Sacramento River Temperature Task Group (SRTTG) Call
Thursday, August 27, 2015 | 2:00 p.m. – 3:45 p.m.

MEETING SUMMARY

Participants:

- Craig Anderson, FWS
- Tricia Bratcher, CDFW
- Matt Brown, USBR
- Charles Chamberlain, USBR
- Eric Danner, NMFS
- Ken Emanuel, SWRCB
- Bob Hughes, CDFW
- Dan Kratville, CDFW
- Ken Kundargi, CDFW
- Scott Ligare, SWRCB
- Duane Linander, CDFW
- Ron Milligan, USBR
- Diane Riddle, SWRCB
- Jason Roberts, CDFW
- John Rueth, CDFW
- Rich Satkowski, SWRCB
- Jim Smith, FWS
- Stacey Smith, USBR
- Brycen Swart, NMFS
- Thuy Washburn, USBR (Facilitator)
- Garwin Yip, NMFS

Note-taking:

- Kelsey Rugani, Kearns & West

Action Items

- Reclamation to follow-up to see if any issues have occurred as a result of the Shasta TCD curtain installation.
- Reclamation to review the previous model runs and consider modifying the model runs moving forward so temperatures are more accurately projected.
- Reclamation to share monthly storage level information with the SRTTG.
- Reclamation to review the level of detailed temperature information that is shared regularly with the SRTTG.
- Reclamation, CDFW and NOAA Fisheries to meet next Wednesday, September 2 from 1:00 – 5:00pm to discuss the possibility of reducing the target temperature and to discuss fall flows in more detail.
- Reclamation to draft a response to Bill Jennings' email once Diane Riddle forwards asking for a response to specific questions/topics.
- Reclamation to send reservoir modeling information to Jason Caldwell/Eric Danner.

Key Discussion Topics with Summary of Outcomes and Agreements:

Fisheries Update

As of August 17, fish are still spawning upstream with 50% of the carcasses observed between Keswick (*KWK*) and ACID Dam, 29.1% between ACID and the Highway 44 Bridge, 17.1% between the Highway 44 Bridge and Clear Creek (*CCR*), and 3.8% below Clear Creek (*CCR*). CDFW noted that spawning is almost complete which is not unusual for the end of August. The carcass survey will be finished either on August 28 or August 31.

There is no new aerial redds survey information since the previous SRTTG meeting.

For juveniles at Red Bluff, the FWS is seeing an increase in the number of catches to approximately 20-30 per day. CDFW anticipates seeing fish emerging out of the redds until mid-October. CDFW noted that spawning was completed by this time last year.

The FWS Livingston Stone National Fish Hatchery has approximately 155,000 fish in tanks outside and has inventoried all fish except for the last 10 females. The hatchery anticipates a release of approximately 400,000 fish. This is less than last year and FWS advises that this is because not as many females were captured at the Keswisck trap and not all the hatchery-born females were retained.

Shasta TCD Curtain Update

Reclamation advised that the Shasta TCD curtain installation for units 1 and 2 will begin on August 31 and should be completed by September 3, at the latest. Reclamation has not heard of any issues either with the curtains or installation but will continue to monitor.

Action: Reclamation to monitor Shasta TCD curtain installation for any issues.

Reclamation noted that the last middle gate will be closed and the PRG gate will be opened on August 31 in order for the installation to occur. These adjustments will occur around 7:00am on August 31.

Operation Update – Temperature Summary

Reclamation advised that a TCD change order was issued. Due to an increase in warm water on August 23, Reclamation opened a PRG gate on August 24 and closed a middle gate on August 25 to increase the amount of cool water in the system. These adjustments reduced the TCD weighted average temperature and Clear Creek (*CCR*) is at 57.8°F. Reclamation anticipates that the temperature will continue to cool down but will continue to evaluate whether other adjustments are needed within the next few days.

Reclamation reviewed a snapshot of the Shasta TCD comparing August 26, 2014 and August 26, 2015. In 2015, four middle gates are closed and four PRG gates are open. In 2014, all side gates were open, while none are currently open this year. Reclamation noted that there is warmer water near the PRG gates and that all middle gates will be closed on Monday.

Fall Flow Propose - Model

Reclamation advised that flows at Trinity were increased on August 21 with a target of 2,800 cfs. This target has been achieved and these flows will likely continue through mid-September. The increase in flows was to prevent a Chinook salmon die-off in the lower Klamath River.

Reclamation reviewed a Sacramento River Modeled Temperature graph that pulled information from an August 7 model run that pulled information from August – October 1993 and November 1986. The model run used a 50% L3MTO Outlook and projected the following Keswick (*KWK*) releases:

- September: 6,500 cfs
- October: 5,000 cfs

- November and December: 4,000 cfs

Reclamation also reviewed a model run using a 10% L3MTO Outlook and the same projected releases at Kewsick (*KWK*). This model run pulled information from August – October 2003 and November 1999. With both model runs, the flows stay the same until September when higher flows occur and the temperature begins to cool off. Each model run yielded similar results. The proposed flows came in lower than the base flows with one exception in mid-October where the temperature spiked.

Reclamation held gate operations at the same place for both model runs. In the 10% L3MTO, there is an option to decrease temperatures at Clear Creek (*CCR*) but that was not done.

Reclamation anticipates that in the latter half of October, the gate configuration would include having one side gate open, based on the 50% L3MTO Outlook.

Reclamation discussed the discrepancy between the June temperature run for the Clear Creek power plant versus current August temperatures. The water is coming in significantly cooler than forecasted, with several contributing factors. One of the contributions is that the Whiskeytown temperature profile from June had warmer water than what has been observed in the last two months. Whiskeytown is also able to store more cold water now than it was in June.

