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FEDERAL ENERGY
REGULATORY COMMISSION

Central Vermont Public Service Corporation

March 24, 2003

Ms. Magalie Roman Salas, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, DC 20426

034

Weybridge Hydroelectric Project (FERC No. 2731)
Article 406 Dissolved Oxygen Monitoring

Dear Secretary Salas:

Central Vermont Public Service Corporation (CVPS) hereby submits seven (7) copies and one original of the report on the results of the 2002 dissolved oxygen (DO) monitoring conducted at the Weybridge Hydroelectric Project under Article 406 of the Project license. The FERC "Order Modifying and Approving Dissolved Oxygen Monitoring Plan Under Article 406" issued January 29, 2002 specifies the requirements for the monitoring and reporting on this work.

This report was previously sent to the U.S. Fish & Wildlife Service and the Vermont Agency of Natural Resources. Both agencies provided comments (attached) and the additional information that they requested is attached to this letter. Both agencies agree that the data collected in 2001 and 2002 shows that dissolved oxygen standards are being met in the project tailrace and that no additional monitoring is necessary provided tailrace conditions remain the same. Continual dam leakage at the project provides adequate freshening flows to the project tailrace, even during periods of extended shutdown. Calculated turnover times further support the conclusion that dissolved oxygen standards are being met in the project tailrace. Both agencies advise considering this issue in the future if dam leakage is reduced. CVPS, as required by FERC's New York Regional Office, regularly monitors leakage at this low hazard dam. The existing leakage rate does not warrant its elimination and our monitoring program will identify any future changes to the leakage situation.

With submittal of this information, CVPS believes it has met all obligations under Article 406 of the Project license. If you have any questions about this submittal, please call me at (802) 747-5707.

Sincerely,

John C. Greenan

John C. Greenan, P.E.
Project Coordinator

cc: J. Cueto (VANR)
M. Grader (USFWS)
R. Luxenberg
J. Wallin
T. Oakes
M. Scarzello

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Additional information on the 12/4/02 Aquaterra letter report:
"Tailrace DO Concentrations at the Weybridge Project during 2002"

1. 03/19/03

CVPS herein provides additional information in response to review comments by the VT Water Quality Division and the US Fish & Wildlife Service on the Aquaterra DO report. The agencies provided comments to CVPS in the attached letters.

1. VT Water Quality Division February 12, 2003 comment:
"For the record, the Agency notes that there were two deficiencies in last summer's sampling effort. The first was the lack of documentation in the report on how long the station had been off line when the August samples were collected. The second related to the fact that the September samples were collected under non-representative conditions. There was unquantified spillage over the eastern spillway and into the tailrace reach"

CVPS Responses:
The station went off line mid-day on July 17, 2003 and remained off line through the August 26, 2002 sampling event. Although the station was off line for more than thirty-nine days when Aquaterra sampled the tailrace water, water had spilled over the dam and into the tailrace area until mid-day on August 21, 2002 when CVPS re-directed base flow to the bypass at the completion of a downstream construction project. Leakage provided the only inflow to the tailrace for the almost five day period between the re-opening of the bypass and the Aqauterra sampling event.

CVPS acknowledges that the unquantified spillage into the tailrace during the September 3 sampling event created non-representative conditions. The Aquaterra report states however: "On both sampling days, there was little if any apparent mixing of dam leakage, dam spillage or sluice release water with the tailrace water." In consideration of the calculated turnover rates and Aquaterra's observation, CVPS believes that the non-representative conditions on September 3 do not materially affect the overall conclusions.

2. US Fish and Wildliife February 13, 2003 comments:
"While tailrace samples were taken at three depths, only one measurement per sample date is included in the report results. Please include all three depth measurements in the final report."

CVPS Response:
According to Roland Luxenberg of Aquaterra, the measurements at each depth were the same so the reported result applies to all three depths.

"The reason why no sample was taken in July should be provided. While your cover letter implies that this may be due to the construction of the diversion structure, it should be explicitly stated."

CVPS Response:
The interpreted reason for no sample in July is correct. Site preparation, flow conditions and the construction project itself combined to make it impracticable to sample the tailrace in July.

"We request that you include a summary of the number and duration of station shutdowns (i.e. periods when the unit (was) not operating) from July through September in the final report."

CVPS Response:
The table below shows the duration of some thirty-four outages that occurred from July through September. While some of the outages lasted for an hour or so, the outage that surrounded the construction of the diversion structure lasted more than fifty-four days. This prolonged outage was the result of both the construction project and the unusually low flows on the Otter Creek.

