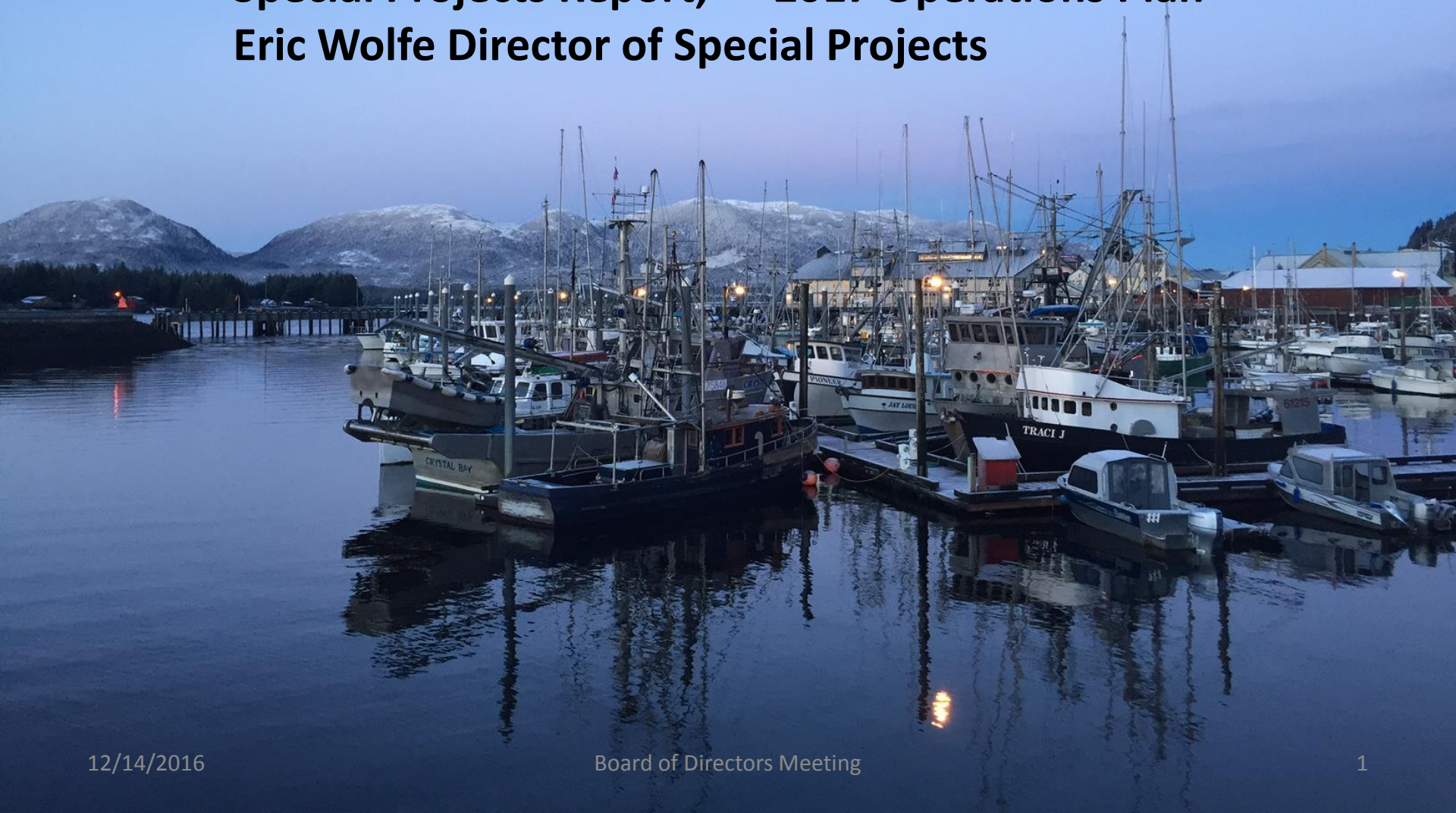
SEAPA Board of Directors Meeting
Ketchikan, Alaska

Special Projects Report, 2017 Operations Plan
Eric Wolfe Director of Special Projects



