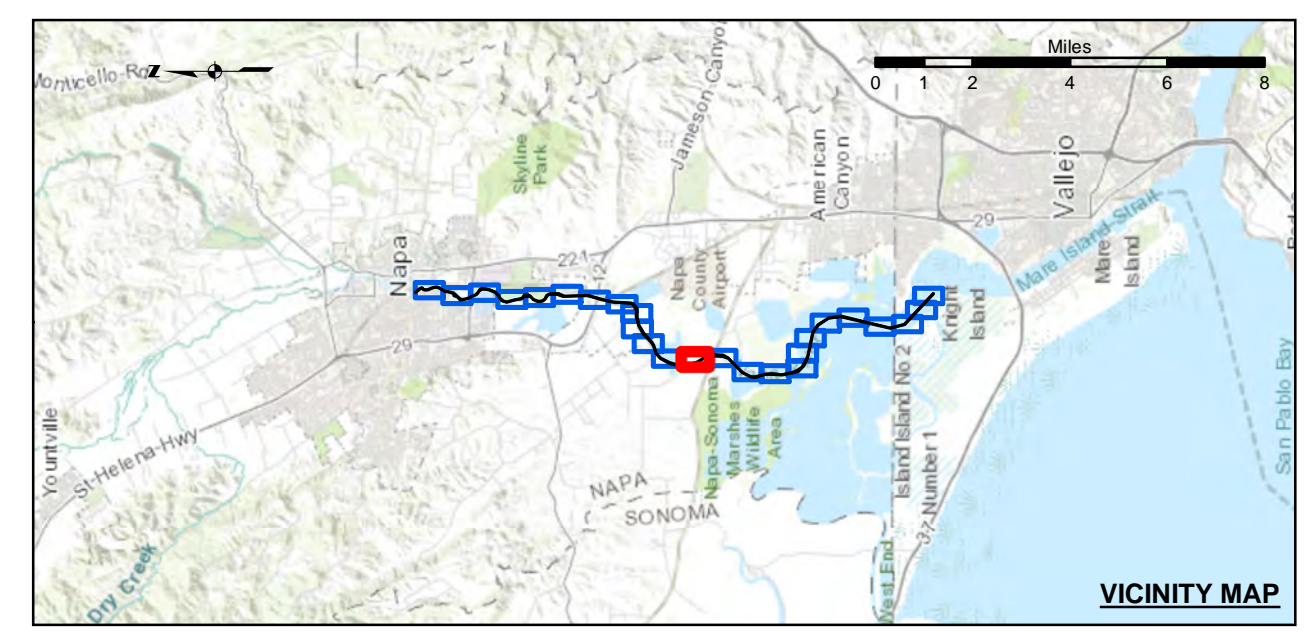
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Prepared Under the Direction of	JOHN D. CUNNINGHAM	Chart Date:	Jul 24, 2019
Submittal:	Hydro Survey Team Leader	Designed by:	PDT
Recommended:	Chief, Hydro Survey Section	Checked by:	PDT
Approved:	Chief, Construction Branch	Drawn by:	PDT

CALIFORNIA  
 NAPA COUNTY  
**NAPA RIVER LOWER CHANNEL CONDITION SURVEY**  
 10 JULY 2019

**Sheet Number**  
 13 of 25

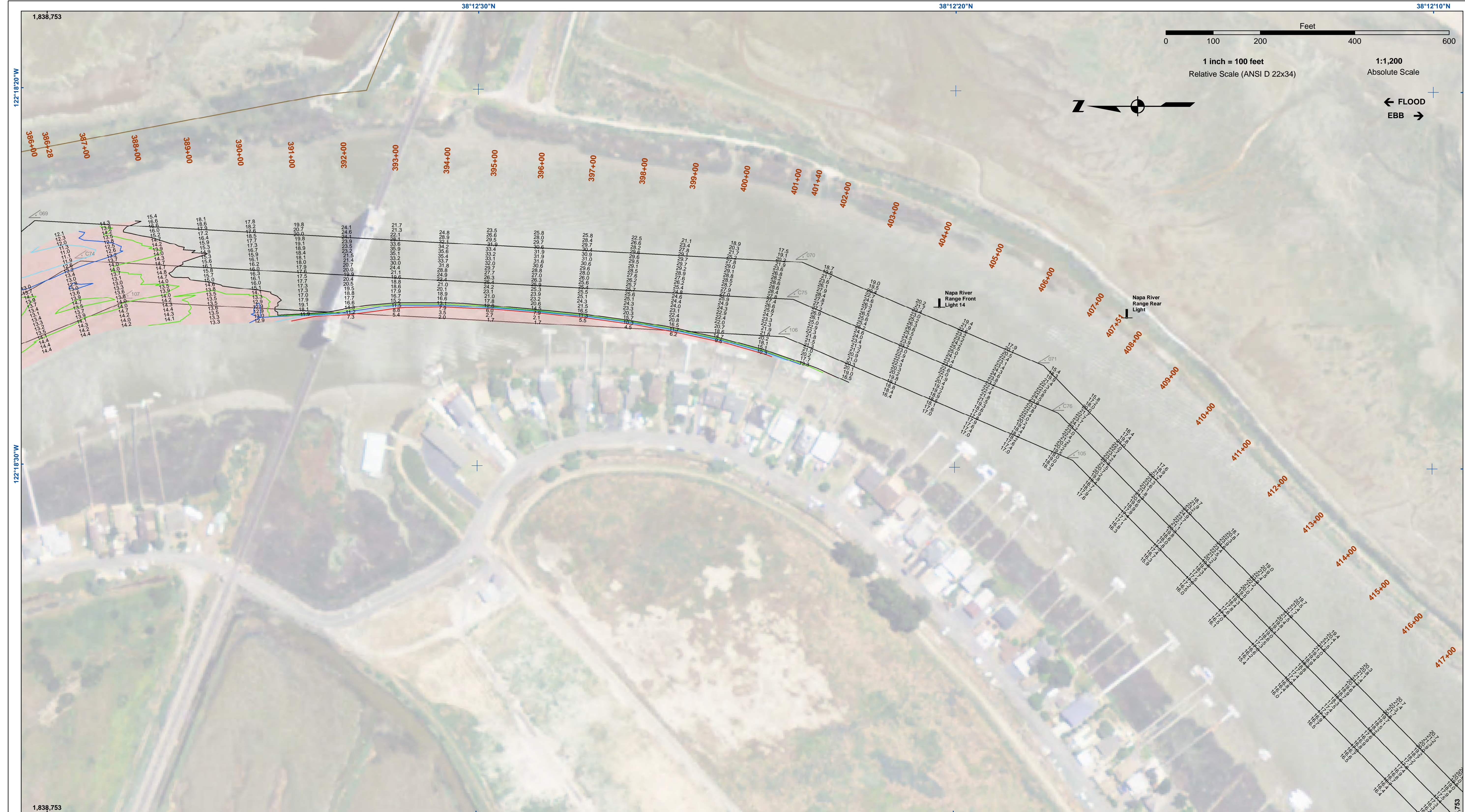


Federal Navigation Channel	Shoaling Area	Beacon, General	-15
Placement Area	Obstruction Point	Navigation Buoy	-13
Anchorage Area	Navigation Buoy	Navigation Buoy	-11
Wreck Area	Navigation Buoy	Shoalest Sounding*	
Submerged Wreck	Shoalest Sounding*		
Angle Point			

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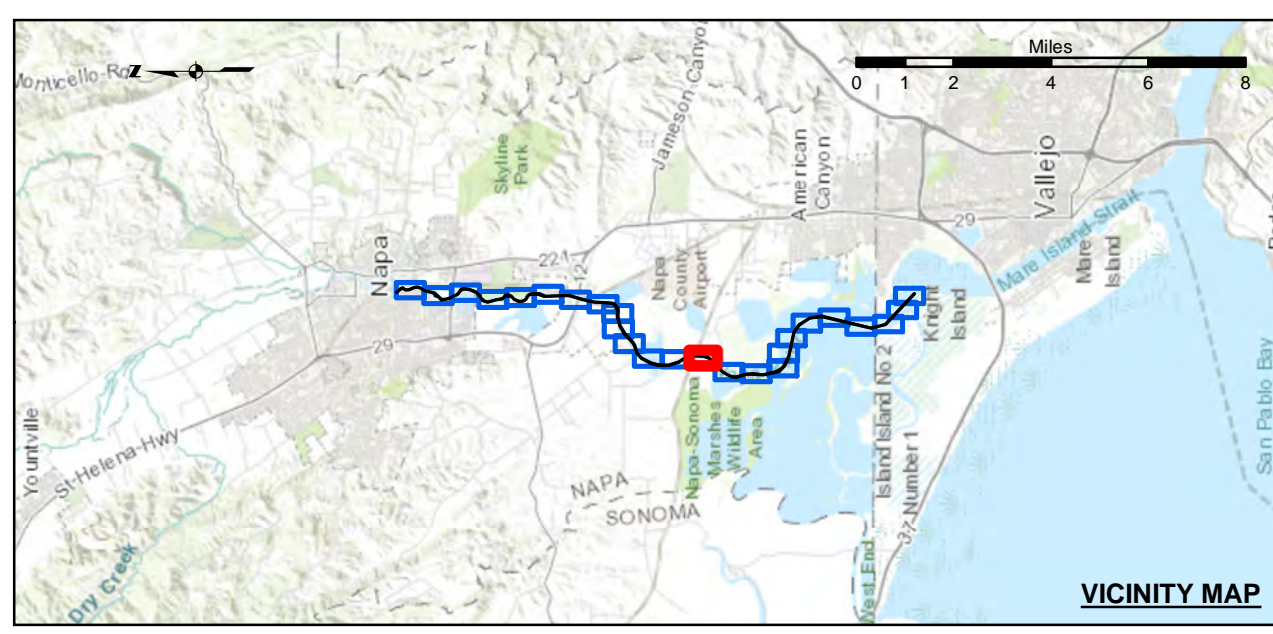
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Chart Date:	Jul 24, 2019
Designed by:	PDT
Plotted by:	PDT
Checked by:	PDT
Drawn by:	PDT

