

1995 Dam Safety Inspections

PUB 3.2
Attachment B

**Lockston
Development**

NEWFOUNDLAND POWER

January 22, 1996

Memorandum From: J.P. Halliday

To: P.R. Hamilton

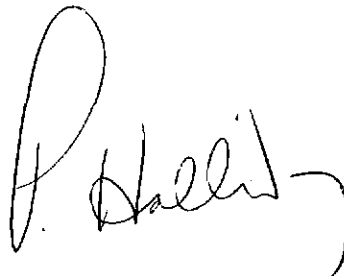
Subject: 1995 Dam Safety Inspections
Lockston Development

File: ENS-0790.30

Please find attached the 1995 Dam Safety Inspection Reports for structures located within the Lockston Development. Structures in this development are in fair condition, with repairs required in several areas for the system to operate safely.

Areas of concern include the Trinity Pond Outlet and Lockston Intake. These structures are scheduled for replacement in the 1996 Capital Budget. Another area of concern is the lower part of the woodstave penstock where staves are crushed and appear rotted in several locations. This situation should be further investigated to determine the integrity of the penstock.

GH/sac

A handwritten signature in dark ink, appearing to read 'J.P. Halliday', is written over the typed name. The signature is fluid and cursive, with a large loop at the top and a long, sweeping tail.

DAM SAFETY INSPECTION

Lockston Canal Intake & Penstock

Dam Type: Concrete

Date & Time of Examination: 1995 11 08

Operational Status at Time of Examination:

Reservoir Water surface elevation F.S.L.

Releases None

Weather Conditions R.D.F. 4°C

Water in storage

Recent Seismic Events None

Examining Party

I. Kerr, G. Humby

INSPECTION CHECKLIST FOR CONCRETE DAM

DAM

Upstream

Cracks Extensive with leaching and large sections spalled (especially at intake)

Joint offsets None Observed

Downstream Face

Cracks Major with considerable leakage

Joint offsets None Observed

Seepage on Downstream Face Extensive - significant water loss all along canal, but especially at intake

Downstream Toe

Cracks Some cavities observed

Undercutting (from erosion) Not significant

Crest

Roadway N/A

Walks OK

Parapet wall N/A

Lighting, etc. N/A

Remarks: - Concrete in very poor condition, especially at intake. Several locations leaking with intake leaking significantly. Large block of concrete (2' x 2') spalled off D/S of intake. Audible leaks all along canal but should be stable due to rockfill. Canal has some vegetation (although recently cleared).

OUTLET WORKS

Intake

Trashrack Clear

Concrete See Concrete Section

Outlet Conduit

Metal work N/A

Penstock See Penstock Section Attached

Control Facilities

Gatehouse Good Condition

Crane N/A

Gate and controls
(description) Manual - Chain Hoist

General condition Good

Operation at time
of examination Open

Control System
Mechanical items Good Condition

Ventilation OK

Lighting OK

Stop logs
General condition N/A
Seals

PENSTOCK

Right of way

Vegetation

Some minor vegetation

Drainage ditches

Drainage poor

Culverts

N/A

Condition of Penstock Bed

Bed Stable - however, drainage poor

Alignment

OK

Settlement

Minor

Penstock Type

Condition of wood,
steel, fiberglass

Wood in fair to poor condition, especially in
lower section where staves are crushed
(probably due to over stressing.)

Cracks

Several cracks in lower section

Stresses

Several staves crushed, probably due to
stresses in pipe or overtightening of bands.