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Additional information on the 12/4/02 Aquaterra letter report:
"Tailrace DO Concentrations at the Weybridge Project during 2002"

2. 03/19/03

Outage Start Date	Outage Duration	
	Days	Hrs:Min
1-Jul-02	0	4:15
1-Jul-02	0	1:00
2-Jul-02	0	4:45
2-Jul-02	0	0:15
2-Jul-02	0	3:14
3-Jul-02	0	5:30
3-Jul-02	0	1:00
3-Jul-02	1	5:30
4-Jul-02	0	1:45
4-Jul-02	0	4:15
5-Jul-02	0	5:15
5-Jul-02	0	9:15
6-Jul-02	0	6:30
6-Jul-02	0	9:15
7-Jul-02	0	4:45
7-Jul-02	0	7:45
7-Jul-02	0	8:15
8-Jul-02	0	7:45
8-Jul-02	0	7:30
9-Jul-02	0	4:30
10-Jul-02	0	2:45
10-Jul-02	0	7:30
11-Jul-02	0	7:15
11-Jul-02	1	1:00
12-Jul-02	2	12:15
17-Jul-02	54	20:00
10-Sep-02	1	2:15
11-Sep-02	5	5:45
17-Sep-02	0	5:45
17-Sep-02	0	4:00
18-Sep-02	0	5:00
18-Sep-02	0	15:15
28-Sep-02	8	5:15
30-Sep-02	1	23:30

" The final report should verify that the leakage sources will continue to provide flow to the tailrace area for the duration of the license. If leakage from any of the identified sources is reduced or eliminated, dissolved oxygen would need to be measured again to verify that levels remain acceptable under stagnant conditions."

CVPS Response:
CVPS acknowledges that if conditions change in the future, additional evaluation and monitoring of DO in the project tailrace may be necessary.

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State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
WATER QUALITY DIVISION
103 South Main Street
Building 10 North
Waterbury, VT 05671-0408

802-241-3770

February 12, 2003

John Greenan, P.E.
Project Coordinator
Central Vermont Public Service Corporation
77 Grove Street
Rutland, Vt 05701

Re: Weybridge Hydroelectric Project - FERC No. 2731
License Article 406/Certification Condition I - Dissolved Oxygen Monitoring

Dear Mr. Greenan:

I am writing in response to your letter of December 10, 2002 transmitting the results of this past summer's tailrace dissolved oxygen monitoring effort. The sampling was done under the study plan filed with FERC by letter dated December 5, 2001.

More recently, in response to a request by this agency and the U.S. Fish and Wildlife Service, CVPS measured the tailrace pool volume to support an assessment of the turnover rates for the pool given the fairly significant amount of leakage at the dam. The pool volume was estimated at about 49,000 cubic feet. You indicate that, although CVPS did shut down the powerhouse to measure the pool, the estimated volume may actually be somewhat high as it is expected that the pool depth would be less during summer low flow. In your letter of December 10, you provide an estimate of 3 cfs for normal leakage (without including the turbine leakage, which has not been quantified). At that leakage rate, the pool volume would turn over in less than five hours. Given the results of the two summers of sampling and the effects of leakage on turnover rates, the Agency concludes that dissolved oxygen standards are being met and that downstream water quality is not threatened by startup of the plant following a low-flow period and resulting displacement of the tailrace pool water. This is predicated on leakage continuing at existing rates. If there is a project to reduce dam leakage, then this issue should again be considered.

For the record, the Agency notes that there were two deficiencies in last summer's sampling effort. The first was the lack of documentation in the report on how long the station had been off line when the

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August samples were collected. The second related to the fact that the September samples were collected under non-representative conditions. There was unquantified spillage over the eastern spillway and into the tailrace reach.

Please let me know if you have any questions or would like to discuss this further. Thank you for your cooperation.

Very truly yours,

Jeffrey R. Cueto, P.E.
Chief, Hydrology Section

c Rod Wentworth, Dept. of Fish and Wildlife
Melissa Grader, U.S. Fish and Wildlife Service

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

REF: FERC No. 2731
Central Vermont Public Service Corp.

