2nd Edition LIHI Handbook Recertification Application Table and Checklist

- **This is a fillable form. Click in each righthand column to enter data or check the applicable box(es).**
- **For YES responses, enter or attach a summary/description and supply links to, or copies of all related documentation.**
- **Identify attachments by the item number below and note if any attachments are confidential.**

Facility Name:	Automatic Hydroelectric Project
LIHI Certificate No:	72
Application Date:	2/11/2021
Application Fee Payment Date:	2/18/2021
1. Updates and Changes Needed to Facility Webpage	☒ N/A – webpage is accurate. ☐ Changes are needed. Describe or attach
2. Updated Facility Information Table:	☒ Updated form attached, either the Single Facility Form or Multiple Facility Excel sheet
3. During the current LIHI term, have there been any:	
FERC license or exemption proceedings, applications, amendments and/or FERC orders?	☐ N/A, facility is not under FERC jurisdiction. ☒ No. ☐ Yes. Describe or attach
Water Quality Certification (WQC) or amendment proceedings?	☐ N/A, no WQC for the facility. ☒ No. ☐ Yes. Describe or attach
FERC-required facility or operational changes?	☒ No. ☐ Yes. Describe or attach
Changes to facility-related management plans, settlement agreements, MOUs or other agreements?	☒ No. ☐ Yes. Describe or attach
Any formal or informal resource agency communications related to the LIHI criteria?	☒ No. ☐ Yes. Describe or attach
4. During the current LIHI term, have there been any activities or changes at the facility:	
Environmental upsets (e.g., oil spills, erosion events, damaging flood events)?	☒ No. ☐ Yes. Describe or attach

Changes in the environmental conditions at the facility (e.g., significant land clearing, dredging, flood damage repairs, construction activities)?	☒ No. ☐ Yes. Describe or attach
Any other issues related to the LIHI criteria that have arisen (e.g., agency comments or new recommendations, stakeholder inquiries, etc.)?	☒ No issues have arisen. ☐ Yes. Describe or attach
5. During the current LIHI term have there been any:	
Deviations or excursions from regulatory requirements?	☒ None have occurred. ☐ Yes. Describe or attach Describe the outcomes of any related actions or any ongoing activities. Provide links here or attach copies of all related documents
FERC compliance orders, notices of non-compliance or violations from FERC, from regulatory agencies, or from stakeholders or the general public?	☒ None received. ☐ Yes. Describe or attach Describe the outcomes of any related actions or any ongoing activities. Provide links here or attach copies of all related FERC, agency and stakeholder documents and communications including compliance reports to FERC
6. Ecological Flows (if not captured above):	

Are there any temporary or permanent changes in impoundment operations that have occurred or are planned, including significant drawdowns (planned for maintenance or dam repairs or extended flashboard removal); and/or changes in flow release quantity or schedules, including white water releases?	☐ No changes have occurred or are planned. ☒ Yes. Describe or attach Two-week drawdown in July 2019, approved by agencies prior to event. Future drawdowns will be coordinated with agencies in advance.
7. Water Quality:	
If applicable, are there any amendments or applications for amendment to the facility's Water Quality Certification (WQC) during the current LIHI term?	☐ N/A, no WQC for the facility. ☒ No WQC amendment proceedings. ☐ Yes, there have been amendment proceedings. Describe or attach Provide links here or attach copies of all related documents
If there is a WQC and you selected Standard B-2, Agency Recommendation in the prior LIHI application, is the WQC is now > 10 years old? Provide a letter from the state water quality agency confirming that the terms and conditions of the existing WQC are still valid and applicable to the facility.	☐ N/A, no WQC for the facility. ☐ No, did not select Standard B-2. ☐ No, WQC is still < 10 years old. ☒ Yes, WQC is > 10 years old, and agency letter is attached. Attached as Appendix 1.
Review the most recent published state impaired waters list (draft or final). Have there been any changes in the listing (new impairments, impairments removed, etc.) for the facility vicinity since the prior LIHI application?	☒ No changes. ☐ Yes. https://www.maine.gov/dep/water/monitoring/305b/2016/28-Feb-2018_2016-ME-IntegratedREPORT.pdf Describe whether the facility operation is a cause of or contributes to such impairments

Identify any changes in stream designation such as state water quality classification changes for the river, Wild and Scenic Rivers designation, or other protected river status changes.	☒ None identified. ☐ Yes. Describe or attach Provide links here or attach copies of all related documents
If water quality monitoring has been conducted at or near the facility by you or others during the current LIHI term, provide links to, or copies of, the final monitoring report, and if applicable, all related FERC and agency consultation and communications.	☐ N/A, no monitoring conducted. ☒ Yes. Report attached as Appendix 2, previously submitted to meet condition 1 on last recertification.
8. Upstream and Downstream Fish Passage:	
Have there been any completed or ongoing fish passage studies during the current LIHI term, including any data collected on fish passage (e.g., return numbers, changes made in seasonal operations, mortalities reported, effectiveness results)?	☐ N/A, no fish passage. ☒ No studies have occurred or are planned. ☐ Yes, studies have occurred or are planned. Describe or attach Provide links here or attach copies of all related documents
Have there been any temporary or permanent changes in passage facilities or related operations that have occurred during the current LIHI term, or that are planned?	☐ N/A, no fish passage. ☐ No changes have occurred or are planned. ☒ Yes, changes have occurred or are planned. Starting in 2020, to facilitate downstream eel passage, all projects on the Messalonskee Stream will now be shutdown from 6pm to 2am from 9/1 through 10/30. See attached Appendix 3
9. Shoreline and Watershed Protection:	

Are there any new or revised agency watershed-related management plans that may affect the facility (e.g., watershed management plan, fishery restoration plan, recovery plan for threatened or endangered species, or other agency plans)?	☒ None identified. ☐ Yes. Describe or attach Provide links here or attach copies of all related documents Describe whether, and if so how, any management plans affect the facility and any operational or facility changes that have been made or may be needed in the future to comply with such plans
10. Threatened and Endangered Species:	
Conduct a U.S. Fish and Wildlife Service IPaC online data check (https://ecos.fws.gov/ipac/) for newly observed or newly listed federally threatened and endangered species.	☒ IPaC report attached. See attached as Appendix 4.
Conduct a state threatened and endangered species data check (may require payment of fees) for newly observed or newly listed state threatened and endangered species.	☒ State listed species report attached. See attached email from MDIFW, Appendix 5.
Describe and summarize any studies of protected species at the facility that were completed or are ongoing during the current LIHI term.	☒ No studies have occurred or are planned ☐ Yes, studies have occurred or are planned. Describe or attach Provide links here or attach copies of all related documents Describe whether, and if so how, study results affect the facility and any related operational or facility changes made or planned
11. Cultural and Historic Resources:	

Are there any structural or operational changes that have occurred or are planned that affect or could affect cultural or historic resources?	☒ No changes have occurred or are planned. ☐ Yes, changes have occurred or are planned. Describe or attach Provide links here or attach copies of any required consultation with the State or Tribal Historic Preservation Officer(s) and/or local governments
Describe and summarize any cultural or historic resource studies at the facility, that were completed or are ongoing during the current LIHI term including mitigation measures taken or planned.	☒ No studies have occurred or are planned ☐ Yes, studies have occurred or are planned. Describe or attach Provide links here or attach copies of all related documents Describe whether, and if so how, any management plans affect the facility and any operational or facility changes that have been made or may be needed in the future to comply with such plans
12. Recreational Resources:	
Provide a description of and current photos of formal and informal recreation areas/facilities along with a description of any temporary or permanent changes in recreational facilities or services, including consultation with recreational stakeholders during the current LIHI term or planned in the foreseeable future.	☐ N/A, the facility has no formal or informal recreation access. ☐ Yes, recreation area photos attached. ☒ No changes have occurred or are planned. ☐ Yes, changes have occurred or are planned. Describe or attach Provide links here or attach copies of all related documents
Provide a summary of inquiries and comments received from stakeholders about recreation sites during the current LIHI term, including any changes made as a result.	☒ No inquiries received. ☐ Yes, inquiries were received. Describe or attach Provide links here or attach copies of all related documents

