

31 March 2017

Honorable Kimberly D. Bose Secretary, Federal Energy Regulatory Commission Federal Energy Regulatory Commission 888 First Street, N.E. Washington, D.C. 20426

Subject: Rugraw, LLC response to FERC question of February 24, 2017
Re: FERC Project No. 12496-002, Lassen Lodge Hydroelectric Project

Dear Kimberly:

In the furtherance of the Final License Application for the Lassen Lodge Hydroelectric Project, FERC P-12496-002, Rugraw, LLC hereby submits this response to FERC question of February 24, 2017.

Rugraw offers the following clarifications and confirms this compilation of proposed mitigation methods as stated below:

Geology and Soil Resources:

- Limit surface disturbance to only those areas needed for construction.
- Stockpile natural top soils and replace, regrade, and revegetate disturbed areas with native vegetation after construction of project facilities.
- Develop a Storm Water and Prevention Control Plan that outlines measures to prevent erosion and sedimentation during project construction.
- Store spoils from project construction in areas that limit erosion of spoil material and prevent run-off into aquatic habitats.
- Surface permanent roads with gravel to a depth and quantity sufficient to maintain a stable road surface.

Aquatic Resources:

- Confine in-water work activities to occur between July 1 and October 15.
- Install coffer dams, silt fences, or other structures to isolate in-water work areas.
- Maintain upstream and downstream fish passage during construction.
- Provide upstream and downstream fish passage at project diversion works.
- Monitor stream flow at the diversion structure, and implement a minimum instream bypass flow of 13 cfs or inflow, whichever is less.

- Provide a ramping rate that will not exceed 1 to 2 inches of stage change per hour as determined in Applicant's consultation with CDFW as follows:
 - 1. Feb. 16 through June 15
 - a. Daylight Hours 1 inch stage change per hour
 - b. Nighttime Hours 2 inches stage change per hour
 - 2. Jun 16 through Oct 31 Daylight and Nighttime Hours 1 inch stage change per hour
 - 3. Nov.1 through Feb. 15 Daylight and Nighttime Hours 2 inches stage change per hour

The ramping rate will be measured at a stream gauge located below the Diversion Structure within the bypassed Project Reach above the Old Hwy. 36 bridge.

- Annually sluice sediments from the project's reservoir during annual high flows. High flows are defined as over 400 cfs natural flow at the diversion site. Sluicing will also take place during project operations where streamflows exceed 108 cfs (Minimum Instream Retained Flow of 13 cfs plus maximum penstock diversion to powerhouse of 95 cfs) by opening the bottom of the sluice gates on either side of the diversion to bypass flow greater than 108cfs. In a season where natural flows never reach stated 400 cfs, the sediment deposits in the reservoir behind the diversion will be evaluated to determine if sluicing of sediments might be desired. In such cases when sluicing is desired, the sluicing might be scheduled by the operator at flows less than 400 cfs.
- Discontinue project operation when the average daily stream temperature exceeds 20 degrees Celsius measured in the project reach below the diversion above the tailrace.
- Implement the Anadromous Fish Monitoring Program and notify the resource agencies when/if anadromous species are found within the bypassed reach.
- Conduct genetic sampling to evaluate impediments to steelhead passage through the bypassed reach if steelhead are detected above Panther Grade in the bypass reach and implement adaptive management to address the potential impediments to passage.
- Implement the Project Operating Rules and Monitoring Program when anadromous salmonids are present in the bypass reach.
- Monitor fish behavior at the project's tailrace and modify the tailrace if fish attraction is observed.
- Develop an operations model for flow and water temperature.

Terrestrial Resources:

- Employ biological monitoring personnel during construction to ensure that measures to protect biological resources are implemented appropriately.
- Provide environmental training to construction staff regarding laws, regulations, and best management practices to protect threatened and endangered species and special-status plant species and their habitats.
- Limit ground-disturbing activity and vegetation clearing.
- Delineate the limits of construction, work areas, and multipurpose areas with flagging, fencing, and/or stakes, and prohibit ground disturbance outside of these limits.

