

Appendix M: Detailed Timeline

North Dam Construction Timeline:

2011 Construction Timeline

Activity	Start Date	End Date	Notes/ Comments
Start Producing FCM at crusher	Oct 2010	Dec 2010	
FCP Pad Construction	Jan 10, 2011	Feb 6, 2011	
SRK 2011 Mobilization and Demobilization from site.	Jan 11, 2011	Nov 14, 2011	<ul style="list-style-type: none"> Construction activities at the North Dam concluded in 2011 on Oct 26, 2011
FCP Building Foundation Crush Placed and Graded	Jan 19, 2011	Jan 22, 2011	
FCP Erection and Commissioning	Jan 23, 2011	Feb 27, 2011	
Percolation Tests	Jan 22, 2011	Feb 1, 2011	
2011 Dam Shell ROQ Placement	Jan 23, 2011	Oct 26, 2011	<ul style="list-style-type: none"> There was a large break in ROQ placement at the North Dam from early May to late Oct 2011 When the 'Seasonal Suspension' thermal cover was removed it was short hauled to the dam shell, placed and compacted
2011 Transition Material Placement	Apr 21, 2011	May 1, 2011	
Key Trench Drill and Blast	Feb 2, 2011	Feb 16, 2011	<ul style="list-style-type: none"> Over-drilled 0.5 m
Hyper-Saline and Massive Ice Zone Excavation	Feb 15, 2011 and Mar 23, 2011	Feb 25, 2011 and Mar 24, 2011	<ul style="list-style-type: none"> Large break between first and later additional excavation Six investigation boreholes drilled in hyper-saline zone on Mar 17, 2011 Small amount of core material also excavated on Mar 23 as it needed to be removed to access hyper-saline material
Peat Zone Drilling and Blasting	Feb 18, 2011	Feb 21, 2011	<ul style="list-style-type: none"> Second access route blasted around 0+75 to 0+80
Ground Temperature Cables ND-VTS-060, 085 and 130 US installed.	Feb 22, 2011	Feb 23, 2011	
Ground Temperature Cables ND-VTS-060 and 085 DS installed.	Feb 24, 2011	Feb 25, 2011	
2011 Leveling Course Placement (Core material)	Feb 24, 2011	Apr 24, 2011	<ul style="list-style-type: none"> 3:2 fines to 20 mm core blend started to be officially placed around Mar 13, 2011 Placed lift over thermosyphons from Apr 17 to Apr 19

Activity	Start Date	End Date	Notes/ Comments
Ground Temperature Cable ND-VTS-130-DS installed.	Feb 26, 2011	Feb 26, 2011	
1 st Trial Pad – Core Placement	Feb 27, 2011	Feb 27, 2011	<ul style="list-style-type: none"> On upstream ROQ shell
Material Testing Lab moved to the FCP Pad	Mar 3, 2011	Mar 3, 2011	
Trial Testing of Manufactured Fines and Original 20 mm Core Material Blends	Mar 5, 2011	Mar 8, 2011	<ul style="list-style-type: none"> Lab testing and field scale trials / placement in key trench
Thermosyphon Fabrication and Installation	Mar 5, 2011	Apr 19, 2011	<ul style="list-style-type: none"> Arctic Foundations left site and Came back on Mar 28, 2011 On Mar 30, 2011 Thermosyphons were started to be moved into the key trench. Radiators finished being installed on Apr 19, 2011
Ground Temperature Cables ND-VTS-040, 060, 085, 130, 175-KT installed.	Mar 30, 2011	Mar 30, 2011	
Adfreeze Thermosyphon Radiator Pile Installation	Apr 4, 2011	Apr 7, 2011	
Seasonal Suspension: Construction of Extended Fillet Zone	Apr 13, 2011	Apr 25, 2011	
Installation of Lower GCL	Apr 25, 2011	Apr 29, 2011	
Ground Temperature Cable ND-HTS-175-32.5 installed.	Apr 25, 2011	Apr 25, 2011	
2011 Core Construction	Apr 25, 2011	May 2, 2011	<ul style="list-style-type: none"> Note: Core is defined as the area above the bedding layer/ leveling course elevation in the Key Trench
Seasonal Suspension: Placement of 0.5m of 16 mm (5/8" clear) material cover	Apr 26, 2011	May 6, 2011	<ul style="list-style-type: none"> HDPE placed under 16 mm clear crush on fillet extension to assist with GCL liner tie in completed in 2012 Main placement of 16 mm cover material started on May 6, 2011
Ground Temperature Cable ND-HTS-130-28.8 installed	Apr 27, 2011	Apr 27, 2011	
Ground Temperature Cable ND-HTS-040-31.5 and ND-HTS-060-28.8 installed.	Apr 28, 2011	Apr 28, 2011	