CALIFORNIA  
**NAPA RIVER LOWER CHANNEL CONDITION SURVEY**  
 10 JULY 2019  
 NAPA COUNTY

**Sheet Reference Number**  
 14 of 25

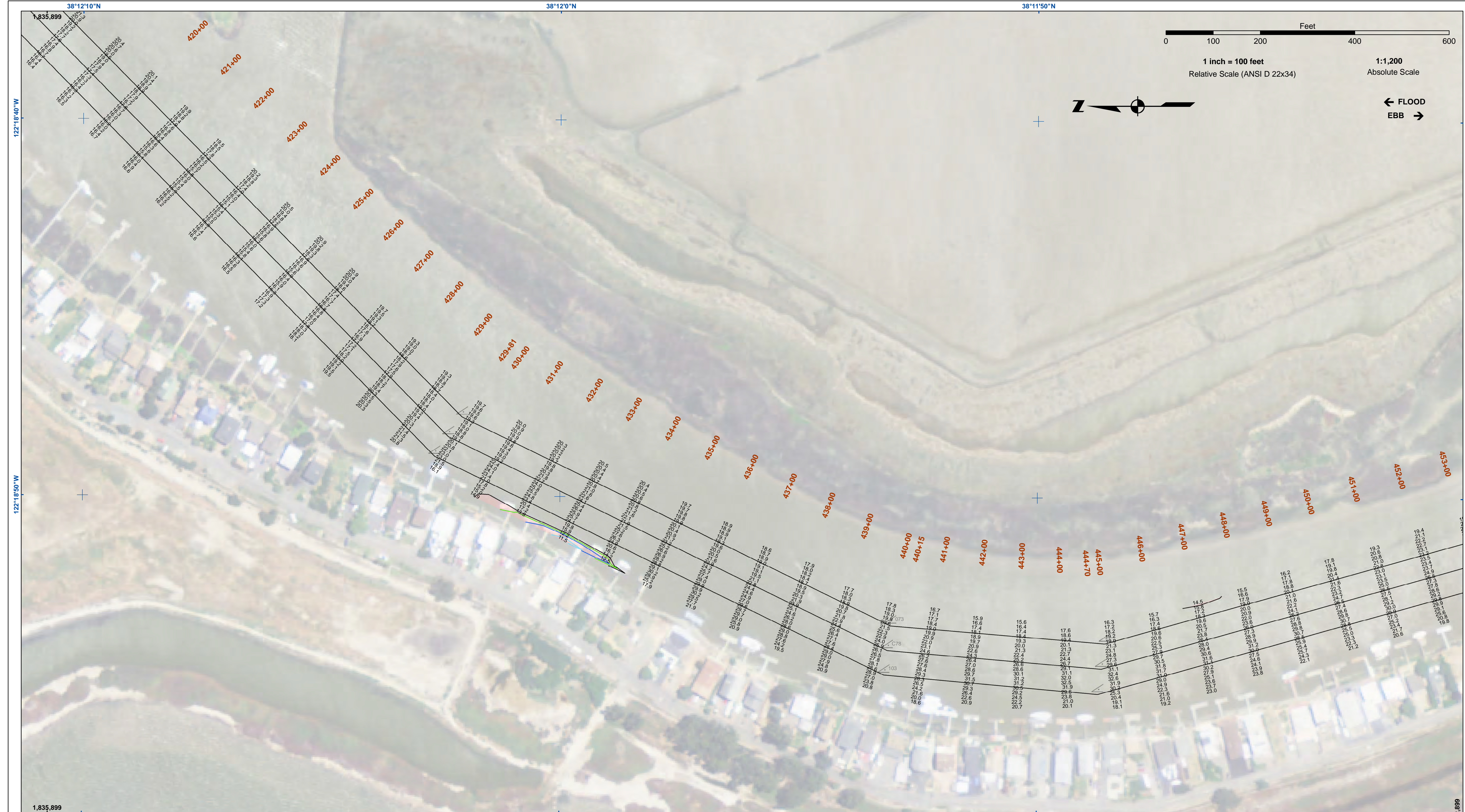


Federal Navigation Channel	Beacon, General	<b>Contours</b>
Shoaling Area	Obstruction Point	
Placement Area	Navigation Buoy	
Anchorage Area	Navigation Buoy	
Wreck Area	Shoalest Sounding*	
Submerged Wreck		
Angle Point		-15
		-14
		-13
		-12
		-11

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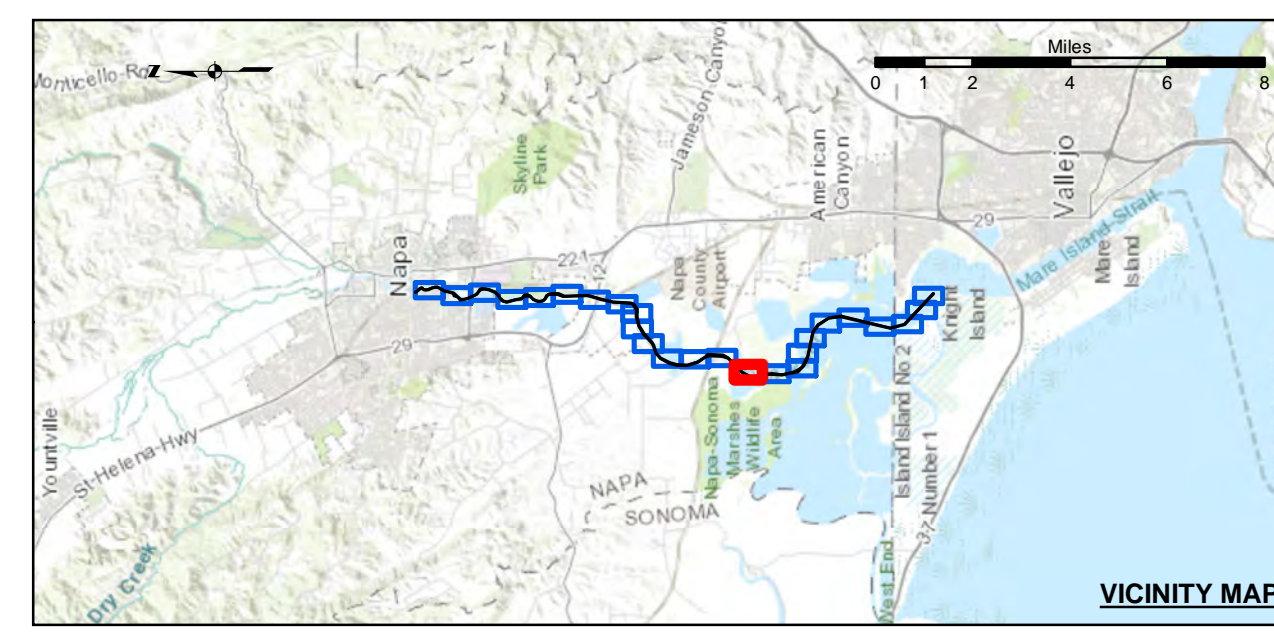
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Chart Date:	Jul 24, 2019
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Plotted by:	PDT
Checked by:	PDT
Drawn by:	PDT

CALIFORNIA  
**NAPA RIVER LOWER CHANNEL CONDITION SURVEY**  
 10 JULY 2019

**Sheet Number**  
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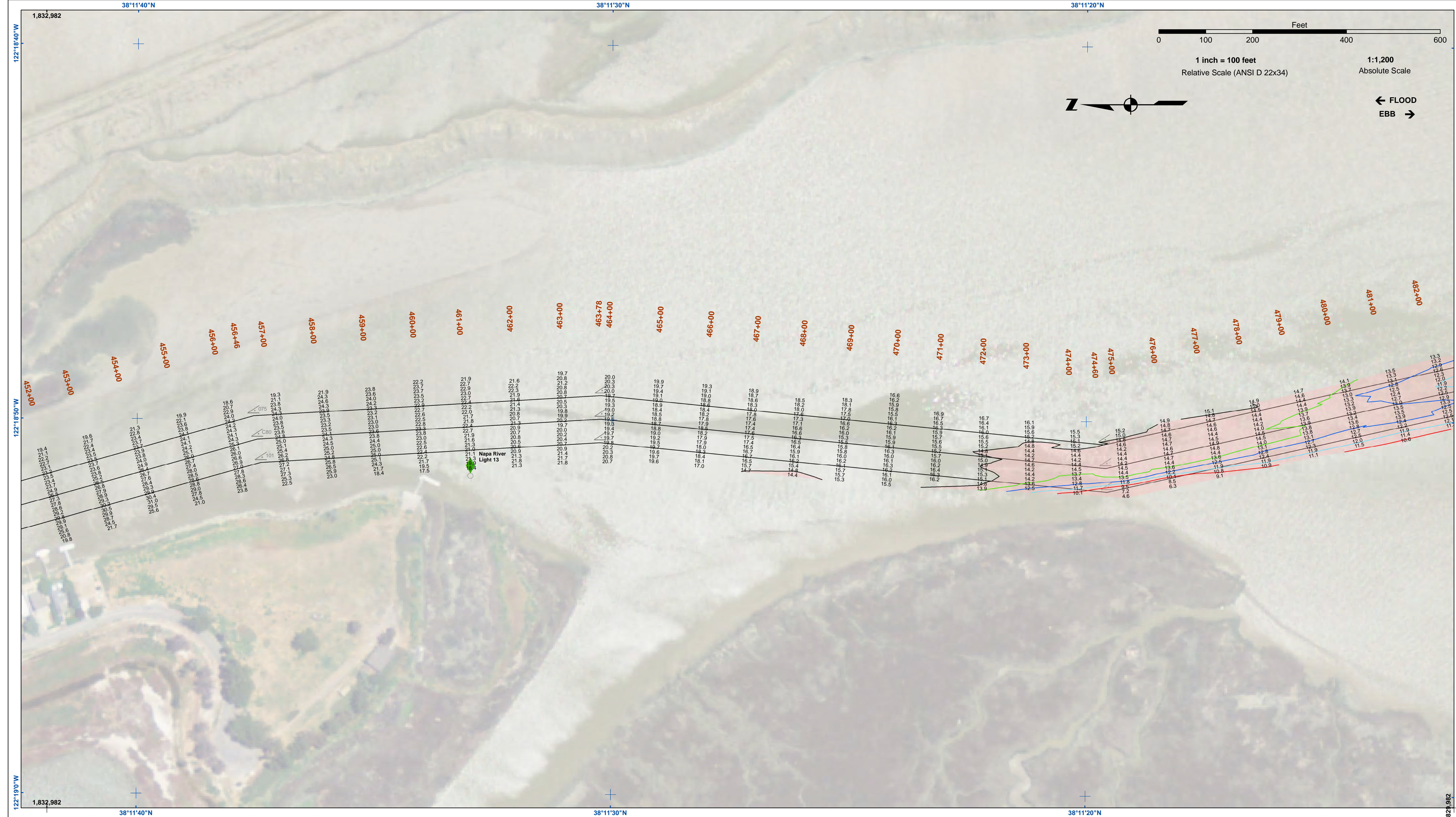


- |                            |                    |     |
|----------------------------|--------------------|-----|
| Federal Navigation Channel | Beacon, General    | -15 |
| Shoaling Area              | Obstruction Point  | -14 |
| Placement Area             | Navigation Buoy    | -13 |
| Anchorage Area             | Navigation Buoy    | -12 |
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| Submerged Wreck            | Shoalest Sounding* |     |
| Angle Point                |                    |     |

