

BOYCE HYDRO POWER LLC

A W.D. Boyce Trusts Legacy Enterprise

Lee W. Mueller & Stephen B. Hultberg, Co-Member Managers
6000 S. M-30 (PO Box 15)
Edenville, MI 48620
Tel: (989) 689-3161 Fax: (989) 689-3155

June 20, 2016

The Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, D.C. 20426

Re: Sanford Project No. 2785
Request for Certification of Incremental Hydropower Generation

Dear Secretary:

Boyce Hydro Power, LLC, (Boyce) licensee for the Sanford Hydroelectric Project No. 2785 hereby applies to the Federal Energy Regulatory Commission (FERC) for an order certifying incremental power generation under the Internal Revenue Code Section 45, production tax credit, pursuant to Section 1301 of the Energy Policy Act of 2005, as amended.

The Sanford Project is located on the Tittabawassee River in the Village of Sanford, Michigan. The license was amended by FERC on September 9, 2013 to allow for an increase in capacity from 3300 KW to 3600 KW by the installation of a new turbine-generator set to replace an existing unit. Work on the installation of this new unit began in April 2015 and is expected to have an in service date of no later than August 1, 2016.

The current license which the Sanford Project is operating under was issued in 1998, and contained the required water release of 210 cfs or more at all times. The bypass requirement was initiated shortly thereafter so the first full year of operation under this condition was 1999. To develop the base year of existing production, an annual flow average was developed for the years 1999 through 2014. The 2014 water year was then used to project the increased production. Exhibit 1 summarizes the anticipated increase in production. Boyce sells its electrical energy to the local utility via different on-peak and off-peak sales rates. Therefore the summary lists the anticipated on-peak production increase at 8.88% and the off-peak increase at 58.51%, with the total increase at 23.36%.

Exhibit 2 explains the methodology used in preparing the projected increase in production of the new turbine-generator set for the water year 2014. Exhibit 3 is the detailed analysis of the increased production.

In answer to the questions posed in your letter of April 5, 2016 we offer the following response.

1. The 650 cfs requirement is easily handled with the spring runoff flows; see Exhibit 2 for further discussion.
2. We have used the average water year at Sanford from the period 1999 to 2014. We have applied our normal operating procedure to these flows for both the existing situation and the anticipated production.

The Secretary
June 20, 2016
Page 2

3. The amendment to License application submitted in 2013 to FERC contained very preliminary projections of the anticipated power increase. They were not based on the in depth analysis that accompanies this submittal.

Boyce respectfully requests the Commission to review the enclosed information and issue an appropriate order certifying the increased power generation for the purpose of Internal Revenue Code Section 45.

If you have any questions or require additional information, please contact me at 989-689-3161.

Sincerely,
Boyce Hydro Power, LLC

A handwritten signature in black ink, appearing to read "Frank O. Christie", with a horizontal line extending to the right.

Frank O. Christie, P.E.
General Manager

cc: Lee W. Mueller, Co-Member Manager
Stephen B. Hultberg, Co-Member Manager

EXHIBIT 1
BOYCE HYDRO POWER, LLC
SUMMARY OF BASELINE AND INCREASED PRODUCTION FROM THE
INSTALLATION OF A NEW AND MORE EFFICIENT TURBINE
AT THE SANFORD PROJECT 2785

	<u>Existing Baseline</u>	<u>New Output</u>	<u>Net Gain</u>	<u>Percent Improvement</u>
On-peak, kWh	5,935,773	6,462,619	526,846	8.88%
Off-peak, kWh	2,446,075	3,877,365	1,431,290	58.51%
Total, kWh	8,381,848	10,339,984	1,958,136	23.36%

EXHIBIT 2

SANFORD NEW POWER GENERATION CALCULATIONS – METHODOLOGY

The average river flow at Sanford for the years 1999 through 2014 was used to establish a base year for this analysis. In 1998 a license was issued for the Sanford Project, part of which required a minimum discharge of 210 cfs at all times into the river downstream, except for 650 cfs from March 1 to April 30. This altered the operating procedure for the plant, so only the years after 1998 were considered. The average annual headwater and tailwater elevations were developed on a monthly basis and used to calculate operating head. The project draws the reservoir down to an average level of 2.7 feet below normal pool for winter operation. The drawdown takes place in December and the full drawdown carries through January and February. The reservoir level returns to full pond during the months of March and April.

There are three dams upstream of the Sanford Reservoir and are operated in unison with Sanford to control the river flow. The Edenville Dam immediately upstream of the Sanford reservoir is operated as a limited store and release facility and so is not discharging water on weekends or holidays unless high river flows require its operation. However, since Sanford is required to discharge water 24 hours a day 7 days a week, the discharge from Sanford must be adjusted to account for the minimum flow requirements. This is done by allocating part of the daily flow (usually Monday or Friday) to meet the weekend minimum flow of 210 cfs (column 3). Historically the minimum March/April flow of 650 cfs has always been met by the high spring runoff conditions without any manipulation. Further, there are times in the dry months (July through October) when there is not enough flow in the river to maintain 210 cfs through the dry period. This occurs in the model the first 6 days of October. When faced with this situation we consult with Michigan DNR and FERC to determine a procedure. Given the option of flows less than 210 cfs versus drawing the reservoir elevation down below its authorized minimum elevation, the decision has always been to go with discharges below 210 cfs.

Our sales Contract with the local utility dictates that we generate as much power as possible during on-peak times (7 am to 10 pm weekdays). Therefore our operating scheme always tries to meet this dictate by maximizing on-peak generation on a daily basis. Because our operating procedures are structured in this manner, we have calculated the average annual production on a daily basis using the average annual discharges (columns 10-24). This display is how we would normally operate the project. The resulting generation is quite close to the average annual production for years 1999-2014. In all calculations we have allocated 210 cfs minimum flow when there are no turbines running.

The new turbine will be the primary or lead turbine at all times. The new turbine satisfies two goals, replacing the spill gates for minimum flow, and providing a more efficient unit as the lead turbine. All minimum flow requirements and as much on-peak production as possible will be met by the new turbine (columns 27-34). Following that, the two old turbines will produce as much on-peak energy as possible (columns 35-44). Any water

EXHIBIT 2

left after these steps will be utilized in off-peak production by the two old turbines
(columns 45-49)

