Q. **Reference: Finance Evidence**

Please provide the data, calculations, reports and underlying Company assumptions that support the Company's ARO for 2010 to 2015 forecast. (Finance Evidence, Schedule I, page 2 of 11, line 31)

A. Please refer to NP-NLH-091 Attachment 1 for the continuity schedule from 2007 until 2015, calculations and underlying assumptions. Also, please refer to NP-NLH-91 Attachment 2 for the Holyrood decommissioning report.

Newfoundland and Labrador Hydro
Asset Retirement Obligation
($ 000s)

Asset Retirement Obligations

	Actuals							Forecast		Proposed		Proposed		Proposed	
	2007	2008	2009		2010		2011	2012		2013		2014		2015	
Asset Retirement Costs															
Opening							11,395	17,976		19,685		17,320		15,047	
Holyrood ARO Addition/Revision	-	-	-		11,395		5,567	3,753		(41)		-		-	
PCB ARO Addition/Revision	-	-	-		-		2,163	-		(44)		-		-	
Holyrood Depreciation	-	-	-		-		(1,149)	(1,980)		(2,218)		(2,213)		(2,213)	
PCB Depreciation	-	-	-		-		-	(64)		(62)		(60)		(60)	
Ending	-	-	-	Page 3	11,395	Page 3	17,976	19,685	Page 3	17,320	Page 3	15,047	Page 3	12,774	Page 3
Asset Retirement Obligation															
Opening					-		11,395	19,593		24,032		24,528		25,194	
Holyrood ARO Addition/Revision	-	-	-		11,395		5,567	3,753		(41)		-		-	
PCB ARO Addition/Revision	-	-	-		-		2,163	-		(44)		-		-	
Holyrood Accretion	-	-	-		-		468	648		776		804		834	
PCB Accretion	-	-	-		-		-	68		67		61		57	
ARO disposed	-	-	-		-		-	(30)		(262)		(199)		(199)	
Ending	-	-	-	Page 2	11,395	Page 2	19,593	24,032	Page 2	24,528	Page 2	25,194	Page 2	25,886	Page 2

Newfoundland and Labrador Hydro
Asset Retirement Obligation - Holyrood and PCB Breakdown
($ 000s)

			Breakdown			
			Holyrood		PCB's	Total	
31-Dec-10							
	Opening		-			-	
	Additions	Page 4	11,395,384			11,395,384	
	Accretion		-			-	
	Revision		-			-	
			11,395,384		-	11,395,384	To Page 1
31-Dec-11							
	Opening		11,395,384			11,395,384	
	Additions		-	Page 8	2,162,593	2,162,593	
	Accretion	Note 1	467,211		-	467,211	
	Revision	Page 5	5,567,518		-	5,567,518	
			17,430,113		2,162,593	19,592,706	To Page 1
31-Dec-12							
	Opening		17,430,113		2,162,593	19,592,706	
	Additions		-		-	-	
	Accretion	Note 1	647,824	Page 8	67,624	715,449	
	Revision	Page 6	3,752,846		-	3,752,846	
	Disposals		-		(30,000)	(30,000)	
			21,830,783		2,200,217	24,031,000	To Page 1
31-Dec-13							
	Opening		21,830,783		2,200,217	24,031,000	
	Additions		-		-	-	
	Accretion	Note 1	775,667	Page 10	67,441	843,108	
	Revision	Page 6	(41,267)		(43,479)	(84,746)	
	Disposals		-	Page 10	(261,850)	(261,850)	
			22,565,182		1,962,329	24,527,512	To Page 1
31-Dec-14							
	Opening		22,565,182		1,962,329	24,527,512	
	Additions		-		-	-	
	Accretion	Note 1	804,114	Page 10	61,362	865,476	
	Revision		-		-	-	
	Disposals		-	Page 10	(198,637)	(198,637)	
			23,369,296		1,825,054	25,194,351	To Page 1
31-Dec-15							
	Opening		23,369,296		1,825,054	25,194,351	
	Additions		-		-	-	
	Accretion	Note 1	833,632	Page 10	57,069	890,701	
	Revision		-		-	-	
	Disposals		-	Page 10	(198,637)	(198,637)	
			24,202,928		1,683,486	25,886,415	To Page 1

Note 1: Accretion Summary

	ARO Calculation Year			
	2010	2011	2012	TOTAL
	(Page 4)	(Page 5)	(Page 6)	
2011	467,211	-	-	467,211
2012	486,366	161,458	-	647,824
2013	506,307	166,140	103,219	775,667
2014	527,066	170,958	106,090	804,114
2015	548,676	175,916	109,040	833,632

a) ARO was originally calculated in 2010 but then revised in both 2011 and then again in 2012 when more information was obtained and further reviews completed.

Newfoundland and Labrador Hydro
Asset Retirement Costs - Holyrood and PCB Breakdown
($ 000s)

Asset Number	Description	Acc Cls	Start Depr	Life Mos	Cost	Acc Dep	Depreciation	NBV	Unit of Prop	Unit of Prop Description
2010										
Holyrood Total					11,395,384	-	-			
2010 Total					11,395,384 Page 1	-	-	11,395,384 Page 1		
2011										
Holyrood Total					16,962,902 Page 1	-1,149,000 Page 1	1,149,236			
PCB Total					2,162,593 Page 1	0	0			
2011 Total					19,125,495	-1,149,000	1,149,000	17,976,495 Page 1		
2012										
Holyrood Total					20,715,386 Page 1	-3,129,472 Page 1	1,980,236			
PCB Total					2,162,593 Page 1	-63,764 Page 1	63,764			
2012 Total					22,877,515	-3,193,236	2,044,000	19,684,279 Page 1		
2013										
Holyrood Total					20,674,386.00 Page 1	-5,348,081 Page 1	2,218,610			
PCB Total					2,119,114 Page 1	-126,000 Page 1	62,236			
2013 Total					22,793,500	-5,474,081	2,280,846	17,319,419 Page 1		
2014										
Holyrood Total					20,674,386 Page 1	-7,560,691 Page 1	2,212,610			
PCB Total					2,119,114 Page 1	-186,261 Page 1	60,261			
2014 Total					22,793,500	(7,746,952)	2,273,072	15,046,548 Page 1		
2015										
Holyrood Total					20,674,386 Page 1	-9,773,301 Page 1	2,212,610			
PCB Total					2,119,114 Page 1	-246,522 Page 1	60,261			
2015 Total					22,793,500	-10,019,823	2,272,871	12,773,677 Page 1		

The asset retirement costs are added to the carrying amount of the related long-lived asset by the same amount as the liability. The balance is then amortized on a straight line basis over the same remaining life of the associated asset. Holyrood will be depreciated from 2011 to 2020, when the asset will be fully depreciated, and the transformers containing Polychlorinated Biphenyls (PCBs) will be depreciated from 2011 to 2025 when all PCBs must be disposed.

Holyrood ARO - Dec 31, 2010

Discount Rate	4.10%

	2021	2022	2023	2024	2025	2026	2027	2028	2029
Original Cash Flows	1,000,000	4,000,000	4,000,000	1,000,000	2,000,000	2,000,000	3,500,000	1,500,000	1,500,000
PV Factor	0.6427	0.6174	0.5931	0.5698	0.5473	0.5258	0.5051	0.4852	0.4661
	642,750	2,469,740	2,372,469	569,757	1,094,634	1,051,522	1,767,688	727,743	699,081

Undiscounted cash flows	20,500,000
PV @ December 31, 2010	11,395,384
Accretion	467,211

	Opening	Accretion	Disposal	Ending
2011	11,395,384	467,211	-	11,862,595
2012	11,862,595	486,366	-	12,348,961
2013	12,348,961	506,307	-	12,855,269
2014	12,855,269	527,066	-	13,382,335
2015	13,382,335	548,676	-	13,931,010
2016	13,931,010	571,171	-	14,502,182
2017	14,502,182	594,589	-	15,096,771
2018	15,096,771	618,968	-	15,715,739
2019	15,715,739	644,345	-	16,360,084
2020	16,360,084	670,763	-	17,030,848
2021	17,030,848	698,265	(1,000,000)	16,729,112
2022	16,729,112	685,894	(4,000,000)	13,415,006
2023	13,415,006	550,015	(4,000,000)	9,965,021
2024	9,965,021	408,566	(1,000,000)	9,373,587
2025	9,373,587	384,317	(2,000,000)	7,757,904
2026	7,757,904	318,074	(2,000,000)	6,075,978
2027	6,075,978	249,115	(3,500,000)	2,825,093
2028	2,825,093	115,829	(1,500,000)	1,440,922
2029	1,440,922	59,078	(1,500,000)	0

Holyrood ARO - Dec 31, 2011 Revision

Old Discount Rate	4.10%
New Discount Rate	2.90%

	2021	2022	2023	2024	2025	2026	2027	2028	2029
Original Cash Flows	1,000,000	4,000,000	4,000,000	1,000,000	2,000,000	2,000,000	3,500,000	1,500,000	1,500,000
Revised Cash Flows	6,750,000	6,750,000	6,750,000	6,750,000					
	5,750,000	2,750,000	2,750,000	5,750,000	(2,000,000)	(2,000,000)	(3,500,000)	(1,500,000)	(1,500,000)
Relevant rate	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%
PV Factor	0.7514	0.7302	0.7096	0.6896	0.6702	0.6513	0.6329	0.6151	0.5978
	4,320,302	2,007,999	1,951,409	3,965,226	(1,340,339)	(1,302,565)	(2,215,246)	(922,635)	(896,633)

PV @ December 31, 2011	5,567,518

	Opening	Accretion	Disposal	Ending
2012	5,567,518	161,458	-	5,728,976
2013	5,728,976	166,140	-	5,895,116
2014	5,895,116	170,958	-	6,066,075
2015	6,066,075	175,916	-	6,241,991
2016	6,241,991	181,018	-	6,423,008
2017	6,423,008	186,267	-	6,609,276
2018	6,609,276	191,669	-	6,800,945
2019	6,800,945	197,227	-	6,998,172
2020	6,998,172	202,947	-	7,201,119
2021	7,201,119	208,832	(5,750,000)	1,659,952
2022	1,659,952	48,139	(2,750,000)	(1,041,910)
2023	(1,041,910)	(30,215)	(2,750,000)	(3,822,125)
2024	(3,822,125)	(110,842)	(5,750,000)	(9,682,967)
2025	(9,682,967)	(280,806)	2,000,000	(7,963,773)
2026	(7,963,773)	(230,949)	2,000,000	(6,194,722)
2027	(6,194,722)	(179,647)	3,500,000	(2,874,369)
2028	(2,874,369)	(83,357)	1,500,000	(1,457,726)
2029	(1,457,726)	(42,274)	1,500,000	0

Note 1: Per CICA 3110.19 - an increase in cash flows would be discounted at new rate

Holyrood ARO - Dec 31, 2011 Revision

Old Discount Rate	4.10%
New Discount Rate	2.78%

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
2011 Cash Flows	-	6,750,000	6,750,000	6,750,000	6,750,000	-	-	-	-	-
Revised Cash Flows	330,000	1,595,000	10,201,400	17,382,530	2,563,000					
	330,000	(5,155,000)	3,451,400	10,632,530	(4,187,000)	-	-	-	-	-
Relevant rate	2.78%	2.78%	2.78%	2.78%	2.78%	2.78%	2.78%	2.78%	2.78%	2.78%
PV Factor	0.8030	0.7812	0.7601	0.7395	0.7195	0.7001	0.6811	0.6627	0.6448	0.6273
	264,979	(4,027,292)	2,623,414	7,863,129	(3,012,651)	-	-	-	-	-

Undiscounted Revision	5,071,930
PV @ December 31, 2011	3,711,579

	Opening	Accretion	Disposal	Ending
2013	3,711,579	103,219	-	3,814,798
2014	3,814,798	106,090	-	3,920,887
2015	3,920,887	109,040	-	4,029,927
2016	4,029,927	112,072	-	4,141,999
2017	4,141,999	115,189	-	4,257,188
2018	4,257,188	118,392	-	4,375,581
2019	4,375,581	121,685	-	4,497,266
2020	4,497,266	125,069	(330,000)	4,292,335
2021	4,292,335	119,370	5,155,000	9,566,704
2022	9,566,704	266,050	(3,451,400)	6,381,354
2023	6,381,354	177,465	(10,632,530)	(4,073,710)
2024	(4,073,710)	(113,290)	4,187,000	(0)

Note 1: Per CICA 3110.19 - an increase in cash flows would be discounted at new rate

PCB Disposal Continuity

UNITS

	orig # units	Estimated PCB Units 75%	Disposal Allocation	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
XFMR Bushings																		
230 KV	120	90.0	9.9%	7.5	6.0	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	90.0
138 KV	66	49.5	5.4%	4.1	3.3	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	49.5
69/66/46 KV	171	128.3	14.0%	10.7	8.6	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.1	128.3
25 KV	59	44.3	4.8%	3.7	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	44.3
4.16-15 KV	226	169.5	18.6%	14.1	11.3	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	169.5
Breaker Bushings																		
230 KV	6	4.5	0.5%	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	4.5
138 KV	36	27.0	3.0%	2.2	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	27.0
69/66/46 KV	210	157.5	17.2%	13.1	10.5	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	157.5
25 KV	24	18.0	2.0%	1.5	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	18.0
4.16-15 KV	0	-	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PT's																		
230 KV	4	3.0	0.3%	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	3.0
138 KV	48	36.0	3.9%	3.0	2.4	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	36.0
69/66/46 KV	60	45.0	4.9%	3.7	3.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	45.0
25 KV	27	20.3	2.2%	1.7	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	20.3
4.16-15 KV	17	12.8	1.4%	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	12.8
CT's																		
230 KV	63	47.3	5.2%	3.9	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	47.3
138 KV	25	18.8	2.1%	1.6	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	18.8
69/66/46 KV	18	13.5	1.5%	1.1	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	13.5
25 KV	32	24.0	2.6%	2.0	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	24.0
4.16-15 KV	6	4.5	0.5%	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	4.5
Total	1218	913.5	100.0%	76.0	61.0	64.7	64.7	64.7	64.7	64.7	64.7	64.7	64.7	64.7	64.7	64.7	64.7	913.5

UNDISCOUNTED $ VALUES

	$ per unit	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
XFMR Bushings															
230 KV	$ 6,000	$ 44,926	$ 36,059	$ 38,251	$ 38,251	$ 38,251	$ 38,251	$ 38,251	$ 38,251	$ 38,251	$ 38,251	$ 38,251	$ 38,251	$ 38,251	$ 38,251
138 KV	$ 5,500	$ 22,650	$ 18,180	$ 19,285	$ 19,285	$ 19,285	$ 19,285	$ 19,285	$ 19,285	$ 19,285	$ 19,285	$ 19,285	$ 19,285	$ 19,285	$ 19,285
69/66/46 KV	$ 2,750	$ 29,342	$ 23,551	$ 24,983	$ 24,983	$ 24,983	$ 24,983	$ 24,983	$ 24,983	$ 24,983	$ 24,983	$ 24,983	$ 24,983	$ 24,983	$ 24,983
25 KV	$ 550	$ 2,025	$ 1,625	$ 1,724	$ 1,724	$ 1,724	$ 1,724	$ 1,724	$ 1,724	$ 1,724	$ 1,724	$ 1,724	$ 1,724	$ 1,724	$ 1,724
4.16-15 KV	$ 550	$ 7,756	$ 6,225	$ 6,604	$ 6,604	$ 6,604	$ 6,604	$ 6,604	$ 6,604	$ 6,604	$ 6,604	$ 6,604	$ 6,604	$ 6,604	$ 6,604
Breaker Bushings															
230 KV	$ 6,000	$ 2,246	$ 1,803	$ 1,913	$ 1,913	$ 1,913	$ 1,913	$ 1,913	$ 1,913	$ 1,913	$ 1,913	$ 1,913	$ 1,913	$ 1,913	$ 1,913
138 KV	$ 5,500	$ 12,355	$ 9,916	$ 10,519	$ 10,519	$ 10,519	$ 10,519	$ 10,519	$ 10,519	$ 10,519	$ 10,519	$ 10,519	$ 10,519	$ 10,519	$ 10,519
69/66/46 KV	$ 2,750	$ 36,034	$ 28,922	$ 30,681	$ 30,681	$ 30,681	$ 30,681	$ 30,681	$ 30,681	$ 30,681	$ 30,681	$ 30,681	$ 30,681	$ 30,681	$ 30,681
25 KV	$ 550	$ 824	$ 661	$ 701	$ 701	$ 701	$ 701	$ 701	$ 701	$ 701	$ 701	$ 701	$ 701	$ 701	$ 701
4.16-15 KV	$ 550	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
PT's															
230 KV	$ 6,000	$ 1,498	$ 1,202	$ 1,275	$ 1,275	$ 1,275	$ 1,275	$ 1,275	$ 1,275	$ 1,275	$ 1,275	$ 1,275	$ 1,275	$ 1,275	$ 1,275
138 KV	$ 5,500	$ 16,473	$ 13,222	$ 14,025	$ 14,025	$ 14,025	$ 14,025	$ 14,025	$ 14,025	$ 14,025	$ 14,025	$ 14,025	$ 14,025	$ 14,025	$ 14,025
69/66/46 KV	$ 2,750	$ 10,296	$ 8,264	$ 8,766	$ 8,766	$ 8,766	$ 8,766	$ 8,766	$ 8,766	$ 8,766	$ 8,766	$ 8,766	$ 8,766	$ 8,766	$ 8,766
25 KV	$ 550	$ 927	$ 744	$ 789	$ 789	$ 789	$ 789	$ 789	$ 789	$ 789	$ 789	$ 789	$ 789	$ 789	$ 789
4.16-15 KV	$ 550	$ 583	$ 468	$ 497	$ 497	$ 497	$ 497	$ 497	$ 497	$ 497	$ 497	$ 497	$ 497	$ 497	$ 497
CT's															
230 KV	$ 6,000	$ 23,586	$ 18,931	$ 20,082	$ 20,082	$ 20,082	$ 20,082	$ 20,082	$ 20,082	$ 20,082	$ 20,082	$ 20,082	$ 20,082	$ 20,082	$ 20,082
138 KV	$ 5,500	$ 8,580	$ 6,886	$ 7,305	$ 7,305	$ 7,305	$ 7,305	$ 7,305	$ 7,305	$ 7,305	$ 7,305	$ 7,305	$ 7,305	$ 7,305	$ 7,305
69/66/46 KV	$ 2,750	$ 3,089	$ 2,479	$ 2,630	$ 2,630	$ 2,630	$ 2,630	$ 2,630	$ 2,630	$ 2,630	$ 2,630	$ 2,630	$ 2,630	$ 2,630	$ 2,630
25 KV	$ 550	$ 1,098	$ 881	$ 935	$ 935	$ 935	$ 935	$ 935	$ 935	$ 935	$ 935	$ 935	$ 935	$ 935	$ 935
4.16-15 KV	$ 550	$ 206	$ 165	$ 175	$ 175	$ 175	$ 175	$ 175	$ 175	$ 175	$ 175	$ 175	$ 175	$ 175	$ 175
Total		$ 224,493	$ 180,185	$ 191,139	$ 191,139	$ 191,139	$ 191,139	$ 191,139	$ 191,139	$ 191,139	$ 191,139	$ 191,139	$ 191,139	$ 191,139	$ 191,139

DISCOUNTED $ VALUES

Discount rate	3.1270%																		
PV Factor		0.9697	0.9403	0.9118	0.8841	0.8573	0.8313	0.8061	0.7817	0.7580	0.7350	0.7127	0.6911	0.6701	0.6498				
PV		$ 217,686	$ 169,424	$ 174,274	$ 168,990	$ 163,866	$ 158,897	$ 154,079	$ 149,407	$ 144,877	$ 140,484	$ 136,224	$ 132,093	$ 128,088	$ 124,204				
Total		$ 2,162,593																	

Discount rate 3.127%

	Opening	Accretion	Disposal	Ending
2012	2,162,593	67,624	(224,493)	2,005,724
2013	2,005,724	62,719	(180,185)	1,888,258
2014	1,888,258	59,046	(191,139)	1,756,164
2015	1,756,164	54,915	(191,139)	1,619,940
2016	1,619,940	50,656	(191,139)	1,479,456
2017	1,479,456	46,263	(191,139)	1,334,580
2018	1,334,580	41,732	(191,139)	1,185,173
2019	1,185,173	37,060	(191,139)	1,031,094
2020	1,031,094	32,242	(191,139)	872,197
2021	872,197	27,274	(191,139)	708,331
2022	708,331	22,150	(191,139)	539,341
2023	539,341	16,865	(191,139)	365,067
2024	365,067	11,416	(191,139)	185,344
2025	185,344	5,796	(191,139)	0

PCB Disposal Continuity

UNITS

	# units	Estimated PCB Units 75%	Disposal Allocation	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
XFMR Bushings																	94.8
230 KV	117	87.8	9.8%	15.0	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	45.0
138 KV	66	49.5	5.5%	-	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	126.6
69/66/46 KV	168	126.0	14.1%	12.0	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	40.2
25 KV	59	44.3	4.9%	-	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	171.2
4.16-15 KV	226	169.5	18.9%	17.0	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	
Breaker Bushings																	4.1
230 KV	6	4.5	0.5%	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	20.5
138 KV	30	22.5	2.5%	-	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	151.1
69/66/46 KV	204	153.0	17.1%	12.0	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	16.4
25 KV	24	18.0	2.0%	-	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	-
4.16-15 KV	0	-	0.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	
PT's																	2.7
230 KV	4	3.0	0.3%	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	30.7
138 KV	45	33.8	3.8%	-	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	52.2
69/66/46 KV	56	42.0	4.7%	14.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	18.4
25 KV	27	20.3	2.3%	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	11.6
4.16-15 KV	17	12.8	1.4%	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
CT's																	49.0
230 KV	63	47.3	5.3%	6.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	20.1
138 KV	25	18.8	2.1%	3.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	14.3
69/66/46 KV	18	13.5	1.5%	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	21.8
25 KV	32	24.0	2.7%	-	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	4.1
4.16-15 KV	6	4.5	0.5%	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Total	1193	894.75	100.0%	81.0	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	67.8	

UNDISCOUNTED $ VALUES

	$ per unit	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
XFMR Bushings														
230 KV	$ 6,000	$ 90,000	$ 39,903	$ 39,903	$ 39,903	$ 39,903	$ 39,903	$ 39,903	$ 39,903	$ 39,903	$ 39,903	$ 39,903	$ 39,903	$ 39,903
138 KV	$ 5,500	$ -	$ 20,634	$ 20,634	$ 20,634	$ 20,634	$ 20,634	$ 20,634	$ 20,634	$ 20,634	$ 20,634	$ 20,634	$ 20,634	$ 20,634
69/66/46 KV	$ 2,750	$ 33,000	$ 26,261	$ 26,261	$ 26,261	$ 26,261	$ 26,261	$ 26,261	$ 26,261	$ 26,261	$ 26,261	$ 26,261	$ 26,261	$ 26,261
25 KV	$ 550	$ -	$ 1,845	$ 1,845	$ 1,845	$ 1,845	$ 1,845	$ 1,845	$ 1,845	$ 1,845	$ 1,845	$ 1,845	$ 1,845	$ 1,845
4.16-15 KV	$ 550	$ 9,350	$ 7,065	$ 7,065	$ 7,065	$ 7,065	$ 7,065	$ 7,065	$ 7,065	$ 7,065	$ 7,065	$ 7,065	$ 7,065	$ 7,065
Breaker Bushings														
230 KV	$ 6,000	$ -	$ 2,046	$ 2,046	$ 2,046	$ 2,046	$ 2,046	$ 2,046	$ 2,046	$ 2,046	$ 2,046	$ 2,046	$ 2,046	$ 2,046
138 KV	$ 5,500	$ -	$ 9,379	$ 9,379	$ 9,379	$ 9,379	$ 9,379	$ 9,379	$ 9,379	$ 9,379	$ 9,379	$ 9,379	$ 9,379	$ 9,379
69/66/46 KV	$ 2,750	$ 33,000	$ 31,888	$ 31,888	$ 31,888	$ 31,888	$ 31,888	$ 31,888	$ 31,888	$ 31,888	$ 31,888	$ 31,888	$ 31,888	$ 31,888
25 KV	$ 550	$ -	$ 750	$ 750	$ 750	$ 750	$ 750	$ 750	$ 750	$ 750	$ 750	$ 750	$ 750	$ 750
4.16-15 KV	$ 550	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
PT's														
230 KV	$ 6,000	$ -	$ 1,364	$ 1,364	$ 1,364	$ 1,364	$ 1,364	$ 1,364	$ 1,364	$ 1,364	$ 1,364	$ 1,364	$ 1,364	$ 1,364
138 KV	$ 5,500	$ -	$ 14,068	$ 14,068	$ 14,068	$ 14,068	$ 14,068	$ 14,068	$ 14,068	$ 14,068	$ 14,068	$ 14,068	$ 14,068	$ 14,068
69/66/46 KV	$ 2,750	$ 38,500	$ 8,754	$ 8,754	$ 8,754	$ 8,754	$ 8,754	$ 8,754	$ 8,754	$ 8,754	$ 8,754	$ 8,754	$ 8,754	$ 8,754
25 KV	$ 550	$ -	$ 844	$ 844	$ 844	$ 844	$ 844	$ 844	$ 844	$ 844	$ 844	$ 844	$ 844	$ 844
4.16-15 KV	$ 550	$ -	$ 531	$ 531	$ 531	$ 531	$ 531	$ 531	$ 531	$ 531	$ 531	$ 531	$ 531	$ 531
CT's														
230 KV	$ 6,000	$ 36,000	$ 21,486	$ 21,486	$ 21,486	$ 21,486	$ 21,486	$ 21,486	$ 21,486	$ 21,486	$ 21,486	$ 21,486	$ 21,486	$ 21,486
138 KV	$ 5,500	$ 16,500	$ 7,816	$ 7,816	$ 7,816	$ 7,816	$ 7,816	$ 7,816	$ 7,816	$ 7,816	$ 7,816	$ 7,816	$ 7,816	$ 7,816
69/66/46 KV	$ 2,750	$ 5,500	$ 2,814	$ 2,814	$ 2,814	$ 2,814	$ 2,814	$ 2,814	$ 2,814	$ 2,814	$ 2,814	$ 2,814	$ 2,814	$ 2,814
25 KV	$ 550	$ -	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000
4.16-15 KV	$ 550	$ -	$ 188	$ 188	$ 188	$ 188	$ 188	$ 188	$ 188	$ 188	$ 188	$ 188	$ 188	$ 188
Total		$ 261,850	$ 198,637	$ 198,637	$ 198,637	$ 198,637	$ 198,637	$ 198,637	$ 198,637	$ 198,637	$ 198,637	$ 198,637	$ 198,637	$ 198,637

DISCOUNTED $ VALUES

Discount rate	3.1270%												
PV Factor		0.9697	0.9403	0.9118	0.8841	0.8573	0.8313	0.8061	0.7817	0.7580	0.7350	0.7127	0.6911	0.6701
PV		$ 253,910	$ 186,774	$ 181,110	$ 175,619	$ 170,294	$ 165,130	$ 160,123	$ 155,268	$ 150,560	$ 145,995	$ 141,568	$ 137,275	$ 133,113
Total		$ 2,156,738												

Hydro
PCB ARO
31-Dec-12

Existing rate	3.127%
Current Rate	3.003%
Rate Used	3.127%

	Opening	Accretion	Disposal	Ending
2013	2,156,738	67,441	(261,850)	1,962,329
2014	1,962,329	61,362	(198,637)	1,825,054
2015	1,825,054	57,069	(198,637)	1,683,486
2016	1,683,486	52,643	(198,637)	1,537,492
2017	1,537,492	48,077	(198,637)	1,386,932
2018	1,386,932	43,369	(198,637)	1,231,664
2019	1,231,664	38,514	(198,637)	1,071,541
2020	1,071,541	33,507	(198,637)	906,411
2021	906,411	28,343	(198,637)	736,117
2022	736,117	23,018	(198,637)	560,498
2023	560,498	17,527	(198,637)	379,388
2024	379,388	11,863	(198,637)	192,614
2025	192,614	6,023	(198,637)	0

newfoundland labrador
hydro
a nalcor energy company

REPORT

Holyrood Thermal Generating Station
Decommissioning Study

Newfoundland and Labrador Hydro
500 Columbus Drive, P.O. Box 12800
St. John's, NL, A1B 0C9

April 16, 2013
133545705

Stantec

Table of Contents

1.0 Introduction

Newfoundland and Labrador Hydro (NLH) operates a three-unit, 490 MW (gross), thermal generating station at Holyrood, NL which supplies electricity to the Island's grid. However, with the planned implementation of the Muskrat Falls Generating Facility as part of the Lower Churchill Project, the electrical generation capability of the Holyrood Thermal Generating Station (HTGS) will no longer be required and selected portions of the station are to be decommissioned and demolished. Therefore, NLH retained the services of Stantec Consulting Ltd. (Stantec) to:

- Identify components of the station that will have to be decommissioned and demolished in light of current environmental regulatory requirements;
- Identify the station components that will be decommissioned and demolished as part of NLHs long term operational strategy; and
- Determine the associated decommissioning and demolition costs;

in support of NLH's General Rate Application to the Public Utilities Board (PUB).

1.1 BACKGROUND

The HTGS is located in the Town of Holyrood, approximately 50 kilometers south west of St. John's, on Conception Bay. The HTGS site is approximately 40 hectares in size and as shown on SK-001 in Appendix 1, it includes a: powerhouse that encompasses the three generation units (boilerhouse and turbines/generators), maintenance shops, a water treatment plant and administrative offices; two – 90 meter and one 110 meter concrete stacks; a waste water treatment system; two-cooling water intake pump houses; numerous ancillary buildings and structures including a guard house, chemical storage buildings, hydrogen storage building, materials storage warehouse, training building, gas turbine building and pipe shop; a switch yard, hazardous waste landfill, a 880,000 barrel tank farm and day tank; and a marine jetty and 2500 meter pipeline for offloading and transporting fuel to the tank farm and day tank.

The plant was constructed in two stages and in 1971 Units #1 and #2, each capable of generating 150 MW, were placed in service. In December 1979, Stage II, consisting of one generating unit (Unit #3) capable of producing 150 MW, was completed. The Unit #3 generator is capable of synchronous condenser operation to assist in grid voltage control during the off peak season.

In 1988 and 1989, Units #1 and #2 were modified to increase their output to 170 MW, bringing the total generating capacity of the station to 490 MW (gross). The plant has a firm net capacity of approximately three billion kilowatt-hours of electricity annually, which represents 37% of the Island's electricity needs.

While the HTGS has provided a significant portion of Newfoundland's electricity requirements, it has been, at times, a source of controversy and concern particularly related to air emissions and the environment. In response to these concerns and an evolving regulatory climate, NLH made process improvements and most notably decreased the allowable sulphur content in the fuel burned at the station, which successfully improved air emissions from the plant.

On December 17, 2012, the Government of Newfoundland and Labrador announced official sanction of the Muskrat Falls development. The Muskrat Falls development includes the 824 MW hydroelectric generating facility at Muskrat Falls, the 1,100 kilometer Labrador-Island Transmission Link, and the Maritime Link from the Island of Newfoundland to Nova Scotia. Once the Muskrat Falls development is brought into service, the HTGS will no longer be required to generate electricity. The HTGS will remain in a stand-by mode for a period of time and will then be used as a synchronous condensing (SC) facility for grid voltage control, utilizing components of the existing Unit #3 in SC mode, according to the following preliminary schedule:

- Present to 2017: full thermal plant operation.
- 2017 - 2020: standby thermal operation, Unit #3 in SC mode.
- 2020 - 2024: decommissioning of HTGS, Unit #3 in SC mode.

1.2 REPORT ORGANIZATION

This report presents a Class 4 opinion of probable cost (OPC) for the planned decommissioning and demolition of the HTGS, based on an operating scenario prescribed by NLH and provides background on the site, expected operations going forward, regulatory requirements, and costing assumptions and methodology.

Section 1 provides an introduction and a brief overview of the site as it exists today and a summary of expected operations at HTGS, as Muskrat Falls comes on line.

Section 2 provides a discussion of the environmental conditions at the site, including a brief overview of the existing environmental setting, the regulatory requirements for operations, and the environmental regulatory requirements that will dictate various aspects of the planned decommissioning and demolition.

Section 3 presents the general approach to the decommissioning and demolition of the HTGS, including the proposed long term operational plan for the station, key assumptions regarding which assets are to remain, and decommissioning and demolition specifics for the major components of the station. This section also includes a discussion regarding optimization of the overall approach to decommissioning and demolition.

Section 4 presents the OPC and the associated costing methodology, including assumptions and exclusions; and a five-year cash flow projection. In addition a discussion on estimated quantities of scrap metal that will be recovered during the demolition is also presented.

Section 5 presents a brief discussion on the overall project time line and decommissioning schedule.

The appendices provide supporting detail.

2.0 Environmental Conditions

This section presents the existing environmental conditions at the site, including a brief overview of environmental setting, operational regulatory requirements, and the environmental regulatory requirements that will dictate various aspects of the planned decommissioning and demolition, and in turn, the associated costs.

2.1 CURRENT ENVIRONMENTAL CONDITIONS

The HTGS has served as an operating power generation facility that has stored and burned Bunker 'C' fuel, with varying levels of sulphur, without emission control, for more than 40 years. Based on the length of operations, the type of operations and the regulatory environment at the time of construction and during the first 20 years of operations, the plant, site and surrounding environment have potential for the presence of a variety of contaminants including metals, petroleum hydrocarbons (PHCs), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and asbestos; and perhaps other compounds. Management programs are in place to address the potential for environmental contamination; however, these have evolved over the years of operation.

There have been some location specific soil contamination investigations on the site, associated with particular civil works requirements. Such investigations have included areas within the tank farm, in the area of the day tank, and the area of the waste water treatment plant; and have included removal or treatment of some soil contaminated with hydrocarbon and metals. Other civil works excavations, such as those for the sewage disposal system, have not identified any contamination of concern. There have not been site contamination investigations over the entire site, which is reasonable given that the HTGS is an operating site. The extent, significance and type of environmental impacts within the station boundaries will become better defined as analysis continues throughout the decommissioning process.

Based on a site visit and discussions with representatives from NLH, areas of potential environmental impact at the HTGS include:

- The tank farm south of the powerhouse.
- The former leach pit area between the north end of the powerhouse and the wastewater treatment equalization basins.
- The day tank area immediately adjacent to the north end of the powerhouse.
- The area immediately south of the powerhouse where the unit, and unit station service transformers are located.
- The yard east of the powerhouse where sludge and filtercake from the WWT plant is stored.

- The switchyard.

Within the plant there are a number of chemicals and materials that are will require careful management from an environmental protection perspective, to ensure they are properly handled, contained and/or disposed. These include, but are not limited to:

- Process chemicals for water and waste water treatment (caustic, acids, flocculants, etc.).
- Asbestos containing materials.
- Mercury containing devices.
- Ozone depleting substances.
- Radionuclide containing devices.
- PCBs.
- Painted surfaces potentially impacted with lead, PCBs or other compounds.
- Solvents, lubricants, oils, greases, hydraulic oils.
- Lead-acid batteries.
- Glycol.
- Bunker 'C' or diesel fuel.

It is noted that several large scale, off-site, human health risk assessments in 1999, 2004 and 2006; and examining environmental effects in 2009, have been completed. In general terms the human health risk assessments concluded that chronic adverse health effects were not expected as a result of operations. Similarly, the environmental effects monitoring concluded that effluent discharges to Conception Bay from the HTGS did not negatively impact the adjacent waters. The results of the next round of environmental effects monitoring is required to be submitted by June 2015.

However, it is anticipated that erosion, in relation to activities at HTGS, along the Conception Bay shoreline may have to be addressed.

2.2 OPERATIONAL REQUIREMENTS

The HTGS, including the powerhouse, wastewater treatment plant, hazardous waste landfill and associated works, currently operates under a *Certificate of Approval* (C of A) issued by the Newfoundland and Labrador Department of Environment and Conservation (NLDEC), pursuant to Section 83 of the provincial *Environmental Protection Act*.

The C of A identifies overall operational objectives as well as the specific monitoring requirements and environmental standards to which the facility must adhere during operations, but also includes requirements for decommissioning and restoration of the plant and site at the end of its useful operating life. The C of A references existing acts, regulations, policies and guidelines which must also be complied with including: the provincial *Environmental Protection Act* and the *Water Resources Act*; as well as the following:

Regulations:

- Air Pollution Control Regulations.
- Environmental Control Water and Sewage Regulations.
- Halocarbon Regulations.
- Storage and Handling of Gasoline and Associated Products Regulations.
- Used Oil Control Regulations.
- Storage of PCB Wastes Regulations.

Guidance Documents:

- Sampling of Water and Wastewater – Industrial Effluent Applications.
- Ambient Air Monitoring.
- Compliance Determination.
- Stack Emission Testing.
- Plume Dispersion Modelling.

In addition, the federal *Fisheries Act* applies to operations at the HTGS; as does the Transport Canada's *Consolidated Transportation of Dangerous Goods Regulations Including Amendment* under the *Transportation of Dangerous Goods Act*, which applies in Newfoundland and Labrador by virtue of a federal-provincial agreement.

2.3 REGULATORY REQUIREMENTS OF DECOMMISSIONING

Based on a review of environmental statutes in the province of Newfoundland and Labrador, there does not appear to be a single or all-encompassing piece of legislation or a single policy that addresses decommissioning and demolition from an environmental protection perspective, with the exception of the fuel oil storage tanks, dykes and pipeline which are required to be demolished. Rather, owners and operators of facilities to be decommissioned and demolished must consider a number of Acts, Regulations and Guidelines at both the federal and provincial levels, including, in particular, the requirements stipulated in their C of A, and they must consult with the appropriate regulatory officials and complete the subsequent decommissioning and demolition work accordingly.

The documents listed below are expected to be generally applicable to decommissioning and demolition at the HTGS. The name of the guiding document is provided in *italics* and is followed by a brief description of the document or the relevant/applicable sections.

- *National Guidelines for Decommissioning Industrial Sites (1991), Canadian Ministers of Environment (CCME).*

  This document presents a logical phased process for assessing and remediating industrial lands to allow other uses and manage environmental concerns at a site. There are no specific directives within, but rather general guidelines "that a site be remediated to a level which will provide long-term environmental protection and will be safe for its intended future use".

- *Environmental Codes of Practice for Steam Electric Power Generation – Decommissioning Phase (EPS 1/PG/6) (1992), Environment Canada.*

  This document is similar in nature to the Decommissioning Guidelines noted above, but is specific to the power generation industry. The Code, like the Guideline, is not a regulation and does not remove any obligation to be compliant with existing regulations. The Code of Practice provides general guidance for the planning, investigation and remediation of electric power generating sites; specific clean-up standards are not included.

- *Environmental Protection Act (SNL – 2002 c E-14.2).*

  - *Certificate of Approval to Operate for the HTGS - AA11-085563.*

    Appendix A – Part 16 requires compliance with the *Storage and Handling of Gasoline and Associated Products Regulations 58/03* which in Section 25.(3) mandates that the owner of a storage tank system to, within 30 days of abandonment, empty the system of all liquids and vapours and dismantle and remove or dispose of the tank system including the dyke and remove the impacted material to the satisfaction of the Department of Environment and Conservation.

    Appendix A - Part 21 requires that a plan to restore areas disturbed by the operation be submitted to the Department of Environment and Conservation ten months before closure.

    Appendix A – Part 45 requires that the hazardous waste landfill be operated in accordance with the Landfill Operations Manual, which specifies (Sections 10 and 11) landfill closure requirements including the preparation of a closure plan, installation of an engineered cover at the time of site closure, and post closure care including leachate monitoring, until leachate quality approaches background groundwater/surface water quality.

Appendix A – Part 55 requires groundwater monitoring at the hazardous waste landfill for a period of 25 years following closure of the landfill.

Appendix B – Provides general objectives for site decommissioning and elements to be included in the decommissioning and restoration plan. Specific clean-up criteria are not provided, but it is noted that a phased environmental investigation to identify the type, extent and degree of impacts at the site is to be undertaken, and the site is to be restored to a condition acceptable to the Department of Environment and Conservation.

- *Environmental Assessment Regulations 54/03.*

  This regulation, per Section 34.(1) and 26., requires that the decommissioning of an electric power generating facility be registered as an undertaking.

- *Storage and Handling of Gasoline and Associated Products Regulations 58/03*.

  Section 25.(3) of the regulation mandates cleaning and dismantling and disposal of the an above ground petroleum storage tank system, as described above.

- *Halocarbon Regulations 41/05.*

  Per sections 7, 22 and 27, this regulation requires the proper handling and disposal of air conditioning, refrigeration or fire extinguishing equipment before decommissioning activities occur and that refrigerants and halons be removed from air conditioning/ refrigeration equipment or fire extinguishing systems that have not been or will not be operated for a period of more than eight months.

- *Guidance Document for the Management of Impacted Sites V-1.01, 2005, Government of Newfoundland and Labrador, Department of Environment and Conservation* and the *Atlantic RBCA (Risk Based Corrective Action) for Petroleum Impacted Sites in Atlantic Canada, Version 3, July 2012*.

  These two documents provide guidance with respect to management and remediation of impacted (petroleum hydrocarbons and other contaminants) sites in NL. The *Management of Impacted Sites* document stipulates that impacted sites may be closed through adherence to a site management process which includes investigation, remediation and application of pre-established clean-up criteria or through the development of site specific criteria or the implementation of risk management techniques in relation to the management and remediation of impacted sites.

  The *RBCA* document provides further detailed technical guidance, as well as specific clean-up targets and protocols to establish site specific clean-up criteria. RBCA generally addresses petroleum hydrocarbon compounds only, unless the Site Professional can demonstrate to the regulator that "…applicable fate and transport equations and Canadian toxicological data sources are used in the risk assessment."

Adherence to these two guiding documents throughout the decommissioning phase at HTGS will be strictly required.

- *Water Resources Act, Chapter W-4.01;*

  Section 18 of the Act requires the holder of a Water Use License, which is issued under the *Act*, to apply for an amendment to that license should the water requirements change.

  It is anticipated that water use requirements at HTGS will decrease at the end of standby thermal operations and this may require NLH to seek an amendment to the terms of their Water Use License.

  It is also noted that the operational requirements of the dam and the fish passageway on Quarry Brook may also change with changes in water use requirements. Any such changes in the operations of the dam and fish passageway will have to be addressed during decommissioning.

  Section 44, requires the owner/operator of a dam to maintain it in good repair and inspect and report to the Minister on the condition of the dam.

- *Asbestos Abatement Regulation (111/98) under the Occupational Health and Safety Act.*

  This regulation prescribes detailed procedures for the safe removal of asbestos and is not repeated herein.

- *Asbestos Waste Disposal Policy(PPD-93-03)*

  This policy requires that asbestos waste be carefully managed such that it does not represent a human health hazard and in particular, Section 5 requires that asbestos waste be considered as special waste and, among other things, be landfilled in a special/hazardous waste area of an approved disposal site.

- *PCB Regulations SOR/2008-273 under the Canadian Environmental Protection Act.*

  This federal regulation dictates the management, storage and disposal of PCBs. Highlights of the regulation relating to decommissioning and demolition are noted:

  - Section 5.(1) (a) prohibits the release of PCBs in the environment in concentrations above 2 mg/kg.

  - Section 6.(b) prohibits the sale of a product containing PCBs in a concentration of 50 mg/kg or greater.

  - Section 19 stipulates that the owner of PCBs shall, within 30 days after they are no longer used, either send them for destruction or for storage at a PCB storage site.

- *Federal Fisheries Act (R.S.C., 1985, C. F-14)*

  This act, per Section 35(1) prohibits the harmful alteration, disruption or destruction (HADD) of fish habitat unless it is authorized. Therefore, if decommissioning or demolition of the HTGS extended into Conception Bay or Quarry Brook, then a HADD Authorization under Section 35(2) would be required.

A preliminary review of the new *Canadian Environmental Assessment Act* was completed and it was determined that the decommissioning and demolition of the HTGS may not trigger a registration requirement under the revised act. This will have to be confirmed.

This overview of the anticipated environmental regulatory requirements was developed based on a review of existing legislation and discussions with NLH. Input from representatives from the federal and provincial departments of Environment/Environment and Conservation, respectively, was not obtained given the preliminary nature of the decommission planning. Input from regulators will be required as the planning proceeds to ensure compliance and that all environmental issues are addressed in an appropriate manner.

3.0 Decommissioning and Demolition Plan

Section 3 presents the general approach to the decommissioning and demolition of the HTGS, including the proposed long term operational plan for the station, key assumptions regarding which assets are to remain, and decommissioning and demolition specifics for the major components of the station. This section also includes a discussion regarding optimization of the overall approach to decommissioning and demolition.

3.1 OPERATIONAL OBJECTIVES

In order to develop a decommissioning and demolition plan and to prepare an OPC, assumptions regarding the long term operational vision for the HTGS, including ownership, operational capabilities, asset retention, etc. were established, based on discussions with representatives of NLH and the HTGS.

From an operational perspective, it is assumed that:

- NLH will retain ownership of the property in the long term and it will remain as an industrial site.
- The thermal generating capability of the station will be eliminated.
- Unit #3 synchronous condensing operations will continue.
- A 50 MW gas turbine will be installed and operated for peak loading.
- The site may serve as Eastern TRO “Regional Operations Centre”.

3.2 DECOMISSIONING AND DEMOLITION

In order to meet the operational objectives defined above, the buildings, assets, equipment and infrastructure required to support SC and future operations; and those that will no longer be necessary, were identified at a conceptual level, based on input from NLH and Station staff, referencing the detailed HTGS ‘Asset List’ provided in Appendix 2.

