2001 Dam Safety Inspection Reports

PUB 1.2 Attachment H

Cape Broyle/Horse Chops Developments



NEWFOUNDLAND POWER

January 11, 2002

Memorandum From: G. Humby

To: S. LaCour

Subject: 2001 Dam Safety Inspection Reports

Cape Broyle / Horsechops Developments

File: 401.01.03.17.01

Attached is a copy of the Dam Safety Inspection Report for structures located in the Cape Broyle and Horsechops Hydroelectric Developments. In general, the structures in this system are in good condition and should operate safely with some minor repairs/maintenance and capital improvements.

Some of the more important items noted in the report include:

- · Heavy vegetation at some structures,
- Deterioration of rip rap and/or rockfill at various structures,
- Deterioration of concrete abutments at Fourth Blackwoods Control structure,
- Continued monitoring of seepage at West Ragged Hills Dam/Spillway,
- Continued monitoring of seepage at various Horsechops structures,
- Deterioration of concrete at Cape Broyle Spillway.

TC/pp Attach:

Lany Humby

Structure: Northwest Blackwoods Freeboard Dam	Date/Time:	2001-11-29
Inspected by : IK, PP, KH	Water Level :	Very Low
Weather: Sunny, Cold, -5°C	Releases:	
		
Upstream Face (Slide movements, Slope protection, Erosion—bed Debris, Unusual conditions) Riprap noted as being irregular but stable.	eaching, Cracks, Sin	kholes, Settlement, Displacement,
Downstream Face (Slide movements, Signs of movements, Crac Considerable amount of water ponded near the downstream to	cks, Seepage or wet on the contract of the con	areas, Unusual conditions) Irained.
Abutments (Seepage, Cracks/joints/bedding planes, Slides, Sign. Good.	s of movement)	
Crest (Surface cracking, Settlement, Lateral movement, Camber) Crest noted as being uneven, and appears to be low in the mid	ddle.	

Seepage and Drainage (Locations(s), Estimated flow(s), Cold Ponded water, with no evidence of flowing water observed.	or (staining), Toe dra	iin and relief wells)
Remarks		

Structure :	Northwest Blackwoods Diversion Dam	Date/Time:	2001-11-29
Inspected by:		Water Level:	
Weather :	Sunny, Cold, -5°C	_ Releases :	
Upstream Factories, Unusual of	ce (Slide movements, Slope protection, Erosion–l	eaching, Cracks, Sin	kholes, Settlement, Displacemen
	irregular but stable.		
p,p			
	F (3):1		1 disi \
	Face (Slide movements, Signs of movements, Croof water noted, as well as some sparse large v		
	ope appears steep but stable.		
Abutments (Se	eepage, Cracks/joints/bedding planes, Slides, Sigi	is of movement)	
		<u></u>	<u></u>
· · · · · · · · · · · · · · · · · · ·			
	cracking, Settlement, Lateral movement, Camber)		
Good condition.			
		·	
	Drainage (Locations(s), Estimated flow(s), Col		ain and relief wells)
Some ponding of	of water evident, but no flow of water observe	<u>d.</u>	
Remarks			
			<u> </u>

ROCKFILL OVERFLOW SPILLWAY

Structure :	Northwest Blackwoods Spillway	Date/Time :	2001-11-29
Inspected by:	IK, PP, KH	Water Level :	Very Low
	Sunny, Cold, -5°C	Releases :	
Upstream Face Debris, Unusual co Upstream face w	as OK	osion-beaching, Cracks, Sin	kholes, Settlement, Displacement,
Downstream Face	iace (Slide movements, Signs of movements) was OK.	nts, Cracks, Seepage or wet	areas, Other)
Abutments (See Abutments were	epage, Cracks/joints/bedding planes, Slide OK.	es, Signs of movement)	
Stilling Basin (Stilling basin was	(Debris, Walls movement/settlement/joints OK.	/erosion)	
Outlet Channe condition/operation N/A	el (Slope protection, Stability of side .n)		ions, Debris in water, Stoplogs
		···-	
Crest (Surface cr No problems obs	acking, Settlement, Lateral movement, Ca erved.	imber)	
Seepage and I	Drainage (<i>Locations(s), Estimated flow(</i> erved.	s), Color (staining), Toe dra	tin and relief wells)
Approach Cha Approach channe	nnel (Slides above channel, Stability of s el was OK.	ide slopes, Log boom, Debr	is, Slope protection)
Remarks New structure, bu	uilt in 2000.		

