#### Gautho, Julia

From:	Eric Coatney <ericcoatney@yahoo.com></ericcoatney@yahoo.com>
Sent:	Thursday, March 27, 2025 2:04 PM
То:	City Council
Cc:	Luke Coatney
Subject:	[PDF] Stockton Bridge - agenda item 8B for today
Attachments:	Stockton Bridge report_Capitola agenda item 8B March 27 2025.pdf

The attachment will be presented at the meeting tonight. We'll bring some copies. We understand that you probably won't have time to read it.

Regards, Eric and Luke Coatney

On Tuesday, March 25, 2025 at 09:50:49 PM PDT, Eric Coatney <ericcoatney@yahoo.com> wrote:

Stockton Bridge has no known log jam that caused flooding since it was opened in 1934. No reason to rebuild it. The footbridge in Perry Park was shaded by two trees in 2023. Those trees were swept out to to the bay under Stockton Bridge. After storms that year, I could count over a 100 logs near the bandstand. Bridge is fine. No need to spend money on a study.

Regards, Eric Coatney 48th Avenue Capitola, CA



# Stockton Avenue Bridge

## BRIDGE PIER DEBRIS MITIGATION FEASIBILITY REPORT

June 28, 2024

The next three pages are pages 35, 54 and 55 of this report with markups. The last page is from a separate reference.

- 1. Report shows the creek will flood Capitola Village with a new bridge.
- 2. Report has two significant errors.

3. Report should be revised or rejected. Report as presented has no useful information to make a decision about steps going forward.

## CSW|ST2

Hydraulic Assessment of Debris Countermeasure Alternatives June 28, 2024

#### **Hydraulic Analysis**

Water surface elevations within Soquel Creek at the Stockton Avenue Bridge were calculated using HEC-RAS version 6.5, the Army Corps of Engineer's Hydrologic Engineering Center's River Analysis System computer program. Use of HEC-RAS to model channel hydraulics for the scenarios provided is considered appropriate as the water in the channel, at the elevations modeled, is flowing in one direction, downstream, toward the ocean during the flow event.

#### Topography

The source for topographic information in the area of the project is the County of Santa Cruz Geographic Information Systems Department.

#### Bridge

The source for dimensions of the Stockton Avenue Bridge is the As Built Plans Set from Caltrans, Document No. 40008995 for Capitola Bridge, dated October 1933.

#### Peak Flow

The peak flow used for the 100-year storm event is 17,500 cfs in accordance with the Federal Emergency Management Agency's (FEMA) Flood Insurance Study (FIS) for Santa Cruz County, CA and Incorporated Areas, FIS No. 06087CV001C.

The peak flow for the lower flow event of 1,200 cfs is pulled from the United States Geological Survey's (USGS) website, "USGS Water Data for the Nation" (waterdata.usgs.gov/nwis). USGS provides data retrieved from a flow monitoring location in Soquel Creek. Between January 2024 and March 2024 four storms produced flows of 1000 cfs or more in Soquel Creek. Large woody debris was observed to be caught below the Stockton Avenue Bridge in February 2024 and in March 2024.

#### Flooding is least likely

### Hydrograph for Unsteady Flow Analysisat low tide!

A simplified hydrograph was developed based upon the flow data for the lower peak flow storm of January 2024. The hydrograph assumes a storm flow duration of 24 hours with peak flow occurring at 9 hours and 15 minutes after the start of the flow event.

#### Starting Hydraulic Grade Line

In this preliminary analysis, to evaluate the response of hydraulic grade line upstream of the Stockton Avenue Bridge to each of the Countermeasure Alternatives, it is assumed that the tide is low and Soquel Creek flows freely at normal depth conditions toward the Pacific Ocean.

HEC-RAS Plan: Opt5US1200 River: SoquelCreek Reach: SoquelCreekUP Profile: PF 1										5 1 1 0 1		
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
SoquelCreekUP	457.43	PF 1	1200.00	0.00	4.10		4.22	0.000397	2.78	432.30	105.69	0.24
SoquelCreekUP	447.43	PF 1	1200.00	0.00	4.10		4.22	0.000393	2.76	434.34	106.24	0.24
SoquelCreekUP	433.47	PF 1	1200.00	0.00	4.09		4.21	0.000388	2.74	437.19	107.04	0.24
SoquelCreekUP	423.47	PF 1	1200.00	0.00	4.09		4.21	0.000385	2.73	439.23	107.63	0.24
SoquelCreekUP	413.47	PF 1	1200.00	0.00	4.09		4.20	0.000381	2.72	441.27	108.21	0.24
SoquelCreekUP	393.46	PF 1	1200.00	0.00	4.08		4.19	0.000375	2.69	445.38	109.37	0.24
SoquelCreekUP	373.46	PF 1	1200.00	0.00	4.07		4.18	0.000368	2.67	449.45	110.53	0.23
SoquelCreekUP	353.46	PF 1	1200.00	0.00	4.07		4.18	0.000362	2.65	453.51	111.70	0.23
SoquelCreekUP	333.46	PF 1	1200.00	0.00	4.06		4.17	0.000356	2.62	457.59	112.86	0.23
SoquelCreekUP	313.46	PF 1	1200.00	0.00	4.06		4.16	0.000350	2.60	461.66	114.03	0.23
SoquelCreekUP	293.46	PF 1	1200.00	0.00	4.05		4.15	0.000344	2.58	465.74	115.20	0.23
SoquelCreekUP	273.46	PF 1	1200.00	0.00	4.04		4.15	0.000339	2.55	469.80	116.36	0.22
SoquelCreekUP	253.46	PF 1	1200.00	0.00	4.04		4.14	0.000333	2.53	473.84	117.53	0.22
SoquelCreekUP	245.93	PF 1	1200.00	0.00	4.04		4.14	0.000331	2.52	475.40	117.97	0.22
SoquelCreekUP	228.95	PF 1	1200.00	0.00	4.03		4.13	0.000327	2.51	478.81	118.96	0.22
SoquelCreekUP	218.85	PF 1	1200.00	0.00	4.03		4.13	0.000324	2.50	480.82	119.53	0.22
SoquelCreekUP	211.97	PF 1	1200.00	0.00	4.03		4.12	0.000322	2.49	482.18	119.92	0.22
SoquelCreekUP	203.28	PF 1	1200.00	0.00	4.03		4.12	0.000318	2.47	485.48	120.80	0.22
SoquelCreekUP	195.4	PF 1	1200.00	0.00	4.02	1.45	4.12	0.000304	2.47	486.29	121.46	0.22
SoquelCreekUP	170.36		Bridge									
SoquelCreekUP	145.32	PF 1	1200.00	0.00	4.01		4.10	0.000294	2.38	505.04	126.03	0.21
SoquelCreekUP	140.31	PF 1	1200.00	0.00	4.01		4.10	0.000305	2.42	496.53	124.07	0.21
SoquelCreekUP	130.3	PF 1	1200.00	0.00	4.00		4.09	0.000324	2.48	483.37	121.08	0.22
SoquelCreekUP	120.28	PF 1	1200.00	0.00	3.99		4.09	0.000344	2.55	470.22	118.09	0.23
SoquelCreekUP	110.27	PF 1	1200.00	0.00	3.98		4.08	0.000366	2.62	457.24	115.10	0.23
SoquelCreekUP	103.87	PF 1	1200.00	0.00	3.97		4.08	0.000387	2.69	445.35	112.37	0.24
SoquelCreekUP	86.16	PF 1	1200.00	0.00	3,99		4.07	0.000266	2.26	531.51	133.52	0.20
SoquelCreekUP	76.02	PF 1	1200.00	0.00	4.00		4.06	0.000196	1.95	616.19	154.32	0.17
SoquelCreekUP	65.88	PF 1	1200.00	0.00	4.00		4.05	0.000161	1.77	677.47	169.42	0.16
SoquelCreekUP	59.74	PF 1	1200.00	0.00	4.00		4.05	0.000147	1.70	707.58	176.85	0.15
SoquelCreekUP	49.6	PF 1	1200.00	0.00	4.01		4.05	0.000131	1.61	747.58	186.74	0.14
SoquelCreekUP	38.98	PF 1	1200.00	0.00	4.01		4.04	0.000116	1.51	794.27	198.32	0.13
SoquelCreekUP	28.98	PF 1	1200.00	0.00	4.01		4.04	0.000107	1.46	824.57	206.33	0.13
SoquelCreekUP	18.98	PF 1	1200.00	0.00	4.01		4.04	0.000117	1.49	804.02	206.12	0.13
SoquelCreekUP	10	PF 1	1200.00	0.00	4.00		4.04	0.000123	1.52	791.15	206.16	0.14
SoquelCreekUP	0	PF 1	1200.00	0.00	4.00	1.32	4.04	0.000138	1.57	766.39	209.47	0.14

