DWR / USBR Temporary Urgency Change Petition, February Delta Outflow

Presented by

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State Water Project Operations

For SWRCB Hearing 2/17/09

Temporary Urgency Change Petition February Delta Outflow/X2

- Modify NDOI/X2 compliance from Chipps Island to Collinsville for 24 days in February
- Waive requiring X2 position for 1-day at Collinsville between February 1 –14
- No change to Vernalis Flow objectives

Urgent Need to Conserve/Build Reservoir Storage for Later Uses

- Cold water for salmonid habitat
- Flows for Delta smelt and salmonids
- Critical needs of water users
- Maintain control of Delta salinity later in 2009 and 2010 if drought continues

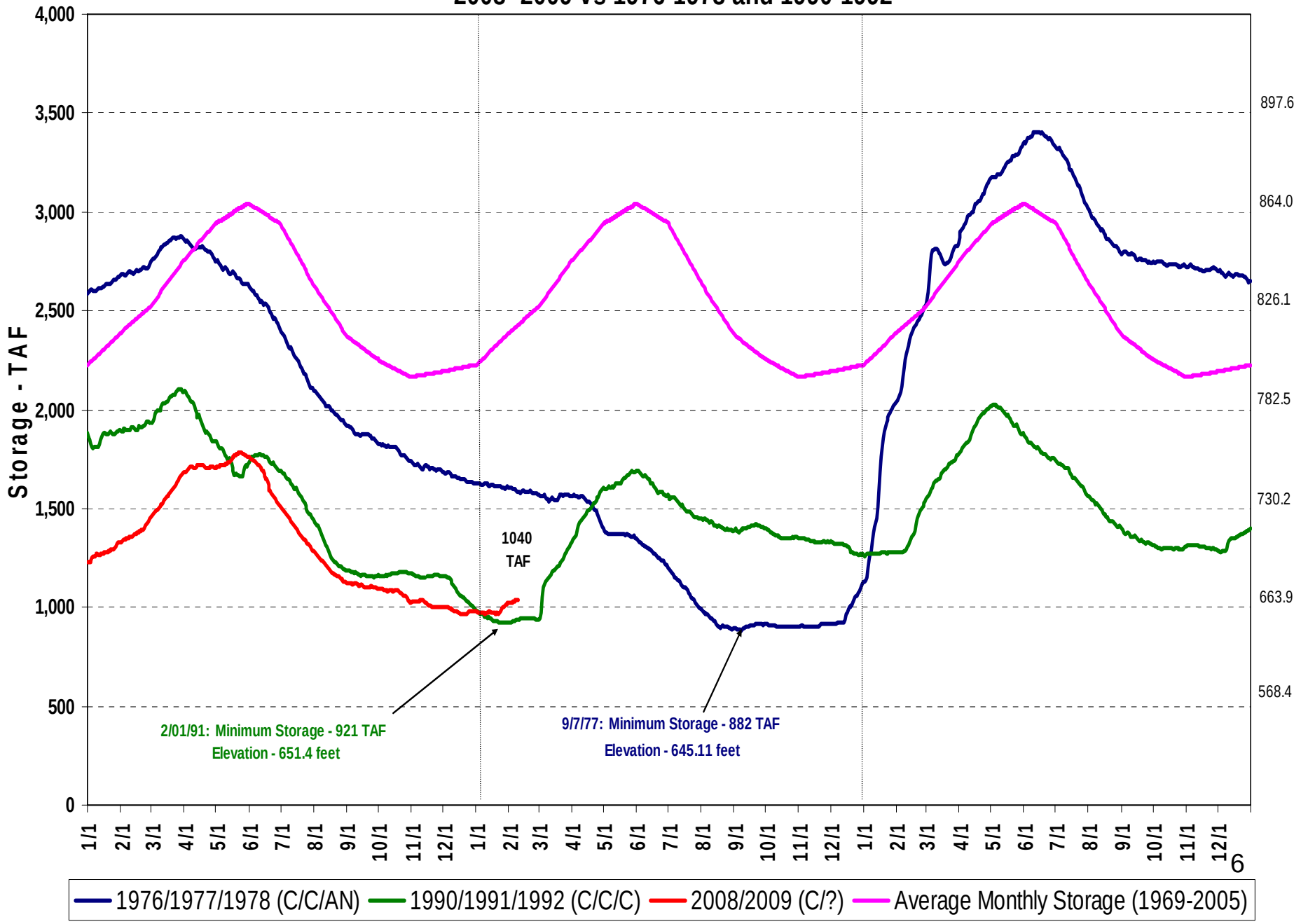
Experiencing a Third Dry Year

Sac Valley hydrologic conditions early Feb

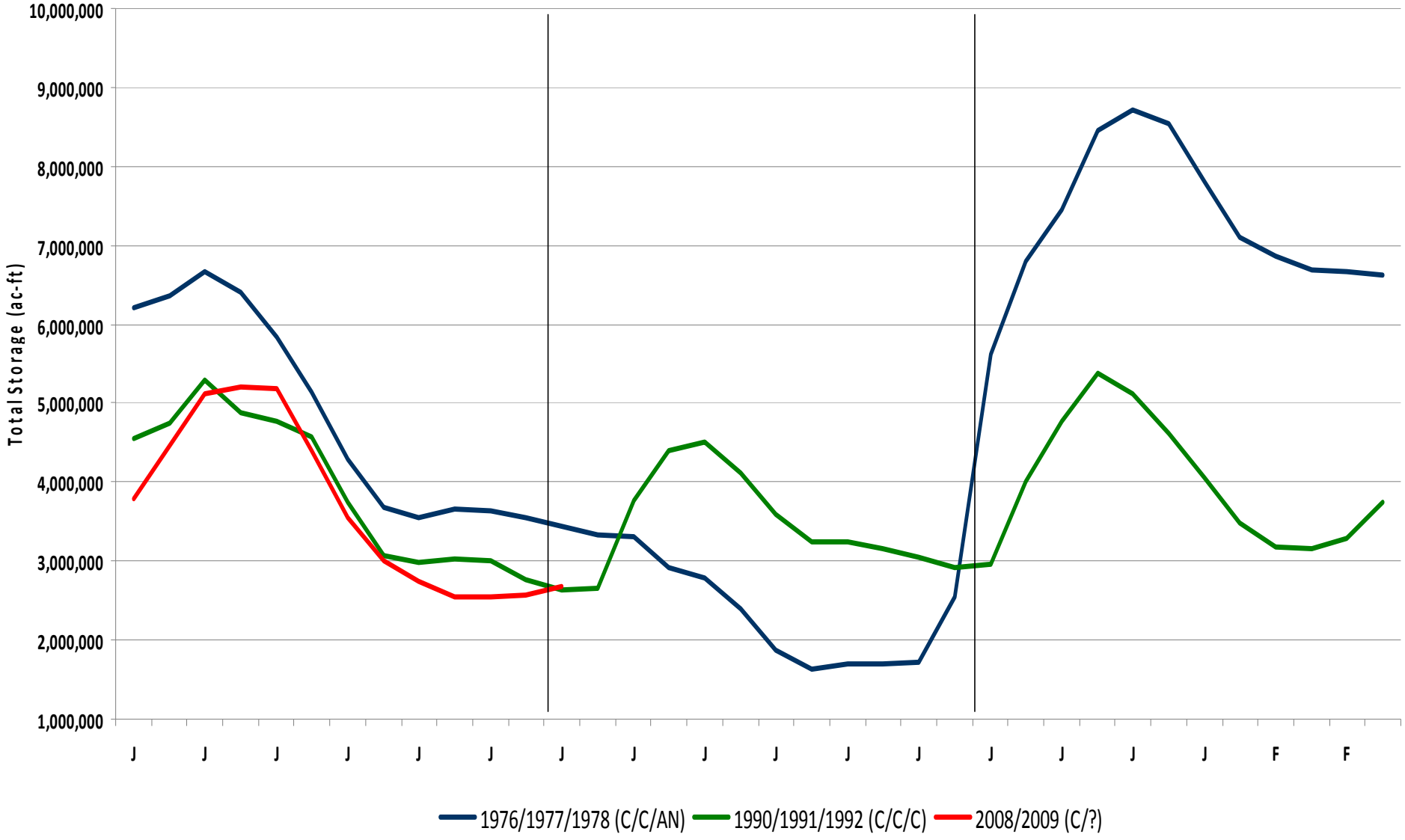
- Precipitation 66% of average to date
- Snowpack 47% of average to date
- Runoff 36% of average to date
- Storage Shasta/Folsom/Oroville 44% of average

Reservoir Storage in Relation to Historical Record

- Lowest December 2008 Oroville Reservoir
- Shasta/Folsom/Oroville storage lower than 1977
- First back-to-back Critically Dry Year combination since operating to the X2 standard in 1995


Oroville Reservoir
2008- 2009 vs 1976-1978 and 1990-1992
Storage - TAF
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
897.6
864.0
826.1
782.5
730.2
663.9
568.4
1040
TAF
2/01/91: Minimum Storage - 921 TAF
Elevation - 651.4 feet
9/7/77: Minimum Storage - 882 TAF
Elevation - 645.11 feet
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
1976/1977/1978 (C/C/AN)
1990/1991/1992 (C/C/C)
2008/2009 (C/?)
Average Monthly Storage (1969-2005)