Other

-

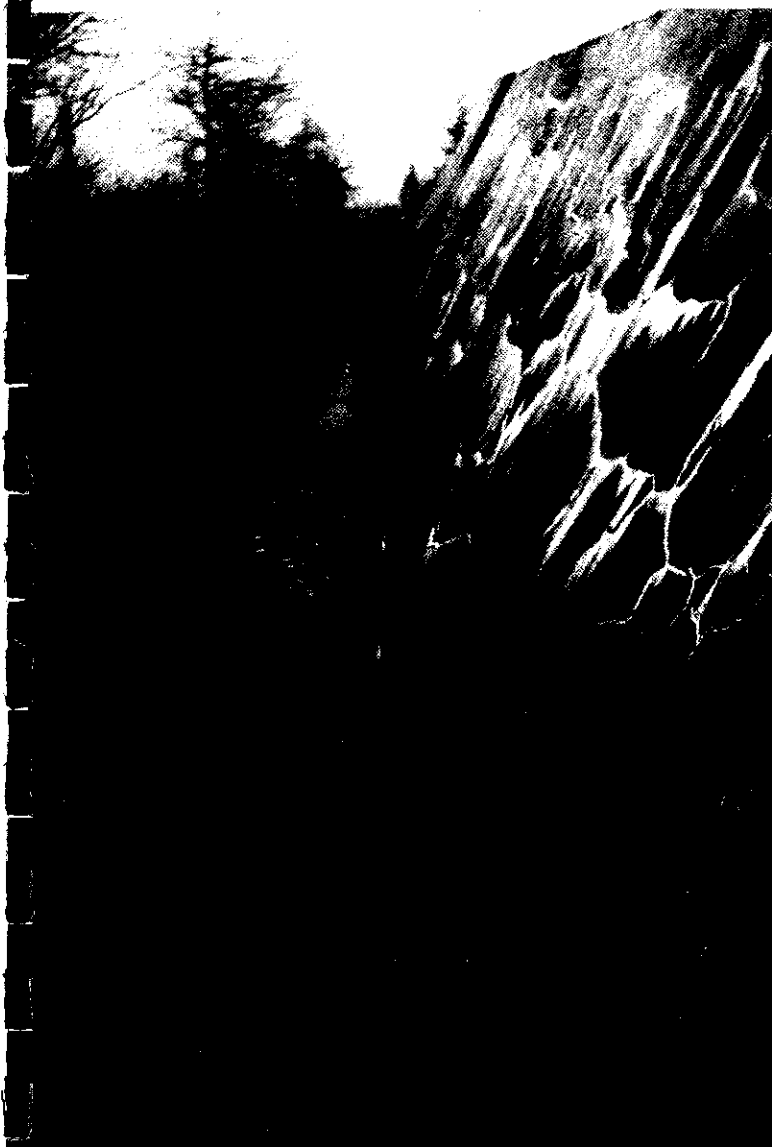
Penstock Supports

Cradles

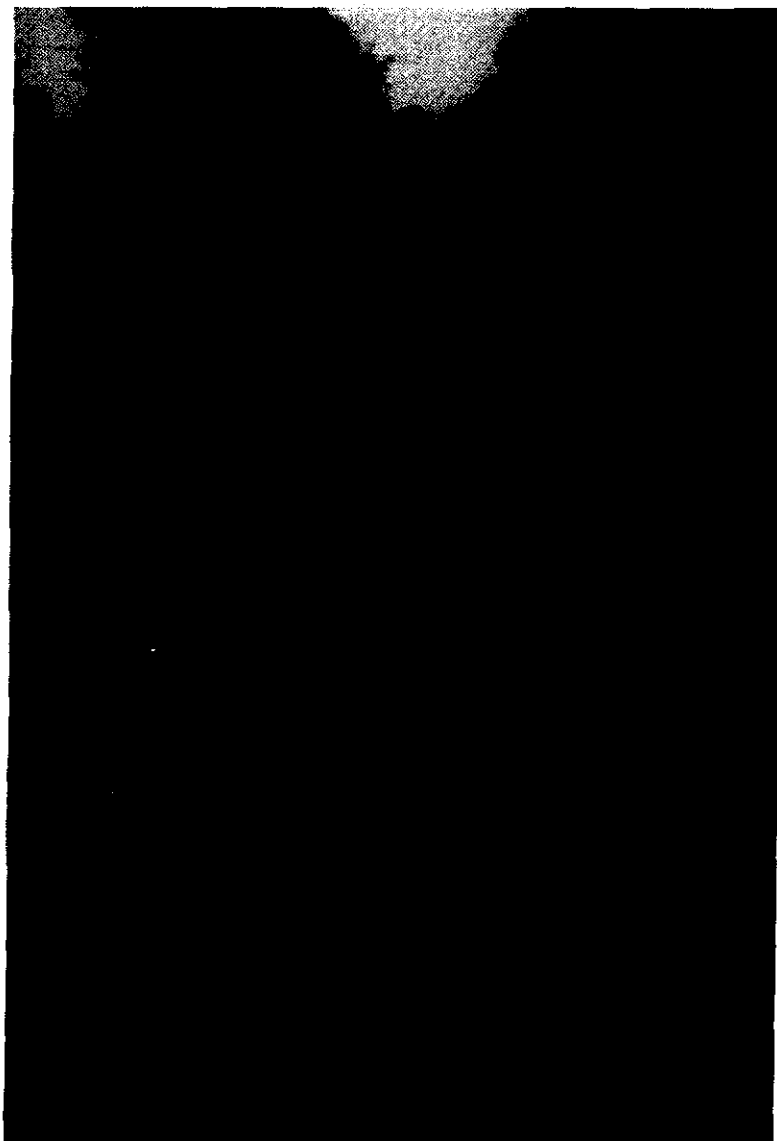
Fair Condition

Saddles

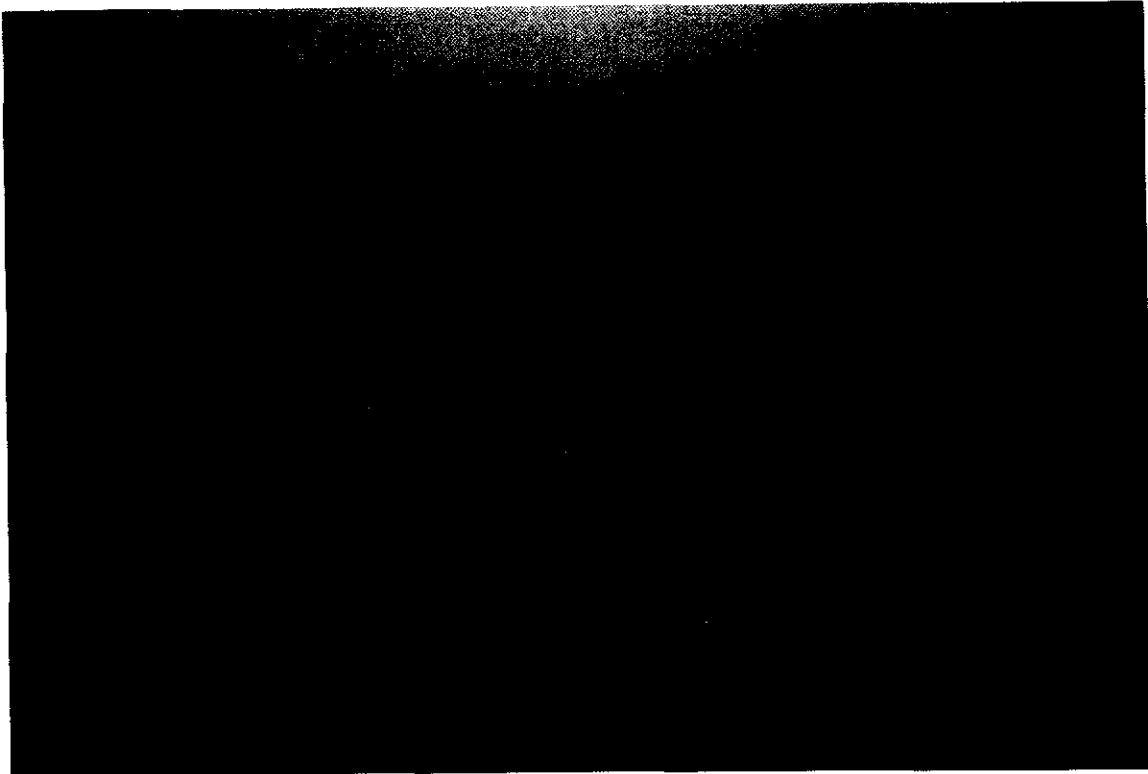
Fair Condition



INTAKE STRUCTURE
LEFT SIDE
DOWNSTREAM FACE



PENSTOCK
LOWER SECTION
LOOKING UPSTREAM



PENSTOCK - LOOKING DOWNSTREAM NEAR INTAKE.

DAM SAFETY INSPECTION

Rattling Pond Dam, Spillway & Outlet

Dam Type: Concrete

Date & Time of Examination: 1995 11 08

Operational Status at Time of Examination:

Reservoir Water surface elevation	<u>Spilling 3 - 4 "</u>
Releases	<u>None</u>
Weather Conditions	<u>R.D.F. 4°C</u>
Water in storage	<u></u>
Recent Seismic Events	<u>None</u>

Examining Party

I. Kerr, G. Humby

INSPECTION CHECKLIST FOR CONCRETE DAM

DAM

Upstream

Cracks Extensive - Some major spalls

Joint offsets None Observed

Downstream Face

Cracks Some Leaching in many places.

Joint offsets None Observed

Seepage on Downstream Face Leaking at toe near canal entrance
(Low Section)

Downstream Toe

Cracks Leaking in several areas.

Undercutting (from
erosion) None Observed

Crest

Roadway N/A

Walks N/A

Parapet wall Crest elevation irregular (several levels)

Lighting, etc. N/A

Foundation at Downstream Toe of Dam

Seepage around dam

Location	<u>No abutments to speak of - flow around spillway side of dam. Also over sluice gate section. (1" over)</u>
Amount	<u></u>
Measurement methods	<u></u>

Remarks: - Gate mechanism appears to be in good repair. Some leakage through sluice gate.