Error: Bottom of creek is below sea level, but it is shown as sea level in this report. Think of the Mississippi River at sea level. It may be 100' deep and a mile across. Top of river is sea level. Bottom of river is 100' below sea level.

Useful report would have readings taken at Soquel Creek at different flow rates and different tides. Ideally, there would be two flow rates where the creek is flowing across the whole creek without a sand berm. Readings at a fairly high tide would be best since flooding is most likely then. The two flow rates should be a far apart as can be to get an idea of how the top and bottom of the creek react to different flows. The design flood of 17,500 will have a higher top of creek and a lower bottom of creek than the readings. You'd need to extrapolate and make a best guess.

The tables and graphs look pretty, but give no useful information about flooding of the creek since the starting point for the computer program is not correct. If the bottom of the creek is wrong then the top of the creek is wrong.

Floods Riverview and Village! This is 170' wider than creek width at Q1200. Water will run down street and flood Village. This width is at low tide. Width and depth at high tide will be greater.

Alternative 5 Q17500

Reach  River Sta  Profile  O Totat  Min Ch El  W.S. Elev  Cit. W/S.  E.G. Slope  Vel Cht  Flow Area  TopWidth  Froude # Cht    SoquelCreekUP  447.43  PF 1  17500.00  0.00  13.13  15.00  0.001634  11.32  1835.27  283.91  0.57    SoquelCreekUP  433.47  PF 1  17500.00  0.00  13.91  14.98  0.001775  11.15  1807.77  283.86  0.58    SoquelCreekUP  433.47  PF 1  17500.00  0.00  12.27  14.47  0.001780  11.05  1794.74  292.16  0.58    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.27  14.73  0.001980  11.92  1294.67  0.02  294.65  0.02  294.55  0.02  294.55  0.02  294.55  0.02  294.55  0.02  294.54  0.02  294.54  0.02  294.54  0.02  294.54  0.02  294.54  0.02  294.54  0.02 </th <th>HEC-RAS Plan: Op</th> <th>Dt5QS17500 F</th> <th>River: Soquei</th> <th>Freek Reach: S</th> <th>SoquelCreekU</th> <th>P Profile: PF</th> <th>1</th> <th></th> <th></th> <th></th> <th></th> <th>,</th> <th></th>	HEC-RAS Plan: Op	Dt5QS17500 F	River: Soquei	Freek Reach: S	SoquelCreekU	P Profile: PF	1					,	
creat  c(cs)  (ft)  <	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chal	Flow Area	Top Width	Froude # Chl
SoquelCreekUP  447.43  PF1  17500.00  0.00  13.13  15.00  0.001634  11.32  188.27  283.81  0.57    SoquelCreekUP  43.347  PF1  17500.00  0.00  13.09  14.98  0.00173  11.15  189.27  282.83  0.58    SoquelCreekUP  43.347  PF1  17500.00  0.00  12.87  14.48  0.001725  11.15  189.271  228.58  0.58    SoquelCreekUP  333.46  PF1  17500.00  0.00  12.27  14.78  0.001780  11.16  1794.74  229.15  0.58    SoquelCreekUP  333.46  PF1  17500.00  0.00  12.20  9.15  14.63  0.001991  11.82  199.50  0.62    SoquelCreekUP  233.46  PF1  17500.00  0.00  12.23  9.10  14.58  0.001991  11.82  159.24  290.55  0.62    SoquelCreekUP  233.46  PF1  17500.00  0.00  12.21  14.47 </td <td></td> <td></td> <td></td> <td>(cfs)</td> <td>(ft)</td> <td>(ft)</td> <td>(ft)</td> <td>(ft)</td> <td>(ft/ft)</td> <td>(ft/s)</td> <td>(sq ft)</td> <td>(ft)</td> <td></td>				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
SoguelCreekUP  447.43  PF 1  17500.00  0.00  13.09  14.94  0.001713  11.138  1817.73  282.83  0.58    SoguelCreekUP  433.47  PF 1  17500.00  0.00  13.01  14.94  0.001713  11.17  182.07  285.66  0.58    SoguelCreekUP  43.87  PF 1  17500.00  0.00  12.87  14.89  0.001762  11.15  182.07  285.66  0.58    SoguelCreekUP  33.46  PF 1  17500.00  0.00  12.27  14.79  0.001762  11.55  1664.13  294.57  0.65    SoguelCreekUP  33.46  PF 1  17500.00  0.00  12.26  9.23  14.68  0.001961  11.82  1618.2  1619.37  294.57  0.62  200.45  0.02  12.33  9.10  14.58  0.001981  11.82  153.25.4  200.49  0.62  200.49  0.62  200.49  0.62  200.42  14.47  0.001912  11.82  153.26  12.	SoquelCreekUP	457.43	PF 1	17500.00	0.00	13.13		15.00	0.001634	11.32	1836.27	283.91	0.57
Soque(CreekUP  433.47  PF 1  1750.00  0.00  13.11  14.49  0.001725  11.17  Neg0.46  287.45  0.58    Soque(CreekUP  43.347  PF 1  17500.00  0.00  12.87  14.49  0.001725  11.17  1789.04  287.16  0.58    Soque(CreekUP  33.46  PF 1  17500.00  0.00  12.27  14.73  0.001726  11.17  187.97  0.60    Soque(CreekUP  33.346  PF 1  17500.00  0.00  12.26  9.23  14.46  0.001980  11.82  1672.24  290.55  0.62    Soque(CreekUP  33.346  PF 1  17500.00  0.00  12.30  9.10  14.45  0.001926  11.82  168.52  200.45  0.62    Soque(CreekUP  233.46  PF 1  17500.00  0.00  12.31  14.47  0.001926  11.82  168.32  20.45  0.62    Soque(CreekUP  23.46  PF 1  17500.00  0.00  12.41  14	SoquelCreekUP	447.43	PF 1	17500.00	0.00	13.09		14.98	0.001679	11.39	1817.73	282.83	0.58