Shasta/Oroville/Folsom Combined Storage



Water Supplies at Critical Level

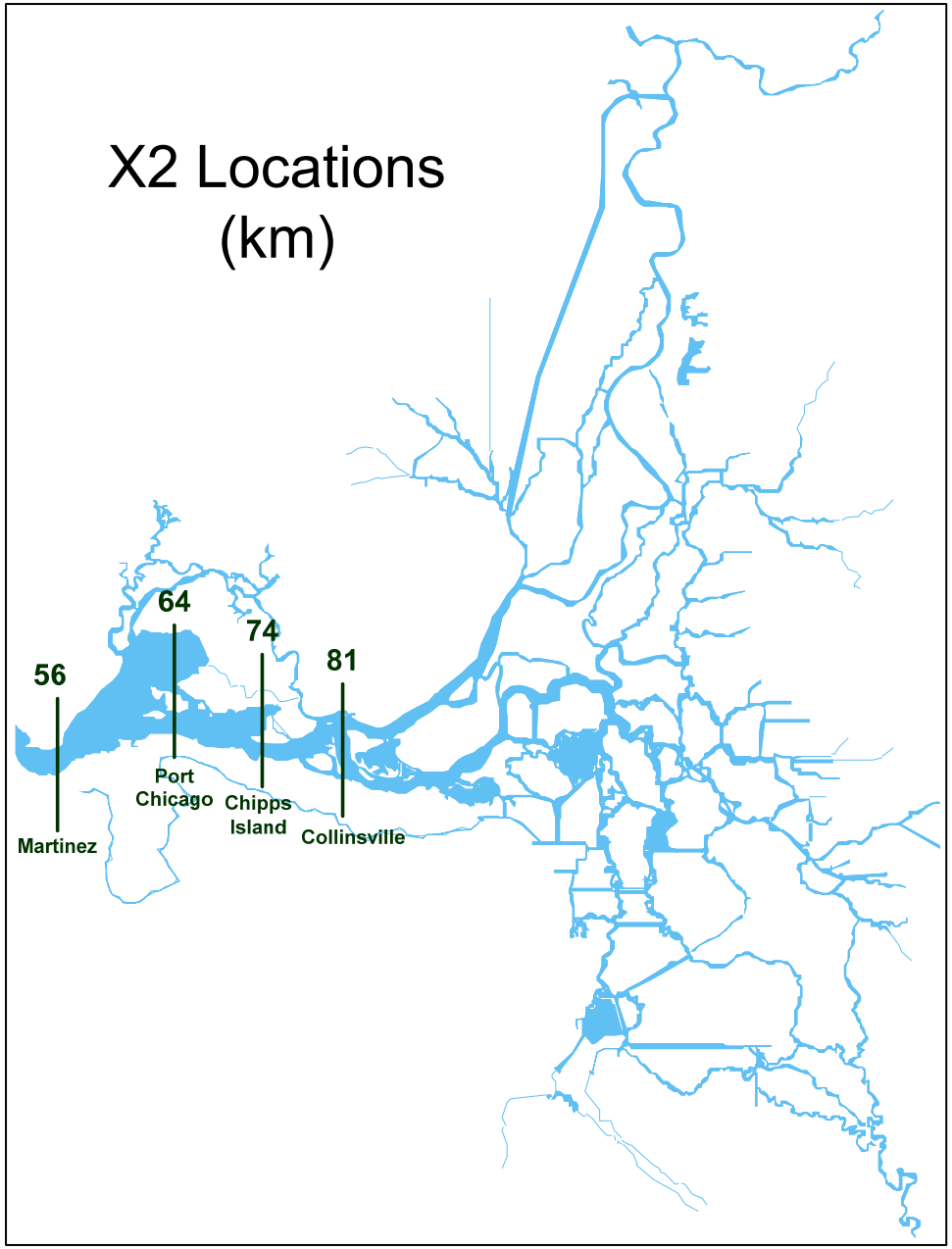
- Sacramento and Feather River settlement contractors have been notified of maximum shortage provisions
- State Water Project M&I allocation of 15% represents greatest deficiency to these contractors ever
- State Water Project has gradually reduced allocation each successive dry year
  - 60% in 2007
  - 35% in 2008
  - 15% in 2009

Risk to South-of-Delta Supply

- San Luis Reservoir storage (at 45% of average) and projected export capability under continued dry conditions poses risk to meeting all needs:
  - Refuge Supplies
  - Senior Water Rights Holders
  - Critical Health and Safety Needs

X2 Standard Defined

- D-1641 objective to benefit fish (Tables 3 & 4)
- X2 represents location of 2 ppt isohaline
- Measured as # of days at Chipps Island as 2.64 EC (salinity) or outflow (11,400 cfs)
- # Days based on prior month 8-River Index
- If Chipps objective not triggered, measure at Collinsville as EC or outflow


X2 Locations
(km)
56
64
74
81
Martinez
Port
Chicago
Chipps
Island
Collinsville

Excerpt D-1641

(Exhibit 1A from DWR/USBR TUC Petition)