Boyce Hydro LLC.
Sanford New Power Generation
June, 2016

		OUTPUT = Head(ft) x Run Hours x Flow(cfs) x Eff(%))/11.8																											
		Total On Peak Output = (34) + (39) + (44)																											
		Total Off Peak Output = (29) + (49)																											
		Future Production												By pass flow is first priority. All calculations provide 210 or 650 cfs 24 hours per day.															
New Kaplan Turbine												Remaining Two Existing Turbines																	
Day	Date	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
	Run Time	New unit	New unit	New unit	New unit	Remaining	New unit	New unit	New unit	New unit	Remaining	Unit 1	Unit 1	Unit 1	Unit 1	Remaining	Unit 2	Unit 2	Unit 2	Unit 2	Remaining	Both Old	Both Old	Both Old	Both Old	Remaining	ON PEAK	OFF PEAK	TOTAL
2014	hours	Flow	Efficiency	OUTPUT	Available	Run Time	Flow	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	total	total	OUTPUT	
	Off Peak	Off Peak	x 90%	Off Peak	Volme, cf	On peak	On Peak	x 90%	On Peak	Volume cfs	On Peak	On Peak	x 90%	On Peak	Volume cfs	On Peak	On Peak	x 90%	On Peak	Volume cfs	Off Peak	Off Peak	x 90%	Off Peak	Volume cfs	kWh	kWh	OUTPUT	
sat	23	24	720	0.814	29,541	35,829,364																							
sun	24	24	720	0.814	29,541	35,129,764																600	16.6	0.774	17,363	0	0	46,904	46,904
	25	9	210	0.728	2,709	89,665,015	15	720	0.814	17,295	50,785,015	600	15.0	0.774	14,708	18,385,015	600	8.5	0.774	8,341	0					40,345	2,709	43,053	
	26	9	210	0.728	2,709	77,165,586	15	720	0.814	17,295	38,285,586	600	15.0	0.774	14,708	5,885,586	600	2.7	0.774	2,667	0					34,670	2,709	37,379	
	27	9	210	0.728	2,891	54,002,107	15	720	0.814	18,463	15,122,107	600	7.0	0.774	7,328	0											25,791	2,891	28,683
	28	9	210	0.728	2,891	46,306,056	15	720	0.814	18,463	7,426,056	600	3.4	0.774	3,599	0											22,062	2,891	24,953
sat	Mar. 1	24	397	0.819	17,907	0																					0	17,907	17,907
sun	2	24	210	0.728	8,412	0																					0	8,412	8,412
	3	9	210	0.728	2,971	50,752,643	15	720	0.814	18,974	11,872,643	600	5.5	0.774	5,913	0											24,886	2,971	27,858
	4	9	210	0.728	2,971	50,791,886	15	720	0.814	18,974	11,911,886	600	5.5	0.774	5,932	0											24,906	2,971	27,878
	5	9	210	0.728	2,971	50,732,796	15	720	0.814	18,974	11,852,796	600	5.5	0.774	5,903	0											24,877	2,971	27,848
	6	9	210	0.728	2,971	50,817,596	15	720	0.814	18,974	11,937,596	600	5.5	0.774	5,945	0											24,919	2,971	27,890
	7	9	210	0.728	2,971	58,460,872	15	720	0.814	18,974	19,580,872	600	9.1	0.774	9,752	0											28,725	2,971	31,697
sat	8	24	720	0.814	30,358	6,710,038																600	3.1	0.774	3,342	0	0	33,700	33,700
sun	9	24	348	0.814	15,593	0																					0	15,593	15,593
	10	9	210	0.728	2,971	54,169,902	15	720	0.814	18,974	15,289,902	600	7.1	0.774	7,615	0											26,588	2,971	29,560
	11	9	210	0.728	2,971	34,861,665	15	646	0.818	17,107	0																17,107	2,971	20,078
	12	9	210	0.728	2,971	38,694,806	15	717	0.814	18,883	0																18,883	2,971	21,855
	13	9	210	0.728	2,971	38,691,648	15	717	0.814	18,882	0																18,882	2,971	21,853
	14	9	210	0.728	2,971	38,744,874	15	717	0.814	18,908	0																18,908	2,971	21,879
sat	15	24	709	0.815	29,929	0																					0	29,929	29,929
sun	16	24	720	0.814	30,358	11,181,885																600	5.2	0.774	5,569	0	0	35,927	35,927
	17	9	650	0.819	9,709	75,487,500	15	720	0.814	17,806	36,607,500	600	15.0	0.774	15,143	4,207,500	600	1.9	0.774	1,961	0					34,910	9,709	44,619	
	18	9	650	0.819	9,709	75,668,828	15	720	0.814	17,806	36,788,828	600	15.0	0.774	15,143	4,388,828	600	2.0	0.774	2,046	0					34,995	9,709	44,704	
	19	9	650	0.819	9,709	75,598,913	15	720	0.814	17,806	36,718,913	600	15.0	0.774	15,143	4,318,913	600	2.0	0.774	2,014	0					34,962	9,709	44,671	
	20	9	650	0.819	9,709	76,245,287	15	720	0.814	17,806	37,365,287	600	15.0	0.774	15,143	4,965,287	600	2.3	0.774	2,316	0					0	35,265	9,709	44,974
	21	9	650	0.819	9,709	83,108,223	15	720	0.814	17,806	44,228,223	600	15.0	0.774	15,143	11,828,223	600	5.5	0.774	5,523	0					0	38,472	9,709	48,181
sat	22	24	720	0.814	30,358	36,574,070																600	16.9	0.774	18,215	0	0	48,572	48,572
sun	23	24	720	0.814	30,358	36,402,666																600	16.9	0.774	18,129	0	0	48,487	48,487
	24	9	720	0.814	10,684	96,064,979	15	720	0.814	17,806	57,184,979	600	15.0	0.774	15,143	24,784,979	600	11.5	0.774	11,579	0					44,528	10,684	55,211	
	25	9	650	0.819	9,709	81,647,227	15	720	0.814	17,806	42,767,227	600	15.0	0.774	15,143	10,367,227	600	4.8	0.774	4,840	0					37,789	9,709	47,498	
	26	9	720	0.814	10,684	116,159,872	15	720	0.814	17,806	77,279,872	700	15.0	0.720	16,434	39,479,872	700	15.0	0.720	16,429	1,679,872	1200	0.4	0.774	785	0	50,669	11,469	62,138
	27	9	720	0.814	10,684	130,067,522	15	720	0.814	17,806	91,187,522	700	15.0	0.720	16,434	53,387,522	700	15.0	0.720	16,429	15,587,522	1200	3.6	0.774	7,285	0	50,669	17,969	68,638
	28	9	720	0.814	10,684	129,633,147	15	720	0.814	17,806	90,753,147	700	15.0	0.720	16,434	52,953,147	700	15.0	0.720	16,429	15,153,147	1200	3.5	0.774	7,082	0	50,669	17,766	68,435
sat	29	24	720	0.814	28,490	88,463,999																1200	20.5	0.774	41,345	0	0	69,835	69,835
sun	30	24	720	0.814	28,490	62,175,549																1200	14.4	0.774	29,059	0	0	57,549	57,549
	31	9	720	0.814	10,684	110,460,229	15	720	0.814	17,806	71,580,229	700	15.0	0.720	16,434	33,780,229	700	13.4	0.720	14,681	0					48,922	10,684	59,605	
	Apr. 1	9	720	0.814	10,421	222,195,048	15	720	0.814	17,368	183,315,048	700	15.0	0.720	16,030	145,515,048	700	15.0	0.720	16,025	107,715,048	1400	9.0	0.720	19,236	62,355,048	49,423	29,657	79,080
	2	9	720	0.814	9,633	277,043,504	15	720	0.814	16,055	238,163,504	700	15.0	0.720	14,818	200,363,504	700	15.0	0.720	14,813	162,563,504	1400	9.0	0.720	17,781	117,203,504	45,685	27,414	73,099
	3	9	720	0.814	10,727	179,070,642	15	720	0.814	17,879	140,190,642	700	15.0	0.720	16,501	102,390,642	700	15.0	0.720	16,496	64,590,642	1400	9.0	0.720	19,802	19,230,642	50,877	30,529	81,406
	4	9	720	0.814	11,122	96,843,515	15	720	0.814	18,536	57,963,515	600	15.0	0.774	15,763	25,563,515	600	11.8	0.774	12,432	0					0	46,732	11,122	57,853
sat	5	24	720	0.814	29,657	118,955,009																1400	23.6	0.720	53,837	0	0	83,494	83,494
sun	6	24	720	0.814	29,657	100,145,649																1200	23.2	0.774	48,723	0	0	78,381	78,381
	7	9	720	0.814	11,122	133,399,981	15	720	0.814	18,536	94,519,981	700	15.0	0.720	17,108	56,719,981	700	15.0	0.720	17,103	18,919,981	1200	4.4	0.774	9,205	0	52,746	20,327	73,073
	8	9	720	0.814	11,122	126,689,054	15	720	0.814	18,536	87,809,054	700	15.0	0.720	17,108	50,009,054	700	15.0	0.720	17,103	12,209,054	1200	2.8	0.774	5,940	0	52,746	17,062	69,808
	9	9	720	0.814	11,122	125,284,892	15	720	0.814	18,536	86,404,892	700	15.0	0.720	17,108	48,604,892	700	15.0	0.720	17,103	10,804,892	1200	2.5	0.774	5,257	0	52,746	16,378	69,124
	10	9	650	0.819	10,107	73,422,981	15	720	0.814	18,536	34,542,981	600	15.0	0.774	15,763	2,													