SPILLWAY

Control Structures

Crest	<u>N/A</u>
Orifices	<u>N/A</u>

Gates and Controls

Type of Gate	<u>N/A</u>
General Condition	<u>N/A</u>
Operation of gates at time of examination	<u>N/A</u>

Approach Channel

Debris	<u>None Observed</u>
Slides above channel	<u>None Observed</u>
Channel side slope stability	<u>Good</u>
Slope Protection	<u>Good</u>

Anchor Blocks

Condition of concrete	<u>Fair-Good with some minor leaching</u>
Settlement	<u>None</u>
Stress cracks	<u>None</u>
Movement	<u>None</u>

Expansion Joints

Leaks	<u>N/A</u>
Stress cracks	<u>N/A</u>

Penstock Cover

Condition of backfill	<u>N/A</u>
Slope stability	<u>N/A</u>

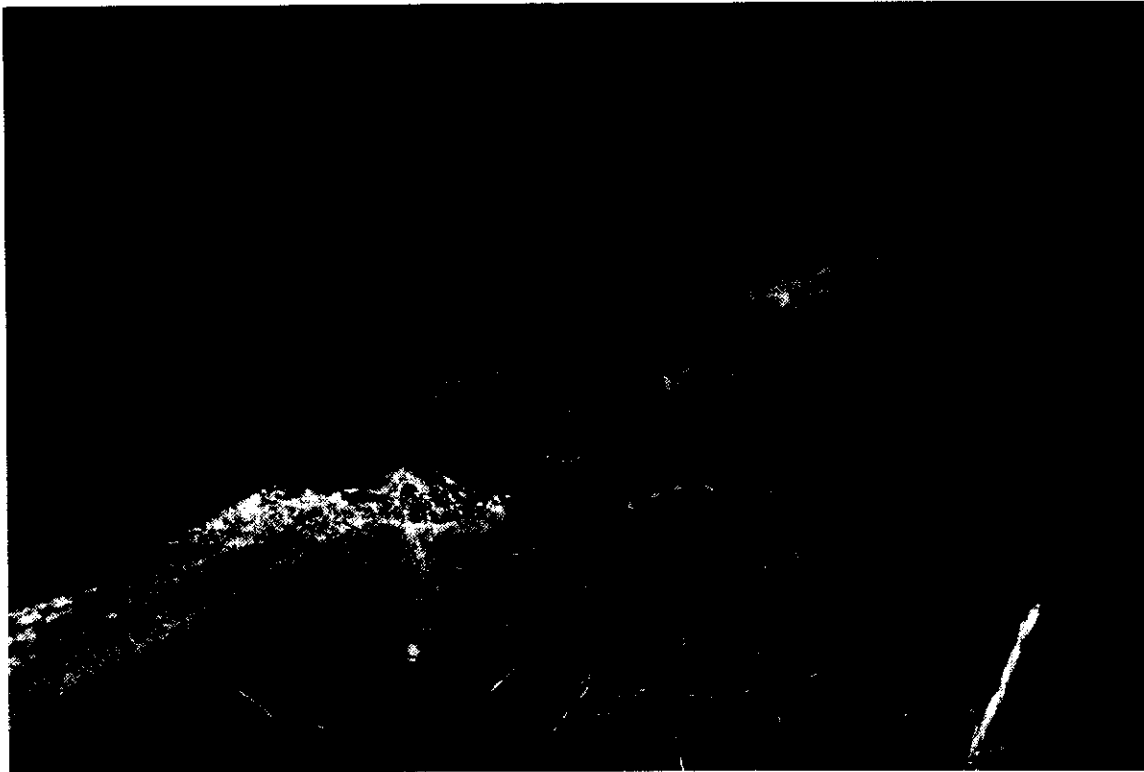
Remarks: Penstock in fair to poor condition with several staves crushed and/or rotted. Several leaks were evident, especially in lower section. Cradles and penstock supports are in fair condition.



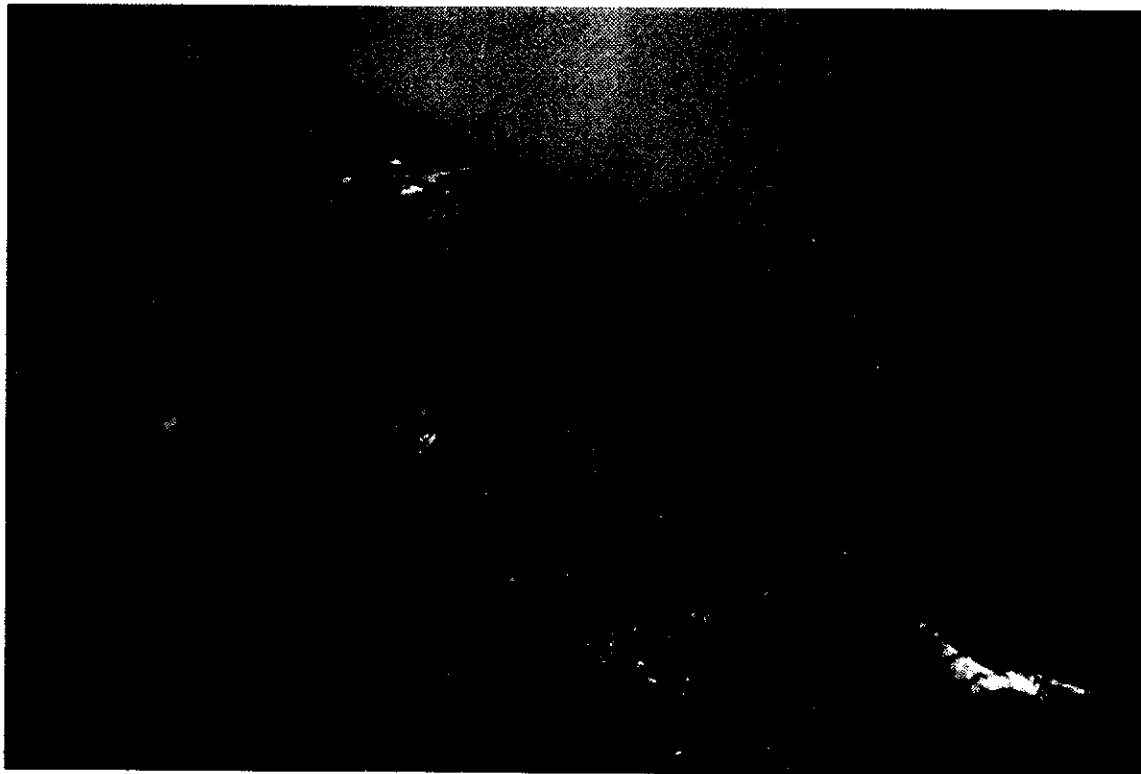
POWER CANAL. UPSTREAM AT CANAL INTAKE.



POWER CANAL.
RIGHT SIDE SHOWING DETERIORATED CONCRETE ON CANAL WALLS.