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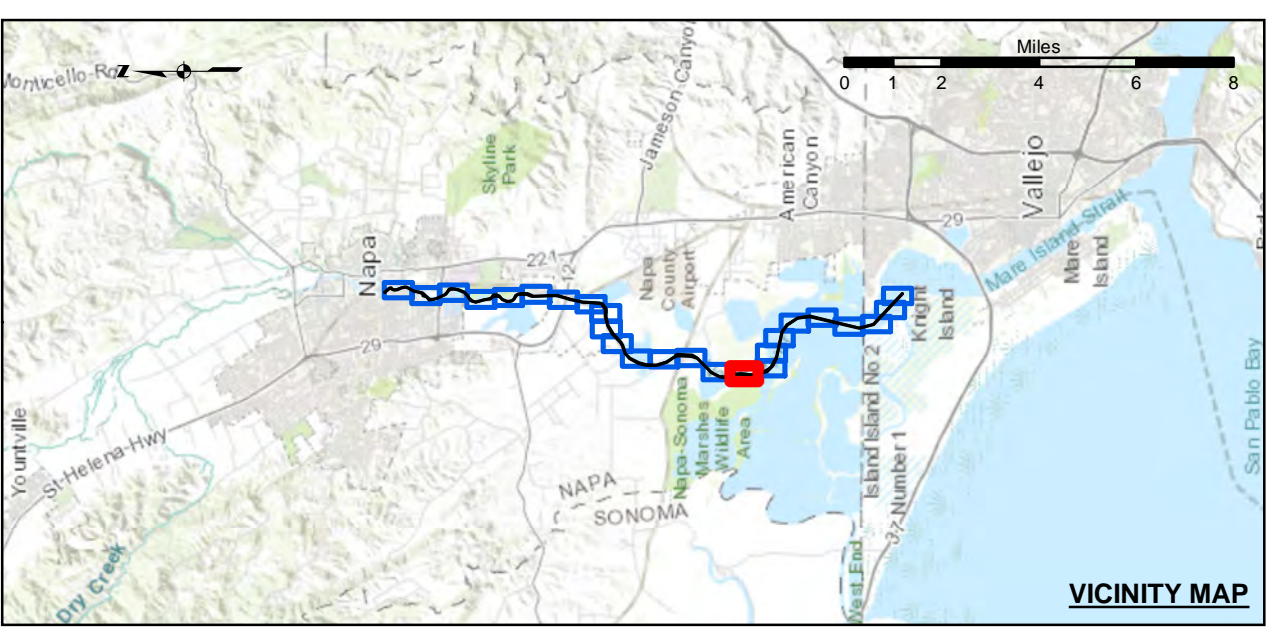
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Chart Date:	Jul 24, 2019
Designed by:	PDT
Plotted by:	PDT
Checked by:	PDT
Drawn by:	PDT

PREPARED UNDER THE DIRECTION OF  
**JOHN D. CUNNINGHAM**  
 LT COLONEL, C.E. DISTRICT ENGINEER

Submitted: Hydro Survey Team Leader  
 Recommended: Chief, Hydro Survey Section  
 Approved: Chief, Construction Branch

**CALIFORNIA**  
**NAPA COUNTY**  
**NAPA RIVER**  
**LOWER CHANNEL**  
**CONDITION SURVEY**  
 10 JULY 2019  
**Sheet**  
**Reference**  
**Number**  
**16 of 25**

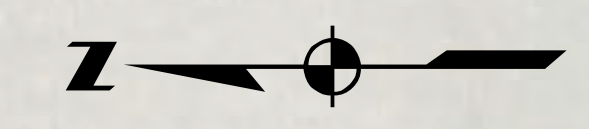
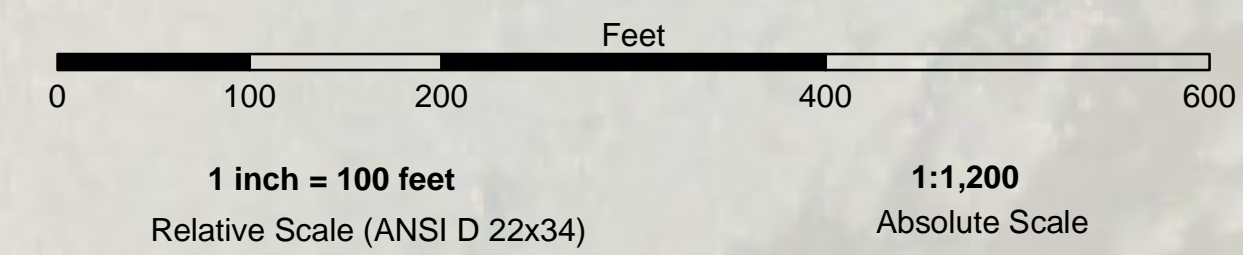
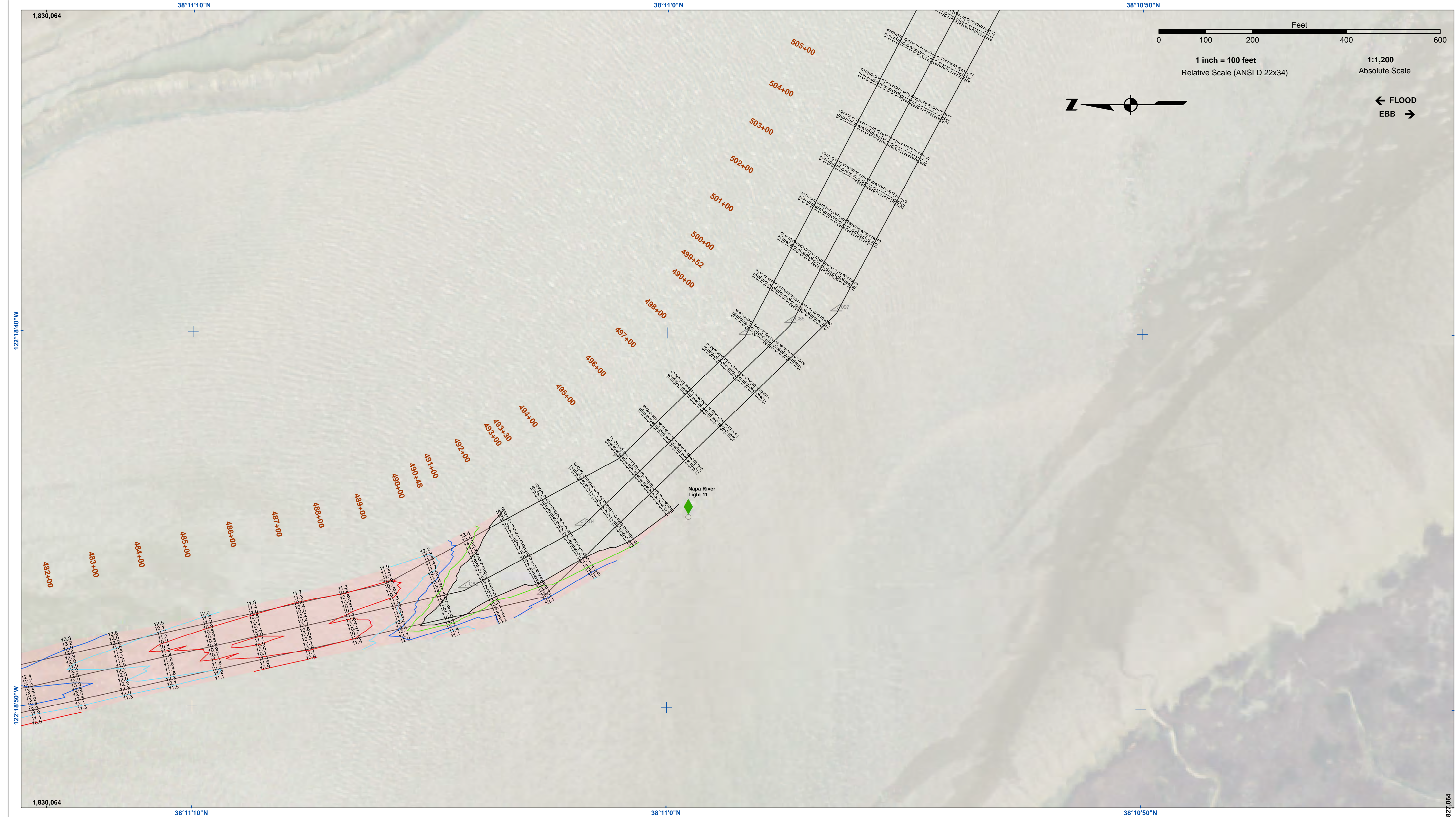


Federal Navigation Channel	Beacon, General	-15
Shoaling Area	Obstruction Point	-14
Placement Area	Navigation Buoy	-13
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Wreck Area	Shoalest Sounding*	-11
Submerged Wreck		
Angle Point		