Boyce Hydro LLC.
Sanford New Power Generation
June, 2016

SANFORD NEW POWER GENERATION																												
Average, Years 1999 to 2014										June 13, 2016																		
Efficiency = turbine Eff. X 90% for total plant efficiency.																												
First 7 hours and the last 2 hours of the day, plus weekends, are Off Peak generation. Use 9 hours for Off peak calculation.																												
From 7 AM to 10 PM (15 hours) during week days are On Peak generation.																												
By pass flow is first priority. All calculations provide 210 or 650 cfs 24 hours per day.																												
Average Annual Flow at Sanford			Average Headwater				Average Tailwater and Head				Existing Off Peak Generation					Existing On Peak Generation					OUTPUT = Head(ft) x Run Hours x Flow(cfs) x Eff(%))/11.8							
Bypass = 210cfs when not running			= 18,144,000 cf/day																									
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				
Sanford	Sanford	Sanford Avail.	Diff. from	Hdwater	Spill Gate	Tailrace	Gross	Net	Number	Total Unit	Total Unit	Unit	Total Unit	Remaining	Unit 1	Unit 1	Unit 1	Unit 1	Remaining	Unit 2 & 3	Unit 2 & 3	Unit 2 & 3	Unit 2 & 3	Remaining				
Discharge	Available	Adjusted	Normal	Elev.	Open	Elev.	Head	Head	of Units	Run Time	Flow	Efficiency	OUTPUT	Available	Run Time	Flow	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available				
Ac-ft/day	cf/day	cf/day	Pool El.	feet	feet	feet	feet	feet	Running	hours	cfs	% @ cfs	kWh	cf after Off-	hours	cfs	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs				
			630.8	630.80 - (4)			(5) - (7)	(8)x98%	Off Peak	Off Peak	Off Peak	x 90%	OFF PEAK	peak & bypass	On peak	On Peak	x 90%	On Peak		On Peak	On Peak	x 90%	On Peak					
18	2327.27	101,375,687	101,375,687	-1.0	629.8	0	604.4	25.4	24.9	1	9.00	700	0.720	9,569	78,695,687	15	700	0.720	15,948	40,895,687	1200	9.5	0.774	19,897	0			
19 sat	2322.30	101,159,176	101,159,176	-1.0	629.8	0	602.8	27.0	26.5	1	40.14	700	0.720	45,367	0													
20 sun	2035.79	88,679,143	88,679,143	-1.0	629.8	0	602.8	27.0	26.5	1	35.19	700	0.720	39,770	0													
21	1482.87	64,593,689	64,593,689	-1.0	629.8	0	602.8	27.0	26.5	1	9.00	700	0.720	10,171	41,913,689	15	700	0.720	16,952	4,113,689	600	1.9	0.774	2,127	0			
22	2041.42	88,924,071	88,924,071	-1.0	629.8	0	604.4	25.4	24.9	1	9.00	700	0.720	9,569	66,244,071	15	700	0.720	15,948	28,444,071	600	13.2	0.774	13,839	0			
23	1485.74	64,718,634	64,718,634	-1.0	629.8	0	602.8	27.0	26.5	1	9.00	700	0.720	10,171	42,038,634	15	700	0.720	16,952	4,238,634	600	2.0	0.774	2,192	0			
24	1484.26	64,654,583	64,654,583	-1.0	629.8	0	602.8	27.0	26.5	1	9.00	700	0.720	10,171	41,974,583	15	700	0.720	16,952	4,174,583	600	1.9	0.774	2,159	0			
25	1484.92	64,683,000	64,683,000	-1.0	629.8	0	602.8	27.0	26.5	1	9.00	700	0.720	10,171	42,003,000	15	700	0.720	16,952	4,203,000	600	1.9	0.774	2,174	0			
26 sat	1487.97	64,816,064	64,816,064	-1.0	629.8	0	602.8	27.0	26.5	1	25.72	700	0.720	29,068	0													
27 sun	1958.77	85,324,131	85,324,131	-1.0	629.8	0	602.8	27.0	26.5	1	33.86	700	0.720	38,266	0													
28	2042.03	88,950,683	88,950,683	-1.0	629.8	0	604.4	25.4	24.9	1	9.00	650	0.747	9,218	67,890,683	15	700	0.720	15,948	30,090,683	600	13.9	0.774	14,640	0			
29	1348.39	58,735,724	58,735,724	-1.0	629.8	0	602.8	27.0	26.5	1	9.00	650	0.747	9,799	37,675,724	15	650	0.747	16,332	2,575,724								
30	1485.96	64,728,557	64,728,557	-1.0	629.8	0	602.8	27.0	26.5	1	9.00	650	0.747	9,799	43,668,557	15	650	0.747	16,332	8,568,557	600	4.0	0.774	4,431	0			
May 1	1441.20	62,778,609	62,778,609	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	55,974,609	15	600	0.774	16,199	23,574,609	600	10.9	0.774	12,644	0			
2	1480.19	64,476,864	64,476,864	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	57,672,864	15	600	0.774	16,199	25,272,864	600	11.7	0.774	13,555	0			
3 sat	1482.17	64,563,468	64,563,468	0	630.8	0	602.8	28.0	27.4	1	29.89	600	0.774	32,280	0													
4 sun	1853.83	80,753,050	80,753,050	0	630.8	0	602.8	28.0	27.4	1	37.39	600	0.774	40,374	0													
5	2325.87	101,314,793	101,314,793	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	94,510,793	15	600	0.774	15,273	62,110,793	1200	14.4	0.774	31,408	0			
6	1941.68	84,579,424	84,579,424	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	77,775,424	15	600	0.774	15,273	45,375,424	1200	10.5	0.774	22,945	0			
7	1200.57	52,296,788	52,296,788	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	45,492,788	15	600	0.774	16,199	13,092,788	600	6.1	0.774	7,022	0			
8	1390.19	60,556,668	60,556,668	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	53,752,668	15	600	0.774	16,199	21,352,668	600	9.9	0.774	11,452	0			
9	1393.25	60,690,183	60,690,183	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	53,886,183	15	600	0.774	16,199	21,486,183	600	9.9	0.774	11,524	0			
10 sat	1484.34	64,657,740	64,657,740	0	630.8	0	602.8	28.0	27.4	1	29.93	600	0.774	32,327	0													
11 sun	833.89	36,324,168	36,324,168	0	630.8	0	601.2	29.6	29.0	1	12.9	600	0.774	14,783	0													
12	1392.18	60,643,273	60,643,273	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	53,839,273	15	600	0.774	16,199	21,439,273	600	9.9	0.774	11,498	0			
13	1160.69	50,559,741	50,559,741	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	43,755,741	15	600	0.774	16,199	11,355,741	600	5.3	0.774	6,090	0			
14	1081.97	47,130,754	47,130,754	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	40,326,754	15	600	0.774	16,199	7,926,754	600	3.7	0.774	4,251	0			
15	1208.58	52,645,911	52,645,911	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	45,841,911	15	600	0.774	16,199	13,441,911	600	6.2	0.774	7,209	0			
16	1441.18	62,777,706	62,777,706	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	55,973,706	15	600	0.774	16,199	23,573,706	600	10.9	0.774	12,643	0			
17 sat	1348.10	58,723,094	44,604,387	0	630.8	0	601.2	29.6	29.0	1	18.8	600	0.774	21,516	0													
18 sun	92.41	4,025,293	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0													
19	1204.19	52,454,660	52,454,660	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	45,650,660	15	600	0.774	16,199	13,250,660	600	6.1	0.774	7,107	0			
20	1201.45	52,335,128	52,335,128	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	45,531,128	15	600	0.774	16,199	13,131,128	600	6.1	0.774	7,043	0			
21	887.38	38,654,363	38,654,363	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	31,850,363	14.6	600	0.774	15,776	0								
22	734.70	32,003,428	32,003,428	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	25,199,428	9.9	600	0.774	10,660	0								
23	808.33	35,210,942	35,210,942	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,406,942	12.2	600	0.774	13,128	0								
24 sat	808.15	35,202,823	21,076,448	0	630.8	0	601.2	29.6	29.0	1	2.1	600	0.774	2,384	0													
25 sun	92.23	4,017,625	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0													
26 hol	93.54	4,074,459	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0													
27	816.21	35,554,202	21,484,661	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0	14,680,661	2.4	600	0.774	2,716	0									
28	1264.39	55,076,694	55,076,694	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0	48,272,694	15	600	0.774	16,199	15,872,694	600	7.3	0.774	8,513	0				
29	988.96	43,079,299	43,079,299	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0	36,275,299	15	600	0.774	16,199	3,875,299	600	1.8	0.774	2,078	0				
30	466.86	20,336,211	20,336,211	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0	13,532,211	1.6	600	0.774	1,783	0									
31 sat	93.41	4,069,047	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0													
June 1 sun	839.22	36,556,466	22,481,512	0	630.8	0	601.2	29.6	29.0	1	3.1	600	0.774	3,527	0													
2	839.22	36,556,466	36,556,466	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0	29,752,466	13.1	600	0.774	14,162	0									
3	964.10	41,996,295	41,996,295	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0	35,192,295	15	600	0.774	16,199	2,792,295	600	1.3	0.774	1,498	0				
4	836.54	36,439,640	36,439,640	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0	29,635,640	13.0	600	0.774	14,073	0			</						