Another contribution could be that the June L3MTO Outlook projected temperatures at 52% above normal, the July Outlook projected temperatures at 43% above normal, and August was projected at 47% above normal. Reclamation noted that these projections may have contributed to the cooling off at Clear Creek (*CCR*).

Jim Smith noted that the current temperatures at Spring Creek are higher than the most recent model run: running at approximately 58.7°F and projected to run at 58°F.

Action: Reclamation to review the previous model runs and consider modifying the model runs moving forward so temperatures are more accurately projected.

Reclamation noted that the Spring Creek power plant graph used the May 5th and May 6th profiles from the Temperature Management Plan, and that the Whiskeytown temperature profiles used both the May 5th and 6th profiles as well as the August 6th profile.

Reclamation does not anticipate changing flows at Spring Creek.

Reclamation was asked about access to the gate chambers once the gates are closed. Reclamation responded noting that they will monitor temperatures and flows once all of the Shasta TCD curtains are installed and fully engaged. Reclamation anticipates that Spring Creek temperatures will run fairly cool in the fall. Reclamation does not anticipate changing the gate configuration and will carefully consider when to open the side gate to prevent issues similar to those arising last year. Reclamation does not think the divers will be able to get into the gate chambers once they are closed, but they might be able to test the temperature.

Reclamation proposed running approximately 7,000 cfs at Clear Creek (*CCR*) (normally running at 7,200 cfs) to assess the change in temperatures. This might better prepare Reclamation for the proposed fall flows and potential temperature impacts. Reclamation noted that the last profile was taken on August 26.

Action: Jason Roberts to test how a 200 cfs drop may impact stranding and the dewatering of redds.

The SRTTG discussed the timing of flows and when flows should stabilize. Reclamation noted that when flows can stabilize is based on rainfall. Reclamation also noted that early spring 2016 flows may be impacted depending on when flows stabilize. At this point, Reclamation anticipates stabilizing flows around November 10. Jason Roberts recommended stabilizing flows in mid-October and encouraged other fish agencies to share their insights.

Action: Reclamation to share monthly storage level information with the SRTTG.

Action: Reclamation to review the level of detailed temperature information that is shared regularly with the SRTTG.

Garwin Yip advised that NOAA Fisheries would like to understand the entirety of the proposed flows/temperatures as well as potential side effects and ramifications. NOAA Fisheries does not have enough information to make a proposal on fall flows. He asked if reducing releases at Folsom and getting more water from Oroville is still a viable option and how Shasta may be impacted.

Reclamation advised that the flows from Oroville to support Folsom have been trued up. Reclamation noted that higher flows in September, October and November will balance well with the needs of the State Water Project. If the SRTTG would like to discuss system-wide storage levels and flow demands, Reclamation encourages convening an in-person meeting.

Jim Smith encouraged Jason Roberts to share his ideas on flows and timing of stabilization. He also encouraged Reclamation to keep Keswick (*KWK*) flows where they are currently.

Reclamation noted that there is NERC testing occurring at Keswick (*KWK*) on August 27.

Garwin noted that NOAA Fisheries is concerned with maintaining a 57°F average and how it impacts the cool water pool and dewatering of redds. Reclamation responded that a significant amount of cool water was not lost during the installation, and that improved performance will be a result of the curtains. Reclamation proposed the idea of reducing the target temperature to 56.5°F not to exceed 57°F.

Action: Reclamation, CDFW and NOAA Fisheries to meet next Wednesday, September 2 to discuss (1) the possibility of reducing the target temperature, and (2) fall flows, in more detail.

Garwin asked how Reclamation plans to respond to an email from Bill Jennings sent earlier in the week. Diane Riddle explained that the email asked what flexibility is there to adjust power generation operations when temperatures exceeded 58°F. Diane mentioned that Reclamation can purchase power on the open market and requested more information about Reclamation's options. Reclamation responded by stating they do not have the authority to purchase power on the open market and that when the temperatures exceeded 58°F earlier in the week, it was not a power-related issue. Reclamation clarified that they coordinate with the Western Area Power Association (WAPA) if power is needed.

Action: Diane Riddle to forward Bill Jennings email to Reclamation**;** Reclamation to draft a response to specific questions/topics.

Action: Reclamation to send reservoir modeling information to Jason Caldwell/Eric Danner.

Next meeting

The next meeting of the SRTTG is scheduled for September 3rd at 1:00 p.m.

Sacramento River Temperature Task Group Meeting

Aug 20, 2015
2:00 pm

Conference Line: 877-718-6527
Pass code: 1954134

Agenda

1. Introductions
2. Fishery update
3. Shasta TCD Curtain Update
4. Operation update
    a. Temperature Summary ***
    b. Shasta snap shot 2015 vs 2014***
5. Fall flow propose – model ***
6. Next meeting

***handout

Draft 8/27/2015

Temperature and Release Summary for Shasta and Trinity - August 2015

(Updated twice a week November through April)