Swan Lake Raise Budget

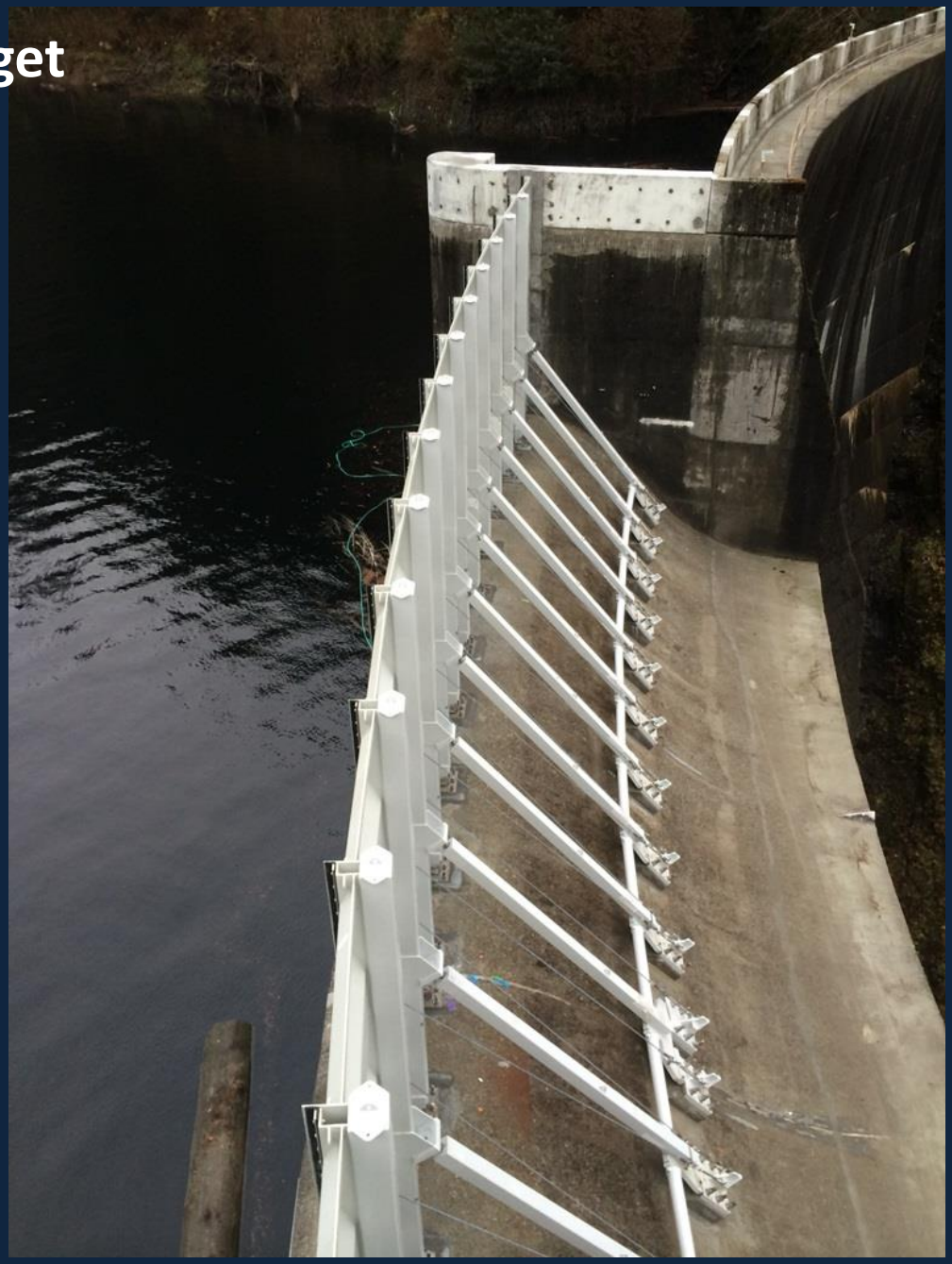
RR242 - SWAN LAKE RESERVOIR EXPANSION PROJECT
FINANCIAL SUMMARY - DEC 6, 2017

APPROVED BUDGET	
$ 11,115,568	FY17 R&R Budget

Expenditures by Fund Source	
$ 719,642	SEAPA Funds Expended
578,000	Grant - DCCED13 (SWL)
2,646	Grant - DCCED13 (Project Mgmt)
3,320,000	Grant - DCCED15
5,098,746	Construction Fund
$ 9,719,035	**Total Expenditures**

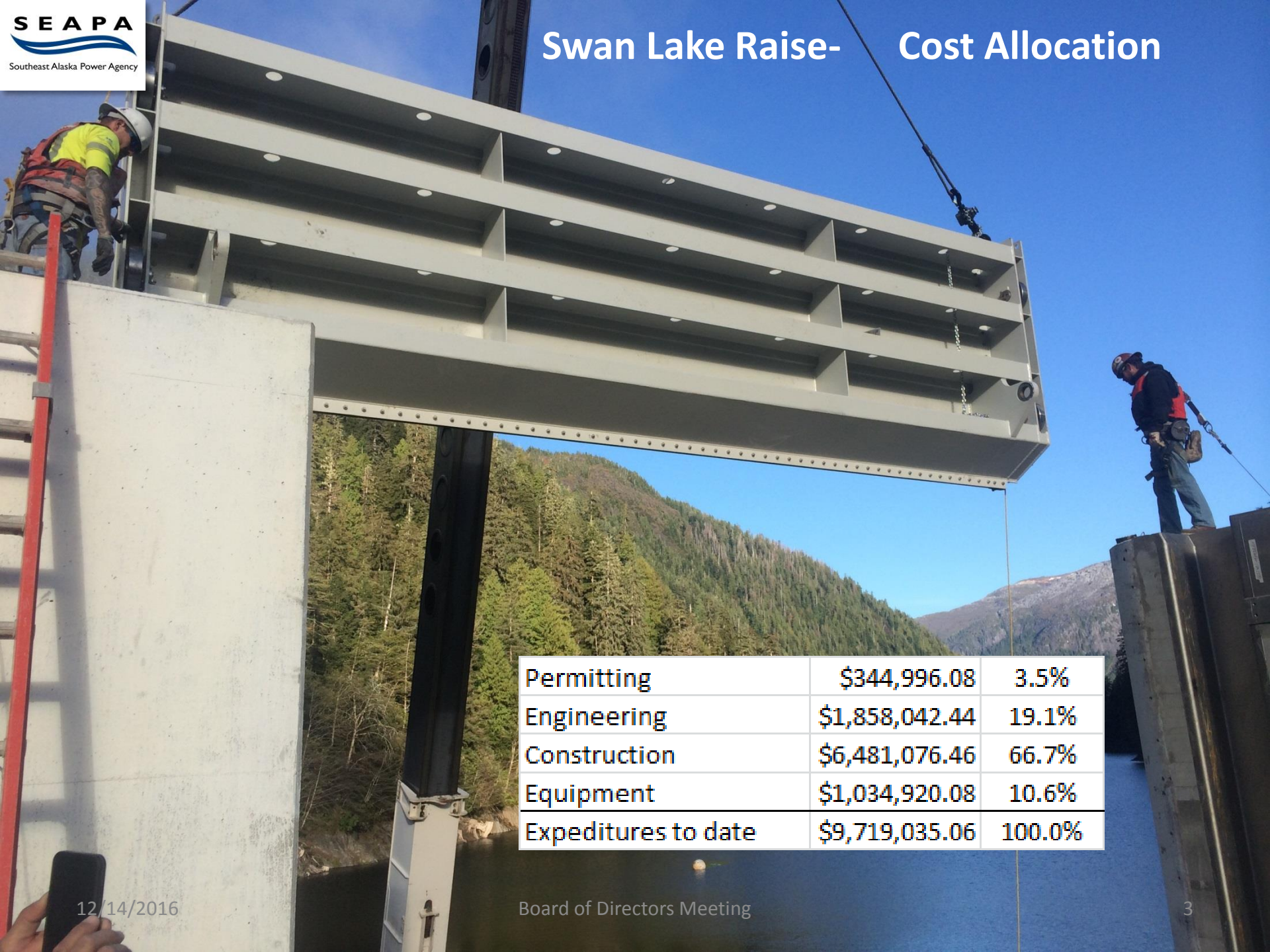
Remaining Project Budget	
$ 1,261,900	Open Task Orders
134,633	Remaining Contingency & Direct Expense
$ 1,396,533	**Remaining Budget**

Funding Sources for Remaining Project	
$ 906,476	Construction Funds Available
490,057	Other SEAPA Funds (R&R)
$ 1,396,533	**Total Expenditures**



Flashboard System Commissioned Nov 2, 2016

Swan Lake Raise- Cost Allocation



Permitting	$344,996.08	3.5%
Engineering	$1,858,042.44	19.1%
Construction	$6,481,076.46	66.7%
Equipment	$1,034,920.08	10.6%
Expeditures to date	$9,719,035.06	100.0%

Remaining Tasks:

- Electrical work almost finished
- Final Project close-out payment with PPM after conclusion of electrical work
- Final Contract payments to Kunz after VG controls pass commissioning requirements
- FERC Engineering Compliance Reports
- Final Project Reports
- Log Removal Process & Log Boom

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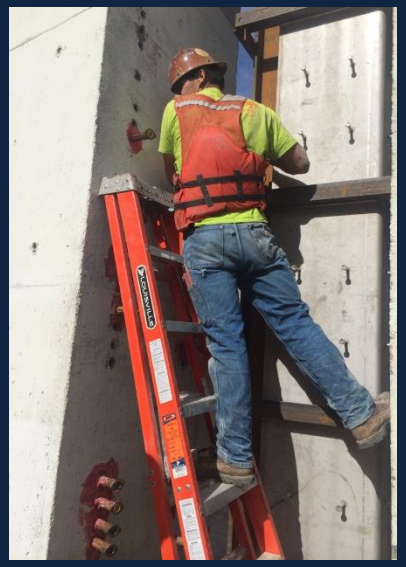