The Asset List identifies all assets within the station, and for the purposes of this study and for the development of the OPC, the Asset List numbering system was cross-referenced with an agreed upon work breakdown structure (WBS), which was used in an earlier iteration of a decommissioning and demolition OPC for the HTGS. The proposed WBS is commonly used in the utility industry and is routinely used for asset management as it provides a readily recognizable format to group assets at a large facility.

For convenience, the buildings and site infrastructure that is to remain, and that which is to be decommissioned/demolished is also identified on SK-001, 002, 003 and SK-5001.

It is assumed that NLH will decommission and demolish the selected components of the HTGS in a safe and cost effective manner, in compliance with applicable environmental requirements, while maximizing opportunities for the recovery and recycling of scrap metals. Based on a review of the asset list with NLH, and in consideration of the age of the assets, and their specialized applications within the HTGS, it was agreed that re-use of the equipment would not be likely.

Conceptually, it is envisioned that the decommissioning and demolition will be completed in three major phases including: planning, pre-decommissioning preparation, and demolition.

Phase 1 - Planning will include: registration of the project with the NLDEC, initiation of the environmental site assessment, completion of any required hazardous materials audits; and engineering.

Phase 2 - Pre-decommissioning will include those tasks that can be completed by Plant staff such as: de-energization of equipment, removal of fluids from equipment and modification of common services that would be affected by demolition and are required in the longer term to support future ongoing operations.

Phase 3 - Decommissioning will include: mobilization to site by the contractor, removal and abatement of hazardous materials, industrial cleaning, demolition, environmental remediation, landfill closure and final grading of the site.

Based on discussions with NLH, the following general assumptions are of particular note:

- Selective decommissioning and demolition will be undertaken within the powerhouse such that the turbine hall, lab, administrative offices, maintenance and water treatment areas remain intact.
- The existing 880,000 barrel tank farm (including the day tank), and associated marine jetty and pipeline, will no longer be required and it is assumed, from an operational perspective and for the purpose of this evaluation, that they will be decommissioned and demolished.
- The existing hazardous waste containment landfill will no longer be required upon cessation of thermal generation at Holyrood, however it will serve an important function during the decommissioning process as it is expected that it will be suitable for the disposal of some of the wastes generated during that process.
- The Wastewater Treatment Plant and Equalization Basins will no longer be required upon cessation of thermal generation however they will be relied upon to provide treatment of the wastewater generated during the decommissioning.
- The dam at Quarry Brook and the environmental monitoring and meteorological monitoring stations will remain.

The decommissioning and demolition plan presented in the following sections, correspond to the divisions of the WBS:

3.2.1 WBS Task 100 - Site and Environment

The decommissioning and demolition activities pertaining to the "site" will take place primarily in Phase 3 and include; removal of sub-grade site services such as piping, vacuum pits, oil water separators and manholes, closure of the landfill, overall site grading and landscaping. In particular:

- Sub-surface infrastructure related to pumphouse #1 cooling water will be decommissioned and demolished.
- Sub-surface infrastructure related to domestic water supply, water for fire protection, domestic wastewater treatment and cooling water supply from pumphouse #1 will be retained.
- It is assumed that piping larger than 300 millimeters in diameter will be excavated and removed, whereas smaller bore pipe will be capped in place.
- The hazardous waste landfill will be closed in accordance with the C of A which requires an engineered low permeability cap.

The decommissioning and demolition tasks pertaining to the 'environment' will take place throughout all three phases of the project and include: assessment, remediation and compliance activities. Site assessment can begin in Phase 1 and will include extensive intrusive investigations, boreholes, test pitting, soil sampling, groundwater monitoring, and laboratory analysis to determine the physical extent, nature and degree of contamination at the station in order to develop a remedial action plan. Depending on accessibility, site assessment activities could continue through to Phase 3.

This task will also include the registration of the decommissioning and demolition project per the provincial EIA Regulation. This will involve the preparation of a project registration document describing the decommissioning and demolition project and the expected environmental impacts. At present it is assumed that registration under the federal Canadian Environmental Assessment Act may not be required, but consultation with Environment Canada will be necessary to confirm this assumption.

Finally, remediation of the site is included in this WBS Task and it encompasses all activities to bring the HTGS site into compliance with environmental legislation. Site remediation may include: removal of petroleum hydrocarbon and metal impacted soils and on-site treatment of impacted soil and groundwater.

Activities related to removal of asbestos, PCB impacted oils, fly ash/boiler ash, industrial cleaning, chemical removal etc. are not included in WBS Task 100, but are assigned to the appropriate WBS division based on where the removal, clean-up or abatement activity occurs.

For example, removal of the asbestos from the boilers is included in WBS Task 300 – Boilers and Auxiliaries; removal of Galbestos siding from the powerhouse is included in WBS Task 200 – Buildings and Structures; and removal and management of PCB impacted oil in the transformers is included in WBS Task 500 – Electrical.

3.2.2 WBS Task 200 - Buildings and Structures

Decommissioning and demolition of the buildings and structures will take place in all three phases of the project, as it is assumed, for the purposes of this study, that some preparatory decommissioning activities such as clean up and chemical removal can be initiated in Phases 1 and 2, but most of the required industrial cleaning and hazardous material removal (i.e. asbestos abatement) this work will be completed in Phase 3, prior to demolition. In particular:

- The buildings that supported thermal generation operations – such as the new guard house, chemical storage building, hydrogen storage building, pipe shop, meter shop, training building, and Shawmount warehouse will be retained.
- Pumphouse # 2 will be retained to provide cooling water for the Unit #3 generator.
- Pumphouse # 1, which services Units #1 and #2 will be partially decommissioned, such that the fire pumps and domestic water pumps are operable.
- The boiler area of the powerhouse building will be decommissioned and demolished as shown on SK-002. The turbine hall, lab, administrative offices, maintenance and water treatment areas will remain.
- Removal of the Galbestos siding on the powerhouse as well as any asbestos containing material, dust or debris remaining on equipment or in cable trays, will require special handling and disposal procedures to ensure worker and environmental health and safety.
- It is assumed that the roof of the powerhouse contains asbestos and will require special handling and disposal procedures to ensure worker and environmental health and safety.
- It is assumed that the building and equipment foundations will be demolished to one metre below grade and the resulting concrete will be pulverized to 150 millimeters minus for rebar recovery and ease of handling.
- It is assumed that the jetty, wharf (including the dynamic fenders) and walkways will be demolished and that the piles supporting the wharf and jetty will also be demolished and removed.
- The massive concrete pedestals supporting the turbine/generators will be demolished and removed.

- Structural modifications may be required and exterior walls and cladding will have to be constructed where demolition of exterior walls of the boiler house has occurred. This construction work is included in WBS Task 800 – Construction.

3.2.3 WBS Task 300 - Boilers and Auxiliaries

The decommissioning and demolition activities pertaining to the boilers and auxiliaries will occur predominantly in Phase 3, but some cleaning and fly ash/boiler ash removal may take place in Phase 2. In addition, decommissioning and demolition of the boilers and auxiliaries will take place prior to demolition of the boilerhouse and as previously noted they will be demolished with a view to maximizing the recovery of scrap metal for sale. In particular,

- Abatement of asbestos in the boiler buckstays and any other affected areas as identified in the asbestos management plan will be completed prior to demolition of the boiler.

- All three boilers and their auxiliary components will be decommissioned and demolished. This includes, but is not limited to, the following:

    - Water walls, burners, steam drum, burner fronts, super heaters, re-heaters, economizers, soot blowers and ash pits,

    - All main steam piping and condensate piping,

    - LP and HP heaters, deaerators, deaerator storage tank, blowdown tanks and feedwater pumps,

    - Fuel oil system components including heaters, pumps heat exchangers and piping,

    - Air and gas components such as FD fans, ductwork, wind box, Lungstrom air heaters, steam coil air heaters, and

    - Flue gas components such as the boiler outlet ductwork and stacks. (It is anticipated that the stacks will be imploded.)

3.2.4 WBS Task 400 - Turbines, Generators and Auxiliaries

Decommissioning and demolition activities pertaining to the turbine/generators and auxiliaries will occur predominantly in Phase 3 and like the boilers, their decommissioning and demolition will take place prior to demolition of the boilerhouse and they will be demolished with a view to maximizing the recovery of scrap metal for sale. In particular,

- Turbine/generators and auxiliaries associated with Units #1 and #2 will be decommissioned and demolished.

- The turbine and auxiliaries associated with Unit #3 will be decommissioned and demolished.

- The generator associated with Unit #3 will be retained.
- The lube oil and seal oil systems and condensing and cooling systems associated with Units #1 and #2 will be decommissioned and removed.
- The 15 MW gas turbine, including the generator, the turbine and the clutch, the inlet air filter and the exhaust system, will be removed.

3.2.5 WBS Task 500 - Electrical

Electrical system decommissioning and demolition will include all components not required to support Unit #3 SC operations, and for the purposes of this study, it is assumed that selected electrical equipment associated with Units #1 and #2 can be safely isolated and removed while allowing SC operations to continue uninterrupted. Further study and engineering evaluation will be required to determine if this is feasible and how it will best be achieved.

The scope of electrical removals is identified on Drawing SK-5001 which is provided in Appendix 1 and it is anticipated that, subject to in-depth verification, the systems identified in red will be removed while those identified in black will remain operational.

Decommissioning and demolition of the electrical system will occur predominantly in Phase 3 and like the other equipment within the station, it will be undertaken to maximize the recovery of scrap metal for sale. The following items, in relation to the electrical demolition are of note:

- The switchyard will remain in use and will not be affected by the decommissioning activities, other than the tie-in points associated with the Unit #1 and Unit #2 outputs. This will be further refined as NLH moves to the actual decommissioning and demolition of the plant.
- Electrical decommissioning and demolition for Unit #1 and #2 will include:
    - Unit generator and associated hydrogen cooling, excitation, CO_2 purging system, protection and control systems.
    - Unit output including isolated phase bus, ground cubicle, output transformer, unit station service transformer, overhead lines to the switchyard and support structures, and associated protection and control systems.
    - Unit electrical boilerhouse and turbine hall services including: motor control centers and feeders to unit pumps, control systems cabinets and associated control room stations, miscellaneous loads and associated control systems, unit Class I and Class II distribution systems including 125VDC and 480VDC battery banks, battery chargers, UPS, distribution panels and branch circuit wiring, distribution transformers, panel boards and branch circuit for heating, lighting and miscellaneous loads.

- Electrical decommissioning and demolition for Unit #3 will be selective as it will remain and continue to function in SC mode. Decommissioning will include:
    - Unit electrical boilerhouse and turbine hall services including: motor control centers and feeders to unit pumps, miscellaneous loads and associated control systems.
    - Unit boilerhouse building electrical services including: distribution transformers, panel boards and branch circuit for heating, lighting and miscellaneous loads.
    - Selective unit control systems.
- Electrical removals associated with the existing 15 MW gas turbine (GT) will include:
    - GT output and associated transformer, unit excitation, protection and control systems.
    - GT Class I distribution systems including 125VDC battery banks, battery chargers, distribution panels and branch circuit wiring.
    - GT building electrical services including distribution transformers, panelboards and branch circuit for heating, lighting and miscellaneous loads, control systems cabinets and associated control room stations.
- Electrical decommissioning and demolition in ancillary facilities will include:
    - Electrical services associated with the water treatment plant and maintenance shops within the powerhouse, the marine jetty, pipeline and tank farm, the stacks (including the ID fans) and the waste water treatment plant.
- Electrical decommissioning and demolition relative to pumphouse #1 will be selective, because the building will remain in use for fire and domestic water pumping functions.
- Electrical services for pumphouse # 2 will be retained.

Optimization of electrical services and equipment or control system architecture and cabinets was not considered in this study, but should be undertaken as the decommissioning planning proceeds and station requirements are better defined.

The decommissioning and demolition of the electrical system will require pre-planning, not just to optimize remaining services and ensure worker and operational safety but also because it will generate a number of materials that will require the implementation of special handling and disposal procedures. In particular, there are seven known unit, unit station service and exciter transformers that at one time contained PCBs, to be decommissioned.

It is also assumed that the plastic sheathing on some older cables may contain PCBs above 50 ppm. The quantification and appropriate management of these cables will be addressed prior to demolition.

For the purposes of this study, it is assumed that the residual concentration of PCBs in the transformer oil is greater than 2 parts per million, and will require de-chlorination. It is noted that the process of de-chlorination, in the transformers containing the PCB impacted oil, will yield 'decontaminated' transformers, which will then be available as scrap metal.

Based on our site visit and discussions with HTGS staff, the following hazardous substances will be generated through demolition of the electrical system:

- PCB impacted transformer oil ~ 123,000 litres.
- Sulfuric acid in battery banks ~ 4,100 litres.
- Lead in battery banks ~ 9,100 kilograms.
- Mercury in level and temperature switches ~ 10 kilograms.
- PCBs in fluorescent and HID lighting fixture ~ 150 kilograms.
- Radionuclide materials in fire alarm and smoke detectors ~ 10 kilograms.

For the purposes of this study, decommissioning and demolition of items related to Instrumentation and Controls, is included in Task 500. Typically, Instrumentation and Controls is assigned to Task 600 in the WBS.

3.2.6 WBS Task 600 - Controls and Instrumentation

All of the decommissioning activities and costs associated with controls and instrumentation for the project have been taken into account in Task 500 – Electrical.

3.2.7 WBS Task 700 - Common Services

The common services that will be decommissioned and demolished include:

- The raw water treatment equipment, tanks and piping.
- Waste water treatment equipment - oil/water separators and equalization basins, tanks, pipes, filter press, etc.
- Cooling water equipment not required for Unit #3 SC operations.
- The various components of the heavy fuel oil system – including the four above ground Bunker "C" fuel storage tanks, the day tank and the pipeline between the marine jetty and day tank on the north side of the powerhouse.

The common services will be decommissioned and demolished in Phase 3, but cleaning of the above ground fuel storage tanks and pipeline, may take place in Phase 2. It is anticipated that the waste water treatment system will play an important part in the decommissioning of the powerhouse and the boilers and other pieces of equipment as it will be able to treat waste water generated during cleaning activities.

Many of the common services inside the boiler house may need to be reconfigured or relocated once partial demolition occurs, in order to serve the remaining areas of the plant. A detailed evaluation of these common services is outside the scope of this study but will eventually need to be completed. Affected common services include: fire protection, service air, instrument air, HVAC, cooling water, domestic water etc. Section 3.3 provides additional discussion in regards to the optimization of the boiler house demolition.

Other items to note with respect to the decommissioning and demolition of common services include:

- The light fuel oil tanks adjacent to the tank farm will remain.
- The existing crane within the powerhouse will remain.
- The lab equipment, water treatment equipment, and maintenance shop equipment within the powerhouse building, will be decommissioned and demolished.

3.2.8 WBS Task 800 – Construction

Some construction will be required during demolition as a considerable portion of the existing powerhouse structure will be retained for future operations. Construction will include structural modifications and installation of cladding at the powerhouse and the pumphouse # 1, as well relocation of electrical and mechanical systems and sub-surface water and sanitary connections.

3.3 OPTIMIZATION OF DECOMMISSIONING AND DEMOLITION

3.3.1 Selective Demolition

The long term operational mode for the HTGS and selective decommissioning and demolition was established as a result of discussions with NLH and is referred to as the “base case” within this study. The final scope of decommissioning and demolition and the project timelines will continue to be refined, as project planning proceeds and NLH moves closer to the actual demolition phase.

For example, selective demolition of the boilerhouse area of the powerhouse is the agreed upon approach, but it is known that the boilerhouse, turbine hall and office area were all constructed as an integral complex. Selectively demolishing and removing only the boilerhouse will result in additional demolition costs due to the care and attention required to remove only certain parts of the building and equipment without damaging the sections that are to remain occupied and

operational. Furthermore, it is expected that additional planning, engineering, coordination and safety measures would also be required for this selective demolition approach.

Some of the items to be reviewed within the context of 'optimization' are discussed in the following sections.

3.3.2 Structural and Architectural

- The structural integrity of the remaining buildings would need to be extensively reviewed. As noted above, the power house was designed as a complex, therefore the turbine hall structure and the administration building structure may need to be reinforced or modified to accommodate a new configuration.
- A new exterior wall girt and cladding system would need to be installed on the north wall of the turbine hall to enclose the building.
- Part of the administration building wall system would need to be reviewed and/or modified as part of it will become an exterior wall as opposed to an interior wall.
- A code review would be required for egress and fire protection requirements.

3.3.3 Mechanical

All of the mechanical systems would need to be reviewed as some or all may require modification once the boilerhouse is demolished. Systems to consider would include, but not be limited to:

- Fire protection system.
- HVAC systems.
- Compressed air systems (service/instrument).
- Cooling water, service water and sanitary systems.
- Hydrogen and CO_2 supply to the Unit #3 generator.

3.3.4 Electrical

Many, if not all, of the electrical systems could be impacted by the demolition of the boilerhouse and will need to be reviewed and possibly modified. Systems to consider in an optimization study would include, but not be limited to:

- Power distribution.
- Lighting, instrumentation and controls.

- Communications, fire alarm and detection systems.

3.3.5 Optimization of Demolition

Optimization of the approach to decommissioning and demolition; and rationalization of the remaining space and services, and any associated modifications and re-construction costs should be established through a detailed engineering assessment, once the requirements for a facility, functioning within the context of a Regional Operations Centre, are understood.

Optimization of the decommissioning and demolition could also examine the following alternatives:

- Abandoning the boilerhouse and equipment in place.
- Demolition of the office, stores and lab at the same time as the boiler house and constructing a smaller and more efficient administration building, suited to a reduced staffing level that would serve as a Regional Operations Centre.
- Same as above, except constructing new offices in the turbine hall in the area previously occupied by Units #1 and #2 turbines/condensers.

Based on our review of similar type large scale industrial decommissioning and demolition projects, it is evident that there are many different ways to execute, phase and tender this type of work. Given the magnitude of the costs associated with decommissioning and demolition, the potential for optimization will continue to be refined as NLH moves to the actual decommissioning and demolition phase of the project.

4.0 Opinion of Probable Cost

Section 4 presents the OPC of the planned decommissioning and demolition including the costing methodology, assumptions and exclusions, as well as a five-year cash flow projection. In addition, a discussion on estimated quantities of scrap metal that could reasonably be recovered during the demolition is provided.

Given the level of project maturity and engineering detail at the study outset, it was agreed that a preparation of a Class 4 OPC, as defined by AACE, would be appropriate as it is consistent with industry practice for projects at this stage of development. Class 4 estimates are prepared for a variety of purposes including: strategic planning, business development, confirmation of economic and/or technical feasibility, and preliminary budget approval, and when project engineering is between 1% and 15% complete. Typical accuracy ranges for a Class 4 OPC are from -15% to -30% on the low side, to +20% to +50% on the high side, depending on the technological complexity of the project.

Therefore, a Class 4 OPC for selective decommissioning and demolition at the HTGS was developed on the basis of proposed long term operational objectives and requirements identified by NLH and described in Section 3. The estimate is conservative and is not based on detailed asset or site evaluations, but rather is a conceptual estimate to assist NLH in financial planning. When the decommissioning scope and environmental conditions of the site become more clearly defined, and the requirements of the environmental regulators are known, the OPC may be further refined.

4.1 COSTING ASSUMPTIONS AND METHODOLOGIES

The OPC presented herein, is based upon:

- The selective decommissioning and demolition scope defined by NLH.
- The assumption that the boiler house and equipment can be selectively demolished in a safe and controlled manner.
- Current regulatory requirements and current (2012) dollars.
- The assumption that, because of the age of the plant, there will be no demand for the further use of any equipment, other than that being used for SC operations.
- The assumption that some potentially significant structural modifications and re-construction work will be required to close in portions of the boiler house and re-connect common services, affected by the selective demolition.
- Drawings provided by NLH.
- Information obtained from in house files for projects of similar scope and size.

- Costing information provided in RS Means/CostWorks (Means).
- Pricing provided by local contractors and local demolition contractors.

The decommissioning and demolition cost methodologies are briefly described below.

4.1.1 The Site and Environment

In order to develop the OPC for the site and environment task, the amount of final landscaping required to restore the site and the demolition requirements for sub-surface infrastructure were considered, as were costs associated with environmental assessment, remediation and compliance.

To determine landscaping and infrastructure demolition costs, site drawings were reviewed, areas to be restored identified and piping and infrastructure quantities estimated. Once these quantities were established, the OPC was developed based on the estimated manpower, equipment and time to complete the defined work.

It is noted that the most significant components in this particular task relate to the landfill closure, environmental assessment and site remediation. While the landfill closure OPC was based on the prescribed closure design in the C of A and current NL construction costs, the assessment and remediation OPC was based on our experience in completing a similar work scope at similarly sized industrial site. It is important to note that the remediation OPC is provided as an 'order of magnitude only', as intrusive site investigations to establish the type, extent and amount of contamination at the site have not been completed.

4.1.2 Buildings and Structures

The OPC for the decommissioning and demolition of buildings and structures was based on pricing provided by an experienced demolition contractor considering the size, height and construction materials of the buildings and structures. The OPC also reflects the fact that selective demolition is to take place in the powerhouse, which requires more care and attention, and in turn more time and cost, than if the entire structure was to be demolished.

The buildings and structures OPC includes the removal and disposal of asbestos containing materials (cladding and roofing of the powerhouse as well as dust and debris on cable trays and throughout the plant), at an approved facility. The OPC is based on estimated quantities generated from the review of building plans and profiles (for the cladding and roofing only) and current abatement and disposal pricing from two contractors.

The OPC also includes the removal of process and other chemicals, and industrial cleaning of the buildings and structures, based upon in-house pricing information for a project of similar scope and size.

4.1.3 Boilers, Turbines, Generators and Auxiliaries

The OPC for the decommissioning and demolition of boilers, turbines, generators and auxiliaries was based on pricing provided by an experienced demolition contractor considering the accessibility and weight of the various components. The OPC also reflects the fact that some selective demolition of equipment, which is more costly, will be required to support planned SC operations.

Also included in the OPC is stack demolition, which is an average of pricing provided by two demolition contractors, to implode the three stacks.

The cost of removing process and other chemicals, industrial cleaning, asbestos abatement and the disposing of dust and boiler/fly ash was also included, based upon in-house pricing information for a project of similar scope and size and on the assumption that the boiler ash and fly ash could be disposed of on-site at the hazardous waste landfill.

4.1.4 Electrical

In order to develop the OPC for the electrical systems within the station, the electrical single line diagram was reviewed and the components to be removed were identified and quantified, through referencing vendor equipment catalogues. The OPC was based on the assumption that the removal of the selected electrical components would be approximately 30% of the cost of a new installation and costing information from the 2012 edition of *RS Means CostWorks* (Means).

It is important to note that the most significant component in the electrical decommissioning OPC is the requirement to dechlorinate, or remove the PCB impacted oil from each of the seven transformers that will no longer be required. Based on name plate data from the individual transformers and recent PCB management cost data, it is estimated that approximately 123,000 litres of PCB impacted oil will have to be managed. For the purposes of developing the OPC it is assumed that the transformer would be dechlorinated by a third party company licensed to complete such work and would include de-chlorination, and transportation and disposal of the residue at an approved site.

4.1.5 Common Services

The OPC for the decommissioning and demolition of common services was based on pricing provided by an experienced demolition contractor considering the accessibility and weight and/or size, and construction materials of the various common service components.

The most significant component of the common services OPC is the preparation of (cleaning) the fuel oil storage tanks for demolition. For this item, an average of tank cleaning pricing provided by two experienced contractors was obtained. The OPC also reflects the fact that some selective demolition of equipment will be required to support SC operations.

4.1.6 Construction

The construction OPC includes an allowance for structural modifications, construction of a new exterior wall and cladding to close in the powerhouse and reconfiguration of common systems within the powerhouse, affected by the demolition, and is based on estimated quantities and in house cost information.

It is noted that the construction OPC is an allowance only and further study would be required to determine what modifications will be necessary and which systems need to be reconnected to allow continued operation in the remaining areas of the powerhouse.

4.1.7 Engineering and Administration

This component of the OPC includes engineering design and construction monitoring and observation fees associated with the decommissioning and demolition project. Owner's costs, interest during construction, escalation, legal and financial costs, permits, licenses and fees are not included.

Finally, a contingency of 10% of the overall demolition cost is included as part of the OPC to fund unplanned items that often develop during a major project of this nature. The contingency provides additional budget that is not allocated to a specific WBS, but is applied to the overall project budget. Generally, contingency allows for funds that the project will utilize but are not allocated at the outset of the project. Contingency differs from estimate accuracy which is based on the level of project definition when the estimate is formulated.

4.2 OPINION OF PROBABLE COST

Based on the long term operational strategy currently envisioned by NLH, including selective demolition of the plant, on-going SC operations, and regulatory compliance; and the costing methodologies described above, the OPC for the decommissioning and demolition of the HTGS is $32,074,000. Based on the definition of a Class 4 estimate and the level of preliminary engineering carried out for this study, it is estimated that the OPC developed herein would have an accuracy range of -10% to +30%.

This OPC, which may be referred to as the 'base case' is broken down in Table 4.2.1 referencing the WBS described previously. The detailed breakdown of the OPC is provided in Appendix 3.

Table 4.2.1 – Summary of the OPC

WBS	Description	Total Cost
100	Site and Environment	$7,135,000
200	Building and Structures	$5,242,000
300	Boiler and Auxiliaries	$4,342,000
400	Turbine, Generator and Auxiliaries	$341,000
500	Electrical	$2,376,000
600	Instrumentation and Control	$0
700	Common Services	$2,692,000
800	Construction	$3,400,000
900	Engineering and Administrative	$3,630,000
	Contingency @ 10%	$2,916,000
	PROJECT TOTAL	$32,074,000

4.2.1 Decommissioning and Demolition Cash Flow

Based on the preliminary decommissioning and demolition schedule, a five-year projection of cash flows between 2020 and 2024, inclusive, was prepared. A summary of the cash flow, which is presented in 2012 dollars is provided in the table below and the detailed cash flow is provided in Appendix 4.

As expected, the forecast shows that just over half of the expenditures will occur in years three and four, when the bulk of the actual demolition and environmental remediation work is to be completed.

Table 4.2.2 – Cash Flow Summary

Year	2020	2021	2022	2023	2024	Total
Projected Expenditure	$330,000	$1,595,000	$10,201,000	$17,385,000	$2,563,000	$32,074,000

4.3 SALVAGE AND SCRAP VALUE

Based upon the age of the HTGS and discussions with potential equipment buyers, it was determined that sale of equipment within the HTGS for re-use would be unlikely and therefore, demolition would proceed on the assumption that the equipment and other assets, including structural steel and re-bar would be scrapped or salvaged for recycling purposes only.

Although a value of the salvageable metals has not been determined, as the pricing is known to vary significantly depending upon the buyer, transportation costs, and market conditions, this section provides a summary of the scrap metal quantities that would likely be generated through the demolition process.

Table 4.3.1 – Scrap Metal Quantities

Station Component	Units	Description	Quantities (Tonnes)
Boilers	#1, #2 and #3	Boiler waterwalls, superheater, reheater, economizer, steam drum, sootblowers, burner fronts, ash pit	4600
Boiler Auxiliaries	#1, #2 and #3	Main Steam piping, primary and secondary superheater inlet and outlet headers, reheater inlet and outlet headers, economizer inlet and outlet headers, HP and LP heaters, deaerator and deaerator storage tank, miscellaneous steam piping - sootblower steam, atomizing steam, aux steam etc., condensate and feedwater piping, boiler feedwater pumps, condensate pumps, condensate tank and blowdown tank, fuel oil piping systems, FD fans, ductwork, windbox and air heaters and flue gas ductwork and components	2700
Turbines	#1, #2 and #3	LP and HP rotors and LP and Casings	400
Condensers	#1, #2 and #3	Condenser and tubing, CW Pumps and condenser vacuum system	500
Generators	#1 and #2	Generator enclosure and the rotor, armature windings, stator windings and field windings	300
Generator Auxiliaries	#1, #2 and #3	Turbine lubrication system and piping, turbine Hydraulic system and piping, generator hydrogen cooling system (Units #1 & #2) and the balance of miscellaneous piping systems	100
Electrical Systems	#1 and #2 and selected components of #3	Unit output, unit station service and exciter transformers, switchgear, MCCs, motors, building electrical services, control cabinets and associated cabling	700
Powerhouse		Structural steel and rebar	3300
Tank Farm		Fuel oil storage tanks	1300
TOTAL			**13900**

5.0 Preliminary Decommissioning Schedule

A simplified project timeline and conceptual decommissioning schedule is presented in Appendix 5. The project timeline provides a snapshot of the proposed sequence of events leading to the cessation of the thermal operations and eventual decommissioning of the generating station, based upon preliminary planning completed by NLH. At present it is anticipated that decommissioning activities will not be initiated until at least the end of 2021 after Muskrat Falls is on line, the HTGS has operated in standby mode and the units are in dry lay-up.

The conceptual decommissioning schedule provides a high level list of the various major pre-decommissioning and decommissioning activities that will be required.

The duration and sequencing of each activity is based on Stantec's professional experience with projects of this nature, and does not reflect optimization of any tasks. The duration of each activity will ultimately depend on contractor availability and the level of resources that are mobilized for this project.

The conceptual decommissioning schedule currently indicates that decommissioning and demolition of the equipment and facilities can be executed within a five year timeframe and be complete by the end of 2024. Based on discussions with an experienced contractor, the actual demolition, after abatement of hazardous materials and industrial cleaning, is anticipated to take approximately eight months. Remediation of environmental impacts is expected to be the longest duration activity.

The schedule can be adjusted to best suit the project and NLH's requirements once additional engineering and planning is completed.

6.0 Appendices

Appendix 1 – Drawings

Appendix 2 – HTGS Asset List

Appendix 3 – Opinion of Probable Cost

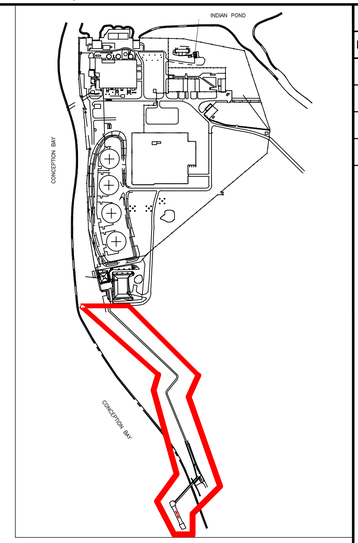
Appendix 4 – Detailed Cash Flow

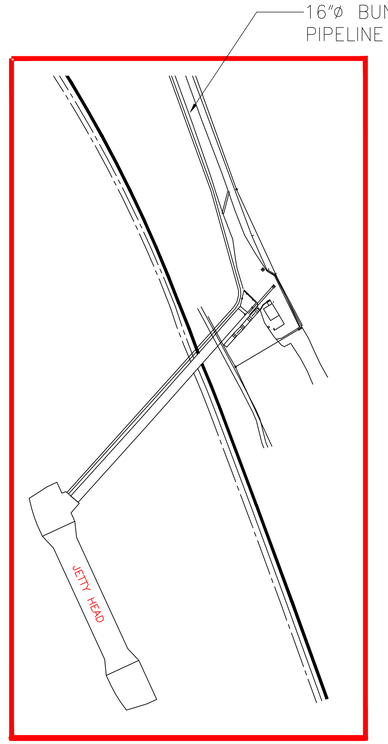
Appendix 5 – Project Schedules

APPENDIX 1

Drawings

WASTE WATER TREATMENT EQUALIZATION BASINS
PUMPHOUSE #1
PUMPHOUSE #2
INDIAN POND
DAY TANK
ABANDONED SEPTIC FIELD
WASTE WATER TREATMENT PLANT
#1
#2
#3
NEW SEPTIC SYSTEM
BOILER STACKS
BOILERHOUSE
CHEMICAL STORAGE BUILDING
MAINTENANCE BUILDINGS
TURBINE/ GENERATORS
TRAINING CENTER
COOLING WATER DISCHARGE
ROADWAY
HYDROGEN STORAGE BUILDING
SHAWMONT BUILDING
FUTURE LOCATION OF 50MW GAS TURBINE
ERT BUILDING
DECOMMISSIONED GAS TURBINE
CONCEPTION BAY
SWITCH YARD
TANK FARM
16"Ø BUNKER 'C' PIPELINE FROM JETTY
HAZARDOUS WASTE LANDFILL (RETAIN & CAP)
LEACHATE HOLDING POND
N





REFERENCE DRAWINGS

DWG. No.	TITLE	BY

KEY PLAN

- DEMOLISH AND/OR DECOMMISSION BUILDINGS AND EQUIPMENT
- NO DEMOLITION IN THIS AREA UNLESS NOTED OTHERWISE
- DEMOLISH EQUIPMENT ONLY AS FOLLOWS:
  UNIT #1 – ALL
  UNIT #2 – ALL
  UNIT #3 – TURBINE, CONDENSER, AND AUXILARIES

PRELIMINARY
FOR INFORMATION ONLY

REV.	ISSUED TO	ISSUED FOR
0	CLIENT	INFORMATION

No.	DATE	BY	REVISIONS	DES.	DFTG.

DESIGNED MDV	DRAWN JJB
CHECKED DESIGN / DFTG.	DATE NOV 20, 2012
	SCALE NTS
APPROVED	SPEC.
P.M. / P.T.	

Stantec
newfoundland labrador hydro
a nalcor energy company

PRELIMINARY DECOMMISSIONING STUDY

HOLYROOD THERMAL GENERATING STATION
OVERALL SITE PLAN

JOB No.	DWG. No.	REV
133545705	SK-001	0

Jan 25, 2013 9:08am JBabin

U:\133545705 Holyrood Decom\15_reference_dwgs\Drawings\NL-HYDRO\From Fredericton\133545705-SK001.dwg

N

RETAIN FIRE PUMPS, DOMESTIC WATER PUMP AND ENCLOSURE

WASTE WATER TREATMENT EQUALIZATION BASINS

PUMPHOUSE #1
PUMPHOUSE UNIT No.1 & No.2
(SERVES UNITS 1&2)

WASTE WATER TREATMENT PLANT

TREATMENT PLANT
ELECTRICAL ROOM

REMOVE UNIT #3 COOLING WATER PUMPS

PUMPHOUSE #2
PUMPHOUSE UNIT No.3
(SERVES UNIT 3)

- ROAD -

STACK No.1
STACK No.2
STACK No.3
35' Ø DAY TANK

WORKSHOP

SEE SK-003 FOR DEMO IN THIS AREA

ELEVATOR

T.G. No.1
T.G. No.2
NEW T.G. No.3

UNIT No.1 SERVICE TRANSFORMER
UNIT No.1 GEN TFR
UNIT No.2 GEN TFR
TFR
UNIT No.3 GEN TFR

VACUUM SEAL PIT

TO CONCEPTION BAY
TO CONCEPTION BAY

OIL SEPARATOR No.1

HYDROGEN STORAGE SHED

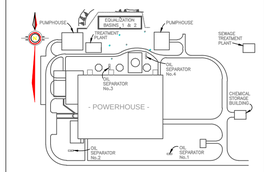
CHEMICAL STORAGE BUILDING

NEW SEWAGE TREATMENT PLANT

UNIT #3 TRANSFORMERS TO REMAIN

UNIT #1 & #2
STATION SERVICE TRANSFORMERS
EXCITER TRANSFORMERS AND UNIT
TRANSFORMERS TO BE REMOVED

- Base Line -



SITE LAYOUT
N.T.S.

REFERENCE DRAWINGS

DWG. No.	TITLE	BY

KEY PLAN

- DEMOLISH BUILDINGS AND EQUIPMENT
- NO DEMOLITION IN THIS AREA UNLESS NOTED OTHERWISE

PRELIMINARY
FOR INFORMATION ONLY

REV.	ISSUED TO	ISSUED FOR
0	CLIENT	INFORMATION

No.	DATE	BY	REVISIONS	DES.	DFTG.

DESIGNED MDV	DRAWN JJB
CHECKED DESIGN / DFTG.	DATE NOV 20, 2012
	SCALE NTS
APPROVED	SPEC.
P.M. / P.T.	

Stantec

newfoundland labrador hydro
a nalcor energy company

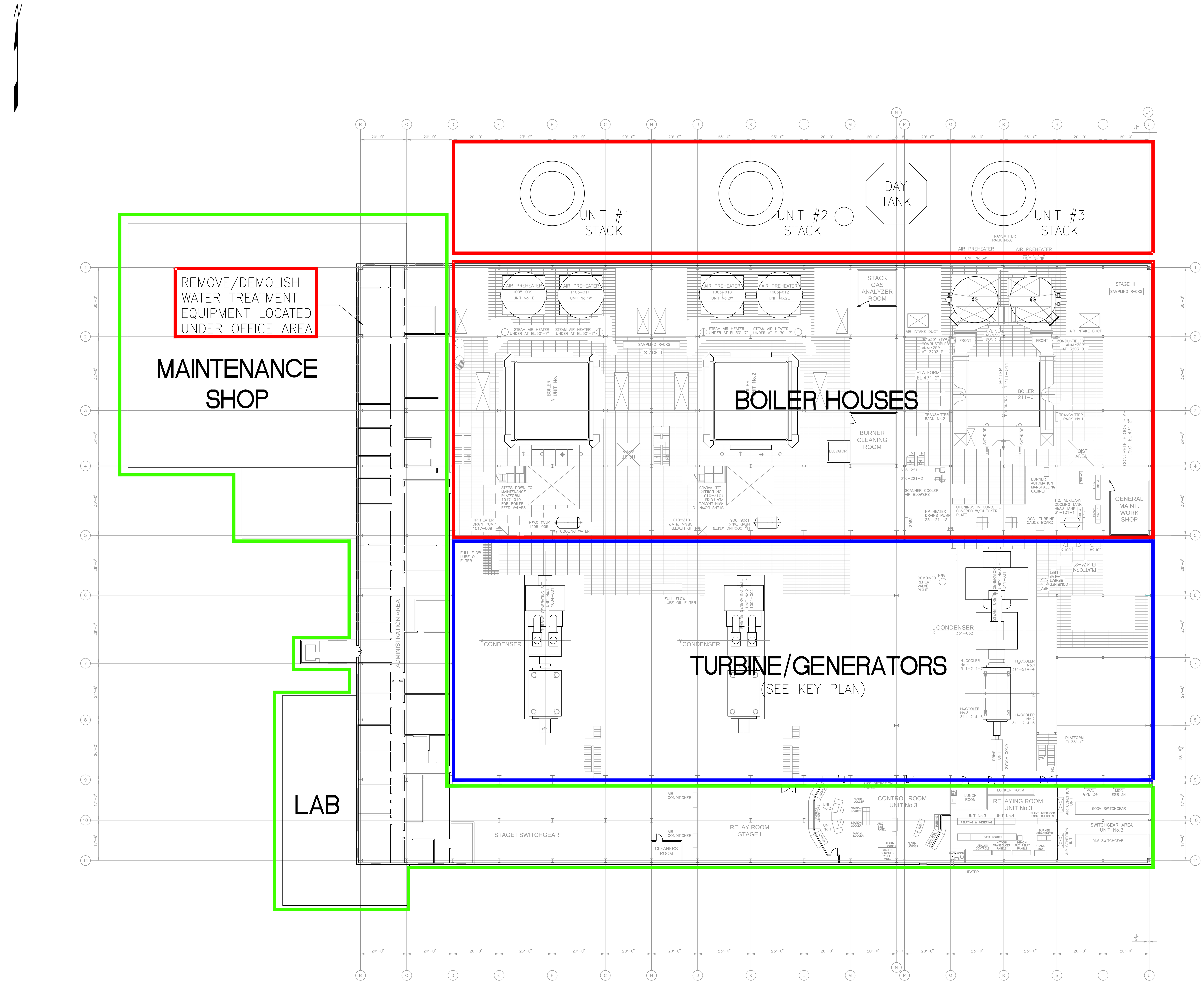
PRELIMINARY DECOMMISSIONING STUDY

HOLYROOD THERMAL GENERATING STATION
POWERHOUSE AREA
SITE PLAN

JOB No.	DWG. No.	REV
133545705	SK-002	0

Jan 25, 2013 9:09am JBabin

U:\133545705 Holyrood Decom\15_reference_dwgs\Drawings\NL-HYDRO\From Fredericton\133545705-SK002.dwg



REFERENCE DRAWINGS

DWG. No.	TITLE	BY

KEY PLAN

- (red box) – DEMOLISH BUILDINGS AND EQUIPMENT
- (blue box) – DEMOLISH EQUIPMENT ONLY AS FOLLOWS: UNIT #1 – ALL; UNIT #2 – ALL; UNIT #3 – TURBINE, CONDENSER, AND AUXILARIES
- (green box) – NO DEMOLITION IN THIS AREA UNLESS NOTED OTHERWISE

PRELIMINARY
FOR INFORMATION ONLY

REV.	ISSUED TO	ISSUED FOR
0	CLIENT	INFORMATION

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing – any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

No.	DATE	BY	REVISIONS	DES.	DFTG.

DESIGNED	DRAWN
CHECKED (DESIGN / DFTG.)	DATE NOV 20, 2012
	SCALE NTS
APPROVED	SPEC.
P.M.	P.T.

Stantec

newfoundland labrador hydro
a nalcor energy company

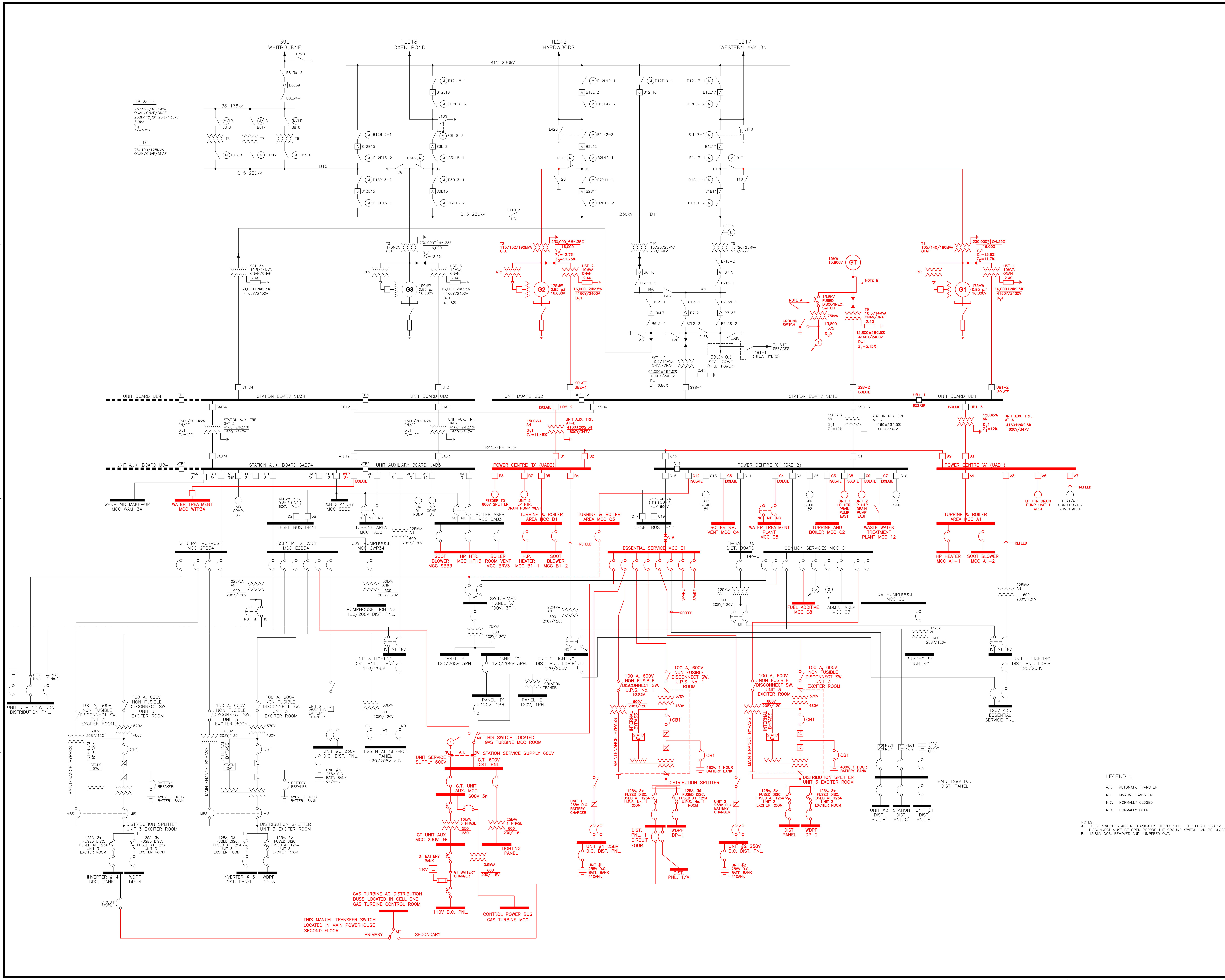
PRELIMINARY DECOMMISSIONING STUDY

HOLYROOD THERMAL GENERATING STATION
POWERHOUSE/TURBINE AREA

JOB No.	DWG. No.	REV.
133545705	SK-003	0

U:\133545705 Holyrood Decom\15_reference_dwgs\Drawings\NL-HYDRO\ From Fredericton\133545705-SK003.dwg

Jan 25, 2013 9:08am JBabin



REFERENCE DRAWINGS

DWG. No.	TITLE	BY

KEY PLAN

- DEMOLISH ELECTRICAL
- RETAIN ELECTRICAL

REV.	ISSUED TO	ISSUED FOR

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

No.	DATE	BY	REVISIONS	DES.	DFTG.