February 13, 2003

John Greenan, P.E.
Central Vermont Public Service Corp.
77 Grove Street
Rutland, VT 05701

Dear Mr. Greenan:

This responds to your December 10, 2002 cover letter and accompanying Dissolved Oxygen Monitoring Report for the Weybridge Project, located on Otter Creek in Addison County, Vermont. The report summarizes the dissolved oxygen sampling effort undertaken during the summer of 2002. We have reviewed the report and have the following comments.

While tailrace samples were taken at three depths, only one measurement per sample date is included in the report results. Please include all three depth sample measurements in the final report.

The reason why no sample was taken in July should be provided. While your cover letter implies that this may be due to the construction of the diversion structure, it should be explicitly stated.

In its comments on the 2001 monitoring report, the Vermont Agency of Natural Resources (VANR) requested that multiple samples be taken if the station was off-line for long periods of time. Last summer was extremely dry, and it is likely that the station was not generating for many days in a row. We request that you include a summary of the number and duration of station shut-downs (i.e., periods when the units were not operating) from July through September in the final report.

We agree that dam and turbine leakage likely provide some level of freshening flows to the tailrace area when the units are off-line. To date, sampling indicates that D.O. levels are acceptable under the existing configuration. In response to a request from the VANR, CVPS measured the tailrace pool volume and calculated the turnover rates for the pool based on three different leakage levels (1, 2 and 3 cfs). CVPS determined that the 49,088 ft^3 tailrace pool would take from 4.6 hours (at 3 cfs) to 13.6 hours (at 1 cfs) to turnover.

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CVPS estimates that the tailrace receives approximately 3 cfs from the following sources: (1) leakage at the western corner of the dam, (2) leakage through the sluice located to the west of the tailrace area, and (3) leakage from a pipe above the eastern side of the east tailrace bay. Therefore, the turnover rate of the tailrace pool should be close to 4.6 hours, which likely is sufficient to maintain suitable D.O. levels.

The final report should verify that the leakage sources will continue to provide flow to the tailrace area for the duration of the license. If leakage from any of the identified sources is reduced or eliminated, dissolved oxygen would need to be measured again to verify that levels remain acceptable under stagnant conditions.

Thank you for this opportunity to comment. We look forward to receiving a final report that addresses the comments and concerns identified in this letter. If you have any questions, please contact Melissa Grader of this office at (413) 548-9138, ext. 18.

Sincerely,

William J. Neidermyer

William J. Neidermyer
Assistant Supervisor
Federal Activities
New England Field Office

cc: Mike Scarzello, CVPSC
Jeff Cueto, VANR/WQD
FERC/DHAC
Reading File
es: MGrader:dw:2/1303:(603)223-2541

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Aquaterra
60 Highland Terrace
South Burlington, Vermont 05403
Tel/fax: (802) 860-5016

4 December 2002

Mr. Michael Scarzello
Central Vermont Public Service Corporation
77 Grove Street
Rutland, VT 05701

Re: Tailrace DO concentrations at Weybridge Project on the Otter Creek during 2002

Dear Mr. Scarzello

Aquaterra sampled Otter Creek water from the stagnant tailrace area of the Weybridge hydroelectric project on 26 August and 3 September of 2002. There was no station generation at the facility and no precipitation in the region during the preceding three days (23 – 26 August, and 31 August – 3 September) for each sampling day.

During the August sampling event, the only water passing through the "turbine" (eastern) section of the river was from leakage at the western corner of the dam, a very small flow through the sluice immediately to the west of the tailrace area, and a smaller powerhouse leakage flow that emanates from a pipe above the eastern side of the east tailrace bay. River discharge during 23 – 26 August averaged 151 cubic feet per second (cfs), and was 139 cfs on 26 August (sum of provisional USGS data from Otter Creek in Middlebury and New Haven River gages). The attached pictures are numbered and depict sampling day conditions as follows: (1) leakage from western end of dam at eastern section; (2) spillage from sluiceway; (3) view of tailrace bays; (4) view of tailrace bays and leakage discharge from western end of dam; (5) leakage and tainter gate release at western section; (6) looking downstream in western section; (7) sluice release (just visible) and powerhouse leakage into eastern tailrace bay.

During the September sampling event, in addition to the above, water was spilling over the crest of the dam. River discharge during 31 August – 3 September averaged 137 cubic feet per second (cfs), and was 127 cfs on 3 September. As above, the attached pictures for the sampling day are: (8) slight spillage of water over rubber dam crest in eastern section; (9) sluice release, and powerhouse leakage into eastern tailrace bay; (10) leakage and tainter gate release at western section.