If applicable, provide links to or copies of, any FERC Environmental and Recreation Inspection reports and reports of follow up activities during the current LIHI term.	☒ N/A, no FERC inspection has occurred ☐ Yes, FERC inspection occurred on: Click and use arrow button to enter date Describe any follow up activities, and provide links here or attach copies of, all related documents
If there is a recreation management plan for the facility, provide any updates to the plan that have occurred during the current LIHI term.	☒ N/A, no recreation management plan for the facility. ☐ No changes have occurred or are planned. ☐ Yes, updated recreation management plan attached.
13. Other:	
Provide updated photos of key project features and updated maps if the FERC boundary has changed.	☐ Yes, photos attached.
If the FERC boundary has changed during the current LIHI term, provide updated maps.	☒ No FERC boundary changes have occurred. ☐ Yes, FERC boundary has changed, map attached.
Review and update the facility, agency and stakeholder contact lists from the prior LIHI application, including all requested contact information therein.	☐ No changes in any contacts. ☒ Yes, updated contact list(s) attached.
Provide a signed Sworn Statement and Waiver Form.	☒ Signed statement attached.

Table B-1.1. Facility Information.

Item	*Information Requested*	*Response (include references to further details)*
Name of the Facility	Facility name (use FERC project name or other legal name)	Automatic Hydroelectric Project
Reason for applying for LIHI Certification	1. To participate in state RPS program 2. and specify the state and the total MW/MWh associated with that participation (value and % of facility total Mw/MWh). 3. To participate in voluntary REC market (e.g., Green-e) 4. To satisfy a direct energy buyer's purchasing requirement 5. To satisfy the facility's own corporate sustainability goals 6. For the facility's corporate marketing purposes 7. Other (describe)	MA II RPS Program, 100%
	If applicable, amount of annual generation (MWh and % of total generation) for which RECs are currently received or are expected to be received upon LIHI Certification	Messalonskee Stream
Location	River name (USGS proper name)	Messalonskee Stream
	Watershed name - Select region, click on the area of interest until the 8-digit HUC number appears. Then identify watershed name and HUC-8 number from the map at: https://water.usgs.gov/wsc/map_index.html	Lower Kennebec HUC 08: 0103000310
	Nearest town(s), county(ies), and state(s) to dam	Waterville, Kennebec, ME
	River mile of dam above mouth	2.6
	Geographic latitude of dam	44°32'50.47"N
	Geographic longitude of dam	69°38'35.37"W
Facility Owner	Application contact names (Complete the Contact Form in Section B-4 also):	Messalonskee Stream Hydro, LLC Andrew Locke

Item	*Information Requested*	*Response (include references to further details)*
	Facility owner company and authorized owner representative name. **For recertifications: If ownership has changed since last certification, provide the effective date of the change.**	Project acquired by Messalonskee Stream Hydro, LLC from Kennebec Water District on 9/23/19
	FERC licensee company name (if different from owner)	
Regulatory Status	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates, or date of exemption	FERC Project No. P-2555 License Issues July 29, 1999, Expires 2036
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Major License
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	#L-17585-33-D-N Signed 8/28/1995, Effective date of License Issue. Maine Department of Environmental Protection
	Hyperlinks to key electronic records on FERC e-library website or other publicly accessible data repositories[1]	https://elibrary.ferc.gov/eLibrary/docinfo?document_id=3090723 https://elibrary.ferc.gov/eLibrary/docinfo?document_id=14801099
Powerhouse	Date of initial operation (past or future for pre-operational applications)	1924
	Total installed capacity (MW) **For recertifications: Indicate if installed capacity has changed since last certification**	.8 MW, No change since last certification.
	Average annual generation (MWh) and period of record used **For recertifications: Indicate if average annual generation has changed since last certification**	3,000 MWh Owner estimate. 300 MWh increase since last certification.
	Mode of operation (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) **For recertifications: Indicate if mode of operation has changed since last certification**	Run-of-river No change since last certification.

[1] For example, the FERC license or exemption, recent FERC Orders, Water Quality Certificates, Endangered Species Act documents, Special Use Permits from the U.S. Forest Service, 3rd-party agreements about water or land management, grants of right-of-way, U.S. Army Corps of Engineers permits, and other regulatory documents. If extensive, the list of hyperlinks can be provided separately in the application.

Item	*Information Requested*	*Response (include references to further details)*
	Number, type, and size of turbine/generators, including maximum and minimum hydraulic capacity and maximum and minimum output of each turbine and generator unit	1 Horizontal Francis turbine with a GE generator. Max 615 cfs Min 535 cfs Max output 800kw Min Output 689kw
	Trashrack clear spacing (inches) for each trashrack	3 inches
	Approach water velocity (ft/s) at each intake if known	Unknown
	Dates and types of major equipment upgrades **For recertifications: Indicate only those since last certification**	No major equipment upgrades since last certification.
	Dates, purpose, and type of any recent operational changes **For recertifications: Indicate only those since last certification**	Shut downs from 6pm to 2am from 9/1 through 10/30 for downstream eel passage started in 2020.
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments	None.
Dam or Diversion	Date of original dam or diversion construction and description and dates of subsequent dam or diversion structure modifications	1924
	Dam or diversion structure length, height including separately the height of any flashboards, inflatable dams, etc. and describe seasonal operation of flashboards and the like	81 foot long, 33 foot high with 2-foot-high flashboards.
	Spillway maximum hydraulic capacity	Unknown
	Length and type of each penstock and water conveyance structure between the impoundment and powerhouse	N/A
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power generation.
Conduit Facilities Only	Date of conduit construction and primary purpose of conduit	
	Source water	
	Receiving water and location of discharge	

Item	*Information Requested*	*Response (include references to further details)*
Impoundment and Watershed	Authorized maximum and minimum impoundment water surface elevations **For recertifications: Indicate if these values have changed since last certification**	94.3, no change since last certification.
	Normal operating elevations and normal fluctuation range **For recertifications: Indicate if these values have changed since last certification**	Within 1 foot of 94.3. No change since last certification.
	Gross storage volume and surface area at full pool **For recertifications: Indicate if these values have changed since last certification**	900 Acre feet, 68 acres. No change since last certification.
	Usable storage volume and surface area **For recertifications: Indicate if these values have changed since last certification**	N/A, project is run-of-river. No change since last certification.
	Describe requirements related to impoundment inflow and outflow, elevation restrictions (e.g., fluctuation limits, seasonality) up/down ramping and refill rate restrictions.	Operation of the Automatic project is dependent on inflow to Messalonskee Lake. When inflow to Messalonskee Lake is greater than approximately 570 cfs, the project is operated as a run-of-river project. When inflow is less than approximately 570 cfs, the project is cycled. All water that does not go through the turbines is passed over the spillway. MSH utilizes the top 0.5 feet of Messalonskee Lake as storage for generation during the summer months and the top 1.0 foot during the winter months.

	Upstream dams by name, ownership and river mile. If FERC licensed or exempt, please provide FERC Project number of these dams. Indicate which upstream dams have downstream fish passage.	• Rice Rips Dam (FERC #2556)
		  • River Mile 7.5
		• Oakland Hydroelectric Project (FERC #2556)
		  • River Mile 9.4
		• Messalonskee Lake Dam (FERC #2556)
		  • River Mile 10.2
		• All Dams owned by MSH
		Dams have no downstream passage, except for eel (nightly shutdowns 9/1-10/30 each year).