Boyce Hydro LLC.
Sanford New Power Generation
June, 2016

		New Kaplin Turbine										Remaining Two Existing Turbines										Future Production							
		26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Day	Date	New unit	New unit	New unit	New unit	Remaining	New unit	New unit	New unit	New unit	Remaining	Unit 1	Unit 1	Unit 1	Unit 1	Remaining	Unit 2	Unit 2	Unit 2	Unit 2	Remaining	Both Old	Both Old	Both Old	Both Old	Remaining	ON PEAK	OFF PEAK	TOTAL
	2014	Run Time	Flow	Efficiency	OUTPUT	Available	Run Time	Flow	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	total	total	OUTPUT
		hours	cfs	% @ cfs	kWh	Volme, cf	hours	cfs	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs	OUTPUT	OUTPUT	OUTPUT
		Off Peak	Off Peak	x 90%	Off Peak		On peak	On Peak	x 90%	On Peak		On Peak	On Peak	x 90%	On Peak		On Peak	On Peak	x 90%	On Peak		Off Peak	Off Peak	x 90%	Off Peak		kWh	kWh	
	18	9	650	0.819	10,107	80,315,687	15	720	0.814	18,536	41,435,687	600	15.0	0.774	15,763	9,035,687	600	4.2	0.774	4,391	0					38,690	10,107	48,797	
sat	19	24	720	0.814	31,526	38,951,176																600	18.0	0.774	20,144	0	0	51,670	51,670
sun	20	24	720	0.814	31,526	26,471,143																600	12.3	0.774	13,690	0	0	45,216	45,216
	21	9	650	0.819	10,744	43,533,689	15	720	0.814	19,703	4,653,689	600	2.2	0.774	2,407	0										22,110	10,744	32,854	
	22	9	650	0.819	10,107	67,864,071	15	720	0.814	18,536	28,984,071	600	13.4	0.774	14,101	0										32,637	10,107	42,744	
	23	9	650	0.819	10,744	43,658,634	15	720	0.814	19,703	4,778,634	600	2.2	0.774	2,471	0										22,175	10,744	32,918	
	24	9	650	0.819	10,744	43,594,583	15	720	0.814	19,703	4,714,583	600	2.2	0.774	2,438	0										22,142	10,744	32,885	
	25	9	650	0.819	10,744	43,623,000	15	720	0.814	19,703	4,743,000	600	2.2	0.774	2,453	0										22,156	10,744	32,900	
sat	26	24	720	0.814	31,526	2,608,064																600	1.2	0.774	1,349	0	0	32,874	32,874
sun	27	24	720	0.814	31,526	23,116,131																600	10.7	0.774	11,955	0	0	43,481	43,481
	28	9	650	0.819	10,107	67,890,683	15	720	0.814	18,536	29,010,683	600	13.4	0.774	14,114	0										32,650	10,107	42,757	
	29	9	650	0.819	10,744	37,675,724	15	698	0.815	19,114	0															19,114	10,744	29,858	
	30	9	650	0.819	10,744	43,668,557	15	720	0.814	19,703	4,788,557	600	2.2	0.774	2,477	0										22,180	10,744	32,924	
May	1	9	210	0.728	3,200	55,974,609	15	720	0.814	20,433	17,094,609	600	7.9	0.774	9,168	0										29,602	3,200	32,802	
	2	9	210	0.728	3,200	57,672,864	15	720	0.814	20,433	18,792,864	600	8.7	0.774	10,079	0										30,512	3,200	33,712	
sat	3	24	720	0.814	32,693	2,355,468																600	1.1	0.774	1,263	0	0	33,956	33,956
sun	4	24	720	0.814	32,693	18,545,050																600	8.6	0.774	9,946	0	0	42,639	42,639
	5	9	280	0.777	4,291	92,242,793	15	720	0.814	19,266	53,362,793	600	15.0	0.774	16,384	20,962,793	600	9.7	0.774	10,595	0					46,245	4,291	50,537	
	6	9	210	0.728	3,017	77,775,424	15	720	0.814	19,266	38,895,424	600	15.0	0.774	16,384	6,495,424	600	3.0	0.774	3,280	0					38,929	3,017	41,946	
	7	9	210	0.728	3,200	45,492,788	15	720	0.814	20,433	6,612,788	600	3.1	0.774	3,547	0										23,980	3,200	27,180	
	8	9	210	0.728	3,200	53,752,668	15	720	0.814	20,433	14,872,668	600	6.9	0.774	7,977	0										28,410	3,200	31,610	
	9	9	210	0.728	3,200	53,886,183	15	720	0.814	20,433	15,006,183	600	6.9	0.774	8,048	0										28,481	3,200	31,681	
sat	10	24	720	0.814	32,693	2,449,740																600	1.1	0.774	1,314	0	0	34,007	34,007
sun	11	24	420	0.819	20,315	0																				0	20,315	20,315	
	12	9	210	0.728	3,200	53,839,273	15	720	0.814	20,433	14,959,273	600	6.9	0.774	8,023	0										28,456	3,200	31,656	
	13	9	210	0.728	3,200	43,755,741	15	720	0.814	20,433	4,875,741	600	2.3	0.774	2,615	0										23,048	3,200	26,248	
	14	9	210	0.728	3,200	40,326,754	15	720	0.814	20,433	1,446,754	600	0.7	0.774	776	0										21,209	3,200	24,409	
	15	9	210	0.728	3,200	45,841,911	15	720	0.814	20,433	6,961,911	600	3.2	0.774	3,734	0										24,167	3,200	27,367	
	16	9	210	0.728	3,200	55,973,706	15	720	0.814	20,433	17,093,706	600	7.9	0.774	9,168	0										29,601	3,200	32,801	
sat	17	24	516	0.818	24,918	0																				0	24,918	24,918	
sun	18	24	210	0.728	9,021	0																				0	9,021	9,021	
	19	9	210	0.728	3,200	45,650,660	15	720	0.814	20,433	6,770,660	600	3.1	0.774	3,631	0										24,065	3,200	27,265	
	20	9	210	0.728	3,200	45,531,128	15	720	0.814	20,433	6,651,128	600	3.1	0.774	3,567	0										24,000	3,200	27,200	
	21	9	210	0.728	3,200	31,850,363	15	590	0.820	16,868	0															16,868	3,200	20,068	
	22	9	210	0.728	3,200	25,199,428	15	467	0.815	13,273	0															13,273	3,200	16,473	
	23	9	210	0.728	3,200	28,406,942	15	526	0.819	15,028	0															15,028	3,200	18,228	
sat	24	24	244	0.801	11,528	0																				0	11,528	11,528	
sun	25	24	210	0.728	9,021	0																				0	9,021	9,021	
hol	26	24	210	0.728	9,021	0																				0	9,021	9,021	
	27	9	210	0.728	3,383	14,680,661	15	272	0.774	7,759	0															7,759	3,383	11,142	
	28	9	210	0.728	3,200	48,272,694	15	720	0.814	20,433	9,392,694	600	4.3	0.774	5,038	0										25,471	3,200	28,671	
	29	9	210	0.728	3,200	36,275,299	15	672	0.817	19,149	0															19,149	3,200	22,349	
	30	9	210	0.728	3,383	13,532,211	15	251	0.761	7,028	0															7,028	3,383	10,410	
sat	31	24	210	0.728	9,021	0																				0	9,021	9,021	
sun	June 1	24	260	0.810	12,435	0																				0	12,435	12,435	
	2	9	210	0.728	3,200	29,752,466	15	551	0.819	15,740	0															15,740	3,200	18,940	
	3	9	210	0.728	3,200	35,192,295	15	652	0.820	18,638	0															18,638	3,200	21,838	
	4	9	210	0.728	3,200	29,635,640	15	549	0.819	15,678	0															15,678	3,200	18,878	
	5	9	210	0.728	3,200	58,038,226	15	600	0.820	17,160	25,638,226	600	11.9	0.774	13,750	0										30,910	3,200	34,110	
	6	9	210	0.728	3,200	57,889,826	15	600	0.820	17,160	25,489,826	600	11.8	0.774	13,671	0										30,830	3,200	34,030	
sat	7	24	720	0.814	32,693	2,359,979																600	1.1	0.774	1,266	0	0	33,959	33,959
sun	8	24	720	0.814	32,693	14,923,008																600	6.9	0.774	8,004	0	0	40,697	40,697
	9	9	720	0.814	11,474	172,552,319	15	720	0.814	19,123	133,672,319	700	15.0	0.720	17,649	95,872,319	700												