Activity	Start Date	End Date	Notes/ Comments
Ground Temperature Cable ND-HTS-085-25.3 installed	Apr 29, 2011	Apr 29, 2011	
Seasonal Suspension: Placement of 2 m ROQ Cover	May 7, 2011	May 2, 2011	<ul style="list-style-type: none"> On Jun 16 some additional dry crush spread round the thermosyphon radiators.
Survey monitoring of Tails Lake Water Level	Jun 22, 2011	Oct 22, 2012	
Installation, Pumping and Decommissioning of Pipeline at Tails Lake	Jul 31, 2011	Oct 3, 2012	<ul style="list-style-type: none"> Bypass of Water from Tails Lake to North Side of Doris Creek Bridge Through Victaulic Pipeline to Weir then overflow onto HDPE mat leading into Doris Creek Discharge rate around 10% of Doris Creek Stream flow Final disconnected pipes moved away from the North Dam area around Oct 22, 2011
Removal of Thermal Cover	Oct 22, 2012	Oct 26, 2012	<ul style="list-style-type: none"> End of 2011 construction activities at the North Dam

2012 Construction Activities

Activity	Start Date	End Date	Notes/ Comments
SRK 2012 Mobilization and Demobilization from site	Jan 6, 2012	May 7, 2012	<ul style="list-style-type: none"> Last Daily report on May 6, 2012
Clearing Snow within the Key Trench, and on surface of ROQ and Transition	Jan 6, 2012	Jan 7, 2012	<ul style="list-style-type: none"> Dirty snow being hauled to Overburden dump and dirty snow pile by Quarry #2 and clean snow being hauled to Tails Lake
Removal of Remainder of Material from Thermal Cover	Jan 7, 2012	Jan 27, 2012	<ul style="list-style-type: none"> ROQ removed by Jan 12, 2012 The final grade for removal was based on the DEM created from the 2011 frozen core elevations. Cleaning was completed to within 0.05 m or less of this DEM typically By Jan 27, most of the 16 mm cover material had been scraped off the base and approximately a meter up the side slope After Jan 27, 2012 a small amount of remaining 16 mm material was periodically scraped off areas before core placement proceeded Around Feb 24, 2012 removing 16 mm material from over fillet hinge
2012 Dam Shell ROQ Placement	Jan 7, 2012	Apr 8, 2012	<ul style="list-style-type: none"> Started with 16 mm material cover being mixed/ blended in with ROQ and placed on the outer dam shell Some minor work was completed on the dam shell after Apr 8, however bulk fill was completed by then, mainly grading and other activities associated with instrument installation
2012 Core Construction	Jan 15, 2012	Mar 27, 2012	<ul style="list-style-type: none"> Last placement was on Mar 27 with freeze-back resulting on Mar 30, 2011.
2012 Transition Material Placement	Jan 27, 2012	Apr 1, 2012	
Ground Temperature Cable ND-HTS-060-31.0 installed	Feb 8, 2012	Feb 8, 2012	
Ground Temperature Cable ND-HTS-085-29.4 installed	Feb 11, 2012	Feb 11, 2012	
Ground Temperature Cable ND-HTS-130-31.0 installed	Feb 12, 2012	Feb 12, 2012	
Ground Temperature Cable ND-HTS-175-33.5 installed	Feb 15, 2012	Feb 15, 2012	

Activity	Start Date	End Date	Notes/ Comments
Trial Pad – 5mm minus Core material	Feb 17, 2012	Feb 17, 2012	<ul style="list-style-type: none"> Core taken from test pad on Feb 19, 2012
Ground Temperature Cable ND-HTS-130-33.5 installed	Mar 10, 2012	Mar 10, 2012	
Installation of Upper GCL	Mar 18, 2012	Mar 31, 2012	<ul style="list-style-type: none"> Start to patch area where lower GCL and upper GCL meet around Jan 24, 2012
GCL Cover Material Placement	Mar 20, 2012	Mar 31, 2012	
Ground Temperature Cable ND-HTS-060-33.5 installed	Mar 11, 2012	Mar 11, 2012	
Ground Temperature Cable ND-HTS-040-33.5 installed	Mar 12, 2012	Mar 12, 2012	
Ground Temperature Cable ND-HTS-085-33.5 installed	Mar 13, 2012	Mar 13, 2012	
Additional Instrumentation Installation (Deep settlement Points, Inclinometer, Surficial Survey Points)	Apr 14, 2012	May 6, 2012	<ul style="list-style-type: none"> Apr 14 installed first survey monument.
Automated data acquisition system Installation	Aug 6, 2012	Aug 9, 2012	