SoquelCreekUP  423.47  PF 1  1750.00  0.00  13.09  14.92  0.001762  11.15  1827,11  285,66  0.58    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.87  14.49  0.001762  11.76  176936  287,16  0.58    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.82  9.23  14.68  0.001963  11.92  162.94  22.94  0.065  0.62    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.33  9.10  14.83  0.001963  11.86  1532.21  284.59  0.62    SoquelCreekUP  233.46  PF 1  17500.00  0.00  12.34  14.52  0.001936  11.86  1532.24  200.49  0.62    SoquelCreekUP  233.46  PF 1  1750.00  0.00  12.41  14.47  0.001936  11.86  1532.54  200.49  0.62    SoquelCreekUP  253.89  PF 1  17500.00 <t< td=""><td>SoquelCreekUP</td><td>433.47</td><td>PF 1</td><td>17500.00</td><td>0.00</td><td>13.11</td><td></td><td>14.94</td><td>0.001713</td><td>11.17</td><td>1830.46</td><td>287.45</td><td>0.58</td></t<>	SoquelCreekUP	433.47	PF 1	17500.00	0.00	13.11		14.94	0.001713	11.17	1830.46	287.45	0.58
SoquelCreekUP  413.47  PF 1  1750.00  0.00  12.87  14.89  0.001762  11.71  1769.98  227.16  0.58    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.27  14.73  0.001780  11.69  1794.74  229.57  0.68    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.26  9.23  14.48  0.001980  11.92  1622.94  200.55  0.62    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.30  9.10  14.58  0.001980  11.82  1638.21  284.15  0.62    SoquelCreekUP  233.46  PF 1  17500.00  0.00  12.31  14.47  0.001912  11.82  1538.21  284.50  0.64  56  0.62  50  0.62  50  0.62  50  0.62  50  0.62  50  0.62  50  0.62  50  0.62  50  0.62  50  14.21  0.002718  11	SoquelCreekUP	423.47	PF 1	17500.00	0.00	13.09		14.92	0.001725	11.15	1821,71	285.66	0.58
Soque(CreekUP  393.46  PF 1  17500.00  0.00  12.87  14.79  0.001780  11.05  1794.74  292.15  0.58    Soque(CreekUP  333.46  PF 1  17500.00  0.00  12.52  9.23  14.68  0.001986  11.92  1694.13  294.57  0.66    Soque(CreekUP  333.46  PF 1  17500.00  0.00  12.30  9.10  14.63  0.001986  11.82  1619.37  294.57  0.62    Soque(CreekUP  333.46  PF 1  17500.00  0.00  12.33  9.10  14.52  0.001936  11.82  1532.24  224.15  0.62    Soque(CreekUP  223.46  PF 1  17500.00  0.00  12.31  14.47  0.001926  11.82  1532.24  204.49  0.62    Soque(CreekUP  228.46  PF 1  17500.00  0.00  12.41  14.34  0.002355  11.29  154.37  177.11  0.66    Soque(CreekUP  228.85  PF 1  17500.00	SoquelCreekUP	413.47	PF 1	17500.00	0.00	12.87		14.89	0.001762	11.71	1769.96	287.16	0.58
SoquelCreekUP  373.46  PF 1  17500.00  0.00  12.70  14.73  0.001920  11.59  1694.13  29487  0.60    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.52  9.23  14.68  0.001981  11.82  1622.94  280.56  0.62    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.33  9.10  14.58  0.001998  11.86  1532.54  220.54  0.62    SoquelCreekUP  233.46  PF 1  17500.00  0.00  12.34  144.47  0.001912  11.82  1532.60  184.58  0.61    SoquelCreekUP  23.46  PF 1  17500.00  0.00  12.41  14.47  0.002365  11.24  1556.87  1779.15  0.66    SoquelCreekUP  28.65  PF 1  17500.00  0.00  12.20  144.27  0.002145  11.24  1509.77  160.75  0.66    SoquelCreekUP  28.65  PF 1  17500.00  0.00	SoquelCreekUP	393.46	PF 1	17500.00	0.00	12.97		14.79	0.001780	11.05	1794.74	292.15	0.58
SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.52  9.23  14.68  0.001966  11.92  162.24  220.55  0.62    SoquelCreekUP  333.46  PF 1  17500.00  0.00  12.50  9.15  14.63  0.001981  11.82  1619.37  289.59  0.62    SoquelCreekUP  233.46  PF 1  17500.00  0.00  12.34  14.52  0.001936  11.86  1532.54  200.49  0.62    SoquelCreekUP  233.46  PF 1  17500.00  0.00  12.21  144.47  0.001912  11.82  1532.54  200.49  0.62    SoquelCreekUP  245.33  PF 1  17500.00  0.00  12.20  144.31  0.002315  11.29  1543.77  166.75  0.66    SoquelCreekUP  218.85  PF 1  17500.00  0.00  12.20  144.27  0.002171  11.54  1550.75  0.66    SoquelCreekUP  218.85  PF 1  17500.00  0.00  12.20	SoquelCreekUP	373.46	PF 1	17500.00	0.00	12.70		14.73	0.001920	11.59	1694.13	294.87	0.60
SoquelCreekUP  33.46  PF 1  17500.00  0.00  12.50  9.15  14.63  0.001861  11.82  1619.37  228.58  0.62    SoquelCreekUP  233.46  PF 1  17500.00  0.00  12.33  9.10  14.58  0.001996  11.86  1536.21  264.15  0.62    SoquelCreekUP  233.46  PF 1  17500.00  0.00  12.31  14.47  0.001912  11.82  1532.64  200.49  0.62    SoquelCreekUP  253.46  PF 1  17500.00  0.00  12.41  14.37  0.002435  11.24  1558.67  177.11  0.66    SoquelCreekUP  228.95  PF 1  17500.00  0.00  12.20  14.27  0.00217  11.54  150.05  161.74  0.64    SoquelCreekUP  23.28  PF 1  17500.00  0.00  12.20  14.26  0.00217  11.54  150.05  161.74  0.64    SoquelCreekUP  23.28  PF 1  17500.00  0.00  1	SoquelCreekUP	353.46	PF 1	17500.00	0.00	12.52	9.23	14.68	0.001986	11.92	1622.94	290.55	0.62
