

1 Q. Please provide by plant and by major expense category for 2019 to 2023 the capital
2 budgets for Newfoundland Hydro and Nalcor Power Supply production
3 organization.

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6 A. Please refer to Tables 1, 2 and 3 for Hydro's 2019 to 2023 production organization
7 capital budgets by plant. Please refer to Table 4 for the Exploits and Star Lake 2019
8 to 2023 capital budgets.

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10 Hydro's five-year capital plan is a living document and is revised on an ongoing basis
11 as new asset condition information becomes available, asset management
12 strategies evolve, and demands and priorities change within asset classes. The five-
13 year capital plan supports Hydro's responsibility to maintain its infrastructure
14 providing safe, reliable and least-cost electricity for customers.

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16 A breakdown by major expense category for Hydro's five-year capital plan is not
17 readily available. Major expense category breakdowns for 2019 can be found in the
18 production proposals in Hydro's approved 2019 Capital Budget Application.

**Table 1: Hydraulic Plant
2019 to 2023 Capital Budget
(\$000s)**

Plant	2019	2020	2021	2022	2023	Total
Bay d'Espoir	12,710.1	13,548.4	15,833.2	15,410.9	3,865.0	61,367.6
Snooks Arm	-	-	289.3	-	-	289.3
Hinds Lake	1,490.4	2,349.8	775.7	673.0	1,655.0	6,943.9
Paradise River	43.8	728.9	435.0	2,459.7	450.0	4,117.4
Granite Canal	562.2	1,437.5	95.0	-	330.0	2,424.7
Cat Arm	-	712.6	779.7	527.3	2,900.0	4,919.6
Upper Salmon	-	2,082.2	747.1	1,624.4	1,775.0	6,228.7
Various ¹	5,409.2	2,761.0	4,390.0	2,250.0	5,250.0	20,060.2
Total	20,215.7	23,620.4	23,345.0	22,945.3	16,225.0	106,351.4

**Table 2: Thermal Plant
2019 to 2023 Capital Budget
(\$000s)**

Plant	2019	2020	2021	2022	2023	Total
Holyrood Thermal Generating Station	7,139.6	6,948.5	11,185.5	6,890.9	4,559.2	36,723.7

**Table 3: Gas Turbines
2019 to 2023 Capital Budget
(\$000s)**

Plant	2019	2020	2021	2022	2023	Total
Holyrood Gas Turbine	3,083.4	2,817.7	2,500.0	-	-	8,401.1
Happy Valley	-	1,486.8	1,400.0	850.0	200.0	3,936.8
Hardwoods	3,021.4	1,725.0	2,825.0	1,600.0	2,100.0	11,271.4
Stephenville	214.6	525.0	1,556.0	500.0	1,500.0	4,295.7
Various ¹	-	300.0	300.0	300.0	300.0	1,200.0
Total	6,319.4	6,854.5	8,581.0	3,250.0	4,100.0	29,104.9

¹ Certain capital projects span multiple plant locations and are budgeted based on a project total. The information to separate out by location is not readily available and therefore have been classified as various.

**Table 4: Exploits and Star Lake Plant
2019 to 2023 Capital Budget**

	(\$000s)					
Plant	2019	2020	2021	2022	2023	Total
Star Lake	1,274.5	705.0	1,230.0	1,080.1	1,233.9	5,523.5
<u>Exploits:</u>						
Grand Falls	8,117.1	1,908.8	4,488.5	800.0	3,567.1	18,881.5
Bishop Falls	4,769.9	1,029.0	2,775.7	2,100.0	2,351.7	13,026.3
Millertown	2,335.5	2,256.8	2,222.0	810.9	1,375.1	9,000.3
Goodyear's Dam	150.0		20,672.9	27,310.1		48,133.0
North Twin Lake Dam				417.0		417.0
South Twin Lake Dam				417.0		417.0
Total	16,647.0	5,899.6	31,389.1	32,935.1	8,527.8	95,398.6

1 Approximately \$63 million of the Exploits five-year capital plan is associated with
2 heavy civil scopes. This includes the Goodyear Dam replacement, which is
3 estimated to cost approximately \$48 million in 2021/2022.

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5 Capital programs, not relating to the construction of the Muskrat Falls Plant, are in
6 early stages of development. Items being investigated include long term
7 warehousing opportunities, operational site infrastructure and site remediation,
8 specialized tools and equipment.

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10 Please refer to PUB-Nalcor-139, Attachment 1 for Hydro's 2019 to 2024 production
11 organization capital budget project listings for Star Lake, Exploits and Paradise
12 River. Hydro included the approved 2019 capital amounts in addition to the
13 forecasted 2020 to 2024 capital plan. Hydro will submit the finalized forecast in its
14 2020 Capital Budget Application due to the Board on August 1, 2019.