DESIGNED NFB	DRAWN RKH
CHECKED DESIGN DFTG.	DATE NOV 23, 2012
	SCALE NTS
APPROVED	SPEC.
P.M. P.T.	

Stantec

HOLYROOD DECOMMISSIONING PLAN

HOLYROOD GENERATING STATION
ELECTRICAL DEMOLITIONS

JOB No.	DWG. No.	REV
133545705	SK-5001	0

U:\133545705 Holyrood Decom\15_reference_dwgs\Drawings\NL-HYDRO\ELECTRICAL\133545705D5001-SK.dwg

Dec 11, 2012 4:56pm kehamilton

APPENDIX 2

HTGS Asset List

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
400												
	270,072	0	0	0	0	0	0	0	Holyrood Grand Plant (no WO's)	HRDUNIT1	HRD00000000	
	270,072	6,690	0	0	0	0	0	0	UNIT 1	HRDUNIT1	HRD10000000	
	270,072	6,690	6,691	0	0	0	0	0	#1 TURBINE & GENERATOR	HRDUNIT1	HRD11000000	
	270,072	6,690	6,691	6,696	0	0	0	0	U1 GENERATOR ASSEMBLY	HRDUNIT1	HRD11500000	
	270,072	6,690	6,691	6,696	6,839	0	0	0	#1 GENERATOR ROTOR	HRDUNIT1	HRD11510000	
	270,072	6,690	6,691	6,696	6,839	6,843	0	0	#1GEN. ROTOR SLIP RNGS & BRUSH	HRDUNIT1	HRD11514000	
	270,072	6,690	6,691	6,696	6,839	99,000,269	0	0	INSTALL ROTORS UNIT 1 - MFG CA	HRDPLANT		
	270,072	6,690	6,691	6,696	6,840	0	0	0	#1 GENERATOR STATOR	HRDUNIT1	HRD11520000	
	270,072	6,690	6,691	6,696	6,840	7,345	0	0	#1 GEN. STANDOFF INSULATORS	HRDUNIT1	HRD11531000	
	270,072	6,690	6,691	6,696	6,840	7,346	0	0	#1 GENERATOR P.T. CUBICLE	HRDUNIT1	HRD11593000	
	270,072	6,690	6,691	6,696	6,840	324,689	0	0	#1 GENERATOR STATOR RELAY	HRDUNIT1		
	270,072	6,690	6,691	6,696	6,840	99,006,829	0	0	50 KVA SINGLE PHASE NEUTRAL GR	HRDPLANT		
	270,072	6,690	6,691	6,696	6,840	99,041,243	0	0	DISCHARGE ANALYSIS SYSTEM	HRDPLANT		
	270,072	6,690	6,691	6,696	6,849	0	0	0	#1 GENERATOR EXCITATION SYSTEM	HRDUNIT1	HRD11610000	
	270,072	6,690	6,691	6,696	6,849	271,310	0	0	#1 EXCITER	HRDUNIT1	HRD11610001	
	270,072	6,690	6,691	6,696	6,849	271,310	99,037,514	0	exciter unit 1	HRDPLANT		
	270,072	6,690	6,691	6,696	6,849	271,311	0	0	#1 EXCITATION TRANSFORMER	HRDUNIT1	HRD11610002	
	270,072	6,690	6,691	6,696	6,849	271,312	0	0	#1 EXCITER FIELD BREAKER	HRDUNIT1	HRD11610003	
	270,072	6,690	6,691	6,696	6,849	99,000,285	0	0	BUILD DYKES AROUND EXCITATION	HRDPLANT		
	270,072	6,690	6,691	6,696	6,850	0	0	0	#1 GEN. HYDROGEN GAS SYSTEM	HRDUNIT1	HRD11620000	
	270,072	6,690	6,691	6,696	6,850	6,806	0	0	#1 GENERATOR SEAL OIL SYSTEM	HRDUNIT1	HRD11450000	
	270,072	6,690	6,691	6,696	6,850	6,806	9,596	0	#1 GEN AC SEAL OIL P/P EAST	HRDUNIT1	HRD11451010	
	270,072	6,690	6,691	6,696	6,850	6,806	9,597	0	#1 GEN AC SEAL OIL P/P WEST	HRDUNIT1	HRD11451020	
	270,072	6,690	6,691	6,696	6,850	6,806	9,600	0	#1 GEN DC SEAL OIL PUMP	HRDUNIT1	HRD11452010	
	270,072	6,690	6,691	6,696	6,850	6,806	9,602	0	#1 GEN. SEAL OIL VACUUM PUMP	HRDUNIT1	HRD11454010	
	270,072	6,690	6,691	6,696	6,850	6,851	0	0	#1 GEN. CO2 GAS PURGE SYSTEM	HRDUNIT1	HRD11630000	
	270,072	6,690	6,691	6,696	6,850	6,852	0	0	#1 GENERATOR COMPRESSED AIR	HRDUNIT1	HRD11640000	
	270,072	6,690	6,691	6,696	6,850	6,853	0	0	#1 GENERATOR HYDROGEN COOLING	HRDUNIT1	HRD11650000	
	270,072	6,690	6,691	6,696	6,850	331,939	0	0	U1 Emergency Hydrogen Venting	HRDUNIT1		
	270,072	6,690	6,691	6,696	99,000,276	0	0	0	ADDITIONAL COSTS FOR BALANCE O	HRDPLANT		
	270,072	6,690	6,691	6,696	99,003,559	0	0	0	REMOVE PCB XFRMER & INSTALL NE	HRDPLANT		
	270,072	6,690	6,691	6,733	0	0	0	0	#1 TURBINE CONDENSER SYSTEM	HRDUNIT1	HRD11160000	
	270,072	6,690	6,691	6,733	6,780	0	0	0	#1 CONDENSER AIR EXTRACTION	HRDUNIT1	HRD11340000	
	270,072	6,690	6,691	6,733	6,780	8,876	0	0	#1 CONDENSER VACUUM PUMP NORTH	HRDUNIT1	HRD11343030	
	270,072	6,690	6,691	6,733	6,780	8,877	0	0	#1 CONDENSER VACUUM PUMP SOUTH	HRDUNIT1	HRD11343031	
	270,072	6,690	6,691	6,733	271,316	0	0	0	#1 TURBINE CONDENSER	HRDUNIT1	HRD11160001	
	270,072	6,690	6,691	6,733	322,986	0	0	0	U1 Condenser Valve Actuators	HRDUNIT1		
	270,072	6,690	6,691	271,309	0	0	0	0	#1 TURBINE	HRDUNIT1	HRD11000001	
	270,072	6,690	6,691	271,309	6,695	0	0	0	#1 TURBINE OIL SYSTEMS	HRDUNIT1	HRD11400000	
	270,072	6,690	6,691	271,309	6,695	6,805	0	0	#1 TURBINE LUBE OIL SYSTEM	HRDUNIT1	HRD11430000	
	270,072	6,690	6,691	271,309	6,695	6,805	6,803	0	#1 TURB LUBE OIL TANK & EQUIP	HRDUNIT1	HRD11410000	
	270,072	6,690	6,691	271,309	6,695	6,805	6,804	0	#1 TURB. LUBE OIL PURIFICATION	HRDUNIT1	HRD11420000	
	270,072	6,690	6,691	271,309	6,695	6,805	6,804	99,039,096	Duplex Filter for Lube oil	HRDPLANT		
	270,072	6,690	6,691	271,309	6,695	6,805	6,829	0	#1 TURB LUBE AC OIL P/P SOUTH	HRDUNIT1	HRD11431131	
	270,072	6,690	6,691	271,309	6,695	6,805	6,830	0	#1 TURB LUBE AC OIL P/P NORTH	HRDUNIT1	HRD11431130	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	6,690	6,691	271,309	6,695	6,805	6,833	0	#1 TURBINE LUBE D.C. PUMP	HRDUNIT1	HRD11432100	
	270,072	6,690	6,691	271,309	6,695	6,805	99,000,373	0	INSTALL OIL SUPERVISORY EQUIPM	HRDPLANT		
	270,072	6,690	6,691	271,309	6,695	6,807	0	0	#1 TURB. HYDRAULIC OIL SYSTEM	HRDUNIT1	HRD11470000	
	270,072	6,690	6,691	271,309	6,695	6,807	6,835	0	#1 TURBINE HYD. OIL PUMP NORTH	HRDUNIT1	HRD11472130	
	270,072	6,690	6,691	271,309	6,695	6,807	6,836	0	#1 TURBINE HYD. OIL PUMP SOUTH	HRDUNIT1	HRD11472131	
	270,072	6,690	6,691	271,309	6,695	6,807	273,260	0	U1 NORTH EHC ACCUMULATOR	HRDUNIT1	HRD11200005	
	270,072	6,690	6,691	271,309	6,695	6,807	273,262	0	U1 SOUTH EHC ACCUMULATOR	HRDUNIT1	HRD11200006	
	270,072	6,690	6,691	271,309	6,695	99,041,696	0	0	thermocouples in turb bearings	HRDPLANT		
	270,072	6,690	6,691	271,309	6,729	0	0	0	#1 TURBINE MAIN STEAM CHEST	HRDUNIT1	HRD11110000	
	270,072	6,690	6,691	271,309	6,730	0	0	0	#1 H.P. TURBINE	HRDUNIT1	HRD11120000	
	270,072	6,690	6,691	271,309	6,731	0	0	0	#1 I.P. TURBINE	HRDUNIT1	HRD11140000	
	270,072	6,690	6,691	271,309	6,732	0	0	0	#1 L.P. TURBINE	HRDUNIT1	HRD11150000	
	270,072	6,690	6,691	271,309	6,734	0	0	0	#1 TURBINE FRONT STANDARD	HRDUNIT1	HRD11170000	
	270,072	6,690	6,691	271,309	6,766	0	0	0	#1 TURBINE RH/IP STEAM CHEST	HRDUNIT1	HRD11130000	
	270,072	6,690	6,691	271,309	6,777	0	0	0	#1 TURBINE GLAND STEAM SYSTEM	HRDUNIT1	HRD11310000	
	270,072	6,690	6,691	271,309	6,778	0	0	0	#1 TURBINE PRE-WARMING SYSTEM	HRDUNIT1	HRD11320000	
	270,072	6,690	6,691	271,309	6,779	0	0	0	#1 TURBINE TURNING GEAR	HRDUNIT1	HRD11330000	
	270,072	6,690	6,691	271,309	6,781	0	0	0	#1 TURBINE DRAINS SYSTEMS	HRDUNIT1	HRD11350000	
	270,072	6,690	6,691	271,309	6,781	342,058	0	0	Cold Reheat Condensate Pots	HRDUNIT1	HRD11350001	
	270,072	6,690	6,691	271,309	270,125	0	0	0	#1 TURBINE BLED STEAM SYSTEM	HRDUNIT1	HRD11400001	
	270,072	6,690	6,691	271,309	99,000,265	0	0	0	ADDITIONAL COSTS FOR TURBINES	HRDPLANT		
	270,072	6,690	6,691	271,309	99,000,268	0	0	0	INSTALL TURBINE PARTS & WINDER	HRDPLANT		
300												
	270,072	6,690	6,699	0	0	0	0	0	#1 BOILER PLANT	HRDUNIT1	HRD12000000	
	270,072	6,690	6,699	6,700	0	0	0	0	#1 BOILER STRUCTURE	HRDUNIT1	HRD12100000	
	270,072	6,690	6,699	6,700	99,000,137	0	0	0	ADDITIONAL COSTS FOR STEAM GEN	HRDPLANT		
	270,072	6,690	6,699	6,700	99,000,148	0	0	0	INSTALL STEAM GENERATOR FOR UP	HRDPLANT		
	270,072	6,690	6,699	6,700	99,029,562	0	0	0	OBSERVATION PORT IN THE BURNER	HRDPLANT		
	270,072	6,690	6,699	6,701	0	0	0	0	#1 BOILER F.W. & SAT'D STEAM	HRDUNIT1	HRD12200000	
	270,072	6,690	6,699	6,701	6,869	0	0	0	#1 BOILER ECONOMIZER	HRDUNIT1	HRD12210000	
	270,072	6,690	6,699	6,701	6,870	0	0	0	#1 BOILER STEAM DRUM	HRDUNIT1	HRD12220000	
	270,072	6,690	6,699	6,701	6,870	99,023,643	0	0	ELECTRONIC LEVEL GUAGE FOR DRU	HRDPLANT		
	270,072	6,690	6,699	6,701	6,871	0	0	0	#1 FURNACE	HRDUNIT1	HRD12240000	
	270,072	6,690	6,699	6,701	6,872	0	0	0	#1 BOILER FILLING AND DRAINING	HRDUNIT1	HRD12260000	
	270,072	6,690	6,699	6,701	6,872	6,706	0	0	#1 BOILER BLOWDOWN DRAINS & LP	HRDUNIT1	HRD12700000	
	270,072	6,690	6,699	6,701	6,872	6,706	7,014	0	#1 BOILER CONTINUOUS BLOWDOWN	HRDUNIT1	HRD12710000	
	270,072	6,690	6,699	6,701	6,872	6,706	359,347	0	UNIT 1 BOILER BLOWDOWN TANK	HRDUNIT1		
	270,072	6,690	6,699	6,702	0	0	0	0	#1 BLR SUPERHEAT& REHEAT ASS'Y	HRDUNIT1	HRD12300000	
	270,072	6,690	6,699	6,702	6,873	0	0	0	#1 BOILER PRIMARY SUPERHEATER	HRDUNIT1	HRD12310000	
	270,072	6,690	6,699	6,702	6,874	0	0	0	#1 BOILER SUPERHEATER ATTEMP.	HRDUNIT1	HRD12320000	
	270,072	6,690	6,699	6,702	6,876	0	0	0	#1 BOILER MAIN STEAM LINES	HRDUNIT1	HRD12340000	
	270,072	6,690	6,699	6,702	6,876	6,902	0	0	#1 BOILER STOP VALVE	HRDUNIT1	HRD12341000	
	270,072	6,690	6,699	6,702	6,876	99,000,151	0	0	INSTALL HIGH PRESSURE STEAM SY	HRDPLANT		
	270,072	6,690	6,699	6,702	6,877	0	0	0	#1BOILER REHEATER ATTEMPERATOR	HRDUNIT1	HRD12350000	
	270,072	6,690	6,699	6,702	6,878	0	0	0	#1 BOILER REHEATER	HRDUNIT1	HRD12360000	
	270,072	6,690	6,699	6,702	322,990	0	0	0	U1 Secondary Superheater	HRDUNIT1		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	6,690	6,699	6,703	0	0	0	0	#1 BOILER AIR SYSTEM	HRDUNIT1	HRD12400000	
	270,072	6,690	6,699	6,703	6,879	0	0	0	#1 BOILER AIR SUPPLY (A/H TO	HRDUNIT1	HRD12440000	
	270,072	6,690	6,699	6,703	6,879	6,979	0	0	#1 BOILER SEAL AIR FAN	HRDUNIT1	HRD12443000	
	270,072	6,690	6,699	6,703	6,879	6,982	0	0	#1 BOILER SCANNER AIR SYSTEM	HRDUNIT1	HRD12446000	
	270,072	6,690	6,699	6,703	6,880	0	0	0	#1 BOILER WINDBOX	HRDUNIT1	HRD12450000	
	270,072	6,690	6,699	6,703	8,777	0	0	0	#1 BOILER F.D. FAN SYSTEM	HRDUNIT1	HRD12410000	
	270,072	6,690	6,699	6,703	8,777	6,943	0	0	#1 BOILER F.D. FAN EAST	HRDUNIT1	HRD12413032	
	270,072	6,690	6,699	6,703	8,777	6,944	0	0	#1 BOILER F.D. FAN WEST	HRDUNIT1	HRD12413033	
	270,072	6,690	6,699	6,703	8,783	0	0	0	#1 BOILER STEAM AIR HEATER	HRDUNIT1	HRD12420000	
	270,072	6,690	6,699	6,703	8,783	6,954	0	0	#1BOILER STEAM AIR HEATER EAST	HRDUNIT1	HRD12423032	
	270,072	6,690	6,699	6,703	8,783	6,955	0	0	#1BOILER STEAM AIR HEATER WEST	HRDUNIT1	HRD12423033	
	270,072	6,690	6,699	6,703	8,783	359,348	0	0	Steam Preheater Flash Tank	HRDUNIT1		
	270,072	6,690	6,699	6,703	8,784	0	0	0	#1 BOILER MAIN AIR HEATER	HRDUNIT1	HRD12430000	
	270,072	6,690	6,699	6,703	8,784	6,914	0	0	#1 BOILER MAIN AIR HEATER EAST	HRDUNIT1	HRD12430032	
	270,072	6,690	6,699	6,703	8,784	6,915	0	0	#1 BOILER MAIN AIR HEATER WEST	HRDUNIT1	HRD12430033	
	270,072	6,690	6,699	6,703	99,031,923	0	0	0	AIR HEATER REPLACEMENT, SEE PL	HRDPLANT		
	270,072	6,690	6,699	6,704	0	0	0	0	#1 BOILER GAS SYSTEM	HRDUNIT1	HRD12500000	
	270,072	6,690	6,699	6,704	6,917	0	0	0	#1 BOILER GAS PASSES	HRDUNIT1	HRD12510000	
	270,072	6,690	6,699	6,704	6,919	0	0	0	#1 BOILER STACK	HRDUNIT1	HRD12570000	
	270,072	6,690	6,699	6,704	6,919	270,294	0	0	#1 BOILER STACK BREECHING	HRDUNIT1	HRD12570001	
	270,072	6,690	6,699	6,704	6,919	270,294	359,206	0	HRD U1 STACK BREECHING STUDY	HRDUNIT1		
	270,072	6,690	6,699	6,704	6,919	270,294	359,294	0	UNIT 1 BREECHING SUPPORT	HRDUNIT1	HRD12571100	
	270,072	6,690	6,699	6,704	6,919	359,330	0	0	Upgrade unit 1 Stack Breeching	HRDUNIT1		
	270,072	6,690	6,699	6,704	6,919	99,000,175	0	0	INSTALL STACKS UNIT #1	HRDPLANT		
	270,072	6,690	6,699	6,704	6,920	0	0	0	#1 BOILER SOOTBLOWING SYSTEM	HRDUNIT1	HRD12580000	
	270,072	6,690	6,699	6,704	6,920	6,933	0	0	#1 BOILER RETRACTABLE S/BLOWER	HRDUNIT1	S	
	270,072	6,690	6,699	6,704	6,920	6,934	0	0	#1 BOILER ROTARY SOOTBLOWERS	HRDUNIT1	HRD12584000	
	270,072	6,690	6,699	6,704	6,920	8,789	0	0	#1 BOILER AIR HEATER S/B's	HRDUNIT1	HRD12585000	
	270,072	6,690	6,699	6,705	0	0	0	0	#1 BOILER FUEL FIRING SYSTEM	HRDUNIT1	HRD12600000	
	270,072	6,690	6,699	6,705	6,987	0	0	0	#1 BOILER HEAVY OIL SYSTEM	HRDUNIT1	HRD12610000	
	270,072	6,690	6,699	6,705	6,987	6,988	0	0	#1 BOILER HEAVY OIL FIRING	HRDUNIT1	HRD12620000	
	270,072	6,690	6,699	6,705	6,987	6,994	0	0	#1 BOILER HEAVY OIL PUMP EAST	HRDUNIT1	HRD12613032	
	270,072	6,690	6,699	6,705	6,987	6,995	0	0	#1 BOILER HEAVY OIL PUMP WEST	HRDUNIT1	HRD12613033	
	270,072	6,690	6,699	6,705	6,987	6,998	0	0	U1BLR HEAVY OIL STM V/V & PIPE	HRDUNIT1	HRD12617000	
	270,072	6,690	6,699	6,705	6,987	6,999	0	0	U1 FUEL OIL ACCUMULATOR	HRDUNIT1	HRD12618000	
	270,072	6,690	6,699	6,705	6,990	0	0	0	#1 BOILER LIGHT OIL	HRDUNIT1	HRD12640000	
	270,072	6,690	6,699	6,705	6,990	6,989	0	0	#1 BOILER LIGHT OIL FIRING	HRDUNIT1	HRD12630000	
	270,072	6,690	6,699	6,705	6,990	8,976	0	0	#1 BOILER LIGHT OIL PUMP EAST	HRDUNIT1	HRD12643032	
	270,072	6,690	6,699	6,705	6,990	8,977	0	0	#1 BOILER LIGHT OIL PUMP WEST	HRDUNIT1	HRD12643033	
	270,072	6,690	6,699	6,705	99,000,170	0	0	0	INSTALL LIGHT OIL SYSTEM UNIT	HRDPLANT		
	270,072	6,690	6,699	6,707	0	0	0	0	#1 BLR AUX STM & COND SYSTEM	HRDUNIT1	HRD12800000	
	270,072	6,690	6,699	6,707	7,020	0	0	0	#1 BOILER ATOMIZING STEAM	HRDUNIT1	HRD12830000	
	270,072	6,690	6,699	6,707	7,021	0	0	0	#1BOILER AUX.STEAM MAIN SUPPLY	HRDUNIT1	HRD12810000	
	270,072	6,690	6,699	6,707	7,022	0	0	0	#1 BOILER AUXILIARY STEAM	HRDUNIT1	HRD12820000	
	270,072	6,690	6,699	6,707	8,802	0	0	0	#1 AUX STEAM CONDENSATE PUMPS	HRDUNIT1	HRD13155000	
	270,072	6,690	6,709	0	0	0	0	0	#1 CONDENSATE & F.W. SYSTEM	HRDUNIT1	HRD13000000	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	6,690	6,709	6,711	0	0	0	0	#1 LOW PRESSURE FEEDWATER SYS	HRDUNIT1	HRD13200000	
	270,072	6,690	6,709	6,711	7,053	0	0	0	#1 DEAERATOR SYSTEM	HRDUNIT1	HRD13250000	
	270,072	6,690	6,709	6,711	7,056	0	0	0	#1 LOW PRESSURE FW RESERVE	HRDUNIT1	HRD13270000	
	270,072	6,690	6,709	6,711	7,056	99,000,198	0	0	INSTALL MATERIAL FOR THE RESER	HRDPLANT		
	270,072	6,690	6,709	6,711	7,056	99,031,610	0	0	TURBINE FLOW METER FOR CONDENS	HRDPLANT		
	270,072	6,690	6,709	6,711	7,059	0	0	0	#1 LOW PRESSURE HEATER 1	HRDUNIT1	HRD13213001	
	270,072	6,690	6,709	6,711	7,066	0	0	0	#1 LOW PRESSURE HEATER 2	HRDUNIT1	HRD13213002	
	270,072	6,690	6,709	6,711	7,066	99,000,208	0	0	INSTALLATION COSTS FOR YUBA HE	HRDPLANT		
	270,072	6,690	6,709	6,711	8,805	0	0	0	#1 LOW PRESSURE HTR DRAIN P/PS	HRDUNIT1	HRD13220000	
	270,072	6,690	6,709	6,711	99,000,215	0	0	0	BAL LOW PRESSURE FEED SYSTEM U	HRDPLANT		
	270,072	6,690	6,709	6,711	99,000,216	0	0	0	INSTALL BALANCE OF LOW PRESSUR	HRDPLANT		
	270,072	6,690	6,709	6,711	99,032,021	0	0	0	LP FEED SYSTEM SEE PL ASSET 21	HRDPLANT		
	270,072	6,690	6,709	6,712	0	0	0	0	#1 BOILER FEEDWATER PUMPING	HRDUNIT1	HRD13300000	
	270,072	6,690	6,709	6,712	8,835	0	0	0	#1 BOILER FEED PUMP EAST	HRDUNIT1	HRD13310032	
	270,072	6,690	6,709	6,712	8,835	7,091	0	0	#1 BOILER FEEDPUMP RECIRC.EAST	HRDUNIT1	HRD13320032	
	270,072	6,690	6,709	6,712	8,835	7,095	0	0	#1 BOILER FW PUMP LUB OIL EAST	HRDUNIT1	HRD13340032	
	270,072	6,690	6,709	6,712	8,835	99,000,234	0	0	INSTALL BOILER FEED PUMPS UNIT	HRDPLANT		
	270,072	6,690	6,709	6,712	8,835	99,000,243	0	0	INSTALL VIBRATION MONITORING E	HRDPLANT		
	270,072	6,690	6,709	6,712	8,835	99,000,245	0	0	MODIFY AND INSTALL BOILER FEED	HRDPLANT		
	270,072	6,690	6,709	6,712	8,835	99,000,253	0	0	PURCHASE 1 INNER CASE BARREL P	HRDPLANT		
	270,072	6,690	6,709	6,712	8,836	0	0	0	#1 BOILER FEED PUMP WEST	HRDUNIT1	HRD13310033	
	270,072	6,690	6,709	6,712	8,836	7,092	0	0	#1 BOILER FEEDPUMP RECIRC.WEST	HRDUNIT1	HRD13320033	
	270,072	6,690	6,709	6,712	8,836	7,096	0	0	#1 BOILER FW PUMP LUB OIL WEST	HRDUNIT1	HRD13340033	
	270,072	6,690	6,709	6,712	8,836	99,000,244	0	0	INSTALL VIBRATION MONITORING E	HRDPLANT		
	270,072	6,690	6,709	6,712	8,836	99,043,181	0	0	MODIFY AND INSTALL BOILER	HRDPLANT		
	270,072	6,690	6,709	6,712	8,836	99,043,187	0	0	PURCHASE 1 INNER CASE BARR	HRDPLANT		
	270,072	6,690	6,709	6,712	9,616	0	0	0	#1 BFP COM GLND SEAL WATER INJ	HRDUNIT1	HRD13361000	
	270,072	6,690	6,709	6,712	9,617	0	0	0	#1 BFP COM GLNDSEAL WATER XFER	HRDUNIT1	HRD13362000	
	270,072	6,690	6,709	6,713	0	0	0	0	#1 HIGH PRESSURE FEEDWATER SYS	HRDUNIT1	HRD13500000	
	270,072	6,690	6,709	6,713	7,112	0	0	0	#1 H.P. HEATER 4	HRDUNIT1	HRD13513004	
	270,072	6,690	6,709	6,713	7,113	0	0	0	#1 H.P. HEATER 5	HRDUNIT1	HRD13513005	
	270,072	6,690	6,709	6,713	7,114	0	0	0	#1 H.P. HEATER 6	HRDUNIT1	HRD13513006	
	270,072	6,690	6,709	6,713	7,128	0	0	0	#1 H.P. FEEDWATER VALVES	HRDUNIT1	HRD13531000	
	270,072	6,690	6,709	6,713	8,932	0	0	0	#1 H.P. HEATERS DRAIN PUMP	HRDUNIT1	HRD13514104	
	270,072	6,690	6,709	7,040	0	0	0	0	#1 CONDENSATE MAKE UP SYSTEM	HRDUNIT1	HRD13110000	
	270,072	6,690	6,709	8,799	0	0	0	0	#1CONDENSATE EXTRACTION SYSTEM	HRDUNIT1	HRD13120000	
	270,072	6,690	6,709	8,799	7,045	0	0	0	#1 COND EXTRACTION PUMP NORTH	HRDUNIT1	HRD13123030	
	270,072	6,690	6,709	8,799	7,045	324,290	0	0	Ext Pump N Motor Prot. Relay	HRDUNIT1		
	270,072	6,690	6,709	8,799	7,049	0	0	0	#1 COND EXTRACTION PUMP SOUTH	HRDUNIT1	HRD13123031	
	270,072	6,690	6,709	8,799	7,049	324,365	0	0	Ext. Pump S Motor Prot. Relay	HRDUNIT1		
400												
	270,072	6,690	6,715	0	0	0	0	0	#1 UNIT GENERATION SERVICES	HRDUNIT1	HRD14000000	
	270,072	6,690	6,715	6,719	0	0	0	0	#1 GENERAL SERVICE COOLING	HRDUNIT1	HRD14500000	
	270,072	6,690	6,715	6,782	0	0	0	0	#1 TURB/GEN COOLING SYSTEM	HRDUNIT1	HRD11360000	
	270,072	6,690	6,715	6,782	9,592	0	0	0	#1 T/G COOLING PUMP SOUTH	HRDUNIT1	HRD11363010	
	270,072	6,690	6,715	6,782	9,593	0	0	0	#1 T/G COOLING PUMP NORTH	HRDUNIT1	HRD11363020	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	6,690	6,715	6,782	99,000,316	0	0	0	INSTALL TURBO GENERATION AUX C	HRDPLANT		
	270,072	6,690	6,715	270,182	0	0	0	0	#1 CW SYSTEM	HRDUNIT1		
	270,072	6,690	6,715	270,182	7,134	0	0	0	#1 C.W. INTAKE	HRDUNIT1	HRD14110000	
	270,072	6,690	6,715	270,182	7,134	99,000,217	0	0	INSTALL FERROUS SULPHATE DOSIN	HRDPLANT		
	270,072	6,690	6,715	270,182	7,134	99,000,307	0	0	BALANCE OF CIRCULATING WATER S	HRDPLANT		
	270,072	6,690	6,715	270,182	7,134	99,000,308	0	0	ADDITIONAL COSTS FOR BALANCE O	HRDPLANT		
	270,072	6,690	6,715	270,182	7,134	99,031,330	0	0	FERROUS SULPHATE DOSING SYSTEM	HRDPLANT		
	270,072	6,690	6,715	270,182	7,135	0	0	0	#1 C.W. DISCHARGE TO OUTFALL	HRDUNIT1	HRD14140000	
	270,072	6,690	6,715	270,182	7,137	0	0	0	#1 C.W.TRAVELLING SCREENS EAST	HRDUNIT1	HRD14112032	
	270,072	6,690	6,715	270,182	7,138	0	0	0	#1 C.W.TRAVELLING SCREENS WEST	HRDUNIT1	HRD14112033	
	270,072	6,690	6,715	270,182	7,146	0	0	0	#1 C.W. PUMP EAST	HRDUNIT1	HRD14123032	
	270,072	6,690	6,715	270,182	7,147	0	0	0	#1 C.W. PUMP WEST	HRDUNIT1	HRD14123033	
	270,072	6,690	6,715	270,182	8,819	0	0	0	#1 C.W. SCREEN WASH SYSTEM	HRDUNIT1	HRD14130000	
	270,072	6,690	6,715	270,182	303,300	0	0	0	Anti Fouling System-Unit 1	HRDUNIT1		
500												
	270,072	6,690	6,723	0	0	0	0	0	#1 ELEC & CONTROLS SYSTEM	HRDUNIT1	HRD15000000	
	270,072	6,690	6,723	6,693	0	0	0	0	#1 TURBINE GOVERNOR SYSTEM	HRDUNIT1	HRD11200000	
	270,072	6,690	6,723	6,693	333,928	0	0	0	Holyrood U1 Mark V Auto Sync	HRDUNIT1	U1	
	270,072	6,690	6,723	6,693	99,000,260	0	0	0	INSTALL GOVENOR UNIT 1 - MFG C	HRDPLANT		
	270,072	6,690	6,723	6,693	99,000,267	0	0	0	UPGRADE TURBINE FOR TURBINE SU	HRDPLANT		
	270,072	6,690	6,723	6,693	99,041,695	0	0	0	control bearings for u1 EHC	HRDPLANT		
	270,072	6,690	6,723	6,721	0	0	0	0	#1 RELAY RM PROTECTN & CONTROL	HRDUNIT1	HRD14800000	
	270,072	6,690	6,723	6,722	0	0	0	0	#1 MAIN CONTROLS	HRDUNIT1	HRD14900000	
	270,072	6,690	6,723	6,722	99,000,384	0	0	0	INSTALL 2 PANELS FOR INSTRUMEN	HRDPLANT		
	270,072	6,690	6,723	6,722	99,000,388	0	0	0	BALANCE OF INSTRUMENTATION	HRDPLANT		
	270,072	6,690	6,723	6,722	99,000,394	0	0	0	INSTALL CED PERCISION TRANSDUC	HRDPLANT		
	270,072	6,690	6,723	6,724	0	0	0	0	#1 GENERATOR BUS DUCT & CONNS	HRDUNIT1	HRD15100000	
	270,072	6,690	6,723	6,724	99,000,328	0	0	0	REMOVE & REPLACE ISOLATED PHAS	HRDPLANT		
	270,072	6,690	6,723	6,726	0	0	0	0	#1 UNIT SERVICE POWER SYSTEM	HRDUNIT1	HRD15300000	
	270,072	6,690	6,723	6,726	7,181	0	0	0	UNIT BOARD UB-1	HRDUNIT1	HRD15310000	
	270,072	6,690	6,723	6,726	7,182	0	0	0	POWER CENTRE A	HRDUNIT1	HRD15320000	
	270,072	6,690	6,723	6,726	7,183	0	0	0	TURBINE & BOILER AREA MCC A1	HRDUNIT1	HRD15330000	
	270,072	6,690	6,723	6,726	7,183	7,399	0	0	H.P. HEATER MCC A1-1	HRDUNIT1	HRD15331000	
	270,072	6,690	6,723	6,726	7,183	7,400	0	0	SOOTBLOWER MCC A1-2	HRDUNIT1	HRD15332000	
	270,072	6,690	6,723	6,728	0	0	0	0	#1 BATTERY CHARGERS	HRDUNIT1	HRD15700000	
	270,072	6,690	6,723	6,728	99,000,354	0	0	0	ADDITIONAL COSTS FOR D.C. DIST	HRDPLANT		
	270,072	6,690	6,723	6,728	99,043,229	0	0	0	250 VOLT DC BATTERY BANK	HRDPLANT		
	270,072	6,690	6,723	6,728	99,043,230	0	0	0	250 VOLT DC BATTERY CHARGE	HRDPLANT		
	270,072	6,690	6,723	7,180	0	0	0	0	GENERATOR TRANSFORMER & AUX'S	HRDUNIT1	HRD15220000	
	270,072	6,690	6,723	7,184	0	0	0	0	TURBINE & BOILER AREA MCC C2	HRDUNIT1	HRD15550000	
	270,072	6,690	6,723	7,184	359,338	0	0	0	MCC-C2 UPGRADE	HRDUNIT1	HRD15550001	
	270,072	6,690	6,723	7,186	0	0	0	0	TURBINE & BOILER AREA MCC C3	HRDUNIT1	HRD15570000	
	270,072	6,690	6,723	7,186	359,339	0	0	0	MCC-C3 UPGRADE	HRDPLANT	HRD15570001	
	270,072	6,690	6,723	7,187	0	0	0	0	BOILER ROOM VENT MCC C4	HRDUNIT1	HRD15580000	
	270,072	6,690	6,723	7,193	0	0	0	0	U1 UPS INVERTER	HRDUNIT1	HRD15710000	
	270,072	6,690	6,723	7,193	325,164	0	0	0	SNMP Upgrade - UPS #1 - HRD	HRDUNIT1		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	6,690	6,723	270,151	0	0	0	0	#1 TURBINE SUPERVISORY SYSTEM	HRDUNIT1	HRD11200001	
	270,072	6,690	6,723	270,295	0	0	0	0	#1 SWITCHGEAR 4160/600V	HRDUNIT1		
	270,072	6,690	6,723	270,295	99,000,421	0	0	0	STUDY FOR METALCLAD SWITCHGEAR	HRDPLANT		
	270,072	6,690	6,723	270,295	99,031,936	0	0	0	UPGRADE SYNC CHECK SYSTEM, SEE	HRDPLANT		
	270,072	6,690	6,723	270,296	0	0	0	0	#1 CABLE RACEWAYS	HRDUNIT1		
	270,072	6,690	6,723	270,296	99,000,114	0	0	0	INSTALL CABLE TRENCHES AND DUC	HRDPLANT		
	270,072	6,690	6,723	270,297	0	0	0	0	#1 CONTROL CABLES	HRDUNIT1		
	270,072	6,690	6,723	270,297	99,000,336	0	0	0	REMOVAL AND REROUTING OF CONTR	HRDPLANT		
	270,072	6,690	6,723	270,298	0	0	0	0	#1 POWER CABLES	HRDUNIT1		
	270,072	6,690	6,723	270,298	99,000,340	0	0	0	INSTALL POWER CABLE #4160 V	HRDPLANT		
	270,072	6,690	6,723	270,298	99,000,342	0	0	0	INSTALL POWER CABLES #600 VOLT	HRDPLANT		
	270,072	6,690	6,723	270,298	99,034,726	0	0	0	CABLE REPLACEMENT	HRDPLANT		
	270,072	6,690	6,723	270,298	99,034,726	99,035,941	0	0	Compaq Armada 1750 Laptop	STJSHOP	FA-IC10429	
	270,072	6,690	6,723	291,668	0	0	0	0	Unit 1 DCS	HRDPLANT		
	270,072	6,690	6,723	309,894	0	0	0	0	600 V Meltric Plugs	HRDUNIT1		
	270,072	6,690	6,723	309,897	0	0	0	0	Boiler Prot & Control	HRDUNIT1		
	270,072	6,690	6,723	309,902	0	0	0	0	Dell Latitude D820 Notebook	HRDPLANT		
	270,072	6,690	6,723	343,111	0	0	0	0	#1 BURNER MANAGEMENT	HRDUNIT1	HRD14810000	
	270,072	6,690	359,302	0	0	0	0	0	UNIT 1 BLANKS AND BLINDS	HRDUNIT1		
700												
	270,072	7,199	0	0	0	0	0	0	HRD COMMON SYSTEMS	HRDPLANT	HRD90000000	
	270,072	7,199	6,727	0	0	0	0	0	STAGE 1 STATION SERVICE POWER	HRDUNIT1	HRD15500000	
	270,072	7,199	6,727	99,000,392	0	0	0	0	COMMISSION THE WIRING FOE ALL	HRDPLANT		
	270,072	7,199	6,727	99,000,404	0	0	0	0	INSTALL STATION SERVICE TRANSF	HRDPLANT		
	270,072	7,199	6,769	0	0	0	0	0	HEATING AND VENTILATION	HRDPLANT	HRD98700000	
	270,072	7,199	6,769	303,242	0	0	0	0	Exciter Room West	HRDPLANT		
	270,072	7,199	6,769	303,270	0	0	0	0	Exciter Room East A/C Unit	HRDPLANT		
	270,072	7,199	6,769	303,271	0	0	0	0	Stage 1 Relay Room North	HRDPLANT		
	270,072	7,199	6,769	303,272	0	0	0	0	Stage 1 Relay Room South	HRDPLANT		
	270,072	7,199	6,769	303,273	0	0	0	0	Stage 2 Relay Room North	HRDPLANT		
	270,072	7,199	6,769	303,274	0	0	0	0	Stage 2 Relay Room South	HRDPLANT		
	270,072	7,199	6,904	0	0	0	0	0	COMPUTERS FOXBORO	HRDPLANT	HRD97900000	
	270,072	7,199	6,904	301,712	0	0	0	0	STATION SERVICE DCS	HRDPLANT		
	270,072	7,199	6,904	358,121	0	0	0	0	WATER TREATMENT PLANT CONTROLS	HRDPLANT	HRD97910000	
	270,072	7,199	7,189	0	0	0	0	0	STATION BOARD SB-12	HRDUNIT1	HRD15510000	
	270,072	7,199	7,190	0	0	0	0	0	DIESEL BUS DB12	HRDUNIT1	HRD15520000	
	270,072	7,199	7,191	0	0	0	0	0	ESSENTIAL SERVICE MCC E1	HRDUNIT1	HRD15540000	
	270,072	7,199	7,192	0	0	0	0	0	POWER CENTER C	HRDUNIT1	HRD15530000	
	270,072	7,199	7,192	7,188	0	0	0	0	COMMON SERVICES MCC C1	HRDUNIT1	HRD15590000	
	270,072	7,199	7,192	7,411	0	0	0	0	C.W. PUMPHOUSE MCC C6	HRDUNIT1	HRD15591000	
	270,072	7,199	7,192	7,413	0	0	0	0	WORKSHOP AREA MCC C9	HRDUNIT1	HRD15593000	
	270,072	7,199	7,192	7,414	0	0	0	0	ADMINISTRATION AREA MCC C7	HRDUNIT1	HRD15594000	
	270,072	7,199	7,195	0	0	0	0	0	STAGE 1 129V D.C.SUPPLY SYSTEM	HRDUNIT1	HRD15770000	
	270,072	7,199	7,195	303,344	0	0	0	0	129 VDC Stage 1 Batteries	HRDPLANT		
	270,072	7,199	7,195	303,345	0	0	0	0	129 VDC Charger A	HRDPLANT		
	270,072	7,199	7,195	303,346	0	0	0	0	129 VDC Charger A	HRDPLANT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,199	7,195	303,350	0	0	0	0	129 VDC Charger A	HRDPLANT		
	270,072	7,199	7,195	303,351	0	0	0	0	129 VDC Charger B	HRDPLANT		
	270,072	7,199	7,204	0	0	0	0	0	HEAVY OIL & FUEL ADDITIVE	HRDPLANT	HRD97200000	
	270,072	7,199	7,204	7,222	0	0	0	0	HEAVY OIL RECEPT EQUIP & ELEC	HRDPLANT	HRD97210000	
	270,072	7,199	7,204	7,222	99,000,419	0	0	0	INSTALL LIGHTNING ARRESTORS FO	HRDPLANT		
	270,072	7,199	7,204	7,222	99,000,420	0	0	0	INSTALL LIGHTNING ARRESTORS HO	HRDPLANT		
	270,072	7,199	7,204	7,223	0	0	0	0	*HEAVY OIL TRANSFER TO STORAGE	HRDPLANT	HRD97220000	
	270,072	7,199	7,204	7,223	99,000,024	0	0	0	ADDITIONAL COSTS FOR TERMNIAL	HRDPLANT		
	270,072	7,199	7,204	7,223	99,000,025	0	0	0	PROVIDE PIPING FOR UNLOADING A	HRDPLANT		
	270,072	7,199	7,204	7,223	99,000,026	0	0	0	INSTALL 18" FUEL OIL ISOLATION	HRDPLANT		
	270,072	7,199	7,204	7,223	99,029,561	0	0	0	MAS 18" FLOWSEAL VALVES C/W AC	HRDPLANT		
	270,072	7,199	7,204	7,224	0	0	0	0	HEAVY OIL STORAGE & PIPING	HRDPLANT	HRD97230000	
	270,072	7,199	7,204	7,224	7,439	0	0	0	HEAVY OIL DAY TANK	HRDPLANT	HRD97241000	
	270,072	7,199	7,204	7,224	7,439	99,000,169	0	0	HEAVY OIL FLOWMETER NORTH OF D	HRDPLANT		
	270,072	7,199	7,204	7,224	7,441	0	0	0	HEAVY OIL - #1 TANK	HRDPLANT	HRD97252000	
	270,072	7,199	7,204	7,224	7,441	99,003,554	0	0	TANK FROM DYKE MODIFICATIONS	HRDPLANT		
	270,072	7,199	7,204	7,224	7,442	0	0	0	HEAVY OIL - #2 TANK	HRDPLANT	HRD97253000	
	270,072	7,199	7,204	7,224	7,442	324,377	0	0	Tank Farm Upgrade	HRDPLANT		
	270,072	7,199	7,204	7,224	7,442	99,043,205	0	0	TANK FARM DYKE MODIFICATION	HRDPLANT		
	270,072	7,199	7,204	7,224	7,443	0	0	0	HEAVY OIL - #3 TANK	HRDPLANT	HRD97254000	
	270,072	7,199	7,204	7,224	7,444	0	0	0	HEAVY OIL - #4 TANK	HRDPLANT	HRD97255000A	
	270,072	7,199	7,204	7,224	7,444	342,394	0	0	HEAVY OIL - #4 TANK	HRDPLANT	HRD97255000	
	270,072	7,199	7,204	7,224	7,444	342,395	0	0	HEAVY OIL - #4 TANK	HRDPLANT	HRD97255001	
	270,072	7,199	7,204	7,224	99,000,164	0	0	0	OIL STORAGE TANKS UNIT #3 (#4	HRDPLANT		
	270,072	7,199	7,204	7,224	99,000,166	0	0	0	BALANCE OF OIL STORAGE SYSTEM	HRDPLANT		
	270,072	7,199	7,204	7,224	99,000,167	0	0	0	BALANCE OF OIL STORAGE SYSTEM	HRDPLANT		
	270,072	7,199	7,204	7,224	99,000,168	0	0	0	BALANCE OF OIL STORAGE SYSTEM	HRDPLANT		
	270,072	7,199	7,204	7,229	0	0	0	0	HEAVY OIL SLOPS SYSTEM	HRDPLANT	HRD97280000	
	270,072	7,199	7,204	271,814	0	0	0	0	HRD TANK FARM DYKES & LINERS	HRDPLANT	HRD97230001	
	270,072	7,199	7,204	286,055	0	0	0	0	FUEL ADDITIVE SYSTEMS	HRDPLANT		
	270,072	7,199	7,204	286,055	6,991	0	0	0	#1 BOILER FUEL ADDITIVE SYSTEM	HRDUNIT1	HRD12650000	
	270,072	7,199	7,204	286,055	6,991	99,031,826	0	0	MODIFY FUEL ADDITIVE SYSTEM, S	HRDPLANT		
	270,072	7,199	7,204	286,055	7,227	0	0	0	F/A STORAGE TANK & PUMPS	HRDPLANT	HRD97260000	
	270,072	7,199	7,204	286,055	7,412	0	0	0	FUEL ADDITIVE MCC C8	HRDUNIT1	HRD15592000	
	270,072	7,199	7,204	286,055	7,940	0	0	0	#2 BOILER FUEL ADDITIVE SYSTEM	HRDUNIT2	HRD22650000	
	270,072	7,199	7,204	286,055	7,940	99,031,829	0	0	MODIFY FUEL ADDITIVE SYSTEM, U	HRDPLANT		
	270,072	7,199	7,204	286,055	8,489	0	0	0	#3 BOILER FUEL ADDITIVE SYSTEM	HRDUNIT3	HRD32650000	
	270,072	7,199	7,204	286,055	8,489	99,000,184	0	0	FUEL OIL ADDITIVES SYSTEM UNIT	HRDPLANT		
	270,072	7,199	7,204	286,055	8,489	99,031,830	0	0	MODIFY FUEL ADDITIVE SYSTEM, S	HRDPLANT		
	270,072	7,199	7,205	0	0	0	0	0	COMPRESSED AIR SYSTEMS	HRDPLANT	HRD97300000	
	270,072	7,199	7,205	7,231	0	0	0	0	AIR COMPRESSORS	HRDPLANT	HRD97310000	
	270,072	7,199	7,205	7,231	8,918	0	0	0	#1 ATLAS COPCO ROTARY COMP	HRDPLANT	HRD97311003	
	270,072	7,199	7,205	7,231	8,918	99,000,061	0	0	OIL FREE ROTORY AIR COMPRESSOR	HRDPLANT		
	270,072	7,199	7,205	7,231	8,918	99,000,080	0	0	BALANCE OF COMPRESSED AIR SYST	HRDPLANT		
	270,072	7,199	7,205	7,231	8,918	99,029,554	0	0	AIR COMPRESSOR VIBRATION PROBE	HRDPLANT		
	270,072	7,199	7,205	7,231	9,488	0	0	0	#2 ATLAS COPCO ROTARY COMP	HRDPLANT	HRD97311002	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,199	7,205	7,231	9,488	99,023,634	0	0	AIR COMPRESSOR, SEE PL ASSET 0	HRDPLANT		
	270,072	7,199	7,205	7,231	9,488	99,031,332	0	0	AIR COMPRESSOR ,SEE PL ASSET 2	HRDPLANT		
	270,072	7,199	7,205	7,231	325,028	0	0	0	#3 ATLAS COPCO ROTARY COMP	HRDPLANT		
	270,072	7,199	7,205	7,231	99,000,081	0	0	0	BALANCE OF AIR COMPRESSORS STA	HRDPLANT		
	270,072	7,199	7,205	7,234	0	0	0	0	COMPRESSED AIR DRYERS SYSTEMS	HRDPLANT	HRD97340000	
	270,072	7,199	7,205	7,234	99,000,078	0	0	0	REPLACE BREAKER FOR INSTRUMENT	HRDPLANT		
	270,072	7,199	7,205	7,234	99,000,079	0	0	0	INSTRUMENT AIR DRYER - MFG PAL	HRDPLANT		
	270,072	7,199	7,205	7,234	99,026,193	0	0	0	COMP AIR SYS-INSTR AIR DRYER 5	HRDPLANT		
	270,072	7,199	7,205	7,235	0	0	0	0	COMPRESSED AIR RECEIVERS	HRDPLANT	HRD97350000	
	270,072	7,199	7,205	7,235	99,000,063	0	0	0	AIR RECIEVERS - MANU DRUMMOND	HRDPLANT		
	270,072	7,199	7,205	7,235	99,000,065	0	0	0	AIR RECIEVER - MANU CLEMMER (S	HRDPLANT		
	270,072	7,199	7,205	7,235	99,000,066	0	0	0	AIR RECIEVER - MANU CLEMMER (	HRDPLANT		
	270,072	7,199	7,205	7,235	99,000,067	0	0	0	AIR RECIEVERS - MANU CLEMMER (	HRDPLANT		
	270,072	7,199	7,205	7,235	99,000,073	0	0	0	AIR RECIEVER - MFG DRUMMOND (I	HRDPLANT		
	270,072	7,199	7,205	7,235	99,000,074	0	0	0	AIR RECIEVER - MFG DRUMMOND (S	HRDPLANT		
	270,072	7,199	7,205	7,235	99,000,075	0	0	0	AIR RECIEVER - MFG DRUMMOND (	HRDPLANT		
	270,072	7,199	7,205	7,235	99,000,076	0	0	0	AIR RECIEVER - MFG FERRO METAL	HRDPLANT		
	270,072	7,199	7,206	0	0	0	0	0	GAS STORAGE SYSTEMS	HRDPLANT	HRD97400000	
	270,072	7,199	7,206	7,236	0	0	0	0	HYDROGEN STORAGE AND SUPPLY	HRDPLANT	HRD97410000	
	270,072	7,199	7,206	7,237	0	0	0	0	CARBON DIOXIDE STORAGE/SUPPLY	HRDPLANT	HRD97420000	
	270,072	7,199	7,206	7,237	99,000,085	0	0	0	HYDROGEN AND CO2 SYSTEM	HRDPLANT		
	270,072	7,199	7,206	7,238	0	0	0	0	NITROGEN STORAGE/SUPPLY SYSTEM	HRDPLANT	HRD97430000	
	270,072	7,199	7,208	0	0	0	0	0	AUXILIARY STEAM SYSTEM	HRDPLANT	HRD97600000	
	270,072	7,199	7,208	342,405	0	0	0	0	Steam Flow Transmitter	HRDPLANT	HRD97600001	
	270,072	7,199	7,208	99,000,093	0	0	0	0	AUXILIARY STEAM SYSTEM	HRDPLANT		
	270,072	7,199	7,209	0	0	0	0	0	LIGHT OIL SYSTEM	HRDPLANT	HRD97800000	
	270,072	7,199	7,209	334,475	0	0	0	0	Fuel Storage Facility Drainage	HRDPLANT		
	270,072	7,199	7,209	99,029,565	0	0	0	0	FUEL TRANSFER CATCHMENT BASINS	HRDPLANT		
	270,072	7,199	7,209	99,034,713	0	0	0	0	OIL STORAGE TANK	HRDPLANT		
	270,072	7,199	7,251	0	0	0	0	0	FIRE PROTECTION SYSTEMS	HRDPLANT	HRD98200000	
	270,072	7,199	7,251	7,270	0	0	0	0	GAS FIRE SUPPRESSION SYSTEMS	HRDPLANT	HRD98250000	
	270,072	7,199	7,251	7,270	299,429	0	0	0	Inergen Fire Suppression Sys.	HRDPLANT	COMM. RM	
	270,072	7,199	7,251	7,270	304,675	0	0	0	Inergen (Fire Suspresion)	HRDGRDHSE		
	270,072	7,199	7,251	7,270	99,039,086	0	0	0	Fire Protection System c/w	HRDGT		
	270,072	7,199	7,251	7,271	0	0	0	0	FIRE ALARM SYSTEM	HRDPLANT	HRD98260000	
	270,072	7,199	7,251	7,486	0	0	0	0	FIRE PUMPS - ELECTRIC	HRDPLANT	HRD98211000	
	270,072	7,199	7,251	7,487	0	0	0	0	FIRE PUMPS - DIESEL	HRDPLANT	HRD98212000	
	270,072	7,199	7,251	327,186	0	0	0	0	Fire Protection System Upgrade	HRDPLANT		
	270,072	7,199	7,251	99,000,045	0	0	0	0	DELUGE SYSTEM TRANSFORMERS FOR	HRDPLANT		
	270,072	7,199	7,251	99,000,046	0	0	0	0	DELUGE SYSTEM TRANSFORMERS FOR	HRDPLANT		
	270,072	7,199	7,251	99,000,047	0	0	0	0	INSTALL A 3 HOUR PENRATION FIR	HRDPLANT		
	270,072	7,199	7,251	99,000,048	0	0	0	0	UPGRADING FOR UNITS 1 & 2	HRDPLANT		
	270,072	7,199	7,251	99,000,049	0	0	0	0	INSTALL FIRE ALARM,CONTROL PAN	HRDPLANT		
	270,072	7,199	7,251	99,000,051	0	0	0	0	POWERHOUSE FIRE PROTECTION STA	HRDPLANT		
	270,072	7,199	7,251	99,000,052	0	0	0	0	POWERHOUSE FIRE PROTECTION IMP	HRDPLANT		
	270,072	7,199	7,251	99,000,053	0	0	0	0	POWERHOUSE FIRE PROTECTION UPG	HRDPLANT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,199	7,251	99,000,054	0	0	0	0	BALANCE OF FIRE FIGHTING SYSTE	HRDPLANT		
	270,072	7,199	7,251	99,000,055	0	0	0	0	INSTALL 2 FIRE HOUSES AND EQUI	HRDPLANT		
	270,072	7,199	7,251	99,031,922	0	0	0	0	ADDT'L COSTS UPGRADE 1 & 2, SE	HRDPLANT		
	270,072	7,199	7,251	99,032,480	0	0	0	0	SPRINKLER SYSTEM UNIT 1	HRDPLANT		
	270,072	7,199	7,251	99,032,481	0	0	0	0	SPRINKLER SYSTEM UNIT 2	HRDPLANT		
	270,072	7,199	7,251	99,032,482	0	0	0	0	SPRINKLER SYSTEM UNIT 3	HRDPLANT		
	270,072	7,199	7,251	99,036,223	0	0	0	0	Wet Sprinkler System	HRDPLANT		
	270,072	7,199	7,253	0	0	0	0	0	COMMUNICATION SYSTEMS	HRDPLANT	HRD98400000	
	270,072	7,199	7,256	0	0	0	0	0	CRANES AND HOISTS	HRDPLANT	HRD98800000	
	270,072	7,199	7,256	271,815	0	0	0	0	HRD POWERHOUSE CRANE	HRDPLANT	HRD98800001	
	270,072	7,199	7,256	271,815	99,000,255	0	0	0	ADDITIONAL COSTS FOR CRANE	HRDPLANT		
	270,072	7,199	7,256	271,816	0	0	0	0	HRD BOILER ROOM HOISTS	HRDPLANT	HRD98800002	
	270,072	7,199	7,256	271,817	0	0	0	0	HRD PUMPHOUSE CRANE STAGE 1	HRDPLANT	HRD98800003	
	270,072	7,199	7,256	271,818	0	0	0	0	HRD PUMPHOUSE CRANE STAGE 2	HRDPLANT	HRD98800004	
	270,072	7,199	7,256	271,818	99,000,257	0	0	0	PUMPHOUSE CRANE	HRDPLANT		
	270,072	7,199	7,256	342,409	0	0	0	0	Unit One Stack Winch	HRDUNIT1	HRD98800011	
	270,072	7,199	7,256	342,423	0	0	0	0	Unit Two Stack Winch	HRDUNIT2	HRD98800012	
	270,072	7,199	7,256	342,424	0	0	0	0	Unit Three Stack Winch	HRDUNIT3	HRD98800013	
	270,072	7,199	7,256	99,000,108	0	0	0	0	INSTALL HOIST FOR UNIT #3	HRDPLANT		
	270,072	7,199	7,259	0	0	0	0	0	VIBRATION READINGS	HRDPLANT	HRD98120000	
	270,072	7,199	7,297	0	0	0	0	0	WARM AIR MAKE-UP	HRDPLANT	HRD98790000	
	270,072	7,199	7,297	7,023	0	0	0	0	#1 WARM AIR MAKE-UP SYSTEM	HRDUNIT1	HRD12870000	
	270,072	7,199	7,297	7,023	303,241	0	0	0	Unit 1 North Wall WAM	HRDPLANT		
	270,072	7,199	7,297	7,023	303,263	0	0	0	Unit 1 South Wall WAM	HRDPLANT		
	270,072	7,199	7,297	7,023	303,264	0	0	0	Unit 1 South Wall WAM	HRDPLANT		
	270,072	7,199	7,297	7,023	303,264	359,292	0	0	Unit1 Air Handling Enclosures	HRDPLANT		
	270,072	7,199	7,297	7,023	303,264	359,349	0	0	Unit 1 WAM Air Handling	HRDUNIT1		
	270,072	7,199	7,297	7,972	0	0	0	0	#2 WARM AIR MAKE-UP SYSTEM	HRDUNIT2	HRD22870000	
	270,072	7,199	7,297	7,972	303,265	0	0	0	Unit 2 North Wall WAM	HRDPLANT		
	270,072	7,199	7,297	7,972	303,266	0	0	0	Unit 2 South Wall WAM	HRDPLANT		
	270,072	7,199	7,297	7,972	303,267	0	0	0	Unit 2 South Wall WAM	HRDPLANT		
	270,072	7,199	7,297	7,972	303,267	359,299	0	0	Unit2 Air Handling Enclosures	HRDPLANT		
	270,072	7,199	7,297	7,972	303,267	359,350	0	0	Unit 2 WAM Air Handling	HRDUNIT2		
	270,072	7,199	7,297	8,522	0	0	0	0	#3 WARM AIR MAKE-UP SYSTEM	HRDUNIT3	HRD32870000	
	270,072	7,199	7,297	8,522	303,268	0	0	0	Unit 3 North Wall WAM	HRDPLANT		
	270,072	7,199	7,297	8,522	303,269	0	0	0	Unit 3 South Wall WAM	HRDPLANT		
	270,072	7,199	7,297	8,522	303,278	0	0	0	Unit 3 North Wall WAM	HRDPLANT		
	270,072	7,199	7,297	8,522	303,279	0	0	0	Unit 3 South Wall WAM Louvers	HRDPLANT		
	270,072	7,199	7,297	8,522	303,279	359,300	0	0	Unit3 Air Handling Enclosures	HRDPLANT		
	270,072	7,199	7,297	8,522	303,279	359,351	0	0	Unit 3 WAM Air Handling	HRDUNIT3		
	270,072	7,199	8,680	0	0	0	0	0	STAGE 2 AUX. DIESEL GENERATOR	HRDUNIT3	HRD34300000	
	270,072	7,199	8,680	99,000,314	0	0	0	0	INSTALL EMERGENCY DIESEL UNIT	HRDPLANT		
	270,072	7,199	8,680	99,000,315	0	0	0	0	INSTALL WOODWARD DIESEL UNIT U	HRDPLANT		
	270,072	7,199	8,680	99,000,396	0	0	0	0	INSTALL RELAYS FOR UNIT 3	HRDPLANT		
	270,072	7,199	8,680	99,031,801	0	0	0	0	DIESEL SYNCHRONIZER, SEE PL AS	HRDPLANT		
	270,072	7,199	8,730	0	0	0	0	0	#3STATION SERVICE POWER SYSTEM	HRDUNIT3	HRD35500000	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,199	8,730	7,410	0	0	0	0	WARM AIR MAKEUP MCC-WAM-34	HRDUNIT1	HRD35580000	
	270,072	7,199	8,730	8,731	0	0	0	0	STATION SERVICE BOARD SB-34	HRDUNIT3	HRD35510000	
	270,072	7,199	8,730	8,732	0	0	0	0	STATION AUXILIARY BOARD SAB-34	HRDUNIT3	HRD35520000	
	270,072	7,199	8,730	8,738	0	0	0	0	GENERAL PURPOSE MCC GPB-34	HRDUNIT3	HRD35530000	
	270,072	7,199	8,730	8,738	99,038,707	0	0	0	SIEMENS BREAKER MCC GPB34	HRDPLANT		
	270,072	7,199	8,730	8,738	99,038,708	0	0	0	SIEMENS BREAKER MCC GPB34	HRDPLANT		
	270,072	7,199	8,730	8,738	99,038,709	0	0	0	SIEMENS BREAKER MCC GPB34	HRDPLANT		
	270,072	7,199	8,730	8,738	99,038,710	0	0	0	SIEMENS BREAKER MCC GPB34	HRDPLANT		
	270,072	7,199	8,730	8,738	99,038,711	0	0	0	SIEMENS BREAKER MCC GPB34	HRDPLANT		
	270,072	7,199	8,730	8,740	0	0	0	0	TURB & BLR STANDBY MCC SDB-34	HRDUNIT3	HRD35540000	
	270,072	7,199	8,730	8,740	358,127	0	0	0	MCC-SDB UPGRADE	HRDUNIT3	HRD35540001	
	270,072	7,199	8,730	8,742	0	0	0	0	DIESEL BUS DB-34	HRDUNIT3	HRD35550000	
	270,072	7,199	8,730	8,743	0	0	0	0	ESSENTIAL SERVICES MCC ESB-34	HRDUNIT3	HRD35551000	
	270,072	7,199	8,730	8,746	0	0	0	0	C.W. PUMPHOUSE MCC CWP-34	HRDUNIT3	HRD35560000	
	270,072	7,199	8,730	8,746	358,108	0	0	0	C.W. SCREEN WASH RELAY PANEL	HRDUNIT3	HRD35562000	
	270,072	7,199	8,730	8,746	359,340	0	0	0	C.W. PUMPHOUSE MCC CWP-34	HRDUNIT3	HRD35561000	
	270,072	7,199	8,730	99,000,405	0	0	0	0	INSTALL STATION SERVICE TRANSF	HRDPLANT		
	270,072	7,199	8,771	0	0	0	0	0	STAGE 2 129V D.C. SUPPLY	HRDUNIT3	HRD35770000	
	270,072	7,199	8,771	99,000,355	0	0	0	0	INSTALL D.C. DISTRIBUTION BOAR	HRDPLANT		
	270,072	7,199	8,771	99,029,568	0	0	0	0	C & D 60 CELL BATTERY BANK	HRDPLANT		
	270,072	7,199	273,390	0	0	0	0	0	UHF PORTABLE HANDIE TALKIE	HRDPLANT	TC10054	
	270,072	7,199	286,056	0	0	0	0	0	BOILER GAS ANALYZING SYSTEMS	HRDPLANT		
	270,072	7,199	286,056	6,926	0	0	0	0	#1 BOILER GAS ANALYZING	HRDUNIT1	HRD12537000	
	270,072	7,199	286,056	7,162	0	0	0	0	DEW POINT MONITORING	HRDPLANT	HRD98180000	
	270,072	7,199	286,056	7,898	0	0	0	0	#2 BOILER GAS ANALYZING	HRDUNIT2	HRD22537000	
	270,072	7,199	286,056	8,446	0	0	0	0	#3 BOILER GAS ANALYZING	HRDUNIT3	HRD32537000	
	270,072	7,199	303,240	0	0	0	0	0	Stage 1 Emergency Diesel	HRDPLANT		
	270,072	7,199	359,306	0	0	0	0	0	COMMON BLANKS AND BLINDS	HRDPLANT		
	270,072	7,202	0	0	0	0	0	0	GAS TURBINE SYSTEM	HRDPLANT	HRD99000000	
	270,072	7,202	7,058	0	0	0	0	0	GAS TURBINE POWER TURB & G/B	HRDPLANT	HRD99200000	
	270,072	7,202	7,058	99,003,600	0	0	0	0	POWER TURBINE FOR HRD. GAS TUR	HRDGT		
	270,072	7,202	7,058	99,003,601	0	0	0	0	MATERIALS TO UPGRADE POWER TUR	HRDGT		
	270,072	7,202	7,308	0	0	0	0	0	GAS TURBINE AVON JET ENGINE	HRDPLANT	HRD99100000	
	270,072	7,202	7,308	99,003,605	0	0	0	0	JET ENGINE; ROLLS ROYCE	HRDGT		
	270,072	7,202	7,309	0	0	0	0	0	GAS TURBINE GENERATOR	HRDPLANT	HRD99300000	
	270,072	7,202	7,309	99,003,606	0	0	0	0	ROTOR FOR GENERATOR AT HRD. GA	HRDGT		
	270,072	7,202	7,309	99,003,607	0	0	0	0	STATOR FOR GENERATOR AT HRD. G	HRDGT		
	270,072	7,202	7,309	99,003,608	0	0	0	0	BALANCE OF GENERATOR FOR HRD.	HRDGT		
	270,072	7,202	7,309	99,003,609	0	0	0	0	UPGRADE BALANCE OF GENERATOR A	HRDGT		
	270,072	7,202	7,310	0	0	0	0	0	HRD GAS TURB ELECT & CONTROL	HRDPLANT	HRD99400000	
	270,072	7,202	7,310	333,927	0	0	0	0	HRD GAS TURB DCS CONTROL	HRDGT		
	270,072	7,202	7,310	99,003,597	0	0	0	0	BILLING, METERING, RELAY CONTR	HRDGT		
	270,072	7,202	7,310	99,003,598	0	0	0	0	UPGRADE CONTROL SYSTEM (GAS TU	HRDGT		
	270,072	7,202	7,311	0	0	0	0	0	GAS TURBINE AUXILIARY SYSTEMS	HRDPLANT	HRD99500000	
	270,072	7,202	7,311	99,003,591	0	0	0	0	COMPRESSED AIR SYSTEM (TANK, D	HRDGT		
	270,072	7,202	7,311	99,003,599	0	0	0	0	UPGRADE MAIN LUBE OIL SET (GAS	HRDGT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

