

1 Q. **2018 Capital Projects \$500,000 and Over, Hydraulic Generation Refurbishment**
 2 **and Modernization, Volume I, Page C-5**

3 *“In the 2018 Capital Budget Application, Hydro has consolidated program, pooled,*
 4 *and stand-alone type hydraulic generation projects into a single project, Hydraulic*
 5 *Generation Refurbishment and Modernization Project, and will respond to hydraulic*
 6 *generation in-service infrastructure failures using the Hydraulic Generation In-*
 7 *Service Failures Project, where applicable. Moving forward, these projects are*
 8 *proposed for work to address the required refurbishment or replacement of assets*
 9 *and have similar justifications and other information presented each year.”*

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 11 For the period 2013 to 2017, provide the total capital expenditures by year for the
 12 hydraulic generation capital projects that would have been included in a single
 13 project under the new consolidated approach.

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 16 A. For the period 2013 to 2017, the total capital expenditures by year for the hydraulic
 17 generation capital projects that would have been included in a single project under
 18 the new consolidated approach are as follows:

Past Projects by Year:	Cost (X \$ 1000)					
	2013	2014	2015	2016	2017	2018
2013 Hydraulic Generating Units:						
Replace Stator Windings Unit 1 - Bay d'Espoir	2,265.7	2,132.5				
Replace Static Excitation Systems – Various	869.1					
Automate Generator Deluge Systems Units 5 and 6 - Bay d'Espoir	311.6	67.7				
Upgrade Generator Bearings- Bay d'Espoir	24.3	207.3				

Overhaul Turbine/Generator Units - Bay d'Espoir and Cat Arm	214.4					
Replace Auto Greasing Systems Units 1 and 3 - Bay d'Espoir	189.9	71.9				
Replace Cooling Water Pumps - Bay d'Espoir	86.5	61.6				
Replace By-Pass Valves Units 3 and 4 - Bay d'Espoir	9.5	172.5	35.5			
2013 Hydraulic Structures						
Upgrade Burnt Dam Spillway - Bay d'Espoir	223.1	635.4	94.4			
Replace Fall Arrest System on Surge Tank 2 - Bay d'Espoir	80.2					
2013 Reservoirs Program						
Upgrade Public Safety Around Dams and Waterways - Bay d'Espoir	337.0					
2013 Common Auxiliary Equipment Program						
Replace Automatic Transfer Switches - Hinds Lake	323.4	93.8				
Replace North End Equipment Door - Bay d'Espoir	136.3					
Install Automated Fuel Monitoring System - Upper Salmon	94.8	96.7				
Purchase Low Pressure Screw Compressor Set - Bay d'Espoir	78.7	24.9				
Install Waste Oil Storage Tank for PCB's - Bay d'Espoir	31.3					
Replace Emergency Diesel Fuel Tank - Paradise River	25.2					
Upgrade Water Flow Control Structure RR Pond - Granite Canal	25.1					
2014 Hydraulic Generating Units:						
Rewind Stator Unit 3 - Bay d'Espoir		2,833.4				
Automate Generator Deluge Systems Units 3 and 6 - Bay d'Espoir		457.9				
Overhaul Turbine/Generator Units - Bay d'Espoir and Hinds Lake		481.2				
Upgrade Generator Bearings Unit 2 - Bay d'Espoir		9.4	252.8			

Replace Automatic Greasing Systems Units 5 and 6 - Bay d'Espoir		166.5			
Replace Generator Bearing Coolers Units 4 and 5 - Bay d'Espoir		136.9			
Replace Turbine/Generator Cooling Water Flow Meters-USL		85.5			
Replace Spherical By Pass Valve Assemblies Units 1 and 2 - Bay d'Espoir		12.8	169.5	77.2	
2014 Hydraulic Structures					
Refurbish Surge Tank 3 - Bay d'Espoir		1,497.0			
Upgrade Burnt Dam Spillway - Bay d'Espoir		126.1	640.2	740.2	
Upgrade Victoria Control Structure - Bay d'Espoir		79.6	235.0	446.9	
Replace Fall Arrest on Surge Tank 1 - Bay d'Espoir		114.9			
2014 Reservoirs Program					
Upgrade Public Safety Around Dams and Waterways - Bay d'Espoir:		246.7			
Raise Height of Earth Dam - Paradise River		158.3			
2014 Site Buildings and Services Program					
Upgrade Shoreline Protection - Cat Arm		31.5			
Upgrade North Cut-Off Dam Access Road - Bay d'Espoir		474.1			
2014 Common Auxiliary Equipment Program					
Replace Engine on Emergency Lift System - West Salmon Spillway		61.2			
2015 Hydraulic Generating Units:					
Replace ABB Exciter Unit 2 - Cat Arm			680.8		
Upgrade Generator Bearings Units 1 and 3 - Bay d'Espoir			8.1	277.1	
Automate Generator Deluge Systems - Bay d'Espoir			567.9		
Refurbish Generation Unit - Snook's Arm			315.0		
Overhaul Turbine/Generator - Various			325.8		