TABLE 3 (continued)
WATER QUALITY OBJECTIVES FOR FISH AND WILDLIFE BENEFICIAL USES

COMPLIANCE LOCATION	INTERAGENCY STATION NUMBER(RKI1[])	PARAMETER	DESCRIPTION (UNIT) [2]	WATER YEAR TYPE [3]	TIME PERIOD	VALUE
DELTA OUTFLOW						
		Net Delta Outflow Index (NDOI) [7]	*Minimum monthly average [8] NDOI (cfs)*	*All*	*Jan*	*4,500 [9]*
				All	*Feb-Jun*	*[10]*
				W,AN	*Jul*	*8,000*
				BN		*6,500*
				D		*5,000*
				C		*4,000*
				W,AN,BN	*Aug*	*4,000*
				D		*3,500*
				C		*3,000*
				All	*Sep*	*3,000*
				W,AN,BN,D	*Oct*	*4,000*
				C		*3,000*
				W,AN,BN,D	*Nov-Dec*	*4,500*
				C		*3,500*

Excerpt D-1641

(Exhibit 1B from DWR/USBR TUC Petition)

Footnote for Table 3

[10] The minimum daily net Delta outflow shall be 7,100 cfs for this period, calculated as a 3-day running average. This requirement is also met if either the daily average or 14-day running average EC at the confluence of the Sacramento and the San Joaquin rivers is less than or equal to 2.64 mmhos/cm (Collinsville station C2). If the best available estimate of the Eight River Index (described in footnote 9) for January is more than 900 TAF, the daily average or 14-day running average EC at station C2 shall be less than or equal to 2.64 mmhos/cm for at least one day between February 1 and February 14; however, if the best available estimate of the Eight River Index for January is between 650 TAF and 900 TAF, the Executive Director of the SWRCB is delegated authority to decide whether this requirement applies. If the best available estimate of the Eight River Index for February is less than 500 TAF, the standard may be further relaxed in March upon the request of the DWR and the USBR, subject to the approval of the Executive Director of the SWRCB. The standard does not apply in May and June if the best available May estimate of the Sacramento River Index (described in footnote 5) for the water year is less than 8.1 MAF at the 90% exceedence level.

Under this circumstance, a minimum 14-day running average flow of 4,000 cfs is required in May and June. Additional Delta outflow objectives are contained in Table 4.

Table 4

Number of Days When Maximumu Daily Average Electrical Conductivity of 2.64 mmhos/cm Must Be Maintained at Specified Location [a]

PMI [b] (TAF)	Chipps Island (Chipps Island Station D10)					PMI [b] (TAF)	Port Chicago (Port Chicago Station C14) [d]					PMI [b] (TAF)	Port Chicago (Port Chicago Station C14) [d]				
	FEB	MAR	APR	MAY	JUN		FEB	MAR	APR	MAY	JUN		FEB	MAR	APR	MAY	JUN
≤ 500	0	0	0	0	0	0	0	0	0	0	0	5250	27	29	25	26	6
750	0	0	0	0	0	250	1	0	0	0	0	5500	27	29	26	28	9
1000	28 [c]	12	2	0	0	500	4	1	0	0	0	5750	27	29	27	28	13
1250	28	31	6	0	0	750	8	2	0	0	0	6000	27	29	27	29	16
1500	28	31	13	0	0	1000	12	4	0	0	0	6250	27	30	27	29	19
1750	28	31	20	0	0	1250	15	6	1	0	0	6500	27	30	28	30	22
2000	28	31	25	1	0	1500	18	9	1	0	0	6750	27	30	28	30	24
2250	28	31	27	3	0	1750	20	12	2	0	0	7000	27	30	28	30	26
2500	28	31	29	11	1	2000	21	15	4	0	0	7250	27	30	28	30	27
2750	28	31	29	20	2	2250	22	17	5	1	0	7500	27	30	29	30	28
3000	28	31	30	27	4	2500	23	19	8	1	0	7750	27	30	29	31	28
3250	28	31	30	29	8	2750	24	21	10	2	0	8000	27	30	29	31	29
3500	28	31	30	30	13	3000	25	23	12	4	0	8250	28	30	29	31	29
3750	28	31	30	31	18	3250	25	24	14	6	0	8500	28	30	29	31	29
4000	28	31	30	31	23	3500	25	25	16	9	0	8750	28	30	29	31	30
4250	28	31	30	31	25	3750	26	26	18	12	0	9000	28	30	29	31	30
4500	28	31	30	31	27	4000	26	27	20	15	0	9250	28	30	29	31	30
4750	28	31	30	31	28	4250	26	27	21	18	1	9500	28	31	29	31	30
5000	28	31	30	31	29	4500	26	28	23	21	2	9750	28	31	29	31	30
5250	28	31	30	31	29	4750	27	28	24	23	3	10000	28	31	30	31	30
≥5500	28	31	30	31	30	5000	27	28	25	25	4	>10000	28	31	30	31	30