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← FLOOD  
EBB →



Federal Navigation Channel	Beacon, General	-15
Shoaling Area	Obstruction Point	-14
Placement Area	Navigation Buoy	-13
Anchorage Area	Navigation Buoy	-12
Wreck Area	Navigation Buoy	-11
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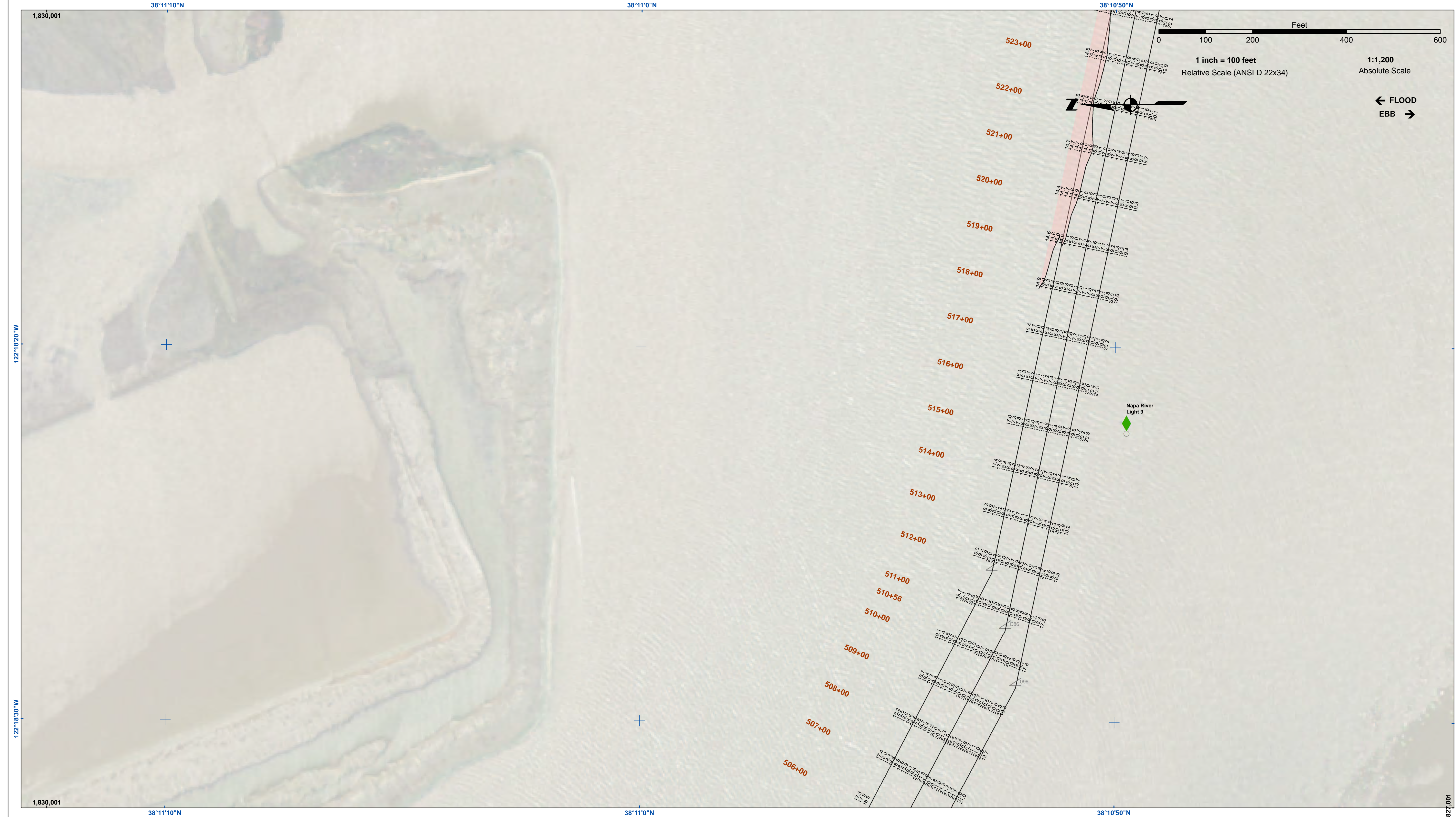
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Prepared Under the Direction of:	Chart Date:
JOHN D. CUNNINGHAM	Jul 24, 2019
Submittal:	Designed by:
Hydro Survey Team Leader	PDT
Recommended:	Checked by:
Chief, Hydro Survey Section	PDT
Approved:	Drawn by:
Chief, Construction Branch	PDT

CALIFORNIA  
**NAPA RIVER  
 LOWER CHANNEL  
 CONDITION SURVEY**  
 10 JULY 2019

**Sheet  
 Reference  
 Number**  
**17 of 25**





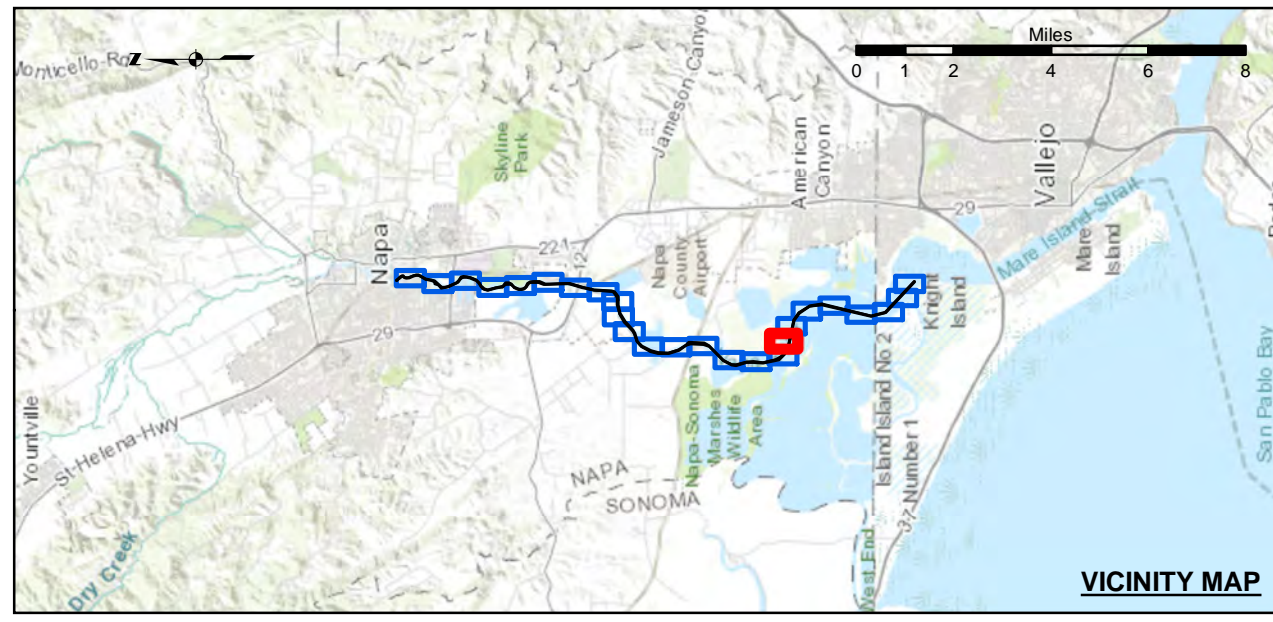
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Prepared Under the Direction of <b>JOHN D. CUNNINGHAM</b> LT COLONEL, C.E. DISTRICT ENGINEER	Chart Date: Jul 24, 2019
Submitted by: Hydro Survey Team Leader	Designed by: PDT
Recommended by: Chief, Hydro Survey Section	Plotted by: PDT
Approved by: Chief, Construction Branch	Checked by: PDT
	Drawn by: PDT