Water Management & 2017 Ops Plan-Methodology

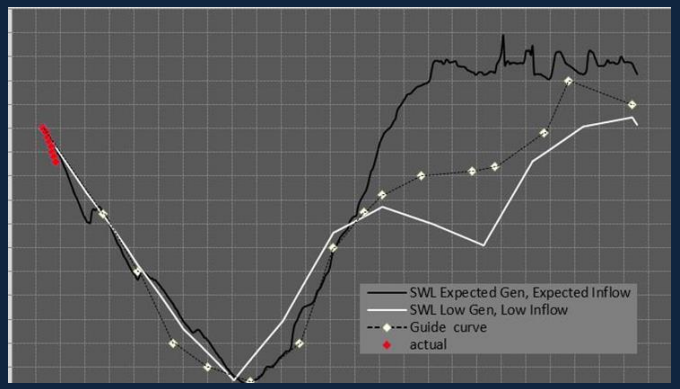
Inputs

Outputs

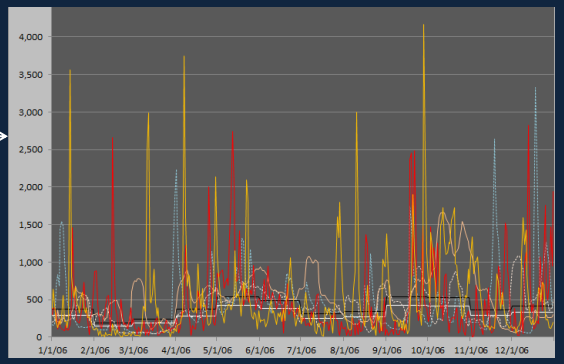
Starting HW level, ST weather and loads, LT load Fcst

Jan	11.0	2.0
Feb	9.8	0.0
Mar	8.0	0.0
Apr	6.0	0.0
May	4.0	0.0
Jun	5.0	0.0
Jul	7.0	0.0
Aug	8.0	0.0
Sep	4.0	0.0
Oct	5.0	0.0
Nov	5.0	0.0
Dec	8.0	7.0
	total	65,592

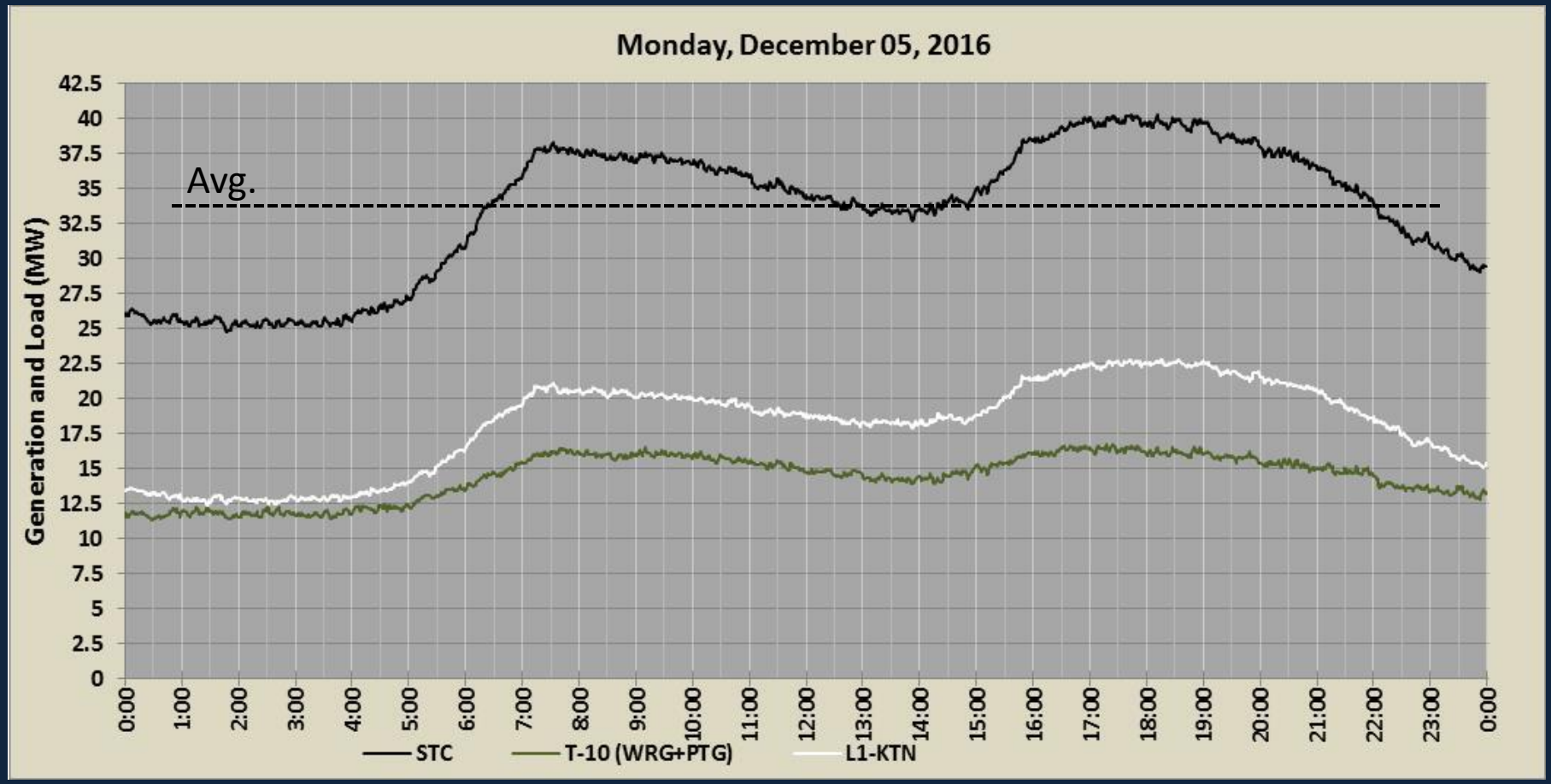
Continuity & Energy Balance Model



Select a range of Inflows that represent a reasonable risk approach to following the PSA