<table>
<tr><th>Item</th><th>Information Requested</th><th>Response (include references to further details)</th></tr>
<tr><td></td><td>Downstream dams by name, ownership, river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream fish passage</td><td>Union Gas Dam (FERC #2556)
River Mile 1.0
Upstream eel passage only</td></tr>
<tr><td></td><td>Operating agreements with upstream or downstream facilities that affect water availability and facility operation</td><td>N/A, Common ownership of all upstream and downstream dams.</td></tr>
<tr><td></td><td>Area of land (acres) and area of water (acres) inside FERC project boundary or under facility control. Indicate locations and acres of flowage rights versus fee-owned property.</td><td>Approximately 200 acres, primarily flowage rights.
Fee owned property approx. 1 acre.</td></tr>
<tr><td rowspan="4">Hydrologic Setting</td><td>Average annual flow at the dam, and period of record used</td><td>310 – see study comment in next row.</td></tr>
<tr><td>Average monthly flows and period of record used</td><td><table><tr><td>January</td><td>250</td></tr><tr><td>February</td><td>273</td></tr><tr><td>March</td><td>518</td></tr><tr><td>April</td><td>967</td></tr><tr><td>May</td><td>439</td></tr><tr><td>June</td><td>215</td></tr><tr><td>July</td><td>107</td></tr><tr><td>August</td><td>72</td></tr><tr><td>September</td><td>75</td></tr><tr><td>October</td><td>136</td></tr><tr><td>November</td><td>300</td></tr><tr><td>December</td><td>368</td></tr></table>Based on 1989 Hydrologic Analysis</td></tr>
<tr><td>Location and name of closest stream gaging stations above and below the facility</td><td>Nezinscot and Sheepscot USGS gages – both rivers are in proximity to Messalonskee Stream. No published USGS data exists for Messalonskee Stream. See included Messalonskee Hydrologic Study include with this application (Appendix 6).</td></tr>
<tr><td>Watershed area at the dam (in square miles). Identify if this value is prorated from gage locations and provide the basis for proration calculation.</td><td>178 square miles.</td></tr>
<tr><td></td><td>Other facility specific hydrologic information</td><td>n/a</td></tr>
</table>

Item	*Information Requested*	*Response (include references to further details)*
Designated Zones of Effect	Number of zones of effect	Zone 1 – Impoundment Zone 2 – Tailrace/Regulated Riverine Reach
	Type of waterbody (river, impoundment, bypassed reach, etc.)	Impoundment and Tailrace/Regulated Riverine Reach
	Upstream and downstream locations by river miles	Zone 1 – Impoundment begins at stream mile 2.6 and ends at stream mile 7.1. Zone 2 – The regulated riverine reach (tailrace) consists of stream that is impounded by the downstream Union Gas project. This zone is located between Union Gas at stream mile 0.93 and the Automatic Dam at stream mile 2.6. This zone is approximately 1.6 miles of stream.
	Delimiting structures or features	Zone 1 – Dam to end of project boundary at stream mile 7.1 Zone 2 – Automatic Dam to Union Gas Dam
Pre-Operational Facilities Only		
Expected operational date	Date generation is expected to begin	
Dam, diversion structure or conduit modification	Description of modifications made to a pre-existing conduit, dam or diversion structure needed to accommodate facility generation. This includes installation of flashboards or raising the flashboard height. Date the modification is expected to be completed	
Change in water flow regime	Description of any change in impoundment levels, water flows or operations required for new generation	

Contacts Forms

All applications for LIHI Certification must include complete contact information.

A. Applicant-related contacts

Facility Owner:	
Name and Title	Andrew Locke, President, HCE Dodge Falls, Inc. Operating Member Messalonskee Stream Hydro, LLC
Company	Messalonskee Stream Hydro, LLC
Phone	617-367-0032
Email Address	alocke@essexhydro.com
Mailing Address	c/o Essex Hydro Associates, L.L.C. 55 Union St. 4th Floor, Boston, MA 02108
Facility Operator (if different from Owner):	
Name and Title	Andrew Locke, Treasurer
Company	Essex Power Services, Inc.
Phone	617-367-0032
Email Address	alocke@essexhydro.com
Mailing Address	c/o Essex Hydro Associates, L.L.C. 55 Union St. 4th Floor, Boston, MA 02108
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	Andrew Locke, Treasurer
Company	Essex Power Services, Inc.
Phone	617-367-0032
Email Address	alocke@essexhydro.com
Mailing Address	c/o Essex Hydro Associates, L.L.C. 55 Union St. 4th Floor, Boston, MA 02108
Party responsible for accounts payable:	
Name and Title	Maureen Donnelly
Company	Essex Power Services, Inc.
Phone	617-367-0032
Email Address	accounts_payable@essexhydro.com
Mailing Address	c/o Essex Hydro Associates, L.L.C. 55 Union St. 4th Floor, Boston, MA 02108

B. Current and relevant state, federal, and tribal resource agency contacts with knowledge of the facility (copy and repeat the following table as needed).

Agency Contact		***Area of Responsibility***
Agency Name	US Fish and Wildlife Service	☐ Flows ☐ Water Quality ☒ Fish/Wildlife ☐ Watershed ☐ T&E Species ☐ Cultural/Historic ☐ Recreation
Name and Title	Peter Lamothe, Program Manager	
Phone	207-902-1556	
Email address	Peter_Lamothe@fws.gov	
Mailing Address	306 Hatchery Road East Orland, ME 04431	
Agency Contact		***Area of Responsibility***
Agency Name	Maine Department of Environmental Protection	☒ Flows ☒ Water Quality ☐ Fish/Wildlife ☐ Watershed ☐ T&E Species ☐ Cultural/Historic ☐ Recreation
Name and Title	Kathy Howatt, Hydropower Coordinator, DLRR	
Phone	207-446-2642	
Email address	Kathy.Howatt@maine.gov	
Mailing Address	17 State House Station Augusta, Maine 04333-0017	
Agency Contact		***Area of Responsibility***
Agency Name	Maine Historic Preservation Commission	☐ Flows ☐ Water Quality ☐ Fish/Wildlife ☐ Watershed ☐ T&E Species ☒ Cultural/Historic ☐ Recreation
Name and Title	Dr. Arthur Spiess, PhD., Chief Historic Preservationist	
Phone	207-287-2789	
Email address	arthur.spiess@maine.gov	
Mailing Address	55 Capitol Street 65 State House Station Augusta, Maine, 04333-0065	
Agency Contact		***Area of Responsibility***
Agency Name	Maine Department of Marine Resources	☒ Flows ☐ Water Quality ☒ Fish/Wildlife ☐ Watershed ☐ T&E Species ☐ Cultural/Historic ☐ Recreation
Name and Title	Gail Wipplehauser	
Phone	207-624-6349	
Email address	gail.wippelhauser@maine.gov	
Mailing Address	#172 State House Station Augusta, ME 04333	
Agency Contact		***Area of Responsibility***
Agency Name	Bureau of Parks and Lands	☐ Flows
Name and Title	James Vogel, Senior Planner	

Phone	207-287-2163	☐ Water Quality ☐ Fish/Wildlife ☐ Watershed ☐ T&E Species ☐ Cultural/Historic ☒ Recreation
Email address		
Mailing Address	22 State House Station Augusta, ME 04333-0022	
Agency Contact		***Area of Responsibility***
Agency Name	Maine Department of Inland Fisheries	☒ Flows ☐ Water Quality ☒ Fish/Wildlife ☐ Watershed ☐ T&E Species ☐ Cultural/Historic ☒ Recreation
Name and Title	John Perry, Environmental Review Coordinator	
Phone	207-287-5254	
Email address	John.perry@maine.gov	
Mailing Address	284 State Street, 41 SHS Augusta, ME 04333	
Agency Contact		***Area of Responsibility***
Agency Name	Maine Department of Inland Fisheries	☒ Flows ☐ Water Quality ☒ Fish/Wildlife ☐ Watershed ☐ T&E Species ☐ Cultural/Historic ☐ Recreation
Name and Title	Keel Kemper, Regional Wildlife Biologist	
Phone	207-287-5369	
Email address	Keel.Kemper@maine.gov	
Mailing Address	270 Lyons Road Sidney, ME 04988	

C. Current stakeholder contacts that are actively engaged with the facility (copy and repeat the following table as needed).

