

2001 Dam Safety Inspection Report

PUB 1.2
Attachment B

Seal Cove Development

NEWFOUNDLAND POWER

January 8, 2002

Memorandum From: G. Humby

To: S. LaCour

Subject: 2001 Dam Safety Inspection Reports
Seal Cove Development

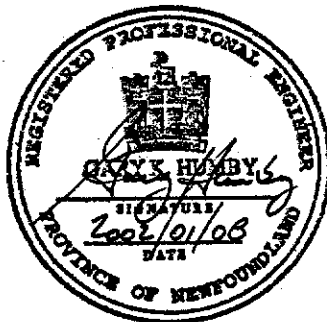
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Attached is a copy of the Dam Safety Inspection Report for structures located in Seal Cove Hydroelectric Development. In general, the structures in this system are in fair condition and should operate safely with some minor repairs/maintenance and capital improvements.

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

- Erosion of the crest near the outlet of Soldiers Pond Dam should continue to be monitored,
- Consideration should be given to replacement of deteriorated timbers on Soldiers Pond spillway,
- Deteriorated concrete along the crest and upstream of the intake gatehouse should be repaired in 2002,
- Deterioration of timbers and leakage around the culvert at Feneilons Pond Dam needs to be addressed in the near future,
- Condition of the deteriorated woodstave penstock needs to continue to be closely monitored throughout the winter until its scheduled replacement in 2002.

Attach:



A handwritten signature in black ink, which appears to read 'Gary Humby'.

EMBANKMENT DAM

Structure :	Soldiers Pond Outlet Dam	Date/Time :	2001-11-14, 2:30 pm
Inspected by :	G.Humby, J.Curran, P.Porter	Water Level :	3.5'
Weather :	Cloud, 0°C	Releases :	Fully Open

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Rip-rap in good condition, well graded, no problems.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Generally good condition. Some erosion on both sides of outlet, noticeable since previous inspection.

Some alder growth on downstream face.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

O.K.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Narrowing of the crest near the outlet, due to erosion of the downstream slope near the outlet.

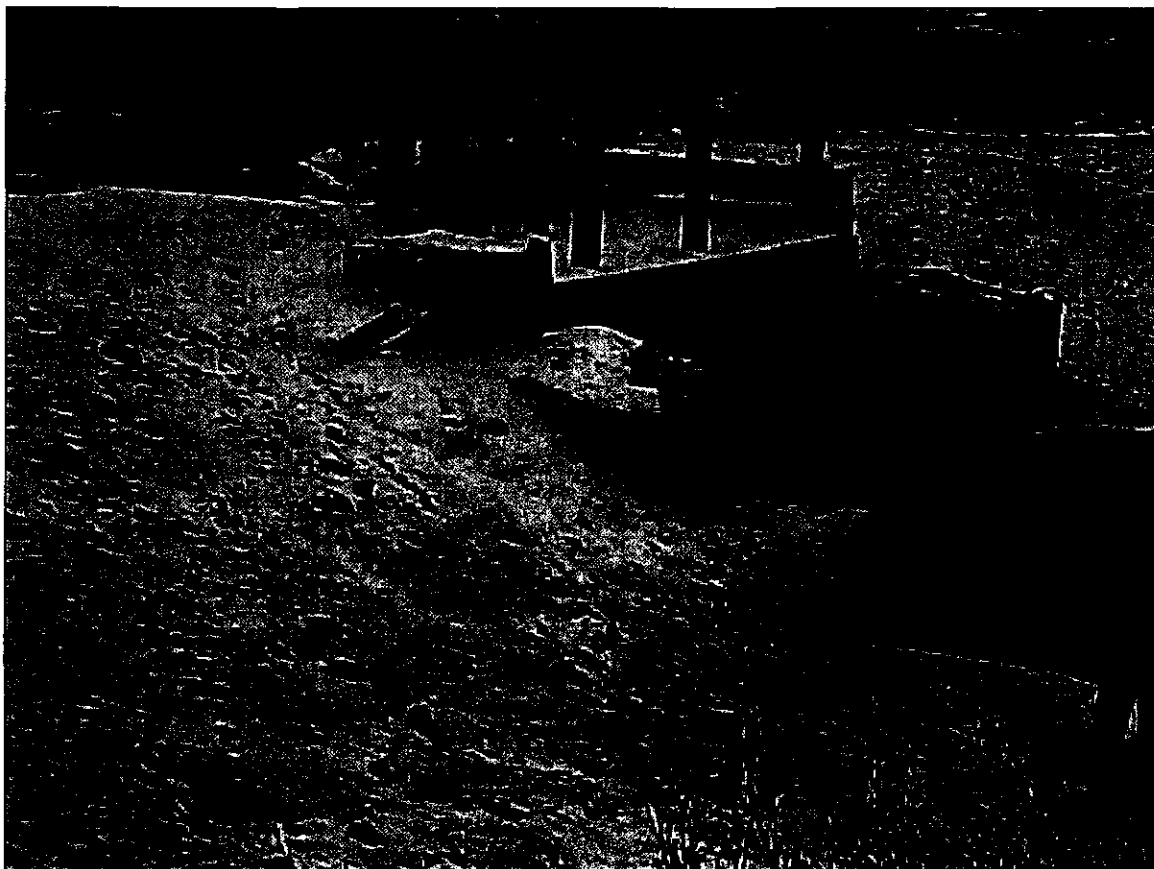
Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

None observed.

Remarks

Overall good condition. Continued monitoring of erosion near the outlet suggested.

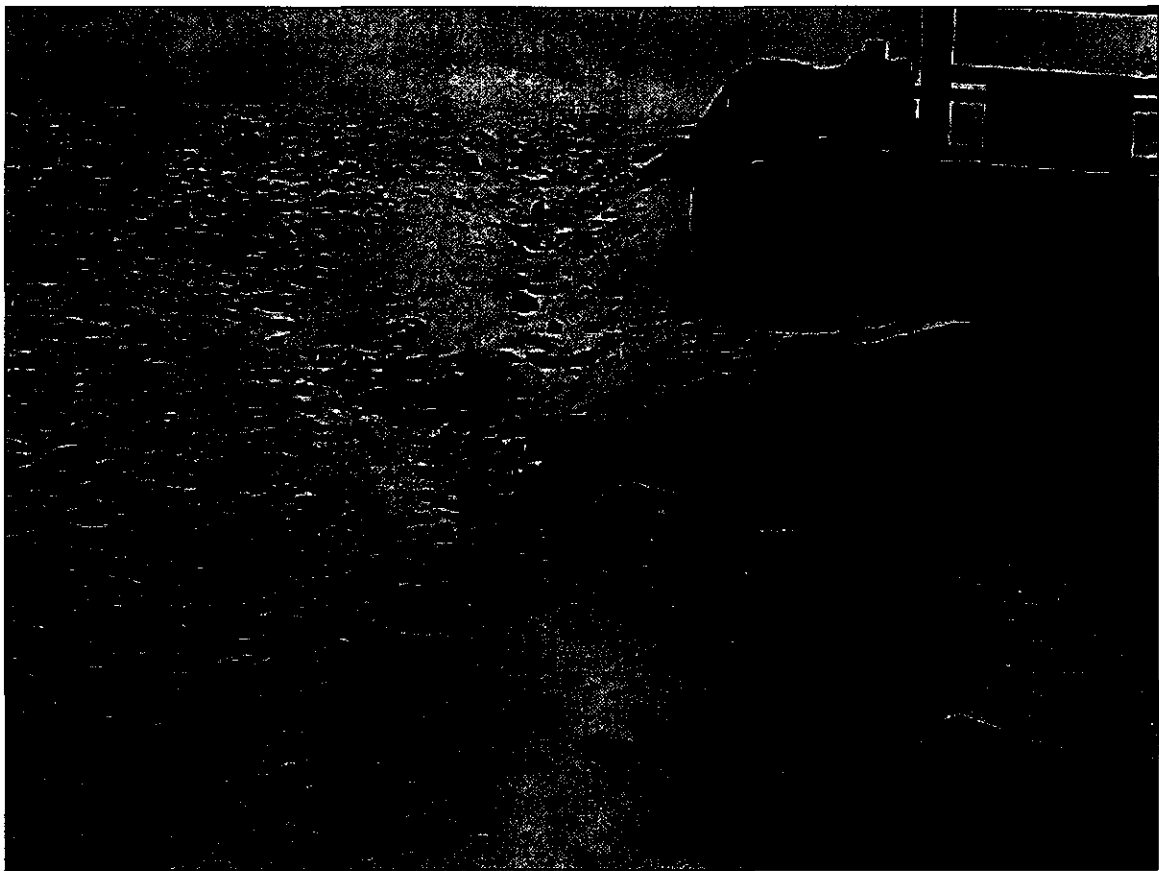
Repair down stream slope near the outlet suggested.