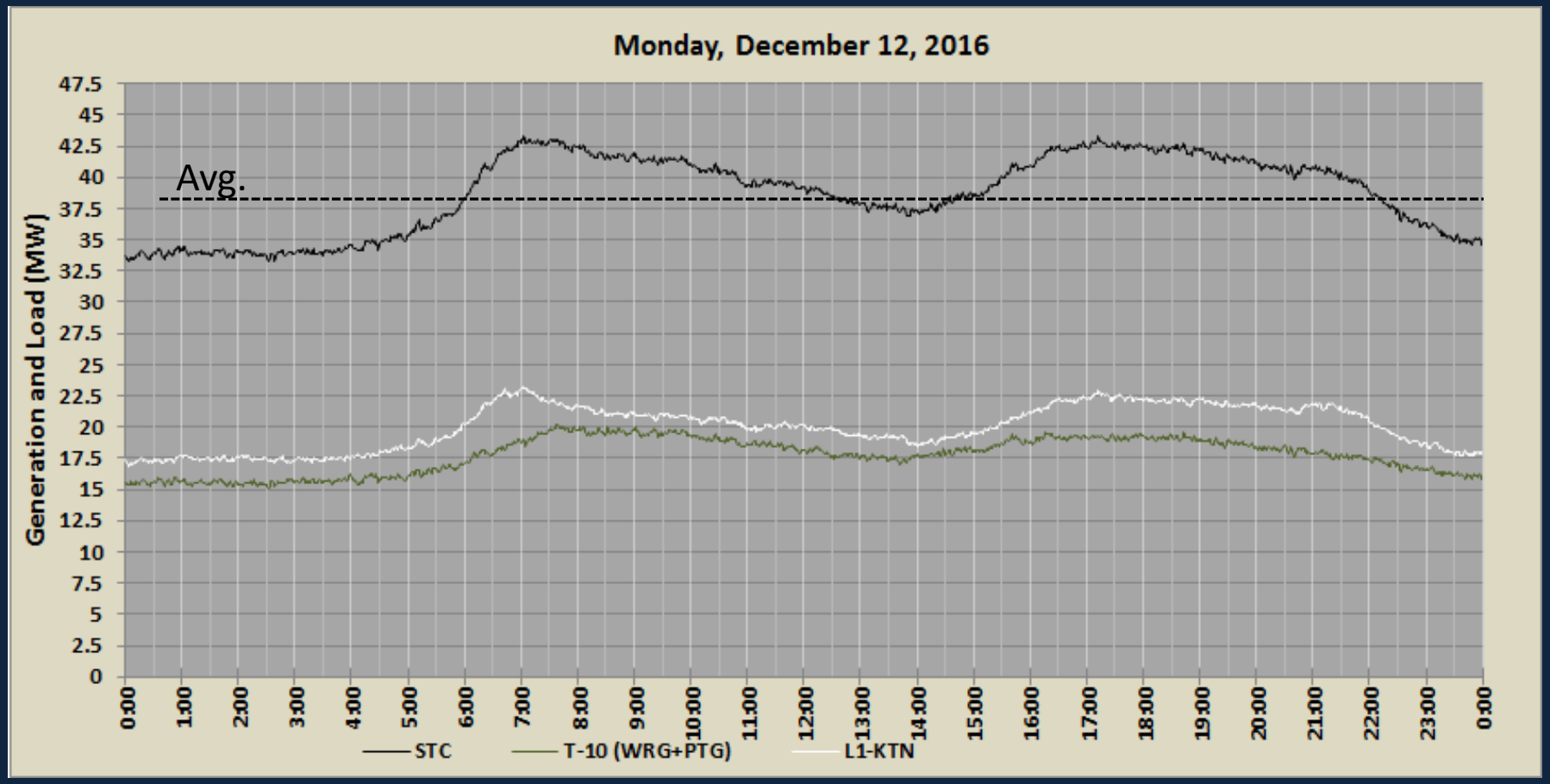


Water Management & 2017 Ops Plan –ST Inputs



SWL Avg. = 13.7 MW SEAPA Avg. = 33 MW TYL Avg. = 19.3 MW

Water Management & 2017 Ops Plan-ST Inputs Changing!



	Hr	L1	T10	SEAPA
Daily Avg Pwr		19.89	17.76	38.74
Peak Loads =>		22.29	19.61	43.293
		Swan	Tyee	
Avg. Gen (aMW)		17.6507	21.08515	
Pk Gen MW		21.677	22.619	

2017 Ops Plan- SWL Generation Schedule Detail

Select a range of Inflows consistent with both observations and the long term weather forecast, then select Generation that doesn't empty the reservoir but meets load, all remaining load will be to inflows and recent load history or forecasts

Jan	11.0	2.0
Feb	9.8	0.0
Mar	8.0	0.0
Apr	6.0	0.0
May	4.0	0.0
Jun	5.0	0.0
Jul	7.0	0.0
Aug	8.0	0.0
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Oct	5.0	0.0
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Dec	8.0	7.0
	total	65,592

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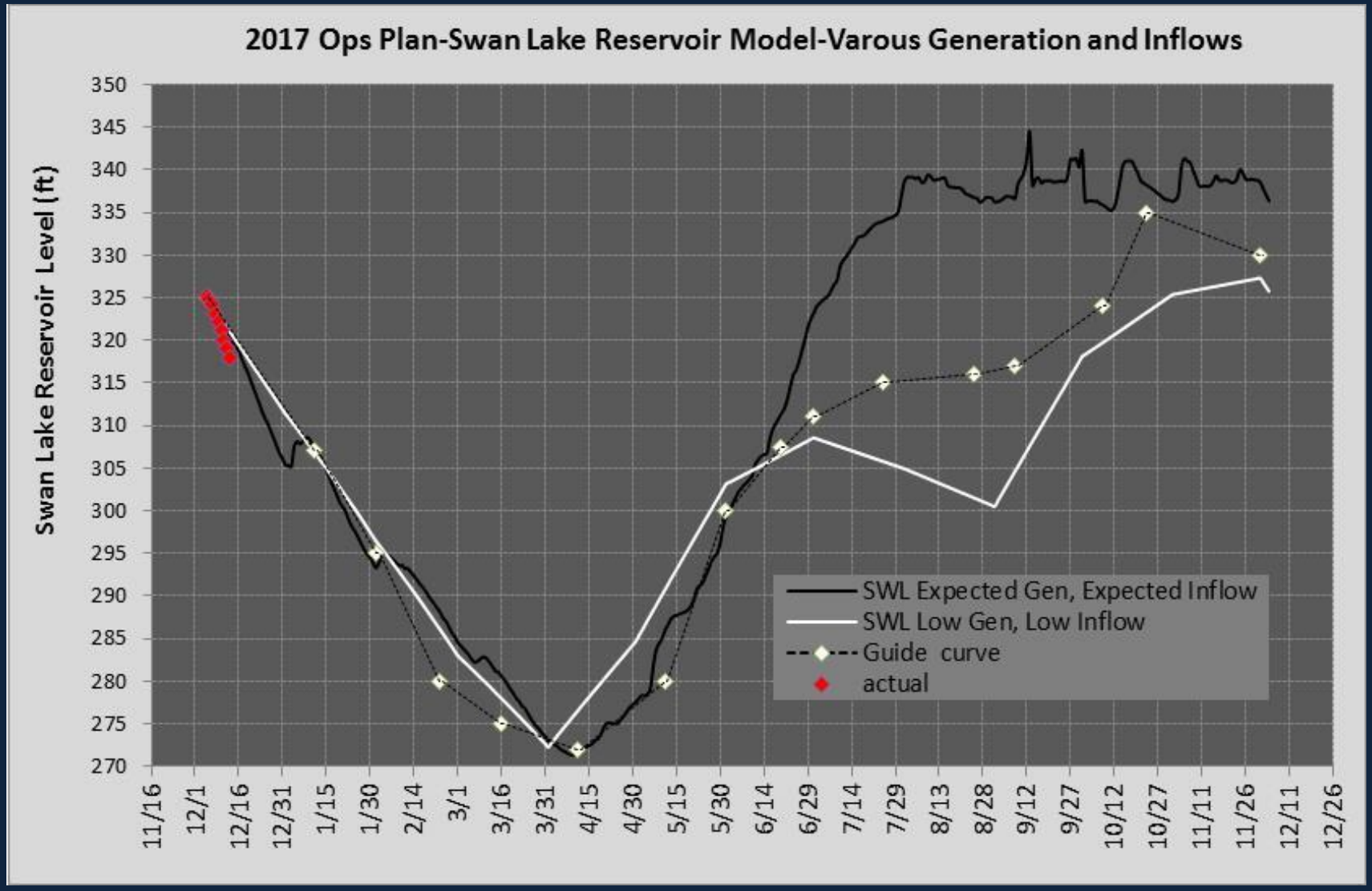
Jul	7.0	0.0
Aug	8.0	0.0
Sep	0.0	0.0
Oct	5.0	0.0
Nov	5.0	0.0
Dec	8.0	7.0
	total	55,416