Stakeholder Contact		***Area of Responsibility***
Organization Name	None	☐ Flows ☐ Water Quality ☐ Fish/Wildlife ☐ Watershed ☐ T&E Species ☐ Cultural/Historic ☐ Recreation
Name and Title		
Phone		
Email address		
Mailing Address		

Sworn Statement and Waiver Form

All applications for LIHI Certification must include the following sworn statement before they can be reviewed by LIHI:

SWORN STATEMENT

As an Authorized Representative of Messalonskee Stream Hydro, LLC, the Undersigned attests that the material presented in the application is true and complete.

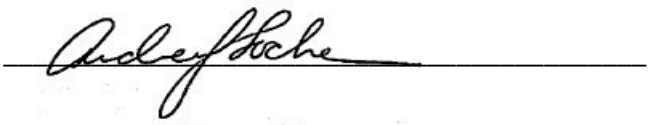
The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's certification program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The Undersigned further acknowledges that if LIHI Certification of the applying facility is granted, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified®.

The Undersigned further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's certification program.

FOR PRE-OPERATIONAL CERTIFICATIONS:

The Undersigned acknowledges that LIHI may suspend or revoke the LIHI Certification should the impacts of the facility, once operational, fail to comply with the LIHI program requirements.

Company Name: Messalonskee Stream Hydro, LLC
Authorized Representative: Essex Power Services, Inc.
Name: Andrew Locke
Title: Treasurer
Authorized Signature: 
Date: 2/11/2021

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JANET T. MILLS
GOVERNOR

GERALD D. REID
COMMISSIONER

April 23, 2019

Mr. Roger Crouse
Kennebec Water District
6 Cool Street
Waterville, Maine 04901

Subject: M4-Automatic Hydroelectric Project LIHI Certification

Dear Mr. Crouse:

The Department of Environmental Protection (Department) was contacted by the Kennebec Water District (KWD) regarding its application for certification of the M4-Automatic Hydroelectric Project (M4 Project) under the Low Impact Hydro Institute (LIHI) program. Specifically, KWD requested the Department verify that the M4 Project is in compliance with its FERC license and that the project does not cause or contribute to non-compliance with Maine's water quality standards.

A water quality sampling plan, designed to demonstrate that the M4 Project is in compliance with water quality standards, was submitted to the Department on May 23, 2017 and carried out during the summer of 2017. Nitrate samples were required to be repeated, as the samples exceeded their holding time. Sampling results were reported to the Department on December 18, 2017. Review of those data indicate that on two dates (July 5 and September 15, chlorophyll-*a* measurements exceeded the Department's draft criterion at station 1 in the impoundment, however, neither of those measurements resulted in a Secchi disk transparency measurement less than 2 meters. Further, on those dates, the chorophyll-*a* concentrations immediately below the dam were less than 8 ppb (parts per billion), indicating that the high readings may not be representative of conditions in the impoundment.

The Department confirms that the water quality certification for this project on August 28, 1995 was transferred from Central Maine Power Company to the Kennebec Water District remains in effect; further, the Department finds that the facility is in compliance with its water quality certification (WQC).

Based on its review of WQC compliance and its review of water quality monitoring conducted at the M4 Project, the Department supports the LIHI certification of the M4-Automatic Hydroelectric Project.

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826

BANGOR
106 HOGAN ROAD, SUITE 6
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769
(207) 764-0477 FAX: (207) 760-3143

website: www.maine.gov/dep

Please let me know if you have questions or comments regarding this determination. I can be reached by telephone at (207) 446-2642, or by email at Kathy.Howatt@maine.gov.

Sincerely,

Kathy Davis Howatt
Hydropower Coordinator
Bureau of Land Resources

KENNEBEC WATER DISTRICT

Jeffrey LaCasse
General Manager

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December 18, 2017

To whom it may concern,

At your request we have completed water quality sampling on the Messalonskee Stream in order to determine whether our hydrostation, the Automatic (M4) Project, qualifies for Low Impact Hydropower Institute (LIHI) certification. The sampling was conducted per DEP Sampling Protocol for Hydropower Studies and as laid out in the sampling plan we submitted titled "Proposed M4 Impoundment Sampling Plan". The results of the sampling can be found in the attached tables and we are able to provide further supporting documentation if necessary including laboratory reports and monitoring forms. For your reference Location 1 is upstream of the dam and Location 2 is downstream of the dam.

Please let me know if you have any questions or concerns by telephone at 923-3358 or by email at mzetterman@kennebecwater.org. We look forward to hearing your feedback.

Sincerely,

Matt Zetterman, P.E.
Director of Water Quality

Table 1a – Location 1, Trophic State Study

	Secchi	Color	pH	Chl-a	T.P.	Total Alk.
	meters	-	*SU*	*ppm*	*ppb*	*ppb*
6/8/2017	2.4	44	7.4	0.0068	19	18
6/22/2017	2.4	40	7.45	0.0084	20	18
7/5/2017	2.25	55	7.27	0.028	68	20
7/19/2017	2.6	45	7.62	0.0037	15	29
8/2/2017	2.85	40	7.35	0.0038	12	19
8/16/2017	2.07	48	7.15	0.0046	14	26
8/30/2017	2.4	37	7.24	0.0043	17	26
9/15/2017	2.6	35	6.89	0.019	12	32
9/27/2017	2.95	42	7.37	0.0048	15	24
10/13/2017	3.2	29	7.07	0.0048	19	16

Table 1b – Location 1, Trophic State Study
Temp. Profiles (°C)

	0	1m	2m	3m	4m	5m	6m	1m Dupe	2m Dupe	3m Dupe
6/8/2017	17.3	16.9	16.7	16.5	16.5	-	-	-	16.6	-
6/22/2017	21.7	21.6	21.5	21.5	21.5	21.5	-	-	21.5	-
7/5/2017	22.6	22.6	22.6	22.6	22.6	22.6	-	22.6	-	-
7/19/2017	23.6	23.6	23.6	23.4	23.2	23.7	-	23.7	-	-
8/2/2017	24.2	24.1	24.1	24.1	24.1	24.0	-	-	24.1	-
8/16/2017	22.6	22.6	22.6	22.6	22.6	22.6	22.6	-	-	22.6
8/30/2017	20.0	20.0	20.0	20.0	20.0	20.0	-	-	20.0	-
9/15/2017	20.1	20.0	20.0	20.0	19.9	19.7	-	-	20.0	-
9/27/2017	21.4	21.5	21.5	20.8	20.8	20.7	-	-	20.8	-
10/13/2017	16.3	16.3	16.3	16.3	16.3	16.3	16.3	-	-	16.3

Table 1c – Location 1, Trophic State Study
DO Profiles (ppm)