Boyce Hydro LLC.
Sanford New Power Generation
June, 2016

SANFORD NEW POWER GENERATION																										
June 13, 2016																										
Efficiency = turbine Eff. X 90% for total plant efficiency.																										
Average, Years 1999 to 2014																										
First 7 hours and the last 2 hours of the day, plus weekends, are Off Peak generation. Use 9 hours for Off peak calculation.																										
From 7 AM to 10 PM (15 hours) during week days are On Peak generation.																										
By pass flow is first priority. All calculations provide 210 or 650 cfs 24 hours per day.																										
Average Annual Flow at Sanford			Average Headwater		Average Tailwater and Head					Existing Off Peak Generation					Existing On Peak Generation					OUTPUT = Head(ft) x Run Hours x Flow(cfs) x Eff(%))/11.8						
Bypass = 210cfs when not running			= 18,144,000 cf/day																							
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		
Sanford	Sanford	Sanford Avail.	Diff. from	Hdwater	Spill Gate	Tailrace	Gross	Net	Number	Total Unit	Total Unit	Unit	Total Unit	Remaining	Unit 1	Unit 1	Unit 1	Unit 1	Remaining	Unit 2 & 3	Unit 2 & 3	Unit 2 & 3	Unit 2 & 3	Remaining		
Discharge	Available	Adjusted	Normal	Elev.	Open	Elev.	Head	Head	of Units	Run Time	Flow	Efficiency	OUTPUT	Available	Run Time	Flow	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available		
Ac-ft/day	cf/day	For Bypass	Pool El.	feet	feet	feet	feet	feet	Running	hours	cfs	% @ cfs	kWh	cf after Off-	hours	cfs	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs		
		cf/day	630.8	630.80 - (4)			(5) - (7)	(8)x98%	Off Peak	Off Peak	Off Peak	x 90%	OFF PEAK	peak & bypass	On peak	On Peak	x 90%	On Peak	On Peak	On Peak	On Peak	x 90%	On Peak	On Peak		
11	3598.45	156,748,279	156,748,279	0	630.8	0.15	604.5	26.3	25.8	2	9.00	600	0.774	18,286	117,868,279	15	700	0.720	16,538	80,068,279	1400	15.0	0.720	35,481	4,468,279	
12	2318.75	101,004,912	101,004,912	0	630.8	0	604.4	26.4	25.9	1	1.00	600	0.774	1,018	92,796,912	15	600	0.774	15,273	60,396,912	1200	14.0	0.774	30,542	0	
13	2126.26	92,620,088	92,620,088	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	85,816,088	15	600	0.774	15,273	53,416,088	1200	12.4	0.774	27,011	0	
14 sat	1484.09	64,646,915	64,646,915	0	630.8	0	602.8	28.0	27.4	1	29.93	600	0.774	32,321	0											
15 sun	1489.13	64,866,583	64,866,583	0	630.8	0	602.8	28.0	27.4	1	30.03	600	0.774	32,431	0											
16	1771.07	77,147,697	77,147,697	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	70,343,697	15	600	0.774	15,273	37,943,697	1200	8.8	0.774	19,187	0	
17	2039.98	88,861,373	88,861,373	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	82,057,373	15	600	0.774	15,273	49,657,373	1200	11.5	0.774	25,111	0	
18	1670.58	72,770,574	72,770,574	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	65,966,574	15	600	0.774	15,273	33,566,574	1200	7.8	0.774	16,974	0	
19	1733.56	75,513,944	75,513,944	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	68,709,944	15	600	0.774	15,273	36,309,944	1200	8.4	0.774	18,361	0	
20	1383.76	60,276,558	60,276,558	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	53,472,558	15	600	0.774	16,199	21,072,558	600	9.8	0.774	11,302	0	
21 sat	576.31	25,103,956	25,103,956	0	630.8	0	601.2	29.6	29.0	1	5.0	600	0.774	5,659	0											
22 sun	93.67	4,080,323	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0											
23	1789.85	77,965,927	63,902,250	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	57,098,250	15	600	0.774	15,273	24,698,250	600	11.4	0.774	12,489	0	
24	1956.89	85,242,037	85,242,037	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	78,438,037	15	600	0.774	15,273	46,038,037	1200	10.7	0.774	23,281	0	
25	1844.24	80,334,914	80,334,914	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	73,530,914	15	600	0.774	15,273	41,130,914	1200	9.5	0.774	20,799	0	
26	774.86	33,753,104	33,753,104	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	26,949,104	11.1	600	0.774	12,006	0						
27	808.52	35,219,062	35,219,062	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,415,062	12.2	600	0.774	13,134	0						
28 sat	1707.73	74,388,540	74,388,540	0	630.8	0	602.8	28.0	27.4	1	34.44	600	0.774	37,192	0											
29 sun	1184.82	51,610,720	51,610,720	0	630.8	0	601.2	29.6	29.0	1	23.89	600	0.774	27,278	0											
30	1392.22	60,645,077	60,645,077	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	53,841,077	15	600	0.774	16,199	21,441,077	600	9.9	0.774	11,499	0	
July 1	1352.82	58,928,779	58,928,779	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	52,124,779	15	600	0.774	16,199	19,724,779	600	9.1	0.774	10,579	0	
2	1258.43	54,817,333	54,817,333	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	48,013,333	15	600	0.774	16,199	15,613,333	600	7.2	0.774	8,374	0	
3	1347.03	58,676,634	58,676,634	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	51,872,634	15	600	0.774	16,199	19,472,634	600	9.0	0.774	10,444	0	
4 hol	719.03	31,320,968	31,320,968	0	630.8	0	601.2	29.6	29.0	1	9.4	600	0.774	10,715	0											
5 sat	809.63	35,267,325	21,163,053	0	630.8	0	601.2	29.6	29.0	1	2.2	600	0.774	2,455	0											
6 sun	92.74	4,039,727	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0											
7	1352.39	58,910,285	58,910,285	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	52,106,285	15	600	0.774	16,199	19,706,285	600	9.1	0.774	10,569	0	
8	1077.45	46,933,639	46,933,639	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	40,129,639	15	600	0.774	16,199	7,729,639	600	3.6	0.774	4,146	0	
9	718.03	31,277,215	26,973,288	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	20,169,288	6.3	600	0.774	6,791	0						
10	466.75	20,331,701	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0											
11	592.06	25,790,024	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0											
12 sat	91.97	4,006,349	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0											
13 sun	92.96	4,049,200	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0											
14	812.96	35,412,568	21,317,768	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	14,513,768	2.3	600	0.774	2,581	0						
15	810.62	35,310,627	35,310,627	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,506,627	12.2	600	0.774	13,204	0						
16	751.12	32,718,815	32,718,815	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	25,914,815	10.4	600	0.774	11,211	0						
17	808.90	35,235,751	35,235,751	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,431,751	12.2	600	0.774	13,147	0						
18	1124.57	48,986,431	34,860,958	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,056,958	11.9	600	0.774	12,858	0						
19 sat	92.25	4,018,527	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0											
20 sun	93.92	4,091,149	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0											
21	1631.98	71,089,008	57,036,157	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	50,232,157	15	600	0.774	15,273	17,832,157	600	8.3	0.774	9,017	0	
22	2261.85	98,526,317	98,526,317	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	91,722,317	15	600	0.774	15,273	59,322,317	1200	13.7	0.774	29,998	0	
23	5002.78	217,921,101	217,921,101	0	630.8	1.25	604.9	25.9	25.4	3	9.00	700	0.720	29,271	149,881,101	15	700	0.720	16,262	112,081,101	1400	15.0	0.720	34,889	36,481,101	
24	2821.43	122,901,354	122,901,354	0	630.8	0	604.4	26.4	25.9	1	9.00	600	0.774	9,164	103,461,354	15	600	0.774	15,273	71,061,354	1400	14.1	0.720	33,427	0	
25	1983.16	86,386,386	86,386,386	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	79,582,386	15	600	0.774	15,273	47,182,386	1200	10.9	0.774	23,859	0	
26 sat	1441.95	62,811,536	54,676,642	0	630.8	0	602.8	28.0	27.4	1	25.31	600	0.774	27,336	0											
27 sun	229.78	10,009,106	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0											
28	812.48	35,391,819	35,391,819	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,587,819	12.3	600	0.774	13,267	0						
29	1170.63	50,992,763	50,992,763	0	630.8	0	602.8																			