Day	Sacramento River Water Temperatures in Degrees F Collected from CDEC (California Data Exchange Center) except for TCD, SPP and Control Point														Mean Daily Release in CFS			Mean Daily Air Temp Degrees F			
	TCD Wt. Avg.	SHD minus TCD (Diff)	Shd	SPP Wt. Avg	Kwk	Bsf	Jlf	Bnd	Rdb	Lws	Control Point 4/1 Ccr	Igo	Sac	Dgc	Shasta Generation El 815	Spring Crk Powerplant Release	Keswick Total Release	RDD	BSF	RDB	LWS
Jul																					
Aug																					
1	53.4	(1.8)	51.6	58.6	54.8	58.5	60.4	61.2	63.0	54.5	56.8	58.6	56.1	61.1	5,313	1,330	6,824	88.0	81.8	79.6	78.8
2	53.8	(1.9)	51.9	58.6	54.8	58.3	59.8	60.8	63.1	53.7	56.0	57.8	55.5	60.1	5,472	1,330	6,828	84.5	79.7	77.8	74.4
3	52.6	(1.2)	51.4	58.7	54.5	58.0	59.7	60.4	62.0	54.2	56.3	58.6	55.8	59.4	5,693	1,358	6,837	84.0	78.2	77.3	73.1
4	53.4	(1.2)	52.2	58.7	54.8	58.0	59.3	60.1	61.9	53.4	56.0	57.8	55.8	59.6	5,187	1,565	6,835	78.5	71.5	71.0	70.6
5	55.0	(1.5)	53.5	58.8	54.5	57.5	58.8	59.5	61.2	53.2	55.7	57.8	55.3	57.6	5,313	1,562	6,836	78.0	73.8	73.5	68.3
6	54.7	(1.7)	? 53.0	58.8	55.3	57.6	58.9	59.5	61.1	53.5	56.2	58.1	55.9	57.5	5,409	1,543	6,836	82.5	76.3	76.7	69.8
7	53.9	(1.7)	52.2	58.8	56.0	58.4	60.3	60.8	62.1	53.4	57.4	58.5 #		58.7	5,397	1,516	6,834	84.5	79.2	80.5	72.1
8	53.9	(2.0)	51.9	58.8	55.8	58.9	60.9	61.1	63.3	53.0	57.4	58.2 #		57.2	5,423	1,545	6,834	81.0	74.8	75.1	68.1
9	53.2	(1.7)	51.5	58.8	55.6	58.7	60.5	61.3	63.3	52.8	57.2	58.2 #		56.6	5,333	1,279	6,858	81.5	76.2	77.1	66.0
10	52.4	(1.3)	51.1	58.8	55.3	58.7	60.2	61.0	62.8	52.5	56.8	57.8 #		56.3	5,031	1,350	6,805	80.5	75.2	75.7	66.6
11	53.4	(1.9)	51.5	58.8	54.4	58.4	59.9	60.7	62.6	52.9	56.2	58.2	55.4	57.0	5,347	1,107	6,781	80.0	75.9	74.6	69.7
12	53.5	(1.8)	51.7	58.8	54.0	57.7	59.0	59.8	62.0	53.0	55.6	58.2	55.0	57.9	5,104	1,175	6,676	77.5	72.8	73.4	68.7
13	53.4	(1.4)	52.0	58.8	54.5	57.5	59.1	59.8	61.6	53.2	56.1	58.1	55.6	58.6	5,350	1,004	6,678	78.0	73.6	74.8	68.8
14	54.1	(1.2)	52.9	58.7	54.6	57.9	59.3	60.1	61.8	53.1	55.9	57.7	55.5	58.5	6,369	1,365	6,598	76.5	74.3	73.9	66.1
15	54.0	(1.3)	52.7	58.8	55.0	57.7	59.2	59.8	61.5	53.3	56.4	58.4	56.0	57.9	5,953	1,268	6,900	88.0	76.5	79.1	68.1
16	53.5	(1.4)	52.1	58.8	55.4	58.2	59.9	60.4	61.9	53.1	57.0	58.6	56.5	58.8	5,259	1,226	6,895	84.5	77.1	78.5	72.2
17	54.2	(1.5)	52.7	58.7	55.6	58.5	60.2	60.8	62.5	52.5	57.1	58.4	56.6	55.6	5,388	1,353	6,923	^ 84.5	78.0	80.5	73.0
18	53.7	(1.6)	52.1	58.7	55.5	58.5	60.1	60.9	62.7	52.3	57.0	58.3	56.4	54.2	4,632	1,514	6,919	86.0	78.6	78.9	73.2
19	54.8	(2.1)	52.7	58.7	55.7	58.5	60.0	60.7	62.4	51.9	57.0	58.0	56.4	53.7	5,368	1,247	6,906	81.5	75.4	74.6	69.6
20	54.4	(1.7)	52.7	58.7	55.6	58.4	59.5	60.2	61.9	52.2	56.9	58.2	56.3	54.5	5,149	1,171	6,922	80.0	74.2	73.2	70.5
21	54.7	(1.7)	53.0	58.7	55.8	58.6	59.9	60.5	61.8	52.3	57.3	58.5	56.7	56.5	5,635	1,285	6,897	80.0	74.2	74.4	70.6
22	55.0	(1.8)	53.2	58.7	55.8	58.9	60.4	61.1	62.7	52.2	57.5	58.6	56.9	55.6	5,648	1,237	6,898	81.5	75.9	75.3	73.9
23	56.6	(3.0)	53.6	58.6	56.3	59.1	60.6	61.2	62.9	52.4	57.8	58.4	57.2	55.5	4,695	1,884	6,898	79.5	74.2	74.2	72.3
24	54.2	(1.5)	52.7	58.7	57.1	59.4	61.0	61.6	63.1	52.9	58.5	58.6	58.0	55.9	5,993	1,441	6,870	81.0	75.1	75.1	73.0
25	53.6	(1.4)	52.2	58.7	56.6	59.8	61.3	62.0	63.5	53.1	58.4	58.6	57.7	56.0	5,381	1,375	6,905	80.5	75.1	76.4	71.8
26	53.8	(1.5)	52.3	58.7	56.0	59.6	60.9	61.5	63.2	53.3	57.8	58.5	57.1	56.0	5,276	1,506	6,899	80.0	74.5	76.0	71.0
27		0.0																			
28		0.0																			
29		0.0																			
30		0.0																			
31																					
Avg	54.0		52.3	58.7	55.4	58.4	60.0	60.6	62.4	53.0	56.9	58.3	56.3	57.2	5,389	1,367	6,842	81.6	75.9	76.0	70.8
Tot cfs															140,118	35,536	177,892				
Tot af															277,924	70,486	352,849				