SoquelCreekUP  33.46  PF 1  17500.00  0.00  12.33  9.10  14.58  0.001999  12.09  1536.21  254.15  0.62    SoquelCreekUP  233.46  PF 1  17500.00  0.00  12.34  14.52  0.001936  11.86  1532.54  200.49  0.62    SoquelCreekUP  253.46  PF 1  17500.00  0.00  12.31  14.47  0.001912  11.82  1552.60  144.58  0.61    SoquelCreekUP  253.46  PF 1  17500.00  0.00  12.20  14.31  0.002315  11.29  1549.77  169.75  0.66    SoquelCreekUP  218.85  PF 1  17500.00  0.00  12.20  14.27  0.00217  11.54  150.73  150.45  0.64    SoquelCreekUP  219.7  PF 1  17500.00  0.00  12.20  14.23  0.00274  11.61  150.79  143.18  0.63    SoquelCreekUP  195.4  PF 1  17500.00  0.00  11.28	SoquelCreekUP	333.46	PF 1	17500.00	0.00	12.50	9.15	14.63	0.001981	11.82	1619.37	289.58	0.62
Sogue(CreekUP  293.46  PF 1  17500.00  0.00  12.34  14.52  0.001912  11.86  1532.54  200.49  0.62    Soque(CreekUP  253.46  PF 1  17500.00  0.00  12.31  14.47  0.001912  11.82  1556.87  177.15  0.67    Soque(CreekUP  226.96  PF 1  17500.00  0.00  12.40  14.31  0.002315  11.24  1556.87  177.11  0.66    Soque(CreekUP  228.95  PF 1  17500.00  0.00  12.20  14.21  0.002117  11.54  1552.05  161.74  0.66    Soque(CreekUP  219.97  PF 1  17500.00  0.00  12.20  14.26  0.002174  11.61  1507.05  0.66    Soque(CreekUP  293.48  PF 1  17500.00  0.00  12.20  14.21  0.001841  11.71  1494.36  0.43.82    Soque(CreekUP  195.4  PF 1  17500.00  0.00  12.08  8.71  14.21  0.001851	SoquelCreekUP	313.46	PF 1	17500.00	0.00	12.33	9.10	14.58	0.001999	12.09	1536.21	254.15	0.62
SoquelCreekUP  273.46  PF 1  17500.00  0.00  12.31  14.47  0.001912  11.82  1532.60  184.58  0.61    SoquelCreekUP  225.346  PF 1  17500.00  0.00  12.41  14.37  0.002355  11.19  1568.72  177.11  0.66    SoquelCreekUP  228.95  PF 1  17500.00  0.00  12.20  14.27  0.002315  11.29  1549.77  169.75  0.66    SoquelCreekUP  218.85  PF 1  17500.00  0.00  12.20  14.27  0.002173  11.54  1520.05  161.74  0.64    SoquelCreekUP  218.85  PF 1  17500.00  0.00  12.20  14.27  0.002173  11.51  150.45  0.64    SoquelCreekUP  195.4  PF 1  17500.00  0.00  12.08  8.71  14.21  0.002174  11.61  1507.90  143.18  0.63    SoquelCreekUP  145.32  PF 1  17500.00  0.00  11.89  13.33	SoquelCreekUP	293.46	PF 1	17500.00	0.00	12.34		14.52	0.001936	11.86	1532.54	200.49	0.62
Sogue(CreekUP  283.46  PF 1  17500.00  0.00  12.41  14.37  0.002435  11.24  1556.87  179.15  0.67    Soque(CreekUP  285.95  PF 1  17500.00  0.00  12.32  14.31  0.002315  11.29  1549.77  168.75  0.66    Soque(CreekUP  218.85  PF 1  17500.00  0.00  12.20  14.27  0.002117  11.54  1520.05  161.74  0.64    Soque(CreekUP  211.97  PF 1  17500.00  0.00  12.20  14.22  0.002137  11.54  1520.05  161.74  0.64    Soque(CreekUP  195.4  PF 1  17500.00  0.00  12.08  8.71  14.21  0.001861  11.151  1528.91  148.82  0.62    Soque(CreekUP  145.32  PF 1  17500.00  0.00  11.89  13.93  0.001851  11.45  1528.91  148.71  0.62    Soque(CreekUP  140.31  PF 1  17500.00  0.00  11.86	SoquelCreekUP	273.46	PF 1	17500.00	0.00	12.31		14.47	0.001912	11.82	1532.60	184.58	0.61
Soque(CreekUP  245.93  PF 1  17500.00  0.00  12.40  14.34  0.002365  11.19  1563.72  177.11  0.66    Soque(CreekUP  228.95  PF 1  17500.00  0.00  12.20  14.21  0.002315  11.29  1549.77  169.75  0.66    Soque(CreekUP  218.95  PF 1  17500.00  0.00  12.20  144.26  0.002178  11.52  1519.73  150.45  0.64    Soque(CreekUP  203.28  PF 1  17500.00  0.00  12.08  8.71  14.21  0.001411  11.61  150.70  143.18  0.63    Soque(CreekUP  195.4  PF 1  17500.00  0.00  12.08  8.71  14.21  0.01841  11.71  149.46  0.60    Soque(CreekUP  143.32  PF 1  17500.00  0.00  11.89  13.93  0.001851  11.45  152.91  148.64  0.60    Soque(CreekUP  140.31  PF 1  17500.00  0.00  11.85 <td< td=""><td>SoquelCreekUP</td><td>253.46</td><td>PF 1</td><td>17500.00</td><td>0.00</td><td>12.41</td><td></td><td>14.37</td><td>0.002435</td><td>11.24</td><td>1556.87</td><td>179.15</td><td>0.67</td></td<>	SoquelCreekUP	253.46	PF 1	17500.00	0.00	12.41		14.37	0.002435	11.24	1556.87	179.15	0.67
Soque(CreekUP  228.95  PF 1  17500.00  0.00  12.32  14.31  0.002315  11.29  1549.77  169.75  0.66    Soque(CreekUP  211.97  PF 1  17500.00  0.00  12.20  14.27  0.002138  11.52  1519.73  150.45  0.64    Soque(CreekUP  203.28  PF 1  17500.00  0.00  12.14  14.23  0.00274  11.61  150.73  150.45  0.64    Soque(CreekUP  195.4  PF 1  17500.00  0.00  12.08  8.71  14.21  0.001841  11.71  149.36  143.82  0.62    Soque(CreekUP  145.32  PF 1  17500.00  0.00  11.89  13.93  0.001851  11.45  1528.91  148.64  0.60    Soque(CreekUP  140.31  PF 1  17500.00  0.00  11.87  13.92  0.002036  11.47  152.51  143.71  0.62    Soque(CreekUP  10.27  PF 1  17500.00  0.00  11.88 <td< td=""><td>SoquelCreekUP</td><td>245.93</td><td>PF 1</td><td>17500.00</td><td>0.00</td><td>12.40</td><td></td><td>14.34</td><td>0.002365</td><td>11.19</td><td>1563.72</td><td>177.11</td><td>0.66</td></td<>	SoquelCreekUP	245.93	PF 1	17500.00	0.00	12.40		14.34	0.002365	11.19	1563.72	177.11	0.66