Boyce Hydro LLC.
Sanford New Power Generation
June, 2016

SANFORD NEW POWER GENERATION																													
Average, Years 1999 to 2014																													
June 13, 2016																													
Efficiency = turbine Eff. X 90% for total plant efficiency.																													
First 7 hours and the last 2 hours of the day, plus weekends, are Off Peak generation. Use 9 hours for Off peak calculation.																													
From 7 AM to 10 PM (15 hours) during week days are On Peak generation.																													
By pass flow is first priority. All calculations provide 210 or 650 cfs 24 hours per day.																													
Average Annual Flow at Sanford					Average Headwater					Average Tailwater and Head					Existing Off Peak Generation					Existing On Peak Generation					OUTPUT = Head(ft) x Run Hours x Flow(cfs) x Eff(%) / 11.8				
Bypass = 210cfs when not running																													
= 18,144,000 cf/day																													
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					
Sanford	Sanford	Sanford Avail.	Diff. from	Hdwater	Spill Gate	Tailrace	Gross	Net	Number	Total Unit	Total Unit	Unit	Total Unit	Remaining	Unit 1	Unit 1	Unit 1	Unit 1	Remaining	Unit 2 & 3	Unit 2 & 3	Unit 2 & 3	Unit 2 & 3	Remaining					
Discharge	Available	Adjusted	Normal	Elev.	Open	Elev.	Head	Head	of Units	Run Time	Flow	Efficiency	OUTPUT	Available	Run Time	Flow	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available					
Ac-ft/day	cf/day	cf/day	Pool El.	feet	feet	feet	feet	feet	Running	hours	cfs	% @ cfs	kWh	cf after Off-	hours	cfs	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs					
			630.8	630.80 - (4)			(5) - (7)	(8)x98%	Off Peak	Off Peak	Off Peak	x 90%	OFF PEAK	peak & bypass	On peak	On Peak	x 90%	On Peak		On Peak	On Peak	x 90%	On Peak						
4	722.38	31,466,662	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0.000	0	0	0	0	0	0	0					
5	676.78	29,480,628	28,703,979	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	21,899,979	7.5	600	0.774	8,123	0									
6	631.86	27,523,913	27,523,913	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	20,719,913	6.7	600	0.774	7,215	0									
7	540.18	23,530,194	18,623,605	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	11,819,605	0.3	600	0.774	390	0									
8	628.52	27,378,219	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
9 sat	91.90	4,003,191	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
10 sun	92.75	4,040,178	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
11	811.72	35,358,440	21,254,619	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	14,450,619	2.2	600	0.774	2,529	0									
12	809.67	35,269,130	35,269,130	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,465,130	12.2	600	0.774	13,172	0									
13	592.85	25,824,756	25,824,756	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	19,020,756	5.5	600	0.774	5,908	0									
14	592.34	25,802,203	19,289,375	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	12,485,375	0.8	600	0.774	881	0									
15	591.86	25,781,454	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
16 sat	91.68	3,993,719	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
17 sun	92.36	4,023,038	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
18	594.20	25,883,394	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
19	594.02	25,875,726	19,494,158	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	12,690,158	1.0	600	0.774	1,098	0									
20	593.35	25,846,407	24,320,131	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	17,516,131	4.4	600	0.774	5,022	0									
21	592.66	25,816,186	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
22	529.61	23,069,658	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
23 sat	92.28	4,019,881	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
24 sun	93.60	4,077,166	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
25	836.89	36,454,976	22,388,142	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	15,584,142	3.0	600	0.774	3,451	0									
26	813.32	35,428,355	35,428,355	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,624,355	12.3	600	0.774	13,295	0									
27	655.55	28,555,947	28,555,947	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	21,751,947	7.4	600	0.774	8,009	0									
28	632.39	27,546,917	27,546,917	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	20,742,917	6.7	600	0.774	7,233	0									
29	1259.49	54,863,341	37,463,187	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	30,659,187	13.8	600	0.774	14,860	0									
30 sat	341.88	14,892,322	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
31 sun	91.72	3,995,523	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
Sept. 1 hol	92.47	4,028,000	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
2	594.16	25,881,590	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
3	593.71	25,862,194	19,483,784	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	12,679,784	1.0	600	0.774	1,089	0									
4	593.32	25,845,054	25,845,054	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	19,041,054	5.5	600	0.774	5,923	0									
5	1443.92	62,897,238	62,897,238	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	56,093,238	15	600	0.774	15,273	23,693,238	600	11.0	0.774	11,981	0				
6 sat	1723.61	75,080,472	75,080,472	0	630.8	0	602.8	28.0	27.4	1	34.76	600	0.774	37,538	0														
7 sun	1717.07	74,795,399	74,795,399	0	630.8	0	602.8	28.0	27.4	1	34.63	600	0.774	37,395	0														
8	813.89	35,453,164	35,453,164	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,649,164	12.3	600	0.774	13,314	0									
9	814.60	35,483,836	35,483,836	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,679,836	12.4	600	0.774	13,337	0									
10	1351.86	58,886,830	58,886,830	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	52,082,830	15	600	0.774	15,273	19,682,830	600	9.1	0.774	9,953	0				
11	811.82	35,362,951	35,362,951	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,558,951	12.3	600	0.774	13,244	0									
12	543.44	23,672,279	23,672,279	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	16,868,279	3.9	600	0.774	4,495	0									
13 sat	92.24	4,018,076	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
14 sun	723.10	31,498,236	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
15	2529.96	110,205,261	109,433,573	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	102,629,573	15	600	0.774	15,273	70,229,573	1400	13.9	0.720	33,036	0				
16	2717.98	118,395,226	118,395,226	0	630.8	0	604.4	26.4	25.9	1	9.00	600	0.774	9,164	98,955,226	15	600	0.774	15,273	66,555,226	1400	13.2	0.720	31,308	0				
17	1978.09	86,165,816	86,165,816	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	79,361,816	15	600	0.774	15,273	46,961,816	1200	10.9	0.774	23,748	0				
18	1437.81	62,631,111	62,631,111	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	55,827,111	15	600	0.774	16,199	23,427,111	600	10.8	0.774	12,565	0				
19	807.82	35,188,840	21,061,112	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	14,257,112	2.1	600	0.774	2,372	0									
20 sat	92.20	4,016,272	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
21 sun	93.43	4,069,949	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
22	725.48	31,601,981	18,144,000	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	0	0	0	0.000	0	0	0	0	0	0					
23	1355.12	59,028,915	58,412,845	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	51,608,845	15	600	0.774	16										

Boyce Hydro LLC.
Sanford New Power Generation
June, 2016

		New Kaplin Turbine										Remaining Two Existing Turbines										OUTPUT = Head(ft) x Run Hours x Flow(cfs) x Eff(%))/11.8							
		By pass flow is first priority. All calculations provide 210 or 650 cfs 24 hours per day.										Total On Peak Output = (34) + (39) + (44)										Total Off Peak Output = (29) + (49)							
Day	Date	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
	Run Time	New unit	New unit	New unit	New unit	Remaining	New unit	New unit	New unit	New unit	Remaining	Unit 1	Unit 1	Unit 1	Unit 1	Remaining	Unit 2	Unit 2	Unit 2	Unit 2	Remaining	Both Old	Both Old	Both Old	Both Old	Remaining	ON PEAK	OFF PEAK	TOTAL
2014	hours	Flow	Efficiency	OUTPUT	Available	Run Time	Flow	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	total	total	OUTPUT	
	Off Peak	Off Peak	x 90%	Off Peak	Volme, cf	On peak	On Peak	x 90%	On Peak	Volume cfs	On Peak	On Peak	x 90%	On Peak	Volume cfs	On Peak	On Peak	x 90%	On Peak	Volume cfs	Off Peak	Off Peak	x 90%	Off Peak	Volume cfs	OUTPUT	OUTPUT	OUTPUT	
	4	9	210	0.728	3,383	11,340,000	15	210	0.728	5,638	0																5,638	3,383	9,021
	5	9	210	0.728	3,200	21,899,979	15	406	0.810	11,459	0																11,459	3,200	14,659
	6	9	210	0.728	3,200	20,719,913	15	384	0.808	10,817	0																10,817	3,200	14,017
	7	9	210	0.728	3,383	11,819,605	15	219	0.734	5,920	0																5,920	3,383	9,303
	8	9	210	0.728	3,383	11,340,000	15	210	0.728	5,638	0																5,638	3,383	9,021
sat	9	24	210	0.728	9,021	0																					0	9,021	9,021
sun	10	24	210	0.728	9,021	0																					0	9,021	9,021
	11	9	210	0.728	3,383	14,450,619	15	268	0.770	7,602	0																7,602	3,383	10,985
	12	9	210	0.728	3,200	28,465,130	15	527	0.819	15,059	0																15,059	3,200	18,259
	13	9	210	0.728	3,200	19,020,756	15	352	0.803	9,864	0																9,864	3,200	13,064
	14	9	210	0.728	3,200	12,485,375	15	231	0.747	6,025	0																6,025	3,200	9,225
	15	9	210	0.728	3,383	11,340,000	15	210	0.728	5,638	0																5,638	3,383	9,021
sat	16	24	210	0.728	9,021	0																					0	9,021	9,021
sun	17	24	210	0.728	9,021	0																					0	9,021	9,021
	18	9	210	0.728	3,383	11,340,000	15	210	0.728	5,638	0																5,638	3,383	9,021
	19	9	210	0.728	3,383	12,690,158	15	235	0.747	6,473	0																6,473	3,383	9,856
	20	9	210	0.728	3,383	17,516,131	15	324	0.794	9,495	0																9,495	3,383	12,878
	21	9	210	0.728	3,383	11,340,000	15	210	0.728	5,638	0																5,638	3,383	9,021
	22	9	210	0.728	3,383	11,340,000	15	210	0.728	5,638	0																5,638	3,383	9,021
sat	23	24	210	0.728	9,021	0																					0	9,021	9,021
sun	24	24	210	0.728	9,021	0																					0	9,021	9,021
	25	9	210	0.728	3,383	15,584,142	15	289	0.783	8,333	0																8,333	3,383	11,715
	26	9	210	0.728	3,200	28,624,355	15	530	0.819	15,143	0																15,143	3,200	18,343
	27	9	210	0.728	3,200	21,751,947	15	403	0.810	11,381	0																11,381	3,200	14,581
	28	9	210	0.728	3,200	20,742,917	15	384	0.808	10,829	0																10,829	3,200	14,029
	29	9	210	0.728	3,200	30,659,187	15	568	0.820	16,238	0																16,238	3,200	19,438
sat	30	24	210	0.728	9,021	0																					0	9,021	9,021
sun	31	24	210	0.728	9,021	0																					0	9,021	9,021
hol	Sept 1	24	210	0.728	9,021	0																					0	9,021	9,021
	2	9	210	0.728	3,383	11,340,000	15	210	0.728	5,638	0																5,638	3,383	9,021
	3	9	210	0.728	3,383	12,679,784	15	235	0.747	6,468	0																6,468	3,383	9,851
	4	9	210	0.728	3,200	19,041,054	15	353	0.802	9,863	0																9,863	3,200	13,063
	5	9	210	0.728	3,017	56,093,238	15	720	0.814	19,266	17,213,238	600	8.0	0.774	8,704	0											27,970	3,017	30,987
sat	6	24	720	0.814	32,693	12,872,472																600	6.0	0.774	6,904	0	0	39,597	39,597
sun	7	24	720	0.814	32,693	12,587,399																600	5.8	0.774	6,751	0	0	39,444	39,444
	8	9	210	0.728	3,200	28,649,164	15	531	0.819	15,156	0																15,156	3,200	18,356
	9	9	210	0.728	3,200	28,679,836	15	531	0.819	15,173	0																15,173	3,200	18,373
	10	9	210	0.728	3,017	52,082,830	15	720	0.814	19,266	13,202,830	600	6.1	0.774	6,676	0											25,942	3,017	28,959
	11	9	210	0.728	3,200	28,558,951	15	529	0.819	15,109	0																15,109	3,200	18,309
	12	9	210	0.728	3,383	16,868,279	15	312	0.792	9,123	0																9,123	3,383	12,506
sat	13	24	210	0.728	9,021	0																					0	9,021	9,021
sun	14	24	210	0.728	9,021	0																					0	9,021	9,021
	15	9	210	0.728	3,017	102,629,573	15	720	0.814	19,266	63,749,573	600	15.0	0.774	16,384	31,349,573	600	14.5	0.774	15,848	0					51,497	3,017	54,515	
	16	9	210	0.728	3,017	111,591,226	15	720	0.814	19,266	72,711,226	700	15.0	0.720	17,781	34,911,226	700	13.9	0.720	16,417	0					53,464	3,017	56,481	
	17	9	210	0.728	3,017	79,361,816	15	720	0.814	19,266	40,481,816	700	15.0	0.720	17,781	2,681,816	600	1.2	0.774	1,351	0					38,398	3,017	41,415	
	18	9	210	0.728	3,200	55,827,111	15	720	0.814	20,433	16,947,111	600	7.8	0.774	9,089	0											29,522	3,200	32,722
	19	9	210	0.728	3,383	14,257,112	15	264	0.770	7,500	0																7,500	3,383	10,883
sat	20	24	210	0.728	9,021	0																					0	9,021	9,021
sun	21	24	210	0.728	9,021	0																					0	9,021	9,021
	22	24	210	0.728	8,533	0	15	0	0.845	0	0																0	8,533	8,533
	23	9	210	0.728	3,200	51,608,845	15	720	0.814	20,433	12,728,845	600	5.9	0.774	6,827	0											27,260	3,200	30,460
	24	9	210	0.728	3,200	44,299,273	15	720	0.814	20,433	5,419,273	600	2.5	0.774	2,907	0											23,340	3,200	26,540
	25	9	210	0.728	3,200	18,553,987	15	344	0.801	9,600	0																9,600	3,200	12,800
	26	9	210	0.728	3,383	11,340,000	15	210	0.728	5,638	0																5,638	3,383	9,021