- Reclaim temporarily disturbed stream and riparian habitat through restoration of preconstruction conditions and riparian plantings and/or seeding, where applicable, with approved seed mixes.
- Conduct preconstruction surveys in all areas of suitable habitat for threatened and endangered and special-status plant species where surveys have not previously been conducted and implement specified protection measures as necessary.
- Avoid, to the extent possible, streams, wetlands, and pond habitats, during construction and use existing stream and wetland crossings where possible.
- Revise the Noxious Weed Management and Revegetation Plan, which includes measures to ensure weeds and non-native invasive vegetation do not reestablish at on-site disposal areas during project construction, and include provisions for riparian plantings along disturbed portions of the South Fork Battle Creek to provide overhanging vegetation.
- Map, and quantify, by vegetation type, the vegetation to be removed as a result of project construction.
- Conduct preconstruction surveys for migratory birds within 100 feet of the project (disturbance area) immediately prior to construction if disturbance will occur during the nesting season (typically April 15 to July 31).
- Establish a 100-foot-buffer around active nests of bird species protected under the Migratory Bird Treaty Act.
- Conduct preconstruction pedestrian or aerial nest surveys in suitable habitat within 1 mile of the project disturbance area during the appropriate nesting time periods needed to identify raptor nest locations and establish the status of nests.
- Apply a buffer to active raptor nests during project construction.
- Design and construct the transmission line in compliance with Avian Power Line Interaction Committee (APLIC) guidance to reduce impacts to avian species (APLIC 2006, 2012).
- Avoid ground-disturbing activity on or near talus slopes to protect Sierra Nevada red fox and American pika.
- Avoid potential bat roosting habitat, including rock crevices, cliffs, and snags.
- Develop a California red-legged frog protection plan and protect their breeding habitat during construction.
- Although not contemplated in the operation of the project, in a commitment to not disturbing potential yellow-legged frog environment, the operator will not collect rocks from in-water environments between March 1 and August 31 to avoid disturbing foothill yellow-legged frogs, and disturbance to pools and slow runs will be minimized.
- Avoid construction activities in riparian areas during the time that egg masses of foothill yellow-legged frogs are present (typically mid-April through mid-May); when egg masses of foothill yellow-legged frogs are found, postpone construction until eggs have hatched. If eggs are identified as being present, construction would be delayed around the immediate area where egg masses are found.
- Conduct preconstruction surveys for juvenile and adult foothill yellow-legged frogs immediately prior to construction when in-water work will occur during the breeding season (typically mid-March to August).

• Relocate juvenile and adult foothill yellow-legged frogs found within the project reach or 500 feet downstream, outside the project construction area.

Land Use and Aesthetics:

- Restrict construction activities to designated areas.
- Limit access roads to a one-lane width of 12 feet whenever possible.
- Restore vegetation directly removed or disturbed during project construction as appropriate and in accordance with California forestry regulations and best practices.
- Reforest temporary access roads per landowner recommendations when they are no longer required.
- Reduce visual contrast where over-story vegetation is removed by thinning and removing trees from the edge of the right-of-way out or away to give a natural appearance, where possible.
- Utilize wood poles to support the transmission line to blend with surrounding vegetation and reduce contrast.
- Utilize existing roads to the maximum possible extent, constructing new access roads only when no feasible alternative exists.

Cultural Resources:

• Implement the Historic Properties Management Plan.

END of Summary of Mitigation Measures proposed by Applicant in response to Agency Consultations and Comments

Project Costs:

1. FERC Question: "Estimated total capital cost of the proposed project" Applicant Response: The estimated capital cost of the project includes the Pre-Construction and Construction Phase Mitigation Measures costs outlined in Appendix A is \$13.5 Million. The estimated cost of preparing the FERC license application to allow for the preparation of the NEPA EIS and studies to support the CEQA EIR preparation and other project pre-construction costs are currently \$3.6 Million. The Applicant estimates that an additional \$0.3 Million will need to be expended in pre-construction costs to complete the CEQA EIR, respond to future comments on the EIS and EIR and other project costs to take place before start of construction for a total of \$3.9 Million. See also the Initial Statement Revision 2 as revised and updated Nov. 20, 2015 filed by the Applicant as a part of the FERC license application in the Nov. Supplemental filing. (Note, the current pre-construction cost estimate of \$3.25 Million is \$0.65 Million greater and the total project cost - Pre-Construction plus Construction of \$17.4 Million - is \$0.4 Million greater than the figures listed in the Initial Statement Revision 2 as revised and updated Nov. 20, 2015,)

