

KJELDSSEN, SINNOCK & NEUDECK, INC.

CIVIL ENGINEERS AND LAND SURVEYORS

STEPHEN K. SINNOCK
CHRISTOPHER H. NEUDECK711 NORTH PERSHING AVENUE
POST OFFICE BOX 844
STOCKTON, CALIFORNIA 95201-0844TELEPHONE (209) 946-0268
FAX (209) 946-0296
E-MAIL ksn@ksninc.comKENNETH L. KJELDSSEN
RETIRED2091-0060
05-500**FILE MEMORANDUM**

March 24, 2010

Subject: Smith Canal and tributary area storage capacity

Project: Smith Canal Interior Drainage Analysis

From: Michael Conrad

**Storage Volume of Smith Canal and Tributary Area**

A closure structure or gate is currently in design for the west end of Smith Canal. This gate is intended to be closed prior to predicted high tide events predicted to reach an elevation of 10 feet (NAVD 88). The purpose of the Smith Canal Gate is to prevent the 100-year high tide event of elevation 10 feet (NAVD 88) from entering Smith Canal. The storage capacity of Smith Canal is shown in the following table:

CONTOUR ELEV	CONTOUR AREA (sf)	DEPTH (FT)	INCREMENTAL VOL (Avg. End) (cf)	CUMULATIVE VOL (Avg. End) (cf)	CUMULATIVE VOL (Avg. End) (Ac-ft)
0	1,704,608		0	0	0.00
1	1,774,616	1	1,739,612	1,739,612	39.94
2	1,840,497	1	1,807,557	3,547,169	81.43
3	1,908,171	1	1,874,334	5,421,503	124.46
4	1,977,947	1	1,943,059	7,364,562	169.07
5	2,047,439	1	2,012,693	9,377,255	215.27
6	2,117,728	1	2,082,584	11,459,838	263.08
7	2,186,605	1	2,152,167	13,612,005	312.49
8	2,260,326	1	2,223,466	15,835,470	363.53
9	2,335,532	1	2,297,929	18,133,399	416.29
10	2,498,070	1	2,416,801	20,550,200	471.77

The contour areas listed in the above table were based on point elevation data from a bathymetric survey of Smith Canal and a LiDar survey of the Smith Canal area.

The following table shows the storage capacity of Smith Canal based on the elevation of the tide at gate closure:

GATE CLOSED AT ELEV	CUMULATIVE VOL (Ac-ft)
3	347.31
4	302.70
5	256.50
6	208.69

GATE CLOSED AT ELEV	CUMULATIVE VOL (Ac-ft)
7	159.28
8	108.24

The "Interior Drainage Analysis Tributary to Smith Canal" dated March 2010 describes and estimates Street storage within the tributary area to Smith Canal. This street storage is listed in the following table:

Drainage Subarea Designation	Drainage Subarea Name	Drainage Subarea Area (Ac)	Available Street Network Storage (Ac-ft)
1	Buena Vista North	121.63	12.0
2	Lake Drive	4.22	0.4
3	Franklin	425.22	42.0
4	Plymouth	90.44	9.0
5	Gardena	54.65	5.4
6	Moreing	35.92	3.5
7	Yosemite Lake	1935.91	193.0
8	Buena Vista South	477.47	47.0
9	Ryde Avenue	167.1	16.7
10	Kingsley Avenue	18.03	1.8
11	Pinetree Drive	7.78	0.8
12	Occidental Avenue	5.6	0.6
13	Pixie Woods	21.33	2.1
TOTAL			334.3

The combined storage volume of Smith Canal and the tributary area street storage is 681.6 Acre feet.

Rainfall Volumes

Utilizing the method described in the "Interior Drainage Analysis Tributary to Smith Canal" dated March 2010 rainfall volumes were calculated for various design storms, which are shown in the following table:

Design Storm	Inches of Rainfall in 24 hours	Rainfall Volume (Acre-feet)
2-Year	1.57	261
5-Year	2.12	400
10-Year	2.47	490
25-Year	2.90	604
50-Year	3.11	660
100-Year	3.51	767

Rainfall vs. Storage Capacity

The following table compares the Smith Canal storage combined with street storage to rainfall volumes:

GATE CLOSED AT ELEV	COMBINED STORAGE VOL (Ac-ft)	STORAGE EXCEEDS RAINFALL VOLUME
3	681	50-year (660)
4	636	25-year (604)
5	590	10-year (490)
6	542	10-year (490)
7	493	10-year (490)
8	442	5-year (400)