-	East Blackwoods Freeboard Dam #1		2001-11-29
Inspected by:			Very Low
Weather:	Sunny, Cold, -5°C	Releases :	Adm
Debris, Unusual co	(Slide movements, Slope protection, Erosion-b nditions) parse but OK. Suspected that the structure		
Downstream Face	ace (Slide movements, Signs of movements, Crowas OK.	icks, Seepage or wet	areas, Unusual conditions)
		· -=	
Abutments (See Abutments were (page, Cracks/joints/bedding planes, Slides, Sign OK.		
	· · · · · · · · · · · · · · · · · · ·		
Crest (Surface cre Crest was OK.	acking, Settlement, Lateral movement, Camber)		
Seepage and D	Prainage (Locations(s), Estimated flow(s), Col	or (staining), Toe dro	nin and relief wells)
Trong observed.			
			,
Remarks Vegetation should	d be cut and cleared.		

Inspected by:	East Blackwoods Freeboard Dam #2 IK, PP, KH Sunny, Cold, -5°C	Water Level :	2001-11-29
	(Slide movements, Slope protection, Erosion anditions)		
Downstream F Downstream face	ace (Slide movements, Signs of movements, was OK.		areas, Unusual conditions)
Abutments (See	epage, Cracks/joints/bedding planes, Slides, S OK.		
Crest (Surface cr Crest was OK.	acking, Settlement, Lateral movement, Cambo	·	
Seepage and Described.	Prainage (Locations(s), Estimated flow(s), C	Color (staining), Toe dra	in and relief wells)
Remarks			

ROCKFILL OVERFLOW SPILLWAY

Structure:	East Blackwoods Spillway	Date/Time :	2001-11-29
Inspected by:	IK, PP, KH	Water Level :	30" Below FSL
Weather:	Sunny, Cold, -5°C	Releases:	
•			
Debris, Unusual co	(Slide movements, Slope protection, Eronditions) but no movement was noted. Some r		
Downstream F Downstream face	ace (Slide movements, Signs of movements) was OK.	nts, Cracks, Seepage or wet	areas, Other)
Abutments (See Abutments were	page, Cracks/joints/bedding planes, Slide OK.	es, Signs of movement)	
Stilling Basin (N/A	Debris, Walls movement/settlement/joints	/erosion)	
condition/operation	(Slope protection, Stability of side n) mmediately downstream of the dam.	slopes, Vegetation/obstruct	ions, Debris in water, Stoplogs
	acking, Settlement, Lateral movement, Ca nor settlement noted along the sheet		
Seepage and D Minor seepage w	Prainage (Locations(s), Estimated flow(as noted along downstream toe, appro	s), Color (staining), Toe dra oximately 1L/s.	in and relief wells)
Approach Char Channel was OK.	nnel (Slides above channel, Stability of s	side slopes, Log boom, Debr	is, Slope protection)
Remarks			
			.,

Inspected by:	East Blackwoods Freeboard Dam #4 IK, PP, KH Sunny, Cold, -5°C	Date/Time : Water Level : Releases :	2001-11-29
Debris, Unusual co	(Slide movements, Slope protection, Erosion- onditions) sparse, but slope seems stable.	-beaching, Cracks, Sin	kholes, Settlement, Displacement,
Downstream F Downstream face	ace (Slide movements, Signs of movements, C was OK.	racks, Seepage or wet o	areas, Unusual conditions)
Abutments (See	epage, Cracks/joints/bedding planes, Slides, Sig OK.	gns of movement)	
Crest (Surface or Crest was OK.	acking, Settlement, Lateral movement, Camber	r)	
Seepage and I	Prainage (Locations(s), Estimated flow(s), Co	olor (staining), Toe dra	in and relief wells)
Remarks			

Structure: East Blackwoods Freeboard Dam #5 Inspected by: IK, PP, KH Weather: Sunny, Cold, -5°C	Water Level :	2001-11-29
Upstream Face (Slide movements, Slope protection, Erosion-be Debris, Unusual conditions) Very steep in places, but slope seems stable. Monitor for move		kholes, Settlement, Displacement,
Downstream Face (Slide movements, Signs of movements, Crac Downstream face was OK.	cks, Seepage or wet	areas, Unusual conditions)
Abutments (Seepage, Cracks/joints/bedding planes, Slides, Signs Abutments were OK.	of movement)	
Crest (Surface cracking, Settlement, Lateral movement, Camber) Crest was OK.		
Seepage and Drainage (Locations(s), Estimated flow(s), Color Steel culvert was present for unwatering. Culvert was in poor c		
Remarks		