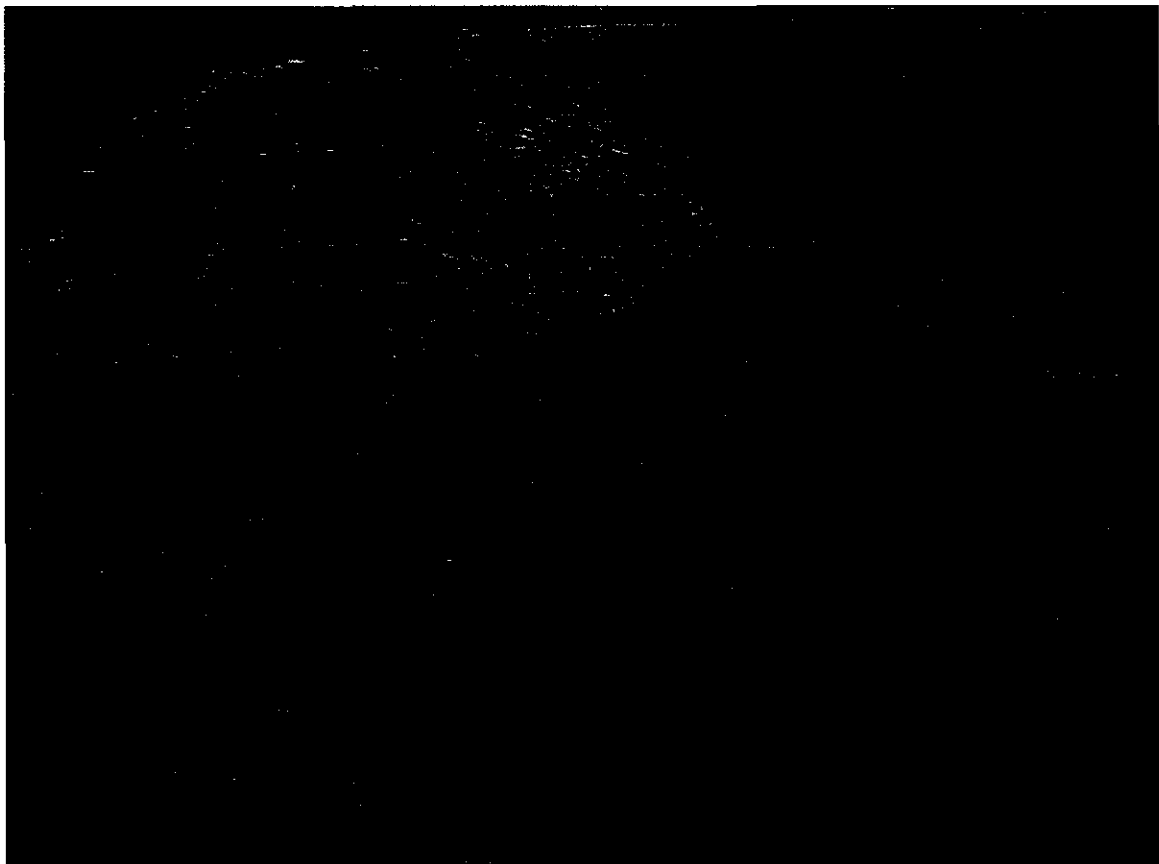
Soldiers Pond Outlet Dam - Erosion of Downstream Slope Near the Outlet



Soldiers Pond Outlet Dam - View of Left Downstream Slope



Soldiers Pond Outlet Dam - Erosion of the Downstream Face



Soldiers Pond Outlet Dam - Erosion of the Downstream Face

OUTLET WORKS

Structure :	Soldiers Pond Outlet	Date/Time :	2001-11-14, 2:45 pm
Inspected by :	G.Humby, J.Curran, P.Porter	Water Level :	3.5'
Weather :	Cloud, 0°C	Releases :	Fully Open

Intake (*Trash rack, Concrete*)

N/A

Outlet Conduit (*Metal work*)

N/A

Control Facilities (*Gatehouse, Crane, Gate/Controls—description/condition, Operation, Mechanical items, Ventilation, Lighting, Stoplogs condition/seals*)
Timber gate with mechanical lift, all in good condition.

Chute (*Debris, Walls movement/settlement/joints/cracks/backfill*)

Clear. Gabion wing walls stable with evidence of rust near and below the waterline.

Floor (*Movement, Settlement, Joints, Drains, Cracks, Condition of concrete, Settlement, Stress cracks, Movement*)
O.K.

Stilling Basin (*Debris in basin, Walls movement, Walls settlement*)

N/A

Outlet Channel (*Slope protection, Stability of side slopes, Vegetation/obstructions, Debris*)

Clear. Stability good.

Remarks

Overall good condition.



Soldiers Pond - Downstream Side of Outlet



Soldiers Pond Outlet Channel – Eroded Rock fill Present

TIMBER-CRIB DAM

Structure :	Soldiers Pond Spillway Dam	Date/Time :	2001-11-14, 3 pm
Inspected by :	G.Humby, J.Curran, P.Porter	Water Level :	3.5 ' Below FSL
Weather :	Cloud, 0°C	Releases :	None

Structure (*Timber structural members, Timber planking, Crib content*)

Overall good condition. Some settlement noted in some locations behind the timber facing.

Upstream Face (*Alignment, Seepage on d/s face, Downstream toe settlement*)

Good condition.

Crest (*Surface cracking, Settlement*)

Some minor depressions.

Abutments (*Condition, Seepage around dam – location/amount*)

No problems noted.

Remarks

Overall good condition. Timber plank facing in good condition. Some minor depressions noted in the crest.

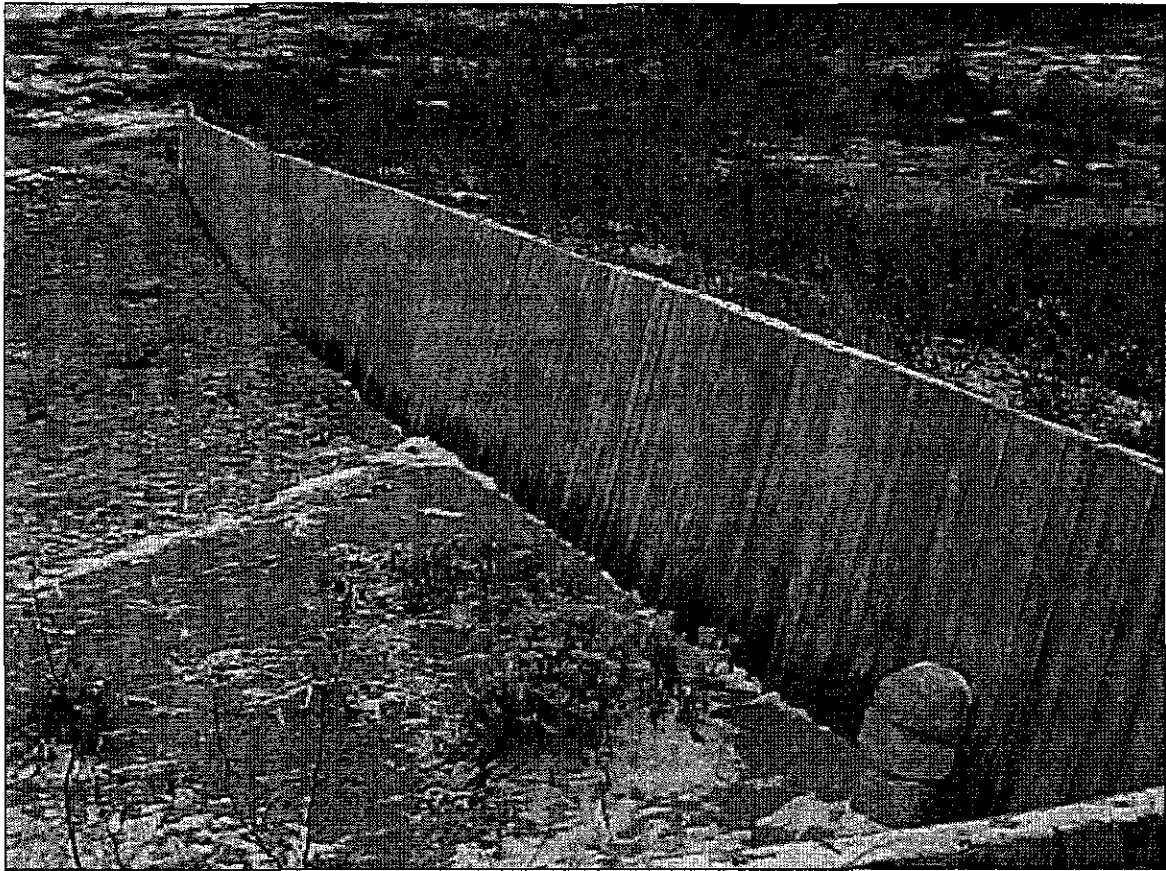
Some settlement of backfill in places.



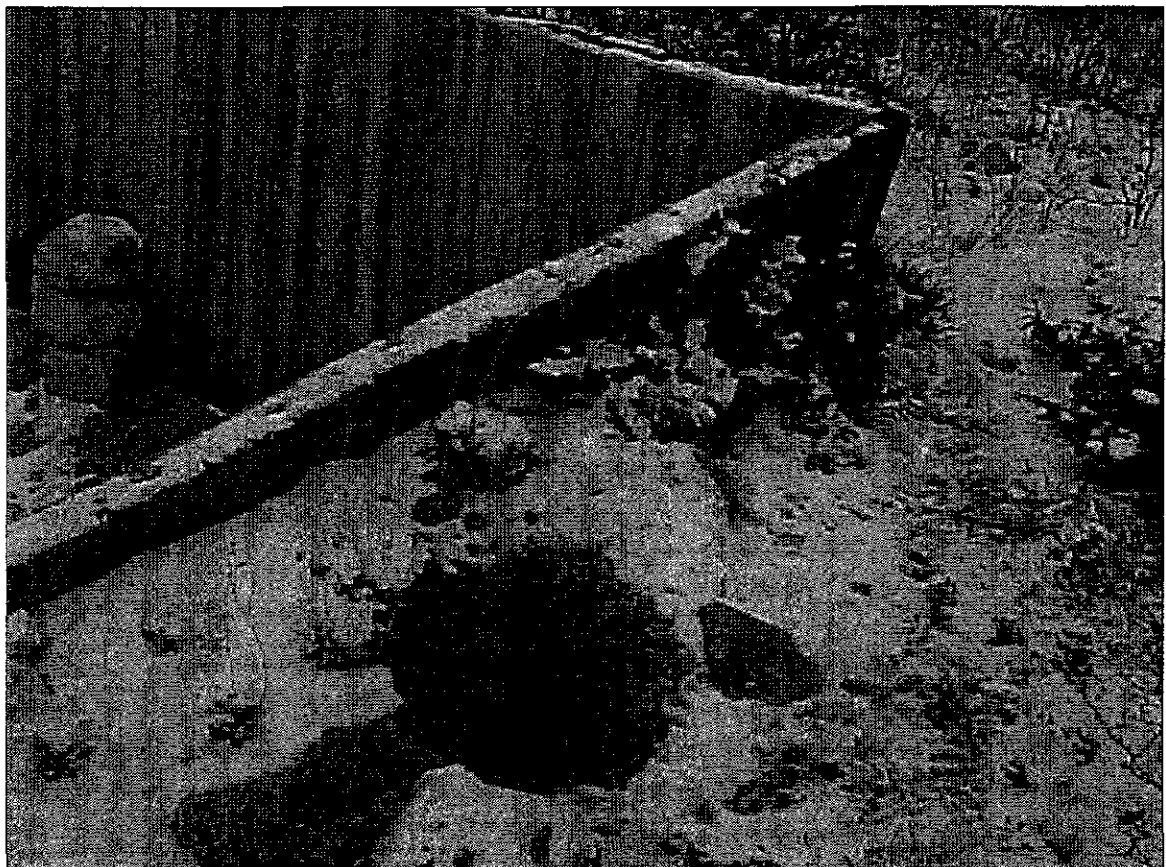
Soldiers Pond - Overall View of Dam and Spillway