CALIFORNIA  
**NAPA RIVER LOWER CHANNEL CONDITION SURVEY**  
 10 JULY 2019  
 NAPA COUNTY

**Sheet Number**  
 18 of 25

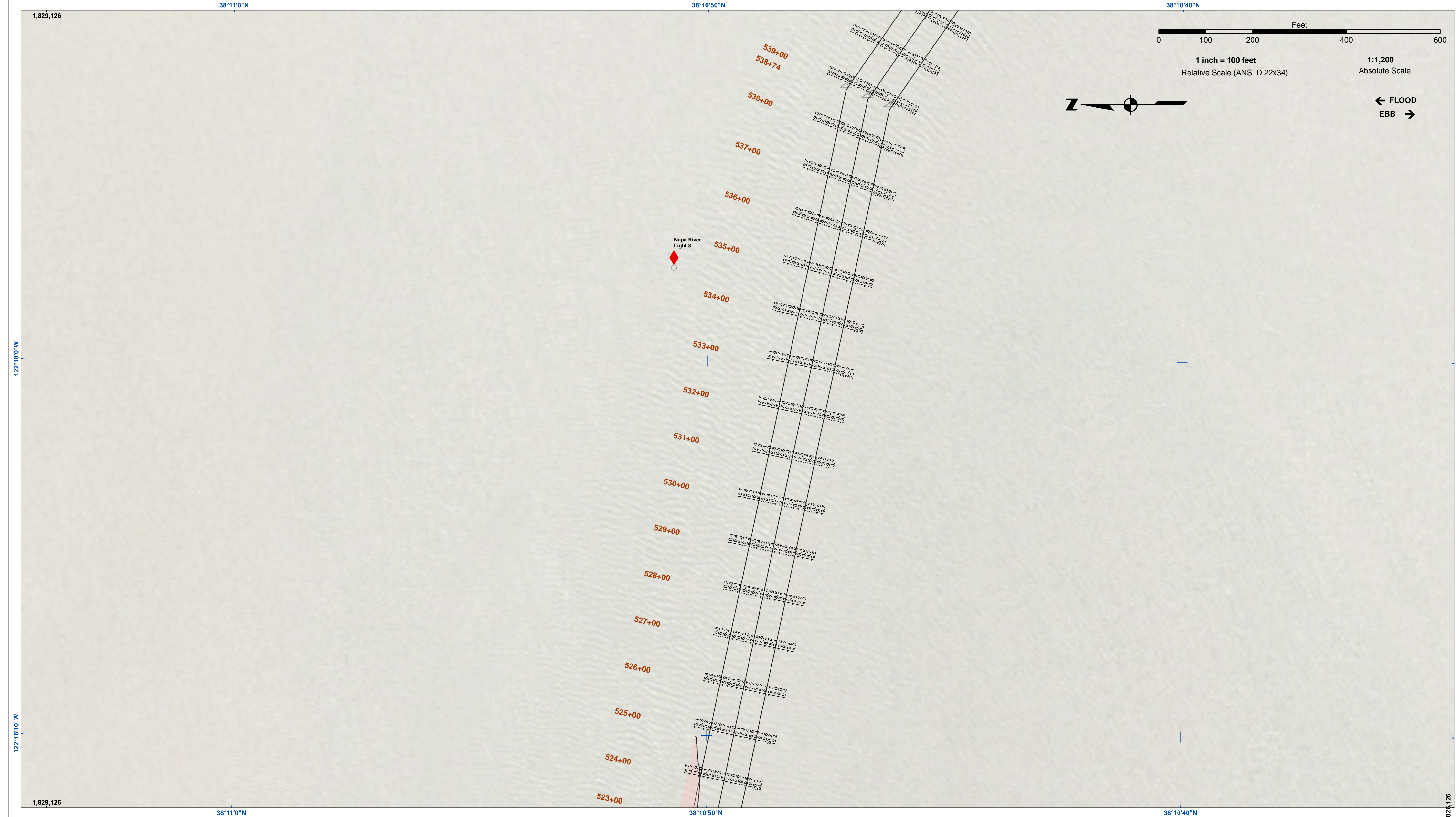


Federal Navigation Channel	Beacon, General	-15
Shoaling Area	Obstruction Point	-14
Placement Area	Navigation Buoy	-13
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Submerged Wreck		
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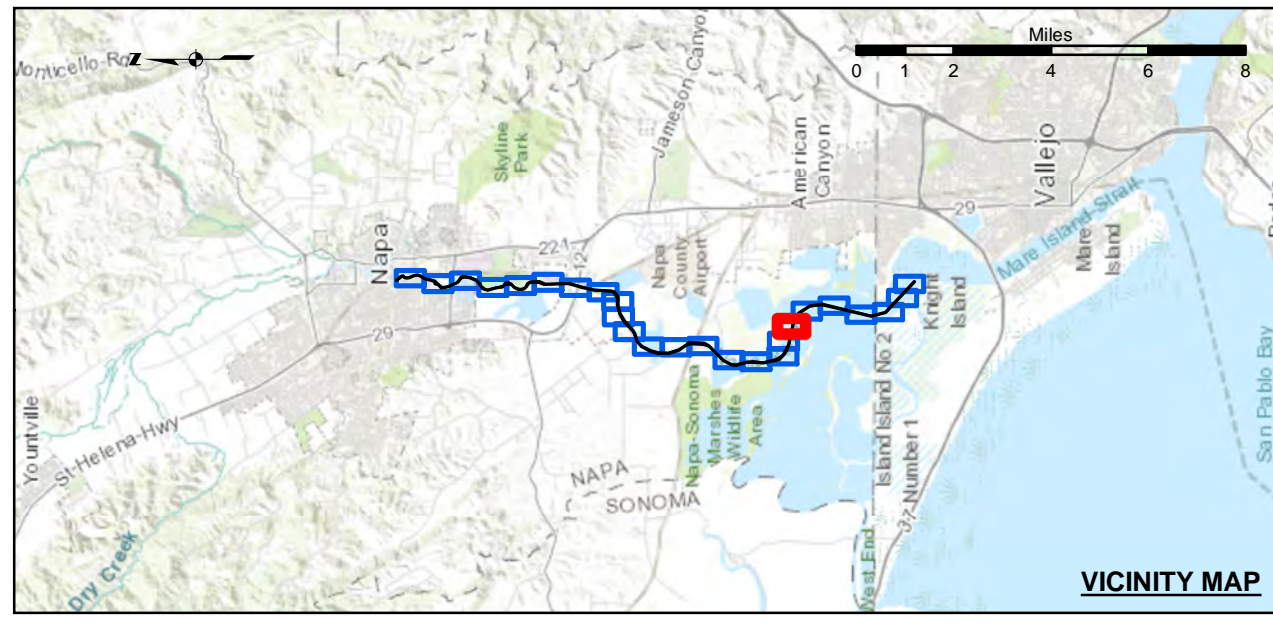


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PREPARED UNDER THE DIRECTION OF <b>JOHN D. CUNNINGHAM</b> LT COLONEL, C.E. DISTRICT ENGINEER	Chart Date: Jul 24, 2019
Submitted: Hydro Survey Team Leader	Designed by: PDT
Recommended: Chief, Hydro Survey Section	Drawn by: PDT
Approved: Chief, Construction Branch	

CALIFORNIA  
**NAPA RIVER  
 LOWER CHANNEL  
 CONDITION SURVEY**  
 10 JULY 2019

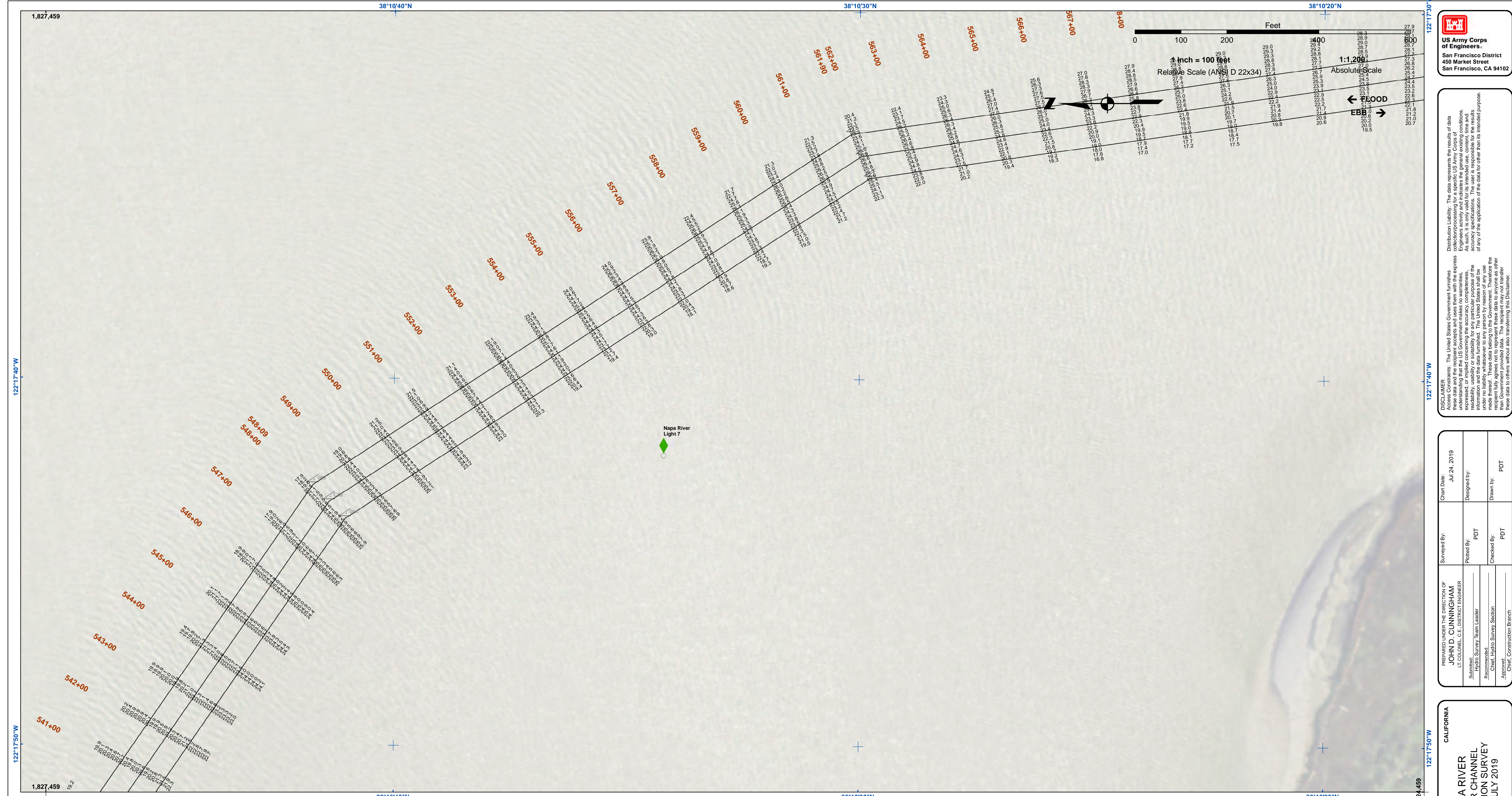


Federal Navigation Channel	Shoaling Area	Beacon, General	Contours -15
Placement Area	Obstruction Point	Navigation Buoy	Contours -14
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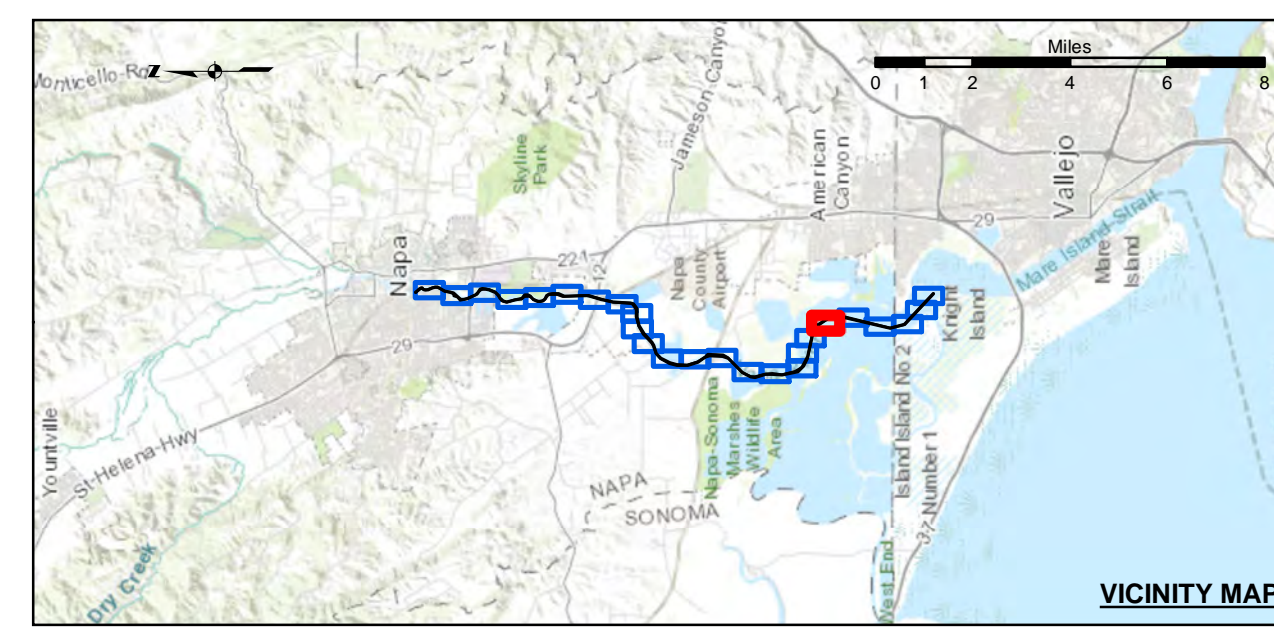