Structure:	East Blackwoods Freeboard Dam #6	Date/Time:	2001-11-29
Inspected by:		Water Level :	
Weather:	Sunny, Cold, -5°C	Releases :	-
Upstream Face Debris, Unusual co Upstream face w		beaching, Cracks, Sin	kholes, Settlement, Displacement,
Downstream F Downstream face	ace (Slide movements, Signs of movements, Coe was OK.	racks, Seepage or wet	areas, Unusual conditions)
Abutments (See	epage, Cracks/joints/bedding planes, Slides, Sig OK.	ns of movement)	
Crest (Surface cr Crest was OK.	acking, Settlement, Lateral movement, Camber)	
	Prainage (<i>Locations(s), Estimated flow(s), Co</i> pted, no flow observed.	lor (staining), Toe dra	in and relief wells)
Remarks			
	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		· · · · · · · · · · · · · · · · · · ·
·			

	East Blackwoods Freeboard Dam #7		2001-11-29
Inspected by:		Water Level :	
weather:	Sunny, Cold, -5°C	Releases :	
Debris, Unusual co	(Slide movements, Slope protection, Erosion onditions) as OK. Riprap was steep but stable.	n–beaching, Cracks, Sin	kholes, Settlement, Displacement,
	ace (Slide movements, Signs of movements, Garas OK. Slope was steep but stable.	Cracks, Seepage or wet	areas, Unusual conditions)
Abutments (See Abutments were	epage, Cracks/joints/bedding planes, Slides, S OK.	igns of movement)	····
Crest (Surface cr Crest was OK.	racking, Settlement, Lateral movement, Cambe	er)	
Seepage and I	Orainage (Locations(s), Estimated flow(s), C	Color (staining), Toe dra	uin and relief wells)
Remarks			

Structure: East Blackwoods Freeboard Dam #8 Inspected by: IK, PP, KH Weather: Sunny, Cold, -5°C		2001-11-29
Upstream Face (Slide movements, Slope protection, Erosion-bed Debris, Unusual conditions) Upstream face was OK. Riprap was small.	eaching, Cracks, Sin	kholes, Settlement, Displacement,
Downstream Face (Slide movements, Signs of movements, Cra Downstream face was OK.	cks, Seepage or wet	areas, Unusual conditions)
Abutments (Seepage, Cracks/joints/bedding planes, Slides, Sign. Abutments were OK.	s of movement)	
Crest (Surface cracking, Settlement, Lateral movement, Camber) Crest was OK.		
Seepage and Drainage (Locations(s), Estimated flow(s), Cold OK	or (staining), Toe dra	ain and relief wells)
Remarks Riprap was small.		

Structure: East Blackwoods Freeboard Dam #9 Inspected by: IK, PP, KH Weather: Sunny, Cold, -5°C	Water Level :	2001-11-29
Upstream Face (Slide movements, Slope protection, Erosion-b Debris, Unusual conditions) Upstream face was OK. Riprap ends before the left abutment.	eaching, Cracks, Sin	kholes, Settlement, Displacement,
Downstream Face (Slide movements, Signs of movements, Cran Downstream face was OK.	acks, Seepage or wet	areas, Unusual conditions)
Abutments (Seepage, Cracks/joints/bedding planes, Slides, Sign Abutments were OK. Low areas noted near the right abutmen	s of movement) t, allowing water to	flow into the adjacent pit.
Crest (Surface cracking, Settlement, Lateral movement, Camber) Crest was OK.		
Seepage and Drainage (Locations(s), Estimated flow(s), Colo OK, with minor ponding noted.	or (staining), Toe dro	ain and relief wells)
Remarks		
		<u> </u>

Structure :	Fourth Blackwoods Freeboard Dam #1	Date/Time :	
Inspected by:			725.6
Weather:	Sunny, Cold, -5ºC	_ Releases :	
		•	
Debris, Unusual co	(Slide movements, Slope protection, Erosion-banditions) vave action, with very little riprap remaining.		kholes, Settlement, Displacement,
	ace (Slide movements, Signs of movements, Crote amounts of vegetation was present.	acks, Seepage or wet	areas, Unusual conditions)
Abutments (See Abutments were	page, Cracks/joints/bedding planes, Slides, Sign OK.		
Crest (Surface cr Crest was genera	acking, Settlement, Lateral movement, Camber) Illy OK, with some rutting noted.		
	Prainage (Locations(s), Estimated flow(s), College was difficult to determine.	or (staining), Toe dro	ain and relief wells)
		- · · · · · · · · · · · · · · · · · · ·	
			•
Remarks			