Soque(CreekUP  218.85  PF 1  17500.00  0.00  12.20  14.27  0.002117  11.54  1520.05  161.74  0.64    Soque(CreekUP  211.97  PF 1  17500.00  0.00  12.20  14.26  0.002138  11.52  1519.73  150.45  0.64    Soque(CreekUP  195.4  PF 1  17500.00  0.00  12.14  142.21  0.001841  11.11  1494.36  143.82  0.62    Soque(CreekUP  170.36  Bridge	SoquelCreekUP	228.95	PF 1	17500.00	0.00	12.32		14.31	0.002315	11.29	1549.77	169.75	0.66
Soque(CreekUP  211.97  PF 1  17500.00  0.00  12.20  14.26  0.002138  11.52  1519.73  150.45  0.64    Soque(CreekUP  203.28  PF 1  17500.00  0.00  12.14  14.23  0.002074  11.61  1507.90  143.18  0.63    Soque(CreekUP  195.4  PF 1  17500.00  0.00  12.08  8.71  14.21  0.01841  11.61  1507.90  143.82  0.62    Soque(CreekUP  170.36  Bridge     13.93  0.001851  11.45  1528.91  148.64  0.60    Soque(CreekUP  130.3  PF 1  17500.00  0.00  11.87  13.92  0.002235  11.41  1421.37  137.80  0.68    Soque(CreekUP  120.28  PF 1  17500.00  0.00  10.88  9.27  13.64  0.002633  13.34  1312.21  156.21  0.81    Soque(CreekUP  10.3.87  PF 1  17500.00  0.00  8.15	SoquelCreekUP	218.85	PF 1	17500.00	0.00	12.20		14.27	0.002117	11.54	1520.05	161.74	0.64
SoquelCreekUP  203.28  PF 1  17500.00  0.00  12.14  14.23  0.002074  11.61  1507.90  143.18  0.63    SoquelCreekUP  195.4  PF 1  17500.00  0.00  12.08  8.71  14.21  0.001841  11.71  1494.36  143.82  0.62    SoquelCreekUP  145.32  PF 1  17500.00  0.00  11.89  13.93  0.001851  11.45  1528.91  143.64  0.60    SoquelCreekUP  140.31  PF 1  17500.00  0.00  11.87  13.92  0.002036  11.47  1525.11  143.71  0.62    SoquelCreekUP  120.28  PF 1  17500.00  0.00  10.88  9.27  13.64  0.00333  13.34  131.21  136.62  0.8  0.01851  11.51  147.73  1.00    SoquelCreekUP  10.37  PF 1  17500.00  0.00  9.62  62  13.50  0.005676  15.80  111.151  147.73  1.00    SoquelCreek	SoquelCreekUP	211.97	PF 1	17500.00	0.00	12.20		14.26	0.002138	11.52	1519.73	150.45	0.64
SoquelCreekUP  195.4  PF 1  17500.00  0.00  12.08  8.71  14.21  0.001841  11.71  1494.36  143.82  0.62    SoquelCreekUP  170.36  PF 1  17500.00  0.00  11.89  13.93  0.001841  11.45  1528.91  148.64  0.60    SoquelCreekUP  140.31  PF 1  17500.00  0.00  11.89  13.93  0.001261  11.45  1528.91  148.64  0.60    SoquelCreekUP  130.3  PF 1  17500.00  0.00  11.85  13.80  0.002425  12.31  1421.37  137.80  0.68    SoquelCreekUP  120.28  PF 1  17500.00  0.00  10.86  9.27  13.64  0.003633  13.34  1312.21  156.21  0.81    SoquelCreekUP  103.87  PF 1  17500.00  0.00  8.15  8.15  12.16  0.005653  16.06  1090.40  139.30  1.00    SoquelCreekUP  76.58  PF 1  17500.00 <t< td=""><td>SoquelCreekUP</td><td>203.28</td><td>PF 1</td><td>17500.00</td><td>0.00</td><td>12.14</td><td></td><td>14.23</td><td>0.002074</td><td>11.61</td><td>1507.90</td><td>143.18</td><td>0.63</td></t<>	SoquelCreekUP	203.28	PF 1	17500.00	0.00	12.14		14.23	0.002074	11.61	1507.90	143.18	0.63
SoquelCreekUP  170.36  Bridge	SoquelCreekUP	195.4	PF 1	17500.00	0.00	12.08	8.71	14.21	0.001841	11.71	1494.36	143.82	0.62
SoquelCreekUP  145.32  PF 1  17500.00  0.00  11.89  13.93  0.001851  11.45  1528.91  148.64  0.60    SoquelCreekUP  140.31  PF 1  17500.00  0.00  11.87  13.92  0.002036  11.47  1525.11  143.71  0.62    SoquelCreekUP  130.3  PF 1  17500.00  0.00  11.87  13.80  0.002425  12.31  1421.37  137.80  0.68    SoquelCreekUP  120.28  PF 1  17500.00  0.00  10.98  13.67  0.002923  13.16  1331.51  137.93  0.74    SoquelCreekUP  10.27  PF 1  17500.00  0.00  9.62  9.62  13.50  0.005676  15.80  111.51  147.73  1.00    SoquelCreekUP  86.16  PF 1  17500.00  0.00  7.37  7.37  11.05  0.005663  16.06  1190.40  139.30  1.00    SoquelCreekUP  65.88  PF 1  1750.00  0.00  6.	SoquelCreekUP	170.36		Bridge	7 6								
SoquelCreekUP  140.31  PF 1  17500.00  0.00  11.87  13.92  0.002036  11.47  1525.11  143.71  0.62    SoquelCreekUP  130.3  PF 1  17500.00  0.00  11.45  13.80  0.002425  12.31  1421.37  137.80  0.68    SoquelCreekUP  120.28  PF 1  17500.00  0.00  10.98  13.67  0.002923  13.16  1331.51  137.93  0.74    SoquelCreekUP  10.27  PF 1  17500.00  0.00  10.88  9.27  13.64  0.003633  13.34  1312.21  156.21  0.81    SoquelCreekUP  103.87  PF 1  17500.00  0.00  8.15  8.15  12.16  0.005653  16.06  1090.40  139.30  1.00    SoquelCreekUP  76.02  PF 1  17500.00  0.00  6.73  6.73  10.38  0.00573  14.92  1173.01  169.85  1.00    SoquelCreekUP  59.74  PF 1  17500.00  0	SoquelCreekUP	145.32	PF 1	17500.00	0.00	11.89		13.93	0.001851	11.45	1528.91	148.64	0.60