Stantec

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,202	7,311	99,003,602	0	0	0	0	AIR INLET PLENUM CHAMBER	HRDGT		
	270,072	7,202	7,311	99,003,603	0	0	0	0	UPGRADE INLET PLENUM AT HRD DU	HRDGT		
	270,072	7,202	7,311	99,027,851	0	0	0	0	110 VOLT C & D BATTERY BANK	HRDGT		
	270,072	7,202	7,311	99,027,852	0	0	0	0	120 VDC BATTERY CHARGER	HRDGT		
	270,072	7,202	359,204	0	0	0	0	0	HOLYROD GAS TURBINE STUDY	HRDGT		
	270,072	7,202	99,027,850	0	0	0	0	0	UPGRADE GAS TURBINE CONTROL PA	HRDGT		
200												
	270,072	7,255	0	0	0	0	0	0	HRD BUILDINGS AND SITE	HRDPLANT	HRD98600000	
	270,072	7,255	7,133	0	0	0	0	0	HRD MARINE TERMINAL STRUCTURE	HRDPLANT	HRD98640000	
	270,072	7,255	7,133	291,152	0	0	0	0	Dock upgrading-Security Projec	HRDPLANT		
	270,072	7,255	7,133	324,311	0	0	0	0	U/G Bldg. Ventilation	HRDPLANT	MARINE TERM.	
	270,072	7,255	7,133	334,476	0	0	0	0	Marine Capstan Lifting Frames	HRDPLANT		
	270,072	7,255	7,133	359,205	0	0	0	0	HOLYROOD MARINE TERMINAL STUDY	HRDPLANT		
	270,072	7,255	7,133	99,000,017	0	0	0	0	ADDITIONAL COSTS FOR INSURANCE	HRDPLANT		
	270,072	7,255	7,133	99,000,018	0	0	0	0	ENHANCEMENT TO WHARF	HRDPLANT		
	270,072	7,255	7,133	99,000,019	0	0	0	0	CATHODIC PROTECTION FOR THE DO	HRDPLANT		
	270,072	7,255	7,133	99,000,106	0	0	0	0	CONSTRUCTION OF NEW PUMPHOUSE	HRDPLANT		
100												
	270,072	7,255	7,257	0	0	0	0	0	HRD LAND	HRDPLANT	HRD98900000	
	270,072	7,255	7,257	7,609	0	0	0	0	HRD GREEN ACRES SITE LAND	HRDPLANT	HRD98944000	
	270,072	7,255	7,257	7,610	0	0	0	0	HRD BUTTERPOT SITE LAND	HRDPLANT	HRD98945000	
	270,072	7,255	7,257	7,611	0	0	0	0	HRD LAWRENCE POND SITE LAND	HRDPLANT	HRD98946000	
	270,072	7,255	7,257	7,612	0	0	0	0	HRD INDIAN POND SITE LAND	HRDPLANT	HRD98947000	
	270,072	7,255	7,257	272,254	0	0	0	0	HRD LAND IMPROVEMENTS	HRDPLANT	HRD98900001	
	270,072	7,255	7,257	272,254	291,150	0	0	0	Site improvements-Sec. project	HRDPLANT		
	270,072	7,255	7,257	272,254	99,000,002	0	0	0	LAND IMPROVEMNETS	HRDPLANT		
	270,072	7,255	7,257	272,254	99,000,003	0	0	0	LAND IMPROVEMENTS	HRDPLANT		
	270,072	7,255	7,257	272,254	99,000,004	0	0	0	LAND IMPROVEMENTS STAGE III	HRDPLANT		
	270,072	7,255	7,257	272,254	99,000,005	0	0	0	LAND IMPROVEMENTS	HRDPLANT		
	270,072	7,255	7,257	272,254	99,000,006	0	0	0	PARKING FACILITIES ON WESTERN	HRDPLANT		
	270,072	7,255	7,257	272,254	99,000,007	0	0	0	PROTECTION AT INTERSECTION OF	HRDPLANT		
	270,072	7,255	7,257	272,254	99,000,009	0	0	0	LAND IMPROVEMENTS AT TANK FARM	HRDPLANT		
	270,072	7,255	7,257	272,254	99,000,010	0	0	0	SODS AND TOPSOIL	HRDPLANT		
	270,072	7,255	7,257	272,254	99,003,525	0	0	0	LAND IMPROVEMENTS FOR WASTE WA	HRDPLANT		
	270,072	7,255	7,257	272,254	99,027,843	0	0	0	LAND IMPROVEMENTS AT GREEN ACR	HRDPLANT		
	270,072	7,255	7,257	272,254	99,032,483	0	0	0	LAND IMPROVEMENTS	HRDPLANT		
	270,072	7,255	7,257	99,018,718	0	0	0	0	LANDSCAPE AREA ADJACENT TO ACC	HRDOFFICE		
	270,072	7,255	7,257	99,041,210	0	0	0	0	LAND	HRDPLANT		
200												
	270,072	7,255	253,041	0	0	0	0	0	HRD CAR WASH SYSTEM	HRDPLANT	HRD98970000	
	270,072	7,255	253,041	99,039,071	0	0	0	0	Foundations and civil work	HRDPLANT		
	270,072	7,255	272,255	0	0	0	0	0	HRD BUILDINGS	HRDPLANT	HRD98900002	
	270,072	7,255	272,255	7,283	0	0	0	0	HRD MAIN POWERHOUSE	HRDPLANT	HRD98610000	
	270,072	7,255	272,255	7,283	7,306	0	0	0	HRD BUILDING SERVICES ELEVATOR	HRDPLANT	HRD98960000	
	270,072	7,255	272,255	7,283	299,949	0	0	0	HRD FALL PROTECTION EQUIPMENT	HRDPLANT		
	270,072	7,255	272,255	7,283	333,646	0	0	0	Safety Egress Lighting	HRDPLANT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,255	272,255	7,283	342,604	0	0	0	Emergency Ladders	HRDPLANT		
	270,072	7,255	272,255	7,283	343,143	0	0	0	Platform, Special Valve	HRDPLANT		
	270,072	7,255	272,255	7,283	359,329	0	0	0	Weatherhoods for Vent Fans	HRDPLANT		
	270,072	7,255	272,255	7,284	0	0	0	0	HRD TRAINING CENTRE	HRDPLANT	HRD98620000	
	270,072	7,255	272,255	7,284	99,000,105	0	0	0	INSTALL INSULATION & HEATING F	HRDPLANT		
	270,072	7,255	272,255	7,285	0	0	0	0	HRD STAGE 1 PUMPHOUSE	HRDPLANT	HRD98630000	
	270,072	7,255	272,255	7,285	99,003,590	0	0	0	FENCING AT HRD GAS TURBINE	HRDGT		
	270,072	7,255	272,255	7,286	0	0	0	0	HRD STAGE 2 PUMPHOUSE	HRDPLANT	HRD98650000	
	270,072	7,255	272,255	7,286	299,950	0	0	0	FALL PROTECTION EQUIPMENT P#2	HRDPLANT		
	270,072	7,255	272,255	7,286	359,341	0	0	0	STAGE II PUMPHOUSE MCC ROOM	HRDPLANT	HRD98651000	
	270,072	7,255	272,255	7,287	0	0	0	0	HRD GUARDHOUSE	HRDPLANT	HRD98660000	
	270,072	7,255	272,255	7,287	324,052	0	0	0	HD Security Camera Systems	HRDOFFICE		
	270,072	7,255	272,255	7,287	334,498	0	0	0	Security Camera Systems - HRD	HRDOFFICE		
	270,072	7,255	272,255	7,287	359,534	0	0	0	HD Security Camera Systems	HRDOFFICE		
	270,072	7,255	272,255	7,288	0	0	0	0	HRD H2 & CO2 STORAGE BUILDING	HRDPLANT	HRD98670000	
	270,072	7,255	272,255	7,302	0	0	0	0	HRD SHAWMONT BUILDING	HRDPLANT	HRD98910000	
	270,072	7,255	272,255	7,303	0	0	0	0	HRD MAIN WAREHOUSE	HRDPLANT	HRD98920000	
	270,072	7,255	272,255	7,303	324,512	0	0	0	3M x 30M Outdoor Storage Ramps	HRDWHYARD		
	270,072	7,255	272,255	7,303	99,002,058	0	0	0	STORAGE RACKS AT HOLYROOD WARE	HRDOFFICE		
	270,072	7,255	272,255	7,303	99,026,217	0	0	0	STEEL SHELVING - MAIN WAREHOUS	HRDOFFICE		
	270,072	7,255	272,255	7,303	99,032,820	0	0	0	PIPE STORAGE RACK	HRDOFFICE		
	270,072	7,255	272,255	7,304	0	0	0	0	HRD WWT PLANT BUILDING	HRDPLANT	HRD98930000	
	270,072	7,255	272,255	7,305	0	0	0	0	HRD WWT BASINS BUILDING	HRDPLANT	HRD98950000	
	270,072	7,255	272,255	7,307	0	0	0	0	HRD GAS TURBINE BUILDING	HRDPLANT	HRD98940000	
	270,072	7,255	272,255	7,307	99,003,595	0	0	0	FOUNDATION (CONCRETE) FOR EQUI	HRDGT		
	270,072	7,255	272,255	7,307	99,003,613	0	0	0	GROUNDING FOR HRD. GAS TURBINE	HRDGT		
	270,072	7,255	272,255	272,256	0	0	0	0	HRD WATER TREATMENT BUILDING	HRDPLANT	HRD98950001	
	270,072	7,255	272,255	291,143	0	0	0	0	Guard house marine terminal	HRDPLANT		
	270,072	7,255	272,255	303,237	0	0	0	0	Guardhouse	HRDGRDHSE		
	270,072	7,255	272,255	303,237	304,497	0	0	0	Furniture	HRDGRDHSE		
	270,072	7,255	272,255	303,237	304,674	0	0	0	Emergency Power Building	HRDGRDHSE		
	270,072	7,255	272,255	303,237	304,677	0	0	0	Air Conditioners	HRDGRDHSE		
	270,072	7,255	272,255	305,735	0	0	0	0	Fall Arrest equip-holyrood	HRDPLANT		
	270,072	7,255	272,255	310,010	0	0	0	0	Fall Arrest Equip-Holyrood	HRDPLANT		
	270,072	7,255	272,255	324,826	0	0	0	0	Fall Arrest Equip-Holyrood	HRDPLANT		
	270,072	7,255	272,255	324,828	0	0	0	0	Fall Arrest Equip-Holyrood	HRDPLANT		
	270,072	7,255	272,255	324,829	0	0	0	0	Fall Arrest Equip-Holyrood	HRDPLANT		
	270,072	7,255	272,255	342,406	0	0	0	0	East Elec. Panel Enclosure	HRDPLANT		
	270,072	7,255	272,255	342,407	0	0	0	0	West Elec. panel Enclosure	HRDPLANT		
	270,072	7,255	272,255	357,449	0	0	0	0	HRD OVERHEAD DOORS	HRDPLANT		
	270,072	7,255	272,255	357,449	357,958	0	0	0	#1 - MAIN POWERHOUSE - WEST	HRDPLANT	HRD98910001	
	270,072	7,255	272,255	357,449	357,959	0	0	0	#2 - MAIN POWERHOUSE - NORTH	HRDPLANT	HRD98910002	
	270,072	7,255	272,255	357,449	357,960	0	0	0	#3 - MAIN POWERHOUSE - NORTH	HRDPLANT	HRD98910004	
	270,072	7,255	272,255	357,449	357,961	0	0	0	#4 - MAIN POWERHOUSE - NORTH	HRDPLANT	HRD98910005	
	270,072	7,255	272,255	357,449	357,962	0	0	0	#5 - MAIN POWERHOUSE - EAST	HRDPLANT	HRD98910006	
	270,072	7,255	272,255	357,449	357,963	0	0	0	#6 - MAIN POWERHOUSE - EAST	HRDPLANT	HRD98910007	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