Structure:	Fourth Blackwoods Freeboard Dam #2	Date/Time :	2001-11-29
Inspected by:		Water Level:	725.6
Weather:	Sunny, Cold, -5°C	Releases :	
Debris, Unusual co	(Slide movements, Slope protection, Erosion—be onditions) y graded, but seemed stable. Some vegetation		kholes, Settlement, Displacement,
Downstream F Heavy to modera	ace (Slide movements, Signs of movements, Cracte amounts of vegetation was present.	cks, Seepage or wet	areas, Unusual conditions)
Abutments (See Abutments were	epage, Cracks/joints/bedding planes, Slides, Signs OK.	s of movement)	
Crest (Surface or Crest was genera	racking, Settlement, Lateral movement, Camber) ally OK, with some rutting noted.		
Seepage and I	Drainage (<i>Locations(s), Estimated flow(s), Colo</i> be was difficult to determine. Vegetation preve	or (staining), Toe dra ented observation o	tin and relief wells) of any seepage.
		<u> </u>	
Remarks Good condition o	verall.		
		·	
Location of the to	e was difficult to determine. Vegetation preve	er (staining), Toe dra	iin and relief wells) If any seepage.

ROCKFILL OVERFLOW SPILLWAY

Fourth Blackwoods Spillway		2001-11-29
IK, PP, KH	Water Level :	
Sunny, Cold, 5ºC	Releases :	
(Slide movements, Slope protection, onditions) as OK.	Erosion–beaching, Cracks, Sin	ukholes, Settlement, Displacement,
		areas, Other)
page, Cracks/joints/bedding planes, St equires riprap, but appears stable.	lides, Signs of movement)	
Debris, Walls movement/settlement/joi	ints/erosion)	
n)		tions, Debris in water, Stoplogs
Prainage (Locations(s), Estimated flo	ow(s), Color (staining), Toe dro	ain and relief wells)
nnel (Slides above channel, Stability o	of side slopes, Log boom, Debr	ris, Slope protection)
	IK, PP, KH Sunny, Cold, 5°C (Slide movements, Slope protection, anditions) as OK. ace (Slide movements, Signs of movement) peing small and poorly graded. Slope protection and poorly graded. Slope protection, but appears stable. Debris, Walls movement/settlement/joints/bedding planes, Stability of sides and immediately downstreed during construction. Sheet pile and during construction. Sheet pile and during construction. Sheet pile and construction. Sheet pile and construction and construction. Sheet pile and construction and construction. Sheet pile and construction are stability of sides above channel, Stability	IK, PP, KH Sunny, Cold, 5°C Releases: Releaseases: Releases: Releases: Releases: Releases: Releases: Releases: Releases: R

OUTLET WORKS

	urth Blackwoods Control Structure		2001-11-29
Inspected by : IK,	PP, KH	Water Level:	725.6
Weather: Su	nny, Cold, 5ºC		
 "			
Intoko (Tresh week C	awayata)		
intake (Trash rack, Co N/A			
		 	
Outlet Conduit (Me	ntal work)		
N/A			
······································			
Control Escilition	Gatehouse, Crane, Gate/Controls-	description loan dition	Operation Machanical items
	o (Gatenouse, Crane, Gate/Controls- toplogs condition/seals)	-aescripноwconamon,	Ореганов, меснинси нет
	are showing deterioration, and serious	s cracking. Steel requ	ires scraping and paint.
Structure still appears			
			
	movement/settlement/joints/cracks/backfi	ill)	
N/A			
 			
			
Floor / Movement Set	tlement, Joints, Drains, Cracks, Condition	n of concrete Settlemen	t Stress cracks Movement)
N/A	tement, Joints, Drains, Cracks, Condition	n oj concrete, settlemen	i, Siress cracks, inovenient)
	<u> </u>		
	ris in basin, Walls movement, Walls settle	ement)	
N/A		·	
Outlet Channel (%)	ope protection, Stability of side slopes, Ve	agatation/obstructions	Dohris)
N/A	pe protection, stability of state stopes, ve	egeiunon oosin actionis,	000.00
	-		
			
Remarks			
Good condition overa	II. Planks were OK. Two tier of Stop k	ogs on site.	
<u>.</u> .			