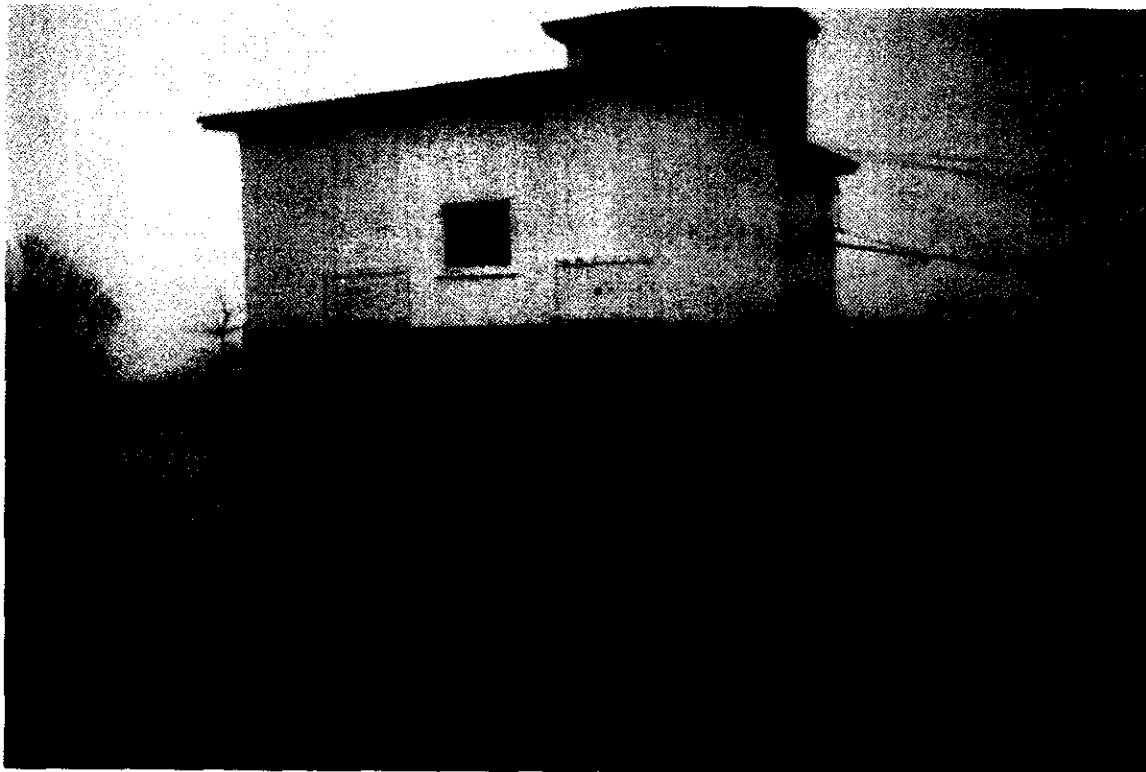
POWER CANAL. SECTION OF CANAL WALL MISSING.



POWER CANAL- TYPICAL LEAKAGE THROUGH CANAL WALL.



POWER CANAL - LOOKING UPSTREAM.



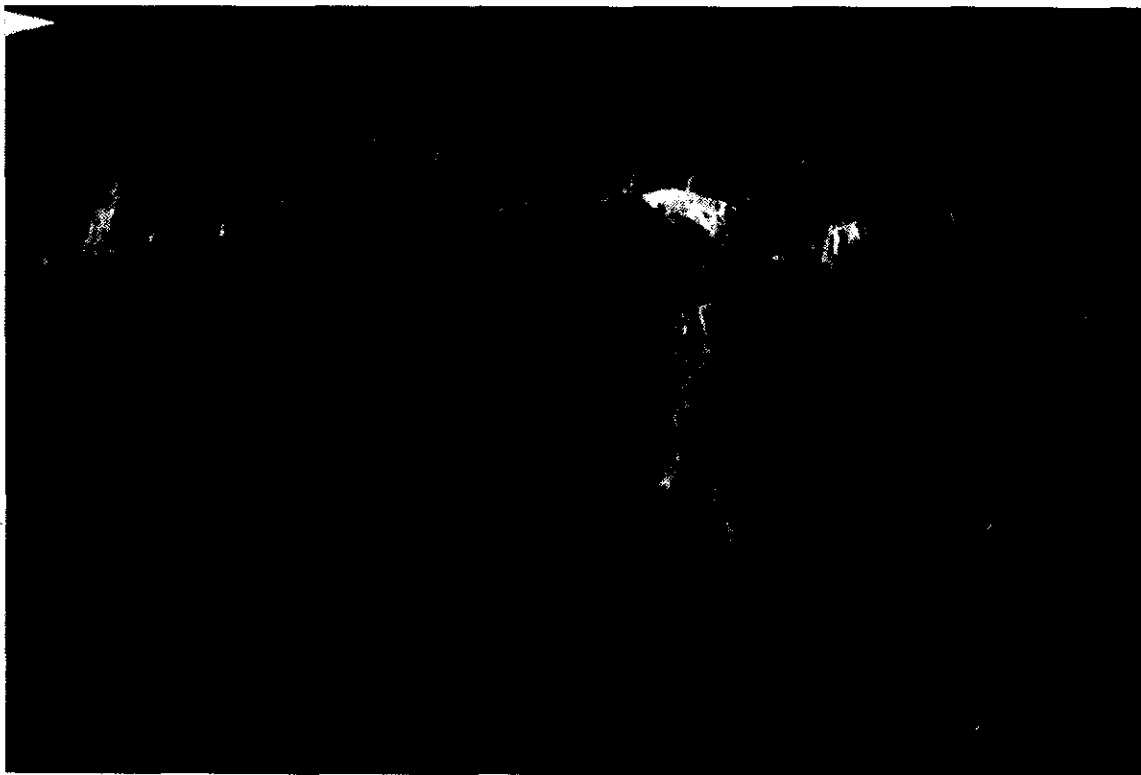
INTAKE STRUCTURE - UPSTREAM



INTAKE - GENERAL VIEW FROM DOWNSTREAM



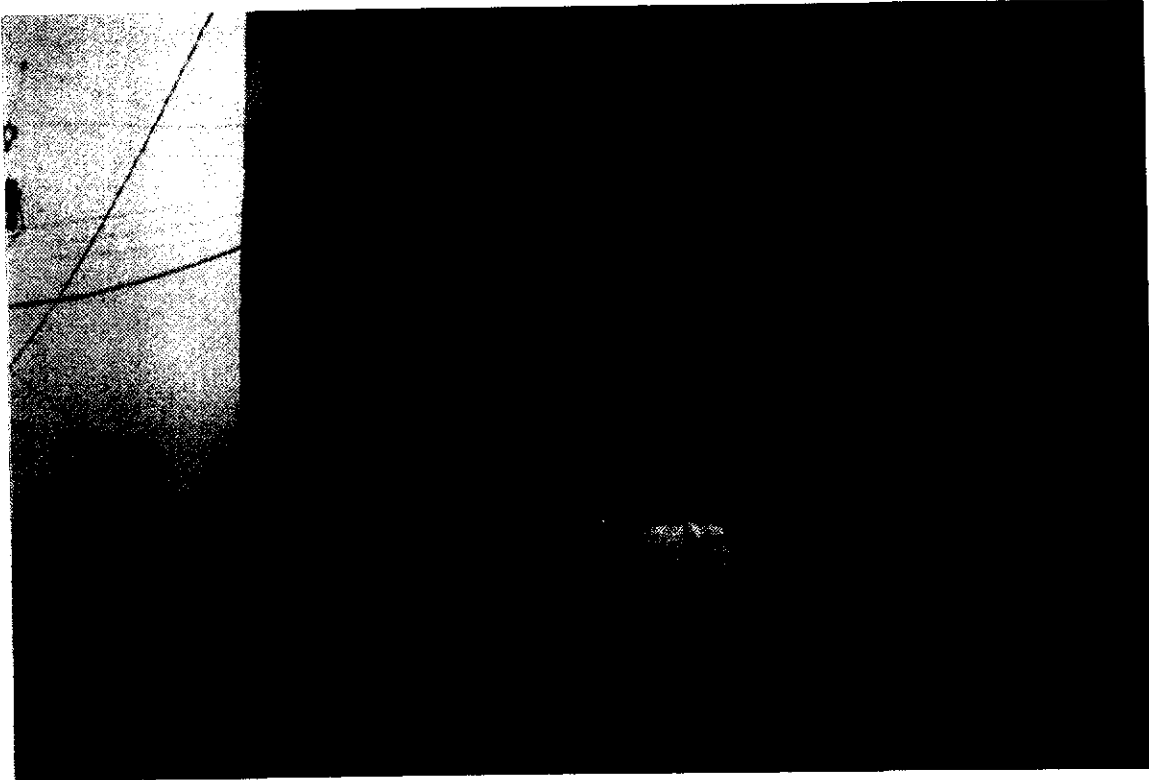
**INTAKE - DOWNSTREAM SHOWING DETERIORATED CONCRETE
NOTE LARGE AREAS OF SPALLED CONCRETE.**