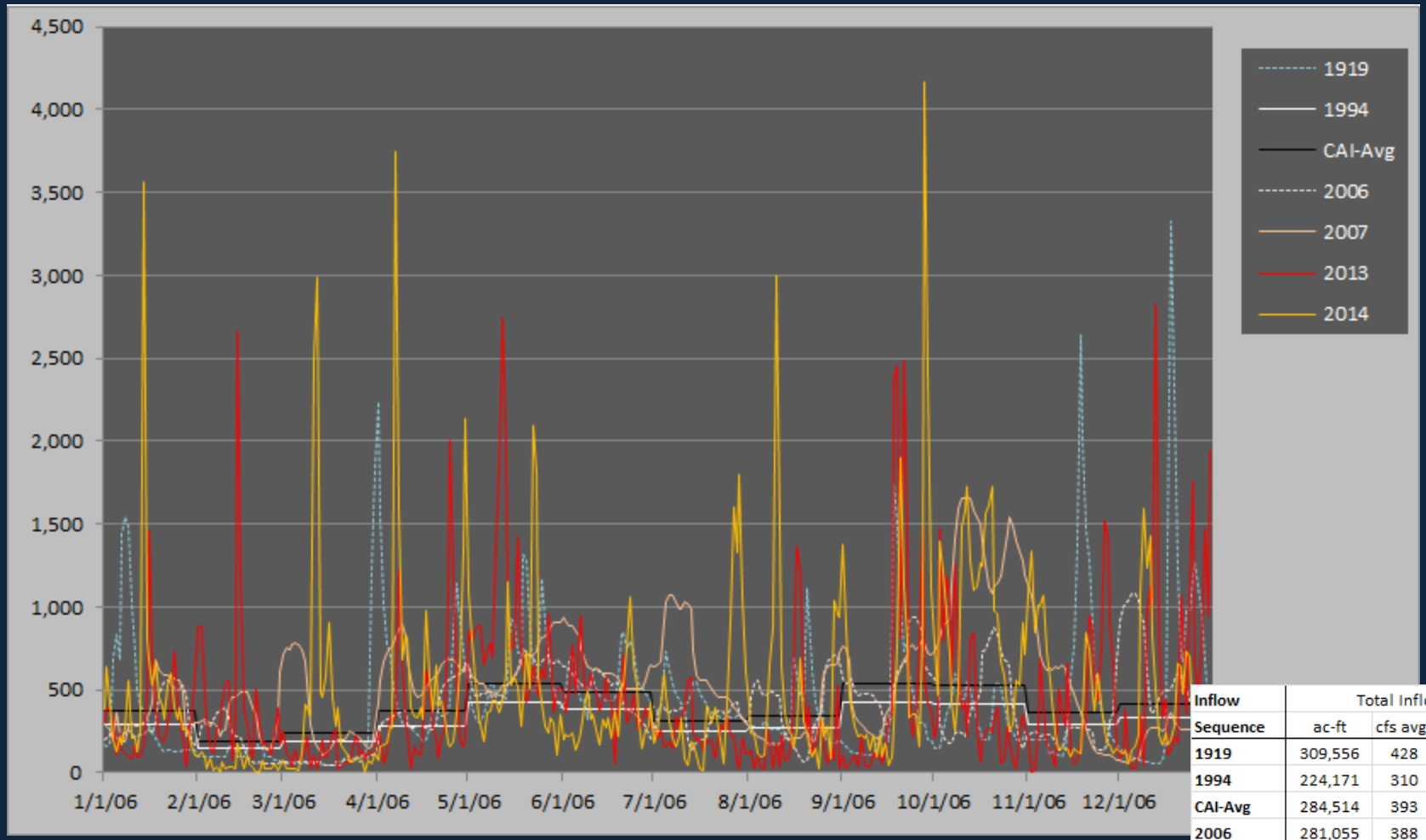
SWL historic average generation is approximately 76,000 MWh, but high Dec. & Jan generation usually means very low generation in March-April (out of water) , for the Ops Plan we have a medium low case as expected and a very low generation schedule as the low case

ST Loads not high enough, should be 17 aMW

Water Management & 2017 Ops Plan-SWL Elevations



2017 Ops Plan- SWL Inflows



Inflow Sequence	Total Inflow ac-ft	cfs avg.	cfs/mi^2	% of Avg.
1919	309,556	428	12.2	100%
1994	224,171	310	8.8	72%
CAI-Avg	284,514	393	11.2	92%
2006	281,055	388	11.1	91%
2007	389,912	539	15.4	126%
2012	331,975	459	13.1	107%
2013	313,968	434	12.4	101%
2014	357,257	494	14.1	115%
Trial	366,697	507	14.5	118%

We know historically, one of these spikes, maybe two, will arrive during the winter

2017 Ops Plan- Summary

2017 Ops Plan Summary

For the reasons demonstrated above, SEAPA staff proposes guide curve elevations be used by the scheduling group as warnings, and after consultation and mutual agreement between SEAPA and the dedicated resource holder, curtailments can then be issued. Guide curve elevations for Swan Lake and Tyee Lake are listed in Figure 5 and correspond with the above plots

As a reference, past Ops Plan maximum draft limits (minimum elevations) are listed below.