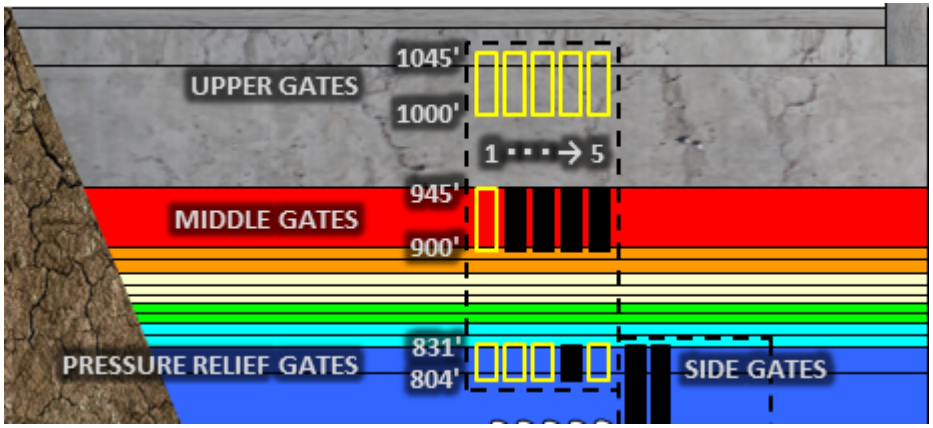
? = Average includes 1-9 estimated hourly readings ! = No Average (10-17 hours missing) & = No Average (18 to 23 hours missing)

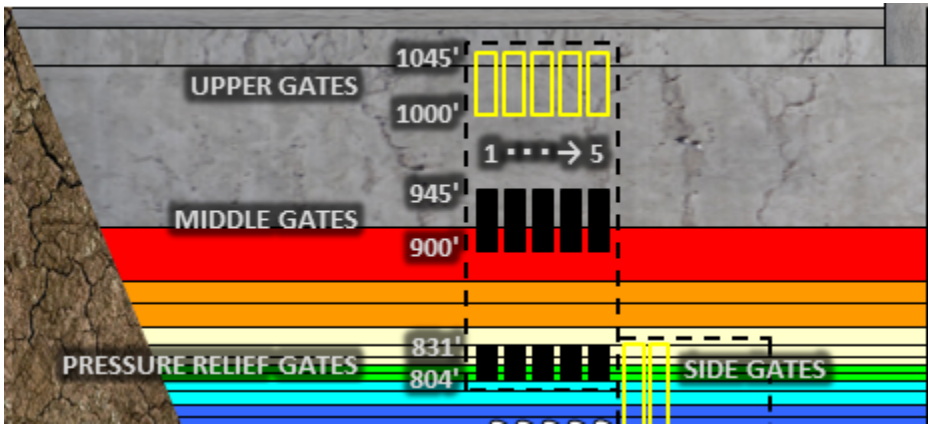
= Station out of service ND = No hourly readings or incorrect % = Data will be down loaded from site at later date by NCAO staff.

When available:
^ = Redding Air Temp Record High
* = Redding Air Temp Record Low

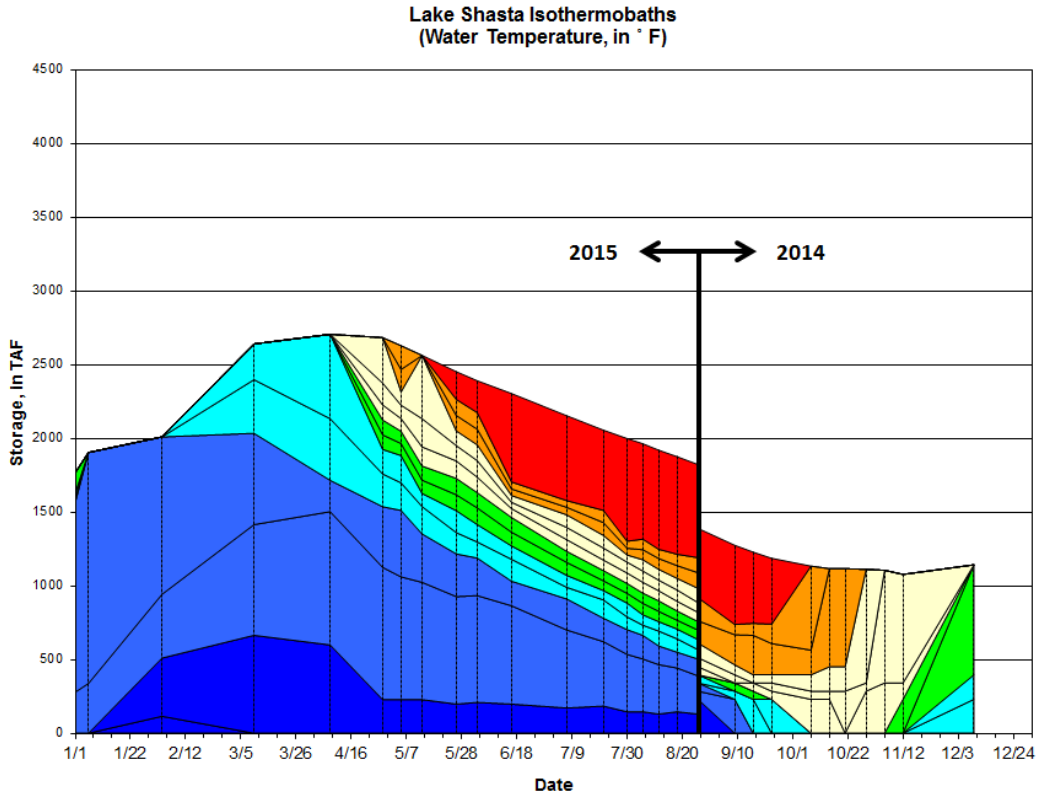
Control Point: Clear Creek 4/1/2015 to 4/17/2015 at 56.0 degrees; 4/18/2015 to 5/14/2015 at 58.0 degrees; 5/15/2015 to 6/4/2015 56.0; 6/5/2015 to present 58.0 degrees.