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Prepared Under the Direction of <b>JOHN D. CUNNINGHAM</b> LT Colonel, C.E. District Engineer	Chart Date: Jul 24, 2019
Submitted: Hydro Survey Team Leader	Designed by: PDT
Recommended: Chief, Hydro Survey Section	Drawn by: PDT
Approved: Chief, Construction Branch	PDT

**CALIFORNIA**  
**NAPA COUNTY**  
**NAPA RIVER**  
**LOWER CHANNEL**  
**CONDITION SURVEY**  
 10 JULY 2019

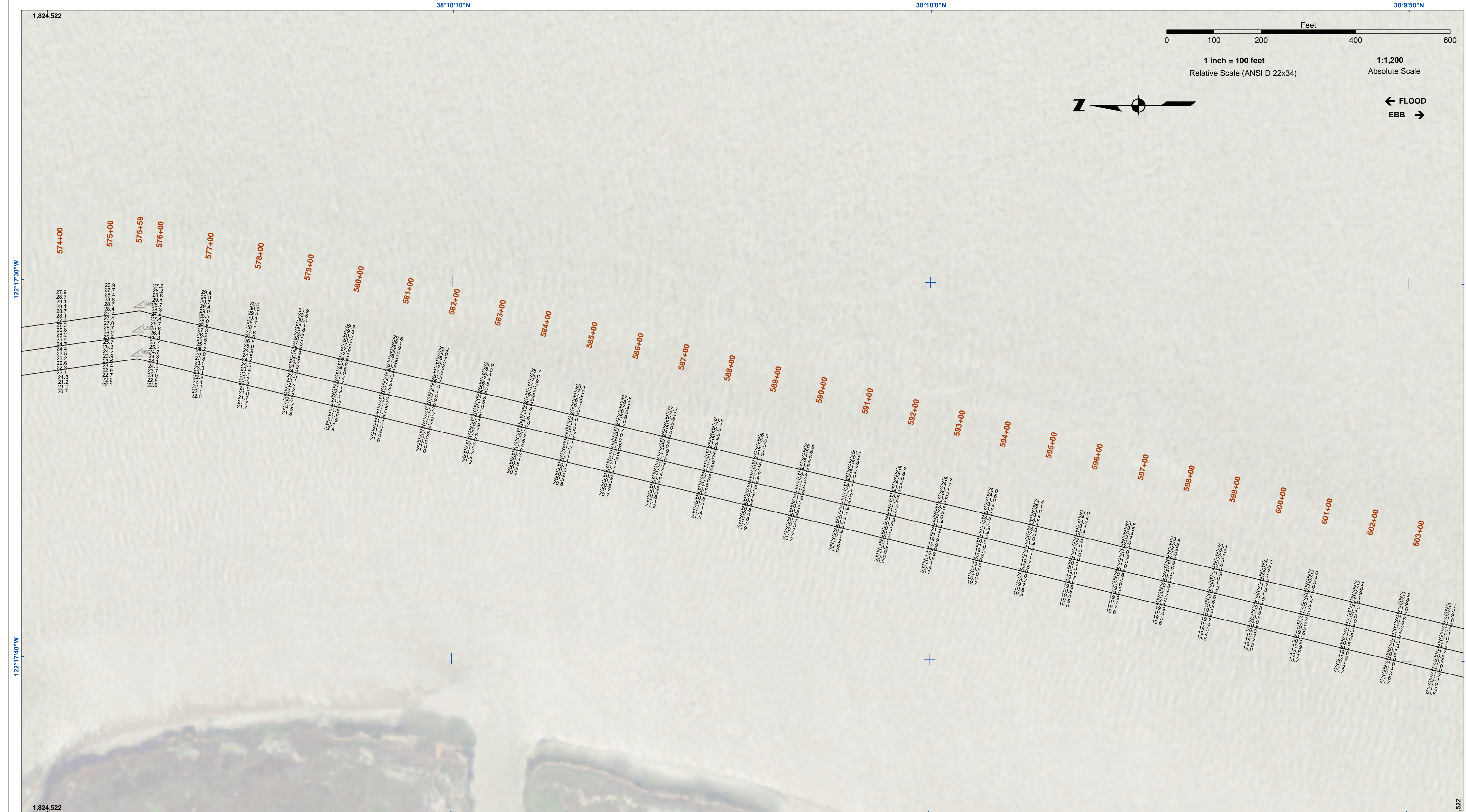


Federal Navigation Channel	Beacon, General	-15
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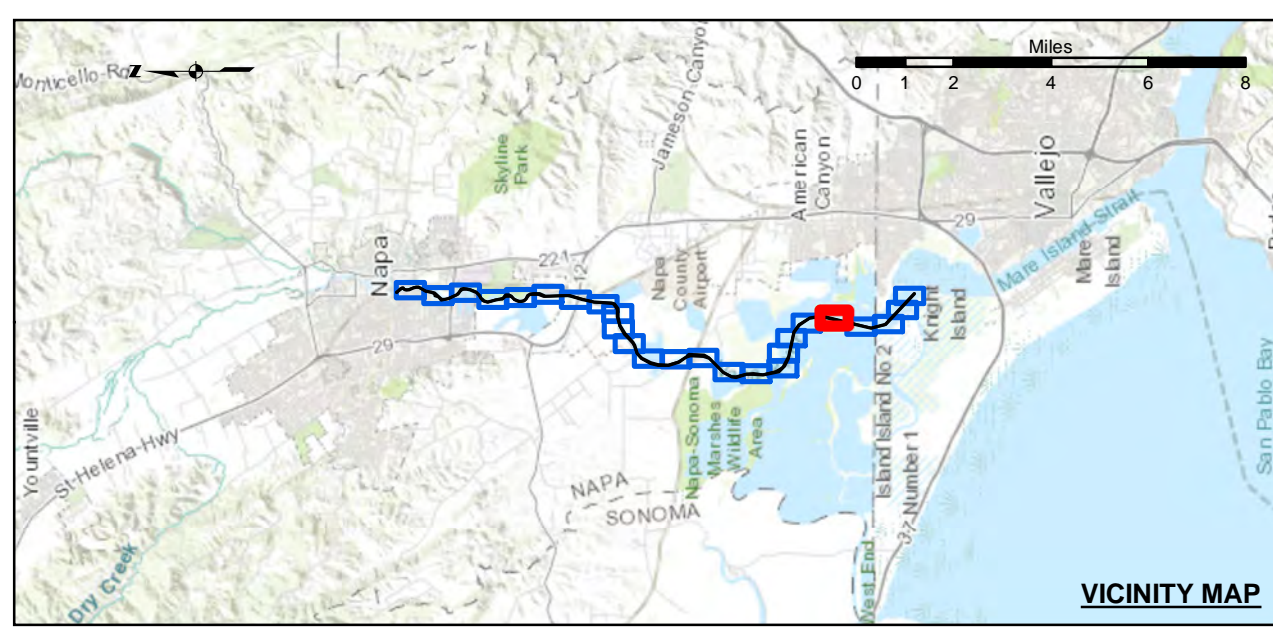
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 San Francisco, CA 94102

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Chart Date:	Jul 24, 2019
Designed by:	PDT
Plotted by:	PDT
Checked by:	PDT
Drawn by:	PDT