SoquelCreekUP  130.3  PF 1  17500.00  0.00  11.45  13.80  0.002425  12.31  1421.37  137.80  0.68    SoquelCreekUP  120.28  PF 1  17500.00  0.00  10.98  13.67  0.002923  13.16  1331.51  137.93  0.74    SoquelCreekUP  110.27  PF 1  17500.00  0.00  10.88  9.27  13.64  0.003633  13.34  1312.21  156.21  0.81    SoquelCreekUP  103.87  PF 1  17500.00  0.00  8.15  8.15  12.16  0.005676  15.80  1111.51  147.73  1.00    SoquelCreekUP  86.16  PF 1  17500.00  0.00  7.37  7.37  11.05  0.005663  16.06  1090.40  139.30  1.00    SoquelCreekUP  65.88  PF 1  17500.00  0.00  6.92  6.92  10.38  0.005734  14.70  1190.18  177.25  1.00    SoquelCreekUP  59.74  PF 1  17500	SoquelCreekUP	140.31	PF 1	17500.00	0.00	11.87		13.92	0.002036	11.47	1525.11	143.71	0.62
SoquelCreekUP120.28PF 117500.000.0010.9813.670.00292313.161331.51137.930.74SoquelCreekUP110.27PF 117500.000.0010.889.2713.640.00363313.341312.21156.210.81SoquelCreekUP103.87PF 117500.000.009.629.6213.500.00567615.801111.51147.731.00SoquelCreekUP86.16PF 117500.000.008.158.1512.160.00565316.061090.40139.301.00SoquelCreekUP76.02PF 117500.000.007.377.3711.050.00568915.381137.69154.861.00SoquelCreekUP65.88PF 117500.000.006.926.9210.380.00572314.921173.01169.851.00SoquelCreekUP59.74PF 117500.000.006.736.7310.090.00573414.701190.18177.251.00SoquelCreekUP49.6PF 11750.000.007.309.570.00346012.081448.60198.820.79SoquelCreekUP38.98PF 11750.000.007.449.460.80313411.411533.92206.960.74SoquelCreekUP18.98PF 11750.000.007.449.460.80313411.411533.92206.960.74SoquelCreekUP18.98PF 11750.	SoquelCreekUP	130.3	PF 1	17500.00	<b>〈</b> 0.00	11.45		13.80	0.002425	12.31	1421.37	137.80	0.68
SoquelCreekUP  110.27  PF 1  17500.00  0.00  10.88  9.27  13.64  0.003633  13.34  1312.21  156.21  0.81    SoquelCreekUP  103.87  PF 1  17500.00  0.00  9.62  13.50  0.005676  15.80  1111.51  147.73  1.00    SoquelCreekUP  86.16  PF 1  17500.00  0.00  8.15  8.15  12.16  0.005653  16.06  1090.40  139.30  1.00    SoquelCreekUP  76.02  PF 1  17500.00  0.00  7.37  7.37  11.05  0.005689  15.38  1137.69  154.86  1.00    SoquelCreekUP  65.88  PF 1  17500.00  0.00  6.92  10.38  0.005734  14.92  1173.01  169.85  1.00    SoquelCreekUP  59.74  PF 1  1750.00  0.00  6.97  6.49  9.78  0.004561  13.44  1302.23  187.14  0.90    SoquelCreekUP  38.98  PF 1  1750.00 <td>SoquelCreekUP</td> <td>120.28</td> <td>PF 1</td> <td>17500.00</td> <td>0.00</td> <td>10.98</td> <td></td> <td>13.67</td> <td>0.002923</td> <td>13.16</td> <td>1331.51</td> <td>137.93</td> <td>0.74</td>	SoquelCreekUP	120.28	PF 1	17500.00	0.00	10.98		13.67	0.002923	13.16	1331.51	137.93	0.74
SoquelCreekUP103.87PF 117500.000.009.629.6213.500.00567615.801111.51147.731.00SoquelCreekUP86.16PF 117500.000.008.158.1512.160.00565316.061090.40139.301.00SoquelCreekUP76.02PF 117500.000.007.377.3711.050.00568915.381137.69154.861.00SoquelCreekUP65.88PF 117500.000.006.926.9210.380.00572314.921173.01169.851.00SoquelCreekUP59.74PF 117500.000.006.736.7310.090.00573414.701190.18177.251.00SoquelCreekUP49.6PF 117500.000.006.976.499.780.00456113.441302.23187.140.90SoquelCreekUP38.98PF 117500.000.007.309.570.0346012.081448.60198.820.79SoquelCreekUP28.98PF 117500.000.007.239.410.00347811.861475.24211.820.79SoquelCreekUP18.98PF 117500.000.007.166.269.380.00373011.961462.96219.520.82SoquelCreekUP10PF 117500.000.007.166.269.380.00373011.961462.96219.520.82SoquelCreekUP0PF	SoquelCreekUP	110.27	PF 1	17500.00	0.00	10.88	9.27	13.64	0.003633	13.34	1312.21	156.21	0.81
SoquelCreekUP86.16PF 117500.000.008.158.1512.160.00565316.061090.40139.301.00SoquelCreekUP76.02PF 117500.000.007.377.3711.050.00568915.381137.69154.861.00SoquelCreekUP65.88PF 117500.000.006.926.9210.380.00572314.921173.01169.851.00SoquelCreekUP59.74PF 117500.000.006.736.7310.090.00573414.701190.18177.251.00SoquelCreekUP49.6PF 117500.000.006.976.499.780.00456113.441302.23187.140.90SoquelCreekUP38.98PF 117500.000.007.309.570.00346012.081448.60198.820.79SoquelCreekUP28.98PF 117500.000.007.449.460.80313411.411533.92206.960.74SoquelCreekUP18.98PF 117500.000.007.239.410.00347811.861475.24211.820.79SoquelCreekUP10PF 117500.000.007.166.269.380.00373011.961462.96219.520.82SoquelCreekUP0PF 117500.000.007.166.269.380.00373011.961462.96219.520.82SoquelCreekUP0PF 117500.00	SoquelCreekUP	103.87	PF 1	17500.00	) 0.00	9.62	9.62	13.50	0.005676	15.80	1111.51	147.73	1.00
SoquelCreekUP76.02PF 117500.000.007.377.3711.050.00568915.381137.69154.861.00SoquelCreekUP65.88PF 117500.000.006.926.9210.380.00572314.921173.01169.851.00SoquelCreekUP59.74PF 117500.000.006.736.7310.090.00573414.701190.18177.251.00SoquelCreekUP49.6PF 117500.000.006.976.499.780.00456113.441302.23187.140.90SoquelCreekUP38.98PF 117500.000.007.309.570.00346012.081448.60198.820.79SoquelCreekUP28.98PF 117500.000.007.239.410.00347811.861475.24211.820.79SoquelCreekUP18.98PF 117500.000.007.166.269.380.00373011.961462.96219.520.82SoquelCreekUP10PF 117500.000.007.166.269.380.00373011.961462.96219.520.82SoquelCreekUP0PF 117500.000.006.416.419.270.00579213.561290.64226.001.00	SoquelCreekUP	86.16	PF 1	17500.00	<b>〈</b> 0.00	8.15	8.15	12.16	0.005653	16.06	1090.40	139.30	1.00