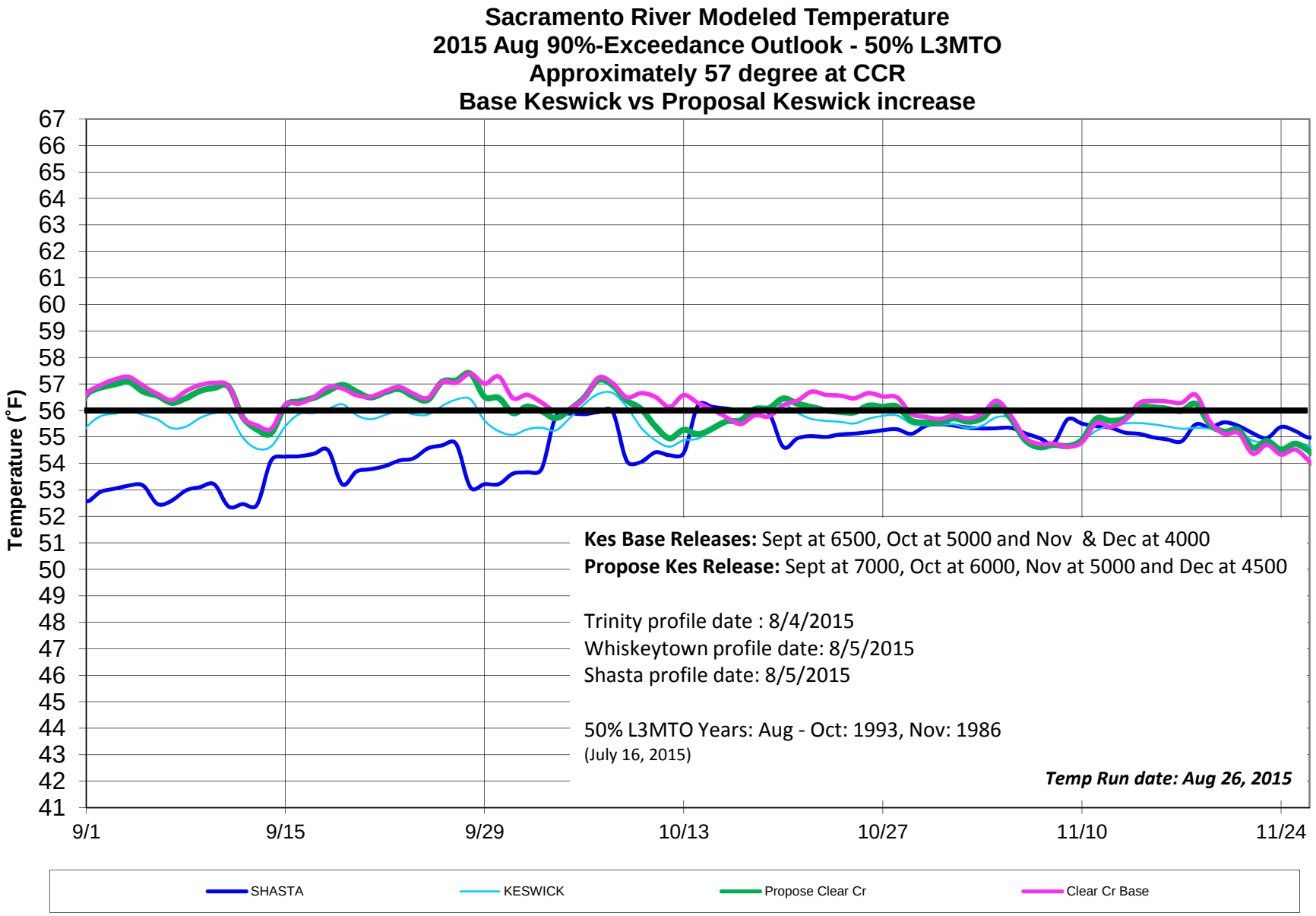
8/26/2015 VS 8/26/2014

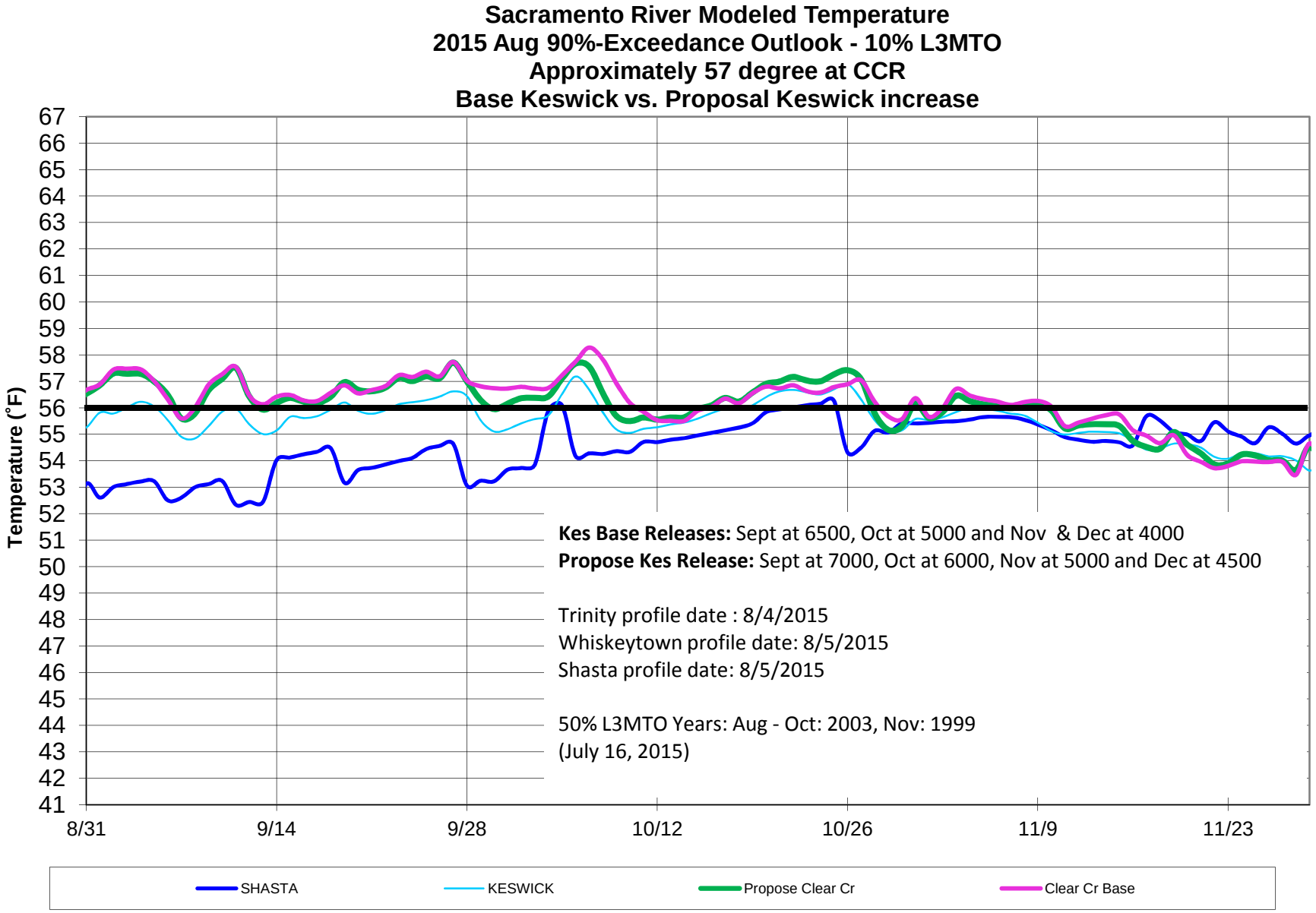




*NOTE: Yellow outline indicates open position, Solid Black indicates closed position.