On both sampling days, there was little if any apparent mixing of dam leakage, dam spillage, or sluice release water with the tailrace water. The river flow rates listed above are well below the estimated 7Q10 river discharge at the project (187 cfs).

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Samples were collected in the early morning beginning one-half hour prior to sunrise. A YSI Model 57 meter and submersible probe was used to make in-situ measurements of dissolved oxygen and temperature at two locations: (1) just to the left (looking downstream) of the wall separating the two tailrace bays (bottom, mid-depth, and surface), and (2) leakage (and spill water if present) just upstream of the small ledge prior to this water entering the main river channel (surface). No stratification was observed in the 7 foot deep tailrace bay.

Grab samples from the tailrace bay were obtained by lowering a sewage sampler (containing a 300 milliliter dissolved oxygen bottle) to mid-depth (about 3.5 feet) at the same location where in-situ measurements were made. Reagents were added to preserve the sample prior to analysis for dissolved oxygen content via the Winkler method at Severn Trent Laboratories in Colchester. Results are summarized in the following table; Analytical Reports are attached.

Date, 2002	26 August		3 September	
Sunrise	0608		0617	
Air temperature, C	10		10	
	Tailrace	Leakage	Tailrace	Leakage/Spill
Sample time	0540	0600	0550	0610
Water temperature, C	21.6	21.3	20.7	20.8
Dissolved oxygen, mg/l				
Meter	8.8	8.9	8.8	9.8
Winkler	8.4/8.6		8.5	
Percent Saturation, Winkler	96/99		96	

Given the high dissolved oxygen levels and percent saturations observed during project shutdown associated with very low river flow and reasonably elevated water temperatures, it appears that facility shutdown operation will not lead to a significant negative impact on dissolved oxygen concentrations in the tailrace region.

Please contact me if you have any questions concerning the information in this letter and the attached materials.

Sincerely

Roland Luxenberg

Roland Luxenberg, P.E.