[a] The requirement for number of days the maximum daily average electrical conductivity (EC) of 2.64 mmhos per centimeter (mmhos/cm) must be maintained at Chipps Island and Port Chicago can also be met with maximum 14-day running average EC of 2.64 mmhos/cm, or 3-day running average NDOIs of 11,400 cfs and 29,200 cfs, respectively. If salinity/flow objectives are met for a greater number of days than the

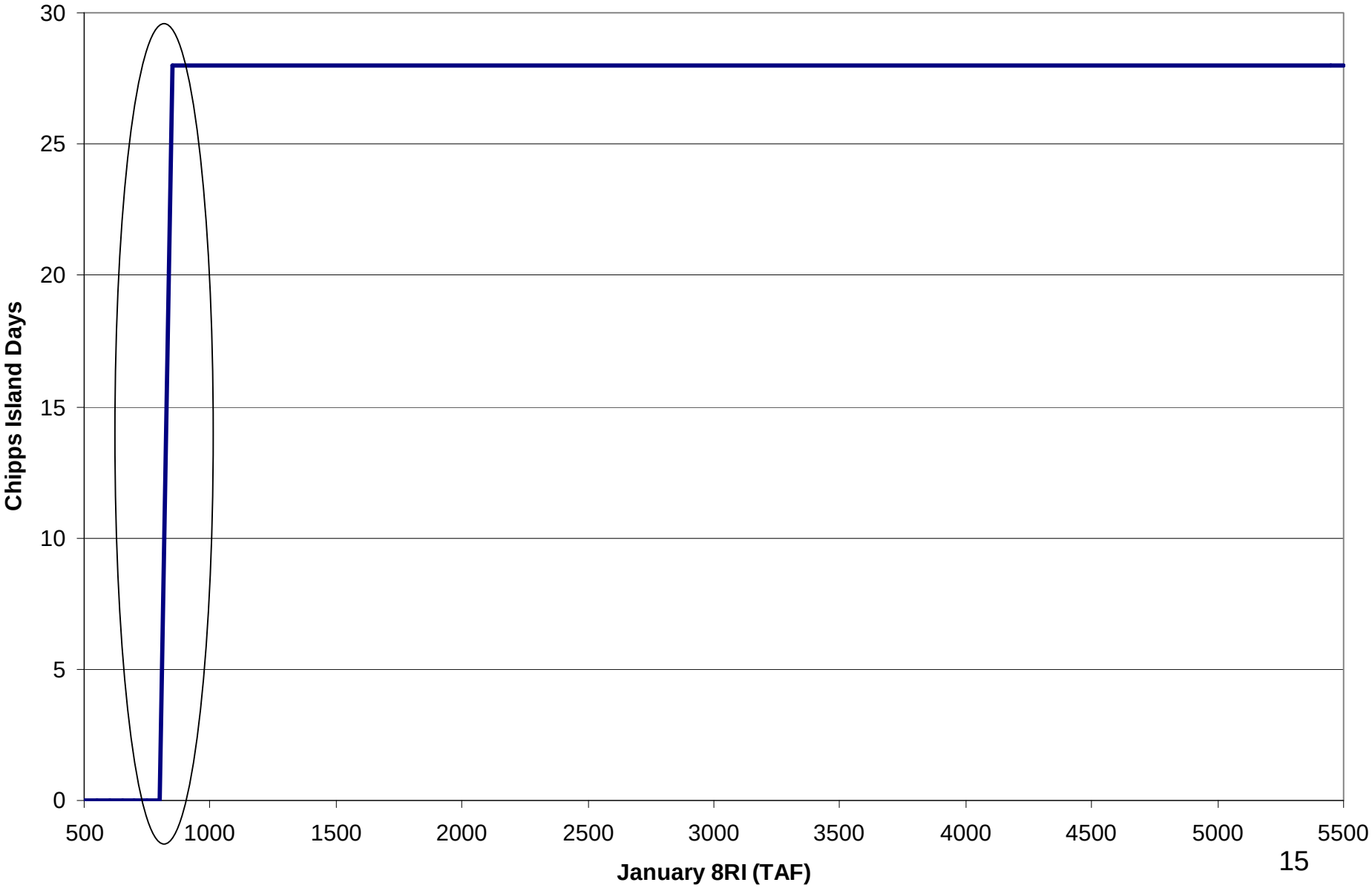
by linear interpolation.