- 2. FERC Question: "Total cost of each proposed environmental measure, including an estimate of any annual maintenance and operation expense for the measure." Applicant Response: See Attachment A for details of these expenses.
- 3. *FERC Question: "Estimated annual cost to operate and maintain the project as proposed."* Applicant Response: See Attachment A for details of these expenses.
- 4. FERC Question: "For each agency 10(j) recommendation you do not propose, please provide an estimate of the capital cost of the measure, including any annual cost to operate and maintain the measure. If the measure would affect the dependable capacity or estimated average annual generation of proposed project, please include an estimate of these affects in your response." Applicant Response: See Attachment A for the details of the estimates for the costs of 10(j) recommendations the Applicant does not propose to adopt. See also Attachment B for graph of details of the estimate for NOAA/NMFS (and USFWS) §10(j) Condition #3 35 cfs MIF vs. 13 cfs MIF agreed to in consultation with CFWS.

Project Design and Safety:

FERC Question: "As part of the licensing process, the Commission will review the safety and adequacy of the proposed project facilities. So that we may begin that review, please provide the following:

- a. Information on the subsurface conditions at the proposed project diversion, including the results of any borings done at the site": Applicant Response: Subsurface investigations will be performed after license issuance. Results of borings and geotechnical engineering of the site will be incorporated into the final diversion design in compliance with all codes and regulations. The geotechnical and diversion structural design will be submitted to the FERC and resource agencies before start of construction of the diversion.
- b. "Stability calculations for the proposed diversion dam based on the Commission's engineering guidelines:" Applicant Response: The final diversion structural design, including stability calculation, will be completed in accordance of the Commission's engineering guidelines and will be submitted to the FERC and resource agencies before start of construction of the diversion.
- c. "An estimate of the 100-year-flood at the proposed diversion, including the basis for the estimate:" Applicant Response: The peak discharge flow (cfs) estimated to occur at the proposed diversion during a 100-year-flood event is 2,500 cfs. This estimation is based upon analysis contained within the "Baseline Hydrologic Analyses for South Fork Battle Creek (Northwest Hydraulic Consultants, November 2014)", a scientific study contained within the Applicant's FERC Licensing documents. Information from actual flows measured within the bypass reach, synthetic flow estimates, on-site observations, high-water event bank scours, historical photographs, and historical flow data were utilized in the preparation of this study to estimate these flows. Table 15 from that study is attached below for ease or reference. This study contains a more detailed discussion of how these estimated flow figures were arrived at.

Table 1. Estimated Instantaneous Peak Flow Frequency for SF Battle Creek near Mineral

Return Interval	Estimated Peak Discharge Near Mineral (cfs)
2-year	610
5-year	990
10-year	1290
25-year	1720
50-year	2090
100-year	<mark>2500</mark>

As relates to these 100-year flood flows estimated to be 2,500 cfs at the diversion site, the "Sediment Transport Analyses for South Fork Battle Creek final report (Northwest Hydraulic Consultants, May 2015), a scientific study contained within the Applicant's FERC Licensing documents, contains a cross-section at Station 5+42 which is the location of the diversion structure. At the 100-year flood flows at the diversion site prior to the diversion structure installation, the water surface level is estimated to be at elevation 4,312 feet with a cross section area of 430 Square Feet and a flow rate of approximately 6 feet per second. For this same flow after installation of the diversion structure, the water surface elevation is estimated to be 4,313.2 feet. Note – The pneumatic gates in the middle of the diversion structure will be opened at flows over 400 cfs, so these gates will be open when a 100-year flood event takes place at approximately 2,500 cfs. See Attachment C for the detailed drawings illustrating these estimates.

Please inform the Applicant if there are any questions or comments on these responses to questions.