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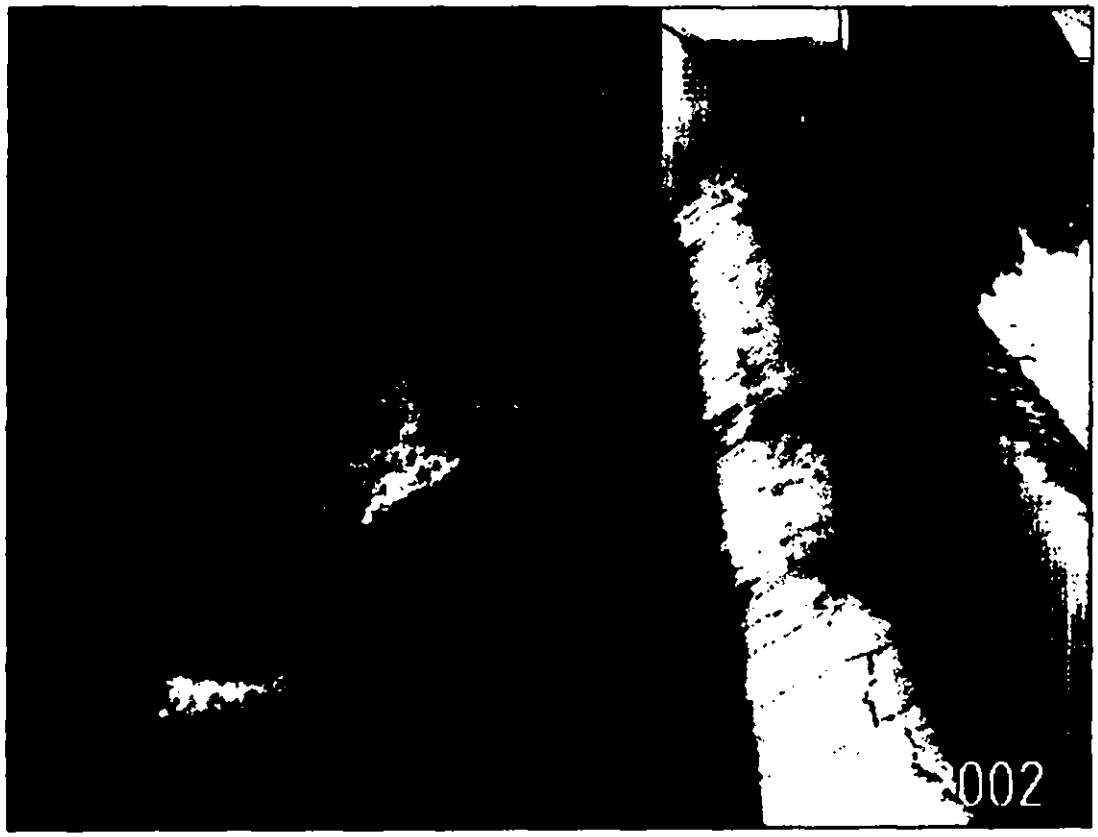
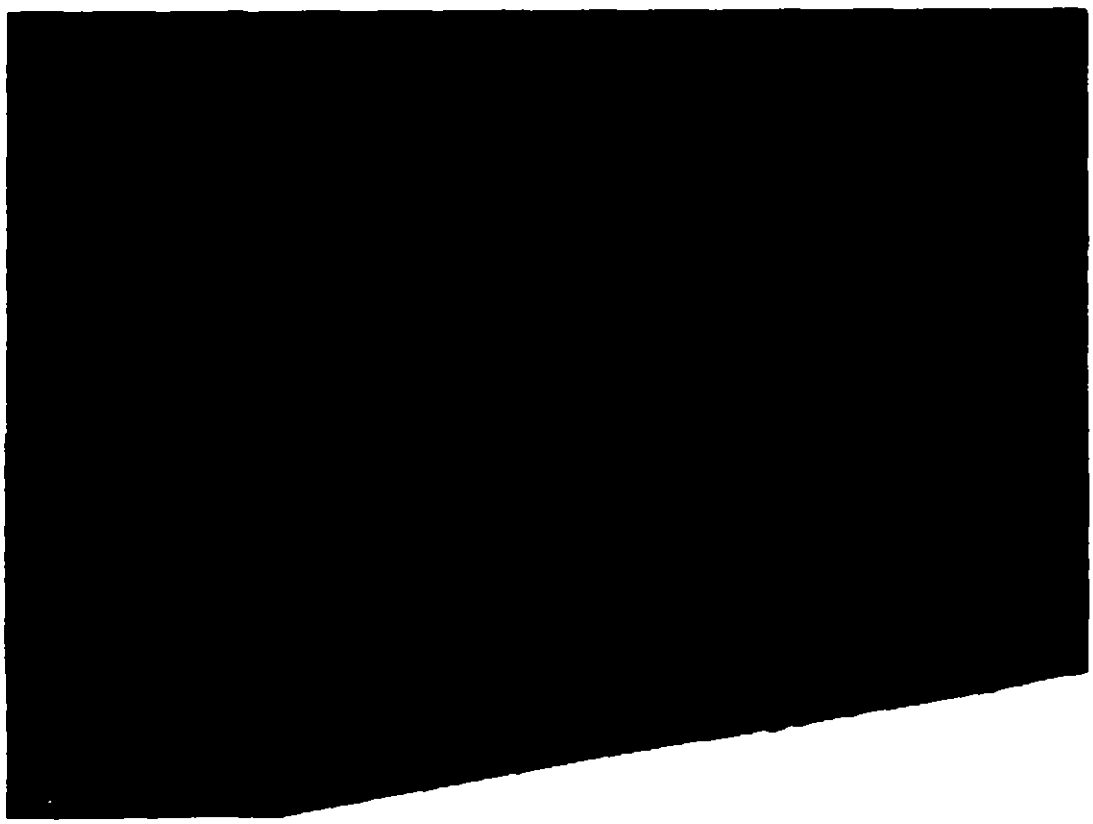