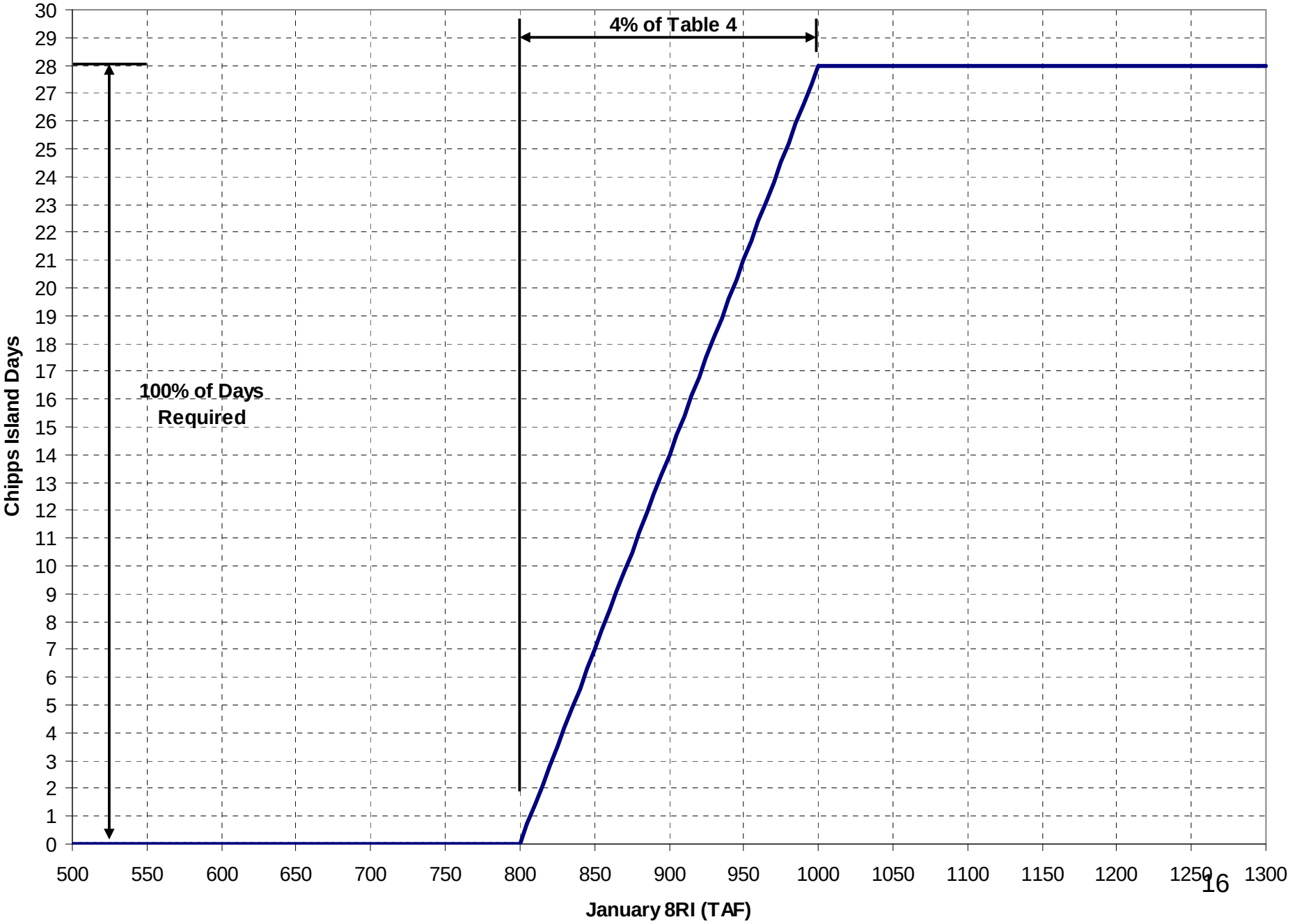
[b] PMI is the best available estimate of the previous month's Eight River Index. (Refer to Footnote 9 for Table 3 for a description of the Eight River Index.)

[c] When the PMI is between 800 TAF and 1000 TAF, the number of days the maximum daily average EC of 2.64 mmhos/cm (or maximum 14-day running average EC of 2.64 mmhos/cm, or 3-day running average NDOI of 11,400 cfs) must be maintained at Chipps Island in February is determined by linear interpolation between 0 and 28 days.

[d] This standard applies only in months when the average EC at Port Chicago during the 14 days immediately prior to the first day of the month is less than or equal to 2.64 mmhos/cm