CALIFORNIA  
**NAPA RIVER  
 LOWER CHANNEL  
 CONDITION SURVEY**  
 10 JULY 2019

**Sheet  
 Reference  
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 21 of 25

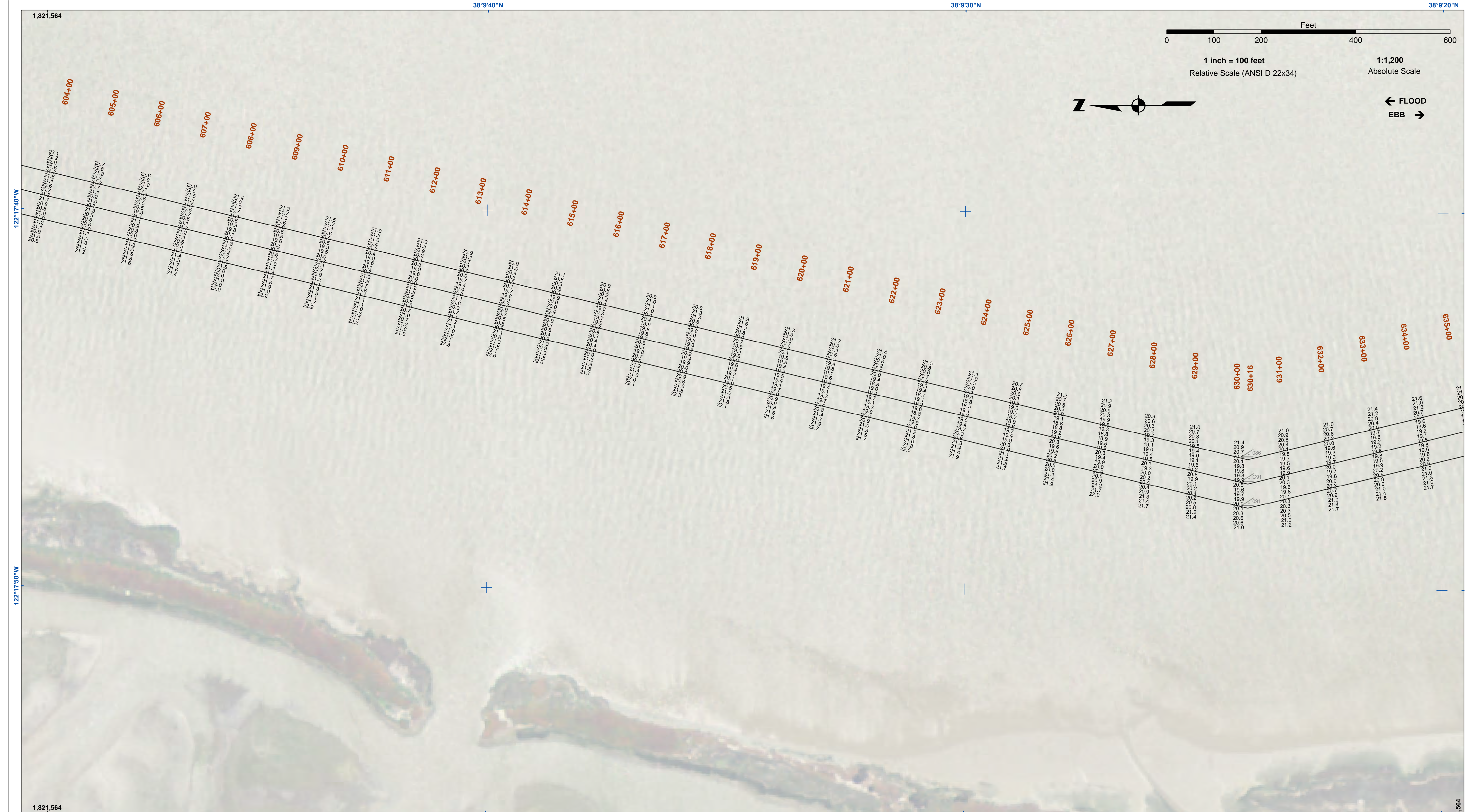


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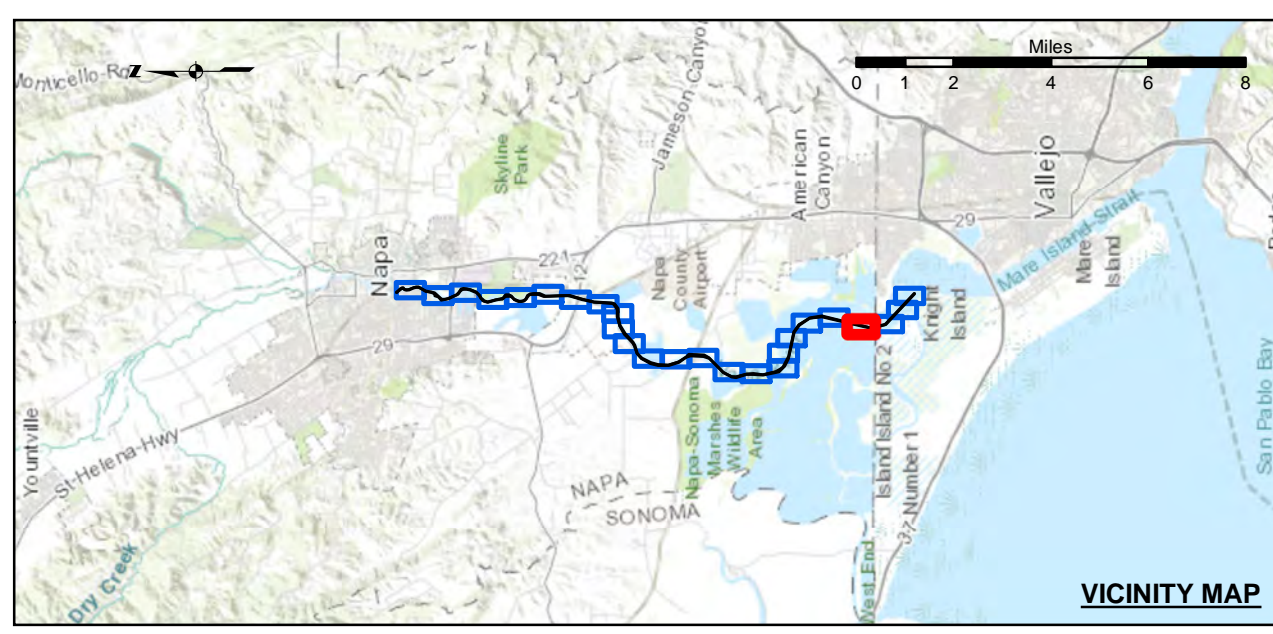
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Prepared Under the Direction of	Chart Date:
LT COLONEL C.E. CUNNINGHAM	Jul 24, 2019
Submitted by	Designed by:
Hydro Survey Team Leader	PDT
Recommended by	Checked by:
Chief, Hydro Survey Section	PDT
Approved by	Drawn by:
Chief, Construction Branch	PDT

CALIFORNIA  
 NAPA COUNTY  
**NAPA RIVER LOWER CHANNEL CONDITION SURVEY**  
 10 JULY 2019

**Sheet Reference Number**  
 22 of 25

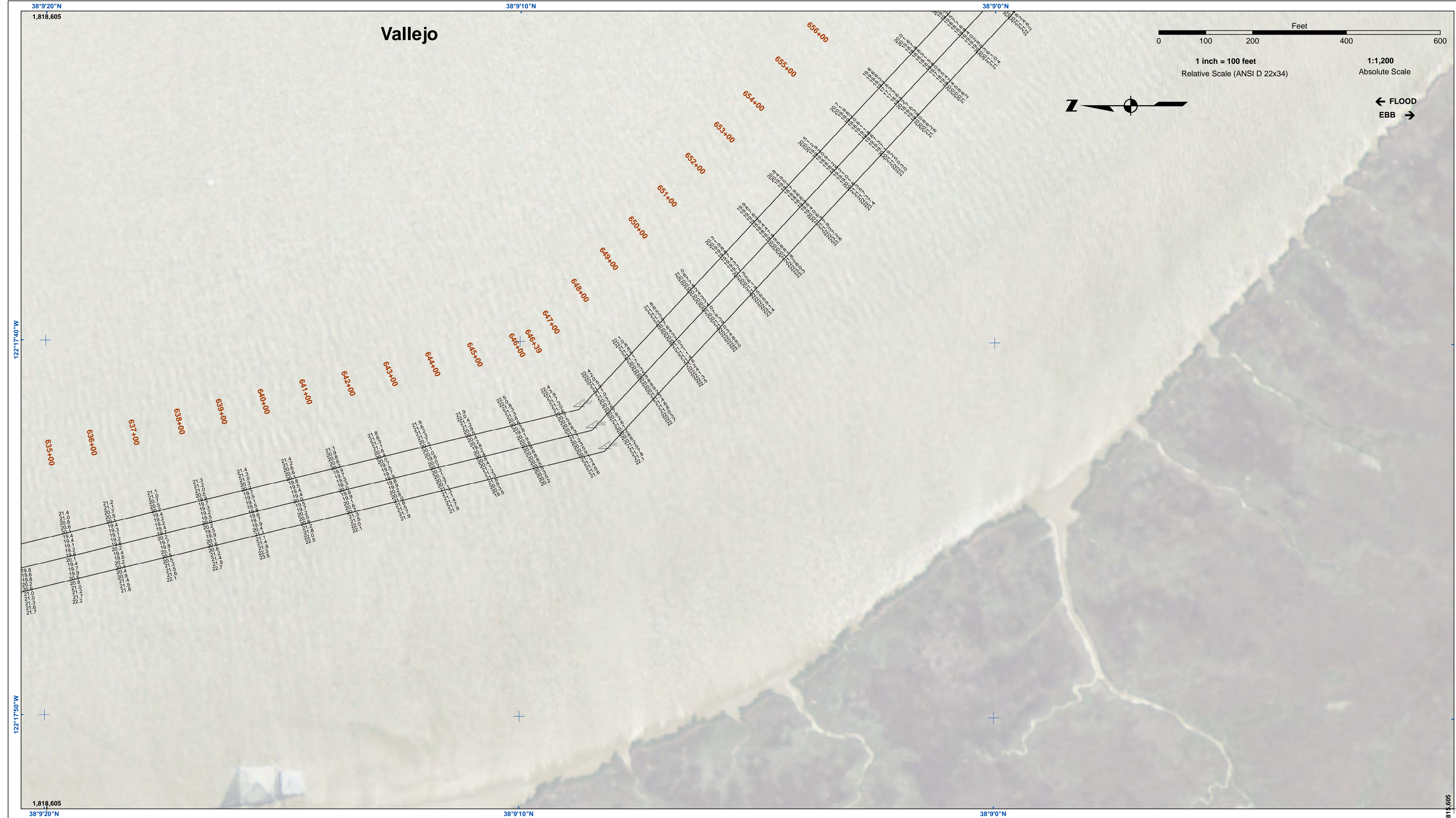


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 SOUNDINGS ARE SHOWN IN FEET AND INDICATE DEPTHS BELOW MEAN LOWER LOW WATER.  
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 \*SHOALEST SOUNDING PER QUARTER PER REACH

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 THE PROJECT DEPTH IS 15 FEET FROM ENTRANCE AT THE MARE ISLAND CAUSEWAY TO ASYLUM SLOUGH, THENCE 10 FEET TO HEAD OF NAVIGATION.  
 VERTICAL CONTROLS:  
 0+00 TO 17+00 - NRFP4 - 30.54ft - USACE - RTK BASE STATION TRANSIT 11 - 6.593m MLLW - USACE - MLLW LEVELED FROM 20 AND TIDAL 5 FROM TIDE STATION 941 5623 ON 3/29/2012.  
 176+00 TO 224+00 - NAPA01 - 2.652m MLLW, -29.111m WGS-84 - USACE - RTK BASE STATION WGS-84 ELEVATION FROM OPUS SOLUTION MLLW ELEV. CALCULATED FROM TRANSIT 11 AND NRFP4 USING RTK OBSERVATIONS PID PENDING.  
 225+00 TO 640+00 - NAPA02 - 3.653m MLLW -28.241m WGS-84 - USACE - RTK BASE STATION WGS-84 ELEVATION FROM OPUS SOLUTION MLLW ELEV. CALCULATED BY INTERPOLATING ELEVATIONS BETWEEN NOAA TIDE STATIONS 941 5623 AND 941 5218 PID PENDING.  
 641+00 TO 692+00 - NAPA03 - 3.553m MLLW -28.416m WGS-84 - USACE - RTK BASE STATION WGS-84 ELEVATION FROM OPUS SOLUTION MLLW ELEV. TRANSFERRED FROM BM 5218 J 1976 VIA RTK ON 4/10/2012 PID PENDING.