Boyce Hydro LLC.
Sanford New Power Generation
June, 2016

SANFORD NEW POWER GENERATION																										
Average, Years 1999 to 2014																										
June 13, 2016																										
Efficiency = turbine Eff. X 90% for total plant efficiency.																										
First 7 hours and the last 2 hours of the day, plus weekends, are Off Peak generation. Use 9 hours for Off peak calculation.																										
From 7 AM to 10 PM (15 hours) during week days are On Peak generation.																										
By pass flow is first priority. All calculations provide 210 or 650 cfs 24 hours per day.																										
Average Annual Flow at Sanford			Average Headwater		Average Tailwater and Head					Existing Off Peak Generation					Existing On Peak Generation					OUTPUT = Head(ft) x Run Hours x Flow(cfs) x Eff(%))/11.8						
Bypass = 210cfs when not running			= 18,144,000 cf/day																							
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		
Sanford	Sanford	Sanford Avail.	Diff. from	Hdwater	Spill Gate	Tailrace	Gross	Net	Number	Total Unit	Total Unit	Unit	Total Unit	Remaining	Unit 1	Unit 1	Unit 1	Unit 1	Remaining	Unit 2 & 3	Unit 2 & 3	Unit 2 & 3	Unit 2 & 3	Remaining		
Discharge	Available	Adjusted	Normal	Elev.	Open	Elev.	Head	Head	of Units	Run Time	Flow	Efficiency	OUTPUT	Available	Run Time	Flow	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available		
Ac-ft/day	cf/day	cf/day	Pool El.	feet	feet	feet	feet	feet	Running	hours	cfs	% @ cfs	kWh	cf after Off-	hours	cfs	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs		
			630.8	630.80 - (4)			(5) - (7)	(8)x98%	Off Peak	Off Peak	Off Peak	x 90%	OFF PEAK	peak & bypass	On peak	On Peak	x 90%	On Peak		On Peak	On Peak	x 90%	On Peak			
27 sat	91.90	4,003,191	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
28 sun	92.75	4,040,178	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
29	811.64	35,354,832	21,251,010	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	14,447,010	2.2	600	0.774	2,526							
30	810.20	35,292,134	35,292,134	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,488,134	12.2	600	0.774	13,190							
Oct. 1	808.82	35,232,142	35,232,142	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,428,142	12.2	600	0.774	13,144							
2	592.06	25,790,024	16,027,470	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
3	466.70	20,329,445	16,027,470	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
4 sat	91.81	3,999,132	16,027,470	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
5 sun	92.87	4,045,591	16,027,470	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
6	596.26	25,973,156	16,027,470	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
7	596.05	25,964,134	25,964,134	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	19,160,134	5.6	600	0.774	6,015							
8	1462.76	63,717,723	63,717,723	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	56,913,723	15	600	0.774	15,273	24,513,723	600	11.3	0.774	12,396	0	
9	960.51	41,839,776	41,839,776	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	35,035,776	15	600	0.774	16,199	2,635,776	600	1.2	0.774	1,414	0	
10	807.52	35,175,759	21,035,402	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	14,231,402	2.1	600	0.774	2,351							
11 sat	91.91	4,003,642	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
12 sun	92.83	4,043,787	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
13	811.84	35,363,853	21,263,640	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	14,459,640	2.2	600	0.774	2,537							
14	810.42	35,302,057	35,302,057	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,498,057	12.2	600	0.774	13,198							
15	720.81	31,398,551	31,398,551	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	24,594,551	9.4	600	0.774	10,195							
16	808.02	35,197,410	24,676,430	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	17,872,430	4.7	600	0.774	5,025							
17	499.68	21,766,084	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
18 sat	91.85	4,000,936	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
19 sun	92.70	4,037,923	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
20	723.41	31,511,768	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
21	811.44	35,346,261	34,607,953	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	27,803,953	11.7	600	0.774	12,664							
22	631.54	27,509,930	27,509,930	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	20,705,930	6.7	600	0.774	7,204							
23	810.10	35,288,074	35,288,074	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,484,074	12.2	600	0.774	13,187							
24	809.04	35,241,615	21,120,202	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	14,316,202	2.1	600	0.774	2,289							
25 sat	92.35	4,022,587	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
26 sun	93.60	4,077,166	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
27	1446.51	63,010,004	48,943,170	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	42,139,170	15	600	0.774	15,273	9,739,170	600	4.5	0.774	4,925	0	
28	1442.74	62,845,817	62,845,817	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	56,041,817	15	600	0.774	15,273	23,641,817	600	10.9	0.774	11,955	0	
29	1169.63	50,949,009	50,949,009	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	44,145,009	15	600	0.774	15,273	11,745,009	600	5.4	0.774	5,939	0	
30	718.62	31,302,926	31,302,926	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	24,498,926	9.4	600	0.774	10,122							
31	808.21	35,205,530	21,090,431	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0	14,286,431	2.1	600	0.774	2,396							
Nov. 1 sat	92.49	4,028,902	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
2 sun	93.69	4,081,225	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
3	1446.17	62,995,119	48,932,345	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	42,128,345	15	600	0.774	15,273	9,728,345	600	4.5	0.774	4,919	0	
4	1350.76	58,839,017	58,839,017	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	52,035,017	15	600	0.774	15,273	19,635,017	600	9.1	0.774	9,929	0	
5	808.81	35,231,691	35,231,691	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,427,691	12.2	600	0.774	13,143							
6	809.17	35,247,479	35,247,479	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,443,479	12.2	600	0.774	13,156							
7	1077.82	46,949,878	45,973,407	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	39,169,407	15	600	0.774	15,273	6,769,407	600	3.1	0.774	3,423	0	
8 sat	718.31	31,289,394	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
9 sun	92.34	4,022,136	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
10	811.55	35,351,223	35,351,223	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,547,223	12.3	600	0.774	13,235							
11	811.31	35,340,849	35,340,849	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,536,849	12.2	600	0.774	13,227							
12	811.17	35,334,534	35,334,534	0	630.8	0	602.8	28.0	27.4	0	0.00	0	0.000	0	28,530,534	12.2	600	0.774	13,223							
13	1349.84	58,798,873	58,798,873	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	51,994,873	15	600	0.774	15,273	19,594,873	600	9.1	0.774	9,909	0	
14	1347.96	58,717,230	58,717,230	0	630.8	0	604.4	26.4	25.9	0	0.00	0	0.000	0	51,913,230	15	600	0.774	15,273	19,513,230	600	9.0	0.774	9,867	0	
15 sat	809.44	35,259,206	21,169,819	0	630.8	0	601.2	29.6	29.0	1	2.2	600	0.774	2,460												
16 sun	93.08	4,054,612	18,144,000	0	630.8	0	601.2	29.6	29.0	0	0.00	0	0.000	0												
17	724.59	31,563,189	31,563,189	0	630.8	0	602.8	28.0																		