1 The Exploits and Star Lake project plans are tied to the revenue stream, which
2 currently is based on the Power Purchase Agreement between Hydro and the
3 Newfoundland and Labrador Government.

Project Description	2019	2020	2021	2022	2023	2024	Total
Install Diesel Generator Fuel Meter - Star Lake	128.5						128.5
Procure Spare Generator Stator Heat Exchangers - Star Lake	110.0						110.0
Purchase Capital Tools - Star Lake	65.0						65.0
Replace Diesel Tank - Star Lake	150.0						150.0
Replace Mechanical Over Speed Switch - Star Lake	145.0						145.0
Replace Sump Pumps - Star Lake	82.0						82.0
Replace Vehicles - Star Lake	146.7						146.7
Unit Controls Modernization Assessment - Star Lake	40.0						40.0
Upgrade Powerhouse Equipment Door Safety Features - Star Lake	157.3						157.3
Upgrade Public Safety Around Dams and Waterway - Star Lake	250.0						250.0
In Service Failures - Star Lake		50.0					50.0
Install Sump Oil Detection System - Star Lake		60.0					60.0
Purchase Capital Tools - Star Lake		20.0					20.0
Replace Battery Charger - Star Lake		75.0					75.0
Replace Protection Devices and Metering Hardware - Star Lake		350.0					350.0
Replace Unit Oil Level Indications - Star Lake		150.0					150.0
In Service Failures - Star Lake			50.0				50.0
Purchase Capital Tools - Star Lake			20.0				20.0
Replace 5km Access Road Topping - Star Lake			500.0				500.0
Replace Bearing Water Filtration System - Star Lake			125.0				125.0
Replace Cooling Water Pumps - Star Lake			105.0				105.0
Replace Intake Bubbler System Compressor - Star Lake			80.0				80.0
Replace Intake Gate Control Hardware - Star Lake			350.0				350.0
Construct Multi-Purpose Room on Mezzanine Floor - Star Lake				315.1			315.1
In Service Failures - Star Lake				50.0			50.0
Penstock Condition Assessment - Star Lake				85.0			85.0
Purchase Capital Tools - Star Lake				20.0			20.0
Replace Alarm Annunciator and Operator Station - Star Lake				350.0			350.0
Replace Excitation Transformer - Star Lake				85.0			85.0
Unit Overhaul - Star Lake				175.0			175.0
Construct Helicopter Pad - Star Lake					93.9		93.9
Expand Site Accommodations - Star Lake					500.0		500.0
In Service Failures - Star Lake					50.0		50.0
Purchase Capital Tools - Star Lake					20.0		20.0
Replace Accommodations Septic System/ Domestic Water - Star Lake					220.0		220.0
Replace Plant PLC - Star Lake					350.0		350.0
In Service Failures - Star Lake						50.0	50.0
Purchase Capital Tools - Star Lake						20.0	20.0
Replace Governor Controls and Add Redundant Excitation - Star Lake						350.0	350.0
Total Star Lake	1,274.5	705.0	1,230.0	1,080.1	1,233.9	420.0	5,943.5