1. Leakage from Western end of Dam at Eastern Section



2. Spillage from Sluiceway

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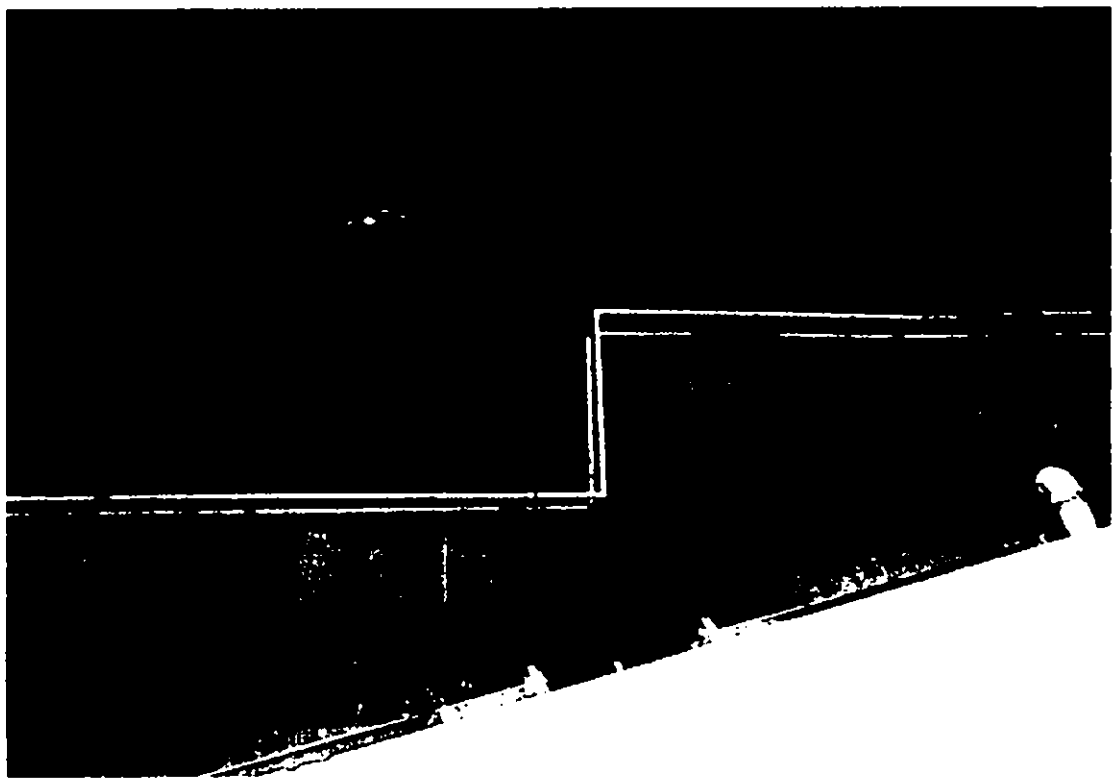
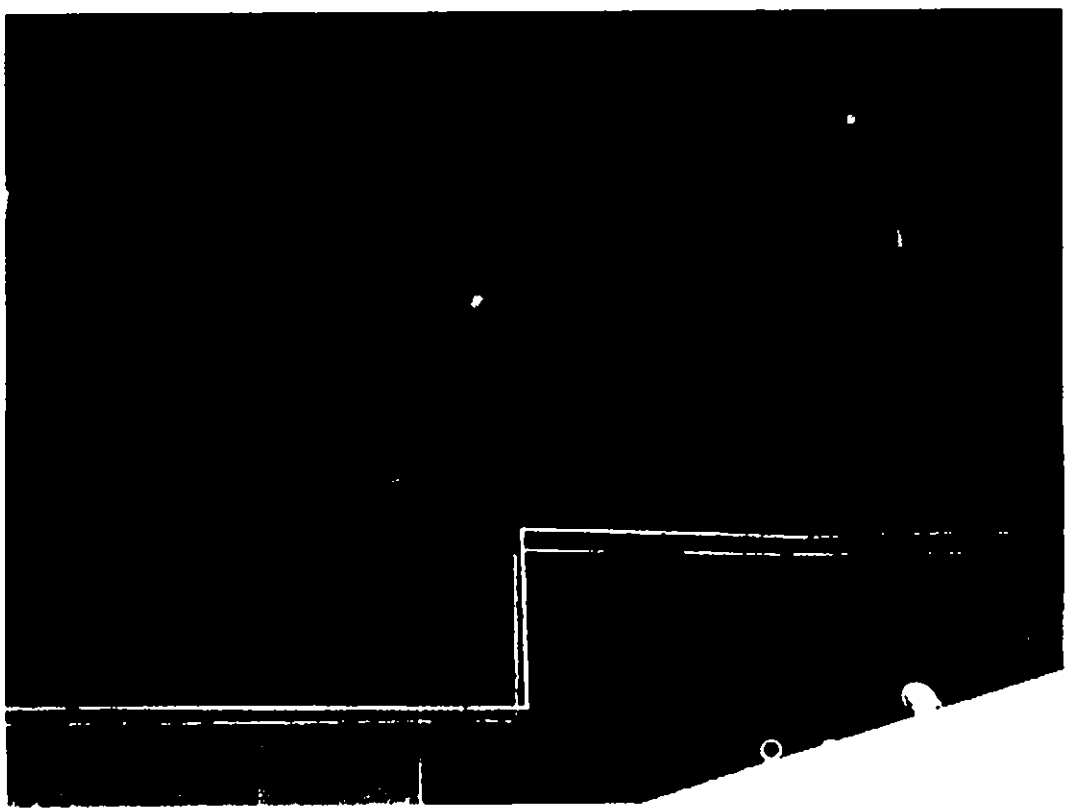