INTAKE - LEAKAGE THROUGH CONSTRUCTION JOINT



INTAKE - LEFT SIDE - DOWNSTREAM



INTAKE - LEFT SIDE SHOWING LARGE AREA OF SPALLED CONCRETE.



INTAKE - TYPICAL LEAKAGE THROUGH CONCRETE.

Walkway

Condition of Piers	<u>N/A</u>
Condition of decking and beams	<u>N/A</u>
Condition of rails	<u>N/A</u>

Stilling Basin

Debris in basin	<u>Minor</u>
Walls movement	<u>None Observed</u>
Walls settlement, etc	<u>None Observed</u>
Slope Protection	<u>OK</u>
Stability of Slopes	<u>OK</u>
Vegetation and Other Obstructions	<u>None Observed</u>

Flashboards

Condition	<u>N/A</u>
Operation	<u>N/A</u>

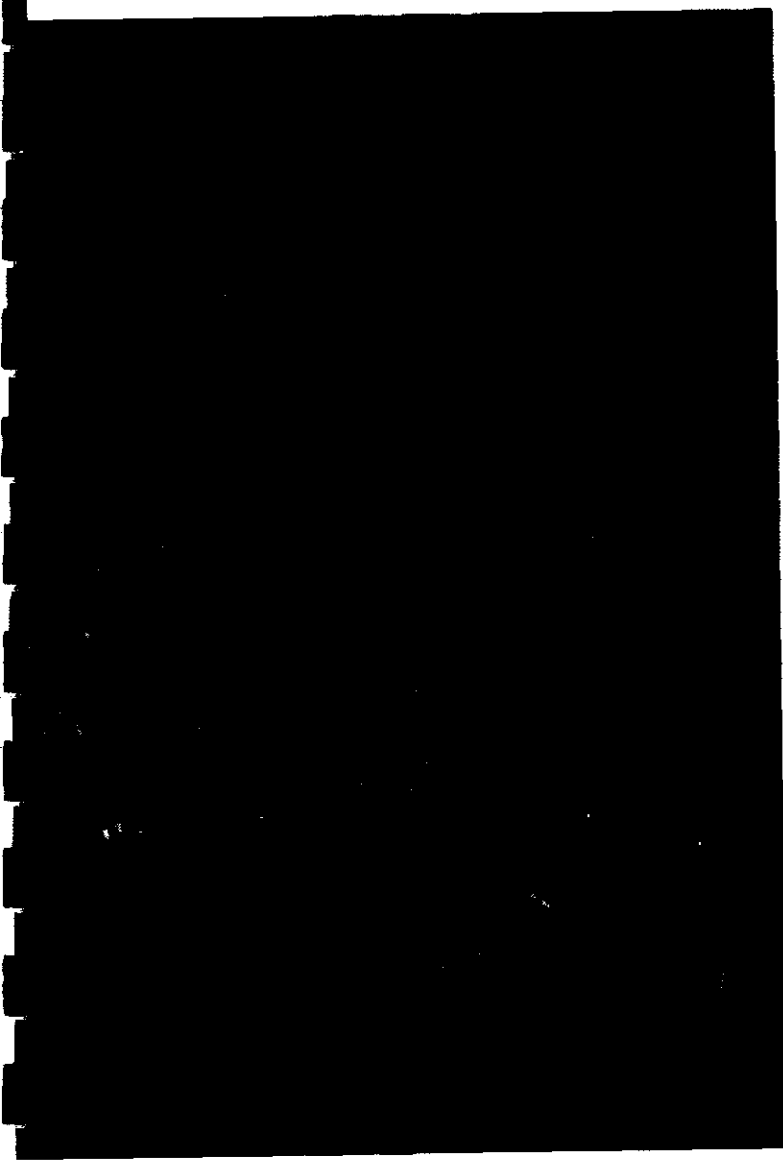
REMARKS: Concrete in good condition. Minor undercutting D/S on left abutment. Also some seepage in this area. Structure spilling 3-4" at time of inspection.



RATTLING POND (FOREBAY) DAM. CANAL INTAKE - UPSTREAM.