Respectfully Submitted,

Charlid Kuffner Managing Partner Rugraw, LLC

Cc: Kenneth Hogan – FERC; Jim Tompkins – Rugraw, LLC

<u>Attachment A - Pre-Construction, During Construction, and Annual Cost of Maintenance and 10(j) Estimate</u>

<u>Lassen Lodge Project</u> Friday, March 31, 2017

COST INCORPORATED IN GENERAL (PRIME) CONSTRUCTION CONTRACT CONDITIONS
PRE-CONSTRUCTION EXPENSES
DURING-CONSTRUCTION EXPENSES
ANNUAL RECURRING EXPENSES

ITEM	INCLUDED IN CONSTRUC TION CONTRACT	PRE- CONSTRUCTION EXPENSES	DURING- CONSTRUCTION EXPENSES	ANNUAL RECURRING EXPENSES	Notes:
I. Geology and Soil Resources:					
- Coolegy and con resources					
1. Limit surface disturbance to only those areas needed for construction.					
2. Stockpile natural top soils and replace, regrade, and revegetate disturbed areas with			\$ 15,000		
native vegetation after construction of project facilities.					
3. Develop a Storm Water and Prevention Control Plan that outlines measures to prevent		\$ 10,000	\$ 250,000		
erosion and sedimentation during project construction.					
4. Store spoils from project construction in areas that limit erosion of spoil material and			\$ 25,000		
prevent run-off into aquatic habitats.					
5. Surface permanent roads with gravel to a depth and quantity sufficient to maintain a			\$ 100,000		
stable road surface.					
II. Aquatic Resources:					
1. Confine in-water work activities to occur between July 1 and October 15.					
2. Install coffer dams, silt fences, or other structures to isolate in-water work areas.			\$ 10,000		
3. Maintain upstream and downstream fish passage during construction.			\$ 10,000		
					Maintaining
4. Provide upstream and downstream fish passage at project diversion works.				\$ 5,000	Fish Passage

5.	Monitor stream flow at the diversion structure, and implement a minimum instream flow			I	\$ 10,000	
					,,,,,,,	Estimated
						annual
				l		production/
6.	Provide a ramping rate of no more than 1 to 2 inches per hour				\$ 5,000	revenue loss
 					7 3,000	Estimated
						annual
						production/
7.	Annually sluice sediments from the project's reservoir during annual high flows				\$ 10,000	revenue loss
 	Almany state seaments from the project's reservoir during aiman high nows				3 10,000	Estimated
						annual
						production/
	Discontinue project eneration when the average daily stream temperature eveneds 20				ć 1F 000	l' ' l
8.	Discontinue project operation when the average daily stream temperature exceeds 20 degrees Celsius measured in the project reach below the diversion above the tailrace.				⇒ 15,000	revenue loss
9.	Implement the Anadromous Fish Monitoring Program and notify the resource agencies				\$ 10,000	
٦.	when anadromous species are detected in the bypassed reach (per ocurrance).				JU,000 ج	
\vdash	when anauromous species are detected in the pypassed reach (per ocurrance).					
						Not required if
						Anadromy not
						found above
10					ć 10.000	
10.	Conduct genetic sampling to evaluate impediments to steelhead passage through the				\$ 10,000	natural barriers
-	bypassed reach if steelhead are detected in the bypass reach and implement adaptive					
\vdash	management to address the potential impediments to passage.					
						Not required if
						Anadromy not
						found above
						natural barriers.
				l		In addition, if 35
				l		cfs MIF in lieu of
				l		13 cfs MIF,
				l		average annual
				l		production loss
						is estimated to
11	Implement the Project Operating Rules and Monitoring Program when anadromous			l	\$ 10,000	be \$533,750
1	salmonids are present in the bypass reach.				70,000 خ	με 3333,/30
12	Monitor fish behavior at the project's tailrace and modify the tailrace if fish attraction is				\$ 3,000	
12.	observed.				ا الالال	
13	Develop an operations model for flow and water temperature.	\$	7,500		\$ 10,000	
13.	bevelop an operations model for now and water temperature.	٦	7,500		0,000 ج	