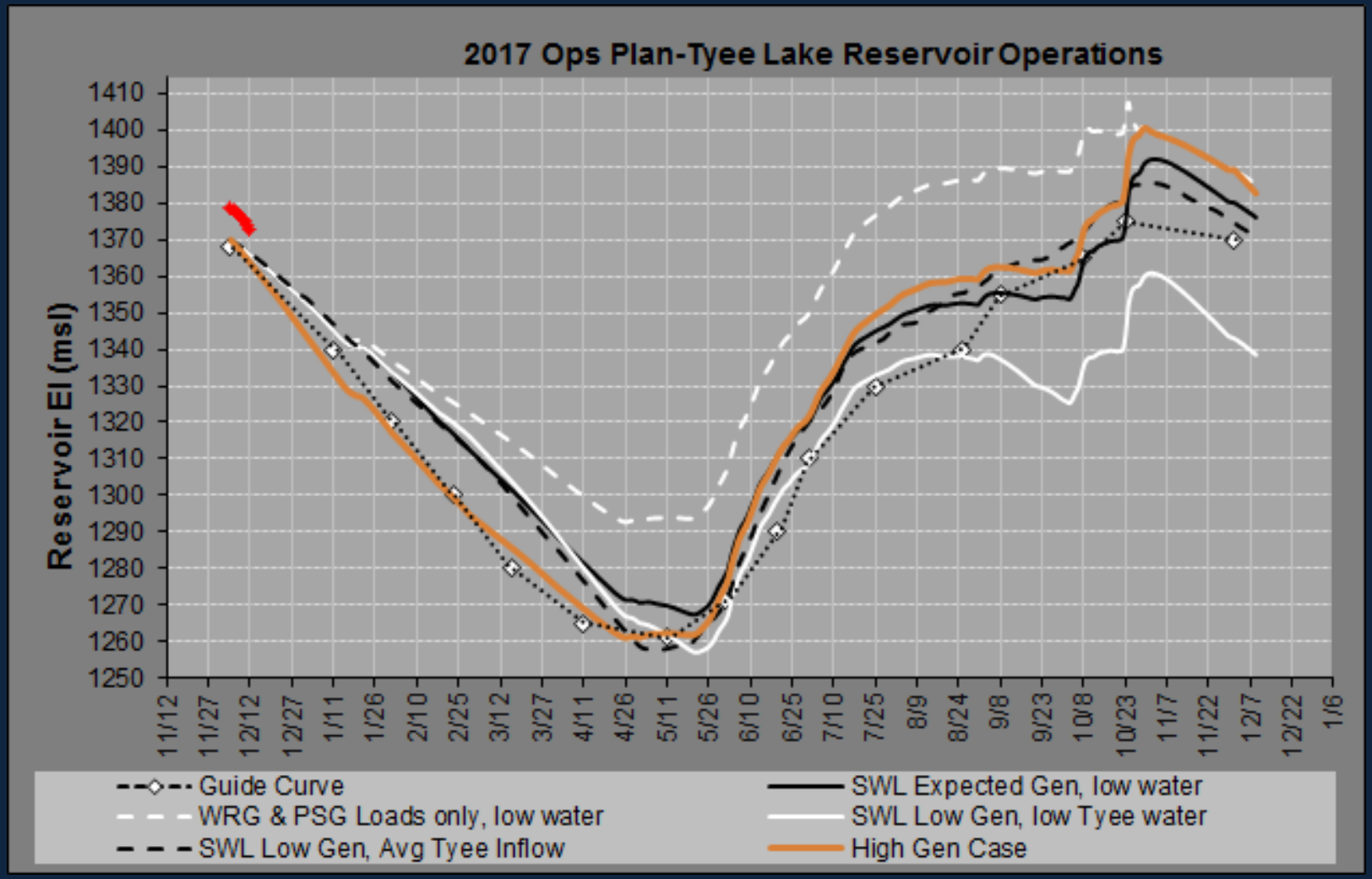
Operations Plan Maximum Draft Limits				Projected
	2014	2015	2016	2017
Swan Lake	275	285	275	273
Tyee Lake	1,265	1,280	1,270	1,261

2016-2017 date	Tyee GC Elevation (msl) ft.	SWL GC Elevation (msl) ft.
12/5	1368	325
1/11	1340	307
2/1	1320	295
2/23	1300	280
3/16	1280	275
4/11	1265	273
5/11	1261	280
6/1	1271	300
6/20	1290	307.5
7/1	1310	311
7/25	1330	315
8/25	1340	316
9/8	1355	317
10/8	1365	324
10/23	1375	335
12/1	1370	330

Figure 5- 2017 Ops Plan guide curves

SUGGESTED MOTION
I move to approve the 2017 SEAPA Operations Plan as defined in the "2017 Ops Plan Summary" on page 6 of the "SEAPA 2017 Operations Plan Report" dated December 6, 2016.