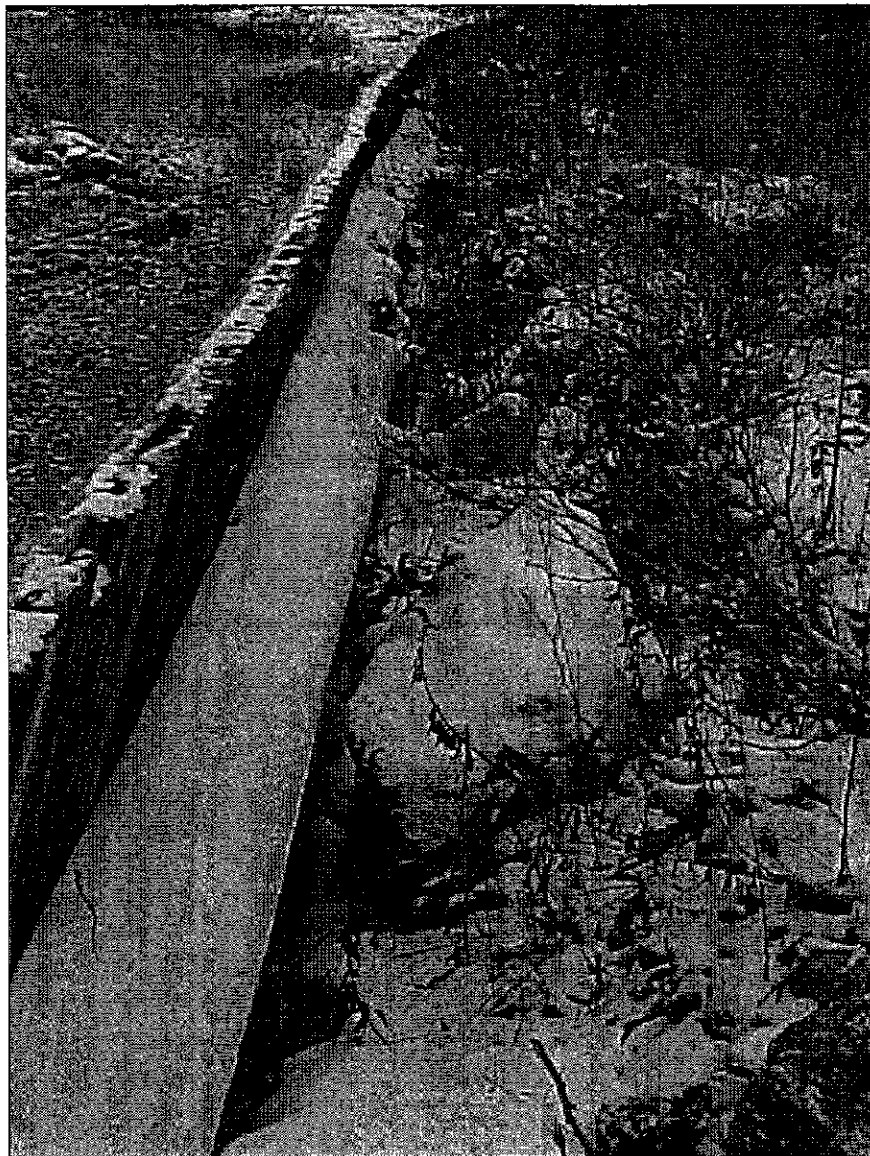
Soldiers Pond - View of Right Crest and Downstream Slope



Soldiers Pond Dam - Left Side Timber Face



Soldiers Pond Dam - Small Sink Hole



Settlement of Backfill – Left Side of Soldiers Pond Dam

TIMBER CRIB OVERFLOW SPILLWAY

Structure :	Soldiers Pond Spillway	Date/Time :	2001-11-14, 3 pm
Inspected by :	G.Humby, J.Curran, P.Porter	Water Level :	3.5'
Weather :	Cloud, 0°C	Releases :	None

Control Structures (*Crest, Orifices*)

N/A

Gates and Controls (*Type of Gate, General condition, Operation of gates at time of inspection*)

N/A

Approach Channel (*Debris, Slides over channel, Channel side slope stability, Slope protection*)

Clear and OK.

Walkway (*Condition of Piers, Condition of decking and beams, Condition of rails*)

N/A

Stilling Bain (*Debris in basin, Walls movement, Walls settlement*)

Some vegetation on the downstream side. Otherwise OK.

Outlet Channel (*Slope Protection, Stability of Slopes, Vegetation and other obstructions*)

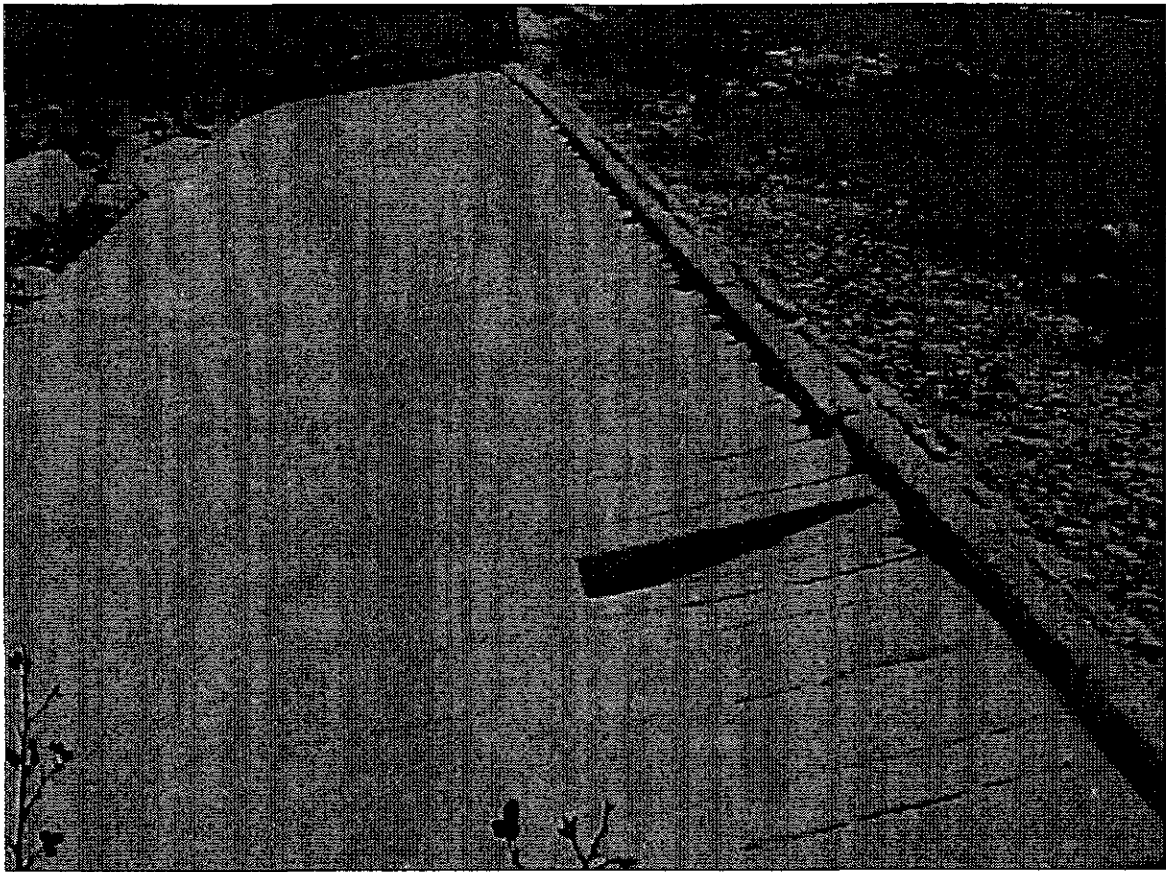
Some vegetation on the downstream side. Otherwise OK.

Flashboards (*Condition, Operation*)