	0	1m	2m	3m	4m	5m	6m	1m Dupe	2m Dupe	3m Dupe
6/8/2017	7.18	7.2	7.15	7.1	7.08	-	-	-	7.09	-
6/22/2017	7.4	7.4	7.4	7.39	7.38	7.38	-	-	7.38	-
7/5/2017	7.08	7.08	7.06	7.03	7.0	7.04	-	7.08	-	-
7/19/2017	6.9	6.9	6.8	6.1	5.6	5.5	-	6.9	-	-
8/2/2017	5.8	5.8	5.8	5.8	5.7	5.7	-	-	5.8	-
8/16/2017	6.5	6.4	6.3	6.3	6.3	6.2	6.1	-	-	6.3
8/30/2017	6.6	6.6	6.6	6.6	6.6	6.5	-	-	6.6	-
9/15/2017	8.09	8.1	8.0	8.0	7.9	7.5	-	-	8.0	-
9/27/2017	7.04	7.06	7.06	6.07	6.08	5.9	-	-	6.1	-
10/13/2017	8.7	8.7	8.7	8.7	8.6	8.5	8.5	-	-	8.7

Table 1d – Location 1, Trophic State Study
Additional Mid-August Parameter Testing

	Iron	Conductivity	Nitrate	DOC	TD Al.	Total Ca.	Total Mg.	Total Na.	Total K.	Total Silica	Chloride	Sulfate
	ppm	us/cm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
8/16/2017	0.06	118.5	-	3.9	<0.02	9.2	1.7	8.6	<1.0	2.5	16	5
8/23/2017	-	-	<0.25	-	-	-	-	-	-	-	-	-

Table 2a – Location 2, Trophic State Study

	Secchi*	Color	pH	Chl-a	T.P.	Total Alk.
Date	*meters*	-	*SU*	*ppm*	*ppb*	*ppb*
6/8/2017	2	47	7.56	0.0064	14	17
6/22/2017	1	50	7.45	0.0074	19	18
7/5/2017	0.9	57	7.4	0.0067	16	20
7/19/2017	0.75	52	7.55	0.0036	14	28
8/2/2017	0.9	48	7.51	0.0035	13	19
8/16/2017	0.9	45	7.28	0.0046	14	26
8/30/2017	0.9	38	7.43	0.0043	14	26
9/15/2017	0.9	50	7.08	0.005	11	18
9/27/2017	0.9	39	7.65	0.0035	14	25
10/13/2017	0.9	30	7.13	0.0035	10	16

*Hit bottom on all secchi disk readings

Table 2b – Location 2, Temperature and Dissolved Oxygen Study*

	Before 7am		After 2pm	
	Temp.	DO	Temp.	DO
6/8/2017	16	9.7	17	9.8
6/22/2017	21.6	8.11	21.8	8.35
7/5/2017	22.6	8.36	23.2	8.3
7/19/2017	23.5	8.27	24.1	8.3
8/2/2017	24.1	7.95	24.3	8.45
8/16/2017	22.6	7.5	23.2	7.8
8/30/2017	20	9	19.8	9.7
9/15/2017	20	9.1	20	9.2
9/27/2017	21.2	8.2	21.4	8.37
10/13/2017	16	9.7	16.4	9.7

*All readings taken at mid-depth because the stream was less than 2 meters deep

Table 2c – Location 2, Trophic State Study
Additional Mid-August Parameter Testing

	Iron	Conductivity	Nitrate	DOC	TD Al.	Total Ca.	Total Mg.	Total Na.	Total K.	Total Silica	Chloride	Sulfate
	ppm	us/cm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
8/16/2017	0.12	119.3	-	4	0.025	9.2	1.7	8.6	<1	2.5	16	5
8/23/2017	-	-	<0.25	-	-	-	-	-	-	-	-	-

Messalonskee Stream Hydro LLC.,

Union Gas Downstream Eel Passage Study

Aug. 30th - Oct. 30th 2020

In conjunction with

Maine Department of Marine Resources

Prepared by Kurstyn True & Skip (George) Zink

Introduction

The Union Gas Hydro project is owned and operated by Messalonskee Stream Hydro LLC (MSH); 55 Union St. 4th Floor, Boston, Massachusetts. It is located on Messalonskee Stream in the city of Waterville, Maine. It is the fifth dam on the stream and the lowest on the system, approximately 1 mile above the confluence of the stream and the Kennebec River.

The Messalonskee Lake Outlet Dam (Snow Pond) is owned by MSH. It is located in the town of Oakland Maine, and serves as the water control dam to power the hydro sites on Messalonskee Stream. There is a 1" fish rack that was installed by a now nonexistent organization to prevent stocked fish passage into Messalonskee Stream.

Messalonskee Lake Dam (Snow Pond) fish rack upstream side.

In a previous ongoing study, MSH worked with the Maine Department of Marine Resources to operate a downstream eel trap at the Snow Pond fish rack. Observations in recent years by both DMR biologists and operations staff on their maintenance rounds have not revealed a population size of eels that would be expected to be present considering the drainage area.

The proposed study at Union Gas is being conducted as a result of inconclusive data at the Snow Pond downstream eel passage study. Eels collected at Union Gas will contribute to population size data of eels living in the Messalonskee Stream system, and the ability for them to pass downstream to the Kennebec River.

Messalonskee Lake Eel counts		
Date started	Date Ended	Total Eels
9/27/2012	11/15/2012	1
8/28/2013	11/7/2013	4
9/8/2014	11/19/2014	0
9/11/2015	11/13/2015	0
9/1/2016	11/16/2016	2
9/15/2017	11/16/2017	1
8/26/2018	11/7/2018	0

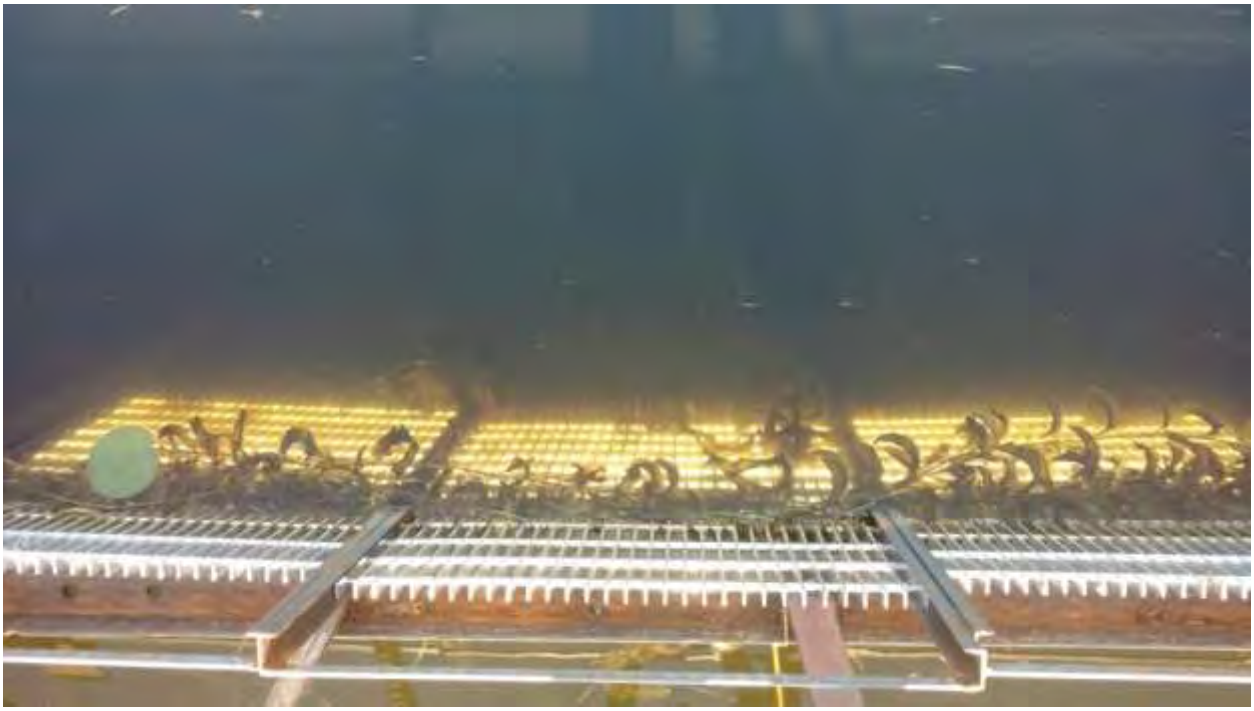
Eel counts from Snow Pond downstream eel passage study

Logistics

On August 4th, 2020 Bob Thornton, Skip Zink, and Andy Hughes met to finalize actions to be taken at Snow Pond considering the fish rack and at Union Gas Station considering the beginning of the downstream eel passage study. The following actions were agreed upon to begin the study.