RATTLING POND DAM - VIEW ALONG CREST



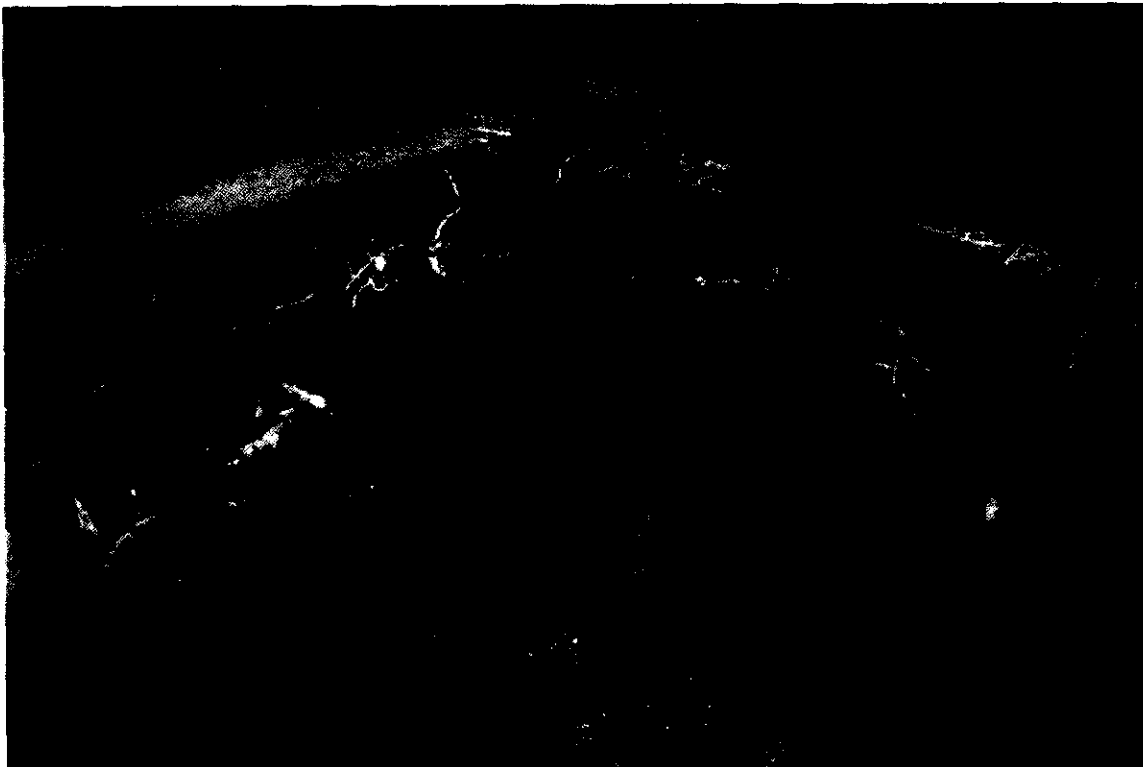
**RATTLING POND DAM
DOWNSTREAM - NEAR CANAL
INTAKE**

**RATTLING POND DAM
SPALLED CONCRETE
ALONG CREST.**





RATTLING POND DAM - CLOSEUP OF SPALLED CONCRETE ON U/S CORNER

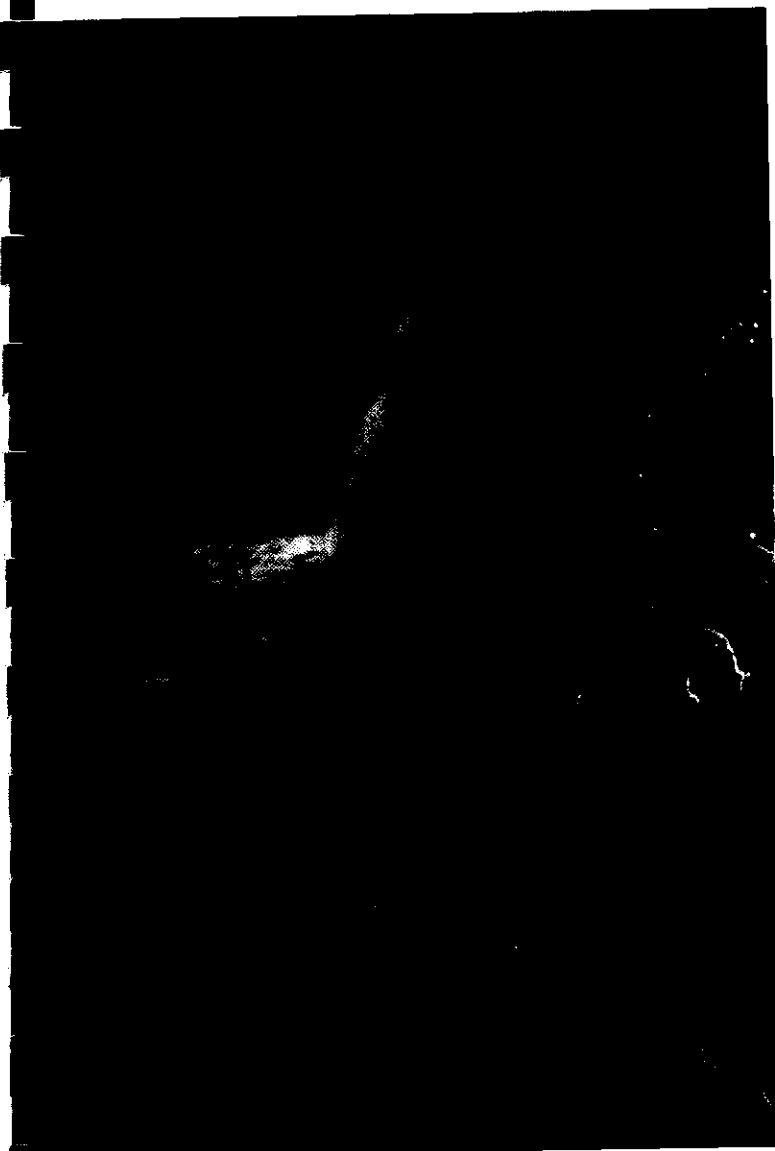


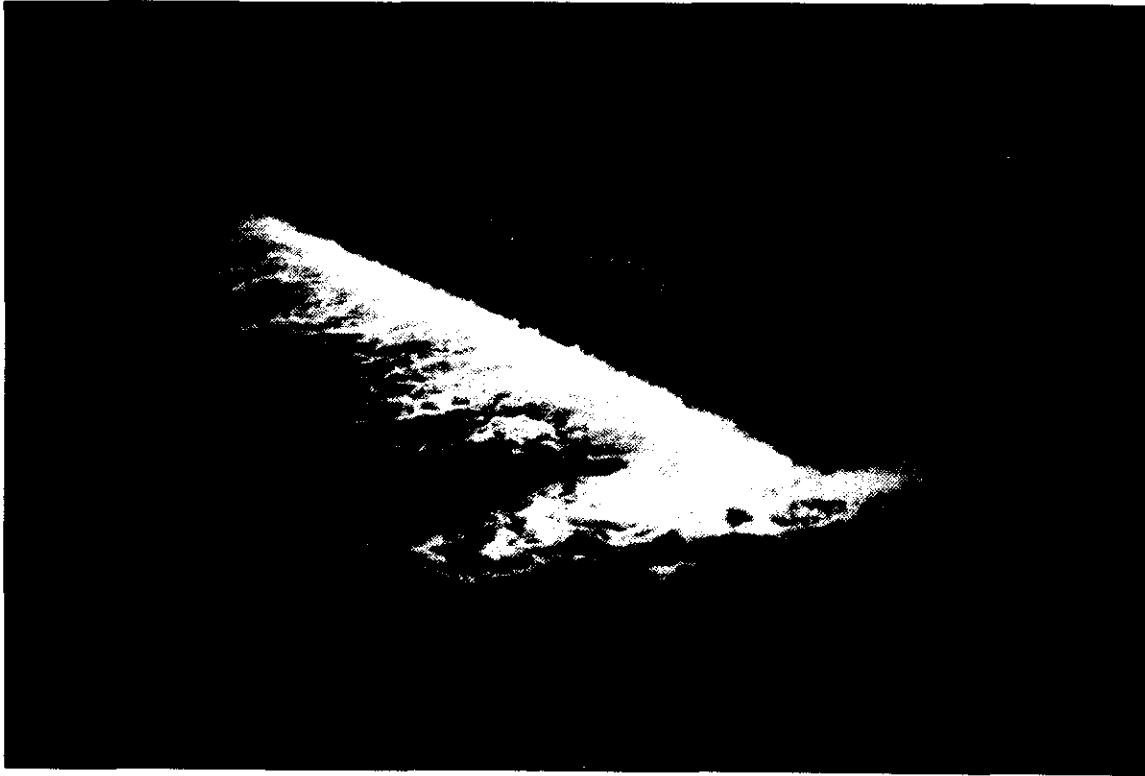
RATTLING POND DAM - DETERIORATED CONCRETE ON D/S FACE

RATTLING POND DAM
DOWNSTREAM LOOKING
TOWARDS RIGHT ABUTMENT
(NOTE WATER FLOWING
AROUND ABUTMENT)