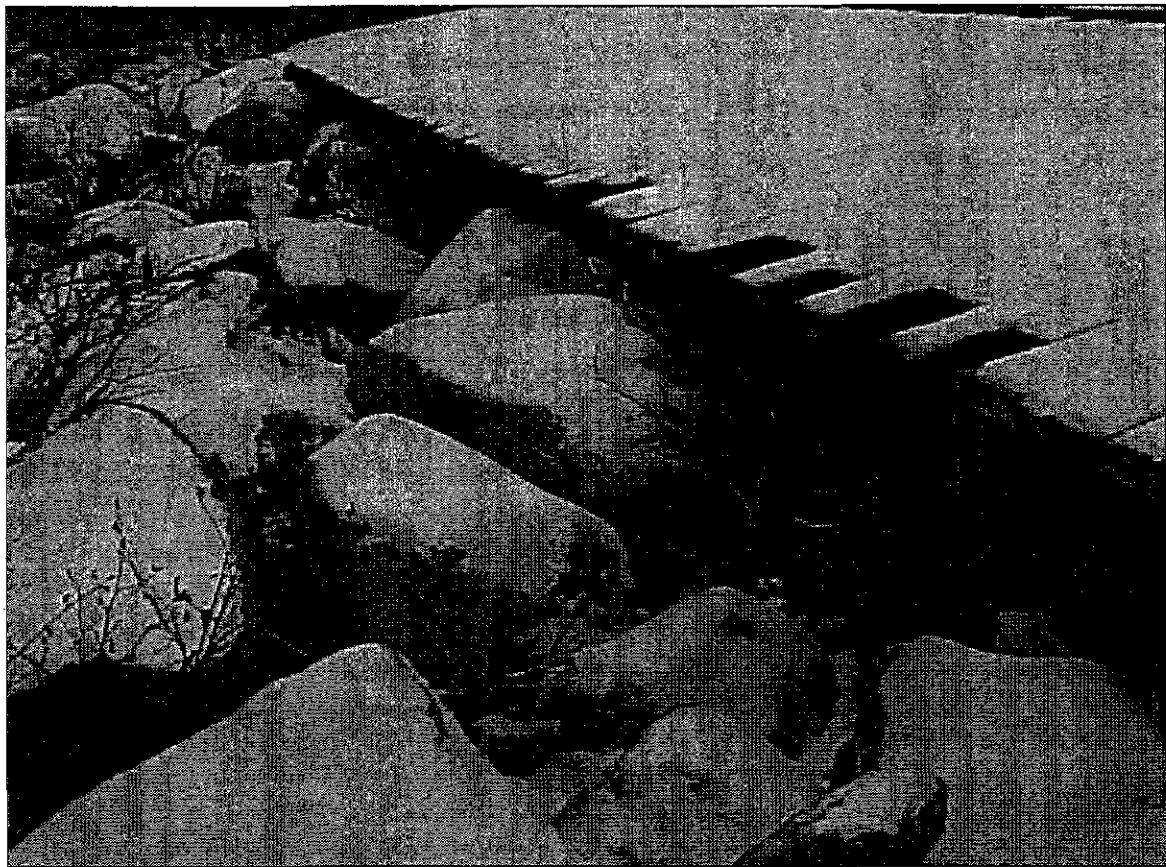
N/A

Remarks

Timber face in good condition. Face separated in places along the left wing wall. Gopher hole present on crest.
Some depressions along the crest. Vegetation needs to be cleared. Plank missing on the spillway crest.
Spillway timber in poor condition.



Soldiers Pond Spillway - Apron and Crest – Missing Plank



Soldiers Pond Spillway - Apron and Rip-Rap

EMBANKMENT DAM

Structure : Fenelons Pond dam Date/Time : 2001-11-14, 1:30 pm.
Inspected by : G.Humby, J.Curran, P.Porter Water Level : 5.5'
Weather : Cloud, 0°C Releases : None

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Riprap sparse in places. Riprap not well graded. Some erosion near the crest.

Riprap sparse near the left spillway abutment.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

No movement observed. No seepage observed water level was low. Vegetation cleared.

Leakage observed around the outlet culvert.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Riprap sparse near the right dam abutment.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Further deterioration of the timber/shotcrete cut-off wall since previous inspection. Some erosion of the crest.

Crest was narrow in places. Migration of fines noticeable along the crest.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

Seepage observed around the culvert.

Remarks

Overall condition fair to poor. Riprap was not well graded, and sparse in places.

Cut-off wall further deteriorated.



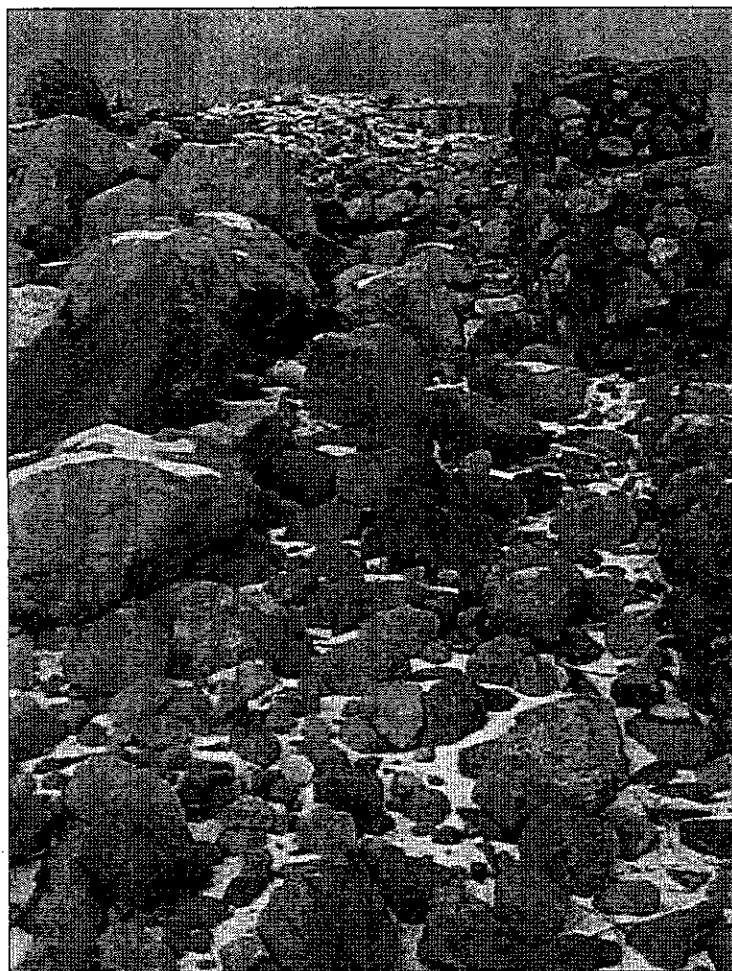
Upstream Face of Fenelons Pond Dam



Downstream Slope of Dam



Erosion at Fenelons Pond Dam Crest



Erosion of Downstream Slope Near Spillway

TIMBER CRIB OVERFLOW SPILLWAY

Structure :	Fenelons Pond Spillway	Date/Time :	2001-11-14, 1:45 pm.
Inspected by :	G.Humby, J.Curran, P.Porter	Water Level :	5.5'
Weather :	Cloud, 0°C	Releases :	None

Control Structures (*Crest, Orifices*)

N/A

Gates and Controls (*Type of Gate, General condition, Operation of gates at time of inspection*)

N/A

Approach Channel (*Debris, Slides over channel, Channel side slope stability, Slope protection*)

Channel clear. Gabions at the abutments were in good condition, some rusting noted in the lower tiers.

Walkway (*Condition of Piers, Condition of decking and beams, Condition of rails*)

Poor condition. Downstream rail missing in places, no upstream rail, decking deteriorated.

Stilling Basin (*Debris in basin, Walls movement, Walls settlement*)

Minor erosion noted. Clippings from brush cutting present.

Outlet Channel (*Slope Protection, Stability of Slopes, Vegetation and other obstructions*)

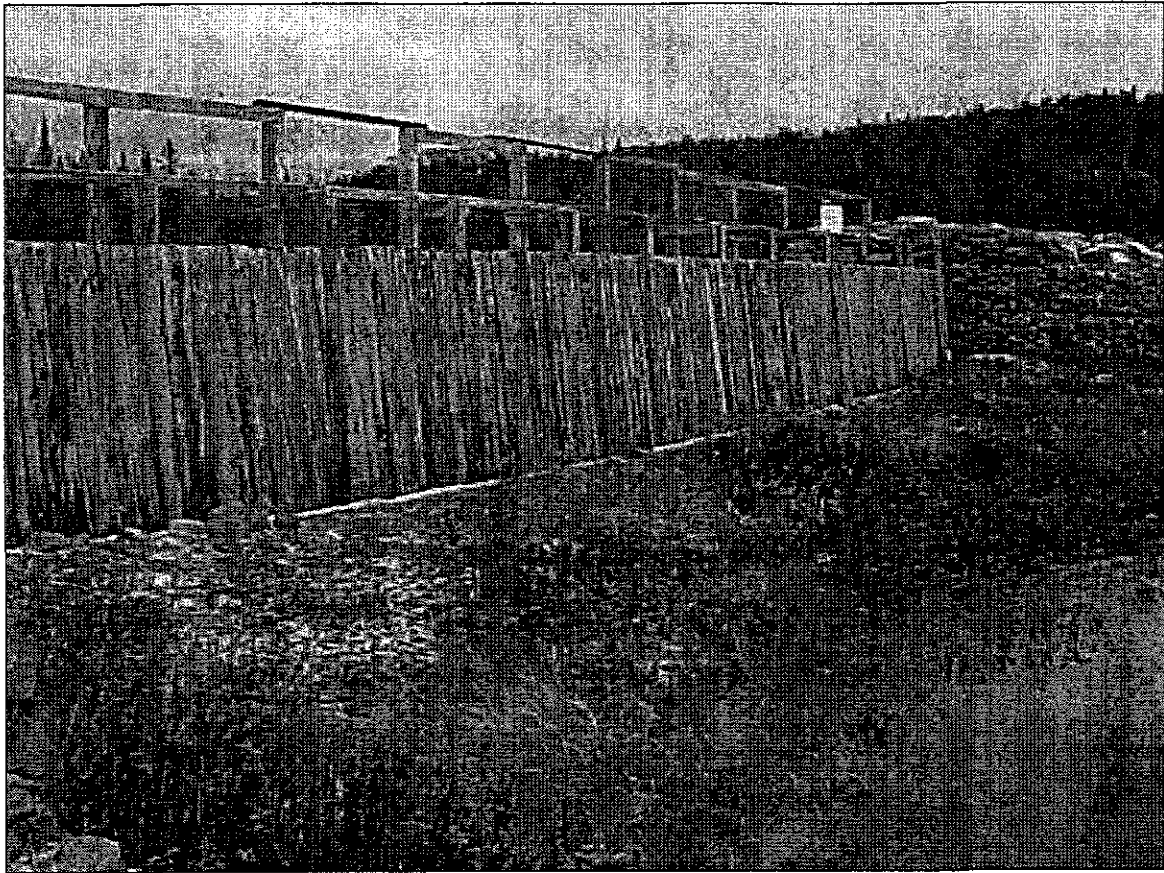
O.K. Alders cleared.