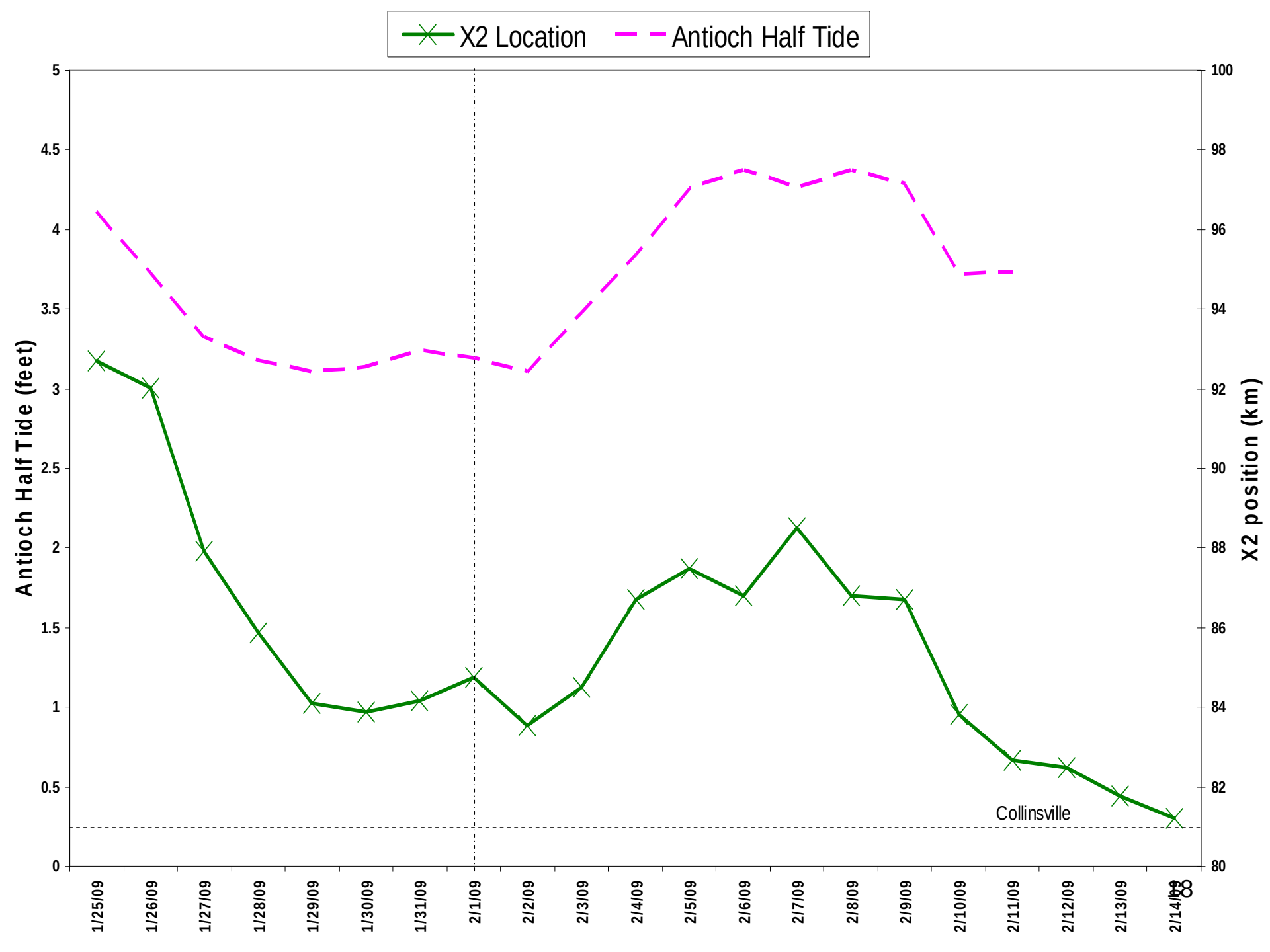
Table 4 in Graphical Form




4% of Table 4
100% of Days Required
Chipps Island Days
January 8RI (TAF)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
1250
1300

Petition for Modified Compliance

- Early February projections showed potential hit to upstream storage of up to 200 taf
- DWR and USBR coordinated with USFWS, NMFS, and DFG prior to submitting petition
  - ✓ OMR flow
  - ✓ E/I Ratio
- DWR and USBR continue to temper modified operations with continued coordination.