Water Management & 2017 Ops Plan-Tyee Elevations



◆ Actual Elevation

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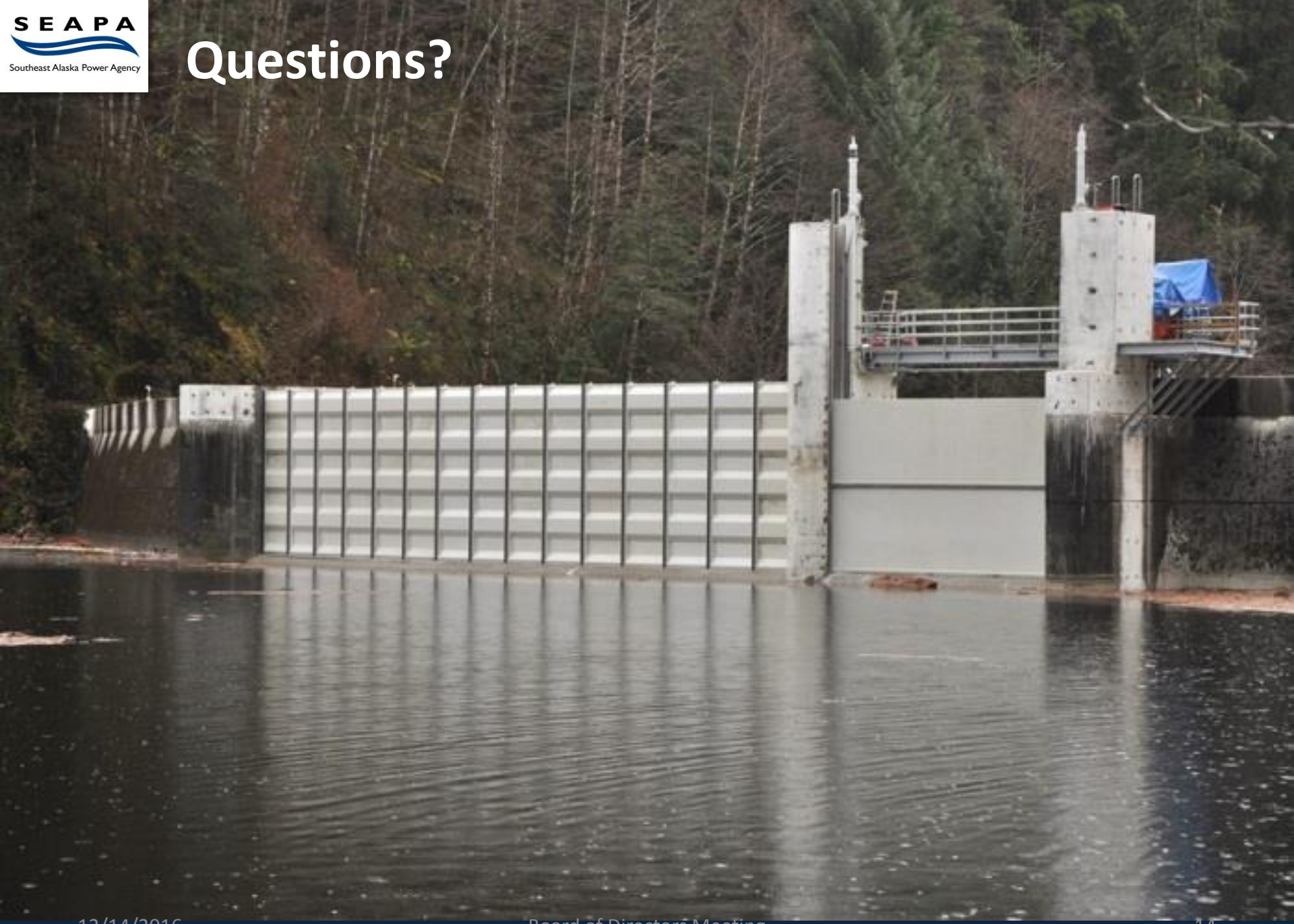
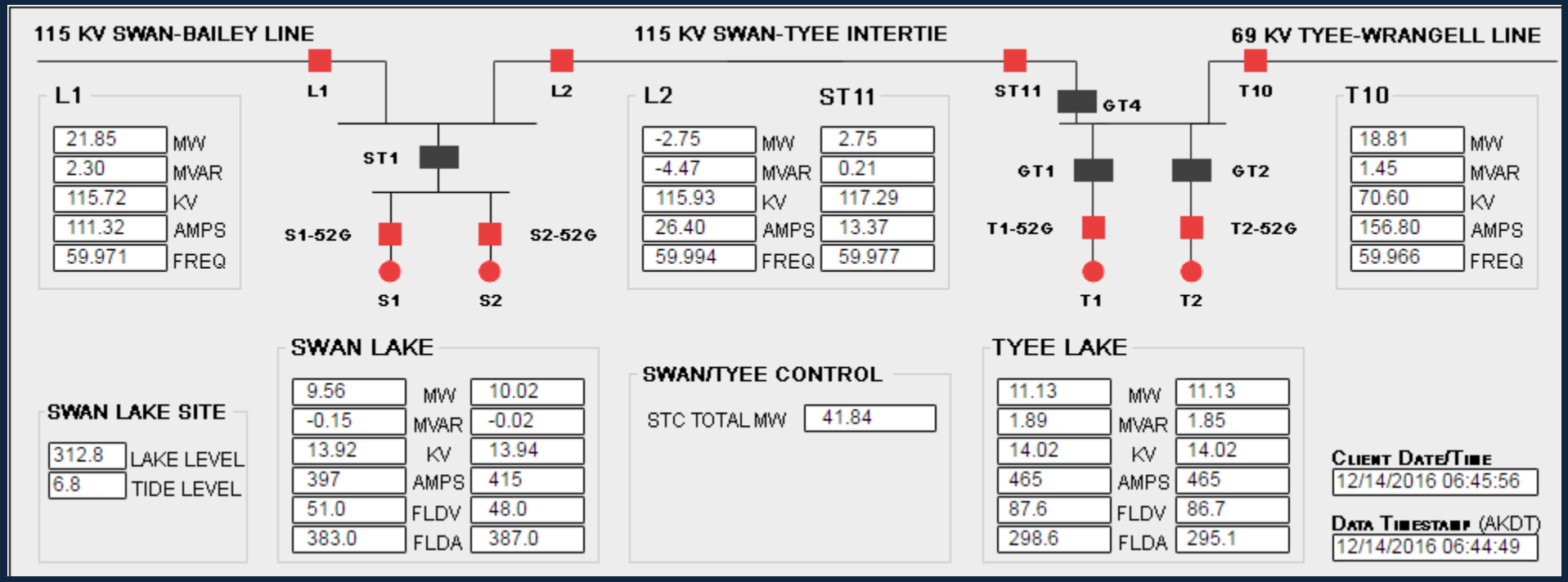
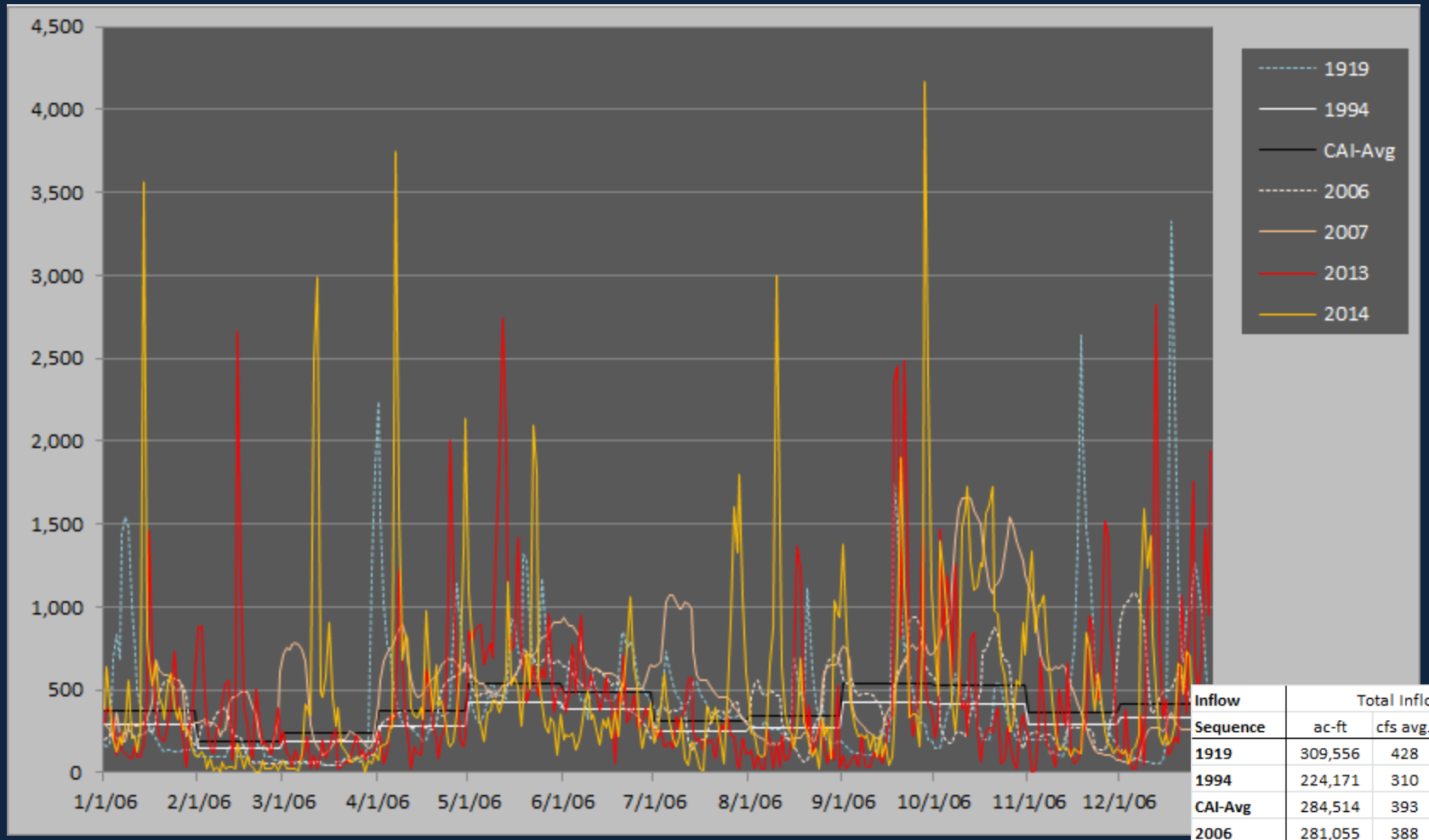
Questions?