Stantec

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,255	272,255	357,449	357,964	0	0	0	#7 - MAIN POWERHOUSE - EAST	HRDPLANT	HRD98910008	
	270,072	7,255	272,255	357,449	357,965	0	0	0	#8 - MAIN POWERHOUSE - SOUTH	HRDPLANT	HRD98910009	
	270,072	7,255	272,255	357,449	357,966	0	0	0	#9 - MAIN POWERHOUSE - WEST	HRDPLANT	HRD98910010	
	270,072	7,255	272,255	357,449	357,967	0	0	0	#10 - PUMPHOUSE #1 - WEST	HRDPLANT	HRD98910011	
	270,072	7,255	272,255	357,449	357,968	0	0	0	#11 - PUMPHOUSE #1 - SOUTH	HRDPLANT	HRD98910012	
	270,072	7,255	272,255	357,449	357,971	0	0	0	#12 - WASTE WATER TREATMENT	HRDPLANT	HRD98910013	
	270,072	7,255	272,255	357,449	357,972	0	0	0	#13 - PUMPHOUSE #2	HRDPLANT	HRD98910014	
	270,072	7,255	272,255	357,449	357,973	0	0	0	#14 - CHEMICAL STORAGE BLDG.	HRDPLANT	HRD98910015	
	270,072	7,255	272,255	357,449	357,974	0	0	0	#15 - CHEMICAL STORAGE BLDG.	HRDPLANT	HRD98910016	
	270,072	7,255	272,255	357,449	357,975	0	0	0	#16 - PIPE SHOP - NORTH	HRDPLANT	HRD98910017	
	270,072	7,255	272,255	357,449	357,976	0	0	0	#17 - TRAINING CENTER	HRDPLANT	HRD98910018	
	270,072	7,255	272,255	357,449	357,977	0	0	0	#18 - WAREHOUSE	HRDPLANT	HRD98910019	
	270,072	7,255	272,255	357,449	357,978	0	0	0	#19 - PIPE SHOP - SOUTH	HRDPLANT	HRD98910020	
	270,072	7,255	272,255	357,449	357,979	0	0	0	#20 - SHAWMOUNT WAREHOUSE	HRDPLANT	HRD98910021	
	270,072	7,255	272,255	357,449	357,980	0	0	0	#21 - HYDROGEN SHED	HRDPLANT	HRD98910022	
	270,072	7,255	272,255	357,449	357,981	0	0	0	#22 - GAS TURBINE BUILDING	HRDPLANT	HRD98910023	
	270,072	7,255	272,255	357,449	359,342	0	0	0	#2A - MAIN POWERHOUSE - NORTH	HRDPLANT	HRD98910003	
	270,072	7,255	272,255	357,449	359,343	0	0	0	#23 - POWERHOUSE INTERIOR	HRDPLANT	HRD98910024	
	270,072	7,255	272,255	359,222	0	0	0	0	HRD FIXED FALL ARREST EQUIP.	HRDPLANT		
	270,072	7,255	272,255	359,222	359,446	0	0	0	HRD-STACK 1 FIXED FALL ARREST	HRDUNIT1		
	270,072	7,255	272,255	359,222	359,447	0	0	0	HRD-STACK 2 FIXED FALL ARREST	HRDUNIT2		
	270,072	7,255	272,255	359,222	359,448	0	0	0	HRD-STACK 3 FIXED FALL ARREST	HRDUNIT3		
	270,072	7,255	272,255	360,018	0	0	0	0	HRD BUILDINGS EXIT DOORS	HRDPLANT	HRD98910100	
	270,072	7,255	272,255	99,027,841	0	0	0	0	GREEN ACRES MONITORING SITE	HRDPLANT		
	270,072	7,255	272,255	99,027,842	0	0	0	0	FOUNDATION FOR WOODEN BLDG AT	HRDPLANT		
100												
	270,072	7,255	272,257	0	0	0	0	0	HRD ROADS & SITE LIGHTING	HRDPLANT	HRD98600001	
	270,072	7,255	272,257	99,000,012	0	0	0	0	ROADS AT THERMAL PLANT	HRDPLANT		
	270,072	7,255	272,257	99,000,013	0	0	0	0	UPGRADE AT TANKER DOCK	HRDPLANT		
	270,072	7,255	272,257	99,000,014	0	0	0	0	PROVIDE SITE ROADS FOR HOLYROO	HRDPLANT		
	270,072	7,255	272,257	99,000,015	0	0	0	0	REPAIR ROADS, WORK ORDER 0035	HRDPLANT		
	270,072	7,255	272,257	99,000,056	0	0	0	0	LIGHTING SYSTEM - OUTDOOR	HRDPLANT		
	270,072	7,255	272,257	99,000,057	0	0	0	0	COSTS TRANSFERED FROM OPERATIN	HRDPLANT		
	270,072	7,255	272,257	99,000,422	0	0	0	0	INSTALL 250WATT STREET LIGHTS	HRDPLANT		
	270,072	7,255	272,257	99,000,423	0	0	0	0	ADDITIONAL COSTS FOR STREET LI	HRDPLANT		
	270,072	7,255	272,257	99,027,844	0	0	0	0	ACCESS ROAD TO GREEN ACRES MON	HRDPLANT		
	270,072	7,255	272,258	0	0	0	0	0	HRD FENCING	HRDPLANT	HRD98600002	
	270,072	7,255	272,258	291,146	0	0	0	0	Fencing - Security Project	HRDPLANT		
	270,072	7,255	272,258	334,492	0	0	0	0	Fence, Security - HRD	HRDPLANT		
	270,072	7,255	272,258	99,000,029	0	0	0	0	CHAIN LINK FENCING	HRDPLANT		
	270,072	7,255	272,258	99,000,030	0	0	0	0	CHAIN LINK FENCING AROUND STOR	HRDPLANT		
	270,072	7,255	272,258	99,000,031	0	0	0	0	CHAIN LINK FENCING,SEE PL ASSE	HRDPLANT		
	270,072	7,255	272,258	99,000,032	0	0	0	0	CHAIN LINK FENCING	HRDPLANT		
	270,072	7,255	272,258	99,000,033	0	0	0	0	REMOVE AND REPLACE FENCING	HRDPLANT		
	270,072	7,255	272,258	99,027,840	0	0	0	0	CHAIN LINK FENCING	HRDPLANT		
	270,072	7,255	272,258	99,027,849	0	0	0	0	GALVANIZED CHAIN LINK FENCING	HRDPLANT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,255	272,259	0	0	0	0	0	HRD STORM DRAINAGE	HRDPLANT	HRD98600003	
	270,072	7,255	272,259	341,794	0	0	0	0	Catch Basins on East and North	HRDPLANT		
	270,072	7,255	272,259	99,000,035	0	0	0	0	STORM AND YARD DRAINAGE STAGE	HRDPLANT		
	270,072	7,255	272,259	99,000,036	0	0	0	0	PLANT DRAINAGE MODIFICATIONS	HRDPLANT		
	270,072	7,255	272,259	99,000,037	0	0	0	0	INSTALL SUB-SURFACE DRAINS STA	HRDPLANT		
	270,072	7,255	272,259	99,003,526	0	0	0	0	POWERHOUSE DRAINAGE SYSTEM	HRDPLANT		
	270,072	7,255	291,154	0	0	0	0	0	Fibre Line to docks-Sec Proj	HRDPLANT		
	270,072	7,255	291,155	0	0	0	0	0	Camera and security-dock	HRDPLANT		
	270,072	7,255	292,266	0	0	0	0	0	HRD DIST SERVICES	HRDPLANT		
	270,072	7,255	292,266	291,153	0	0	0	0	Distribution line-sec proj	HRDPLANT		
	270,072	7,255	292,266	99,000,406	0	0	0	0	INSTALL WOOD POLE STRUCTURES D	HRDPLANT		
	270,072	7,255	292,266	99,000,407	0	0	0	0	WOOD POLE STRUCTURES FOR HOLYR	HRDPLANT		
	270,072	7,255	292,266	99,000,408	0	0	0	0	ADDITIONAL COSTS FOR WOOD POLE	HRDPLANT		
	270,072	7,255	292,266	99,000,409	0	0	0	0	INSTALL DISTRIBUTION TRANSFORM	HRDPLANT		
	270,072	7,255	292,266	99,023,675	0	0	0	0	WOOD POLE STRUCTURES	HRDPLANT		
	270,072	7,255	292,266	99,023,677	0	0	0	0	150 WATT HPS STREETLIGHTS	HRDPLANT		
	270,072	7,255	292,266	99,023,680	0	0	0	0	WESTINGHOUSE 10 KVA POLE TRANS	HRDPLANT		
	270,072	7,255	292,266	99,023,682	0	0	0	0	WESTINGHOUSE 15 KVA POLE TYPE	HRDPLANT	FA-T30007	
	270,072	7,255	292,266	99,023,684	0	0	0	0	WESTINGHOUSE 15 KVA POLE TYPE	HRDPLANT	FA-T5184	
	270,072	7,255	292,266	99,023,687	0	0	0	0	GENERAL ELECTRIC 25 KVA POLE T	HRDPLANT		
	270,072	7,255	292,266	99,027,647	0	0	0	0	POLE HARDWARE	HRDPLANT		
	270,072	7,255	292,266	99,027,648	0	0	0	0	#1/0 AASC PRIMARY CONDUCTOR	HRDPLANT		
	270,072	7,255	292,266	99,027,649	0	0	0	0	#1/0 PEWP SECONDARY CONDUCTOR	HRDPLANT		
	270,072	7,255	292,266	99,027,650	0	0	0	0	30' WOOD POLES	HRDPLANT		
	270,072	7,255	292,266	99,027,651	0	0	0	0	40' WOOD POLES	HRDPLANT		
	270,072	7,255	292,266	99,027,652	0	0	0	0	#2 QUAD SERVICE CONDUCTOR	HRDPLANT		
	270,072	7,255	292,266	99,027,653	0	0	0	0	25KVA TRANSFORMERS	HRDPLANT		
	270,072	7,255	292,266	99,029,569	0	0	0	0	UPGRADE SITE SERVICES HOLYROOD	HRDPLANT		
	270,072	7,255	292,266	99,032,022	0	0	0	0	WOOD POLE STRUCTURES, SEE PL A	HRDPLANT		
200												
	270,072	7,255	99,002,057	0	0	0	0	0	FIRE TRAINING GROUNDS FOR HOLY	HRDOFFICE		
	270,072	7,255	99,023,635	0	0	0	0	0	TRANSPORTABLE AMBIENT MONITORI	HRDPLANT		
	270,072	7,255	99,023,636	0	0	0	0	0	TRANSPORTABLE AMBIENT MONITORI	HRDPLANT		
	270,072	7,255	99,023,637	0	0	0	0	0	TRANSPORTABLE AMBIENT MONITORI	HRDPLANT		
	270,072	7,255	99,039,841	0	0	0	0	0	SECURITY SURVEILLANCE SYSTEM	HRDOFFICE		
700												
	270,072	7,505	0	0	0	0	0	0	HRD TOOLS & EQUIPMENT	HRDPLANT	HRD98355000	
	270,072	7,505	7,265	0	0	0	0	0	SAFETY EQUIPMENT AND PPE	HRDPLANT	HRD98190000	
	270,072	7,505	7,265	7,267	0	0	0	0	FIRE FIGHTING EQUIPMENT	HRDPLANT	HRD98220000	
	270,072	7,505	7,265	7,267	358,922	0	0	0	Foam Cart #1	HRDPLANT		
	270,072	7,505	7,265	7,267	358,923	0	0	0	Foam Cart #2	HRDPLANT		
	270,072	7,505	7,265	7,267	99,004,724	0	0	0	ROSCO SMOKE GENERATOR C/W CASE	HRDOFFICE	FA-03227	
	270,072	7,505	7,265	7,267	99,004,760	0	0	0	BREATHING APPARATUS MODEL - MO	HRDOFFICE	FA-01936	
	270,072	7,505	7,265	7,267	99,004,761	0	0	0	BREATHING APPARATUS MODEL - MO	HRDOFFICE	FA-1935	
	270,072	7,505	7,265	7,267	99,004,762	0	0	0	SCOTT 2.2 SELF CONTAINED BREAT	HRDOFFICE	FA-03418	
	270,072	7,505	7,265	7,267	99,004,763	0	0	0	SCOTT GO-NO-GO REGULATOR TESTE	HRDOFFICE	FA-003189	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,505	7,265	7,267	99,004,783	0	0	0	BAUER BREATHING AIR COMPRESSOR	HRDOFFICE	FA-01911	
	270,072	7,505	7,265	7,267	99,004,792	0	0	0	2.2 PRESSURE DEMAND AIR PAK -	HRDOFFICE	FA-03416	
	270,072	7,505	7,265	7,267	99,018,387	0	0	0	PIONEER 60 MINUTE CYLINDER - M	HRDOFFICE	FA-003188	
	270,072	7,505	7,265	7,267	99,023,423	0	0	0	#3 ANGUS MOBILE FOAM CART UNIT	HRDOFFICE	FA-01902	
	270,072	7,505	7,265	7,267	99,023,427	0	0	0	SCOT 60 MINUTE AIR PAK C/W 2 C	HRDOFFICE	FA-03417	
	270,072	7,505	7,265	7,267	99,026,210	0	0	0	SCBA 60 MIN E-Z FLO AIR-PAKS	HRDOFFICE	FA-003186	
	270,072	7,505	7,265	7,267	99,026,211	0	0	0	SCBA 88 CU. FT CYLINDER & VALV	HRDOFFICE	FA-003185	
	270,072	7,505	7,265	7,267	99,034,124	0	0	0	SCBA 60 MIN E-Z FLO AIR-PA	HRDOFFICE	FA-003187	
	270,072	7,505	7,265	7,267	99,034,204	0	0	0	BAUER BREATHING AIR COMPRESSOR	HRDOFFICE	FA-01912	
	270,072	7,505	7,265	7,267	99,034,205	0	0	0	BAUER BREATHING AIR COMPRESSOR	HRDOFFICE	FA-01913	
	270,072	7,505	7,265	7,267	99,034,206	0	0	0	BAUER BREATHING AIR COMPRESSOR	HRDOFFICE	FA-01914	
	270,072	7,505	7,265	7,267	99,034,207	0	0	0	BAUER BREATHING AIR COMPRESSOR	HRDOFFICE	FA-01915	
	270,072	7,505	7,265	7,267	99,039,951	0	0	0	Scott SCUBA Packs	HRDOFFICE		
	270,072	7,505	7,265	333,647	0	0	0	0	Fall Protection	HRDPLANT	5903	
	270,072	7,505	7,265	333,648	0	0	0	0	Fall Protection	HRDPLANT		
	270,072	7,505	7,265	333,649	0	0	0	0	Fall Protection	HRDPLANT	5902	
	270,072	7,505	7,265	333,650	0	0	0	0	Fall Protection	HRDPLANT		
	270,072	7,505	7,265	359,442	0	0	0	0	HRD Fall Protection Stack1	HRDPLANT		
	270,072	7,505	7,265	333,650	0	0	0	0	Fall Protection	HRDPLANT		
	270,072	7,505	7,265	359,442	0	0	0	0	HRD Fall Protection Stack1	HRDPLANT		
	270,072	7,505	7,265	359,443	0	0	0	0	HRD Fall Protection Stack2	HRDPLANT		
	270,072	7,505	7,265	359,444	0	0	0	0	HRD Fall Protection Stack3	HRDPLANT		
	270,072	7,505	7,265	99,004,737	0	0	0	0	LAERDAL RESUSCI ANNE & BABY C/	HRDOFFICE	FA-01909	
	270,072	7,505	7,265	99,034,050	0	0	0	0	Heat Stress Monitor	HRDOFFICE	FA-03422	
	270,072	7,505	7,471	0	0	0	0	0	OIL SPILL RESPONSE EQUIPMENT	HRDPLANT	HRD98135000	
	270,072	7,505	7,471	99,029,551	0	0	0	0	EMERGENCY OIL POLLUTION CLEAN	HRDPLANT		
	270,072	7,505	7,471	99,029,551	99,037,382	0	0	0	1996 WALTRON UTILITY TRAILER	HRDPLANT	FA-V8801	
	270,072	7,505	7,471	99,029,551	99,037,383	0	0	0	1996 WALTRON UTILITY TRAILER	HRDPLANT	FA-V8802	
	270,072	7,505	9,551	0	0	0	0	0	SHOPS EQUIPMENT	HRDPLANT	HRD98351200	
	270,072	7,505	9,551	287,503	0	0	0	0	Fume Extractor	HRDPLANT		
	270,072	7,505	9,551	288,505	0	0	0	0	Marine Oil Boom, 50Ft X 24	HRDPLANT		
	270,072	7,505	9,551	290,935	0	0	0	0	Current G.F.I..	HRDPLANT		
	270,072	7,505	9,551	299,314	0	0	0	0	Gas Detector	HRDPLANT		
	270,072	7,505	9,551	299,315	0	0	0	0	Gas Detector	HRDPLANT		
	270,072	7,505	9,551	299,316	0	0	0	0	Gas Dectector	HRDPLANT		
	270,072	7,505	9,551	299,449	0	0	0	0	Bench Top PH Meter	HRDOFFICE		
	270,072	7,505	9,551	303,347	0	0	0	0	4.16kV Grounding Truck	HRDPLANT		
	270,072	7,505	9,551	303,348	0	0	0	0	4.16kV Grounding Truck	HRDPLANT		
	270,072	7,505	9,551	307,741	0	0	0	0	Riding Lawn Mower	HRDOFFICE		
	270,072	7,505	9,551	307,741	308,698	0	0	0	Riding Lawn Mower	HRDOFFICE		
	270,072	7,505	9,551	307,777	0	0	0	0	OIL CONTAINMENT BOOM POLEMAR	HRDPLANT		
	270,072	7,505	9,551	319,794	0	0	0	0	Epoke Sand & Salt Spreader	HRDOFFICE		
	270,072	7,505	9,551	324,762	0	0	0	0	4.16kv grounding truck	HRDPLANT		
	270,072	7,505	9,551	324,763	0	0	0	0	4.16 Kv grounding truck	HRDPLANT		
	270,072	7,505	9,551	331,920	0	0	0	0	Hydraulic Wrench	HRDPLANT		
	270,072	7,505	9,551	333,368	0	0	0	0	Boom Style Hydraulic Lift	HRDPLANT	TOOLS	
	270,072	7,505	9,551	333,370	0	0	0	0	Snowthrower	HRDPLANT		
	270,072	7,505	9,551	333,371	0	0	0	0	Lawn Mower	HRDPLANT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,505	9,551	333,408	0	0	0	0	Hydraulic Scissor Lift	HRDPLANT	MAINT. TOOLS	
	270,072	7,505	9,551	334,345	0	0	0	0	Instrumentation Calibrator	HRDPLANT		
	270,072	7,505	9,551	359,186	0	0	0	0	VIBRATION DATA COLLECTOR KIT	HRDPLANT		
	270,072	7,505	9,551	359,187	0	0	0	0	PRESSURE CALIBRATOR	HRDPLANT		
	270,072	7,505	9,551	359,188	0	0	0	0	FLUKE PROCESS CALIBRATOR	HRDPLANT		
	270,072	7,505	9,551	359,189	0	0	0	0	#1 FLOOR SCRUBBER	HRDPLANT		
	270,072	7,505	9,551	359,190	0	0	0	0	#2 FLOOR SCRUBBER	HRDPLANT		
	270,072	7,505	9,551	359,191	0	0	0	0	#3 FLOOR SCRUBBER	HRDPLANT		
	270,072	7,505	9,551	359,192	0	0	0	0	#4 FLOOR SCRUBBER	HRDPLANT		
	270,072	7,505	9,551	359,301	0	0	0	0	HART 375 Field Communicator	HRDPLANT		
	270,072	7,505	9,551	359,437	0	0	0	0	Laser Alignment Equipment	HRDPLANT		
	270,072	7,505	9,551	364,779	0	0	0	0	Public Address System	HRDOFFICE		
	270,072	7,505	9,551	99,001,539	0	0	0	0	METAL CUTTING LATHE	HRDOFFICE	FA-003463	
	270,072	7,505	9,551	99,001,548	0	0	0	0	DEADWEIGHT TESTER	HRDPLANT	FA-003429	
	270,072	7,505	9,551	99,001,551	0	0	0	0	DIALARC AC/DC WELDER	HRDPLANT	FA-003461	
	270,072	7,505	9,551	99,001,849	0	0	0	0	1981 35HP JOHNSON OUTBOARD	HRDOFFICE	FA-003062	
	270,072	7,505	9,551	99,001,850	0	0	0	0	1981 PRINCECRAFT JUMBO ALUMINU	HRDOFFICE	FA-003071	
	270,072	7,505	9,551	99,002,059	0	0	0	0	PCB STORAGE CONTAINER AT HOLYR	HRDOFFICE		
	270,072	7,505	9,551	99,004,048	0	0	0	0	DEWDICATOR DELUXE SILCONE CHIP	HRDOFFICE	FA-003124	
	270,072	7,505	9,551	99,004,051	0	0	0	0	RADIUS TAPER GAUGE	HRDOFFICE	FA-01231	
	270,072	7,505	9,551	99,004,075	0	0	0	0	BIDDLE DIGITAL LOW RESISTANCE	HRDOFFICE	FA-003115	
	270,072	7,505	9,551	99,004,246	0	0	0	0	BRUEL & KJAER VIBRATION METER	HRDOFFICE	FA-003123	
	270,072	7,505	9,551	99,004,247	0	0	0	0	PORTABLE ACID DEW POINT METER	HRDOFFICE	FA-003139	
	270,072	7,505	9,551	99,004,249	0	0	0	0	HUNTON DIGITAL LOGIC CHECKER -	HRDOFFICE	FA-003129	
	270,072	7,505	9,551	99,004,260	0	0	0	0	MICROSCANNER "D" SERIES C/W LE	HRDOFFICE	FA-003012	
	270,072	7,505	9,551	99,004,261	0	0	0	0	DRAEGER RZ25 UNIVERSAL TEST SE	HRDOFFICE	FA-01918	
	270,072	7,505	9,551	99,004,264	0	0	0	0	DDT-USD TEST SET	HRDOFFICE	FA-003118	
	270,072	7,505	9,551	99,004,347	0	0	0	0	IRD VIBRATION PICKUP CALIBRATO	HRDOFFICE	FA-4400	
	270,072	7,505	9,551	99,004,703	0	0	0	0	LAPPING TABLE C/W STAND - MODE	HRDOFFICE	FA-01601	
	270,072	7,505	9,551	99,004,704	0	0	0	0	ENERPAC MOBILE HYDRAULIC FLOOR	HRDOFFICE	FA-01844	
	270,072	7,505	9,551	99,004,705	0	0	0	0	SEMI-UNIVERSAL INDEX & STANDAR	HRDOFFICE	FA-01847A	
	270,072	7,505	9,551	99,004,706	0	0	0	0	VERTICAL TURRETT MILLING MACHI	HRDOFFICE	FA-01864	
	270,072	7,505	9,551	99,004,707	0	0	0	0	SHELL MILLING CUTTER C/W SLITT	HRDOFFICE	FA-01847	
	270,072	7,505	9,551	99,004,708	0	0	0	0	FIBERSCOPE C/W CAMERA & OLYMPU	HRDOFFICE	FA-3394	
	270,072	7,505	9,551	99,004,711	0	0	0	0	LOT BOILER ACCESS SCAFFOLDING	HRDOFFICE		
	270,072	7,505	9,551	99,004,711	290,477	0	0	0	SCAFFOLDING	HRDPLANT		
	270,072	7,505	9,551	99,004,712	0	0	0	0	ULTRASONIC CORROSION GAUGE - M	HRDOFFICE	FA-3396	
	270,072	7,505	9,551	99,004,713	0	0	0	0	ELECTRIC WIRE ROPE HOIST - MOD	HRDOFFICE	FA-1844A	
	270,072	7,505	9,551	99,004,714	0	0	0	0	INTEGRATED SOUND LEVEL METERIN	HRDOFFICE	FA-01857	
	270,072	7,505	9,551	99,004,715	0	0	0	0	DIMENSION 400 POWER SOURCE ARC	HRDOFFICE	FA-01602	
	270,072	7,505	9,551	99,004,716	0	0	0	0	17" AUTOMATIC FLOOR SCRUBBER -	HRDOFFICE	FA-01188	
	270,072	7,505	9,551	99,004,719	0	0	0	0	1 1/2 " HYTORQ RATCHET WRENCH	HRDOFFICE	FA-003028	
	270,072	7,505	9,551	99,004,722	0	0	0	0	HIGH PRESSURE WATERWASH SYSTEM	HRDOFFICE	FA-003081	
	270,072	7,505	9,551	99,004,723	0	0	0	0	PORTABLE NOMONOX BREATHING SYS	HRDOFFICE	FA-003079	
	270,072	7,505	9,551	99,004,727	0	0	0	0	GOODWELL FUNCTION GENERATOR -	HRDOFFICE	FA-003127	
	270,072	7,505	9,551	99,004,728	0	0	0	0	TOA AUDIO AMPLIFIER	HRDOFFICE	FA-003140	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,505	9,551	99,004,733	0	0	0	0	SELECT-A-TORQ RATCHET TOOL C/W	HRDOFFICE	FA-02076	
	270,072	7,505	9,551	99,004,734	0	0	0	0	HYDRAULIC CONSOLE MODULE - MOD	HRDOFFICE	FA-02076A	
	270,072	7,505	9,551	99,004,735	0	0	0	0	3 TON CM PULLER - MODEL 640	HRDOFFICE	FA-02989	
	270,072	7,505	9,551	99,004,740	0	0	0	0	WORKSHOP BENCHES C/W HEAVY DUT	HRDOFFICE	FA-003036	
	270,072	7,505	9,551	99,004,749	0	0	0	0	ESS 500 ARC SPEED WELDER SSYTE	HRDOFFICE	FA-003113	
	270,072	7,505	9,551	99,004,750	0	0	0	0	PORTABLE AIR WINCH C/W 150' WI	HRDOFFICE	FA-02077	
	270,072	7,505	9,551	99,004,751	0	0	0	0	SHOP WORK BENCHES W/ 4 DRAWERS	HRDOFFICE	FA-003031	
	270,072	7,505	9,551	99,004,756	0	0	0	0	REUTER STOKES HEAT STRESS MONI	HRDOFFICE	FA-01853	
	270,072	7,505	9,551	99,004,765	0	0	0	0	PELTON CRANE VALIDATOR	HRDOFFICE	FA-01851	
	270,072	7,505	9,551	99,004,766	0	0	0	0	STRESSTEL ULTRASONIC THICKNESS	HRDOFFICE	FA-3395	
	270,072	7,505	9,551	99,004,767	0	0	0	0	DIALARC 250 AC/DC WELDER C/W R	HRDOFFICE	FA-01610	
	270,072	7,505	9,551	99,004,769	0	0	0	0	HILTI HAMMER DRILL C/W CARBIDE	HRDOFFICE	FA-F2289	
	270,072	7,505	9,551	99,004,770	0	0	0	0	CANADIANA 12 HP SNOWBLOWER	HRDOFFICE	FA-003064	
	270,072	7,505	9,551	99,004,772	0	0	0	0	CONNAL LAPPING TOOL	HRDOFFICE	FA-01841	
	270,072	7,505	9,551	99,004,775	0	0	0	0	JANCY MAGNETIC BASE PORTABLE	HRDOFFICE	FA-F2274	
	270,072	7,505	9,551	99,004,776	0	0	0	0	300 AMP ELECTRIC WELDING MACHI	HRDOFFICE	FA-01605	
	270,072	7,505	9,551	99,004,777	0	0	0	0	HILTI ELECTRIC JACKHAMMER - MO	HRDOFFICE	FA-004216	
	270,072	7,505	9,551	99,004,780	0	0	0	0	1/2 TON BUDGIT ELECTRIC CHAIN	HRDOFFICE	FA-01867	
	270,072	7,505	9,551	99,004,781	0	0	0	0	CHECKER BOOM JIB CRANE	HRDOFFICE	FA-01866	
	270,072	7,505	9,551	99,004,782	0	0	0	0	RECORDING RESUCSI ANNE C/W REC	HRDOFFICE	FA-01949	
	270,072	7,505	9,551	99,004,784	0	0	0	0	SURFACE GRINDER C/W ACCESSORIE	HRDOFFICE	FA-01870	
	270,072	7,505	9,551	99,004,785	0	0	0	0	TRANSMATION CALIBRATOR	HRDOFFICE	FA-003144	
	270,072	7,505	9,551	99,004,789	0	0	0	0	12" SINGLE PHASE RADIAL ARM SA	HRDOFFICE	FA-003077	
	270,072	7,505	9,551	99,004,791	0	0	0	0	TEKTRONIX OSCILLOSCOPE C/W ACC	HRDOFFICE	FA-003138	
	270,072	7,505	9,551	99,004,794	0	0	0	0	8' STEEL STANDARD HAND BENDING	HRDOFFICE	FA-003030	
	270,072	7,505	9,551	99,004,796	0	0	0	0	PORTABLE OIL FILTER C/W CARTRI	HRDOFFICE	FA-003015	
	270,072	7,505	9,551	99,004,802	0	0	0	0	TORQUE RATCHET WRENCH & LINK	HRDOFFICE	FA-003029	
	270,072	7,505	9,551	99,004,803	0	0	0	0	HIGH SPEED ELECTRIC POWER PACK	HRDOFFICE	FA-003210	
	270,072	7,505	9,551	99,004,804	0	0	0	0	INSULATOR RESISTANCE TESTER	HRDOFFICE	FA-003117	
	270,072	7,505	9,551	99,004,805	0	0	0	0	FRISKUS FUME EXTRACTOR	HRDOFFICE	FA-003431	
	270,072	7,505	9,551	99,004,806	0	0	0	0	5 TON HOIST HITACHI JET MODEL	HRDOFFICE	FA-02078	
	270,072	7,505	9,551	99,004,807	0	0	0	0	ELECTRIC CHAIN HOIST - MODEL P	HRDOFFICE	FA-01069	
	270,072	7,505	9,551	99,004,809	0	0	0	0	INDUCTION HEATER C/W STANDARD	HRDOFFICE	FA-003114	
	270,072	7,505	9,551	99,018,379	0	0	0	0	10" TABLE SAW	HRDOFFICE	FA-003076	
	270,072	7,505	9,551	99,018,380	0	0	0	0	SHOPMASTER WELDING MACHINE	HRDOFFICE	FA-01607	
	270,072	7,505	9,551	99,018,381	0	0	0	0	SHOPMASTER WELDING MACHINE	HRDOFFICE	FA-003026	
	270,072	7,505	9,551	99,018,382	0	0	0	0	VARIABLE AC POWER SUPPLY	HRDOFFICE	FA-003145	
	270,072	7,505	9,551	99,018,383	0	0	0	0	PRECISION PRESSURE TRANSMITTER	HRDOFFICE	FA-003142	
	270,072	7,505	9,551	99,018,389	0	0	0	0	BAR & TUBE PRINTER KIT	HRDOFFICE	FA-01190	
	270,072	7,505	9,551	99,018,392	0	0	0	0	THERMOPROBE - MODEL TP-3	HRDOFFICE	FA-003013	
	270,072	7,505	9,551	99,018,395	0	0	0	0	IGNITOR TEST BOX	HRDOFFICE	FA-003206	
	270,072	7,505	9,551	99,021,841	0	0	0	0	TOA CHART RECORDER	HRDOFFICE	FA-003141	
	270,072	7,505	9,551	99,021,843	0	0	0	0	HYDROGEN METER - MODEL 380	HRDOFFICE	FA-003130	
	270,072	7,505	9,551	99,021,844	0	0	0	0	DIGITAL PRECISION POWER SUPPLY	HRDOFFICE	FA-003125	
	270,072	7,505	9,551	99,021,846	0	0	0	0	JOFRA OVEN - MODEL 600S	HRDOFFICE	FA-003135	
	270,072	7,505	9,551	99,021,847	0	0	0	0	MICOM 800/2 DATA CONCENTRATOR	HRDOFFICE	FA-003136	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,505	9,551	99,021,848	0	0	0	0	BLACK BOX MODEM - MODEL MD935B	HRDOFFICE	FA-003122	
	270,072	7,505	9,551	99,021,849	0	0	0	0	H/P DIGITAL MULTIMETER - MODEL	HRDOFFICE	FA-003128	
	270,072	7,505	9,551	99,021,854	0	0	0	0	PHILLIPS FUNCTION GENERATOR -	HRDOFFICE	FA-003148	
	270,072	7,505	9,551	99,021,856	0	0	0	0	HP POWER SUPPLY - MODEL 6296A	HRDOFFICE	FA-003209	
	270,072	7,505	9,551	99,021,857	0	0	0	0	FURNACE EFFICIENCY UNIT	HRDOFFICE	FA-003146	
	270,072	7,505	9,551	99,023,420	0	0	0	0	HYDROGEN PURITY METER/ANALYZER	HRDOFFICE	FA-003014	
	270,072	7,505	9,551	99,023,421	0	0	0	0	ULTRASONIC METER	HRDOFFICE	FA-003003	
	270,072	7,505	9,551	99,023,422	0	0	0	0	STROBE KIT FOR 890 DATA - MODE	HRDOFFICE	FA-02293	
	270,072	7,505	9,551	99,023,424	0	0	0	0	1 1/2" AIR IMPACT WRENCH	HRDOFFICE	FA-003027A	
	270,072	7,505	9,551	99,023,425	0	0	0	0	FRISKUS PORTABLE EXHAUST FAN	HRDOFFICE		
	270,072	7,505	9,551	99,023,426	0	0	0	0	FRISKUS PORTABLE EXHAUST FAN	HRDOFFICE		
	270,072	7,505	9,551	99,023,430	0	0	0	0	DC ADJUSTABLE POWER SUPPLY	HRDOFFICE	FA-003149	
	270,072	7,505	9,551	99,023,431	0	0	0	0	SCOPEMETER MODEL FLUKE97	HRDOFFICE	FA-003208	
	270,072	7,505	9,551	99,023,432	0	0	0	0	HIPOTRONICS INSULATION RESISTA	HRDOFFICE	FA-003116	
	270,072	7,505	9,551	99,023,669	0	0	0	0	GILLIBRATOR TOP LOADING VARIAB	HRDOFFICE	FA-03299	
	270,072	7,505	9,551	99,024,430	0	0	0	0	WDPF CRIMPING TOOL FOR COAXIAL	HRDOFFICE	FA-003204	
	270,072	7,505	9,551	99,026,212	0	0	0	0	PORTABLE FLOOR CRANE MODEL #42	HRDOFFICE	FA-003119	
	270,072	7,505	9,551	99,026,871	0	0	0	0	HEAVY DUTY SELF DUMPING HOPPER	HRDOFFICE	FA-003069	
	270,072	7,505	9,551	99,026,874	0	0	0	0	SECTIONAL SCAFFOLDING FOR BOIL	HRDOFFICE		
	270,072	7,505	9,551	99,026,875	0	0	0	0	MENTOR DYNAMIC JIB CRANE C/W E	HRDOFFICE	FA-03428	
	270,072	7,505	9,551	99,028,546	0	0	0	0	4000 LB AIR WINCH TUGGER	HRDOFFICE	FA-03427	
	270,072	7,505	9,551	99,028,556	0	0	0	0	GOLDSTAR WELDING MACHINE	HRDOFFICE	FA-4259	
	270,072	7,505	9,551	99,028,559	0	0	0	0	FILTERCART VENT CART	HRDOFFICE	FA-03486	
	270,072	7,505	9,551	99,028,642	0	0	0	0	PORTABLE DRUM UNLOADING PUMP	HRDOFFICE	FA-03465	
	270,072	7,505	9,551	99,030,071	0	0	0	0	AERIAL WORK PLATFORM	HRDOFFICE	FA-03425	
	270,072	7,505	9,551	99,030,073	0	0	0	0	WARFUM TUR-630A/120 METAL LATH	HRDOFFICE	FA-001849	
	270,072	7,505	9,551	99,030,077	0	0	0	0	PORTABLE PRESSURE INDICATOR	HRDOFFICE	FA-4016	
	270,072	7,505	9,551	99,030,395	0	0	0	0	FIBERSCOPE C/W CAMERA OLYMPUS	HRDOFFICE	FA-3393	
	270,072	7,505	9,551	99,030,396	0	0	0	0	WDFP CRIMPING TOOL FOR COAXIAL	HRDOFFICE	FA-003203	
	270,072	7,505	9,551	99,030,397	0	0	0	0	WDFP CRIMPING TOOL FOR COAXIAL	HRDOFFICE	FA-03202	
	270,072	7,505	9,551	99,032,080	0	0	0	0	KUBOTA DUMP CART, CATCHER,	HRDOFFICE	FA-003073A	
	270,072	7,505	9,551	99,032,817	0	0	0	0	DECADE BOX	HRDOFFICE	FA-003430	
	270,072	7,505	9,551	99,032,818	0	0	0	0	PRESSURE CALIBRATOR	HRDOFFICE	FA-4278	
	270,072	7,505	9,551	99,032,821	0	0	0	0	TOOL & EQUIPMENT STORAGE	HRDOFFICE		
	270,072	7,505	9,551	99,032,822	0	0	0	0	TOOL & EQUIPMENT STORAGE	HRDOFFICE		
	270,072	7,505	9,551	99,032,823	0	0	0	0	ENCORE AUTO FLOOR SCRUBBER	HRDOFFICE		
	270,072	7,505	9,551	99,032,824	0	0	0	0	ABRASIVE BLASTER	HRDOFFICE	FA-03365	
	270,072	7,505	9,551	99,034,046	0	0	0	0	Olympus Videoscope System	HRDOFFICE	FA-4411	
	270,072	7,505	9,551	99,034,625	0	0	0	0	LASER ALIGNMENT KIT:CSI ULTRA	HRDOFFICE	FA-003367	
	270,072	7,505	9,551	99,034,638	0	0	0	0	STEEL DUMPSTERS	HRDPLANT		
	270,072	7,505	9,551	99,034,647	0	0	0	0	OIL PRESSURE TEST PUMP	HRDOFFICE	FA-003366	
	270,072	7,505	9,551	99,035,122	0	0	0	0	Graphic Sign Maker General	HRDPLANT	FA-003183	
	270,072	7,505	9,551	99,035,712	0	0	0	0	Impact Wrench 1 1/2' Drive	HRDPLANT	FA-5242	
	270,072	7,505	9,551	99,035,713	0	0	0	0	Diesel Engine Driven Welder	HRDPLANT	FA-001604	
	270,072	7,505	9,551	99,035,751	0	0	0	0	MK5 Gas Detector Monitor	HRDPLANT	FA-003420	
	270,072	7,505	9,551	99,035,752	0	0	0	0	MK5 Gas Detector Monitor	HRDPLANT	FA-003421	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,505	9,551	99,035,780	0	0	0	0	Mikata Electric Jackhammer	HRDPLANT	FA-05245	
	270,072	7,505	9,551	99,035,785	0	0	0	0	Air Impact Socket Set 1 1/2"	HRDPLANT	FA-4424	
	270,072	7,505	9,551	99,036,388	0	0	0	0	Battery Test Device	HRDOFFICE	FA-003466	
	270,072	7,505	9,551	99,036,389	0	0	0	0	Portable Hydraulic Calibrator	HRDOFFICE		
	270,072	7,505	9,551	99,036,393	0	0	0	0	AIRBORNE CONTAMINANTS	HRDOFFICE	FA-003419	
	270,072	7,505	9,551	99,036,394	0	0	0	0	Pipe Bevelling tool Climax	HRDOFFICE	FA-5244	
	270,072	7,505	9,551	99,036,954	0	0	0	0	OIL CONTAINMENT BOOM VERSATECH	HRDPLANT		
	270,072	7,505	9,551	99,037,530	0	0	0	0	Portable Pipe Threader	HRDPLANT		
	270,072	7,505	9,551	99,037,531	0	0	0	0	Relay Test Set Model	HRDPLANT	FA-003467	
	270,072	7,505	9,551	99,037,533	0	0	0	0	COBRASAW Vertical BAnd Saw	HRDPLANT		
	270,072	7,505	9,551	99,037,624	0	0	0	0	Battery Ground Fault Locator	HRDOFFICE	FA-5205	
	270,072	7,505	9,551	99,037,629	0	0	0	0	Replace PH Meter	HRDOFFICE		
	270,072	7,505	9,551	99,038,629	0	0	0	0	HandHels Scaner & Communicator	HRDPLANT	FA-5333	
	270,072	7,505	9,551	99,039,176	0	0	0	0	TRANSMATION CALIBRATOR - MODEL	HRDOFFICE	FA-003143	
	270,072	7,505	9,551	99,039,177	0	0	0	0	LAMBDA POWER SUPPLY	HRDOFFICE	FA-003147	
	270,072	7,505	9,551	99,039,545	0	0	0	0	DEFIBRILLATOR HSFR2 W/CASE	HRDPLANT		
	270,072	7,505	9,551	99,039,949	0	0	0	0	Floor Model Drill Press	HRDPLANT		
	270,072	7,505	9,551	99,040,813	0	0	0	0	INTEGRATED SOUND LEVEL	HRDOFFICE	FA-003357	
	270,072	7,505	9,551	99,040,814	0	0	0	0	INTEGRATED SOUND LEVEL	HRDOFFICE	FA-01858	
	270,072	7,505	9,551	99,040,827	0	0	0	0	Waste Dumpsters	HRDOFFICE		
	270,072	7,505	9,551	99,040,828	0	0	0	0	Waste Dumpsters	HRDOFFICE		
	270,072	7,505	9,551	99,040,861	0	0	0	0	FLOODLIGHT 150 W INCANDESCENT	HRDPLANT		
	270,072	7,505	9,551	99,040,862	0	0	0	0	FLOODLIGHT 150 W INCANDESCENT	HRDPLANT		
	270,072	7,505	9,551	99,041,355	0	0	0	0	3M MULTIMEDIA PROJECTOR	HRDOFFICE		
	270,072	7,505	9,551	99,041,374	0	0	0	0	Conductivity Digital Myron	HRDOFFICE		
	270,072	7,505	9,551	99,041,375	0	0	0	0	Conductivity Digital Myron	HRDOFFICE		
	270,072	7,505	9,551	99,041,376	0	0	0	0	Flourtube Disposal	HRDOFFICE		
	270,072	7,505	9,551	99,041,379	0	0	0	0	Emergency Response Equipment	HRDPLANT		
	270,072	7,505	257,678	0	0	0	0	0	BOTTLED WATER	HRDOFFICE		
	270,072	7,505	271,851	0	0	0	0	0	HRD VEHICLES & MOBILE EQUIPMT	HRDPLANT	HRD98355001	
	270,072	7,505	271,851	42,316	0	0	0	0	Retired V9786,88 FORKLIFT	BIFAUCTION	V9786R	
	270,072	7,505	271,851	166,415	0	0	0	0	V9813,99 CAT 416C FEL BACK-HOE	HRDOFFICE	V9813	
	270,072	7,505	271,851	244,397	0	0	0	0	Retired V2555, 00 DODGE 15 PAX	BIFAUCTION	V2555R	
	270,072	7,505	271,851	254,097	0	0	0	0	V9822,01 CAT FRKLIFT MDL 3P30K	HRDOFFICE	V9822	
	270,072	7,505	271,851	293,432	0	0	0	0	Retired V7025,05 KAWASAKI MULE	HRDOFFICE	V7025R	
	270,072	7,505	271,851	317,951	0	0	0	0	V2638, 08 DODGE DAKOTA	HRDOFFICE	V2638	
	270,072	7,505	271,852	0	0	0	0	0	HRD OFFICE EQUIPMENT	HRDPLANT	HRD98351201	
	270,072	7,505	271,852	325,086	0	0	0	0	Fitness Equipment	HRDPLANT		
	270,072	7,505	271,852	325,087	0	0	0	0	Fitness Equipment	HRDPLANT		
	270,072	7,505	271,852	99,001,340	0	0	0	0	OFFICE SAFE - SENTRY 6330	HRDOFFICE	FA-01275	
	270,072	7,505	271,852	99,002,419	0	0	0	0	3M OVERHEAD PROJECTOR - MODEL	HRDOFFICE	FA-01717	
	270,072	7,505	271,852	99,002,460	0	0	0	0	CANON NP2020 PHOTOCOPIER	HRDOFFICE	FA-01326	
	270,072	7,505	271,852	99,004,736	0	0	0	0	GARDEX FIREPFOOF RECORDS SAFE	HRDOFFICE	FA-01274	
	270,072	7,505	271,852	99,039,952	0	0	0	0	Modular Furniture	HRDOFFICE		
	270,072	7,505	288,300	0	0	0	0	0	HRD OPERATIONS TOOLS & EQUIP	HRDPLANT		
	270,072	7,505	288,300	288,384	0	0	0	0	EASI DRIVE	HRDPLANT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,505	288,300	305,708	0	0	0	0	Arc Flash Suits, Category 4	HRDPLANT		
	270,072	7,505	288,300	305,709	0	0	0	0	Remote Racking Device	HRDPLANT		
	270,072	7,505	288,300	99,034,231	0	0	0	0	OIL STORAGE TANKS	HRDPLANT		
	270,072	7,505	357,725	0	0	0	0	0	LTAP DEPT TOOLS AND EQUIPMENT	HRDPLANT		
	270,072	7,505	357,725	359,208	0	0	0	0	Canon iPF710 Plotter	HRDOFFICE		
	270,072	7,505	359,459	0	0	0	0	0	Speed Scrub 32" Autoscrubber	HRDPLANT		
	270,072	7,505	359,461	0	0	0	0	0	Vibration Data Collector	HRDPLANT		
	270,072	7,505	359,467	0	0	0	0	0	Tools And Equipement	HRDPLANT		
	270,072	7,505	362,198	0	0	0	0	0	Fume Extractor	HRDPLANT		
	270,072	7,505	99,023,660	0	0	0	0	0	PORTABLE HAND HELD COLORIMETER	HRDPLANT		
	270,072	7,505	99,023,662	0	0	0	0	0	FISHER SCIENTIFIC ISOTEMP OVEN	HRDPLANT	FA-003445	
400												
	270,072	7,635	0	0	0	0	0	0	UNIT 2	HRDUNIT2	HRD20000000	
	270,072	7,635	7,636	0	0	0	0	0	#2 TURBINE & GENERATOR	HRDUNIT2	HRD21000000	
	270,072	7,635	7,636	7,664	0	0	0	0	#2 TURBINE CONDENSER SYSTEM	HRDUNIT2	HRD21160000	
	270,072	7,635	7,636	7,664	7,694	0	0	0	#2 CONDENSER AIR EXTRACTION	HRDUNIT2	HRD21340000	
	270,072	7,635	7,636	7,664	7,694	8,884	0	0	#2 CONDENSER AIR VAC P/P NORTH	HRDUNIT2	HRD21343030	
	270,072	7,635	7,636	7,664	7,694	8,891	0	0	#2 CONDENSER AIR VAC P/P SOUTH	HRDUNIT2	HRD21343031	
	270,072	7,635	7,636	7,664	271,326	0	0	0	#2 TURBINE CONDENSER	HRDUNIT2	HRD21160001	
	270,072	7,635	7,636	7,664	322,987	0	0	0	U2 Condenser Actuators	HRDUNIT3		
	270,072	7,635	7,636	7,699	0	0	0	0	#2 TURBINE DRAINS SYSTEMS	HRDUNIT2	HRD21350000	
	270,072	7,635	7,636	7,753	0	0	0	0	U2 GENERATOR	HRDUNIT2	HRD21500000	
	270,072	7,635	7,636	7,753	7,754	0	0	0	#2 GENERATOR ROTOR	HRDUNIT2	HRD21510000	
	270,072	7,635	7,636	7,753	7,754	7,755	0	0	#2GENERATOR ROTOR SLIP RINGS &	HRDUNIT2	HRD21514000	
	270,072	7,635	7,636	7,753	7,759	0	0	0	#2 GENERATOR STATOR	HRDUNIT2	HRD21520000	
	270,072	7,635	7,636	7,753	7,759	7,763	0	0	#2 GEN STANDOFF INSULATORS	HRDUNIT2	HRD21531000	
	270,072	7,635	7,636	7,753	7,759	7,765	0	0	#2 GENERATOR P.T. CUBICLE	HRDUNIT2	HRD21593000	
	270,072	7,635	7,636	7,753	7,759	324,690	0	0	#2 GENERATOR STATOR RELAY	HRDUNIT2		
	270,072	7,635	7,636	7,753	7,759	99,003,560	0	0	REMOVE PCB XFRMER & INSTALL NE	HRDPLANT		
	270,072	7,635	7,636	7,753	7,768	0	0	0	#2 GEN HYDROGEN GAS SYSTEM	HRDUNIT2	HRD21620000	
	270,072	7,635	7,636	7,753	7,768	7,732	0	0	#2 GENERATOR SEAL OIL SYSTEM	HRDUNIT2	HRD21450000	
	270,072	7,635	7,636	7,753	7,768	7,732	9,626	0	#2 TURB AC SEAL OIL PUMP EAST	HRDUNIT2	HRD21451010	
	270,072	7,635	7,636	7,753	7,768	7,732	9,628	0	#2 GEN AC SEAL OIL PUMP WEST	HRDUNIT2	HRD21451020	
	270,072	7,635	7,636	7,753	7,768	7,732	9,630	0	#2 GEN DC SEAL OIL PUMP	HRDUNIT2	HRD21452010	
	270,072	7,635	7,636	7,753	7,768	7,732	9,632	0	#2 GEN SEAL OIL VACUUM PUMP	HRDUNIT2	HRD21454010	
	270,072	7,635	7,636	7,753	7,768	7,773	0	0	#2 GEN CO2 GAS PURGE SYSTEM	HRDUNIT2	HRD21630000	
	270,072	7,635	7,636	7,753	7,768	7,776	0	0	#2 GENER COMPRESSED AIR PURGE	HRDUNIT2	HRD21640000	
	270,072	7,635	7,636	7,753	7,768	7,777	0	0	#2 GENERATOR HYDROGEN COOLING	HRDUNIT2	HRD21650000	
	270,072	7,635	7,636	7,753	99,034,724	0	0	0	PARTIAL DISCHARGE ANALYSIS SYS	HRDPLANT		
	270,072	7,635	7,636	7,753	99,043,191	0	0	0	ADDITIONAL COSTS FOR BALAN	HRDPLANT		
	270,072	7,635	7,636	7,767	0	0	0	0	#2 GENERATOR EXCITATION SYSTEM	HRDUNIT2	HRD21610000	
	270,072	7,635	7,636	7,767	271,322	0	0	0	#2 EXCITER	HRDUNIT2	HRD21610001	
	270,072	7,635	7,636	7,767	271,322	99,036,228	0	0	Exciter Unit #2	HRDPLANT		
	270,072	7,635	7,636	7,767	271,324	0	0	0	#2 EXCITATION TRANSFORMER	HRDUNIT2	HRD21610002	
	270,072	7,635	7,636	7,767	271,325	0	0	0	#2 EXCITER FIELD BREAKER	HRDUNIT2	HRD21610003	
	270,072	7,635	7,636	271,317	0	0	0	0	#2 TURBINE	HRDUNIT2	HRD21000001	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,635	7,636	271,317	7,638	0	0	0	#2 TURBINE MAIN STEAM CHEST	HRDUNIT2	HRD21110000	
	270,072	7,635	7,636	271,317	7,643	0	0	0	#2 H.P. TURBINE	HRDUNIT2	HRD21120000	
	270,072	7,635	7,636	271,317	7,647	0	0	0	#2 TURB REHEAT/IP STEAM CHEST	HRDUNIT2	HRD21130000	
	270,072	7,635	7,636	271,317	7,652	0	0	0	#2 I.P. TURBINE	HRDUNIT2	HRD21140000	
	270,072	7,635	7,636	271,317	7,658	0	0	0	#2 L.P. TURBINE	HRDUNIT2	HRD21150000	
	270,072	7,635	7,636	271,317	7,671	0	0	0	#2 TURBINE FRONT STANDARD	HRDUNIT2	HRD21170000	
	270,072	7,635	7,636	271,317	7,686	0	0	0	#2 TURBINE GLAND STEAM SYSTEM	HRDUNIT2	HRD21310000	
	270,072	7,635	7,636	271,317	7,690	0	0	0	#2 TURBINE PRE-WARMING SYSTEM	HRDUNIT2	HRD21320000	
	270,072	7,635	7,636	271,317	7,692	0	0	0	#2 TURBINE TURNING GEAR	HRDUNIT2	HRD21330000	
	270,072	7,635	7,636	271,317	7,711	0	0	0	#2 TURBINE OIL SYSTEMS	HRDUNIT2	HRD21400000	
	270,072	7,635	7,636	271,317	7,711	7,719	0	0	#2 TURBINE LUBE OIL SYSTEM	HRDUNIT2	HRD21430000	
	270,072	7,635	7,636	271,317	7,711	7,719	7,712	0	#2 TURB LUBE OIL TANK & EQUIP	HRDUNIT2	HRD21410000	
	270,072	7,635	7,636	271,317	7,711	7,719	7,715	0	#2 TURB LUBE OIL PURIFICATION	HRDUNIT2	HRD21420000	
	270,072	7,635	7,636	271,317	7,711	7,719	7,715	99,039,097	Duplex Filter for Lube oil	HRDPLANT		
	270,072	7,635	7,636	271,317	7,711	7,719	7,720	0	#2 TURB LUBE A.C. OIL P/P NORT	HRDUNIT2	HRD21431130	
	270,072	7,635	7,636	271,317	7,711	7,719	7,721	0	#2 TURB LUBE A.C. OIL P/P SOUT	HRDUNIT2	HRD21431131	
	270,072	7,635	7,636	271,317	7,711	7,719	7,725	0	#2 TURBINE LUBE D.C. PUMP	HRDUNIT2	HRD21432100	
	270,072	7,635	7,636	271,317	7,711	7,741	0	0	#2TURBINE HYDRAULIC OIL SYSTEM	HRDUNIT2	HRD21470000	
	270,072	7,635	7,636	271,317	7,711	7,741	7,743	0	#2 TURBINE HYD. OIL PUMP NORTH	HRDUNIT2	HRD21472130	
	270,072	7,635	7,636	271,317	7,711	7,741	7,744	0	#2 TURBINE HYD. OIL PUMP SOUTH	HRDUNIT2	HRD21472131	
	270,072	7,635	7,636	271,317	7,711	7,741	273,263	0	U2 NORTH EHC ACCUMULATOR	HRDUNIT2	HRD21200005	
	270,072	7,635	7,636	271,317	7,711	7,741	273,265	0	U2 SOUTH EHC ACCUMULATOR	HRDUNIT2	HRD21200006	
	270,072	7,635	7,636	271,317	271,319	0	0	0	#2 TURBINE BLED STEAM SYSTEM	HRDUNIT2	HRD21000002	
	270,072	7,635	7,636	271,317	334,451	0	0	0	#2 TURBINE DRAINS SYSTEMS	HRDUNIT2		
	270,072	7,635	7,636	271,317	99,043,190	0	0	0	INSTALL TURBINE PARTS & WI	HRDPLANT		
300												
	270,072	7,635	7,786	0	0	0	0	0	#2 BOILER PLANT	HRDUNIT2	HRD22000000	
	270,072	7,635	7,786	7,787	0	0	0	0	#2 BOILER STRUCTURE	HRDUNIT2	HRD22100000	
	270,072	7,635	7,786	7,787	99,029,563	0	0	0	OBSERVATION PORT IN THE BURNER	HRDPLANT		
	270,072	7,635	7,786	7,787	99,043,174	0	0	0	INSTALL STEAM GENERATOR FO	HRDPLANT		
	270,072	7,635	7,786	7,787	99,043,175	0	0	0	ADDITIONAL COSTS FOR STEAM	HRDPLANT		
	270,072	7,635	7,786	7,789	0	0	0	0	#2 BOILER FW & SAT'D STEAM SYS	HRDUNIT2	HRD22200000	
	270,072	7,635	7,786	7,789	7,790	0	0	0	#2 BOILER ECONOMIZER	HRDUNIT2	HRD22210000	
	270,072	7,635	7,786	7,789	7,794	0	0	0	#2 BOILER STEAM DRUM	HRDUNIT2	HRD22220000	
	270,072	7,635	7,786	7,789	7,794	99,023,642	0	0	DRUM LEVEL MONITORING - UNIT 2	HRDPLANT		
	270,072	7,635	7,786	7,789	7,801	0	0	0	#2 FURNACE	HRDUNIT2	HRD22240000	
	270,072	7,635	7,786	7,789	7,806	0	0	0	#2 BOILER FILLING AND DRAINING	HRDUNIT2	HRD22260000	
	270,072	7,635	7,786	7,789	7,806	7,945	0	0	#2 BLR BLOW DWN DRAINS&LP PIPE	HRDUNIT2	HRD22700000	
	270,072	7,635	7,786	7,789	7,806	7,945	7,946	0	#2 BOILER CONTINUOUS BLOWDOWN	HRDUNIT2	HRD22710000	
	270,072	7,635	7,786	7,789	7,806	7,945	359,346	0	UNIT 2 BOILER BLOWDOWN TANK	HRDUNIT2		
	270,072	7,635	7,786	7,810	0	0	0	0	#2 BOILER SUPERHEATER & REHEAT	HRDUNIT2	HRD22300000	
	270,072	7,635	7,786	7,810	7,811	0	0	0	#2 BOILER PRIMARY SUPERHEATER	HRDUNIT2	HRD22310000	
	270,072	7,635	7,786	7,810	7,813	0	0	0	#2 BOILER SUPERHEATER ATTEMP'R	HRDUNIT2	HRD22320000	
	270,072	7,635	7,786	7,810	7,823	0	0	0	#2 BOILER MAIN STEAM LINES	HRDUNIT2	HRD22340000	
	270,072	7,635	7,786	7,810	7,823	322,451	0	0	#2 Boiler Stop Valve	HRDUNIT2		
	270,072	7,635	7,786	7,810	7,830	0	0	0	#2BOILER REHEATER ATTEMPERATOR	HRDUNIT2	HRD22350000	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,635	7,786	7,810	7,835	0	0	0	#2 BOILER REHEATER	HRDUNIT2	HRD22360000	
	270,072	7,635	7,786	7,810	309,158	0	0	0	#2 Blr Sec. Superhtr upgrade	HRDUNIT2		
	270,072	7,635	7,786	7,838	0	0	0	0	#2 BOILER AIR SYSTEM	HRDUNIT2	HRD22400000	
	270,072	7,635	7,786	7,838	7,879	0	0	0	#2 BLR AIR SUPPLY (A/H TO WIND	HRDUNIT2	HRD22440000	
	270,072	7,635	7,786	7,838	7,879	7,882	0	0	#2 BLR AIR SUPPLY SEAL AIR FAN	HRDUNIT2	HRD22443000	
	270,072	7,635	7,786	7,838	7,879	7,885	0	0	#2 BOILER SCANNER AIR	HRDUNIT2	HRD22446000	
	270,072	7,635	7,786	7,838	7,886	0	0	0	#2 BOILER WINDBOX	HRDUNIT2	HRD22450000	
	270,072	7,635	7,786	7,838	8,781	0	0	0	#2 BOILER F.D. FAN ASSEMBLY	HRDUNIT2	HRD22410000	
	270,072	7,635	7,786	7,838	8,781	7,843	0	0	#2 BOILER F.D. FAN EAST	HRDUNIT2	HRD22413032	
	270,072	7,635	7,786	7,838	8,781	7,844	0	0	#2 BOILER F.D. FAN WEST	HRDUNIT2	HRD22413033	
	270,072	7,635	7,786	7,838	8,785	0	0	0	#2 BOILER STEAM AIR HEATER	HRDUNIT2	HRD22420000	
	270,072	7,635	7,786	7,838	8,785	7,855	0	0	#2BOILER STEAM AIR HEATER EAST	HRDUNIT2	HRD22423032	
	270,072	7,635	7,786	7,838	8,785	7,856	0	0	#2BOILER STEAM AIR HEATER WEST	HRDUNIT2	HRD22423033	
	270,072	7,635	7,786	7,838	8,785	359,352	0	0	Steam Preheater Flash Tank	HRDUNIT2		
	270,072	7,635	7,786	7,838	8,786	0	0	0	#2 BOILER MAIN AIR HEATER	HRDUNIT2	HRD22430000	
	270,072	7,635	7,786	7,838	8,786	7,863	0	0	#2 BOILER MAIN AIR HEATER EAST	HRDUNIT2	HRD22430032	
	270,072	7,635	7,786	7,838	8,786	7,863	331,941	0	U2 APHE HOT END BRG SEAL COVER	HRDUNIT2		
	270,072	7,635	7,786	7,838	8,786	7,863	331,943	0	U2 APHE COLD END REPAIRS	HRDUNIT2		
	270,072	7,635	7,786	7,838	8,786	7,864	0	0	#2 BOILER MAIN AIR HEATER WEST	HRDUNIT2	HRD22430033	
	270,072	7,635	7,786	7,838	8,786	7,864	331,942	0	U2 APHW HOT END BRG SEAL COVER	HRDUNIT2		
	270,072	7,635	7,786	7,838	8,786	7,864	331,944	0	U2 APHW COLD END REPAIRS	HRDUNIT2		
	270,072	7,635	7,786	7,838	99,000,149	0	0	0	INSTALL SCANNER AIR FILTERS ON	HRDPLANT		
	270,072	7,635	7,786	7,838	99,034,284	0	0	0	COMBUSTION AIR HEATING SYSTEM	HRDPLANT		
	270,072	7,635	7,786	7,890	0	0	0	0	#2 BOILER GAS SYSTEM	HRDUNIT2	HRD22500000	
	270,072	7,635	7,786	7,890	7,891	0	0	0	#2 BOILER GAS PASSES	HRDUNIT2	HRD22510000	
	270,072	7,635	7,786	7,890	7,900	0	0	0	#2 BOILER STACK	HRDUNIT2	HRD22570000	
	270,072	7,635	7,786	7,890	7,900	271,327	0	0	#2 STACK BREECHING	HRDUNIT2	HRD22570001	
	270,072	7,635	7,786	7,890	7,900	271,327	359,207	0	HRD U2 STACK BREECHING STUDY	HRDUNIT2		
	270,072	7,635	7,786	7,890	7,900	299,552	0	0	Boiler Stack Liner Unit 2	HRDPLANT		
	270,072	7,635	7,786	7,890	7,904	0	0	0	#2 BOILER SOOTBLOWING SYSTEM	HRDUNIT2	HRD22580000	
	270,072	7,635	7,786	7,890	7,904	7,907	0	0	#2 BOILER RETRACTABLE S/B'S	HRDUNIT2	HRD22583000	
	270,072	7,635	7,786	7,890	7,904	7,908	0	0	#2 BOILER ROTARY SOOTBLOWERS	HRDUNIT2	HRD22584000	
	270,072	7,635	7,786	7,890	7,904	8,790	0	0	#2 BOILER AIR HEATER S/B'S	HRDUNIT2	HRD22585000	
	270,072	7,635	7,786	7,912	0	0	0	0	#2 BOILER FUEL FIRING SYSTEM	HRDUNIT2	HRD22600000	
	270,072	7,635	7,786	7,912	7,913	0	0	0	#2 BOILER HEAVY OIL SYSTEM	HRDUNIT2	HRD22610000	
	270,072	7,635	7,786	7,912	7,913	7,582	0	0	#2 BOILER HEAVY OIL FIRING	HRDUNIT2	HRD22620000	
	270,072	7,635	7,786	7,912	7,913	7,916	0	0	#2 BOILER HEAVY OIL PUMP EAST	HRDUNIT2	HRD22613032	
	270,072	7,635	7,786	7,912	7,913	7,917	0	0	#2 BOILER HEAVY OIL PUMP WEST	HRDUNIT2	HRD22613033	
	270,072	7,635	7,786	7,912	7,913	7,920	0	0	U2 BLR HVY OIL STM V/V & PIPE	HRDUNIT2	HRD22617000	
	270,072	7,635	7,786	7,912	7,913	7,921	0	0	U2 FUEL OIL ACCUMULATOR	HRDUNIT2	HRD22618000	
	270,072	7,635	7,786	7,912	7,935	0	0	0	#2 BOILER LIGHT OIL	HRDUNIT2	HRD22640000	
	270,072	7,635	7,786	7,912	7,935	7,933	0	0	#2 BOILER LIGHT OIL FIRING	HRDUNIT2	HRD22630000	
	270,072	7,635	7,786	7,912	7,935	8,980	0	0	#2 BOILER LIGHT OIL PUMP EAST	HRDUNIT2	HRD22643032	
	270,072	7,635	7,786	7,912	7,935	8,981	0	0	#2 BOILER LIGHT OIL PUMP WEST	HRDUNIT2	HRD22643033	
	270,072	7,635	7,786	7,912	99,000,171	0	0	0	INSTALL LIGHT OIL SYSTEM UNIT	HRDPLANT		
	270,072	7,635	7,786	7,953	0	0	0	0	#2 BLR AUX STEAM & CONDENSATE	HRDUNIT2	HRD22800000	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,635	7,786	7,953	7,954	0	0	0	#2 BOILER AUX. STEAM MAIN	HRDUNIT2	HRD22810000	
	270,072	7,635	7,786	7,953	7,960	0	0	0	#2 BOILER AUXILIARY STEAM	HRDUNIT2	HRD22820000	
	270,072	7,635	7,786	7,953	7,968	0	0	0	#2 BOILER ATOMIZING STEAM	HRDUNIT2	HRD22830000	
	270,072	7,635	7,786	7,953	8,803	0	0	0	#2 AUXSTEAM CONDENSATE & P/P'S	HRDUNIT2	HRD23155000	
	270,072	7,635	7,978	0	0	0	0	0	#2 CONDENSATE & F.W. SYSTEM	HRDUNIT2	HRD23000000	
	270,072	7,635	7,978	7,980	0	0	0	0	#2 CONDENSATE MAKE UP SYSTEM	HRDUNIT2	HRD23110000	
	270,072	7,635	7,978	7,992	0	0	0	0	#2 L P FEEDWATER SYSTEM	HRDUNIT2	HRD23200000	
	270,072	7,635	7,978	7,992	7,997	0	0	0	#2 LOW PRESSURE HEATER 1	HRDUNIT2	HRD23213001	
	270,072	7,635	7,978	7,992	7,998	0	0	0	#2 LOW PRESSURE HEATER 2	HRDUNIT2	HRD23213002	
	270,072	7,635	7,978	7,992	7,998	99,000,218	0	0	REPLACEMENT OF TUBE BUNDLE IN	HRDPLANT		
	270,072	7,635	7,978	7,992	7,998	99,003,556	0	0	ADD'L COST TO ADD REDUCERS TO	HRDPLANT		
	270,072	7,635	7,978	7,992	8,017	0	0	0	#2 DEAERATOR SYSTEM	HRDUNIT2	HRD23250000	
	270,072	7,635	7,978	7,992	8,032	0	0	0	#2 RESERVE FW SYSTEM	HRDUNIT2	HRD23270000	
	270,072	7,635	7,978	7,992	8,032	99,031,611	0	0	TURBINE FLOW METER WITH VALVES	HRDPLANT		
	270,072	7,635	7,978	7,992	8,032	99,043,176	0	0	INSTALL MATERIAL FOR THE R	HRDPLANT		
	270,072	7,635	7,978	7,992	8,807	0	0	0	#2 LOW PRESSURE HTR DRAIN P/PS	HRDUNIT2	HRD23220000	
	270,072	7,635	7,978	7,992	99,043,177	0	0	0	BAL LOW PRESSURE FEED SYST	HRDPLANT		
	270,072	7,635	7,978	7,992	99,043,178	0	0	0	INSTALL BALANCE OF LOW PRE	HRDPLANT		
	270,072	7,635	7,978	8,037	0	0	0	0	#2 BOILER FEEDWATER PUMPING	HRDUNIT2	HRD23300000	
	270,072	7,635	7,978	8,037	8,847	0	0	0	#2 BOILER FEED PUMP WEST	HRDUNIT2	HRD23310033	
	270,072	7,635	7,978	8,037	8,847	8,039	0	0	#2 BOILER FEEDPUMP RECIRC.WEST	HRDUNIT2	HRD23320033	
	270,072	7,635	7,978	8,037	8,847	8,051	0	0	#2 BLR FW PUMP LUBE OIL WEST	HRDUNIT2	HRD23340033	
	270,072	7,635	7,978	8,037	8,847	99,000,242	0	0	INSTALL VIBRATON MONITORING EQ	HRDPLANT		
	270,072	7,635	7,978	8,037	8,847	99,043,183	0	0	MODIFY AND INSTALL BOILER	HRDPLANT		
	270,072	7,635	7,978	8,037	8,847	99,043,189	0	0	PURCHASE 1 INNER CASE BARR	HRDPLANT		
	270,072	7,635	7,978	8,037	8,848	0	0	0	#2 BOILER FEED PUMP EAST	HRDUNIT2	HRD23310032	
	270,072	7,635	7,978	8,037	8,848	8,038	0	0	#2 BOILER FEEDPUMP RECIRC.EAST	HRDUNIT2	HRD23320032	
	270,072	7,635	7,978	8,037	8,848	8,050	0	0	#2 BLR FW PUMP LUBE OIL EAST	HRDUNIT2	HRD23340032	
	270,072	7,635	7,978	8,037	8,848	99,000,241	0	0	INSTALL VIBRATION MONITORING E	HRDPLANT		
	270,072	7,635	7,978	8,037	8,848	99,043,182	0	0	MODIFY AND INSTALL BOILER	HRDPLANT		
	270,072	7,635	7,978	8,037	8,848	99,043,188	0	0	PURCHASE 1 INNER CASE BARR	HRDPLANT		
	270,072	7,635	7,978	8,037	9,639	0	0	0	#2 BFP COM GLAND SEALWATER INJ	HRDUNIT2	HRD23361000	
	270,072	7,635	7,978	8,037	9,640	0	0	0	#2 BFP COM GLANDSEALWATER XFER	HRDUNIT2	HRD23362000	
	270,072	7,635	7,978	8,059	0	0	0	0	#2 H.P. FEEDWATER SYSTEM	HRDUNIT2	HRD23500000	
	270,072	7,635	7,978	8,059	8,066	0	0	0	#2 H.P. HEATER 4	HRDUNIT2	HRD23513004	
	270,072	7,635	7,978	8,059	8,067	0	0	0	#2 H.P. HEATER 5	HRDUNIT2	HRD23513005	
	270,072	7,635	7,978	8,059	8,068	0	0	0	#2 H.P. HEATER 6	HRDUNIT2	HRD23513006	
	270,072	7,635	7,978	8,059	8,087	0	0	0	#2 H.P. FEEDWATER VALVES	HRDUNIT2	HRD23531000	
	270,072	7,635	7,978	8,059	8,903	0	0	0	#2 H.P. HEATERS DRAIN PUMP	HRDUNIT2	HRD23514104	
	270,072	7,635	7,978	8,059	331,938	0	0	0	U2 HP Heater 5 2009 Replace	HRDUNIT2		
	270,072	7,635	7,978	8,800	0	0	0	0	#2 CONDENSATE EXTRACTION SYST	HRDUNIT2	HRD23120000	
	270,072	7,635	7,978	8,800	7,986	0	0	0	#2 COND EXTRACTION PUMP NORTH	HRDUNIT2	HRD23123030	
	270,072	7,635	7,978	8,800	7,986	324,367	0	0	C. Ext Pump N Prot. Relay	HRDUNIT2		
	270,072	7,635	7,978	8,800	7,987	0	0	0	#2 COND.EXTRACTION PUMP SOUTH	HRDUNIT2	HRD23123031	
	270,072	7,635	7,978	8,800	7,987	324,369	0	0	C. Ext. Pmp S. Mot Prot Relay	HRDUNIT2		
400												