3. View of Tailrace Bays



4. View of Tailrace Bays and Leakage Discharge from Western end of Dam

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5. Leakage and Tainter Gate Release at Western Section.

6. Looking Downstream in Western Section

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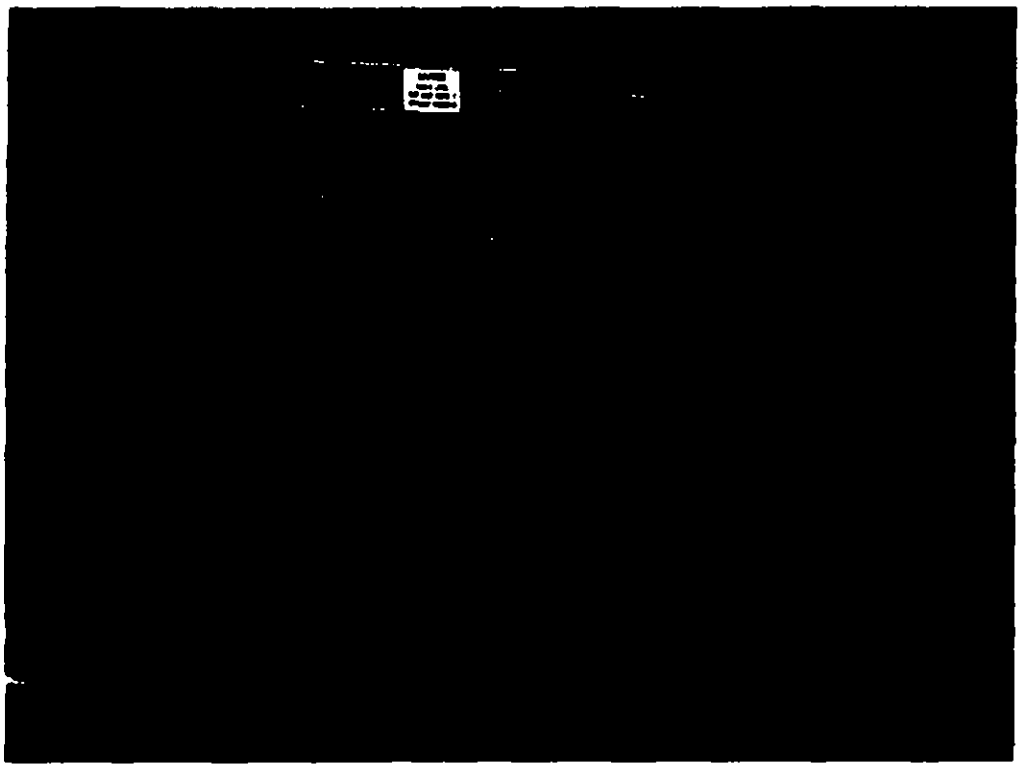
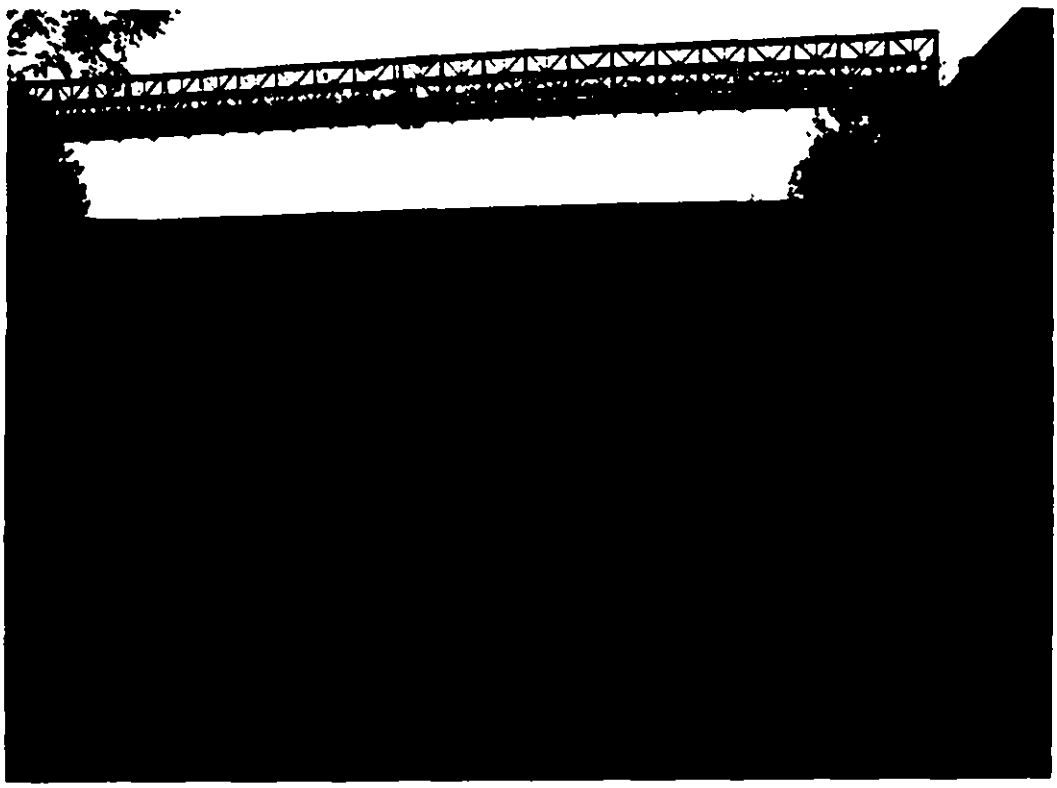