Flashboards (*Condition, Operation*)

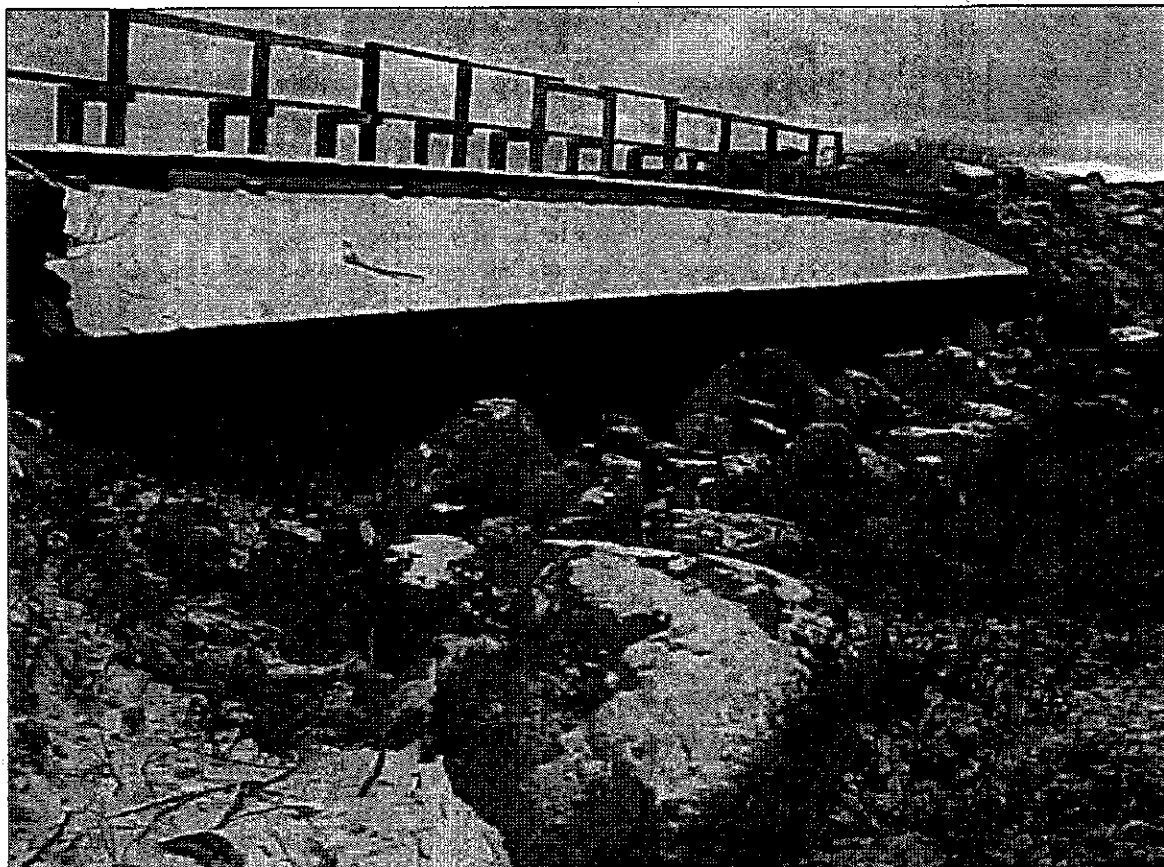
N/A

Remarks

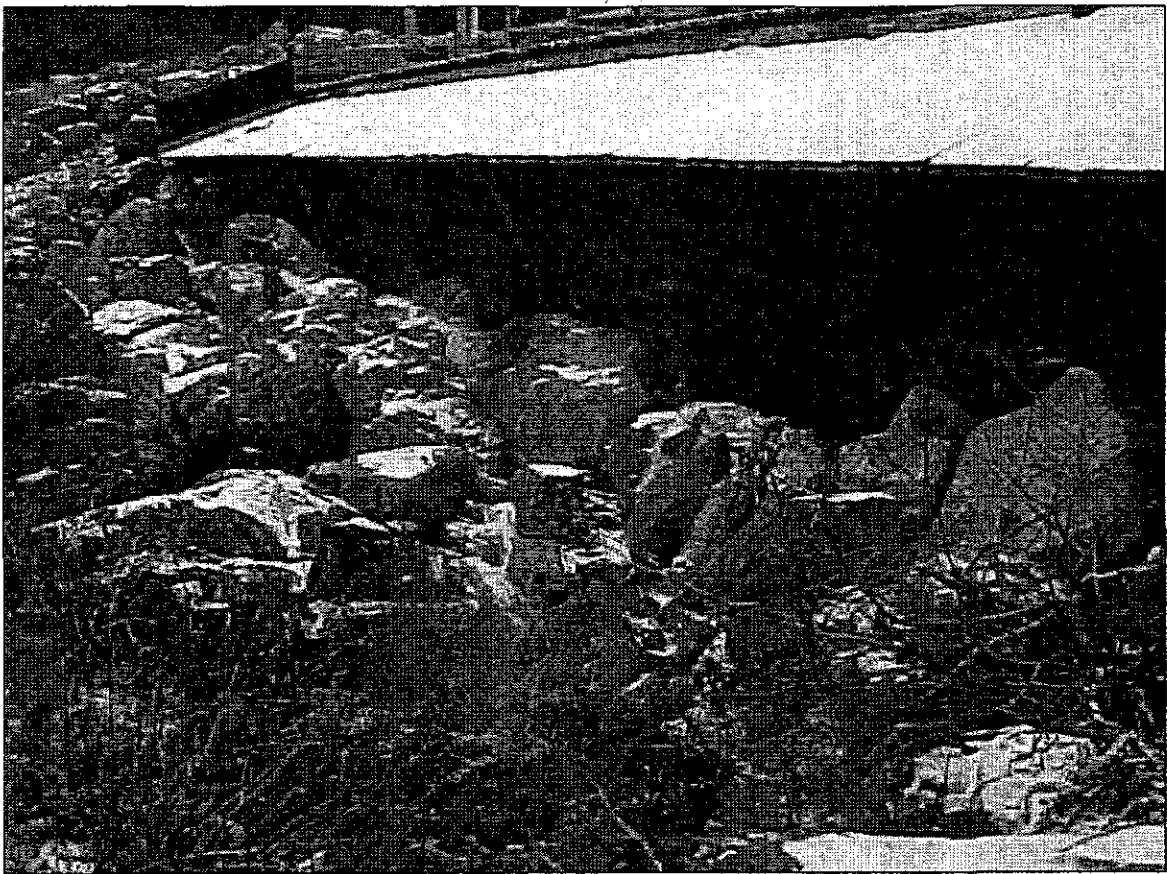
Fair to poor condition. Timber showing signs of further deterioration. Crib ballast missing.



Upstream View of Fenelons Pond Spillway



Downstream View of Fenelons Pond Spillway



Fenelons Pond Spillway - Apron and Riprap



Fenelons Pond Spillway Channel - Vegetation

OUTLET WORKS

Structure : <u>Fenelons Pond Outlet</u>	Date/Time : <u>2001-11-14</u>
Inspected by : <u>G.Humby, J.Curran, P.Porter</u>	Water Level : <u>5.5'</u>
Weather : <u>Cloud, 0°C</u>	Releases : <u>None</u>

Intake (*Trash rack, Concrete*)

No trash rack.

Outlet Conduit (*Metal work*)

Evidence of rust. No change since last inspection.

Control Facilities (*Gatehouse, Crane, Gate/Controls—description/condition, Operation, Mechanical items, Ventilation, Lighting, Stoplogs condition/seals*)

No gatehouse. Timber gate/mechanical lift. Fully closed with considerable leakage noted.

Chute (*Debris, Walls movement/settlement/joints/cracks/backfill*)

N/A

Floor (*Movement, Settlement, Joints, Drains, Cracks, Condition of concrete, Settlement, Stress cracks, Movement*)

OK

Stilling Basin (*Debris in basin, Walls movement, Walls settlement*)

N/A

Outlet Channel (*Slope protection, Stability of side slopes, Vegetation/obstructions, Debris*)

Clear, no obstructions. Slope stability good.

Remarks

Leakage noted on the right side of the culvert.



Fenelons Pond Outlet Culvert – Leaking with Gate Closed



Fenelons Pond - Outlet Works

CONCRETE DAM

Structure :	Seal Cove Forebay Dam	Date/Time :	2001-11-16, 11 am.
Inspected by :	G.Humby, J.Curran, P.Porter	Water Level :	
Weather :	Cloud, 5°C	Releases :	

Upstream Face (*Cracks, Joint offsets*)

Minor cracks, some spalling, some deterioration. Joint offsets OK.

Downstream Face (*Cracks, Joint offsets, Seepage on d/s face*)

Minor seepage on the downstream face. Some erosion of the crest and downstream face due to overtopping.

Minor joint offsets, some deterioration noted near some joints.

Downstream Toe (*Cracks, undercutting from erosion*)

Minor erosion. Some ponding of water due to seepage.

Crest (*Roadway, Walks, Parapet Wall, Lighting, etc.*)

Minor settlement noted in places along the crest.

Some deterioration, some displacement of rock fill due to overtopping.

Abutments (*Condition, Seepage around dam – location/amount*)