- An eight hour shutdown from 18:00 to 2:00 of the MSH hydro facilities each night from 8/30/20 to 10/30/20 coordinated with the nightly removal of fish racks at Snow Pond.
- The Snow Pond fish rack will be modified with 11 aluminum 1" racks to accommodate the operations staff nightly removal and replacement.
- The trap from the previous Snow Pond study will be removed and replaced with 1" rack.
- A steel access platform will be lag bolted onto the top of the spillway at Union Gas for the staff to check the eel trap.
- 1" coated screen will be installed along the total length of the flashboards reaching 1ft above the boards to prevent eel passage.
- An eel trap (22"x22"x22") holding pen with screen mesh and ½" screen will be reinforced with 1" coated screen and secured behind the flashboards with a 6" pipe through the flashboard into the headpond.
- A cod finger cone will be used in the transition from the 6"pipe into the trap holding pen.
- An eel release chute will be constructed on the downstream side of the dam, using 6" PVC pipe.

Left: Platform and eel trap installation Right: 1” coated screen installation on flashboard



Snow Pond installation of aluminum 1” racking

Downstream Eel Passage Study Procedure

- The eel trap at Union Gas will be checked daily in the a.m. for silver eels.
- Eel length, count, weather conditions and incidental fish will be recorded.
- Eels will be released using the PVC chute.
- Headpond levels will be maintained to prevent eel passage over the flashboard screen and access to the trap entrance.
- Data will be recorded by hand then transferred to a shared document.

Data and Results

At the conclusion of the study**, a total of 11 silver American Eels** had been trapped, measured, and released. A variety of sizes were captured, suggesting male and female specimens were involved.

Specimen #	Length (cm)	Date
1	32	Sept. 23
2	32	Sept. 25
3	30	Sept.26
4	48	Sept. 27
5	34	Oct. 6
6	32	Oct. 8
7	30	Oct. 11
8	48	Oct. 14
9	54	Oct. 15
10	67	Oct. 15
11	77	Oct. 15

Silver eel lengths collected at Union Gas downstream passage trap

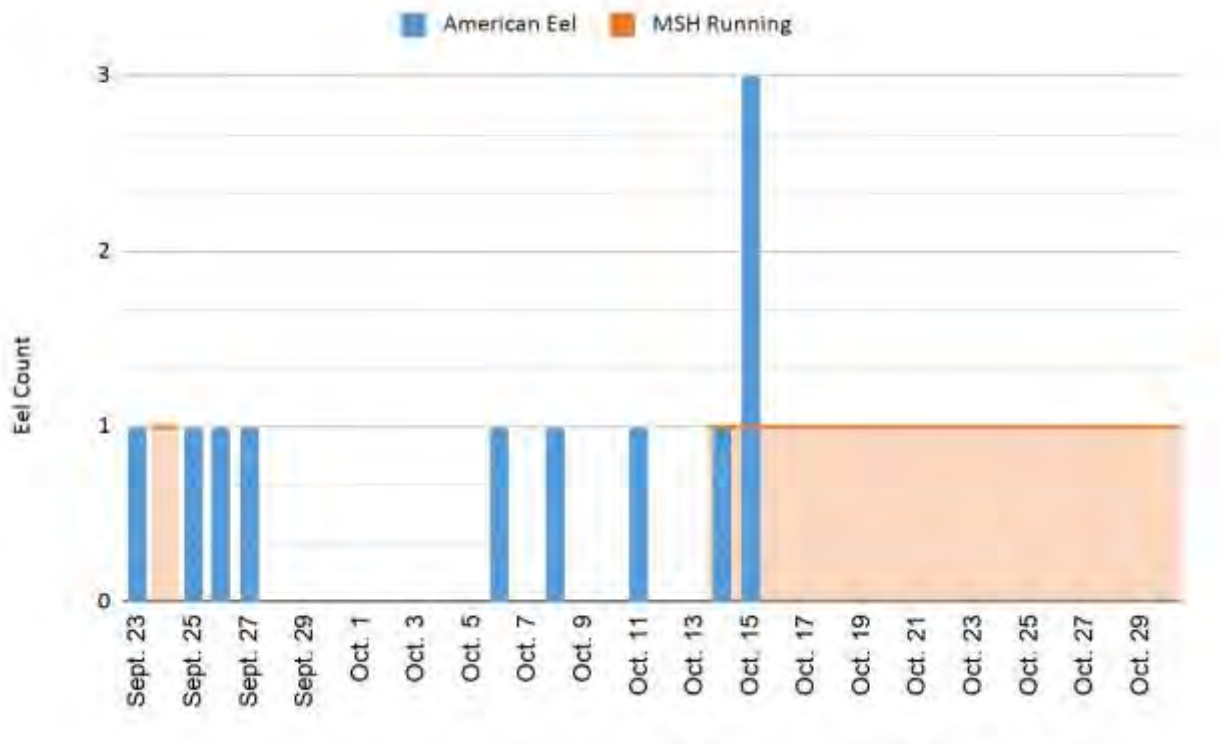
Incidental fish counts:

253 Largemouth bass

24 Redbreast sunfish

12 Smallmouth bass

5 Pumpkinseed sunfish



A comparison of dates when silver eels were trapped and when MSH stations were running.

Conclusion

The decision to move the downstream eel passage study from Snow Pond to Union Gas has yielded more accurate data representing the American eel population in the Messalonskee Stream system. The installation of the ADA angler platform at Snow Pond changed the observed bank flow and efficiency of the eel trap. The deep gate control at Union Gas in conjunction with the design of the spillway trap has provided the best eel count data to date.

All eels were released downstream using the PVC chute to bypass the hydro unit. One mortality was recorded, the individual was dead upon checking the trap, with no apparent injuries.

Any comments or questions are welcome, we look forward to hearing them.

Skip Zink georgezink14@live.com
Kurstyn True truekurstyn@gmail.com

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To: February 11, 2021
Consultation Code: 05E1ME00-2021-SLI-0643
Event Code: 05E1ME00-2021-E-01972
Project Name: Automatic Hydroelectric Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: http://www.fws.gov/windenergy/eagle_guidance.html Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: http://www.fws.gov/mainefieldoffice/Project%20review4.html

Additionally, wind energy projects should follow the wind energy guidelines: http://www.fws.gov/windenergy/ for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at:

http://www.towerkill.com; and at:
http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2021-SLI-0643
Event Code: 05E1ME00-2021-E-01972
Project Name: Automatic Hydroelectric Project
Project Type: POWER GENERATION
Project Description: LIHI Recertification
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@44.5668346,-69.65034547374268,14z

Counties: Kennebec and Somerset counties, Maine

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9045

Fishes

NAME	STATUS
Atlantic Salmon *Salmo salar*	Endangered

Population: Gulf of Maine DPS
There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/2097

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

IPaC Record Locator: 296-99214765 February 11, 2021

Subject: Consistency letter for the 'Automatic Hydroelectric Project' project indicating that any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Dear Andrew Locke:

The U.S. Fish and Wildlife Service (Service) received on February 11, 2021 your effects determination for the 'Automatic Hydroelectric Project' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. You indicated that no Federal agencies are involved in funding or authorizing this Action. This IPaC key assists users in determining whether a non-Federal action may cause "take"[1] of the northern long-eared bat that is prohibited under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Please report to our office any changes to the information about the Action that you entered into IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation.