7. Sluice Release (just visible) and Discharge into Eastern Tailrace Bay.



8. Spillage of water over Rubber Dam Crest in Eastern Section

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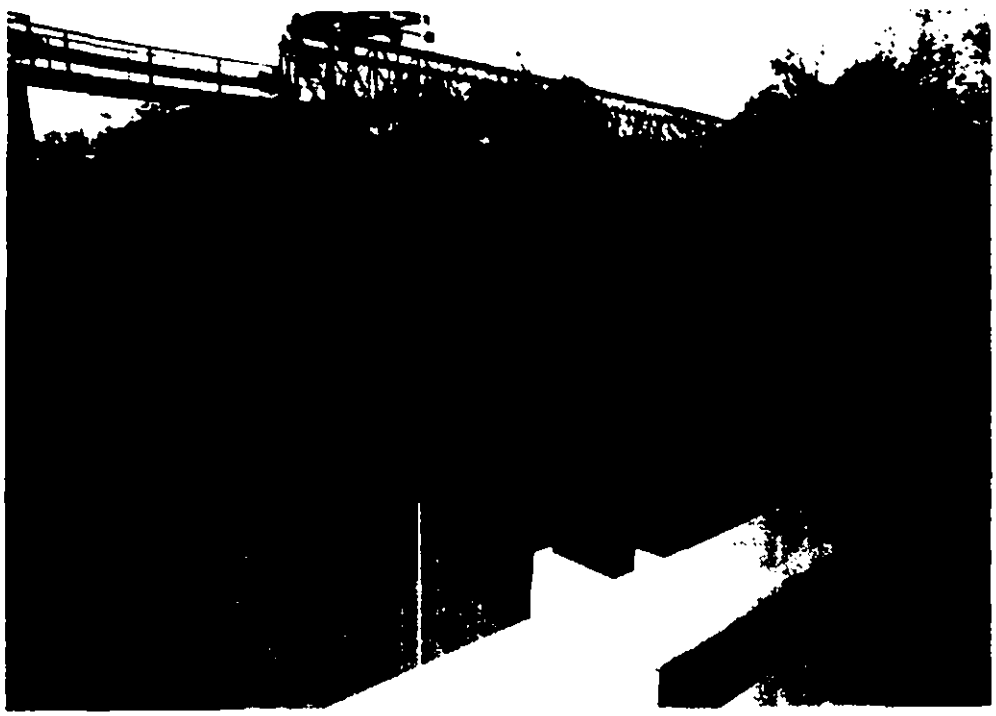
9. Sluice Release and Discharge into Eastern Tailrace Bay.



10. Leakage and Tainter Gate Release at Western Section.