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,635	8,093	0	0	0	0	0	#2 UNIT GENERATION SERVICES	HRDUNIT2	HRD24000000	
	270,072	7,635	8,093	7,703	0	0	0	0	#2 TURB/GEN COOLING SYSTEM	HRDUNIT2	HRD21360000	
	270,072	7,635	8,093	7,703	9,622	0	0	0	#2 T/G COOLING PUMP SOUTH	HRDUNIT2	HRD21363010	
	270,072	7,635	8,093	7,703	9,624	0	0	0	#2 T/G COOLING PUMP NORTH	HRDUNIT2	HRD21363020	
	270,072	7,635	8,093	7,703	299,550	0	0	0	Unit 2 CW Travelling Structure	HRDPLANT		
	270,072	7,635	8,093	7,703	299,551	0	0	0	Unit 2 CW Travelling Structure	HRDPLANT		
	270,072	7,635	8,093	8,132	0	0	0	0	#2 GENERAL SERVICE COOLING	HRDUNIT2	HRD24500000	
	270,072	7,635	8,093	271,486	0	0	0	0	#2 CW SYSTEM	HRDUNIT2	HRD24000001	
	270,072	7,635	8,093	271,486	8,095	0	0	0	#2 C.W. INTAKE SYSTEM	HRDUNIT2	HRD24110000	
	270,072	7,635	8,093	271,486	8,095	99,043,179	0	0	INSTALL FERROUS SULPHATE D	HRDPLANT		
	270,072	7,635	8,093	271,486	8,095	99,043,192	0	0	BALANCE OF CIRCULATING WAT	HRDPLANT		
	270,072	7,635	8,093	271,486	8,095	99,043,224	0	0	FERROUS SULPHATE DOSING SY	HRDPLANT		
	270,072	7,635	8,093	271,486	8,097	0	0	0	#2 C.W.TRAVELLING SCREENS EAST	HRDUNIT2	HRD24112032	
	270,072	7,635	8,093	271,486	8,098	0	0	0	#2 C.W.TRAVELLING SCREENS WEST	HRDUNIT2	HRD24112033	
	270,072	7,635	8,093	271,486	8,106	0	0	0	#2 C.W. PUMP EAST	HRDUNIT2	HRD24123032	
	270,072	7,635	8,093	271,486	8,107	0	0	0	#2 C.W. PUMP WEST	HRDUNIT2	HRD24123033	
	270,072	7,635	8,093	271,486	8,120	0	0	0	#2 C.W. DISCHARGE TO OUTFALL	HRDUNIT2	HRD24140000	
	270,072	7,635	8,093	271,486	8,821	0	0	0	#2 C.W. SCREEN WASH SYSTEM	HRDUNIT2	HRD24130000	
	270,072	7,635	8,093	271,486	303,301	0	0	0	Anti Fouling System Unit 2	HRDUNIT2		
500												
	270,072	7,635	8,152	0	0	0	0	0	#2 ELECTRICAL & CONTROLS SYS	HRDUNIT2	HRD25000000	
	270,072	7,635	8,152	7,677	0	0	0	0	#2 TURBINE GOVERNOR SYSTEM	HRDUNIT2	HRD21200000	
	270,072	7,635	8,152	7,677	324,486	0	0	0	Elec trip Device	HRDUNIT2	FA-2	
	270,072	7,635	8,152	7,677	333,931	0	0	0	HRD U2 MARK V AUTO SYNC	HRDUNIT2	2	
	270,072	7,635	8,152	7,677	99,000,377	0	0	0	INSTALL ADDITIONAL TURBINE SUP	HRDPLANT		
	270,072	7,635	8,152	7,677	99,034,709	0	0	0	ELECTROHYDRAULIC CONTROL	HRDPLANT		
	270,072	7,635	8,152	7,677	99,036,221	0	0	0	Inverter	HRDPLANT		
	270,072	7,635	8,152	8,138	0	0	0	0	#2 RELAY RM PROTECT & CONTROL	HRDUNIT2	HRD24800000	
	270,072	7,635	8,152	8,144	0	0	0	0	#2 MAIN CONTROLS	HRDUNIT2	HRD24900000	
	270,072	7,635	8,152	8,144	99,043,197	0	0	0	INSTALL 2 PANELS FOR INSTR	HRDPLANT		
	270,072	7,635	8,152	8,144	99,043,199	0	0	0	BALANCE OF INSTRUMENTATION	HRDPLANT		
	270,072	7,635	8,152	8,144	99,043,200	0	0	0	INSTALL CED PERCISION TRAN	HRDPLANT		
	270,072	7,635	8,152	8,153	0	0	0	0	#2 GEN. BUS DUCTS & CONN'S	HRDUNIT2	HRD25100000	
	270,072	7,635	8,152	8,153	99,043,193	0	0	0	REMOVE & REPLACE ISOLATED	HRDPLANT		
	270,072	7,635	8,152	8,155	0	0	0	0	#2 GEN. TRANSFORMER & AUX'S	HRDUNIT2	HRD25220000	
	270,072	7,635	8,152	8,156	0	0	0	0	#2 UNIT SERVICE POWER SYSTEM	HRDUNIT2	HRD25300000	
	270,072	7,635	8,152	8,156	8,157	0	0	0	UNIT BOARD UB-2	HRDUNIT2	HRD25310000	
	270,072	7,635	8,152	8,156	8,162	0	0	0	POWER CENTRE B	HRDUNIT2	HRD25320000	
	270,072	7,635	8,152	8,156	8,168	0	0	0	TURBINE & BOILER AREA MCC B1	HRDUNIT2	HRD25330000	
	270,072	7,635	8,152	8,156	8,169	0	0	0	H.P. HEATER MCC B1-1	HRDUNIT2	HRD25331000	
	270,072	7,635	8,152	8,156	8,170	0	0	0	SOOTBLOWER MCC B1-2	HRDUNIT2	HRD25332000	
	270,072	7,635	8,152	8,173	0	0	0	0	#2 BATTERY CHARGERS	HRDUNIT2	HRD25700000	
	270,072	7,635	8,152	8,173	99,000,349	0	0	0	INSTALL BATTERY CHARGER	HRDPLANT		
	270,072	7,635	8,152	8,173	99,032,476	0	0	0	250 VOLT DC BATTERY BANK	HRDPLANT		
	270,072	7,635	8,152	8,173	99,032,478	0	0	0	250 VOLT DC BATTERY CHARGER	HRDPLANT		
	270,072	7,635	8,152	8,174	0	0	0	0	UPS 2, INVERTER	HRDUNIT2	HRD25710000	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	7,635	8,152	8,174	325,165	0	0	0	SNMP Upgrade - UPS #2 - HRD	HRDUNIT2		
	270,072	7,635	8,152	8,174	99,029,560	0	0	0	INVERTER DISTRIBUTION UNIT #2	HRDPLANT		
	270,072	7,635	8,152	8,186	0	0	0	0	#2 BATTERY BANKS	HRDUNIT2	HRD25750000	
	270,072	7,635	8,152	8,186	99,032,477	0	0	0	250 VOLT BATTERY BANK	HRDPLANT		
	270,072	7,635	8,152	8,186	99,032,479	0	0	0	250 VOLT DC BATTERY CHARGER	HRDPLANT		
	270,072	7,635	8,152	271,475	0	0	0	0	#2 CABLE RACEWAYS	HRDUNIT2	HRD25000001	
	270,072	7,635	8,152	271,475	99,000,333	0	0	0	INSTALL CONDUIT FOR BOILER CON	HRDPLANT		
	270,072	7,635	8,152	271,475	99,043,173	0	0	0	INSTALL CABLE TRENCHES AND	HRDPLANT		
	270,072	7,635	8,152	271,476	0	0	0	0	#2 CONTROL CABLES	HRDUNIT2	HRD25000002	
	270,072	7,635	8,152	271,476	99,000,338	0	0	0	INSTALL CONTROL CABLES FOR GEN	HRDPLANT		
	270,072	7,635	8,152	271,476	99,000,339	0	0	0	INSTALL CONTROL CABLES FOR BOI	HRDPLANT		
	270,072	7,635	8,152	271,477	0	0	0	0	#2 POWER CABLES	HRDUNIT2	HRD25000003	
	270,072	7,635	8,152	271,477	99,043,194	0	0	0	INSTALL POWER CABLE #4160	HRDPLANT		
	270,072	7,635	8,152	271,477	99,043,195	0	0	0	INSTALL POWER CABLES #600	HRDPLANT		
	270,072	7,635	8,152	271,477	99,043,228	0	0	0	CABLE REPLACEMENT	HRDPLANT		
	270,072	7,635	8,152	271,478	0	0	0	0	#2 SWITCHGEAR 4160 & 600 VOLT	HRDUNIT2	HRD25000004	
	270,072	7,635	8,152	271,478	99,043,202	0	0	0	STUDY FOR METALCLAD SWITCH	HRDPLANT		
	270,072	7,635	8,152	271,478	99,043,226	0	0	0	UPGRADE SYNC CHECK SYSTEM,	HRDPLANT		
	270,072	7,635	8,152	271,479	0	0	0	0	#2 TSI	HRDUNIT2	HRD25000005	
	270,072	7,635	8,152	299,451	0	0	0	0	Unit 2 DCS	HRDPLANT		
	270,072	7,635	8,152	309,895	0	0	0	0	600 V Meltric Plugs	HRDUNIT2		
	270,072	7,635	8,152	309,898	0	0	0	0	Boiler Prot & Control	HRDUNIT2		
	270,072	7,635	8,152	343,112	0	0	0	0	#2 BURNER MANAGEMENT	HRDUNIT2	HRD24810000	
	270,072	7,635	359,303	0	0	0	0	0	UNIT 2 BLANKS AND BLINDS	HRDUNIT2		
400												
	270,072	8,193	0	0	0	0	0	0	UNIT 3	HRDUNIT3	HRD30000000	
	270,072	8,193	8,194	0	0	0	0	0	#3 TURBINE & GENERATOR	HRDUNIT3	HRD31000000	
	270,072	8,193	8,194	8,223	0	0	0	0	#3 TURBINE CONDENSER SYSTEM	HRDUNIT3	HRD31160000	
	270,072	8,193	8,194	8,223	8,252	0	0	0	#3 CONDENSER AIR EXTRACTION	HRDUNIT3	HRD31340000	
	270,072	8,193	8,194	8,223	8,252	8,892	0	0	#3 CONDENSR AIR VAC PUMP NORTH	HRDUNIT3	HRD31343030	
	270,072	8,193	8,194	8,223	8,252	8,893	0	0	#3 CONDENSR AIR VAC PUMP SOUTH	HRDUNIT3	HRD31343031	
	270,072	8,193	8,194	8,223	8,252	99,000,295	0	0	CONDENSER AIR REMOVAL SYSTEM S	HRDPLANT		
	270,072	8,193	8,194	8,223	271,677	0	0	0	#3 TURBINE CONDENSER	HRDUNIT3	HRD31160001	
	270,072	8,193	8,194	8,223	271,677	99,000,292	0	0	INSTALL ONE CONDENSER TUBE LEA	HRDPLANT		
	270,072	8,193	8,194	8,223	271,677	99,000,293	0	0	INSTALL CONDENSER STAGE III	HRDPLANT		
	270,072	8,193	8,194	8,223	322,988	0	0	0	U3 Condenser Actuators	HRDUNIT3		
	270,072	8,193	8,194	8,223	99,000,297	0	0	0	BALANCE OF CONDENSER SYSTEM ST	HRDPLANT		
	270,072	8,193	8,194	8,298	0	0	0	0	U3 GENERATOR	HRDUNIT3	HRD31500000	
	270,072	8,193	8,194	8,298	8,299	0	0	0	#3 GENERATOR ROTOR	HRDUNIT3	HRD31510000	
	270,072	8,193	8,194	8,298	8,299	8,300	0	0	#3GEN ROTOR SLIP RINGS & BRUSH	HRDUNIT3	HRD31514000	
	270,072	8,193	8,194	8,298	8,299	99,000,271	0	0	INSTALL ROTOR UNIT 3 - MFG HIT	HRDPLANT		
	270,072	8,193	8,194	8,298	8,304	0	0	0	#3 GENERATOR STATOR	HRDUNIT3	HRD31520000	
	270,072	8,193	8,194	8,298	8,304	8,308	0	0	#3 GEN. STANDOFF INSULATORS	HRDUNIT3	HRD31531000	
	270,072	8,193	8,194	8,298	8,304	8,310	0	0	#3 GENERATOR P.T. CUBICLE	HRDUNIT3	HRD31593000	
	270,072	8,193	8,194	8,298	8,304	324,691	0	0	#3 GENERATOR STATOR RELAY	HRDUNIT3		
	270,072	8,193	8,194	8,298	8,304	99,000,274	0	0	INSTALL STATOR UNIT 3 - MFG HI	HRDPLANT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	8,193	8,194	8,298	8,313	0	0	0	#3 GEN.HYDROGEN GAS SYSTEM	HRDUNIT3	HRD31620000	
	270,072	8,193	8,194	8,298	8,313	8,288	0	0	#3 GENERATOR SEAL OIL SYSTEM	HRDUNIT3	HRD31450000	
	270,072	8,193	8,194	8,298	8,313	8,288	9,662	0	#3 GEN AC SEAL OIL PUMP	HRDUNIT3	HRD31451010	
	270,072	8,193	8,194	8,298	8,313	8,288	9,664	0	#3 GEN DC SEAL OIL PUMP	HRDUNIT3	HRD31452010	
	270,072	8,193	8,194	8,298	8,313	8,288	9,666	0	#3 GEN SEAL OIL VAC PUMP	HRDUNIT3	HRD31454010	
	270,072	8,193	8,194	8,298	8,313	8,318	0	0	#3 GENERATOR CO2 GAS PURGE	HRDUNIT3	HRD31630000	
	270,072	8,193	8,194	8,298	8,313	8,321	0	0	#3 GENERATOR COMPRESSED AIR	HRDUNIT3	HRD31640000	
	270,072	8,193	8,194	8,298	8,322	0	0	0	#3 GENERATOR HYDROGEN COOLING	HRDUNIT3	HRD31650000	
	270,072	8,193	8,194	8,298	99,000,277	0	0	0	BALANCE OF GENERATORS	HRDPLANT		
	270,072	8,193	8,194	8,298	99,039,100	0	0	0	Partial Discharge Analysis	HRDPLANT	FA-IC03468	
	270,072	8,193	8,194	8,312	0	0	0	0	#3 GENERATOR EXCITATION SYSTEM	HRDUNIT3	HRD31610000	
	270,072	8,193	8,194	8,312	271,679	0	0	0	#3 EXCITER	HRDUNIT3	HRD31610001	
	270,072	8,193	8,194	8,312	271,679	99,000,281	0	0	INSTALL EXCITER UNIT 3 - MFG W	HRDPLANT		
	270,072	8,193	8,194	8,312	271,680	0	0	0	#3 EXCITATION TRANSFORMER	HRDUNIT3	HRD31610002	
	270,072	8,193	8,194	8,312	271,680	99,000,284	0	0	INSTALL EXCITATION TRANSFORMER	HRDPLANT		
	270,072	8,193	8,194	8,312	271,681	0	0	0	#3 FIELD BREAKER	HRDUNIT3	HRD31610003	
	270,072	8,193	8,194	8,312	271,681	99,000,288	0	0	INSTALL EXCITATION FIELD BREAK	HRDPLANT		
	270,072	8,193	8,194	8,312	99,000,290	0	0	0	BALANCE OF EXCITATION SYSTEM S	HRDPLANT		
	270,072	8,193	8,194	8,326	0	0	0	0	#3 GENERATOR SYNCRONOUS COND	HRDPLANT	HRD31660000	
	270,072	8,193	8,194	271,675	0	0	0	0	#3 TURBINE	HRDUNIT3	HRD31000001	
	270,072	8,193	8,194	271,675	8,196	0	0	0	#3 TURBINE MAIN STEAM CHEST	HRDUNIT3	HRD31110000	
	270,072	8,193	8,194	271,675	8,201	0	0	0	#3 H.P. TURBINE	HRDUNIT3	HRD31120000	
	270,072	8,193	8,194	271,675	8,206	0	0	0	#3 TURB REHEAT/IP STEAM CHEST	HRDUNIT3	HRD31130000	
	270,072	8,193	8,194	271,675	8,211	0	0	0	#3 I.P. TURBINE	HRDUNIT3	HRD31140000	
	270,072	8,193	8,194	271,675	8,217	0	0	0	#3 L.P. TURBINE	HRDUNIT3	HRD31150000	
	270,072	8,193	8,194	271,675	8,230	0	0	0	#3 TURBINE FRONT STANDARD	HRDUNIT3	HRD31170000	
	270,072	8,193	8,194	271,675	8,236	0	0	0	#3 TURBINE GOVERNOR SYSTEM	HRDUNIT3	HRD31200000	
	270,072	8,193	8,194	271,675	8,236	99,000,262	0	0	INSTALL GOVENOR UNIT 3 - MFG H	HRDPLANT		
	270,072	8,193	8,194	271,675	8,236	99,023,644	0	0	TURBINE ROTOR MOVEMENT MONITOR	HRDPLANT		
	270,072	8,193	8,194	271,675	8,244	0	0	0	#3 TURBINE GLAND STEAM SYSTEM	HRDUNIT3	HRD31310000	
	270,072	8,193	8,194	271,675	8,248	0	0	0	#3 TURBINE PRE-WARMING SYSTEM	HRDUNIT3	HRD31320000	
	270,072	8,193	8,194	271,675	8,250	0	0	0	#3 TURBINE TURNING GEAR	HRDUNIT3	HRD31330000	
	270,072	8,193	8,194	271,675	8,257	0	0	0	#3 TURBINE DRAINS SYSTEMS	HRDUNIT3	HRD31350000	
	270,072	8,193	8,194	271,675	8,270	0	0	0	#3 TURBINE OIL SYSTEMS	HRDUNIT3	HRD31400000	
	270,072	8,193	8,194	271,675	8,270	8,275	0	0	#3 TURBINE LUBE OIL SYSTEM	HRDUNIT3	HRD31430000	
	270,072	8,193	8,194	271,675	8,270	8,275	8,271	0	#3 TURB LUBE OIL TANK & EQUIP	HRDUNIT3	HRD31410000	
	270,072	8,193	8,194	271,675	8,270	8,275	8,274	0	#3 TURB LUBE OIL PURIFICATION	HRDUNIT3	HRD31420000	
	270,072	8,193	8,194	271,675	8,270	8,275	8,276	0	#3 TURB AC FLUSHING OIL PUMP	HRDUNIT3	HRD31431130	
	270,072	8,193	8,194	271,675	8,270	8,275	8,281	0	#3 TURBINE LUBE D.C. PUMP	HRDUNIT3	HRD31432100	
	270,072	8,193	8,194	271,675	8,270	8,275	9,546	0	#3 TURBINE AUXILIARY OIL PUMP	HRDUNIT3	HRD31434100	
	270,072	8,193	8,194	271,675	8,270	8,294	0	0	#3 TURBINE JACKING OIL SYSTEM	HRDUNIT3	HRD31460000	
	270,072	8,193	8,194	271,675	8,270	8,294	8,295	0	#3 TURBINE JACKING OIL PUMP	HRDUNIT3	HRD31461000	
	270,072	8,193	8,194	271,675	8,270	99,039,523	0	0	Fire Protection System for	HRDPLANT		
	270,072	8,193	8,194	271,675	271,676	0	0	0	#3 TURBINE BLED STEAM	HRDUNIT3	HRD31000002	
	270,072	8,193	8,194	271,675	271,676	99,000,319	0	0	INSTALL BLED - STEAM SYSTEMS U	HRDPLANT		
	270,072	8,193	8,194	271,675	303,298	0	0	0	Metric Tools Unit #3	HRDUNIT3		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	8,193	8,194	271,675	308,871	0	0	0	Upgrade to Unit #3 Turbine	HRDUNIT3		
	270,072	8,193	8,194	271,675	331,940	0	0	0	U3 SS Regulator System 2009	HRDUNIT3		
	270,072	8,193	8,194	271,675	99,000,266	0	0	0	INSTALL TURBINE UNIT 3 - MFG H	HRDPLANT		
	270,072	8,193	8,194	271,675	99,027,839	0	0	0	DRILL TAP BEARINGS FOR TURBINE	HRDPLANT		
	270,072	8,193	8,194	99,000,322	0	0	0	0	SPECIAL TOOLS - UNIT #3 -HOLYR	HRDPLANT		
300												
	270,072	8,193	8,336	0	0	0	0	0	#3 BOILER PLANT	HRDUNIT3	HRD32000000	
	270,072	8,193	8,336	8,337	0	0	0	0	#3 BOILER STRUCTURE	HRDUNIT3	HRD32100000	
	270,072	8,193	8,336	8,337	99,000,138	0	0	0	INSTALL SOOT BLOWERS	HRDPLANT		
	270,072	8,193	8,336	8,337	99,000,139	0	0	0	STEAM GENERATOR	HRDPLANT		
	270,072	8,193	8,336	8,337	99,000,140	0	0	0	STEAM GENERATOR	HRDPLANT		
	270,072	8,193	8,336	8,337	99,000,141	0	0	0	PRESSURIZED OIL GUNS	HRDPLANT		
	270,072	8,193	8,336	8,337	99,000,142	0	0	0	STEAM GENERATORS	HRDPLANT		
	270,072	8,193	8,336	8,337	99,003,553	0	0	0	FOUR FABRIC TYPE EXPANSION JOI	HRDPLANT		
	270,072	8,193	8,336	8,337	99,029,564	0	0	0	OBSERVATION PORT IN THE BURNER	HRDPLANT		
	270,072	8,193	8,336	8,339	0	0	0	0	#3 BOILER FW & SAT'D STEAM SYS	HRDUNIT3	HRD32200000	
	270,072	8,193	8,336	8,339	8,340	0	0	0	#3 BOILER ECONOMIZER	HRDUNIT3	HRD32210000	
	270,072	8,193	8,336	8,339	8,344	0	0	0	#3 BOILER STEAM DRUM	HRDUNIT3	HRD32220000	
	270,072	8,193	8,336	8,339	8,344	99,000,397	0	0	YARWAY AQUARIAN 300 ELECTRONIC	HRDPLANT		
	270,072	8,193	8,336	8,339	8,344	99,023,641	0	0	SOLID STATE DRUM LEVEL MONITOR	HRDPLANT		
	270,072	8,193	8,336	8,339	8,351	0	0	0	#3 FURNACE	HRDUNIT3	HRD32240000	
	270,072	8,193	8,336	8,339	8,355	0	0	0	#3 BOILER FILLING AND DRAINING	HRDUNIT3	HRD32260000	
	270,072	8,193	8,336	8,339	8,355	8,494	0	0	#3 BOILER BLOWDOWN DRAINS & LP	HRDUNIT3	HRD32700000	
	270,072	8,193	8,336	8,339	8,355	8,494	8,495	0	#3 BOILER CONTINUOUS BLOWDOWN	HRDUNIT3	HRD32710000	
	270,072	8,193	8,336	8,339	8,355	8,494	359,345	0	UNIT 3 BOILER BLOWDOWN TANK	HRDUNIT3		
	270,072	8,193	8,336	8,339	8,355	99,000,182	0	0	BOILER VENTS AND DUCTS UNIT #3	HRDPLANT		
	270,072	8,193	8,336	8,359	0	0	0	0	#3 BOILER SUPERHEATER & REHEAT	HRDUNIT3	HRD32300000	
	270,072	8,193	8,336	8,359	8,360	0	0	0	#3 BOILER PRIMARY SUPERHEATER	HRDUNIT3	HRD32310000	
	270,072	8,193	8,336	8,359	8,362	0	0	0	#3 BOILER SUPERHEATER ATTEMP	HRDUNIT3	HRD32320000	
	270,072	8,193	8,336	8,359	8,362	99,000,145	0	0	INSTALL #3 BOILER SUPERHEATER	HRDUNIT2		
	270,072	8,193	8,336	8,359	8,366	0	0	0	#3BOILER SECONDARY SUPERHEATER	HRDUNIT3	HRD32330000	
	270,072	8,193	8,336	8,359	8,372	0	0	0	#3 BOILER MAIN STEAM LINES	HRDUNIT3	HRD32340000	
	270,072	8,193	8,336	8,359	8,372	8,373	0	0	#3 BOILER STOP VALVE	HRDUNIT3	HRD32341000	
	270,072	8,193	8,336	8,359	8,372	99,000,154	0	0	HIGH PRESSURE STEAM SYSTEM	HRDPLANT		
	270,072	8,193	8,336	8,359	8,372	99,000,155	0	0	HIGH PRESSURE STEAM SYSTEM UNI	HRDPLANT		
	270,072	8,193	8,336	8,359	8,379	0	0	0	#3BOILER REHEATER ATTEMPERATOR	HRDUNIT3	HRD32350000	
	270,072	8,193	8,336	8,359	8,384	0	0	0	#3 BOILER REHEATER	HRDUNIT3	HRD32360000	
	270,072	8,193	8,336	8,387	0	0	0	0	#3 BOILER AIR SYSTEM	HRDUNIT3	HRD32400000	
	270,072	8,193	8,336	8,387	8,426	0	0	0	#3 BOILER AIR SUPPLY (A/H TO	HRDUNIT3	HRD32440000	
	270,072	8,193	8,336	8,387	8,426	8,429	0	0	#3 BOILER AIR SUPPLY SEAL AIR	HRDUNIT3	HRD32443000	
	270,072	8,193	8,336	8,387	8,426	8,432	0	0	#3 BOILER SCANNER AIR SYSTEM	HRDUNIT3	HRD32446000	
	270,072	8,193	8,336	8,387	8,433	0	0	0	#3 BOILER WINDBOX	HRDUNIT3	HRD32450000	
	270,072	8,193	8,336	8,387	8,782	0	0	0	#3 BOILER F.D. FAN SYSTEM	HRDUNIT3	HRD32410000	
	270,072	8,193	8,336	8,387	8,782	8,392	0	0	#3 BOILER F.D. FAN EAST	HRDUNIT3	HRD32413032	
	270,072	8,193	8,336	8,387	8,782	8,392	324,380	0	FDF East Mot Prot Relay	HRDUNIT3		
	270,072	8,193	8,336	8,387	8,782	8,393	0	0	#3 BOILER F.D. FAN WEST	HRDUNIT3	HRD32413033	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	8,193	8,336	8,387	8,782	8,393	324,382	0	FDF West Mot Prot Relay	HRDUNIT3		
	270,072	8,193	8,336	8,387	8,787	0	0	0	#3 BOILER STEAM AIR HEATER	HRDUNIT3	HRD32420000	
	270,072	8,193	8,336	8,387	8,787	8,404	0	0	#3BOILER STEAM AIR HEATER EAST	HRDUNIT3	HRD32423032	
	270,072	8,193	8,336	8,387	8,787	8,405	0	0	#3BOILER STEAM AIR HEATER WEST	HRDUNIT3	HRD32423033	
	270,072	8,193	8,336	8,387	8,787	309,899	0	0	#3 Blr stm air htr drains east	HRDUNIT3		
	270,072	8,193	8,336	8,387	8,787	309,900	0	0	#3 blr stm air htr drains west	HRDUNIT3		
	270,072	8,193	8,336	8,387	8,787	359,353	0	0	Steam Preheater Flash Tank	HRDUNIT3	3	
	270,072	8,193	8,336	8,387	8,788	0	0	0	#3 BOILER MAIN AIR HEATER	HRDUNIT3	HRD32430000	
	270,072	8,193	8,336	8,387	8,788	8,410	0	0	#3 BOILER MAIN AIR HEATER EAST	HRDUNIT3	HRD32430032	
	270,072	8,193	8,336	8,387	8,788	8,411	0	0	#3 BOILER MAIN AIR HEATER WEST	HRDUNIT3	HRD32430033	
	270,072	8,193	8,336	8,437	0	0	0	0	#3 BOILER GAS SYSTEM	HRDUNIT3	HRD32500000	
	270,072	8,193	8,336	8,437	8,438	0	0	0	#3 BOILER GAS PASSES	HRDUNIT3	HRD32510000	
	270,072	8,193	8,336	8,437	8,448	0	0	0	#3 BOILER STACK	HRDUNIT3	HRD32570000	
	270,072	8,193	8,336	8,437	8,448	271,682	0	0	#3 STACK BREECHING	HRDUNIT3	HRD32570001	
	270,072	8,193	8,336	8,437	8,448	271,682	99,003,555	0	UNIT #3 STACK BREECHING, SEE P	HRDPLANT		
	270,072	8,193	8,336	8,437	8,448	99,000,177	0	0	INSTALL STACKS UNIT #3	HRDPLANT		
	270,072	8,193	8,336	8,437	8,452	0	0	0	#3 BOILER SOOTBLOWING SYSTEM	HRDUNIT3	HRD32580000	
	270,072	8,193	8,336	8,437	8,452	8,455	0	0	#3 BOILER RETRACTABLE S/B'S	HRDUNIT3	HRD32583000	
	270,072	8,193	8,336	8,437	8,452	8,456	0	0	#3 BOILER ROTARY SOOTBLOWERS	HRDUNIT3	HRD32584000	
	270,072	8,193	8,336	8,437	8,452	8,791	0	0	#3 BLR AIR HEATER SOOTBLOWERS	HRDUNIT3	HRD32585000	
	270,072	8,193	8,336	8,437	8,452	253,040	0	0	#3 BOILER WATERLANCE	HRDUNIT3	HRD32587000	
	270,072	8,193	8,336	8,437	8,452	99,039,065	0	0	high pressure water lances	HRDPLANT		
	270,072	8,193	8,336	8,437	8,452	99,039,066	0	0	high pressure water lances	HRDPLANT		
	270,072	8,193	8,336	8,437	8,452	99,039,067	0	0	high pressure water lances	HRDPLANT		
	270,072	8,193	8,336	8,437	8,452	99,039,068	0	0	SUNFLO SERIES P2000 PUMP	HRDPLANT	FA-04208	
	270,072	8,193	8,336	8,437	8,452	99,039,069	0	0	thermatel thermal dispersion	HRDPLANT		
	270,072	8,193	8,336	8,437	8,452	99,039,070	0	0	thermatel thermal dispersion	HRDPLANT		
	270,072	8,193	8,336	8,460	0	0	0	0	#3 BOILER FUEL FIRING SYSTEM	HRDUNIT3	HRD32600000	
	270,072	8,193	8,336	8,460	8,461	0	0	0	#3 BOILER HEAVY OIL SYSTEM	HRDUNIT3	HRD32610000	
	270,072	8,193	8,336	8,460	8,461	8,464	0	0	#3 BOILER HEAVY OIL PUMP EAST	HRDUNIT3	HRD32613032	
	270,072	8,193	8,336	8,460	8,461	8,465	0	0	#3 BOILER HEAVY OIL PUMP WEST	HRDUNIT3	HRD32613033	
	270,072	8,193	8,336	8,460	8,461	8,468	0	0	U3 BLR HVYOIL P/P STM,VLV,PIPE	HRDUNIT3	HRD32617000	
	270,072	8,193	8,336	8,460	8,461	8,471	0	0	#3 BOILER HEAVY OIL FIRING	HRDUNIT3	HRD32620000	
	270,072	8,193	8,336	8,460	8,461	359,344	0	0	U3 Fuel Oil Accumulator	HRDUNIT3		
	270,072	8,193	8,336	8,460	8,484	0	0	0	#3 BOILER LIGHT OIL SYSTEM	HRDUNIT3	HRD32640000	
	270,072	8,193	8,336	8,460	8,484	7,740	0	0	#3 BOILER LIGHT OIL PUMP WEST	HRDUNIT3	HRD32643033	
	270,072	8,193	8,336	8,460	8,484	8,481	0	0	#3 BOILER LIGHT OIL FIRING	HRDUNIT3	HRD32630000	
	270,072	8,193	8,336	8,460	8,484	8,481	99,000,144	0	INSTALL 9 LIGHT OIL IGNITORS F	HRDPLANT		
	270,072	8,193	8,336	8,460	8,484	8,983	0	0	#3 BOILER LIGHT OIL PUMP EAST	HRDUNIT3	HRD32643032	
	270,072	8,193	8,336	8,460	99,000,158	0	0	0	FUEL OIL SYSTEM UNIT #3	HRDPLANT		
	270,072	8,193	8,336	8,460	99,000,172	0	0	0	INSTALL LIGHT OIL SYSTEM UNIT	HRDPLANT		
	270,072	8,193	8,336	8,503	0	0	0	0	#3 BLR AUX STEAM & CONDENSATE	HRDUNIT3	HRD32800000	
	270,072	8,193	8,336	8,503	8,504	0	0	0	#3 BOILER AUX. STEAM MAIN	HRDUNIT3	HRD32810000	
	270,072	8,193	8,336	8,503	8,510	0	0	0	#3 BOILER AUXILIARY STEAM	HRDUNIT3	HRD32820000	
	270,072	8,193	8,336	8,503	8,518	0	0	0	#3 BOILER ATOMIZING STEAM	HRDUNIT3	HRD32830000	
	270,072	8,193	8,336	8,503	8,543	0	0	0	#3 AUXILIARY STEAM CONDENSATE	HRDUNIT3	HRD33150000	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	8,193	8,528	0	0	0	0	0	#3 CONDENSATE & F.W. SYSTEM	HRDUNIT3	HRD33000000	
	270,072	8,193	8,528	8,530	0	0	0	0	#3 CONDENSATE MAKE UP SYSTEM	HRDUNIT3	HRD33110000	
	270,072	8,193	8,528	8,546	0	0	0	0	#3 LOW PRESSURE FEEDWATER	HRDUNIT3	HRD33200000	
	270,072	8,193	8,528	8,546	8,551	0	0	0	#3 LOW PRESSURE HEATER 1	HRDUNIT3	HRD33213001	
	270,072	8,193	8,528	8,546	8,551	99,000,206	0	0	INSTALL LOW PRESSURE FEED SYST	HRDPLANT		
	270,072	8,193	8,528	8,546	8,552	0	0	0	#3 LOW PRESSURE HEATER 2	HRDUNIT3	HRD33213002	
	270,072	8,193	8,528	8,546	8,552	99,000,207	0	0	INSTALL LOW PRESSURE FEED SYST	HRDPLANT		
	270,072	8,193	8,528	8,546	8,571	0	0	0	#3 DEAERATOR SYSTEM	HRDUNIT3	HRD33250000	
	270,072	8,193	8,528	8,546	8,586	0	0	0	#3 LOW PRESSURE F.W. RESERVE	HRDUNIT3	HRD33270000	
	270,072	8,193	8,528	8,546	8,586	99,000,199	0	0	COSTS INCURRED FOR RESERVE FEE	HRDPLANT		
	270,072	8,193	8,528	8,546	8,586	99,000,200	0	0	INSTALL SPARE PARTS FOR RESERV	HRDPLANT		
	270,072	8,193	8,528	8,546	8,586	99,031,612	0	0	TURBINE FLOW METER WITH VALVES	HRDPLANT		
	270,072	8,193	8,528	8,546	8,809	0	0	0	#3 L P HEATER DRAIN PUMPS	HRDUNIT3	HRD33220000	
	270,072	8,193	8,528	8,590	0	0	0	0	#3 BOILER FEEDWATER PUMPING	HRDUNIT3	HRD33300000	
	270,072	8,193	8,528	8,590	8,859	0	0	0	#3 BOILER FEED PUMP - EAST	HRDUNIT3	HRD33310032	
	270,072	8,193	8,528	8,590	8,859	8,591	0	0	#3 BOILER FEEDPUMP RECIRC EAST	HRDUNIT3	HRD33320032	
	270,072	8,193	8,528	8,590	8,859	8,603	0	0	#3 BOILER FW P/P LUBE OIL EAST	HRDUNIT3	HRD33340032	
	270,072	8,193	8,528	8,590	8,859	324,412	0	0	BFP East Mot Prot Relay	HRDUNIT3		
	270,072	8,193	8,528	8,590	8,859	99,000,239	0	0	INSTALL BOILER FEED PUMP UNIT	HRDPLANT		
	270,072	8,193	8,528	8,590	8,859	99,000,246	0	0	INSTALL VIBRATION MONITOR FOR	HRDPLANT		
	270,072	8,193	8,528	8,590	8,860	0	0	0	#3 BOILER FEED PUMP - WEST	HRDUNIT3	HRD33310033	
	270,072	8,193	8,528	8,590	8,860	8,592	0	0	#3 BOILER FEEDPUMP RECIRC WEST	HRDUNIT3	HRD33320033	
	270,072	8,193	8,528	8,590	8,860	8,604	0	0	#3 BLR FW PUMP LUBE OIL WEST	HRDUNIT3	HRD33340033	
	270,072	8,193	8,528	8,590	8,860	324,414	0	0	BFP West Mot Prot. Relay	HRDUNIT3		
	270,072	8,193	8,528	8,590	8,860	99,000,240	0	0	INSTALL BOILER FEED PUMP UNIT	HRDPLANT		
	270,072	8,193	8,528	8,590	8,860	99,000,247	0	0	INSTALL VIBRATION MONITOR FOR	HRDPLANT		
	270,072	8,193	8,528	8,590	9,675	0	0	0	#3 BFP COM GLAND SEAL WATR INJ	HRDUNIT3	HRD33361000	
	270,072	8,193	8,528	8,590	9,676	0	0	0	#3 BFP COM GLNDSEAL WTR TRANSF	HRDUNIT3	HRD33362000	
	270,072	8,193	8,528	8,590	99,034,739	0	0	0	BFP RECIRCULATION SYSTEM	HRDPLANT		
	270,072	8,193	8,528	8,611	0	0	0	0	#3 H.P. FEEDWATER SYSTEM	HRDUNIT3	HRD33500000	
	270,072	8,193	8,528	8,611	8,618	0	0	0	#3 H.P. HEATER 4	HRDUNIT3	HRD33513004	
	270,072	8,193	8,528	8,611	8,618	99,031,613	0	0	HIGH PRESSURE FEEDWATER HEATER	HRDPLANT		
	270,072	8,193	8,528	8,611	8,619	0	0	0	#3 H.P. HEATER 5	HRDUNIT3	HRD33513005	
	270,072	8,193	8,528	8,611	8,619	99,031,614	0	0	HIGH PRESSURE FEEDWATER HEATER	HRDPLANT		
	270,072	8,193	8,528	8,611	8,620	0	0	0	#3 H.P. HEATER 6	HRDUNIT3	HRD33513006	
	270,072	8,193	8,528	8,611	8,620	99,031,615	0	0	HIGH PRESSURE FEEDWATER HEATER	HRDPLANT		
	270,072	8,193	8,528	8,611	8,639	0	0	0	#3 H.P. FEEDWATER VALVES	HRDUNIT3	HRD33531000	
	270,072	8,193	8,528	8,611	8,933	0	0	0	#3 H.P. HEATERS DRAIN PUMP	HRDUNIT3	HRD33514104	
	270,072	8,193	8,528	8,611	99,000,161	0	0	0	REPLACE HP HEAT EXCHANGERS	HRDPLANT		
	270,072	8,193	8,528	8,611	99,000,249	0	0	0	BALANCE OF HIGH PRESSURE FEED	HRDPLANT		
	270,072	8,193	8,528	8,801	0	0	0	0	#3 CONDENSATE EXTRACTION SYST	HRDUNIT3	HRD33120000	
	270,072	8,193	8,528	8,801	8,536	0	0	0	#3 CONDENS EXTRACT'N P/P NORTH	HRDUNIT3	HRD33123030	
	270,072	8,193	8,528	8,801	8,536	324,370	0	0	C. Ext. Pmp N Mot Prot Relay	HRDUNIT3		
	270,072	8,193	8,528	8,801	8,536	99,000,210	0	0	INSTALL MATERIAL FOR CONDENSAT	HRDPLANT		
	270,072	8,193	8,528	8,801	8,536	99,000,211	0	0	INSTALL CONDENSATE EXTRACTION	HRDPLANT		
	270,072	8,193	8,528	8,801	8,537	0	0	0	#3 CONDENS EXTRACT'N P/P SOUTH	HRDUNIT3	HRD33123031	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	8,193	8,528	8,801	8,537	324,372	0	0	C Ext Pump S Mot Prot Relay	HRDUNIT3		
	270,072	8,193	8,528	8,801	8,537	99,000,212	0	0	INSTALL CONDENSATE EXTRACTION	HRDPLANT		
	270,072	8,193	8,528	8,801	8,537	99,000,213	0	0	CONDENSATE RETUREN SYSTEM	HRDPLANT		
400												
	270,072	8,193	8,645	0	0	0	0	0	#3 UNIT GENERATION SERVICES	HRDUNIT3	HRD34000000	
	270,072	8,193	8,645	8,262	0	0	0	0	#3 TURB/GEN WATER COOLING SYS	HRDUNIT3	HRD31360000	
	270,072	8,193	8,645	8,262	9,658	0	0	0	#3 T/G COOLING WATER PUMP EAST	HRDUNIT3	HRD31363010	
	270,072	8,193	8,645	8,262	9,660	0	0	0	#3 T/G COOLING WATER PUMP WEST	HRDUNIT3	HRD31363020	
	270,072	8,193	8,645	8,691	0	0	0	0	#3 GENERAL SERVICE COOLING	HRDUNIT3	HRD34500000	
	270,072	8,193	8,645	271,678	0	0	0	0	#3 CW SYSTEM	HRDUNIT3	HRD34000001	
	270,072	8,193	8,645	271,678	8,647	0	0	0	#3 C.W. INTAKE SYSTEM	HRDUNIT3	HRD34110000	
	270,072	8,193	8,645	271,678	8,647	99,000,306	0	0	INSTALL 2 INTAKE SCREEN & DRIV	HRDPLANT		
	270,072	8,193	8,645	271,678	8,647	99,000,309	0	0	BALANCE OF CIRCULATING WATER S	HRDPLANT		
	270,072	8,193	8,645	271,678	8,647	99,043,180	0	0	INSTALL FERROUS SULPHATE D	HRDPLANT		
	270,072	8,193	8,645	271,678	8,647	99,043,225	0	0	FERROUS SULPHATE DOSING SY	HRDPLANT		
	270,072	8,193	8,645	271,678	8,649	0	0	0	#3 CW TRAVELLING SCREENS EAST	HRDUNIT3	HRD34112032	
	270,072	8,193	8,645	271,678	8,650	0	0	0	#3 CW TRAVELLING SCREENS WEST	HRDUNIT3	HRD34112033	
	270,072	8,193	8,645	271,678	8,658	0	0	0	#3 C.W. PUMP EAST	HRDUNIT3	HRD34123032	
	270,072	8,193	8,645	271,678	8,658	324,374	0	0	CWP East Mot Prot Relay	HRDUNIT3		
	270,072	8,193	8,645	271,678	8,659	0	0	0	#3 C.W. PUMP WEST	HRDUNIT3	HRD34123033	
	270,072	8,193	8,645	271,678	8,659	324,378	0	0	CWP West Mot. Prot Relay	HRDUNIT3		
	270,072	8,193	8,645	271,678	8,676	0	0	0	#3 C.W. DISCHARGE TO OUTFALL	HRDUNIT3	HRD34140000	
	270,072	8,193	8,645	271,678	8,823	0	0	0	#3 C.W. SCREEN WASH SYSTEM	HRDUNIT3	HRD34130000	
	270,072	8,193	8,645	271,678	8,823	99,000,303	0	0	INSTALL SCREEN WASH PUMP UNIT	HRDPLANT		
	270,072	8,193	8,645	271,678	279,782	0	0	0	SYNCH CONDENSER AUX CW SYSTEM	HRDUNIT3		
	270,072	8,193	8,645	271,678	303,295	0	0	0	Anti Fouling System U3	HRDUNIT3		
	270,072	8,193	8,645	271,678	99,000,300	0	0	0	INSTALL 2 CIRCULATING WATER PU	HRDPLANT		
500												
	270,072	8,193	8,712	0	0	0	0	0	#3 ELECTRICAL SYSTEM & CONTROL	HRDUNIT3	HRD35000000	
	270,072	8,193	8,712	8,698	0	0	0	0	U3 RELAY RM PROTECTION&CONTROL	HRDUNIT3	HRD34800000	
	270,072	8,193	8,712	8,698	99,000,324	0	0	0	INSTALL PROTECTIVE CONTROL AND	HRDPLANT		
	270,072	8,193	8,712	8,698	99,000,325	0	0	0	INSTALL EQUIPMENT TO PROVIDE E	HRDPLANT		
	270,072	8,193	8,712	8,699	0	0	0	0	#3 BURNER MANAGEMENT	HRDUNIT3	HRD34810000	
	270,072	8,193	8,712	8,699	99,024,413	0	0	0	C.I.U. PANEL FOR BURNER MANAGE	HRDPLANT		
	270,072	8,193	8,712	8,704	0	0	0	0	#3 MAIN CONTROLS	HRDUNIT3	HRD34900000	
	270,072	8,193	8,712	8,704	99,000,385	0	0	0	INSTALL 1 PANEL FOR INSTRUM &	HRDPLANT		
	270,072	8,193	8,712	8,704	99,000,386	0	0	0	PROVIDE UNIT RELIABILITY AND I	HRDPLANT		
	270,072	8,193	8,712	8,704	99,000,389	0	0	0	BALANCE OF INSTRUMENTATION STA	HRDPLANT		
	270,072	8,193	8,712	8,704	99,031,989	0	0	0	ADDITIONAL COST , PANEL SEE PL	HRDPLANT		
	270,072	8,193	8,712	8,704	99,043,201	0	0	0	INSTALL CED PERCISION TRAN	HRDPLANT		
	270,072	8,193	8,712	8,713	0	0	0	0	#3 GENERATOR BUS DUCT & CONN'S	HRDUNIT3	HRD35100000	
	270,072	8,193	8,712	8,713	99,000,327	0	0	0	INSTALL BUS DUCT (GENERATOR)	HRDPLANT		
	270,072	8,193	8,712	8,715	0	0	0	0	#3 GEN. TRANSFORMER & AUX	HRDUNIT3	HRD35220000	
	270,072	8,193	8,712	8,716	0	0	0	0	#3 UNIT SERVICE POWER SYSTEM	HRDUNIT3	HRD35300000	
	270,072	8,193	8,712	8,716	8,717	0	0	0	UNIT BOARD UB-3	HRDUNIT3	HRD35310000	
	270,072	8,193	8,712	8,716	8,718	0	0	0	UNIT AUX. BOARD UAB-3	HRDUNIT3	HRD35320000	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	8,193	8,712	8,716	8,722	0	0	0	TURBINE AREA MCC TAB-34	HRDUNIT3	HRD35330000	
	270,072	8,193	8,712	8,716	8,724	0	0	0	BOILER AREA BAB-3	HRDUNIT3	HRD35340000	
	270,072	8,193	8,712	8,716	8,725	0	0	0	H.P. HEATER MCC HPH-3	HRDUNIT3	HRD35341000	
	270,072	8,193	8,712	8,716	8,726	0	0	0	SOOTBLOWER MCC SB3	HRDUNIT3	HRD35342000	
	270,072	8,193	8,712	8,716	8,728	0	0	0	BOILER ROOM VENT MCC BRV-3	HRDUNIT3	HRD35344000	
	270,072	8,193	8,712	8,750	0	0	0	0	#3 BATTERY CHARGERS	HRDUNIT3	HRD35700000	
	270,072	8,193	8,712	8,750	358,100	0	0	0	#2 - 129 VDC 3 PHASE CHARGER	HRDUNIT3	HRD35702000	
	270,072	8,193	8,712	8,750	359,337	0	0	0	#1 - 129 VDC 3 PHASE CHARGER	HRDUNIT3		
	270,072	8,193	8,712	8,750	99,000,351	0	0	0	INSTALL BATTERY CHARGER STAGE	HRDPLANT		
	270,072	8,193	8,712	8,750	99,000,352	0	0	0	INSTALL BATTERY CHARGER STAGE	HRDPLANT		
	270,072	8,193	8,712	8,751	0	0	0	0	UPS 3 INVERTER	HRDUNIT3	HRD35710000	
	270,072	8,193	8,712	8,751	325,166	0	0	0	SNMP Upgrade - UPS #3 - HRD	HRDUNIT3		
	270,072	8,193	8,712	8,751	99,038,700	0	0	0	UNINTERRUPTIBLE POWER SUPPLY	HRDPLANT		
	270,072	8,193	8,712	8,751	99,038,702	0	0	0	DISTRIBUTION PANELBOARD	HRDPLANT		
	270,072	8,193	8,712	8,751	99,038,703	0	0	0	DISTRIBUTION PANELBOARD	HRDPLANT		
	270,072	8,193	8,712	8,757	0	0	0	0	UPS 4 INVERTER	HRDUNIT3	HRD35720000	
	270,072	8,193	8,712	8,757	325,167	0	0	0	SNMP Upgrade - UPS #4 - HRD	HRDUNIT3		
	270,072	8,193	8,712	8,757	99,038,704	0	0	0	DISTRIBUTION PANELBOARD	HRDPLANT		
	270,072	8,193	8,712	8,757	99,038,705	0	0	0	DISTRIBUTION PANELBOARD	HRDPLANT		
	270,072	8,193	8,712	8,763	0	0	0	0	#3 BATTERY BANKS	HRDUNIT3	HRD35750000	
	270,072	8,193	8,712	8,763	99,000,356	0	0	0	INSTALL D.C. DISTRIBUTION BOAR	HRDPLANT		
	270,072	8,193	8,712	8,763	99,029,566	0	0	0	C & D 120 CELL BATTERY BANK	HRDPLANT		
	270,072	8,193	8,712	8,763	99,029,567	0	0	0	C & D 120 CELL BATTERY BANK	HRDPLANT		
	270,072	8,193	8,712	8,763	99,038,706	0	0	0	BATTERY CHARGER	HRDPLANT		
	270,072	8,193	8,712	271,763	0	0	0	0	U3 CABLE RACEWAYS	HRDUNIT3	HRD34800001	
	270,072	8,193	8,712	271,763	99,000,115	0	0	0	INSTALL CABLE TRENCHES AND DUC	HRDPLANT		
	270,072	8,193	8,712	271,763	99,000,330	0	0	0	INSTALL CABLE TRAYS AND CONDUI	HRDPLANT		
	270,072	8,193	8,712	271,763	99,024,411	0	0	0	CABLE TRAY - 2 FT WIDTH	HRDPLANT		
	270,072	8,193	8,712	271,763	99,024,412	0	0	0	METAL CONDUIT 3/4" DIAMETER	HRDPLANT		
	270,072	8,193	8,712	271,764	0	0	0	0	U3 CONTROL CABLES	HRDUNIT3	HRD34800002	
	270,072	8,193	8,712	271,764	99,000,335	0	0	0	INSTALL CONTROL CABLES STAGE I	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,417	0	0	0	#14 AWG CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,418	0	0	0	#16 AWG CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,419	0	0	0	#12-2 CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,420	0	0	0	#12 AWG CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,421	0	0	0	#16 AWG INSTRUMENT CONTROL CAB	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,422	0	0	0	#16 AWG CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,423	0	0	0	#16AWG CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,424	0	0	0	#16 AWG CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,425	0	0	0	#14 AWG CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,426	0	0	0	#16 AWG TYPE TX CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,764	99,024,427	0	0	0	#16 AWG TYPE KX CONTROL CABLE	HRDPLANT		
	270,072	8,193	8,712	271,765	0	0	0	0	U3 POWER CABLES	HRDUNIT3	HRD34800003	
	270,072	8,193	8,712	271,765	99,000,341	0	0	0	INSTALL POWER CABLE #4160 VOLT	HRDPLANT		
	270,072	8,193	8,712	271,765	99,000,343	0	0	0	INSTALL POWER CABLES #600 VOLT	HRDPLANT		
	270,072	8,193	8,712	271,765	99,024,428	0	0	0	#4 AWG POWER CABLE	HRDPLANT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	8,193	8,712	271,765	99,024,429	0	0	0	#16 AWG POWER CABLE	HRDPLANT		
	270,072	8,193	8,712	271,766	0	0	0	0	U3 SWITCHGEAR 4160 & 600 VOLT	HRDUNIT3	HRD34800005	
	270,072	8,193	8,712	271,766	99,000,363	0	0	0	INSTALL METALCLAD SWITCHGEAR C	HRDPLANT		
	270,072	8,193	8,712	271,766	99,031,935	0	0	0	CONTROL SYSTEM, SEE PL ASSET 0	HRDPLANT		
	270,072	8,193	8,712	271,766	99,043,203	0	0	0	STUDY FOR METALCLAD SWITCH	HRDPLANT		
	270,072	8,193	8,712	271,766	99,043,227	0	0	0	UPGRADE SYNC CHECK SYSTEM,	HRDPLANT		
	270,072	8,193	8,712	271,767	0	0	0	0	U3 TSI	HRDUNIT3	HRD34800006	
	270,072	8,193	8,712	271,767	99,024,410	0	0	0	BENTLEY NEVADA TURBINE SUPERVI	HRDPLANT		
	270,072	8,193	8,712	301,711	0	0	0	0	UNIT 3 DCS	HRDPLANT		
	270,072	8,193	8,712	309,896	0	0	0	0	600 V Meltric Plugs	HRDUNIT3		
	270,072	8,193	8,712	309,901	0	0	0	0	Boiler prot & Control	HRDUNIT3		
	270,072	8,193	359,304	0	0	0	0	0	UNIT 3 BLANKS AND BLINDS	HRDUNIT3		
700												
	270,072	9,739	0	0	0	0	0	0	HRD WATER TREATMENT &ENVIRONMT	HRDPLANT	HRD97131200	
	270,072	9,739	7,203	0	0	0	0	0	HRD WATER TREATMENT PLANT	HRDPLANT	HRD97100000	
	270,072	9,739	7,203	7,210	0	0	0	0	HRD RAW WATER SYSTEM	HRDPLANT	HRD97110000	
	270,072	9,739	7,203	7,210	7,534	0	0	0	QUARRY BROOK DAM & FISHWAY SYS	HRDPLANT	HRD98652000	
	270,072	9,739	7,203	7,210	8,937	0	0	0	RAW WATER PUMP SOUTH	HRDPLANT	HRD97111031	
	270,072	9,739	7,203	7,210	8,975	0	0	0	RAW WATER PUMP NORTH	HRDPLANT	HRD97111030	
	270,072	9,739	7,203	7,210	99,000,041	0	0	0	PORTABLE DOMESTIC WELL	HRDPLANT		
	270,072	9,739	7,203	7,210	99,000,042	0	0	0	BALANCE OF WATER SUPPLY SYSTEM	HRDPLANT		
	270,072	9,739	7,203	7,210	99,000,043	0	0	0	SUPPLY WATER TO PLANT	HRDPLANT		
	270,072	9,739	7,203	7,211	0	0	0	0	HRD DOMESTIC WATER SYSTEM	HRDPLANT	HRD97140000	
	270,072	9,739	7,203	7,247	0	0	0	0	WT PLANT & ETAPRO COMPUTERS	HRDPLANT	HRD97930000	
	270,072	9,739	7,203	7,247	99,034,737	0	0	0	PERFORMANCE MONITORING UNITS	HRDPLANT		
	270,072	9,739	7,203	9,857	0	0	0	0	GENERAL SERVICE COOLING WATER	HRDPLANT	HRD97112031	
	270,072	9,739	7,203	9,857	99,000,090	0	0	0	GENERAL SERVICE COOLING SYSTEM	HRDPLANT		
	270,072	9,739	7,203	286,051	0	0	0	0	ANALYICAL SYSTEMS	HRDENVSITES		
	270,072	9,739	7,203	286,051	6,720	0	0	0	#1 ANALYTICAL SYSTEMS	HRDUNIT1	HRD14600000	
	270,072	9,739	7,203	286,051	8,135	0	0	0	#2 ANALYTICAL SYSTEMS	HRDUNIT2	HRD24600000	
	270,072	9,739	7,203	286,051	8,695	0	0	0	#3 ANALYTICAL SYSTEMS	HRDUNIT3	HRD34600000	
	270,072	9,739	7,203	286,052	0	0	0	0	CHEMICAL DOSING SYSTEMS	HRDENVSITES		
	270,072	9,739	7,203	286,052	7,055	0	0	0	#1 CHEMICAL DOSING SYSTEM	HRDUNIT1	HRD13260000	
	270,072	9,739	7,203	286,052	7,055	99,000,250	0	0	INSTALL CHEMICAL FEED SYSTEM -	HRDPLANT		
	270,072	9,739	7,203	286,052	7,055	99,000,252	0	0	INSTALL CHEMICAL FEED PUMPS ON	HRDPLANT		
	270,072	9,739	7,203	286,052	7,055	99,000,387	0	0	INSTALL RECORDING INSTRUMENT F	HRDPLANT		
	270,072	9,739	7,203	286,052	7,055	99,031,324	0	0	ADDITIONAL COSTS TO CHEMICAL F	HRDPLANT		
	270,072	9,739	7,203	286,052	8,026	0	0	0	#2 CHEMICAL DOSING SYSTEM	HRDUNIT2	HRD23260000	
	270,072	9,739	7,203	286,052	8,026	99,043,184	0	0	INSTALL CHEMICAL FEED SYST	HRDPLANT		
	270,072	9,739	7,203	286,052	8,026	99,043,185	0	0	INSTALL CHEMICAL FEED PUMP	HRDPLANT		
	270,072	9,739	7,203	286,052	8,026	99,043,198	0	0	INSTALL RECORDING INSTRUME	HRDPLANT		
	270,072	9,739	7,203	286,052	8,580	0	0	0	#3 CHEMICAL DOSING SYSTEM	HRDUNIT3	HRD33260000	
	270,072	9,739	7,203	286,052	8,580	99,000,251	0	0	INSTALL CHEMICAL FEED SYSTEM S	HRDPLANT		
	270,072	9,739	7,203	286,052	8,580	99,043,186	0	0	INSTALL CHEMICAL FEED PUMP	HRDPLANT		
	270,072	9,739	7,203	286,053	0	0	0	0	CONDENSATE POLISHERS	HRDENVSITES		
	270,072	9,739	7,203	286,053	6,967	0	0	0	#1 CONDENSATE POLISHER PLANT	HRDUNIT1	HRD14410000	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	9,739	7,203	286,053	7,401	0	0	0	CONDENSATE POLISHER MCC A1-3	HRDUNIT1	HRD15333000	
	270,072	9,739	7,203	286,053	8,127	0	0	0	#2 CONDENSATE POLISHER PLANT	HRDUNIT2	HRD24410000	
	270,072	9,739	7,203	286,053	8,171	0	0	0	CONDENSATE POLISHER MCC B1-3	HRDUNIT2	HRD25333000	
	270,072	9,739	7,203	286,053	8,686	0	0	0	#3 CONDENSATE POLISHER PLANT	HRDUNIT3	HRD34410000	
	270,072	9,739	7,203	286,053	8,727	0	0	0	CONDENSATE POLISHER BAB 3-3	HRDUNIT3	HRD35343000	
	270,072	9,739	7,203	286,053	99,000,214	0	0	0	INSTALL CONDENSATION POLISHERS	HRDPLANT		
	270,072	9,739	7,203	286,054	0	0	0	0	FERROUS SULPHATE SYSTEMS	HRDENVSITES		
	270,072	9,739	7,203	286,054	9,509	0	0	0	UNIT #1 FER/SULP TANK & PIPING	HRDPLANT	HRD98175210	
	270,072	9,739	7,203	286,054	9,510	0	0	0	UNIT #2 FER/SULP TANK & PIPING	HRDPLANT	HRD98175220	
	270,072	9,739	7,203	286,054	9,511	0	0	0	UNIT #3 FER/SULP TANK & PIPING	HRDPLANT	HRD98175230	
	270,072	9,739	7,203	286,057	0	0	0	0	WATER TREATMENT PLANT SYSTEMS	HRDENVSITES		
	270,072	9,739	7,203	286,057	6,802	0	0	0	W.T.P. BRINE SYSTEM	HRDPLANT	HRD97170000	
	270,072	9,739	7,203	286,057	7,185	0	0	0	WATER TREAT & MCC C5	HRDUNIT1	HRD15560000	
	270,072	9,739	7,203	286,057	7,212	0	0	0	W.T.P. SULFURIC ACID SYSTEM	HRDPLANT	HRD97160000	
	270,072	9,739	7,203	286,057	7,213	0	0	0	WTP FLOCULANT CHEMICAL INJECT.	HRDPLANT	HRD97180000	
	270,072	9,739	7,203	286,057	7,214	0	0	0	W.T.P. PRIMARY TRAINS	HRDPLANT	HRD97131000	
	270,072	9,739	7,203	286,057	7,220	0	0	0	W.T.P. MIXED BEDS	HRDPLANT	HRD97137000	
	270,072	9,739	7,203	286,057	7,422	0	0	0	W.T.P. CLARIFIER SYSTEM	HRDPLANT	HRD97121000	
	270,072	9,739	7,203	286,057	8,748	0	0	0	W T P & AUX. BLR MCC WTP-34	HRDUNIT3		
	270,072	9,739	7,203	286,057	9,864	0	0	0	W.T.P. SAND FILTER SYSTEM	HRDPLANT	HRD97122100	
	270,072	9,739	7,203	286,057	9,879	0	0	0	W.T.P. CLEARWELL SYSTEM	HRDPLANT	HRD97123000	
	270,072	9,739	7,203	286,057	9,995	0	0	0	6400 CHEMICAL INJECTION	HRDPLANT	HRD97181332	
	270,072	9,739	7,203	286,057	10,037	0	0	0	W.T.P. CAUSTIC SYSTEM	HRDPLANT	HRD97150000	
	270,072	9,739	7,203	309,729	0	0	0	0	ANALYTICAL BALANCE	HRDOFFICE		
	270,072	9,739	7,203	309,825	0	0	0	0	ICP OES 6500 DUO MASS SPEC.	HRDOFFICE		
	270,072	9,739	7,203	324,333	0	0	0	0	Lab Instr.	HRDPLANT		
	270,072	9,739	7,203	331,925	0	0	0	0	METTLER ANALYTICAL BALANCE	HRDOFFICE		
	270,072	9,739	7,203	359,305	0	0	0	0	WTP BLANKS AND BLINDS	HRDPLANT		
	270,072	9,739	7,203	99,000,188	0	0	0	0	ACID TREATMENT PLANT UNIT #3	HRDPLANT		
	270,072	9,739	7,203	99,000,189	0	0	0	0	INSTALL ACID & CAUSTIC TREATME	HRDPLANT		
	270,072	9,739	7,203	99,000,191	0	0	0	0	INSTALL BALANCE OF PLANT(WATER	HRDPLANT		
	270,072	9,739	7,203	99,000,192	0	0	0	0	INSTALL BALANCE OF PLANT(WATE	HRDPLANT		
	270,072	9,739	7,203	99,000,193	0	0	0	0	BALANCE OF PLANT UNIT #3 (WATE	HRDPLANT		
	270,072	9,739	7,203	99,000,196	0	0	0	0	BALANCE OF PLANT FOR WATER TRE	HRDPLANT		
	270,072	9,739	7,203	99,000,197	0	0	0	0	INSTALL STORM DRAINAGE PIPE FO	HRDPLANT		
	270,072	9,739	7,203	99,004,050	0	0	0	0	PRECISION SCIENTIFIC SAYBOLT	HRDOFFICE	FA-003095	
	270,072	9,739	7,203	99,004,710	0	0	0	0	WILL MICROSCOPE C/W HYGENION L	HRDOFFICE	FA-003098	
	270,072	9,739	7,203	99,004,773	0	0	0	0	METTLER ANALYTICAL BALANCE	HRDOFFICE	FA-003093	
	270,072	9,739	7,203	99,004,799	0	0	0	0	METTLER ELECTRONIC BALANCE	HRDOFFICE	FA-003094	
	270,072	9,739	7,203	99,026,876	0	0	0	0	NEOTRONICS MINIGAS NICAD	HRDOFFICE	FA-02276	
	270,072	9,739	7,203	99,028,541	0	0	0	0	CONSOLIDATED CONTINENTAL S-C-T	HRDOFFICE	FA-003096	
	270,072	9,739	7,203	99,028,542	0	0	0	0	CONSOLIDATED CONTINENTAL PORTA	HRDOFFICE	FA-003381	
	270,072	9,739	7,203	99,028,543	0	0	0	0	CONSOLIDATED CONTINENTAL PORTA	HRDOFFICE	FA-003432	
	270,072	9,739	7,203	99,028,544	0	0	0	0	BRANSON ULTRASONIC CLEANER	HRDOFFICE	FA-003433	
	270,072	9,739	7,203	99,029,555	0	0	0	0	UPGRADE WASTE WATER TREATMENT	HRDPLANT		
	270,072	9,739	7,203	99,030,074	0	0	0	0	DIGITAL LAB TESTER STIRRER, PR	HRDOFFICE	FA-003104	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	9,739	7,203	99,030,076	0	0	0	0	FISHER ACCUMBT PH METER 50	HRDOFFICE	FA-003099	
	270,072	9,739	7,203	99,030,401	0	0	0	0	GRASEBY HI-VOL CALIBRATOR	HRDOFFICE	FA-04433	
	270,072	9,739	7,203	99,031,785	0	0	0	0	BALANCE OF WATER TREATMENT PLA	HRDPLANT		
	270,072	9,739	7,203	99,031,926	0	0	0	0	ADDT'L COST, BAL OF WATER TREA	HRDPLANT		
	270,072	9,739	7,203	99,032,816	0	0	0	0	SCIENTECH ANALYTICAL BALANCE	HRDOFFICE	FA-003459	
	270,072	9,739	7,203	99,034,126	0	0	0	0	FISHER VERSA BATH	HRDOFFICE	FA-003100	
	270,072	9,739	7,203	99,034,283	0	0	0	0	UPGRADE WATER TREATMENT PLANT	HRDPLANT		
	270,072	9,739	7,203	99,035,816	0	0	0	0	GAS ANALYZER - DATALOGGER	HRDOFFICE	FA-003447	
	270,072	9,739	7,203	99,039,368	0	0	0	0	SO2 ANALYZER	HRDOFFICE		
	270,072	9,739	7,203	99,039,948	0	0	0	0	SPECTROPHOTOMETER DR4000	HRDOFFICE		
	270,072	9,739	7,203	99,040,811	0	0	0	0	NEOTRONICS MINIGAS NICAD	HRDOFFICE	FA-02274	
100												
	270,072	9,739	7,260	0	0	0	0	0	ENVIRONMENTAL MONITORING	HRDPLANT	HRD98130000	
	270,072	9,739	7,260	7,472	0	0	0	0	MET STATION - GREEN ACRES	HRDPLANT	HRD98136000	
	270,072	9,739	7,260	7,472	324,336	0	0	0	Upgrade Meteorological Station	HRDENVSITES	ENV. SITE	
	270,072	9,739	7,260	9,725	0	0	0	0	EMISS MON STN BUTTERPOT RD	HRDPLANT	HRD98131100	
	270,072	9,739	7,260	9,725	291,515	0	0	0	AIR MONITORING SYSTEM	HRDPLANT		
	270,072	9,739	7,260	9,725	324,310	0	0	0	Upgrade SO2 Monitors	HRDENVSITES		
	270,072	9,739	7,260	9,725	99,023,658	0	0	0	SO2 SULPHER DIOXIDE AMBIENT	HRDPLANT		
	270,072	9,739	7,260	9,725	99,023,663	0	0	0	YOKOGAWA STRIP CHART RECORDER	HRDPLANT		
	270,072	9,739	7,260	9,725	99,023,664	0	0	0	BEL-ART DESSICATING CABINET C/	HRDPLANT		
	270,072	9,739	7,260	9,725	99,023,668	0	0	0	HIGH VOLUME AIR SAMPLING EQUIP	HRDPLANT		
	270,072	9,739	7,260	9,725	99,023,672	0	0	0	DATA LOGGERS C/W TEMPERATURE S	HRDPLANT		
	270,072	9,739	7,260	9,725	99,027,847	0	0	0	YOKOGAWA STRIP CHART RECORDER	HRDPLANT		
	270,072	9,739	7,260	9,725	99,027,848	0	0	0	CITADEL LINE CONDITIONERS	HRDPLANT		
	270,072	9,739	7,260	9,726	0	0	0	0	EMISS MON STN GREEN ACRES	HRDPLANT	HRD98131200	
	270,072	9,739	7,260	9,726	291,534	0	0	0	AIR MONITORING SYSTEM	HRDPLANT		
	270,072	9,739	7,260	9,726	325,152	0	0	0	Upgrade SO2 Monitors	HRDENVSITES		
	270,072	9,739	7,260	9,726	99,023,666	0	0	0	HIGH VOLUME AIR SAMPLING EQUIP	HRDPLANT		
	270,072	9,739	7,260	9,726	99,023,667	0	0	0	HIGH VOLUME AIR SAMPLING EQUIP	HRDPLANT		
	270,072	9,739	7,260	9,726	99,027,845	0	0	0	PRESSURE TRANSDUCER/FLOW METER	HRDPLANT		
	270,072	9,739	7,260	9,726	99,027,846	0	0	0	FLOURESCENT SULPHUR DIOXIDE AN	HRDPLANT		
	270,072	9,739	7,260	9,726	99,043,206	0	0	0	SO2 SULPHER DIOXIDE AMBIEN	HRDPLANT		
	270,072	9,739	7,260	9,726	99,043,209	0	0	0	YOKOGAWA STRIP CHART RECOR	HRDPLANT		
	270,072	9,739	7,260	9,726	99,043,212	0	0	0	BEL-ART DESSICATING CABINE	HRDPLANT		
	270,072	9,739	7,260	9,726	99,043,215	0	0	0	DATA LOGGERS C/W TEMPERATU	HRDPLANT		
	270,072	9,739	7,260	9,726	99,043,218	0	0	0	YOKOGAWA STRIP CHART RECOR	HRDPLANT		
	270,072	9,739	7,260	9,726	99,043,221	0	0	0	CITADEL LINE CONDITIONERS	HRDPLANT		
	270,072	9,739	7,260	9,727	0	0	0	0	EMISS MON STN INDIAN POND RD	HRDPLANT	HRD98131300	
	270,072	9,739	7,260	9,727	291,535	0	0	0	AIR MONITORING SYSTEM	HRDPLANT		
	270,072	9,739	7,260	9,727	325,153	0	0	0	Upgrade SO2 Monitors	HRDENVSITES		
	270,072	9,739	7,260	9,727	99,023,670	0	0	0	HIGH VOLUME AIR SAMPLING EQUIP	HRDPLANT		
	270,072	9,739	7,260	9,727	99,043,207	0	0	0	SO2 SULPHER DIOXIDE AMBIEN	HRDPLANT		
	270,072	9,739	7,260	9,727	99,043,210	0	0	0	YOKOGAWA STRIP CHART RECOR	HRDPLANT		
	270,072	9,739	7,260	9,727	99,043,213	0	0	0	BEL-ART DESSICATING CABINE	HRDPLANT		
	270,072	9,739	7,260	9,727	99,043,216	0	0	0	DATA LOGGERS C/W TEMPERATU	HRDPLANT		