If your Action proceeds as described and no additional information about the Action's effects on species protected under the ESA becomes available, no further coordination with the Service is required with respect to the northern long-eared bat.

The IPaC-assisted determination for the northern long-eared bat **does not** apply to the following ESA-protected species that also may occur in your Action area:

- Atlantic Salmon Salmo salar Endangered

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species listed above.

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[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Automatic Hydroelectric Project

2. Description

The following description was provided for the project 'Automatic Hydroelectric Project':

LIHI Recertification

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@44.5668346,-69.65034547374268,14z

Determination Key Result

This non-Federal Action may affect the northern long-eared bat; however, any take of this species that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o).

Determination Key Description: Northern Long-eared Bat 4(d) Rule
This key was last updated in IPaC on **May 15, 2017**. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for non-Federal actions is to assist determinations as to whether proposed actions are excepted from take prohibitions under the northern long-eared bat 4(d) rule.

If a non-Federal action may cause prohibited take of northern long-eared bats or other ESA-listed animal species, we recommend that you coordinate with the Service.

Determination Key Result

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   No

2. Will your activity purposefully **Take** northern long-eared bats?

   No

3. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

4. [Semantic] Is the project action area located within 0.25 miles of a known northern long-eared bat hibernaculum?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

   Automatically answered
   No

5. [Semantic] Is the project action area located within 150 feet of a known occupied northern long-eared bat maternity roost tree?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

   Automatically answered
   No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

0

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

Andrew Locke

From: Kemper, Keel <Keel.Kemper@maine.gov> on behalf of Kemper, Keel
Sent: Friday, January 22, 2021 8:27 AM
To: Andrew Locke
Subject: RE: Threatened & Endangered Species in the vicinity of the Messalonskee Projects

Yes, correct…nothing new identified…

Sand Hill Crane has nested here for sometime now. While very cool, it is not a state regulated species.

KK

G. Keel Kemper
Regional Wildlife Biologist
MDIFW
270 Lyons Road
Sidney, ME 04988
207-287-5369

From: Andrew Locke <alocke@essexhydro.com>
Sent: Thursday, January 21, 2021 5:46 PM
To: Kemper, Keel <Keel.Kemper@maine.gov>
Subject: Threatened & Endangered Species in the vicinity of the Messalonskee Projects

Keel -

I hope this email finds you well.

We are recertifying the Messalonskee projects with LIHI. Are Black Terns (*Chlidonias niger*) still the only state listed endangered species associated with Messalonskee?

Thank you,

Andrew

On Wed, Feb 17, 2016 at 2:36 PM Kemper, Keel <Keel.Kemper@maine.gov> wrote:

> Black Tern (*Chlidonias niger*) is the only state listed endangered species associated with Messalonskee…Thanks

HYDROLOGIC ANALYSIS of the MESSALONSKEE STREAM DRAINAGE for CENTRAL MAINE POWER COMPANY

prepared by

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OCTOBER 1989

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I. INTRODUCTION AND PURPOSE

Central Maine Power Company (CMP) owns and operates four small hydroelectric stations on Messalonskee Stream. These stations, from upstream to downstream, are Oakland (4000 hp), Rice Rips (2800 hp), Automatic (1250 hp), and Union Gas (2000 hp). CMP also owns and operates the Messalonskee Lake Dam which is located immediately upstream of the Oakland Station. Messalonskee Lake provides storage and flow regulation for the four downstream hydroelectric stations within the constraints imposed by recreational users and lake shore property owners.

The five dams owned by CMP comprise four hydroelectric projects licensed by the Federal Energy Regulatory Commission. These are as follows:

- FERC No. 2559 - Oakland (includes Messalonskee Lake)
- FERC No. 2557 - Rice Rips
- FERC No. 2555 - Automatic
- FERC NO. 2556 - Union Gas

The licenses for each of the four projects expire on December 31, 1993. By current FERC regulations, new license applications must be submitted no later than December 31, 1991. As part of its efforts to obtain new licenses for the stations on Messalonskee Stream, CMP has initiated work on the environmental aspects of the projects.

A complete and accurate understanding of the hydrologic characteristics of the Messalonskee Stream watershed is an essential prerequisite to environmental analysis of the projects and consideration of the possibility of changes to flow regimes in the lower Messalonskee drainage.

This report is intended to provide definition of historic and current hydrologic conditions in the Messalonskee Stream drainage and examine the potential for modifying the present flow regime and regulation pattern.

II. CHARACTERISTICS OF THE MESSALONSKEE STREAM WATERSHED

A. Physical Characteristics

Messalonskee Stream is located within the Kennebec River watershed, as shown in Figure 1. It has a total drainage area of 210 square miles at its mouth. The Messalonskee Stream drainage area is situated in the southern edge of the Kennebec River watershed. Messalonskee Stream enters into the Kennebec River in the town of Waterville, approximately two miles north of the Sidney/Waterville town line.

The headwaters of the Messalonskee drainage are formed by the Belgrade Lakes, consisting of North Pond, East Pond, Salmon Lake, Great Pond, Long Pond, and Snow Pond (Messalonskee Lake). Figure 2 shows the Messalonskee Stream watershed. The drainage area at the outlet of Messalonskee Lake is 177 square miles. The drainage area at the outlet of Long Pond is 121 square miles. The discharge from Long Pond occurs at Wings Mills Dam and flows directly into Messalonskee Lake. The remaining 56 square miles of drainage area above Messalonskee Lake Dam consists of several, small, unregulated lowland streams.

The terrain in the basin can be classified as hilly with relatively wide valleys. While the upland areas can be relatively steep, the perennial streams are generally low gradient, meandering drainages with numerous adjoining wetlands. The normal elevation of East Pond, the uppermost impoundment, is 263 ft, while the elevation of Messalonskee Lake, the lowest of the Belgrade Lakes, is 235.4 ft. Messalonskee Stream discharges into the Kennebec River at an elevation of about 26 ft. Of the 209 ft drop between Messalonskee Lake and the Kennebec River, 176

ft are developed for hydroelectric purposes by the Oakland, Rice Rips, Automatic, and Union Gas impoundments. Figure 3 contains a profile of the stream between Messalonskee Lake and the Kennebec River.

The quantity and distribution of river flow to the lower Messalonskee Stream (below Messalonskee Lake) is predominantly controlled by the operation of Messalonskee Lake Dam. The drainage areas of each of CMP's four hydroelectric sites are indicated in Table 1.

In turn, the quantity and distribution of river flow into Messalonskee Lake is significantly affected by the operation of the Belgrade Lakes. The drainage area at the Wings Mills Dam at the outlet of Long Pond is 121 mi^2, representing 68% of the drainage area above Messalonskee Lake Dam.

North Pond, East Pond, Salmon Lake, Great Pond, and Long Pond comprise (along with Messalonskee Lake) the Belgrade Lakes. The existence and management of these impoundments dominates the flow regime of the lower Messalonskee Stream. It is important to note that the Belgrade Lakes are managed almost exclusively for recreational purposes. The following sections of this report will investigate and define the effect of the management of the Belgrade Lakes on the streamflow characteristics of Messalonskee Stream. Table 2 provides a summary of the lakes of the upper Messalonskee drainage.