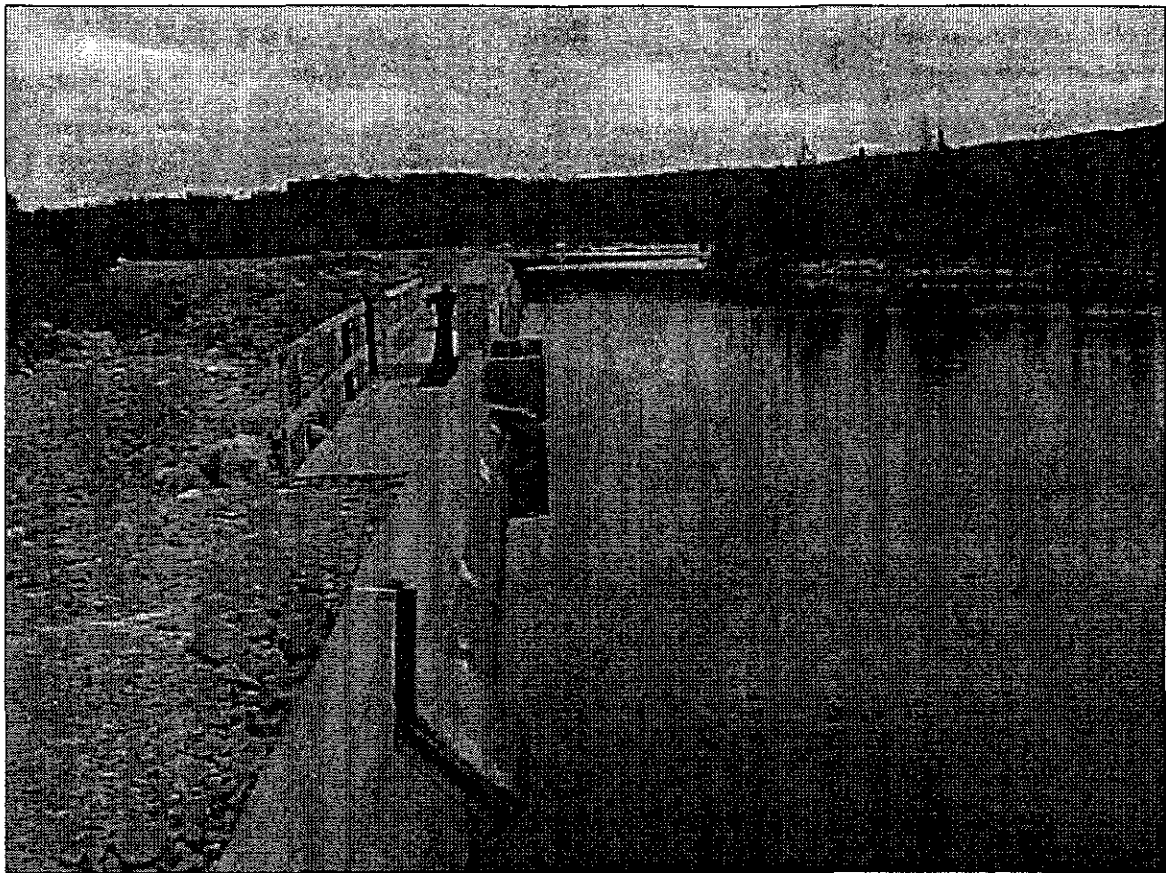
Good condition, no seepage noted.

Remarks

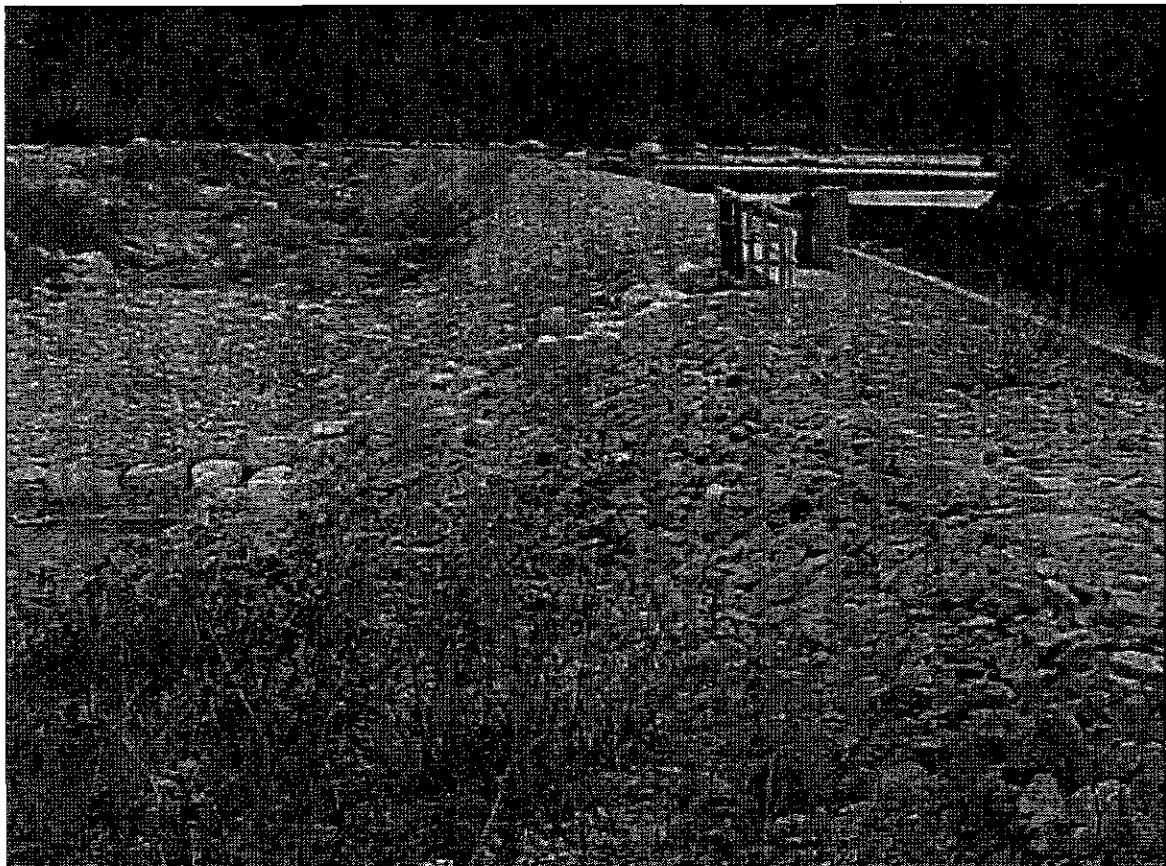
Leakage around the sluice gate to be repaired. Slope repairs downstream of the gate are OK.

Walkway over the sluice gate should be replaced immediately.

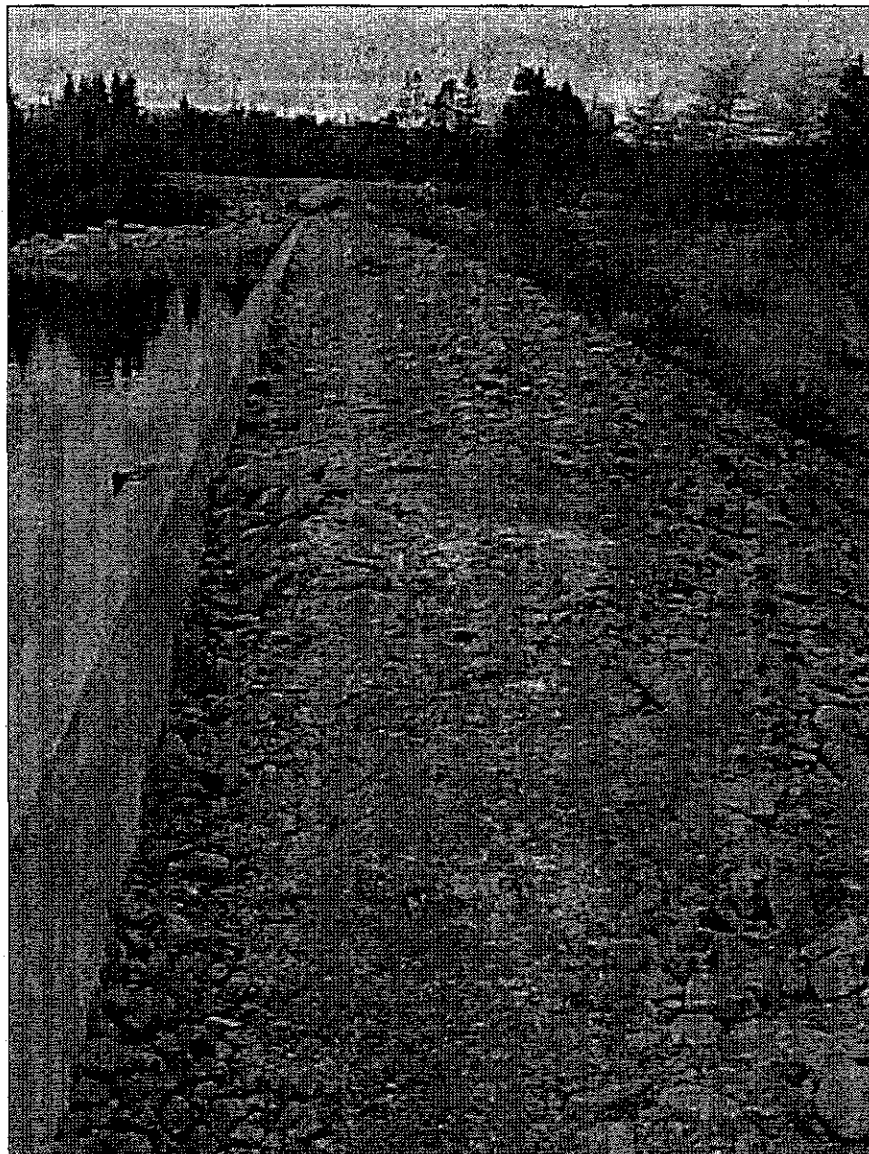
Timber gate-mechanical lift OK, except for leakage.