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	9,739	7,260	9,727	99,043,219	0	0	0	YOKOGAWA STRIP CHART RECOR	HRDPLANT		
	270,072	9,739	7,260	9,727	99,043,222	0	0	0	CITADEL LINE CONDITIONERS	HRDPLANT		
	270,072	9,739	7,260	9,728	0	0	0	0	EMISS MON STN LAWRENCE POND RD	HRDPLANT	HRD98131400	
	270,072	9,739	7,260	9,728	291,536	0	0	0	AIR MONITORING SYSTEM	HRDPLANT		
	270,072	9,739	7,260	9,728	325,154	0	0	0	Upgrade SO2 Monitors	HRDENVSITES		
	270,072	9,739	7,260	9,728	99,023,671	0	0	0	HIGH VOLUME AIR SAMPLING EQUIP	HRDPLANT		
	270,072	9,739	7,260	9,728	99,043,208	0	0	0	SO2 SULPHER DIOXIDE AMBIEN	HRDPLANT		
	270,072	9,739	7,260	9,728	99,043,211	0	0	0	YOKOGAWA STRIP CHART RECOR	HRDPLANT		
	270,072	9,739	7,260	9,728	99,043,214	0	0	0	BEL-ART DESSICATING CABINE	HRDPLANT		
	270,072	9,739	7,260	9,728	99,043,217	0	0	0	DATA LOGGERS C/W TEMPERATU	HRDPLANT		
	270,072	9,739	7,260	9,728	99,043,220	0	0	0	YOKOGAWA STRIP CHART RECOR	HRDPLANT		
	270,072	9,739	7,260	9,728	99,043,223	0	0	0	CITADEL LINE CONDITIONERS	HRDPLANT		
	270,072	9,739	7,260	278,551	0	0	0	0	CONTINUOUS EMISSIONS MONITOR	HRDPLANT		
	270,072	9,739	7,260	278,551	278,552	0	0	0	STACK PROBES	HRDPLANT		
	270,072	9,739	7,260	278,551	278,553	0	0	0	TUBE BUNDLES	HRDPLANT		
	270,072	9,739	7,260	278,551	278,554	0	0	0	GAS ANALYZER/SWITCHING CABINET	HRDPLANT		
	270,072	9,739	7,260	278,551	278,555	0	0	0	PC DATA ACQUISTION SYSTEM	HRDPLANT		
	270,072	9,739	7,260	278,551	278,555	342,549	0	0	CEMS DATA ACQUISITION SYSTEM	HRDPLANT		
	270,072	9,739	7,260	278,551	278,556	0	0	0	DCW AND ETAPRO	HRDPLANT		
	270,072	9,739	7,260	278,551	278,557	0	0	0	CAL GAS STORAGE AND	HRDPLANT		
	270,072	9,739	7,260	278,551	333,651	0	0	0	Fall Protection	HRDPLANT		
	270,072	9,739	7,260	278,551	333,659	0	0	0	CEMS Ventilation System	HRDPLANT		
	270,072	9,739	7,260	278,551	342,548	0	0	0	GAS ANALYSER/CABINET (PG-7)	HRDPLANT		
	270,072	9,739	7,260	324,289	0	0	0	0	Volumetric Air Flow Calibrator	HRDPLANT		
	270,072	9,739	7,260	324,334	0	0	0	0	BAM Enclosure	HRDENVSITES		
	270,072	9,739	7,260	325,151	0	0	0	0	EMISS MON STN MOBILE SITE	HRDPLANT		
	270,072	9,739	7,260	325,151	325,155	0	0	0	Upgrade SO2 Monitors	HRDENVSITES		
	270,072	9,739	7,260	99,023,673	0	0	0	0	MISCELLANEOUS SPARE PARTS	HRDPLANT		
	270,072	9,739	7,260	99,036,224	0	0	0	0	Opacity Emissions Monitoring	HRDPLANT		
	270,072	9,739	7,260	99,036,225	0	0	0	0	Opacity Emissions Monitoring	HRDPLANT		
	270,072	9,739	7,260	99,036,226	0	0	0	0	Opacity Emissions Monitoring	HRDPLANT		
	270,072	9,739	7,260	99,038,620	0	0	0	0	Thermatel Thermal Dispersion	HRDPLANT		
	270,072	9,739	7,260	99,038,621	0	0	0	0	Thermatel Thermal Dispersion	HRDPLANT		
	270,072	9,739	7,260	99,041,230	0	0	0	0	MOBILE AMBIENT MONITORIN SYSTE	HRDPLANT		
700												
	270,072	9,739	10,038	0	0	0	0	0	HRD WASTE WATER TREATMNT SYSTM	HRDPLANT	HRD98164000	
	270,072	9,739	10,038	7,258	0	0	0	0	SEWAGE DISPOSAL	HRDPLANT	HRD98110000	
	270,072	9,739	10,038	7,258	99,000,039	0	0	0	SEWAGE DISPOSAL SYSTEM STAGE I	HRDPLANT		
	270,072	9,739	10,038	7,258	99,000,040	0	0	0	INSTALL SEWAGE DISPOSAL SYSTEM	HRDPLANT		
	270,072	9,739	10,038	7,258	99,039,422	0	0	0	Sewage disposal system	HRDPLANT		
	270,072	9,739	10,038	7,263	0	0	0	0	OIL/WATER SEPARATORS	HRDPLANT	HRD98160000	
	270,072	9,739	10,038	7,263	99,003,534	0	0	0	OIL SEPARATOR SYSTEM	HRDPLANT		
	270,072	9,739	10,038	7,405	0	0	0	0	WASTE WATER TREATMENT MCC C12	HRDUNIT1	HRD15531000	
	270,072	9,739	10,038	7,473	0	0	0	0	SUMPS & PUMPS/PIPING	HRDPLANT	HRD98161000	
100												
	270,072	9,739	10,038	10,053	0	0	0	0	CONTROL WASTE LANDFILL	HRDPLANT	HRD98167100	

Client: **Newfoundland and Labrador Hydro**
Project: **Holyrood Decommissioning**
Project No: **133545705**

STANTEC CONSULTING

WBS CROSS REFERENCE

Prepared by: **MDV**
Date: **19-Dec-12**
Revision No.: **0**
Issue Date: **19-Dec-12**
Checked:

Stantec	Newfoundland and Labrador Hydro Asset Registry								Description	Location	Unit No.	Comments
WBS	Asset	Asset	Asset	Asset	Asset	Asset	Asset	Asset				
	270,072	9,739	10,038	10,053	303,248	0	0	0	Landfill Sampling Apparatus	HRDENVSITES		
	270,072	9,739	10,038	10,053	99,032,475	0	0	0	SOLID WASTE DISPOSAL SITE	HRDPLANT		
	270,072	9,739	10,038	10,053	99,032,833	0	0	0	WASTE DUMPSTERS FOR INTERIM	HRDOFFICE		
	270,072	9,739	10,038	10,053	99,034,289	0	0	0	SOLID WASTE DISPOSAL SITE	HRDPLANT		
	270,072	9,739	10,038	303,249	0	0	0	0	Regen Waste Treatment Study	HRDENVSITES		
700												
	270,072	9,739	10,038	99,003,527	0	0	0	0	CONCRETE BASINS FOR W.W.T.S.	HRDPLANT		
	270,072	9,739	10,038	99,003,528	0	0	0	0	CLARIFIER SYSTEM FOR W.W.T.S.	HRDPLANT		
	270,072	9,739	10,038	99,003,529	0	0	0	0	CAUSTIC SODA STORAGE SYSTEM FO	HRDPLANT		
	270,072	9,739	10,038	99,003,530	0	0	0	0	FILTER PRESS SYSTEM AT W.W.T.S	HRDPLANT		
	270,072	9,739	10,038	99,003,531	0	0	0	0	BALANCE OF WASTE WATER TREATME	HRDPLANT		
	270,072	9,739	10,038	99,026,251	0	0	0	0	DOSING TANK & AGITATION SYSTEM	HRDPLANT		