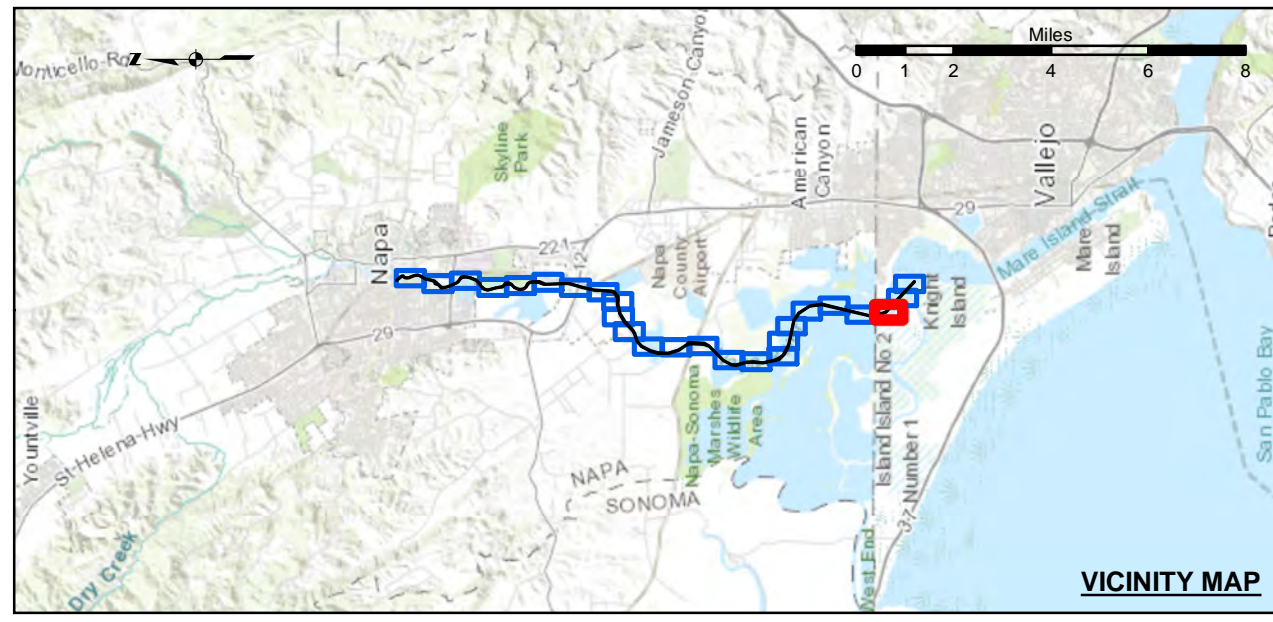
**US Army Corps of Engineers**  
 San Francisco District  
 450 Market Street  
 San Francisco, CA 94102

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Prepared Under the Direction of <b>JOHN D. CUNNINGHAM</b> LT Colonel, C.E. District Engineer	Chart Date: Jul 24, 2019
Submittal: Hydro Survey Team Leader	Designed by: PDT
Recommendation: Chief, Hydro Survey Section	Drawn by: PDT
Approval: Chief, Construction Branch	PDT

CALIFORNIA  
 NAPA COUNTY  
**NAPA RIVER  
 LOWER CHANNEL  
 CONDITION SURVEY**  
 10 JULY 2019

**Sheet  
 Reference  
 Number**  
**23 of 25**

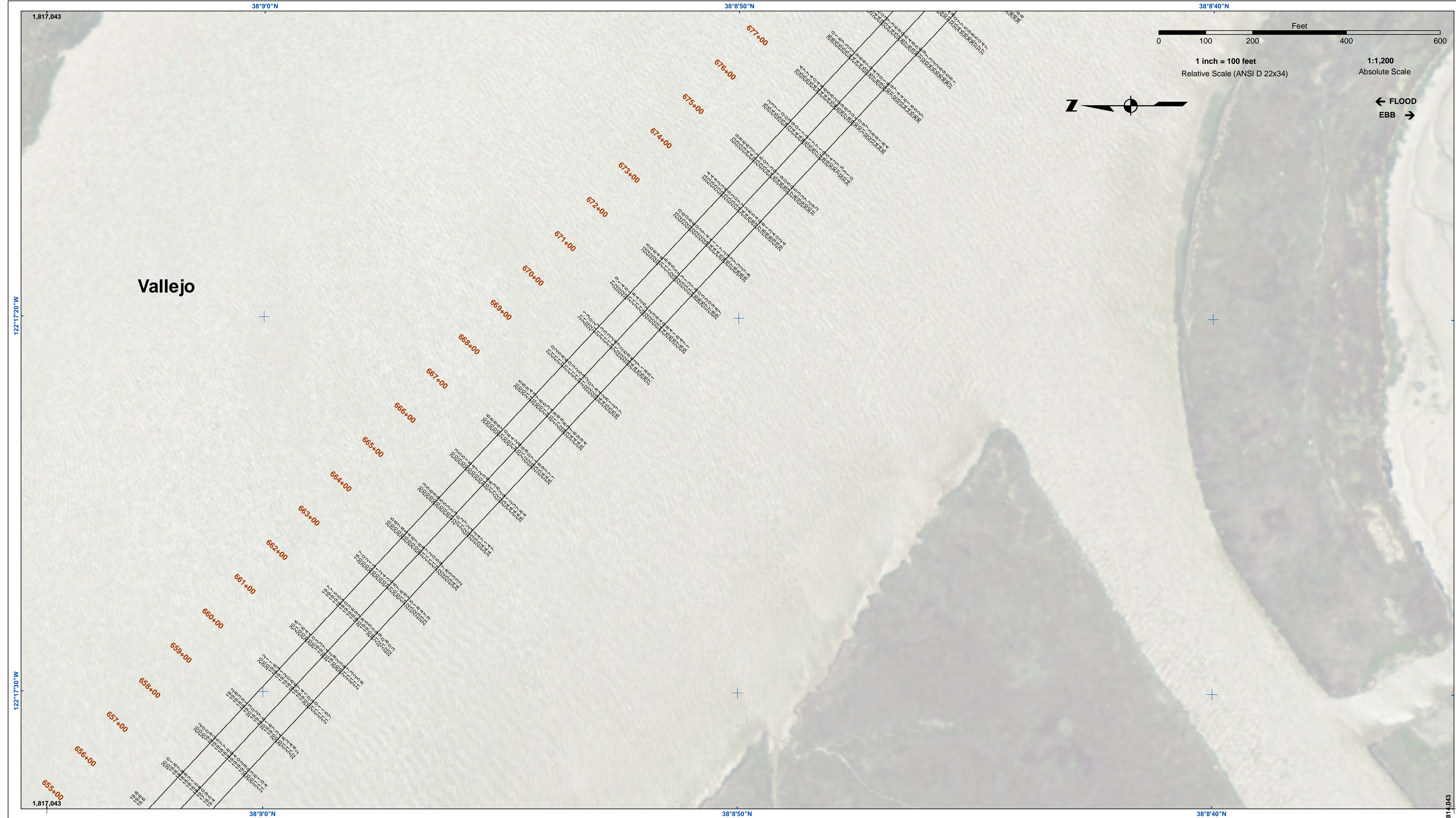


Federal Navigation Channel	Beacon, General	-15
Shoaling Area	Obstruction Point	-14
Placement Area	Navigation Buoy	-13
Anchorage Area	Navigation Buoy	-12
Wreck Area	Navigation Buoy	-11
Submerged Wreck	Shoalest Sounding*	
Angle Point		

**NOTES:**  
 HORIZONTAL COORDINATE SYSTEM:  
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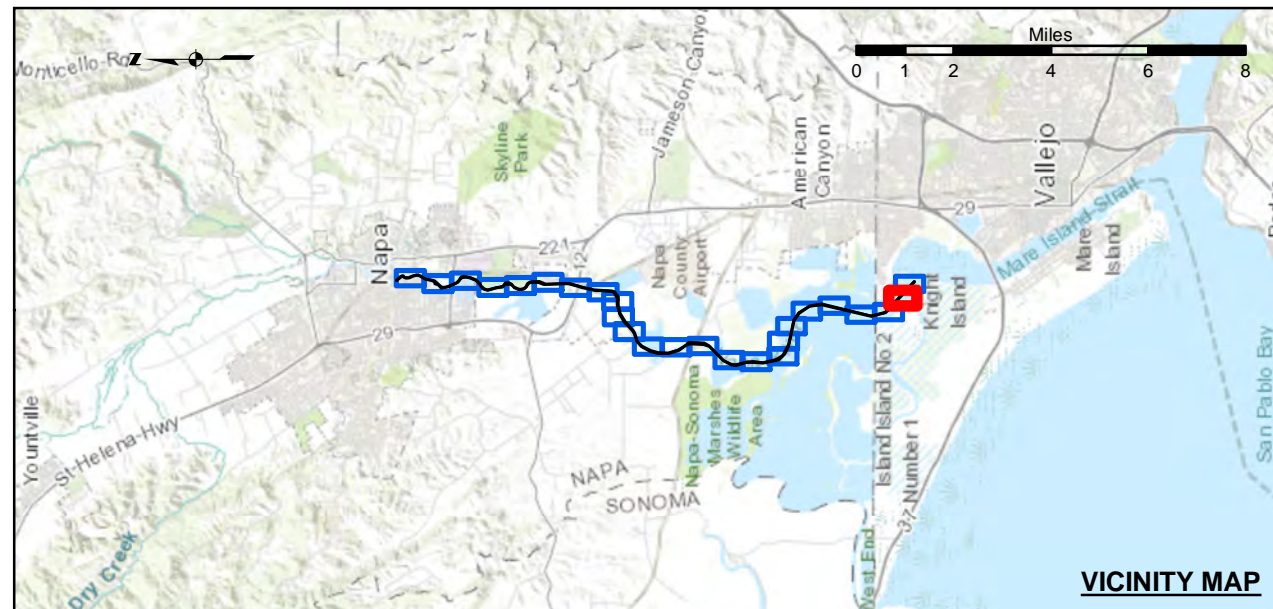


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Prepared Under the Direction of <b>JOHN D. CUNNINGHAM</b> LT COLONEL, C.E. DISTRICT ENGINEER	Chart Date: Jul 24, 2019
Subplot: Hydro Survey Team Leader	Designed by: PDT
Recommended: Chief, Hydro Survey Section	Plotted by: PDT
Approved: Chief, Construction Branch	Checked by: PDT
	Drawn by: PDT

CALIFORNIA  
**NAPA RIVER  
 LOWER CHANNEL  
 CONDITION SURVEY**  
 10 JULY 2019



Federal Navigation Channel	Beacon, General	Contours
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Placement Area	Navigation Buoy	-14
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