Sacramento River Modeled Temperature
2015 Aug 90%-Exceedance Outlook - 50% L3MTO
Approximately 57 degree at CCR
Base Keswick vs Proposal Keswick increase
Temperature (°F)
67
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
43
42
41
9/1
9/15
9/29
10/13
10/27
11/10
11/24
Kes Base Releases: Sept at 6500, Oct at 5000 and Nov & Dec at 4000
Propose Kes Release: Sept at 7000, Oct at 6000, Nov at 5000 and Dec at 4500
Trinity profile date : 8/4/2015
Whiskeytown profile date: 8/5/2015
Shasta profile date: 8/5/2015
50% L3MTO Years: Aug - Oct: 1993, Nov: 1986
(July 16, 2015)
Temp Run date: Aug 26, 2015
SHASTA
KESWICK
Propose Clear Cr
Clear Cr Base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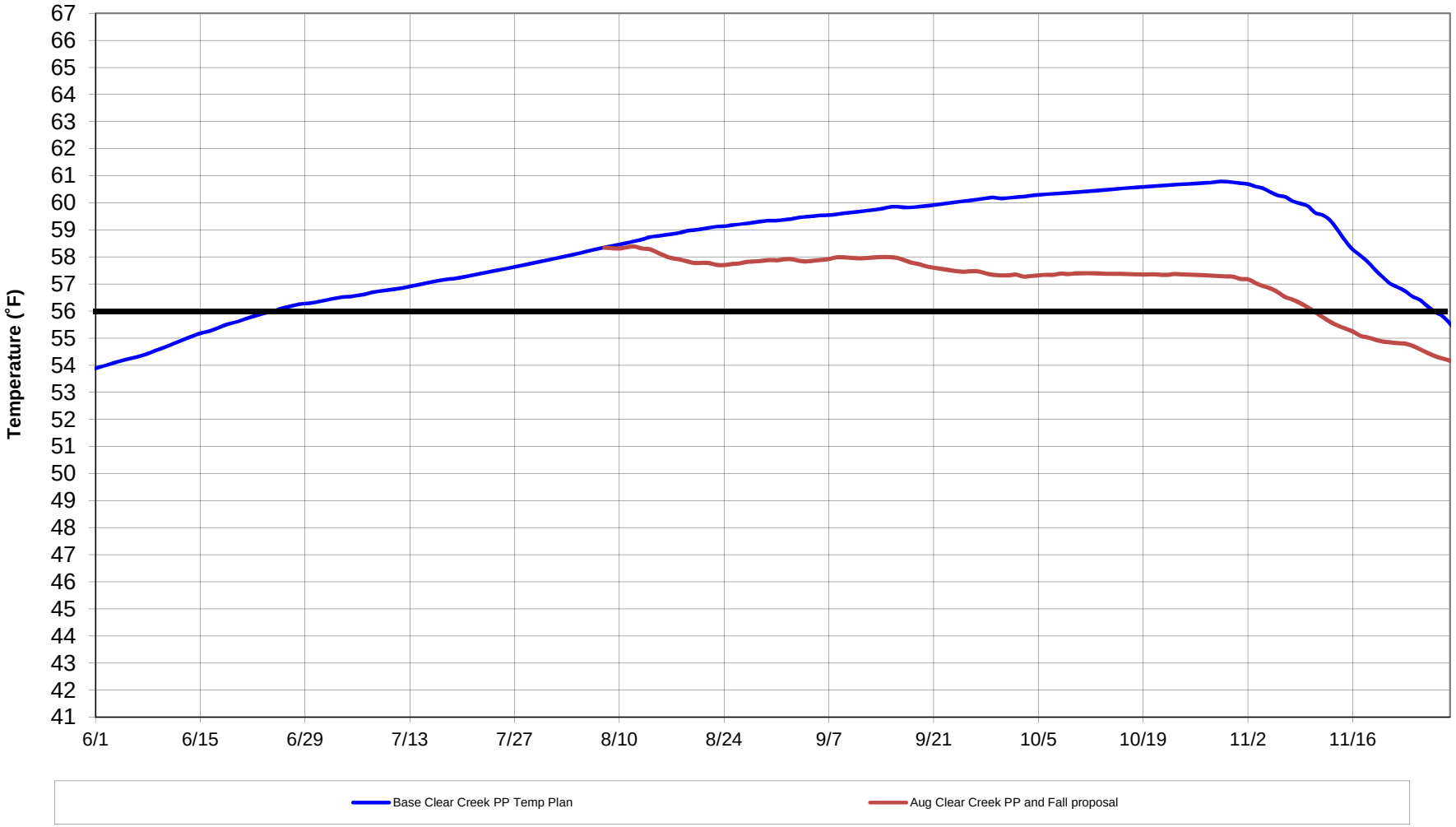
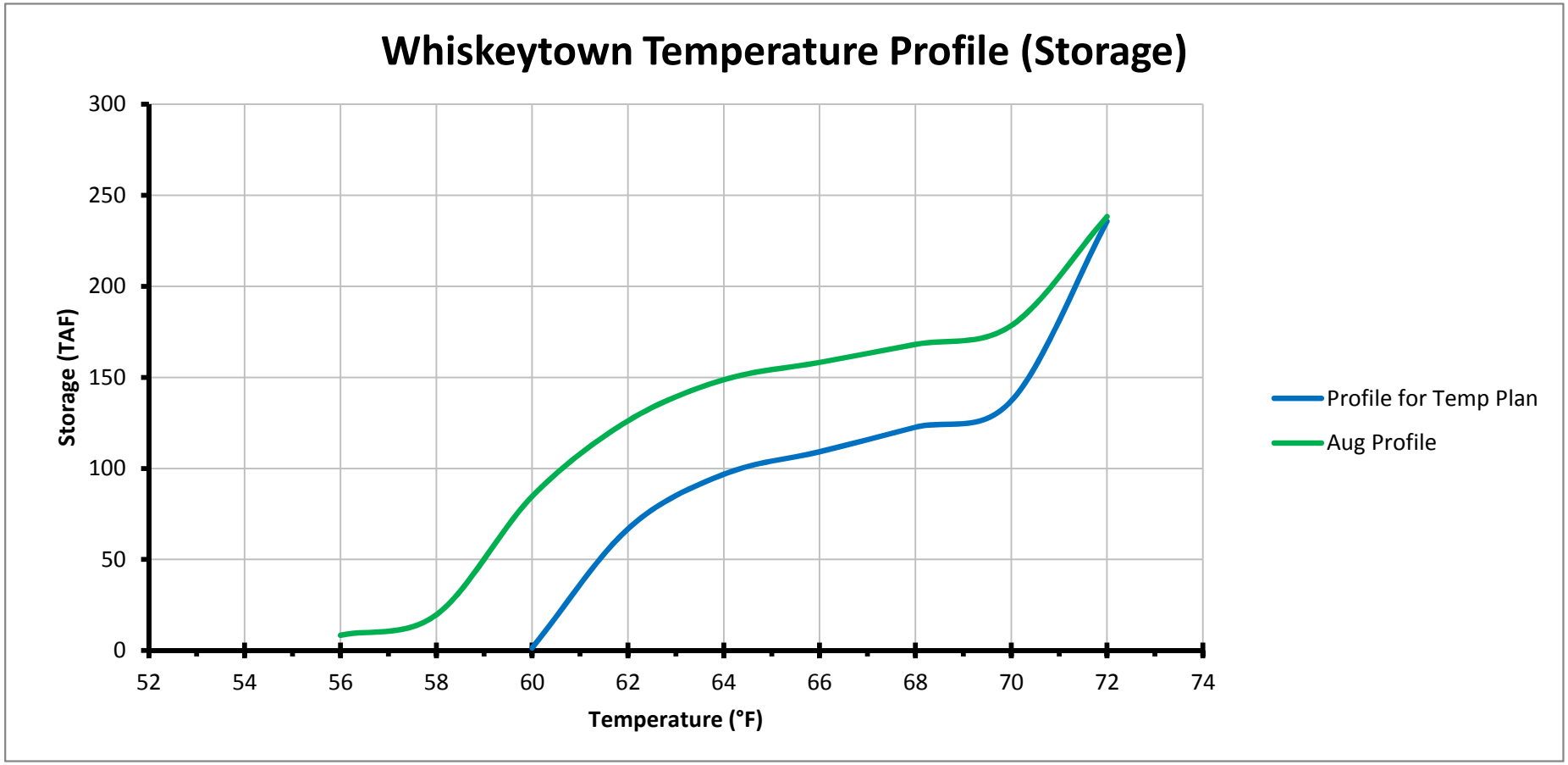
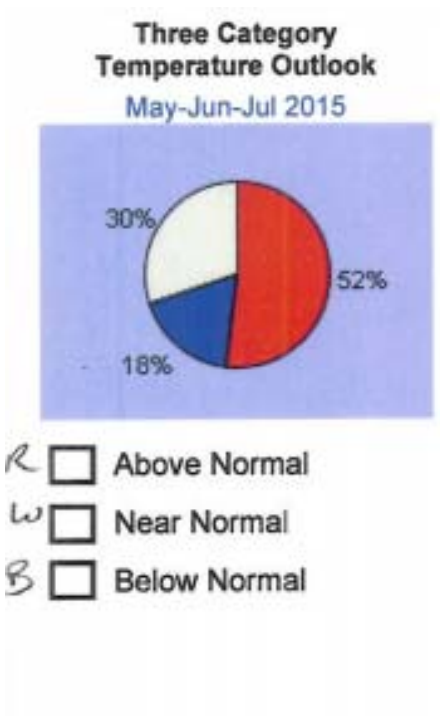
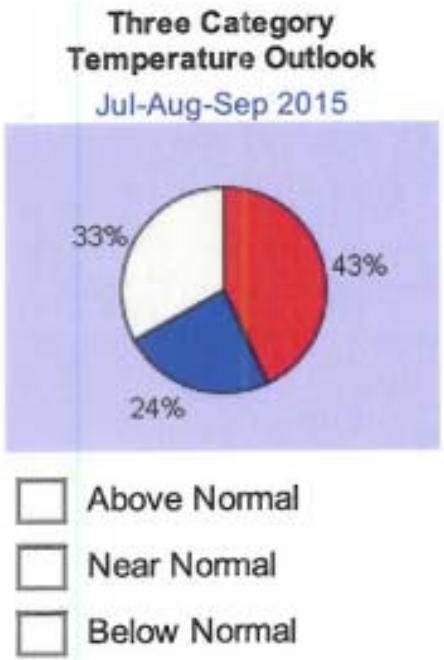
67
66
65
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
43
42
41
8/31
9/14
9/28
10/12
10/26
11/9
11/23
Kes Base Releases: Sept at 6500, Oct at 5000 and Nov & Dec at 4000
Propose Kes Release: Sept at 7000, Oct at 6000, Nov at 5000 and Dec at 4500
Trinity profile date : 8/4/2015
Whiskeytown profile date: 8/5/2015
Shasta profile date: 8/5/2015
50% L3MTO Years: Aug - Oct: 2003, Nov: 1999
(July 16, 2015)
SHASTA
KESWICK
Propose Clear Cr
Clear Cr Base