2017 Ops Plan- Methodology- current conditions



2017 Ops Plan- SWL Inflows



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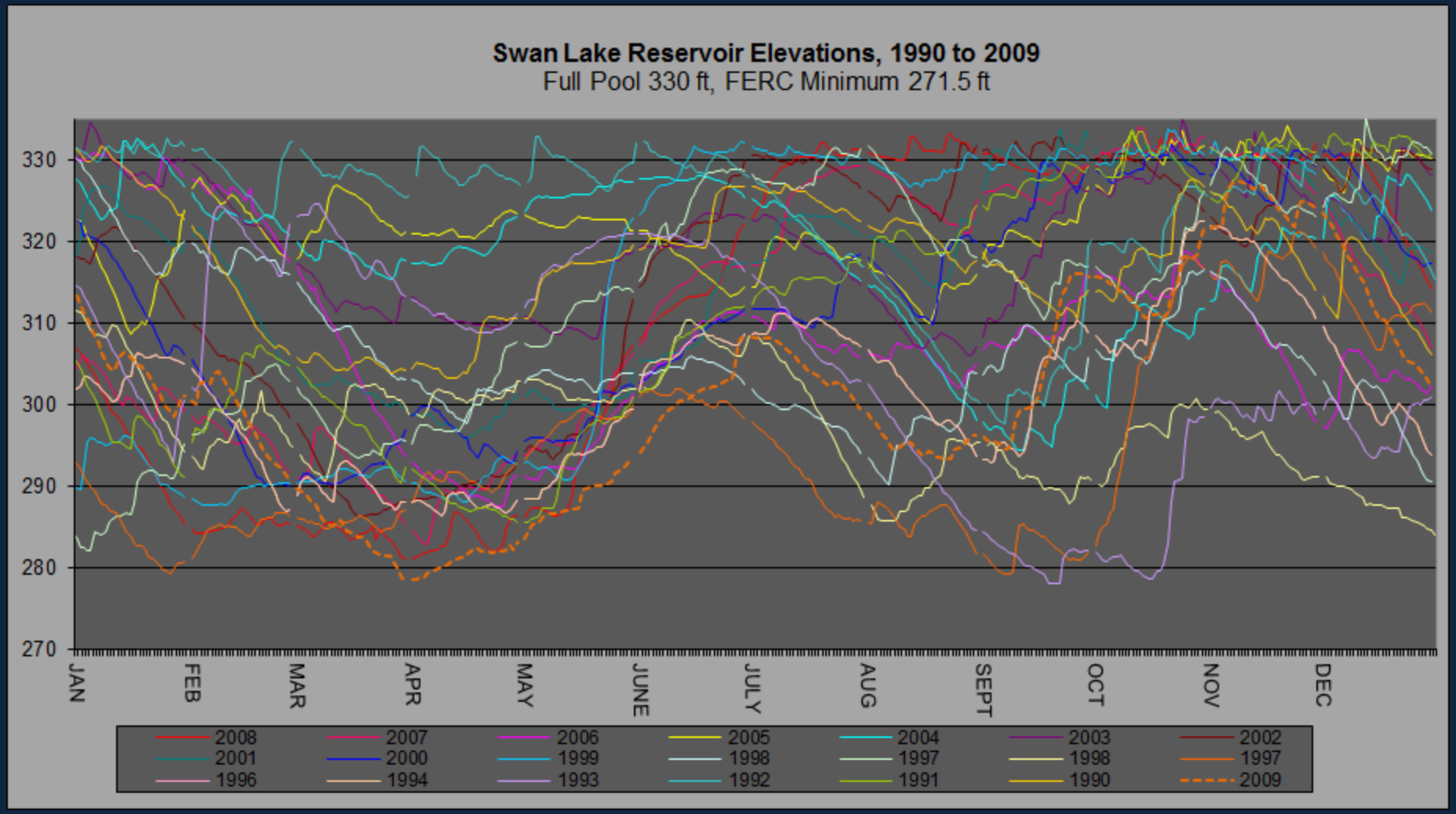
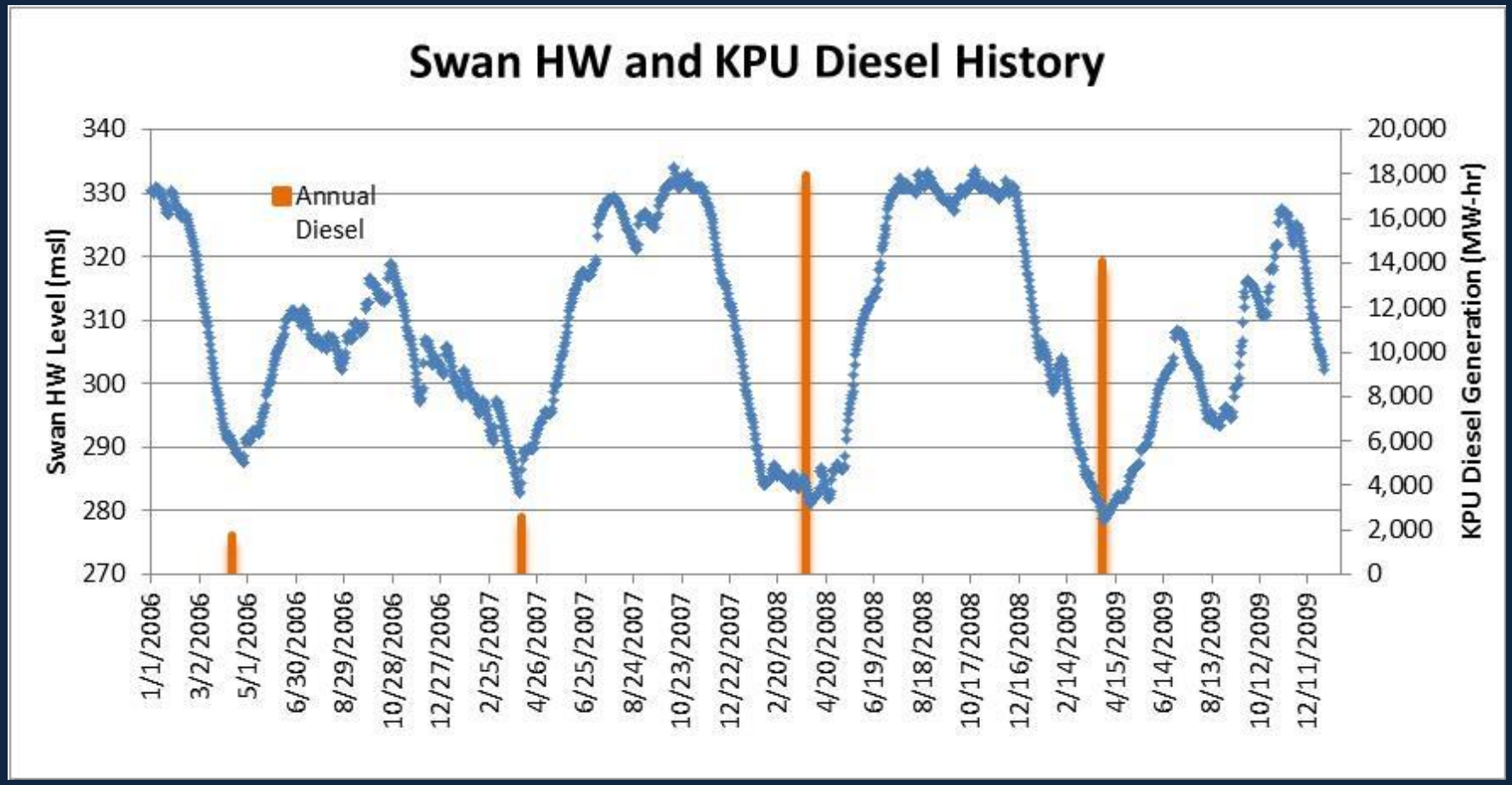
Water Management – Historical SWL Elevations



Water Management – Historical SWL Elevations & Diesel Generation



Why is spill occurring and diesel generation in the same year?