Sites						
Replace Automatic Greasing Systems Units 2 and 4 - Bay d'Espoir			231.5			
Replace Generator Bearing Coolers - Bay d'Espoir			132.2			
Refurbish Unit Relay Protection - Paradise River			9.0	129.1		
2015 Hydraulic Structures						
Replace Interior Coating on Surge Tank 3 - Bay d'Espoir			1,262.7			
Rehabilitate Salmon River Spillway - Bay d'Espoir			522.9	871.1		
Refurbish Intakes - Bay d'Espoir			26.4	262.2		
2015 Reservoirs Program						
Upgrade Public Safety Around Dams and Waterways - Various Sites			468.7			
2015 Site Buildings and Services Program						
Refurbish Access Road - Cat Arm			939.8			
Replace Pump House and Associated Equipment - Bay d'Espoir			137.0	128.6	279.6	
2015 Common Auxiliary Equipment Program:						
Replace Station Service Breakers - Cat Arm			646.1	185.9	176.3	
Install Hydro Meteorological Stations - Various Sites			372.2			
Upgrade Equipment Doors - Various Sites			285.4	115.4	46.7	
Install Infrared View Ports - Various Sites			54.7	151.3		
2016 Hydraulic Generating Units:						
Overhaul Turbine/Generator Units 6 and 7 - Bay d'Espoir				544.5	56.2	
Replace Powerhouse 1 Station Service Transformer - Bay d'Espoir				45.0	356.2	
Replace Vibration Monitoring System Unit 7 - Bay d'Espoir				272.1		
Replace Spherical By-Pass Valves Units 1 and 2 - Bay d'Espoir				154.8	196.7	

Refurbish Station Water System - Upper Salmon				38.3	255.9	
Replace Generator Cooling Water Piping - Hinds Lake				278.4		
Assess Vent Chambers Units 1 to 6 - Bay d'Espoir				85.7		
2016 Hydraulic Structures						
Replace Interior and Exterior Protective Coating on Surge Tank 2 - Bay d'Espoir				2,735.7		
Perform Condition Assessment of Control Structure - Hinds Lake				351.1		
2016 Reservoirs Program						
Upgrade Public Safety Around Dams and Waterways - Bay d'Espoir				334.7		
2016 Site Buildings and Services Program						
Replace Site Facilites - Bay d'Espoir				270.4	5,394.2	6,316.7
Upgrade Work - Cat Arm				240.4	1,670.9	
Rehabilitate Shoreline Protection - Cat Arm				104.7	1,038.2	
2016 Common Auxiliary Equipment Program:						
Replace Control Room/Communications Room Air Conditioning - Hinds Lake				31.0	63.3	
2017 Hydraulic Generating Units:						
Refurbish Powerhouse Station Services - Bay d'Espoir					413.2	3,933.9
Replace Exciter Controls Units 1 to 6 - Bay d'Espoir					119.2	3,227.8
Water System Replacements - Bay d'Espoir and Cat Arm					265.5	2,288.3
Overhaul Turbine/Generators - Cat Arm					305.4	
Replace Slip Rings Units 1-6 - Bay d'Espoir					312.6	159.7
Refurbish Main Generator Breaker - Upper Salmon					271.1	
Install Asset Health Monitoring System - Upper Salmon					438.0	203.4

2017 Hydraulic Structures						
Control Structure Refurbishments - Various Sites					1,735.3	452.9
2017 Reservoirs Program						
Upgrade Public Safety Around Dams and Waterways - Bay d'Espoir					489.0	
Install Wind Monitoring Station North Salmon Dam SD-2 - Bay d'Espoir					165.5	
2017 Common Auxiliary Equipment Program:						
Upgrade Ventilation in Powerhouse 1 and 2 - Bay d'Espoir					134.1	863.8
Refurbish Sump Level System for Powerhouse 2 - Bay d'Espoir					38.7	264.5
Replace Floor Annunciator Panels - Bay d'Espoir					46.8	
	2013*	2014*	2015*	2016*	2017**	2018**
Total Approved 2013	5,326.1	3,370.9	129.9			
Total Approved 2014		6,973.0	1,297.5	1,264.3		
Total Approved 2015			6,986.2	2,120.7	502.6	
Total Approved 2016				5,486.8	9,031.6	6,316.7
Total Approved 2017					4,734.4	11,394.3
Total Annual Expenditure	5,326.1	10,343.9	8,413.6	8,871.8	14,268.6	17,711.0

* Indicates that the numbers provided are actual expenditures.

** Indicates that the numbers provided are budgetary forecasts for previously approved projects.