APPENDIX 3

Opinion of Probable Cost

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

STANTEC CONSULTING
Opinion of Probable Construction Cost
Summary

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	ASSET #	DESCRIPTION	APPROXIMATE SCRAP METAL		TOTAL COST
				UNIT	QUANTITY	
	1	270072	PROJECT TOTAL DECOMMISSIONING COSTS		15212	$29,158,300
100	2		SITE AND ENVIRONMENT		25	$7,135,000
200	3		BUILDINGS AND STRUCTURES		3534	$5,241,700
300	4		BOILER AND AUXILIARIES		8058	$4,342,000
400	5		TURBINE, GENERATOR AND AUXILIARIES		1500	$341,300
500	6		ELECTRICAL		720	$2,376,300
600	8		INSTRUMENTATION & CONTROL		0	$0
700	9		COMMON SERVICES		1375	$2,692,000
800	10		CONSTRUCTION			$3,400,000
900	11		ENGINEERING & ADMINISTRATION			$3,630,000
	12					
-	13					
-	14					
-	15					
-	16					
-	17					
-	18					
-	19					
-	20					
-	21					
-	25					
-	26					
-	27					
-	28					
-	29					
-	30					
-	31					
-	32					
-	33					
	34					
-	35					
-	36					
-	37					
-	38					
-	39					
-	40					

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

Stantec

STANTEC CONSULTING
Opinion of Probable Construction Cost
Site and Environment
WBS 100

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	REV	ASSET	DESCRIPTION	Qty	Unit	Labour					Material		Labour & Material		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
100	0			SITE AND ENVIRONMENT - Total Cost					0		0		0		7,135,000	25	7,135,000
100	1			SITE ROUGH GRADING AND LANDSCAPING					0		0		0		600,000	0	600,000
	2			THIS ITEM INCLUDES	1	LS			0		0		0	600,000	600,000	0	600,000
				-Rehabilitate Area after Road to Marine Terminal is Removed					0				0		0	0	0
	3			-Filling of all Depressions, Pits, Trenches, Basements, etc with Crushed Concrete					0		0		0		0	0	0
	5			-Rough Grading of Fuel Tank Farm Area					0		0		0		0	0	0
	6			-Rehabilitation of Fuel Tank Farm Area					0		0		0		0	0	0
	7			-Rough Grading of the Area of the Site on the North Side of the Plant					0		0		0		0	0	0
	8			-Rehabilitation of the Area of the Site on the North Side of the Plant					0		0		0		0	0	0
	9								0		0		0		0	0	0
100	10			SITE ACCESS (Roads, Parking, Fencing)					0		0		0		120,000	0	120,000
	11			THIS ITEM INCLUDES	1	LS			0		0		0	120,000	120,000	0	120,000
				-Removal of Road from Marine Terminal to the Tank Farm													
	13			-Rehabilitation of the East-West road on the North side of the Plant.					0		0		0		0	0	0
	14			-Rehabilitatation of the East-West road on the South side of the Plant.					0		0		0		0	0	0
	15			-Rehabilitation of the North South Road on the East Side of the Plant					0		0		0		0	0	0
	16								0		0		0		0	0	0
	17								0		0		0		0	0	0
100	18			SITE SERVICES					0		0		0		100,000	25	100,000
				THIS ITEM INCLUDES	1	LS			0				0	100,000	100,000	0	100,000
	20			- Removal of 84" Diameter CMP From West Vacuum Pit to Conception Bay					0		0		0		0	0	0
	21			-Removal of Grating & Steel Frame from Top of Vacuum Pit					0		0		0		0	0	0
	22			-Removal of Concrete Walls of Pit to 3 ft Below Grade					0		0		0		0	0	0
	23			-Removal of 42" Diameter Concrete Pipe on West/North Side of Plant (Warm Water Recirculation)					0		0		0		0	0	0
	24			-Removal of 42" Dia. Concrete Pipe on South/East/North Side of Plant (Warm Water Recirculation)					0		0		0		0	0	0
	35			-Remove 60" Diameter Concrete Pipe on West Side of Plant (CW Supply Line to Unit No. 2)					0		0		0		0	0	0
	36			-Remove of 60" Diameter Concrete Pipe on West Side of Plant (CW Supply Line to Unit No. 1)					0		0		0		0	0	0
	37			-Removal of 60" Diameter Concrete Pipe on North Side of Plant (CW Supply Line to Unit No. 3)					0		0		0		0	0	0
	38			-Removal of 18" Diameter Drain on North Side of Plant					0		0		0		0	0	0
	39			-Removal of Oil/Water Seperators Nos 2 & 3					0		0		0		0	0	0
	40			-Remove Approximately 15 Manholes					0		0		0		0	0	0
	41			-Open Ends of Pipes 12" Diameter and Smaller to be Plugged with Concrete & may be Abandoned					0		0		0		0	0	0
	32			-Removal of Utilidor Between Power House and Pump House #1					0		0		0		0	0	0
				-Crushing Concrete Rubble to 6" Minus & Removal of Reinforcing Steel					0		0		0		0	25	
									0		0		0		0	0	
	35								0		0		0		0	0	0
100	36			WASTE LANDFILL					0		0		0		390,000	0	390,000
	37			**THIS ITEM INCLUDES**	1	LS			0		0		0	390,000	390,000	0	390,000
				-Installation of Cover/Cap on the Solid Waste Landfill													
	39			-Removal Leachate Holding Pond after Cover/Cap is Installed on the Solid Waste Landfill Site					0		0		0		0	0	0
	40								0		0		0		0	0	0
	41								0		0		0		0	0	0
100	42			ENVIRONMENTAL ASSESSMENT, REMEDIATION & COMPLIANCE					0		0		0		5,925,000	0	5,925,000
	43			Environmental Site Assessment	1	LS			0		0		0	1,275,000	1,275,000	0	1,275,000
	44			Environmental Impact Assessment RegistrationSite Assessment	1	LS			0		0		0	50,000	50,000	0	50,000
	45			Site Remediation	1	LS			0		0		0	4,600,000	4,600,000	0	4,600,000
	46								0		0		0		0	0	0
	74								0		0		0		0	0	

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

STANTEC CONSULTING
Opinion of Probable Construction Cost
Buildings and Structures
WBS 200

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	REV	ASSET	DESCRIPTION	Qty	Unit	Labour					Material		Labour & Material		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
200	0			TOTAL FOR BUILDINGS and STRUCTURES							0		0		5,241,700	3,534	5,241,700
	1		7283	MAIN POWERHOUSE											1,775,900	3,115	1,775,900
	2			REMOVAL OF ACM MATERIALS													
	3			-Cladding	1	LS					0		0	281,100	281,100	0	281,100
	4			-Roofing	1	LS								113,000	113,000	0	113,000
	5			DEMOLITION OF REMAINDER OF POWERHOUSE BUILDING INCLUDING	1	LS								1,381,800	1,381,800	3,000	1,381,800
	6			-Removal of Overhead Doors							0		0		0	0	0
	7			-Removal of Structural Steel							0		0		0	0	0
	8			-Removal of Miscellaneous Metals							0		0		0	0	0
	9			-Removal of Concrete Building Foundations							0		0		0	0	0
	10			-Removal of Concrete Equipment Foundations							0		0		0	0	0
	11			-Removal of Concrete Slabs on Grade					0		0		0		0	0	0
	12			-Crushing Concrete Rubble to 6" Minus & Removal of Reinforcing Steel					0		0		0		0	115	0
	13			-Fill Depressions and Cavities with Crushed Concrete					0		0		0		0	0	0
	14								0		0		0		0	0	0
	15								0		0		0		0	0	0
200	16			COMMON SERVICES BUILDINGS (WW TREATMENT & PORTION OF PUMPHOUSE #1)					0		0		0		571,200	176	571,200
	17			DEMOLITION OF COMMON SERVICES BUILDINGS	1	LS			0		0		0	571,200	571,200	0	571,200
	18			-Removal of Structural Steel					0		0		0		0	132	0
	19			-Removal of Miscellaneous Metals					0		0		0		0	0	0
	20			- Removal of Concrete Building Foundations					0		0		0		0	0	0
	21			-Removal of Concrete Equipment Foundations					0		0		0		0	0	0
	22			-Removal of Concrete Slabs on Grade					0		0		0		0	0	0
	23			-Crushing Concrete Rubble to 6" Minus & Removal of Reinforcing Steel					0		0		0		0	44	0
	24			-Fill Depressions & Cavities with Crushed Concrete					0		0		0		0	0	0
	25								0		0		0		0	0	0
	26								0		0		0		0	0	0
200	27			MARINE STRUCTURES					0		0		0		810,600	148	810,600
	28			THIS ITEM INCLUDES	1	LS			0		0		0	810,600	810,600	120	810,600
				-Removal of Jetty					0		0					0	0
	30			-Removal of Bridge to Jetty					0		0		0		0	0	0
	31			-Removal of Walkway along Shoreline					0		0		0		0	0	0
	32			-Removal of Guard House					0		0		0		0	0	0
	33			-Removal of Fencing					0		0		0		0	0	0
	34			-Recoverery of All Debris from Water					0		0		0		0	0	0
	35			-Crushing of Concrete Rubble to 6" Minus & Remove Reinforcing Steel					0		0		0		0	28	0
	36			-Filling Depressions & Cavities with Crushed Concrete					0		0		0		0	0	0
	37								0		0		0		0	0	0
	38								0		0		0		0	0	0
200	39			HRD AUXILARY BUILDINGS					0		0		0		60,000	38	60,000
	40			THIS ITEM INCLUDES	1	LS			0		0		0	60,000	60,000	27	60,000
	41			-Removal of Complete Gas Turbine building and Foundation to 3 ft below Grade					0		0		0		0	0	0
	42			-Removal of ERT Center (Old Guard House) Building and Foundation to 3ft Below Grade					0		0		0		0	0	0
	43			-Crushing Concrete Rubble to 6" Minus & Removal of Reinforcing Steel					0		0		0		0	11	0
	44			-Filling Depressions & Cavities with Crushed Concrete					0		0		0		0	0	0
200				TURBINE GENERATOR BUILDING											252,000	62	252,000

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

STANTEC CONSULTING
Opinion of Probable Construction Cost
Buildings and Structures
WBS 200

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	REV	ASSET	DESCRIPTION	Qty	Unit	Labour					Material		Labour & Material		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
				THIS ITEM INCLUDES	1	LS								252,000	252,000		252,000
				-Removal of Concrete Turbine /Generator Pedestal Foundations Units 1 & 2												0	
				-Crushing Concrete Rubble to 6" Minus & Removal of Reinforcing Steel												62	
															0		
	52								0		0		0		0		0
200	53			DEMOLITION FACILITY DECOMMISSIONING					0		0		0		1,772,000	0	1,772,000
	51			-Chemical Removal	1	LS			0		0		0	150,000	150,000	0	150,000
	52			-Industrial Cleaning	1	LS			0		0		0	1,447,000	1,447,000	0	1,447,000
	53			-Asbestos Abatement	1	LS			0		0		0	175,000	175,000	0	175,000
	57								0		0		0		0	0	0
	58								0		0		0		0	0	0

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

Stantec

STANTEC CONSULTING
Opinion of Probable Construction Cost
Boiler and Auxilaries
WBS 300

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	REV	ASSET	DESCRIPTION	Qty	Unit	Labour					Material		Labour & Materials		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
300	0			BOILERS AND AUXILARIES - TOTAL DEMOLITION COST					0		0		0		4,342,000	8,058	4,342,000
	1			SUBTOTAL FOR BOILER COMPONENTS INDICATED	1	LS								2,694,500	2,694,500	7,500	2,694,500
	2		6699	BOILER PLANT (Units 1, 2, & 3)					0		0		0		0	0	IN SUBTOTAL
	3			THIS ITEM INCLUDES					0		0		0		0		0
			6700	-Removal of the Complete Boilers Including Water Walls, Burner Fronts and Ash Pits													
	5			-Removal of Boiler Fronts and Rear Wall Headers					0		0		0		0	0	0
	6								0		0		0		0	0	0
300	7			BOILER AUXILLARIES (Units 1, 2, & 3)					0		0		0		0	IN SUBTOTAL	IN SUBTOTAL
	8			THIS ITEM INCLUDES					0		0		0		0	0	0
	18			-Removal of the Reheater and Super heater Sections and Piping									0		0	0	0
	10			-Removal of the Steam Drums and Associated Piping					0		0		0		0	0	0
	11			-Removal of the Main Steam Lines to Turbines					0		0		0		0	0	0
	12			-Remove Econimizer and Condensate Tank					0		0		0		0	0	0
	13			-Removal of the Miscellaneous Steam and Condensate Piping					0		0		0		0	0	0
	14			-Removal of the Boiler Blow Down Tank and Blowdown Piping					0		0		0		0	0	0
	15								0		0		0		0	0	0
300	16			FUEL HANDLING SYSTEMS (units 1, 2, &3)					0		0		0		0	IN SUBTOTAL	IN SUBTOTAL
	17		6987	THIS ITEM INCLUDES					0		0		0		0	0	0
				-Removal of the Main Heavy Fuel Oil Pumps									0		0	0	0
	19			-Remove Heavy Fuel Oil Heat Exchangers and Miscellaneous Equipment					0		0		0		0	0	0
	20			-Removal of the Heavy Fuel Oil Piping					0		0		0		0	0	0
	21			-Remove Light Oil Pumps					0		0		0		0	0	0
	22			-Remove Light oil Piping					0		0		0		0	0	0
	23								0		0		0		0	0	0
300	24			BOILER AIR SYSTEMS Units 1, 2, &3)					0		0		0		0	IN SUBTOTAL	IN SUBTOTAL
	25		6703	THIS ITEM INCLUDES					0		0		0		0	0	0
				-Removal of FD Fan					0				0		0	0	0
	27			-Removal of the Air Supply Ductwork to FD Fan and to Windbox					0		0		0		0	0	0
	28			-Removal of the Boiler Windbox					0		0		0		0	0	0
	29			-Removal of the Steam Coil Airheaters					0		0		0		0	0	0
	30			- Removal of the Main Lungstrom Airheaters					0		0		0		0	0	0
	31								0		0		0		0	0	0
300	32			BOILER GAS SYSTEMS AND STACKS (Units 1, 2, &3)					0		0		0		1,313,500	558	1,313,500
	33		6704	THIS ITEM INCLUDES	1	LS			0		0		0	1,313,500	1,313,500	0	1,313,500
			6704	-Removal of Boiler Outlet Gas Ductwork to Stack												0	0
	35			-Removal of Stacks					0		0		0		0	230	0
	36			-Removal of the Boiler Soot blowers					0		0		0		0	0	0
	37			-Crushing Concrete Rubble to 6" Minus & Removal of Reinforcing Steel					0		0		0		0	328	0
	38								0		0		0		0	0	0
300	39			BOILER CONDENSATE SYSTEM (Units 1, 2, &3)					0		0		0		0	IN SUBTOTAL	IN SUBTOTAL
	40			THIS ITEM INCLUDES	1	LS			0		0		0		0	0	0
				-Removal of theLow Pressure Feedwater Heaters													
	42			-Removal of the Boiler Dearator Tank and Piping					0		0		0		0	0	0
	43			- Removal of the Boiler Feedwater Pumps and Piping					0		0		0		0	0	0
	44			-Removal of the Boiler High Pressure Feedwater Heaters					0		0		0		0	0	0
	45			-Removal of the Boiler Condensate Pumps and Extraction System					0		0		0		0	0	0
	46			-Removal of the Condensate Piping					0		0		0		0	0	0
	63																

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

Stantec

STANTEC CONSULTING
Opinion of Probable Construction Cost
Boiler and Auxilaries
WBS 300

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	REV	ASSET	DESCRIPTION	Qty	Unit	Labour					Material		Labour & Materials		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
	64																
300	65			PREDEMOLITION FACILITY DECOMMISSIONING											334,000	0	334,000
	66			-Disposal of Dust/Fly Ash/Boiler Ash (on Site in Hazardous Waste Landfill)	1,800	Ton								5	9,000		9,000
				-Asbestos Abatement of Boiler	1	LS			0		0			325,000	325,000		325,000
300																	
	56								0		0		0		0	0	0

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

STANTEC CONSULTING
Opinion of Probable Construction Cost
Turbines, Generators and Auxillaries
WBS 400

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	REV	ASSET	DESCRIPTION	Qty	Unit	Labour					Material		Labour & Material		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
400	0			TOTAL FOR TURBINES, GENERATORS AND AUXILLARIES					0		0		0		341,300	1,500	341,300
				THIS ITEM INCLUDES	1	LS								341,300	341,300	1,500	
	2			TURBINE GENERATORS (Units 1 & 2)					0		0		0		0	0	INCL ABOVE
	3			-Removal of the Generator Stators					0		0		0		0	0	0
	4			-Removal of the Hydrogen Gas and Lube Systems					0		0		0		0	0	0
	5			-Removal of the Excitation Systems					0		0		0		0	0	0
	6								0		0		0		0	0	0
	7								0		0		0		0	0	0
400	8			CONDENSING SYSTEM (Units 1, 2, &3)					0		0		0		0	0	INCL ABOVE
	9			-Removal of the Main Unit Condenser					0		0		0		0	0	0
	10			-Removal and/or Filling of the Condenser Outfall Piping to Seal Pit					0		0		0		0	0	0
	11			-Remove and /or Fill in Condenser Seal Pits					0		0		0		0	0	0
	12			-Remove and/or Fill in Condenser Seal Pit Outfall Piping.					0		0		0		0	0	0
	13								0		0		0		0	0	0
	14								0		0		0		0	0	0
400	15			TURBINES AND AUXILLARIES (Units 1, 2, & 3)					0		0		0		0	0	INCL ABOVE
	16			-Removal of the Main LP and HP Turbines and Auxillaries					0		0		0		0	0	0
	17			-Removal of the Turbine Lubrication and Hydraulic Systems					0		0		0		0	0	0
	18								0		0		0		0	0	0
	19								0		0		0		0	0	0
	20								0		0		0		0	0	0
400	21			COOLING WATER SYSTEM (Units 1, 2, &3)					0		0		0		0	0	INCL ABOVE
	22			-Removal of the Main Cooling Water Pumps (2 each per unit) located in the Pumphouses)					0		0		0		0	0	0
	23			-Removal of the Turbine Generator Cooling Pumps and Piping for Units 1 & 2)					0		0		0		0	0	0
	24			-Remove/Fill in Main Cooling Water Piping to Condensers					0		0		0		0	0	0
	25			-Removal of the Cooling Water Piping to Turbine Generators for Units 1 & 2.					0		0		0		0	0	0
	26								0		0		0		0	0	0
	27								0		0		0		0	0	0
	28								0		0		0		0	0	0
	29								0		0		0		0	0	0
	30								0		0		0		0	0	0
	31								0		0		0		0	0	0
	32								0		0		0		0	0	0
	33								0		0		0		0	0	0

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

STANTEC CONSULTING
Opinion of Probable Construction Cost
Electrical
WBS 500

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date: **0-Jan-00**
Checked:

WBS	Line	Rev.	Asset	Description	Qty	Unit	Labour					Material		Labour & Materials		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
500	0			TOTAL ELECTRICAL COST					0		0		0		0	720	2,376,300
	1			SITE DISTRIBUTION		Lot			0		0		0		0	8	26,400
	2			Removal of Overhead Lines between Unit Transformers and Switchyard					0		0		0		0	3	18,000
	3			Removal of GT Output Services					0		0		0		0	1	1,000
	4			Removal of Marine Jetty and Wharf Services					0		0		0		0	4	7,400
	5								0		0		0		0	0	0
	6								0		0		0		0	0	0
	7								0		0		0		0	0	0
	8								0		0		0		0	0	0
	9								0		0		0		0	0	0
	10								0		0		0		0	0	0
	11								0		0		0		0	0	0
	12								0		0		0		0	0	0
	13								0		0		0		0	0	0
	14								0		0		0		0	0	0
	15			ELECTRICAL POWER SYSTEMS		Lot			0		0		0		0	239	528,100
	16			Removal of Switchgear and Protection Relays					0		0		0		0	6	21,200
	17			Removal of Switchgear Power Cables					0		0		0		0	26	17,500
	18			Removal of CT and PT Cables					0		0		0		0	1	3,600
	19			Removal of MCCs					0		0		0		0	55	44,000
	20			Removal of Electric Motors					0		0		0		0	27	45,100
	21			Removal of MCC Power Cables					0		0		0		0	64	161,900
	22			Removal of Building Electrical Services					0		0		0		0	11	82,600
	23			Removal of building Electrical Services Power Cables					0		0		0		0	14	66,800
	24			Removal of Cable Trays and Grounding					0		0		0		0	17	35,700
	25			Removal & Disposal of Battery Banks					0		0		0		0	18	44,800
	26			Removal & Disposal of Battery Acid					0		0		0		0	0	4,900
	27								0		0		0		0	0	0
	28			TRANSFORMERS AND AUXILLARIES		Lot			0		0		0		0	375	1,138,100
	29			Dechlorination of Oil Filled Transformers (Includes Disposal of Transformer Oil)					0		0		0		0	0	1,098,700
	30			Removal of Isolated Phase Bus					0		0		0		0	10	13,200
	31			Removal of Secondary Cables					0		0		0		0	7	5,200
	32			Removal of Oil Filled Transformers					0		0		0		0	358	21,000
	33								0		0		0		0	0	0
	34								0		0		0		0	0	0
	35								0		0		0		0	0	0
	36			CONTROLS		Lot			0		0		0		0	98	683,700
	37			Removal of Control Cabinets					0		0		0		0	24	42,200
	38			Removal of Control Cables					0		0		0		0	61	465,500
	39			Removal of Instrumentation					0		0		0		0	4	29,800
	40			Removal of Instrumentation Cables					0		0		0		0	9	146,200
	41								0		0		0		0	0	0
	42								0		0		0		0	0	0
	43								0		0		0		0	0	0
	44								0		0		0		0	0	0
	45								0		0		0		0	0	0
	46								0		0		0		0	0	0
	47								0		0		0		0	0	0

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

STANTEC CONSULTING
Opinion of Probable Construction Cost
Electrical
WBS 500

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date: **0-Jan-00**
Checked:

WBS	Line	Rev.	Asset	Description	Qty	Unit	Labour					Material		Labour & Materials		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
	48								0		0		0		0	0	0
	49								0		0		0		0	0	0
	50								0		0		0		0	0	0
	51								0		0		0		0	0	0
	52								0		0		0		0	0	0
	53								**0**		**0**		**0**		**0**	**0**	**0**
	54								0		0		0		0	0	0
	55								0		0		0		0	0	0
	56								0		0		0		0	0	0
	57								0		0		0		0	0	0
	58								0		0		0		0	0	0
	59								**0**		**0**		**0**		**0**	**0**	**0**
	60								0		0		0		0	0	0
	61								0		0		0		0	0	0
	62								0		0		0		0	0	0
	63								0		0		0		0	0	0
	64								0		0		0		0	0	0
	65								0		0		0		0	0	0
	66								0		0		0		0	0	0
	67								0		0		0		0	0	0
	68								0		0		0		0	0	0
	69								0		0		0		0	0	0
	70								0		0		0		0	0	0
	71								0		0		0		0	0	0
	72								0		0		0		0	0	0
	73								0		0		0		0	0	0
	74								0		0		0		0	0	0
	75								0		0		0		0	0	0
	76								0		0		0		0	0	0
	77								0		0		0		0	0	0
	78								0		0		0		0	0	0
	79								0		0		0		0	0	0
	80								0		0		0		0	0	0

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

STANTEC CONSULTING
Opinion of Probable Construction Cost
Instrumentation & Control
NOT USED

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	REV	ASSET	DESCRIPTION	Qty	Unit	Labour					Material		Labour & Material		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
600	0								0		0		0			9	0
									0		0		0		0	9	0
	2								0		0		0		0	0	0
	3								0		0		0		0	0	0
	4								0		0		0		0	0	0
	5								0		0		0		0	0	0
	6								0		0		0		0	0	0
	7								0		0		0		0	0	0
	8								0		0		0		0	0	0
	9								0		0		0		0	0	0
	10								0		0		0		0	0	0
	11								0		0		0		0	0	0
	12								0		0		0		0	0	0
	13								0		0		0		0	0	0
	14								0		0		0		0	0	0
	15								0		0		0		0	0	0
	16								0		0		0		0	0	0
	17								0		0		0		0	0	0
	18								0		0		0		0	0	0
	19								0		0		0		0	0	0
	20								0		0		0		0	0	0
	21								0		0		0		0	0	0
	22								0		0		0		0	0	0
	23								0		0		0		0	0	0
	24								0		0		0		0	0	0
	25								0		0		0		0	0	0
	26								0		0		0		0	0	0
	27								0		0		0		0	0	0
	28								0		0		0		0	0	0
	29								0		0		0		0	0	0
	30								0		0		0		0	0	0
	31								0		0		0		0	0	0
	32								0		0		0		0	0	0
	33								0		0		0		0	0	0
	34								0		0		0		0	0	0
	35								0		0		0		0	0	0
	36								0		0		0		0	0	0
	37								0		0		0		0	0	0
	38								0		0		0		0	0	0
	39								0		0		0		0	0	0
	40								0		0		0		0	0	0
	41								0		0		0		0	0	0
	42								0		0		0		0	0	0
	43								0		0		0		0	0	0
	44								0		0		0		0	0	0

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

Stantec

STANTEC CONSULTING
Opinion of Probable Construction Cost
Common Services
WBS 700

Prepared by:
Date: **25-Jan-13**
Revision No.: **0**
Issue Date: **0-Jan-00**
Checked:

Area	Line	Rev.	WBS	Description	Qty	Unit	Labour					Material		Labour & Material		Metals	Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Ton	
700	**0**			**COMMON SERVICES - TOTAL DEMOLITION COST**					**0**		**0**		**0**		**2,692,000**	**1,375**	**2,692,000**
	1			**RAW WATER AND WATER TREATMENT**					**0**		**0**		**0**		**66,000**	**0**	**66,000**
	2			-Removal of Complete Water Treatment Plant Equipment Including Pumps, Tanks and Piping	1	LS			0		0		0	66,000	66,000	0	66,000
	3								0		0		0		0	0	0
	4								0		0		0		0	0	0
700	**5**			**WASTE WATER TREATMENT**					**0**		**0**		**0**		**70,000**	**25**	**70,000**
	6			THIS ITEM INCLUDES	1	LS			0		0		0	70,000	70,000	0	70,000
				-Removal of the Oil Water Separators for Units 1 & 2 (Oil Water Separator for Unit #3 to Remain)												0	
	8			-Removal of the Oil Water Seperator Sumps, Pumps and Piping					0		0		0		0	0	0
	9			-Removal of Water Retention Basins 1 & 2					0		0		0		0	0	0
	10			-Removal of Waste Water Treatment Plant Tanks, Filters, Pumps and Piping					0		0		0		0	0	0
	11			-Crushing of Concrete Rubble to 6" Minus & Removal of Reinforcing Steel					0		0		0		0	25	0
	12								0		0		0		0	0	0
700	13			CLEANING TANKS & PIPELINE					0		0		0		2,021,500	0	2,021,500
	14			THIS ITEM INCLUDES	1	LS			0		0		0	2,021,500	2,021,500	0	2,021,500
				-Cleaning Main Tanks 1, 2, 3, & 4					0		0		0		0	0	0
	16			-Cleaning of Pipelines from Marine Terminal to Tank Farm					0		0		0		0	0	0
	17			-Cleaning of Day Tank and Pipeline from Tank Farm To the Power House					0		0		0		0	0	0
	18								0		0		0		0	0	0
	19								0		0		0		0	0	0
	20								0		0		0		0	0	0
	21								0		0		0		0	0	0
700	**22**			**HEAVY FUEL OIL SYSTEM**					**0**		**0**		**0**		**534,500**	**1,350**	**534,500**
	23			THIS ITEM INCLUDES BUT IS NOT LIMITED TO	1	LS			0		0		0	534,500	534,500	1,350	534,500
	24			-Removal of Heavy Fuel Oil Unloading Pumps, Piping and Systems on the Marine Terminal					0		0		0		0	0	0
	25			-Removal of Heavy Fuel Oil Piping from the Marine Terminal to the Tank Farm					0		0		0		0	0	0
	26			-Removal of Heavy Fuel Oil Storage Tanks 1, 2, 3 & 4					0		0		0		0	0	0
	27			-Removal of the Heavy Fuel Oil Piping from the Storage Tanks to the Power House					0		0		0		0	0	0
	28			-Removal of the Day Storage Tank adjacent to the Power House					0		0		0		0	0	0
	29								0		0		0		0	0	0
	30								0		0		0		0	0	0
	31								0		0		0		0	0	0
	32								0		0		0		0	0	0
	33								0		0		0		0	0	0
	34								0		0		0		0	0	0
	35								0		0		0		0	0	0
	36								0		0		0		0	0	0
	37								0		0		0		0	0	0
	38								0		0		0		0	0	0
	39								0		0		0		0	0	0
	40								0		0		0		0	0	0
	41								0		0		0		0	0	0
	42								0		0		0		0	0	0
	43								0		0		0		0	0	0
	44																

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

STANTEC CONSULTING
Opinion of Probable Construction Cost
Construction
WBS 800

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	REV	ASSET	DESCRIPTION	Qty	Unit	Labour					Material		Labour & Material		Metals		Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Unit Cost	Cost	
800	0			CONSTRUCTION - TOTAL COST					0		0		0		3,400,000		0	3,400,000
	1			CAPITAL INVESTMENT ALLOWANCE					0		0		0		3,400,000		0	3,400,000
	2			THIS ITEM INCLUDES BUT IS NOT LIMITED TO					0		0		0		0		0	0
	3			-Structural Modification and Wall Closure at the Turbine Building	1	LS			0		0		0	1,000,000	1,000,000		0	1,000,000
	4			-Structural Modifications and Wall Closure at Pump House #1	1	LS			0		0		0	300,000	300,000		0	300,000
	5			-Relocation and Modification of Electrical & Mechanical Systems	1	LS			0		0		0	2,000,000	2,000,000		0	2,000,000
	6			-Relocation and Modification of Underground Water and Sewer Systems	1	LS			0		0		0	100,000	100,000		0	100,000
	7								0		0		0		0		0	0
	8								0		0		0		0		0	0
	9								0		0		0		0		0	0
	10								0		0		0		0		0	0
	11								0		0		0		0		0	0
	12								0		0		0		0		0	0
	13								0		0		0		0		0	0
	14								0		0		0		0		0	0
	15								0		0		0		0		0	0
	16								0		0		0		0		0	0
	17								0		0		0		0		0	0
	18								0		0		0		0		0	0
	19								0		0		0		0		0	0
	20								0		0		0		0		0	0
	21								0		0		0		0		0	0
	22								0		0		0		0		0	0
	23								0		0		0		0		0	0
	24								0		0		0		0		0	0
	25								0		0		0		0		0	0
	26								0		0		0		0		0	0
	27								0		0		0		0		0	0
	28								0		0		0		0		0	0
	29								0		0		0		0		0	0
	30								0		0		0		0		0	0
	31								0		0		0		0		0	0
	32								0		0		0		0		0	0
	33								0		0		0		0		0	0
	34								0		0		0		0		0	0
	35								0		0		0		0		0	0
	36								0		0		0		0		0	0
	37								0		0		0		0		0	0
	38								0		0		0		0		0	0
	39								0		0		0		0		0	0
	40								0		0		0		0		0	0
	41								0		0		0		0		0	0
	42								0		0		0		0		0	0
	43								0		0		0		0		0	0

Client: **Newfoundland and Labrador Hydro**
Project: **Decommissioning Holyrood Thermal Plant**
Project No: **133545705**
Currency: **CAD**

STANTEC CONSULTING
Opinion of Probable Construction Cost
Engineering & Administration
WBS 900

Prepared by: **GRM**
Date: **25-Jan-13**
Revision No.: **0**
Issue Date:
Checked:

WBS	LINE	REV	ASSET	DESCRIPTION	Qty	Unit	Labour					Material		Labour & Material		Metals		Total Cost
							hr per Unit	Prod. Factor	Total Hours	Rate	Cost	Unit Cost	Cost	Unit Cost	Cost	Unit Cost	Cost	
900	0			ENGINEERING & ADMINISTRATION - TOTAL COST					0		0		0		3,630,000	0		3,630,000
	1			ENGINEERING					0		0		0		2,420,000	0		2,420,000
	2			THIS ITEM INCLUDES BUT NOT LIMITED TO	1	LS			0		0		0	2,420,000	2,420,000	0		2,420,000
	3			-Design of Wall Closure at Pump House #1					0		0		0		0	0		0
	4			-Design of Wall Closure at Turbine Building					0		0		0		0	0		0
	5			-Design of Solid Waste Landfill Cover					0		0		0		0	0		0
	6			-Engineering for Site Remediation					0		0		0		0	0		0
	7			-Preparation of Final Site Grading and Landscapind Drawing					0		0		0		0	0		0
	8			-Any Other Engineering that may be Required to Decommission the Site					0		0		0		0	0		0
	9			-Preparation of Tender Documents					0		0		0		0	0		0
	10								0		0		0		0	0		0
	11								0		0		0		0	0		0
	12								0		0		0		0	0		0
	13								0		0		0		0	0		0
	14								0		0		0		0	0		0
	15			COMPLIANCE MONITORING/INSPECTION AND REPORTING					0		0		0		1,210,000	0		1,210,000
	16			THIS ITEM INCLUDES	1	LS			0		0		0	1,210,000	1,210,000	0		1,210,000
	17			-Removal and Disposal of Galbestos Siding					0		0		0		0	0		0
	18			-Removal and Disposal of ACM Roofing					0		0		0		0	0		0
	19			-Cleaning of Main Heavy Fuel Oil Tanks					0		0		0		0	0		0
	20			-Cleaning of Pipeline from the marine Terminal to the Tank Farm					0		0		0		0	0		0
	21			-Cleaning of Day Tank and Pipeline from the Tank Farm to the Day Tank					0		0		0		0	0		0
	22			-Demolition and Removal of Pipeline					0		0		0		0	0		0
	23			-Demolition and Removal of Stacks					0		0		0		0	0		0
	24			-Capping of Solid Waste Landfill Cell					0		0		0		0	0		0
	25			-Inspection of New Construction					0		0		0		0	0		0
	26			-All Other Work Required to Decommission the Plant and Site					0		0		0		0	0		0
	27								0		0		0		0	0		0
	28								0		0		0		0	0		0
	29								0		0		0		0	0		0
	30								0		0		0		0	0		0
	31								0		0		0		0	0		0
	32								0		0		0		0	0		0
	33								0		0		0		0	0		0
	34								0		0		0		0	0		0
	35								0		0		0		0	0		0
	36								0		0		0		0	0		0
	37								0		0		0		0	0		0
	38								0		0		0		0	0		0
	39								0		0		0		0	0		0
	40								0		0		0		0	0		0
	41								0		0		0		0	0		0
	42								0		0		0		0	0		0
	43								0		0		0		0	0		0
	44								0		0		0		0	0		0

APPENDIX 4

Detailed Cash Flow

NEWFOUNDLAND AND LABRADOR HYDRO
HTGS DECOMMISSIONING STUDY
DECOMMISSIONING AND DEMOLITION COST CASH FLOW (2012 $)

WBS	Area Description	Total Cost	2020	2021	2022	2023	2024
100		$ 7,135,000	$ -	$ 550,000	$ 2,375,000	$ 2,100,000	$ 2,110,000
	SITE ROUGH GRADING AND LANDSCAPING	$ 600,000	$ -	$ -	$ -	$ -	$ 600,000
	SITE ACCESS (Roads, Parking, Fencing)	$ 120,000	$ -	$ -	$ -	$ -	$ 120,000
	SITE SERVICES	$ 100,000	$ -	$ -	$ -	$ 100,000	$ -
	WASTE LANDFILL	$ 390,000	$ -	$ -	$ -	$ -	$ 390,000
	ENVIRONMENTAL ASSESSMENT, REMEDIATION & COMPLIANCE	$ 5,925,000	$ -	$ 550,000	$ 2,375,000	$ 2,000,000	$ 1,000,000
200		$ 5,241,700		$ -	$ 1,700,000	$ 3,541,700	$ -
	MAIN POWERHOUSE	$ 1,775,900	$ -	$ -	$ -	$ 1,775,900	$ -
	COMMON SERVICES BUILDINGS	$ 571,200	$ -	$ -	$ -	$ 571,200	$ -
	MARINE STRUCTURES	$ 810,600	$ -	$ -	$ -	$ 810,600	$ -
	HRD AUXILARY BUILDINGS	$ 60,000	$ -	$ -	$ -	$ 60,000	$ -
	TURBINE GENERATOR BUILDING	$ 252,000	$ -	$ -	$ -	$ 252,000	$ -
	FACILITY DECOMMISSIONING	$ 1,772,000	$ -	$ -	$ 1,700,000	$ 72,000	$ -
300		$ 4,342,000	$ -	$ -	$ 334,000	$ 4,008,000	$ -
	BOILER PLANT and AUXILLARIES (Units 1, 2, & 3)	$ 2,694,500	$ -	$ -	$ -	$ 2,694,500	$ -
	BOILER AUXILLARIES (Units 1, 2, & 3) - Incl Above	$ -	$ -	$ -	$ -	$ -	$ -
	FUEL HANDLING SYSTEMS (Units 1, 2, & 3) - Incl Above	$ -	$ -	$ -	$ -	$ -	$ -
	BOILER AIR SYSTEMS (Units 1, 2, & 3) - Incl Above	$ -	$ -	$ -	$ -	$ -	$ -
	BOILER GAS SYSTEMS AND STACKS (Units 1, 2, &3)	$ 1,313,500	$ -	$ -	$ -	$ 1,313,500	$ -
	BOILER CONDENSATE SYSTEM (Units 1, 2, & 3) - Incl Above	$ -	$ -	$ -	$ -	$ -	$ -
	FACILITY DECOMMISSIONING	$ 334,000	$ -	$ -	$ 334,000	$ -	$ -
400		$ 341,300	$ -	$ -	$ -	$ 341,300	$ -
	TURBINE GENERATORS (Units 1 & 2)	$ 341,300	$ -	$ -	$ -	$ 341,300	$ -
	CONDENSING SYSTEM (Units 1, 2, & 3) - Incl Above	$ -	$ -	$ -	$ -	$ -	$ -
	TURBINES AND AUXILLARIES (Units 1, 2, & 3) - Incl Above	$ -	$ -	$ -	$ -	$ -	$ -
	COOLING WATER SYSTEM (Units 1, 2, & 3) - Incl Above	$ -	$ -	$ -	$ -	$ -	$ -
500		$ 2,376,300	$ -	$ -	$ 1,099,000	$ 1,277,300	$ -
	SITE DISTRIBUTION	$ 26,400	$ -	$ -	$ -	$ 26,400	$ -
	ELECTRICAL POWER SYSTEMS	$ 528,100	$ -	$ -	$ -	$ 528,100	$ -
	TRANSFORMERS AND AUXILLARIES	$ 1,138,100	$ -	$ -	$ 1,099,000	$ 39,100	$ -
	CONTROLS	$ 683,700	$ -	$ -	$ -	$ 683,700	$ -
600							
	Included in 500 Electrical	$ -	$ -	$ -	$ -	$ -	$ -
700		$ 2,692,000	$ -	$ -	$ 2,556,000	$ 136,000	$ -
	RAW WATER AND WATER TREATMENT	$ 66,000	$ -	$ -	$ -	$ 66,000	$ -
	WASTE WATER TREATMENT	$ 70,000	$ -	$ -	$ -	$ 70,000	$ -
	CLEANING TANKS & PIPELINE	$ 2,021,500	$ -	$ -	$ 2,021,500	$ -	$ -
	HEAVY FUEL OIL SYSTEM	$ 534,500	$ -	$ -	$ 534,500	$ -	$ -
800		$ 3,400,000		$ -	$ -	$ 3,400,000	$ -
	CONSTRUCTION	$ 3,400,000	$ -	$ -	$ -	$ 3,400,000	$ -
900		$ 3,630,000	$ 300,000	$ 900,000	$ 1,210,000	$ 1,000,000	$ 220,000
	ENGINEERING	$ 2,420,000	$ 300,000	$ 900,000	$ 800,000	$ 300,000	$ 120,000
	COMPLIANCE MONITORING/INSPECTION AND REPORTING	$ 1,210,000	$ -	$ -	$ 410,000	$ 700,000	$ 100,000
	SUB-TOTAL (excluding contingency):	$ 29,158,300	$ 300,000	$ 1,450,000	$ 9,274,000	$ 15,804,300	$ 2,330,000
	CONTINGENCY ALLOWANCE	$ 2,915,830	$ 30,000	$ 145,000	$ 927,400	$ 1,580,430	$ 233,000
	GRAND TOTAL:	**$ 32,074,130**	**$ 330,000**	**$ 1,595,000**	**$ 10,201,400**	**$ 17,384,730**	**$ 2,563,000**

APPENDIX 5

Project Schedules

Stantec

Newfoundland and Labrador Hydro
Holyrood Thermal Generating Station - Decommissioning

newfoundland labrador hydro
a nalcor energy company

Project Timeline

Revision: 1 - January 25, 2013

Task No.	Task Description / Quarter:	2013				2014				2015				2016				2017				2018				2019				2020				2021				2022				2023				2024				2025				2026			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	Unit Operation Timeline																																																			
1	Unit #1,2 &3 Normal Operation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■																																
2	Unit #3 Synchronous Operation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	Lower Churchill Project comes On-Line																				♦ - Dec 2017																																			
4	Unit #1,2 & 3 Operates in Standby Mode																					■	■	■	■	■	■	■	■																										
5	Unit #1,2 & 3 in Dry Layup																													■	■	■	■	■	■	■	■																		
6	Decommissioing Engineering and Planning																													■	■	■	■	■	■	■	■	■	■	■	■												
7	Pre-Decommissioning Activities																																	■	■	■	■	■	■	■	■												
8	Decommissioning Activities																																									■	■	■	■	■	■	■	■						
9	Decommissioning Complete																																															♦ - Dec 2024					

Stantec

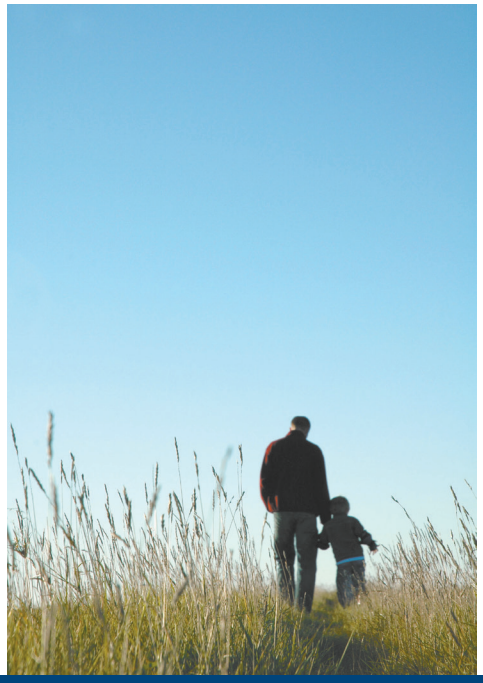
newfoundland labrador hydro
a nalcor energy company

Newfoundland and Labrador Hydro
Holyrood Thermal Generating Station - Decommissioning

Conceptual Decommissioning Schedule

Revision: 1 - January 25, 2013

Task No.	Task Description	2020				2021				2022				2023				2024				2025			
	Quarter:	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	Decommissioning Engineering and Planning																								
1	Closure Confirmation					♦ - Jan 1 2021																			
2	Project Registration					♦ - Jan 2 2021																			
3	Project Registration Review Period by NL Dept of Env.																								
4	Environmental Site Assessments																								
5	Hazardous Material Audit																								
6	Decommissioning Engineering and Planning																								
7	Issue Decommissioning Tenders and Award																								
	Pre-Decommissioning Activities (Plant)																								
8	De-Energize all Equipment																								
9	Remove fluids from all equipment																								
10	Remove remaining Oil from Pipeline and Tanks																								
11	Relocate/Install common services impacted by demolition																								
	Decommissioning Activities (Contractor(s))																								
12	Site Environmental Remediation																								
13	Decommissioning Inspection and Inventory																								
14	Chemical Removal and Industrial Cleaning																								
15	Hazardous Material Abatement																								
16	Demolish/Remove Equipment (includes fuel oil system, tanks, boiler and auxiliaries, turbine/generators and auxiliaries, Water Treatment System, Waste Water Treatment System, etc.)																								
17	Demolish Building and Structures (Includes, fuel receiving jetty, boiler house, stacks, pumphouse(partial) etc.																								
18	Install new wall systems as required to close-in affected buildings																								
19	Material Disposal																								
20	Remove and/or remediate seal pits and underground piping/conduits																								
22	Final Site Grading and Landscaping																								
23	Demobilization																				♦ - Dec 2024				



ONE TEAM. INFINITE SOLUTIONS.

Stantec Consulting Ltd.

845 Prospect Street
Fredericton, NB E3B2T7

Tel: (506) 452-7000
Fax: (506) 452-0112

133545705
PR-CO-FRE-2013APR16-P1V1