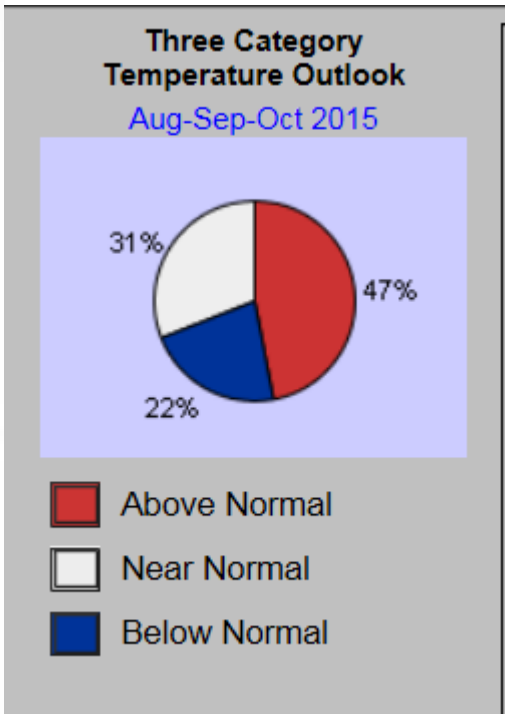
Spring Creek PP Temp plan vs. Aug Temper run




Whiskeytown Temperature Profile (Storage)
Storage (TAF)
300
250
200
150
100
50
0
52
54
56
58
60
62
64
66
68
70
72
74
Temperature (°F)
Profile for Temp Plan
Aug Profile


Three Category
Temperature Outlook
May-Jun-Jul 2015
30%
52%
18%
R
Above Normal
W
Near Normal
B
Below Normal


Three Category
Temperature Outlook
Jul-Aug-Sep 2015
33%
43%
24%
Above Normal
Near Normal
Below Normal


Three Category
Temperature Outlook
Aug-Sep-Oct 2015
31%
47%
22%
Above Normal
Near Normal
Below Normal

June Temp Plan

				PRG Open	Side Gates	
7 JUL	2015	0	0	2	1	**First Side Gate Used**
5 AUG	2015	0	0	3	0	Transitional Phase into Full Side Gate Ops
9 AUG	2015	0	0	2	1	Transitional Phase into Full Side Gate Ops
31 AUG	2015	0	0	1	1	Transitional Phase into Full Side Gate Ops
29 SEP	2015	0	0	0	1	Transitional Phase into Full Side Gate Ops
1 OCT	2015	0	0	1	1	**Last Transitional Phase into Full Side Gate Ops**
11 OCT	2015	0	0	0	1	**Primary reliance of side gate**

Aug Flow Plan

2 Sept	2015	0	0	2	1	Transitional Phase into Full Side Gate Ops
20 Sept	2015	0	0	1	1	Transitional Phase into Full Side Gate Ops
27 Oct	2015	0	0	0	1	Transitional Phase into Full Side Gate Ops
18 Nov	2015	0	0	1	1	**Last Transitional Phase into Full Side Gate Ops**
27 Nov	2015	0	0	2	1	**Never get to all side gate**