SoquelCreekUP  65.88  PF 1  17500.00  0.00  6.92  10.38  0.005723  14.92  1173.01  169.85  1.00    SoquelCreekUP  59.74  PF 1  17500.00  0.00  6.73  6.73  10.99  0.005734  14.70  1190.18  177.25  1.00    SoquelCreekUP  49.6  PF 1  17500.00  0.00  6.97  6.49  9.78  0.004561  13.44  1302.23  187.14  0.90    SoquelCreekUP  38.98  PF 1  17500.00  0.00  7.30  9.57  0.003460  12.08  1448.60  198.82  0.79    SoquelCreekUP  28.98  PF 1  17500.00  0.00  7.44  9.46  0.803134  11.41  1533.92  206.96  0.74    SoquelCreekUP  18.98  PF 1  17500.00  0.00  7.23  9.41  0.003478  11.86  1475.24  211.82  0.79    SoquelCreekUP  10  PF 1  17500.00  0.00  7.16	SoquelCreekUP	76.02	PF 1	17500.00	0.00	7.37	7.37	11.05	0.005689	15.38	1137.69	154.86	1.00
SoquelCreekUP  59.74  PF 1  17500.00  0.00  6.73  6.73  10.09  0.005734  14.70  1190.18  177.25  1.00    SoquelCreekUP  49.6  PF 1  17500.00  0.00  6.97  6.49  9.78  0.004561  13.44  1302.23  187.14  0.90    SoquelCreekUP  38.98  PF 1  17500.00  0.00  7.30  9.57  0.003460  12.08  1448.60  198.82  0.79    SoquelCreekUP  28.98  PF 1  17500.00  0.00  7.44  9.46  0.803134  11.41  1533.92  206.96  0.74    SoquelCreekUP  18.98  PF 1  17500.00  0.00  7.23  9.41  0.003478  11.86  1475.24  211.82  0.79    SoquelCreekUP  10  PF 1  17500.00  0.00  7.16  6.26  9.38  0.003730  11.96  1462.96  219.52  0.82    SoquelCreekUP  0  PF 1  17500.00  0.00 <t< td=""><td>SoquelCreekUP</td><td>65.88</td><td>PF 1</td><td>17500.00</td><td>0.00</td><td>6.92</td><td>6.92</td><td>10.38</td><td>0.005723</td><td>14.92</td><td>1173.01</td><td>169.85</td><td>1.00</td></t<>	SoquelCreekUP	65.88	PF 1	17500.00	0.00	6.92	6.92	10.38	0.005723	14.92	1173.01	169.85	1.00
SoquelCreekUP  49.6  PF 1  17500.00  0.00  6.97  6.49  9.78  0.004561  13.44  1302.23  187.14  0.90    SoquelCreekUP  38.98  PF 1  17500.00  0.00  7.30  9.57  0.003460  12.08  1448.60  198.82  0.79    SoquelCreekUP  28.98  PF 1  17500.00  0.00  7.44  9.46  0.003134  11.41  1533.92  206.96  0.74    SoquelCreekUP  18.98  PF 1  17500.00  0.00  7.23  9.41  0.003478  11.86  1475.24  211.82  0.79    SoquelCreekUP  10  PF 1  17500.00  0.00  7.16  6.26  9.38  0.003730  11.96  1462.96  219.52  0.82    SoquelCreekUP  0  PF 1  17500.00  0.00  6.41  6.41  9.27  0.005792  13.56  1290.64  226.00  1.00	SoquelCreekUP	59.74	PF 1	17500.00	0.00	6.73	6.73	10.09	0.005734	14.70	1190.18	177.25	1.00
SoquelCreekUP  38.98  PF 1  17500.00  7.30  9.57  0.003460  12.08  1448.60  198.82  0.79    SoquelCreekUP  28.98  PF 1  17500.00  0.00  7.44  9.46  0.803134  11.41  1533.92  206.96  0.74    SoquelCreekUP  18.98  PF 1  17500.00  0.00  7.23  9.41  0.003478  11.86  1475.24  211.82  0.79    SoquelCreekUP  10  PF 1  17500.00  0.00  7.16  6.26  9.38  0.003730  11.96  1462.96  219.52  0.82    SoquelCreekUP  0  PF 1  17500.00  0.00  6.41  6.41  9.27  0.005792  13.56  1290.64  226.00  1.00	SoquelCreekUP	49.6	PF 1	17500.00	<b>1</b> 0.00	6.97	6.49	9.78	0.004561	13.44	1302.23	187.14	0.90
SoquelCreekUP  28.98  PF 1  17500.00  0.00  7.44  9.46  0.003134  11.41  1533.92  206.96  0.74    SoquelCreekUP  18.98  PF 1  17500.00  0.00  7.23  9.41  0.003478  11.86  1475.24  211.82  0.79    SoquelCreekUP  10  PF 1  17500.00  0.00  7.16  6.26  9.38  0.003730  11.96  1462.96  219.52  0.82    SoquelCreekUP  0  PF 1  17500.00  0.00  6.41  6.41  9.27  0.005792  13.56  1290.64  226.00  1.00	SoquelCreekUP	38.98	PF 1	17500.00	<b>X</b> 0.00	7.30		9.57	0.003460	12.08	1448.60	198.82	0.79
SoquelCreekUP  18.98  PF 1  17500.00  0.00  7.23  9.41  0.003478  11.86  1475.24  211.82  0.79    SoquelCreekUP  10  PF 1  17500.00  0.00  7.16  6.26  9.38  0.003730  11.96  1462.96  219.52  0.82    SoquelCreekUP  0  PF 1  17500.00  0.00  6.41  6.41  9.27  0.005792  13.56  1290.64  226.00  1.00	SoquelCreekUP	28.98	PF1	17500.00	0.00	7.44		9.46	0.003134	11.41	1533.92	206.96	0.74
SoquelCreekUP  10  PF 1  17500.00  7.16  6.26  9.38  0.003730  11.96  1462.96  219.52  0.82    SoquelCreekUP  0  PF 1  17500.00  0.00  6.41  6.41  9.27  0.005792  13.56  1290.64  226.00  1.00	SoquelCreekUP	18.98	PF 1	17500.00	0.00	7.23		9.41	0.003478	11.86	1475.24	211.82	0.79
SoquelCreekUP 0 PF 1 7500.00 100 6.41 6.41 9.27 0.005792 13.56 1290.64 226.00 1.00	SoquelCreekUP	10	PF 1	17500.00	0.00	7.16	6.26	9.38	0.003730	11.96	1462.96	219.52	0.82
	SoquelCreekUP	0	PF 1	17500.00	<b>〈</b> 0.00	6.41	6.41	9.27	0.005792	13.56	1290.64	226.00	1.00