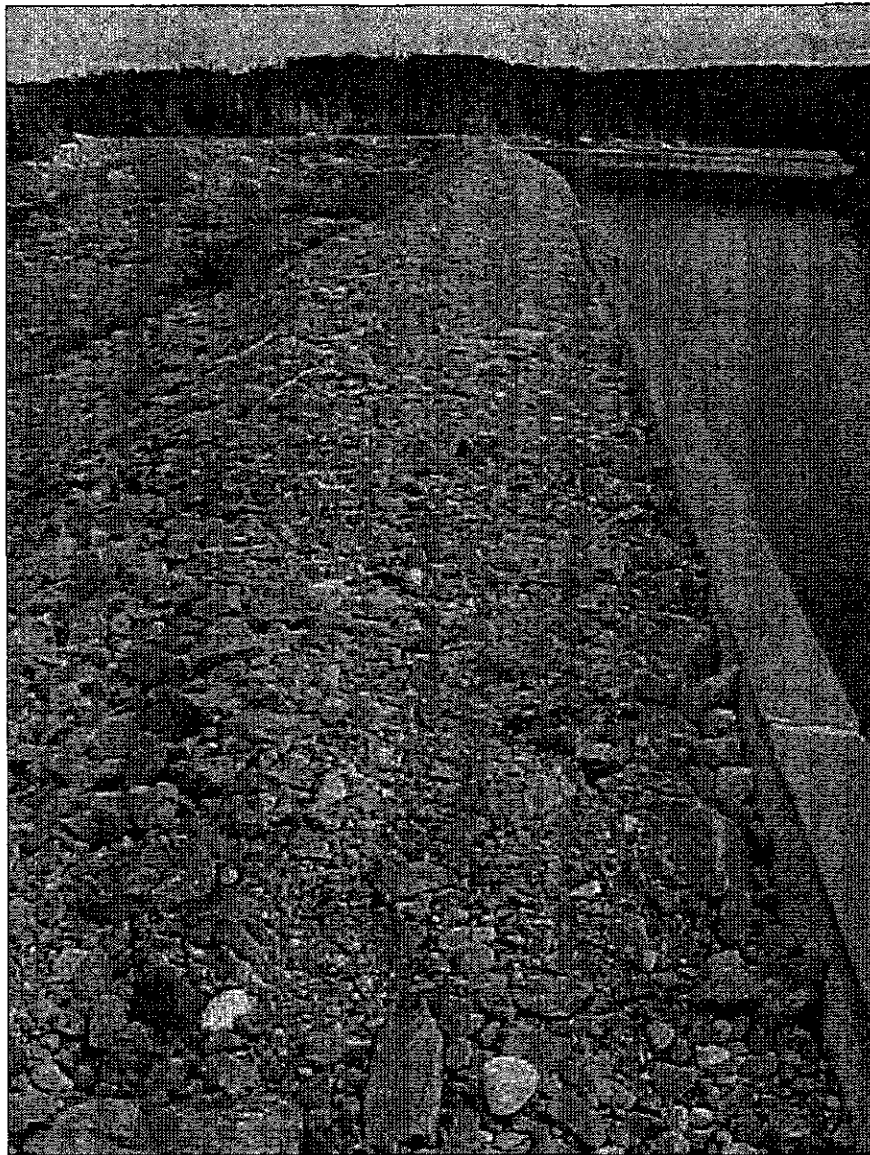
Seal Cove Forebay Dam -- Upstream Face



Seal Cove Forebay Dam -- Downstream Slope



Seal Cove Forebay Dam – View of Crest



Seal Cove Forebay Dam – View of Crest

CONCRETE SPILLWAY

Structure :	Seal Cove Forebay Main Spillway	Date/Time :	2001-11-16, 11 am.
Inspected by :	G.Humby, J.Curran, P.Porter	Water Level :	Below spill
Weather :	Cloud 5°C	Releases :	None

Control Structures (*Crest, Orifices*)

Crest deteriorated with exposed reinforcement steel and exposed aggregate in places

Gates and Controls (*Type of Gate, General condition, Operation of gates at time of inspection*)

N/A

Approach Channel (*Debris, Slides over channel, Channel side slope stability, Slope protection*)

Some driftwood present, should be cleared. Slope protection and stability good.

One minor slide noted on the RHS, some rock fill needs to be replaced.

Walkway (*Condition of Piers, Condition of decking and beams, Condition of rails*)

N/A

Stilling Basin (*Debris in basin, Walls movement, Walls settlement*)

Minor amount of driftwood present. No movement or settlement noted.

Outlet Channel (*Slope Protection, Stability of Slopes, Vegetation and other obstructions*)

Slope protection and stability good. Some minor alder growth, no major obstructions.

Gabions in good condition.

Flashboards (*Condition, Operation*)

N/A

Remarks

Overall fair to good condition. Some deterioration of concrete. Some minor sliding of rock fill.

No major displacement of material. Gabions in good condition.



Seal Cove Forebay Spillway - Crest



Seal cove Forebay Spillway – Crest With Missing Rock Fill

CONCRETE SPILLWAY

Structure :	Seal Cove Forebay Emergency Spillway	Date/Time :	2001-11-16, 11 am.
Inspected by :	G.Humby, J.Curran, P.Porter	Water Level :	Below spill
Weather :	Cloud 5°C	Releases :	None

Control Structures (*Crest, Orifices*)

Concrete overflow crest in good condition.

Gates and Controls (*Type of Gate, General condition, Operation of gates at time of inspection*)

N/A

Approach Channel (*Debris, Slides over channel, Channel side slope stability, Slope protection*)

Clear. Stability and slope protection good.

Walkway (*Condition of Piers, Condition of decking and beams, Condition of rails*)

N/A

Stilling Basin (*Debris in basin, Walls movement, Walls settlement*)

Clear. Some minor erosion on the RHS.

Outlet Channel (*Slope Protection, Stability of Slopes, Vegetation and other obstructions*)

Some minor erosion noted in the downstream riprap. No vegetation or obstructions present.

Flashboards (*Condition, Operation*)

N/A

Remarks

Overall good condition.

OUTLET WORKS

Structure : <u>Seal Cove Forebay Intake</u>	Date/Time : <u>2001-11-16, 11 am</u>
Inspected by : <u>G.Humby, J.Curran, P.Porter</u>	Water Level : _____
Weather : <u>Cloud 5°C</u>	Releases : _____

Intake (*Trash rack, Concrete*)

Trash rack in good condition, some deterioration.

Significant spalling of concrete along the crest. Sandbags in place to prevent high water level leakage.

Outlet Conduit (*Metal work*)

Wood stave penstock, deteriorated condition.

Control Facilities (*Gatehouse, Crane, Gate/Controls—description/condition, Operation, Mechanical items, Ventilation, Lighting, Stop logs condition/seals*)

Concrete foundation of gatehouse severely deteriorated. Mechanical lift-steel gate in good condition.

Ventilation, operation, and lighting good.

Chute (*Debris, Walls movement/settlement/joints/cracks/backfill*)

No debris.

Floor (*Movement, Settlement, Joints, Drains, Cracks, Condition of concrete, Settlement, Stress cracks, Movement*)

Not inspected

Stilling Basin (*Debris in basin, Walls movement, Walls settlement*)

N/A

Outlet Channel (*Slope protection, Stability of side slopes, Vegetation/obstructions, Debris*)

N/A

Remarks

Concrete deteriorated at the crest, and the gatehouse foundation.



Seal Cove Forebay Outlet – Replace Walkway



Seal Cove Forebay Outlet – Replace Walkway

PENSTOCK

Structure : Seal Cove Penstock Date/Time : 2001-11-16, 11 am.
Inspected by : G.Humby, J.Curran, P.Porter Water Level : _____
Weather : Cloud 5°C Releases : _____

Right of Way (*Vegetation, Drainage ditches, Culverts*)
Clearing of alders required. Poor drainage in places.

Condition of Penstock Bed (*Alignment, Settlement*)
Poor drainage in places.

Condition of Pipe (*Type, Cracks, Stresses, Leaks, Bands, Plates, Joints, Other*)
Wood staves deteriorated, significant leakage. Bands rusted.

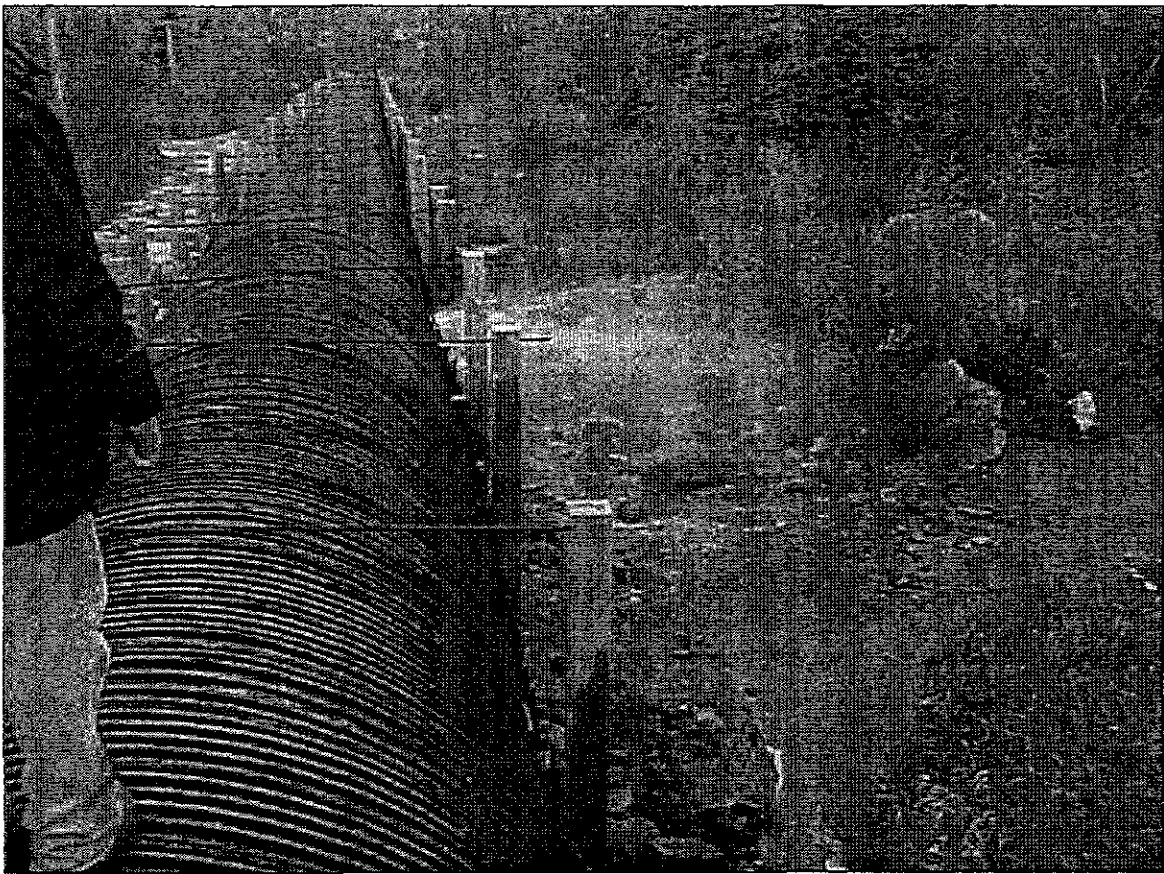
Penstock Supports (*Saddles, Piers, etc.*)
6 X 6 supports in good condition. Cradles deteriorated.