Summary of 2011 Core Material Placement

Date	Volume of Placement (m³)	Cumulative Volume (m³)
Mar 13 2011	342	342
Mar 14 2011	139	481
Mar 15 2011	45	526
Mar 16 2011	9	535
Mar 17 2011	220	755
Mar 18 2011	139	894
Mar 19 2011	218	1,112
Mar 20 2011	206	1,312
Mar 21 2011	403	1,715
Mar 23 2011	203	1,831
Mar 24 2011	220	2,051
Mar 26 2011	236	2,287
Mar 27 2011	58	2,345
Mar 28 2011	74	2,419
Mar 31 2011	257	2,676
Apr 2 2011	41	2,717
Apr 3 2011	322	3,039
Apr 5 2011	306	3,345
Apr 6 2011	284	3,629
Apr 7 2011	383	4,012
Apr 9 2011	229	4,241
Apr 10 2011	402	4,643
Apr 11 2011	177	4,820
Apr 12 2011	23	4,843
Apr 13 2011	120	4,963
Apr 14 2011	53	5,016
Apr 15 2011	54	5,070
Apr 17 2011	203	5,273
Apr 18 2011	274	5,547
Apr 19 2011	123	5,670
Apr 20 2011	210	5,880
Apr 21 2011	420	6,300
Apr 22 2011	172	6,472
Apr 23 2011	276	6,748

Date	Volume of Placement (m³)	Cumulative Volume (m³)
Apr 24 2011	247	6,995
Apr 25 2011	183	7,178
Apr 26 2011	48	7,226
Apr 27 2011	384	7,610
Apr 28 2011	253	7,863
Apr 29 2011	188	8,051
May 2 2011	962	9,013

Summary of 2012 Core Material Placement

Date	Volume of Placement (m³)	Cumulative Volume (m³)
Jan 22 2012	376.76	376.76
Jan 23 2012	203.02	579.78
Jan 24 2012	236.83	816.61
Jan 25 2012	261.38	1,077.99
Jan 27 2012	395.75	1,473.74
Jan 28 2012	63.94	1,537.68
Jan 29 2012	184.12	1,721.80
Jan 30 2012	518.77	2,240.57
Jan 31 2012	418.41	2,658.98
Feb 2 2012	325.49	2,984.47
Feb 4 2012	288.85	3,273.32
Feb 6 2012	479.39	3,752.71
Feb 8 2012	370.34	4,123.05
Feb 11 2012	291.78	4,414.83
Feb 12 2012	128.87	4,543.70
Feb 13 2012	278.05	4,821.75
Feb 15 2012	244.56	5,066.31
Feb 17 2012	114.41	5,180.72
Feb 18 2012	192.19	5,372.91
Feb 19 2012	172.55	5,545.46
Feb 20 2012	225.85	5,771.31
Feb 21 2012	206.91	5,978.22
Feb 22 2012	435.22	6,413.44
Feb 24 2012	262.66	6,676.10
Feb 26 2012	211.71	6,887.81
Feb 27 2012	222.09	7,109.90
Feb 28 2012	71.22	7,181.12
Feb 29 2012	270.37	7,451.49
Mar 1 2012	114.25	7,565.74
Mar 2 2012	268.51	7,834.25
Mar 3 2012	45.1	7,879.35
Mar 4 2012	290.68	8,170.03
Mar 6 2012	355.43	8,525.46
Mar 8 2012	255.26	8,780.72

Date	Volume of Placement (m³)	Cumulative Volume (m³)
Mar 9 2012	191.54	8,972.26
Mar 10 2012	296.3	9,268.56
Mar 11 2012	130.94	9,399.50
Mar 12 2012	175.67	9,575.17
Mar 13 2012	322.14	9,897.31
Mar 15 2012	94.05	9,991.36
Mar 16 2012	47.8	10,039.16
Mar 17 2012	150.93	10,190.09
Mar 19 2012	266.29	10,456.38
Mar 21 2012	145.11	10,601.49
Mar 23 2012	24.4	10,625.89
Mar 27 2012	31.44	10,657.33