III. Terrestrial Resources:

1. Employ biological monitoring personnel during construction to ensure that measures to		\$	25,000	
protect biological resources are implemented appropriately (120 days).		7		
2. Provide environmental training to construction staff regarding laws, regulations, and	\$ 5,000			
best management practices to protect threatened and endangered species and special-				
status plant species and their habitats.				
Limit ground-disturbing activity and vegetation clearing.				
 Delineate the limits of construction, work areas, and multipurpose areas with flagging, 		\$	5,000	
fencing, and/or stakes, and prohibit ground disturbance outside of these limits.		۲	3,000	
5. Reclaim temporarily disturbed stream and riparian habitat through restoration of		\$	10,000	
preconstruction conditions and riparian plantings and/or seeding, where applicable,		7	10,000	
with approved seed mixes.				
6. Conduct preconstruction surveys in all areas of suitable habitat for threatened and	\$ 10,000			
endangered and special-status plant species where surveys have not previously been	7 10,000			
conducted and implement specified protection measures as necessary.				
 Avoid, to the extent possible, streams, wetlands, and pond habitats, during construction 				
and use existing stream and wetland crossings where possible.				
		۲.	F 000	
8. Revise the Noxious Weed Management and Revegetation Plan, which includes measures		\$	5,000	
to ensure weeds and non-native invasive vegetation do not reestablish at on-site		-		
disposal areas during project construction, and include provisions for riparian plantings		_		
along disturbed portions of the South Fork Battle Creek to provide overhanging				
vegetation.				
9. Map, and quantify, by vegetation type, the vegetation to be removed as a result of		\$	5,000	
project construction.				
10. Conduct preconstruction surveys for migratory birds within 100 feet of the project	\$ 5,000			
(disturbance area) immediately prior to construction if disturbance will occur during the				
nesting season (typically April 15 to July 31).				
11. Establish a 100-foot-buffer around active nests of bird species protected under the	\$ 2,500			
Migratory Bird Treaty Act.				
12. Conduct preconstruction pedestrian or aerial nest surveys in suitable habitat within 1	\$ 5,000			
mile of the project disturbance area during the appropriate nesting time periods needed				
to identify raptor nest locations and establish the status of nests.				
13. Apply a buffer to active raptor nests during project construction.	\$ 2,500			
14. Design and construct the transmission line in compliance with Avian Power Line	\$ 2,500	\$	10,000	
Interaction Committee (APLIC) guidance to reduce impacts to avian species (APLIC 2006,				
2012).				
15. Avoid ground-disturbing activity on or near talus slopes to protect Sierra Nevada red fox				
and American pika.				

16. Avoid potential bat roosting habitat, including rock crevices, cliffs, and snags.				
17. Develop a California red-legged frog protection plan and protect their breeding habitat	\$	7,500	\$ 2,500	
during construction.				
18. Although not contemplated in the operation of the project, in a commitment to not				
disturbing potential yellow-legged frog environment, the operator will not collect rocks				
from in-water environments between March 1 and August 31 to avoid disturbing foothill				
yellow-legged frogs, and disturbance to pools and slow runs will be minimized.				
19. Avoid construction activities in riparian areas during the time that egg masses of foothill				
yellow-legged frogs are present (typically mid-April through mid-May); when egg masses				
of foothill yellow-legged frogs are found, postpone construction until eggs have				
hatched. If eggs are identified as being present, construction would be delayed around				
the immediate area where egg masses are found.				
20. Conduct preconstruction surveys for juvenile and adult foothill yellow-legged frogs	\$ 10	0,000		
immediately prior to construction when in-water work will occur during the breeding				
season (typically mid-March to August).				
21. Relocate juvenile and adult foothill yellow-legged frogs found within the project reach			\$ 1,000	
or 500 feet downstream, outside the project construction area.				
IV. Land Use and Aesthetics:				
Restrict construction activities to designated areas.				
2. Limit access roads to a one-lane width of 12 feet whenever possible.				
3. Restore vegetation directly removed or disturbed during project construction as			\$ 10,000	
appropriate and in accordance with California forestry regulations and best practices.				
4. Reforest temporary access roads per landowner recommendations when they are no			\$ 7,500	
longer required.				
5. Reduce visual contrast where over-story vegetation is removed by thinning and				
removing trees from the edge of the right-of-way out or away to give a natural				
appearance, where possible.				
6. Utilize wood poles to support the transmission line to blend with surrounding				
vegetation and reduce contrast.				
7. Utilize existing roads to the maximum possible extent, constructing new access roads				
only when no feasible alternative exists.				