Anchor Blocks (*Condition of concrete, Settlement, Stress cracks, Movement*)
N/A

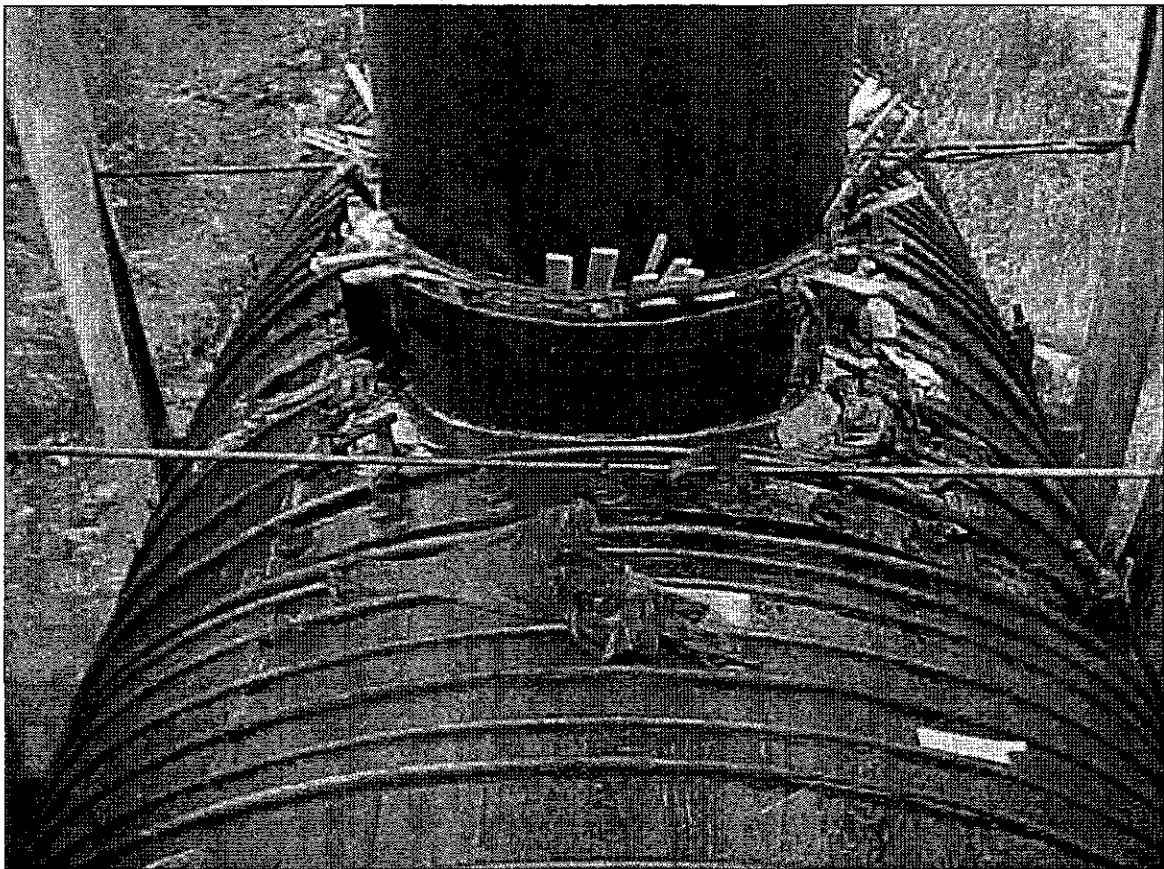
Expansion Joints (*Leaks, Stress cracks*)
Significant leakage.

Penstock Cover (*Condition of backfill, Slope stability*)
N/A

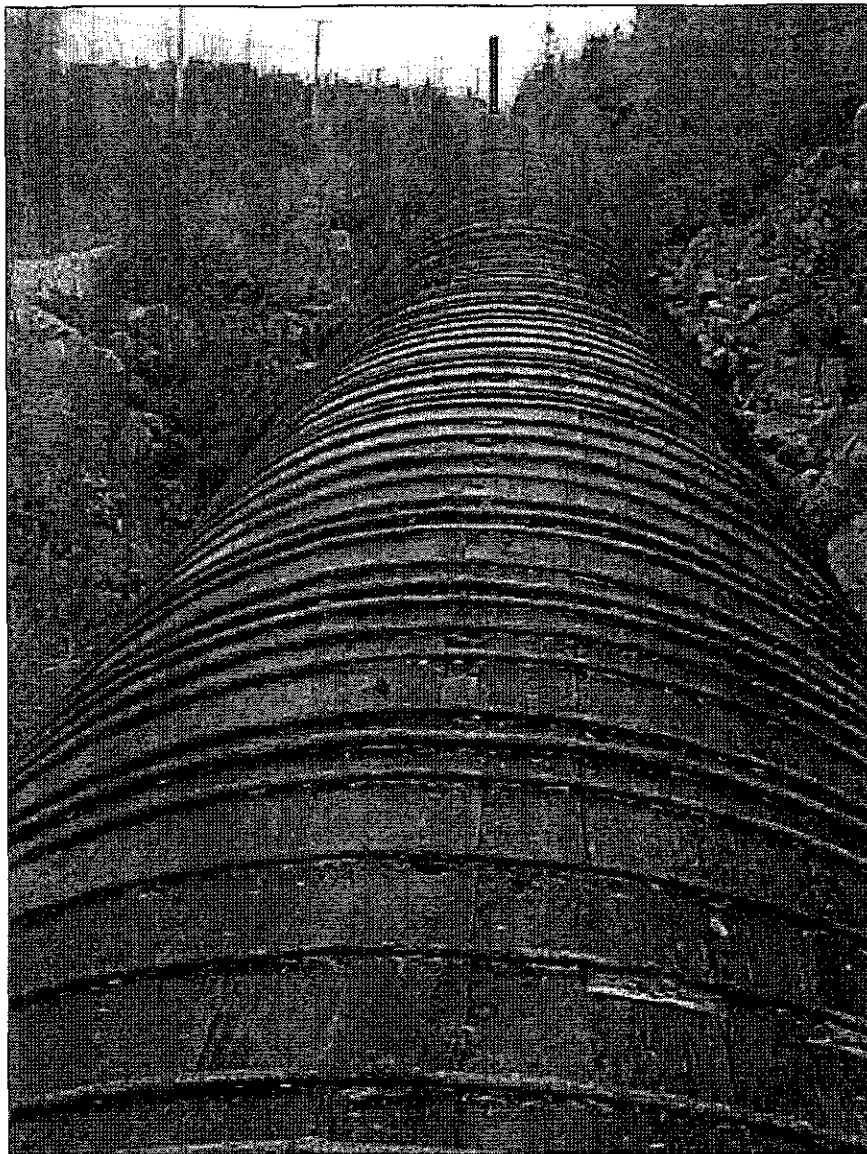
Remarks
Significant leakage, in scattered areas. Wood staves deteriorated throughout, bands rusted throughout.
Areas having major leakage should attempt repairs.



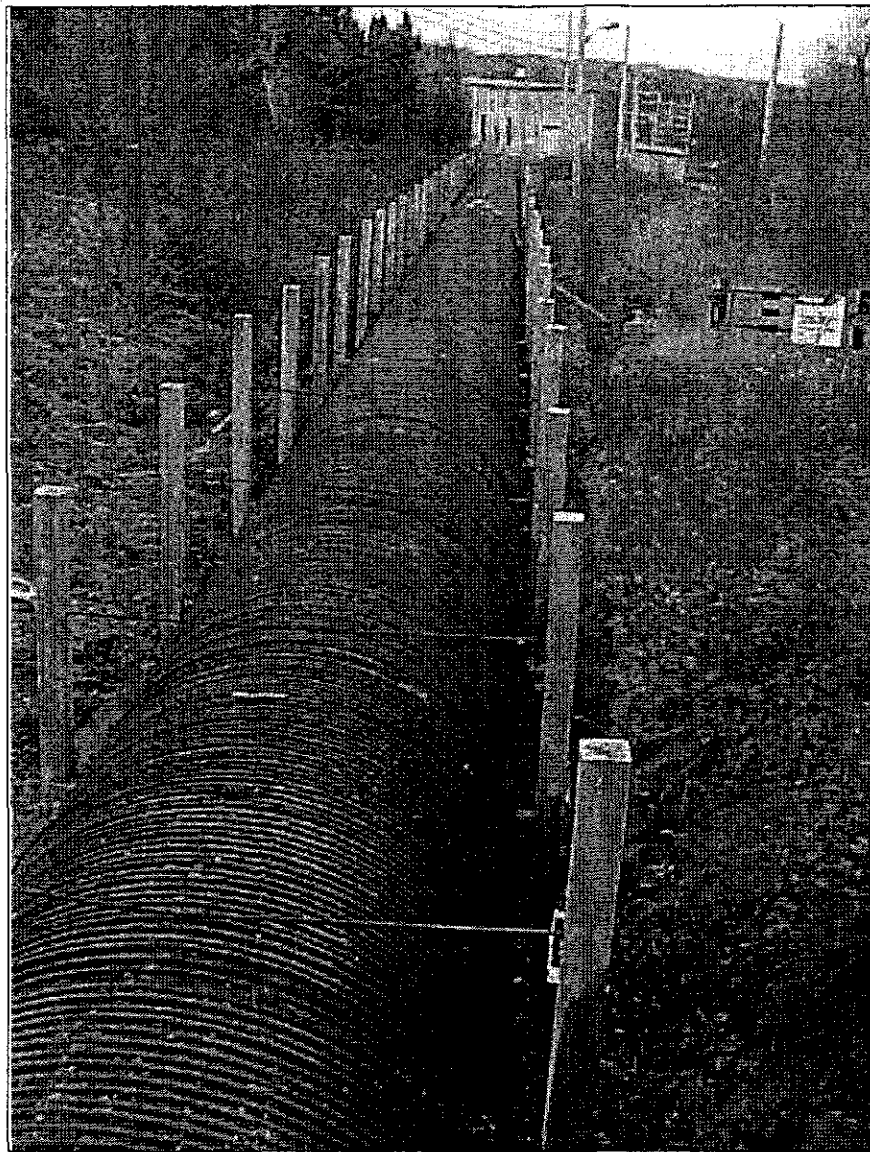
Seal Cove Penstock - Leak



Seal Cove Penstock - Leak Repair



Seal Cove Penstock – Condition and Alignment



Seal cove Penstock – Condition and Alignment