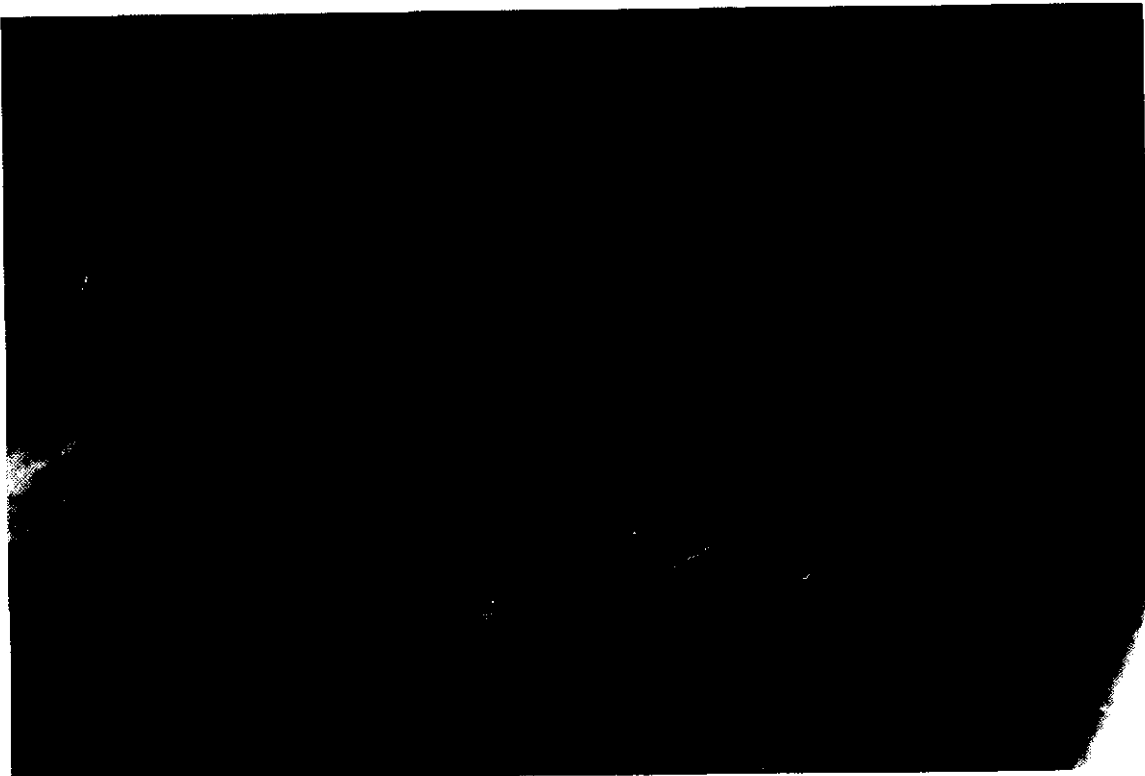


RATTLING POND SPILLWAY
GENERAL VIEW FROM
LEFT SIDE





RATTLING POND SPILLWAY - DOWNSTREAM - SPILLING APPROX 3"



RATTLING POND SPILLWAY - MINOR SEEPAGE AT LEFT ABUTMENT.

DAM SAFETY INSPECTION

Trinity Pond Dam, & Outlet

Dam Type: Concrete Buttress

Date & Time of Examination: 1995 11 08

Operational Status at Time of Examination:

Reservoir Water surface elevation	<u>6' Below crest of outlet</u>
Releases	<u>None</u>
Weather Conditions	<u>Drizzle, Fog 4°C</u>
Water in storage	<u></u>
Recent Seismic Events	<u>None</u>

Examining Party

I. Kerr, G. Humby

INSPECTION CHECKLIST FOR CONCRETE DAM

DAM

Upstream

Cracks Some spalling & exposed rebar on buttress

Joint offsets None Observed

Downstream Face

Cracks Significant leaching - some spalling especially deck & buttress.