Project Description	2019	2020	2021	2022	2023	2024	Total
Bishop's Falls							
Carry Over 2019 Scope - Bishop's Falls	4,132.1						4,132.1
Spillway Gantry Crane Refurbishment - Year 1 of 2 (Engineering) - Bishop's Falls	94.3						94.3
Turbine Chamber Emergency Closure Gates (Engineering) - Bishop's Falls	381.7						381.7
Unit 1-7 Generator Control PLCs - Year 1 (Engineering) - Bishop's Falls	73.2						73.2
Wing Dam - Reinstate Rip Rap on Upstream Slope - Bishop's Falls	88.6						88.6
Spillway Gantry Crane Refurbishment - Year 2 of 2 (Construction) - Bishop's Falls		1,029.0					1,029.0
Forebay Inlet Gates Refurbishment and Dogging System - 2021/2022 - Bishop's Falls			200.0	750.0			950.0
Powerhouse Concrete Refurbishment - Bishop's Falls			934.0				934.0
Spillway Gate Refurbishment - 2020/2023 - Bishop's Falls			450.0	450.0	450.0		1,350.0
Unit 1-7 Exciter Refurbishment - 2020/2022 - Bishop's Falls			180.0	900.0			1,080.0
Units 1-7 Generator Control PLCs - Year 2 (Construction) - Bishop's Falls			711.7				711.7
Upgrades to Dewatering and Oil Separator System - Bishop's Falls			300.0				300.0
SCADA Improvements - Bishop's Falls					108.0		108.0
Turbine Chamber Emergency Closure Gates Year 2 of 5 - Bishop's Falls					1,793.7	2,544.5	4,338.2
Refurbish Forebay Intake Concrete Gravity Section - Bishop's Falls						500.0	500.0
Total Bishop's Falls	4,769.9	1,029.0	2,775.7	2,100.0	2,351.7	3,044.5	16,070.8
Goodyear's Dam							
Carry Over 2019 Scope - Goodyear's Dam	150.0						150.0
Dam Replacement - 2021/2022 - Goodyear's Dam			20,672.9	27,310.1			47,983.0
Total Goodyear's Dam	150.0	-	20,672.9	27,310.1	-	-	48,133.0
Grand Fall's							
Carry Over 2019 Scope - Grand Fall's	3,912.8						3,912.8
Generator Room Automation (PLC) Upgrade - Year 2 of 2 (Construction) - Grand Fall's	277.2						277.2
Inside and Outside Spill Gate Rebuild and Concrete Repairs - Year 1 of 3 (Design and Fabricate Stoplogs) - Grand Fall's	1,053.0	246.6	2,163.5				3,463.1
Intake Gate Hoist Rebuild & Hoist Cover Repair - Year 2 of 2 (Construction) - Grand Fall's	568.5						568.5
Unit 5-8 Basement Upgrade - Year 1 of 2 (Engineering) - Grand Fall's	124.1						124.1
Unit 5-8 Penstock Repairs and Concrete Rehab. - Year 2 of 2 (Construction) - Grand Fall's	1,271.7						1,271.7
Unit 5-8 Tailrace Upgrade - Year 1 of 2 (Engineering) - Grand Fall's	269.3						269.3
Upgrade Fire Detection System - Grand Fall's	253.5						253.5
Upgrade Public Safety Around Dams and Waterway - Year 1 of 2 - Grand Fall's	387.0	1,379.2					1,766.2
Intake 2 and 4 Improvements - 2020/2021 - Grand Fall's		283.0	1,415.0				1,698.0
Refurbish Converter Building and Reconfigure Breakers - 2021/2022 - Grand Fall's			225.0	800.0			1,025.0
Replace Fireline Piping - Grand Fall's			235.0				235.0
Replace Vehicles - Grand Fall's			450.0				450.0
Plant Dewatering and Oil Separation Improvements - Engineering - Grand Fall's					150.0		150.0
Refurbish/Replace Old Forebay Concrete Gravity Section, Gates, and Power Canal Embankment - Grand Fall's					900.0		900.0
Unit 5-8 Basement Upgrade - Year 2 of 2 (Construction) - Grand Fall's					714.3		714.3
Unit 5-8 Tailrace Upgrade - Year 2 of 2 (Construction) - Grand Fall's					1,802.8		1,802.8
Unit 4 Penstock and Draft Tube Inspection- Grand Fall's						200.0	200.0
Unit 5-8 Inspect Penstock - Grand Fall's						166.0	166.0
Unit 9 Perform Capital Level Condition Assessment - Unit, Penstock, Draft tube - Grand Fall's						450.0	450.0
Total Grand Fall's	8,117.1	1,908.8	4,488.5	800.0	3,567.1	816.0	19,697.5
Millertown							
Carry Over 2019 Scope - Millertown	113.7						113.7
Spillgate Refurbishment - Year 1 of 3 (Engineering and Stoplogs) - Millertown	1,535.0	1,235.0	2,027.0				4,797.0

Upgrade Public Safety Around Dams and Waterway (Millertown, Buchans, NT & ST) - Year 1 of 2 - Millertown	686.8	1,021.8					1,708.6
Millertown Dam - Condition Assessment of Submerged Gates - Millertown			195.0				195.0
Electrical Distribution & Control Upgrade - 2022/2023 - Millertown				506.9	1,375.1		1,882.0
Refurbish Submerged Gates- 2022/2024 - Millertown				304.0		1,400.0	1,704.0
Upgrade Accommodation -Millertown						300.0	300.0
Total Millertown	2,335.5	2,256.8	2,222.0	810.9	1,375.1	1,700.0	10,700.3
North/South Twin Dam							
Dam Refurbishment - 2022/2024 - North Twin Dam				417.0		3,000.0	3,417.0
Dam Refurbishment - 2022/2024- South Twin Dam				417.0		3,000.0	3,417.0
Total North/South Twin Dam	-	-	-	834.0	-	6,000.0	6,834.0
Total Exploits	15,372.5	5,194.6	30,159.1	31,855.0	7,293.9	11,560.5	101,435.6

Project Description	2019	2020	2021	2022	2023	2024	Total
Replace Drainage Pumps - Paradise River	43.8	343.2					387.0
Install Automated Fuel Monitoring System - Paradise River		385.7					385.7
Overhaul Unit - Paradise River			185.0				185.0
Penstocks Level II Condition Assessment - Paradise River			130.0				130.0
Resurface Access Road and Intake - Paradise River				961.1			961.1
Replace Condition Monitoring Equipment - Paradise River					450.0		450.0
Total Star Lake	43.8	728.9	315.0	961.1	450.0	-	2,498.8