X2 Location
Antioch Half Tide
Antioch Half Tide (feet)
X2 position (km)
Collinsville
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
100
98
96
94
92
90
88
86
84
82
80
1/25/09
1/26/09
1/27/09
1/28/09
1/29/09
1/30/09
1/31/09
2/1/09
2/2/09
2/3/09
2/4/09
2/5/09
2/6/09
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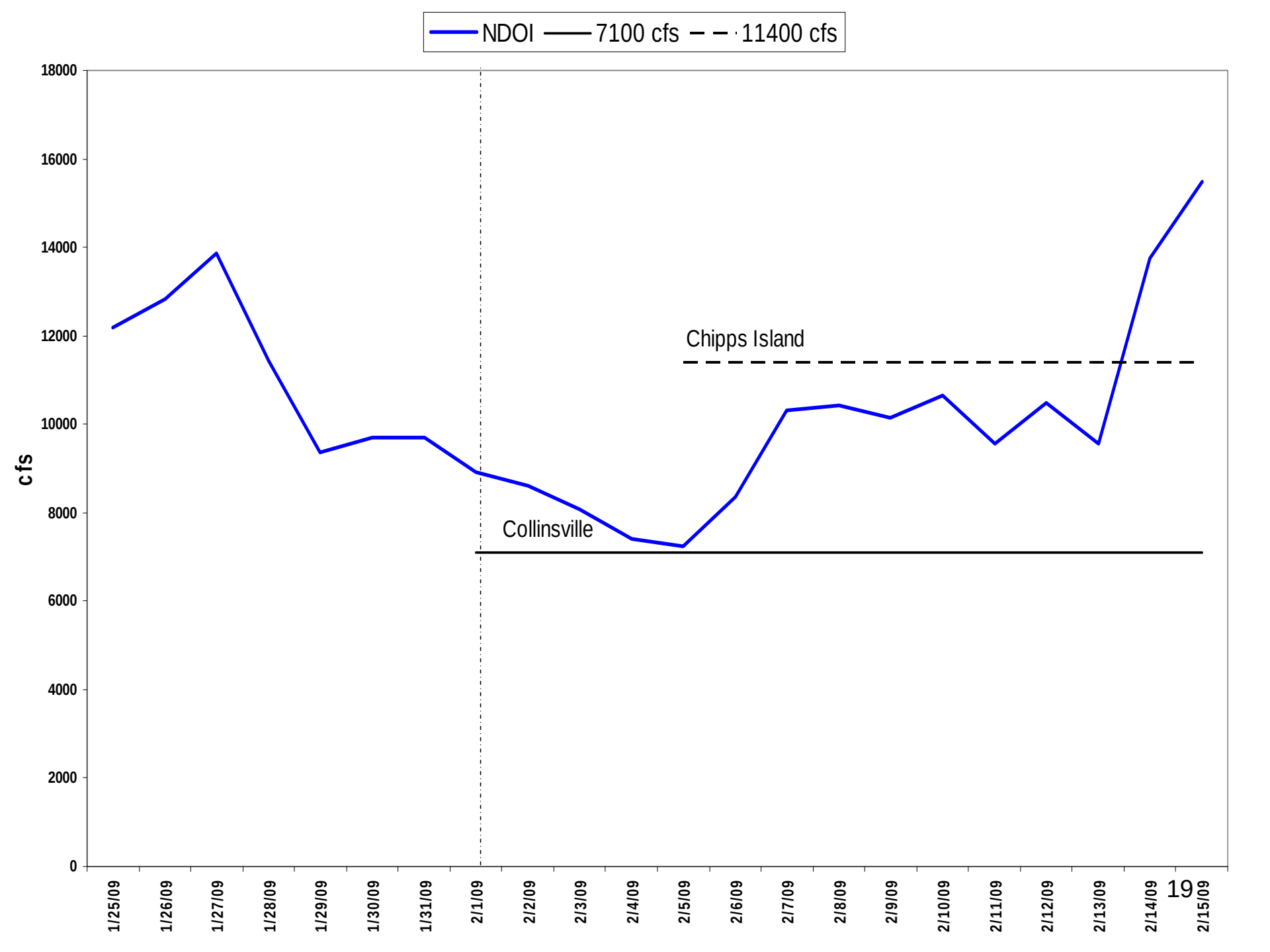
2/12/09
2/13/09
2/14/09


NDOI
7100 cfs
11400 cfs
Chipps Island
Collinsville
cfs
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
1/25/09
1/26/09
1/27/09
1/28/09
1/29/09
1/30/09
1/31/09
2/1/09
2/2/09
2/3/09
2/4/09
2/5/09
2/6/09
2/7/09
2/8/09
2/9/09
2/10/09
2/11/09
2/12/09
2/13/09
2/14/09
2/15/09

Modified Operations Result in Minor Changes

- Came within 0.22 km of meeting the “starting gate” objective on Feb. 14
- Actual average Delta outflow will likely match unmodified standard requirements through February 16
- Operated to OMR flow that was acceptable to fishery agencies

Updated Information

- No longer request change in Vernalis flow
  - Classification of San Joaquin Valley is critically dry
  - Flow objective will be met
- Chipps Island NDOI is being met as of Feb.15
- Exports continue to be tempered by OMR objectives
- Sacramento River flow is forecasted to reach “off ramp” level of greater than 20,000 cfs for 3 days
- However, March hydrology may be dry and concerns will remain

Balanced Approach

Change is in the Public Interest by balancing competing interests through this year and into next:

- Salmonids
- Delta Fish
- Public Water Supply
- Delta Water Quality

- Recommend SWRCB approve urgency change petition
- DWR and USBR will comply with fish agencies requirements for listed species
- DWR and USBR will provide updates to SWRCB on water supply conditions
- DWR and USBR may need to submit additional petitions during the year