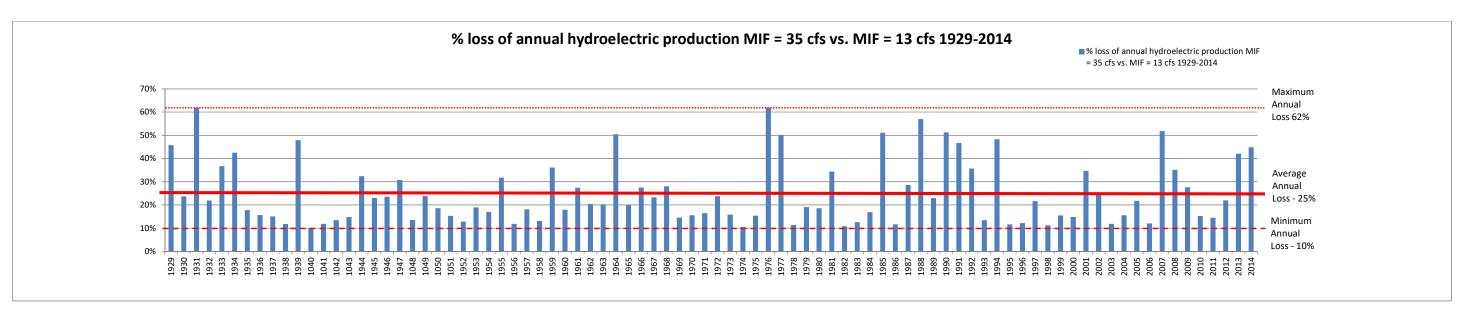
V. Cultural Resources:

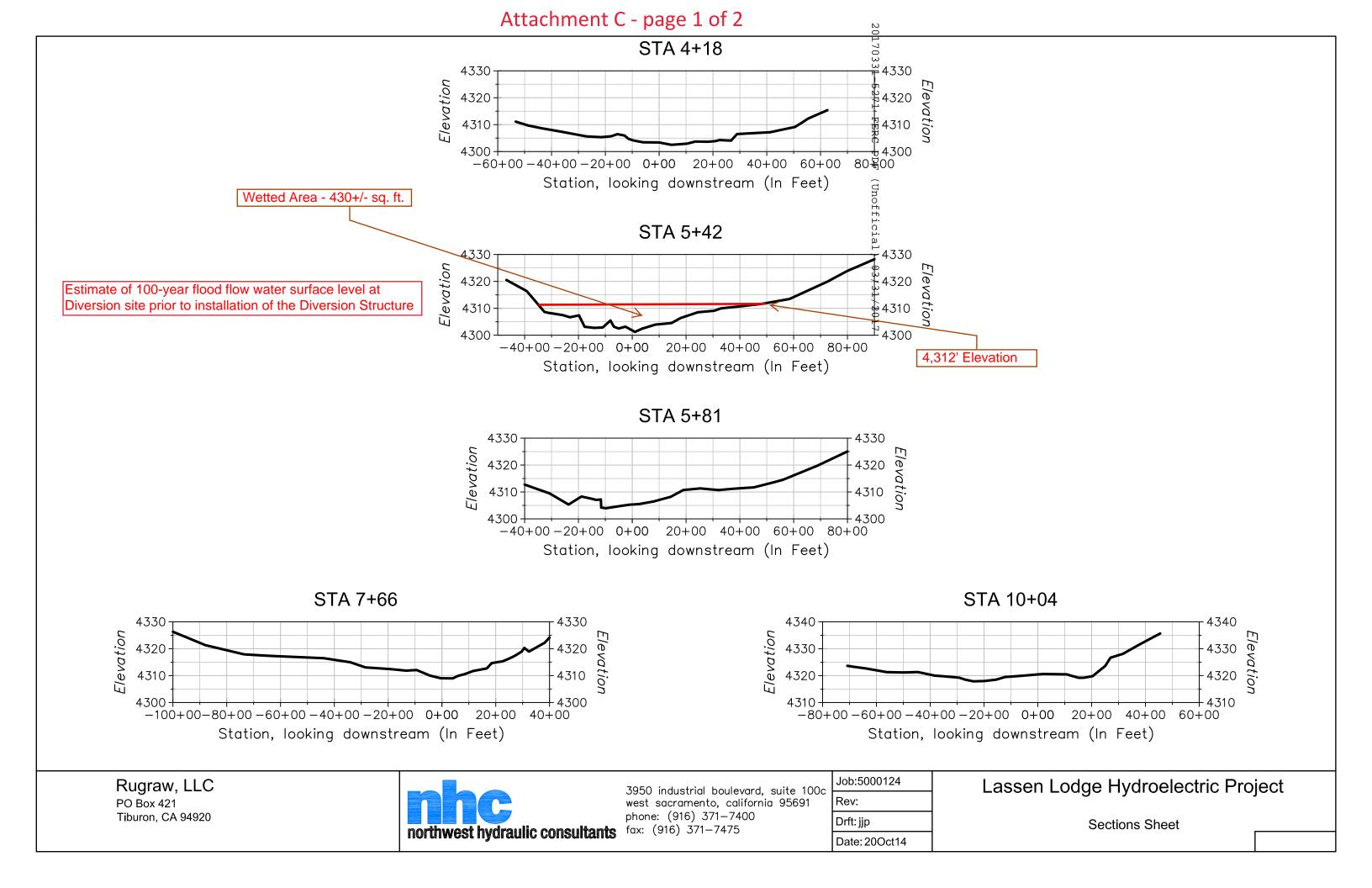
1. Implement the Historic Properties Management Plan.		\$ 10,000	\$ 10,000	\$ 2,000	
TOTALS		\$ 116,500	\$ 501,000	\$ 90,000	
				\$60,000	
				annual est.	
		These costs	These costs		
			are included in	expense	
		the	the	and	
		Construction Con	Construction	\$30,000	
		Cost Estimate		annual est.	
		of the Project	of the Project	lost	
				revenue	
				reduction	
Additional Annual Operating Expenses					
Operations Staff				\$ 90,000	
Annual Right of Way Expense				\$ 25,000	
Annual Utilities and Operational Equipment Expense				\$ 20,000	
Annual Maintenance Reserve				\$ 50,000	
Annual Interconnection Operator Operations and Maintenance Fees		·		\$ 25,000	
Annual Operating Costs (including measures and lost revenue from implementing measures noted a	above)			\$300,000	

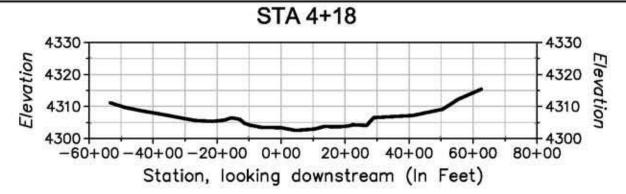
Estimated cost of Agency 10(J) items that Applicant proposes be modified from Agency in	itial 10(j) proposals	Additional Expense During Construction	Additional Annual Expense	Notes:
CDFWS - None				
SWRCB - None				
NOAA/NMFS - See Detail below:				
§10(j) Condition #2: Water Temperature Monitoring and Criteria (A and D) - NOAA Temperatures and Methodolgy as opposed to CDFWS Temp./Method			\$ 15,000	Estimated annual production/ revenue loss
§10(j) Condition #2: Water Temperature Monitoring and Criteria (A) - Additional Temperature Montiforing immediately below Panther Grade		\$ 25,000	\$ 5,000	No site control and Site Access also an issue. Propose exisitng station below Ponderossa Way Bridge instead.
§10(j) Condition #2: Water Temperature Monitoring and Criteria (C) - Additional Temperature Montiforing immediately below Angel Falls		\$ 25,000	\$ 5,000	Site Access an issue. Propose station just above tailrace instead.