Joint offsets None Observed

Seepage on Downstream Face None Observed

Downstream Toe

Cracks Gate opened at time of inspection

Undercutting (from erosion) Could not inspect

Crest

Roadway N/A

Walks Good

Parapet wall N/A

Lighting, etc. N/A

ABUTMENTS

Foundation at Downstream Toe of Dam

Seepage around dam

Location None Observed

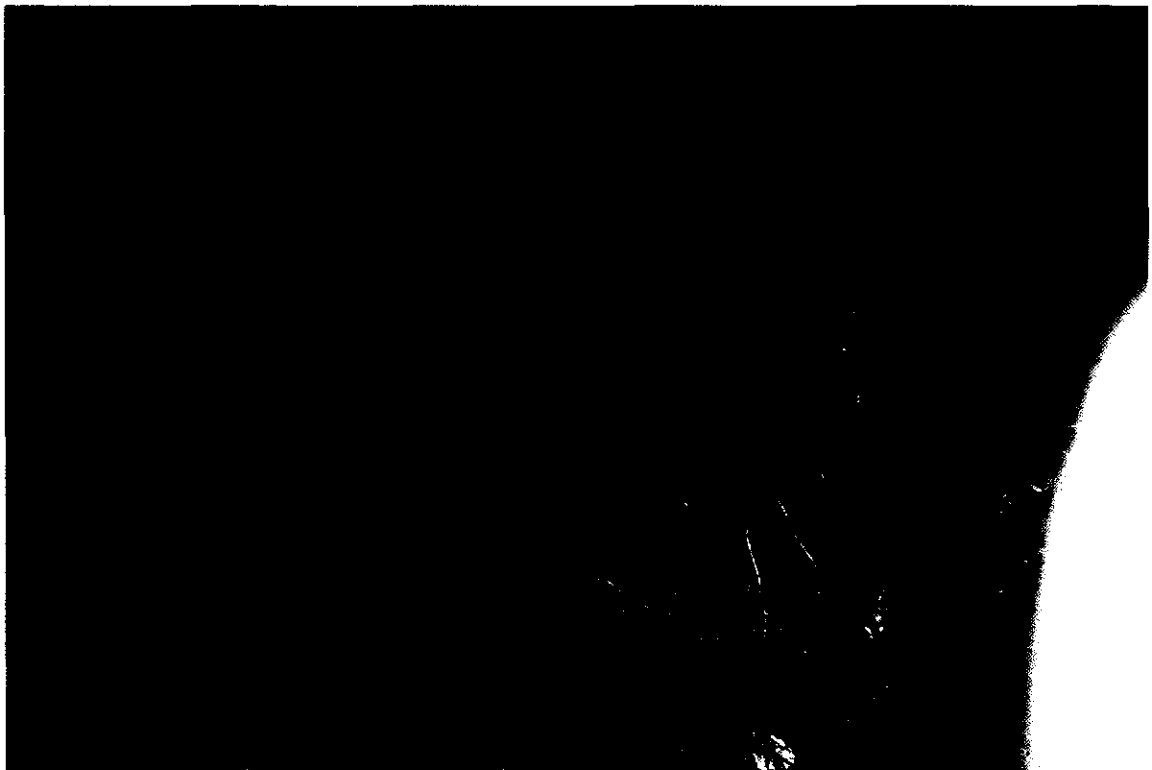
Amount _____

Measurement methods _____

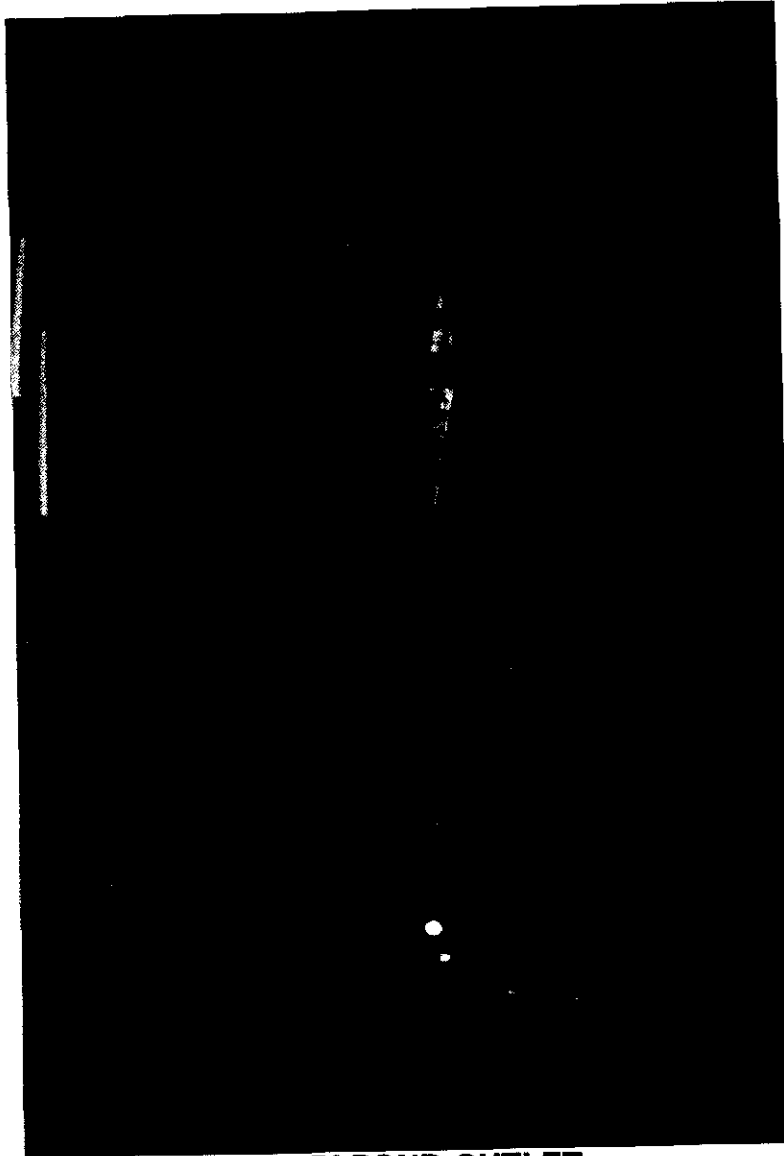
Remarks: - Deck concrete severely deteriorated. Left gate leaking. Gate mechanism appeared to be in good repair.



TRINITY POND OUTLET - VIEW FROM UPSTREAM



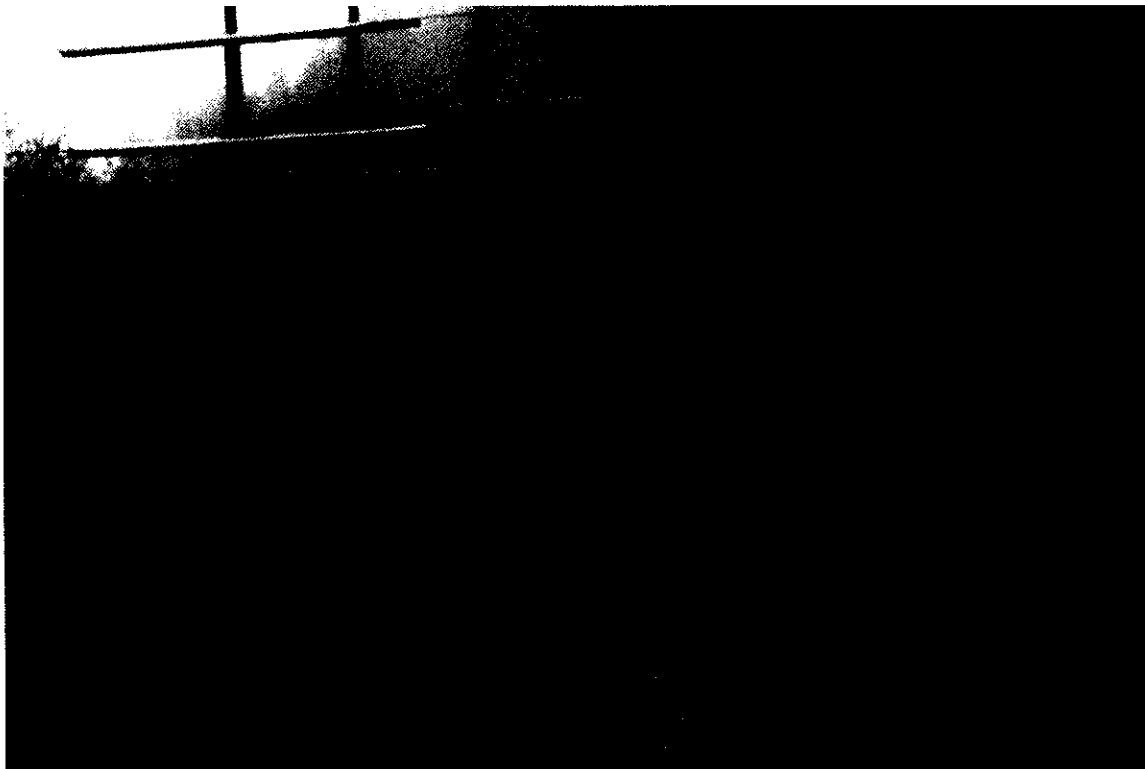
TRINITY POND OUTLET - DOWNSTREAM



TRINITY POND OUTLET
GATE LIFT MECHANISM



TRINITY POND OUTLET - DOWNSTREAM - RIGHT ABUTMENT.



TRINITY POND OUTLET - DOWNSTREAM - LEFT ABUTMENT