CFS will be lower since some water in village!

Error: Bottom of creek will be lower in at high flow than elevation shown on previous page. High flow will scour creek bed.



Scour and subsequent fill during flood passage, Colorado River at Lees Ferry, Arizona, water Figure 7-13. year 1956. A. Low to high flow. B. High to low flow.

scour the creek bed? like this for Soquel Creek? How much will the flow For more than \$100,000, should there be graph

Channel Form and Process

a "shift in rating." a change often seen in gaging-station records is, in stream-gaging parlance, served change with time of the relation of river stage to discharge. Such

of ephemeral streams and apparently of large rivers in semiarid climates. presumably because perennial flow tends to winnow away the fine material and fills again during the falling stage. This phenomenon is characteristic discharges during the passage of a spring snowmelt. It can be seen that It is less typical of rivers in humid areas or those in high mountains, the whole width of the bed tends progressively to cut as the stage rises Colorado River at Lees Ferry, Arizona, showing cross sections at various Figure 7-13 presents an example of bed scour, using data for the

Table 7-3. Selected data on amounts of scour observed in various rivers.

0.5y <sub>1</sub>	1.75 to 2 X regime denth	20	0	40 60 12 to 15	32			126 55	75	10 to 15 22	Maximum Depth of Scour Below Normal Bed Elevation (ft.)
width constricted to $\frac{1}{2}$ that upstream	sand, silt	very fine sand	fine sand	bank pilings in sand bridge pier in silt, sand scoured to bedrock	cobbles moved, boulders smoothed to bedrock	gravel, in gorge 100–150 ft. wide	embedded in sand,	sand to gravel (cobbles) $2'' \times 6''$ plank	sand, gravel, cobbles	silt, gravel sand. gravel	Particle Size in River Bed, or Material Encountered
$v_1 = upstream$ depth	"regime" depth	10	10 to 12		? 12 to 20			35	50 stage	20 24 stage	Flow Depth (ft.)
bridge piers. Laursen (1960)	and Borland (1954) Lacey in Blench (1957, p. 103)	Imperial Dam Colorado River, Yuma, Lane	annual flood Colorado River, cable at	Rio Grande Lane and Borland (1954) Yellow River $w \approx 600$ ft.	Canadian River at Eufaula		Place Callyoff	Black Canyon	of Reclamation, 1950 Black Canyon, Colorado River (freg. = 1/50 vrs)	Pacolet River Colorado River, U. S. Bureau	Location and Source of Data

229