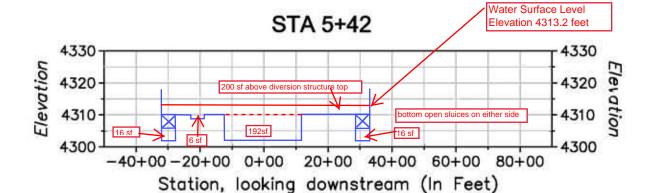
§10(j) Condition #3: Flow Gage Monitoring Plan (A) - Locate flow gauge just below Panther Grade					No site control and Site Access also an issue. Propose exisitng station below Ponderossa Way Bridge
§10(j) Condition #3: Flow Gage Monitoring Plan (C) - Locate flow gauge just below Angel Falls		\$ 25,000	\$	5,000	Site Access an issue. Propose station just above tailrace
instead of just above tailrace		\$ 25,000	\$	5.000	instead.
					Estimated annual production/ revenue loss. See also
§10(j) Condition #3 - 35 cfs MIF vs. 13 cfs MIF agreed to in consultation with CFWS			\$53	33,750	Attachment B
§10(j) Condition #4: Salmonid Monitoring Plan (A) - instead of quaterly snorkel surveys do snorkel					
surveys after 400+ cfs over Angel Falls as agreed to with CFWS §10(j) Condition #4: Salmonid Monitoring Plan (C) - not do quarterly resident <i>O mykiss</i> studies			\$	7,500	
that are outside of NOAA/NMFS jurisdiction			٠ ٢	20,000	
§10(j) Condition #4: Salmonid Monitoring Plan (D) - not do quarterly salmonid studies but still			، ب	20,000	
inform Resource Agencies if andromous fish are found in Project Reach			\$ 2	20,000	
§10(j) Condition #5: Benthic Macroinvertebrate Monitoring Plan - Do baseline BMI study - not do					
ongoing BMI studies in years 2-4 and every 4th year and reporting			\$	5,000	
§10(j) Condition #6: Debris and Sediment Management (C)(3) - Do DSMP. Sluice any sediment					
build-up. Do not do downstream sediment monitoring, vegitation mapping or pebble counts s			\$ 9	90,000	
Department of Interior/USFWS - See Detail below:					
All items from the NOAA/NMFS comments above also apply to the Department of					
Interior/USFWS 10(j) conditions for items 2-6 as noted.					

Attachment B

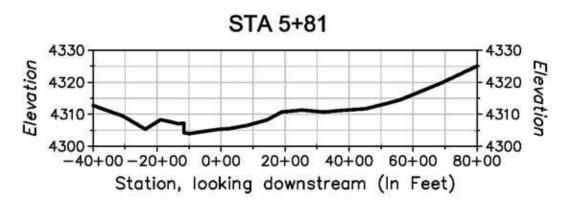


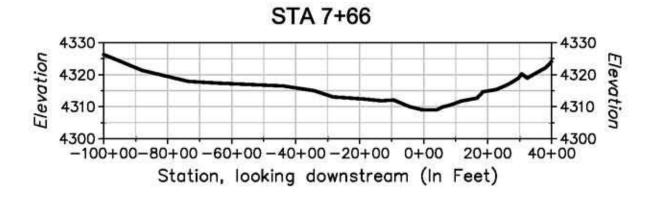


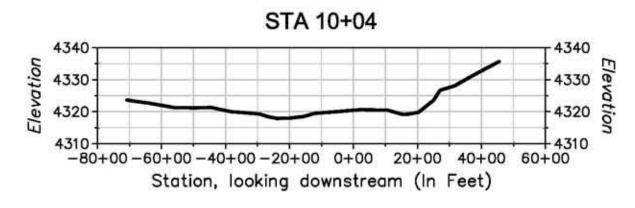




Cross Section of Diversion Structure and estimated 100-year flood flow water surface Level







Rugraw, LLC PO Box 421 Tiburon, CA 94920 northwest hydraulic consultants

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Job:5000124	٦
Rev:	
Drft: jjp	٦
Date: 20Oct14	

Lassen Lodge Hydroelectric Project

Sections Sheet

20170331-5271 FERC PDF (Unofficial) 03/31/2017
Document Content(s)
P-12496 LLHP FERC response 170331 wac.PDF1-16