Boyce Hydro LLC.
Sanford New Power Generation
June, 2016

		New Kaplin Turbine										Remaining Two Existing Turbines																	
		26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Day	Date	New unit	New unit	New unit	New unit	Remaining	New unit	New unit	New unit	New unit	Remaining	Unit 1	Unit 1	Unit 1	Unit 1	Remaining	Unit 2	Unit 2	Unit 2	Unit 2	Remaining	Both Old	Both Old	Both Old	Both Old	Remaining	ON PEAK	OFF PEAK	TOTAL
	2014	Run Time	Flow	Efficiency	OUTPUT	Available	Run Time	Flow	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	Flow	Run Time	Efficiency	OUTPUT	Available	total	total	OUTPUT
		hours	cfs	% @ cfs	kWh	Volme, cf	hours	cfs	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs	cfs	hours	% @ cfs	kWh	Volume cfs	OUTPUT	OUTPUT	OUTPUT
		Off Peak	Off Peak	x 90%	Off Peak		On peak	On Peak	x 90%	On Peak		On Peak	On Peak	x 90%	On Peak		On Peak	On Peak	x 90%	On Peak		Off Peak	Off Peak	x 90%	Off Peak		kWh	kWh	
	20	9	210	0.728	3,200	24,498,023	15	454	0.815	12,903	0															12,903	3,200	16,103	
	21	9	210	0.728	3,200	28,391,606	15	526	0.819	15,020	0															15,020	3,200	18,220	
sat	22	24	272	0.797	12,784	0																				0	12,784	12,784	
sun	23	24	210	0.728	9,021	0																				0	9,021	9,021	
	24	9	210	0.728	3,383	14,475,427	15	268	0.770	7,606	0															7,606	3,383	10,989	
	25	9	210	0.728	3,017	52,084,634	15	720	0.814	19,266	13,204,634	600	6.1	0.774	6,677	0										25,943	3,017	28,960	
	26	9	210	0.728	3,383	14,376,193	15	266	0.770	7,554	0															7,554	3,383	10,937	
hol	27	24	210	0.728	9,021	0																				0	9,021	9,021	
	28	9	210	0.728	3,017	56,025,128	15	720	0.814	19,266	17,145,128	600	7.9	0.774	8,670	0										27,936	3,017	30,953	
sat	29	24	246	0.801	11,627	0																				0	11,627	11,627	
sun	30	24	210	0.728	9,021	0																				0	9,021	9,021	
	Dec. 1	9	210	0.728	2,857	52,357,528	15	720	0.814	18,244	13,477,528	600	6.2	0.774	6,454	0										24,698	2,857	27,555	
	2	9	210	0.728	2,857	52,134,702	15	720	0.814	18,244	13,254,702	600	6.1	0.774	6,347	0										24,591	2,857	27,448	
	3	9	210	0.728	2,857	51,897,443	15	720	0.814	18,244	13,017,443	600	6.0	0.774	6,234	0										24,478	2,857	27,335	
	4	9	210	0.728	3,040	28,365,444	15	525	0.819	14,256	0															14,256	3,040	17,296	
	5	9	210	0.728	3,040	24,472,764	15	453	0.815	12,246	0															12,246	3,040	15,286	
sat	6	24	244	0.801	10,975	0																				0	10,975	10,975	
sun	7	24	210	0.728	8,594	0																				0	8,594	8,594	
	8	9	210	0.728	3,040	28,503,019	15	528	0.819	14,325	0															14,325	3,040	17,365	
	9	9	210	0.728	3,040	28,559,402	15	529	0.819	14,353	0															14,353	3,040	17,393	
	10	9	210	0.728	2,857	55,885,749	15	720	0.814	18,244	17,005,749	600	7.9	0.774	8,143	0										26,387	2,857	29,245	
	11	9	210	0.728	2,857	55,699,911	15	720	0.814	18,244	16,819,911	600	7.8	0.774	8,054	0										26,298	2,857	29,156	
	12	9	210	0.728	2,857	41,361,536	15	720	0.814	18,244	2,481,536	600	1.1	0.774	1,188	0										19,432	2,857	22,289	
sat	13	24	210	0.728	8,594	0																				0	8,594	8,594	
sun	14	24	210	0.728	8,594	0																				0	8,594	8,594	
	15	9	210	0.728	2,857	42,055,723	15	720	0.814	18,244	3,175,723	600	1.5	0.774	1,521	0										19,765	2,857	22,622	
	16	9	210	0.728	2,857	68,093,791	15	720	0.814	18,244	29,213,791	600	13.5	0.774	13,989	0										32,233	2,857	35,091	
	17	9	210	0.728	2,857	91,356,504	15	720	0.814	18,244	52,476,504	600	15.0	0.774	15,515	20,076,504	600	9.3	0.774	9,609	0				43,368	2,857	46,225		
	18	9	210	0.728	2,857	90,881,083	15	720	0.814	18,244	52,001,083	600	15.0	0.774	15,515	19,601,083	600	9.1	0.774	9,381	0				43,140	2,857	45,998		
	19	9	210	0.728	2,857	90,371,381	15	720	0.814	18,244	51,491,381	600	15.0	0.774	15,515	19,091,381	600	8.8	0.774	9,137	0				42,896	2,857	45,753		
sat	20	24	720	0.814	31,058	22,630,786																600	10.5	0.817	12,171	0	0	43,230	43,230
sun	21	24	355	0.815	16,259	0																				0	16,259	16,259	
	22	9	210	0.728	2,857	48,990,337	15	720	0.814	18,244	10,110,337	600	4.7	0.774	4,841	0										23,085	2,857	25,943	
	23	9	210	0.728	2,857	50,776,098	15	720	0.814	18,244	11,896,098	600	5.5	0.774	5,697	0										23,941	2,857	26,798	
	24	9	210	0.728	2,857	28,796,703	15	533	0.819	13,602	0															13,602	2,857	16,459	
hol	25	24	210	0.728	8,960	0																				0	8,960	8,960	
	26	9	210	0.728	3,040	63,087,434	15	720	0.814	19,412	24,207,434	600	11.2	0.774	12,334	0										31,746	3,040	34,786	
sat	27	24	720	0.814	31,058	34,510,002																700	13.7	0.720	16,356	0	0	47,415	47,415
sun	28	24	720	0.814	29,055	127,849,536																1400	24.0	0.720	53,632	6,889,536	0	82,687	82,687
	29	9	720	0.814	10,284	268,573,428	15	720	0.814	17,141	229,693,428	700	15.0	0.720	15,820	191,893,428	700	15.0	0.720	15,815	154,093,428	1400	9.0	0.720	18,984	108,733,428	48,775	29,268	78,043
	30	9	720	0.814	10,649	207,838,138	15	720	0.814	17,748	168,958,138	700	15.0	0.720	16,380	131,158,138	700	15.0	0.720	16,375	93,358,138	1400	9.0	0.720	19,656	47,998,138	50,503	30,305	80,808
	31	9	720	0.814	10,946	91,608,018	15	720	0.814	18,244	52,728,018	600	15.0	0.774	15,515	20,328,018	600	9.4	0.774	9,729	0				0	43,488	10,946	54,435	
																											ON	OFF	TOTAL
																										Total kWh	6,462,619	3,877,365	10,339,984

Document Content(s)

2016 6 20 Sanford new power generation submittal.PDF.....1-19