Table 1

Drainage Area of Project Dams
Messalonskee Projects

Facility	Drainage Area (mi^2)	Percent of Drainage Area Controlled by Messalonskee Lake Dam
Oakland Station	178	99%
Rice Rips Station	185	96%
Automatic Station	205	86%
Union Gas Station	207	86%

Table 2

Lakes of the Upper Messalonskee Drainage

Name	Normal Water Elev. (ft)	Surface Area (acres)	Drainage Area (mi^2)
East Pond	263.0	1,823	7
North Pond	254.0	2,115	27
Salmon Lake	278.0	667	9
Great Pond	247.7	8,228	83
Long Pond	238.1	2,718	121
Messalonskee Lake[1]	235.4	3,600	177

[1]Top of flashboards.

B. Historic Operating Mode of Messalonskee Lake

While the Belgrade Lakes have historically been managed for flood control and recreational uses, the lower Messalonskee Stream has historically been managed predominantly for generation of electricity to the extent consistent with meeting the expectations of recreational users and shorefront owners along Messalonskee Lake. While no explicit agreement exists, it has been CMP's historic practice to manage water levels in Messalonskee Lake to enhance recreational use during the summer months. A drawdown of 0.5 ft is a target level for management purposes. A drawdown of 1.0 ft or greater is used under extreme hydrologic conditions.

CMP's hydroelectric stations on Messalonskee Stream are operated as a peaking system. The individual projects, when considered separately, operate essentially as run-of-river in that they utilize available inflow and, with the exception of Union Gas, do not draw down the ponds. The Messalonskee system peaking operation is created by management and releases from Messalonskee Lake. When inflows or storage from the lake are available, the system is operated a limited number of hours per day at approximately 530 cfs to 570 cfs constrained by maintaining the target pool level on Messalonskee Lake between elevations 234.9 ft and 235.4 ft. (mean sea level datum). According to the plant operators, a significant number of complaints begin to be registered by waterfront property owners when the pond exceeds 235.6 ft or drops below 234.7 ft. When the plants are not generating, the outflow from Messalonskee Lake Dam is limited to leakage flows estimated at 12 cfs to 15 cfs. The narrow operating band of Messalonskee Lake severely limits its operational flexibility and minimizes the availability of its

storage for downstream uses. Within the normal 6 inch operating band, the storage potential is estimated to be roughly 1500 acre-feet of water. This is equivalent to 25 cfs for one month. At Union Gas, the pond level is controlled by an automated float system, and is drawn down approximately a foot and a half in order to store and utilize the inflow from upstream leakage and runoff for generation.

III. FLOW DURATION ANALYSIS AND RESULTS

A. Available Data and Records

As indicated in Section I, the purpose of this report is to define historic and likely future flow conditions in the lower Messalonskee Stream. The objectives for this report are three-fold:

1. Develop monthly flow duration curves representative of long-term historic flow conditions which accurately portray the quantity and distribution of flow available at each of the project dams.

2. Concentrating on critical low flow months, analyze the potential impact of Water level Order #L-011097-36-A-N enacted on October 30, 1985 which governs the operation of Salmon Lake, Great Pond, and Long Pond (see Appendix 1).

3. Determine the flow available for continuous release from Messalonskee Lake which would be consistent with the Water Level Order while protecting the recreation, fish, wildlife and wetland resources of Messalonskee Lake.

Available data for the project was examined for its adequacy for accomplishing these three objectives. A summary of available data is provided below.

1. Project Data

CMP has collected daily headpond and gate opening data at Messalonskee Dam since the 1940's.

2. U.S.G.S. Data

The United States Geological Survey water supply data for the Nezinscot and Sheepscot Rivers was compiled for analysis. These gages both have long-term records available and are in the proximity of the Messalonskee drainage. The Nezinscot River gage has flow records available since October 1941 while the Sheepscot River gage has continuous records available since October, 1938. No published USGS data exists for Messalonskee Stream.

3. N.O.A.A. Data

Precipitation data from the National Oceanic and Atmospheric Administration were compiled for the Augusta, Waterville, and Rumford stations.

4. Miscellaneous Sources

Other sources of significant information included the DEP Water Level Order #L-011097-36-A-N, DEP files concerning this water level order, interviews with CMP field and office personnel, and CMP internal files.

B. Flow Duration Analysis: Methodology and Results

In reviewing the available data base, it was apparent that the most significant limitations were the lack of gaged streamflow data in Messalonskee or Belgrade Stream, and the lack of historic operations data at Wings Mills Dam (the inlet to Messalonskee Lake).

Data collected by CMP at the Messalonskee Lake Dam was available, and was compiled and reviewed to determine its adequacy for use in further analysis. This data consists of single entry, daily logs maintained by the Plant Operator recording the elevation of Messalonskee Lake, the gate opening, the output of Oakland Station, the time of day that the gate opening was initiated, and the total energy generated for the previous 24 hours. The data were analyzed, and found to be unreliable for the following reasons:

1. The headwater staff gauge is located upstream of the fish protection screen. The screen is often partially clogged by debris thereby developing headlosses which are highly variable, but can exceed 12 inches. Therefore, headwater elevations recorded by the operator will not be representative of actual headwater levels at the gate structure.

2. The headwater levels are recorded using a local datum. The relationship of this datum to mean sea level datum and the elevation of project structures is not known. Therefore, actual head on the gates could not be readily determined.

3. The Plant Operator reported that a drawdown occurs in the approach flow to the gates when one or two gates are open full. This drawdown reflects a headloss due to approach channel geometry. This headloss is variable, but in all cases reduces the head at the gate itself.

4. The actual discharge coefficient of the gate and gate structure is difficult to determine and estimates could be as much as 15% to 20% in error.

Based on these findings, these data were judged to be inadequate for the task of developing reliable monthly flow duration characteristics.

Despite the lack of reliable data collected on-site, it was felt that flow duration curves for the Messalonskee drainage could be simulated reasonably well by utilizing historic data for nearby gaged stream.

ND&T reviewed the available USGS data and drainage area characteristics above several gaged sites. Records were examined to identify gaged sites having both a long-term record and watershed characteristics similar to the Messalonskee drainage. It was preferred that selected gaged sites represent relatively unregulated drainages in order to develop estimates of the amount of inflow likely to be available to Messalonskee Lake during any month. Once inflow was estimated, the historic Messalonskee Lake operating guidelines could be applied to establish flow duration characteristics at the outlet. This attempt to simulate historic flows makes two significant assumptions:

1. Messalonskee Lake storage is limited to less than monthly carry-over, that is, monthly inflow equals monthly outflow.

2. The upper Belgrade Lakes were historically operated as run-of-river facilities.

The first assumption should be reasonably accurate because of the limited operating band of Messalonskee Lake. The second assumption is less certain, as historic operating records for the Belgrade Lakes are unavailable. Nonetheless, the second assumption is generally considered to be historically valid during the low flow summer months when the impoundments were managed to maintain water levels at spillway crest during the recreation season.

Because of the extensive storage and regulation of Messalonskee Stream, it was recognized that its flow characteristics would be quite unique. The Messalonskee Stream drainage above Messalonskee Lake Dam has fully 17% of its area comprised of water bodies. An additional 2 to 3% is characterized by hydrophytic vegetation with direct access to a free water surface. Even in more humid climates, evaporation can significantly exceed precipitation during summer months and, on smaller drainages, play a significant role in the availability of water.

Therefore, the approach to simulation developed by ND&T was to first estimate flow duration characteristics for the watershed in an unregulated state, then apply the regulation pattern used by CMP on these unregulated flows, and finally, to account for the additional losses due to evaporation.

Following the review of USGS records, two gages were selected for analysis based on proximity and drainage area similarity. The gages selected include the Nezinscot and Sheepscot River gages. The Nezinscot River drainage is located 33 miles west southwest of the Messalonskee drainage with a drainage area above the gage of 169 mi^2. The Nezinscot drainage is generally steeper than the

Messalonskee with narrower river valleys and the average elevation is about 200 feet higher. The Sheepscot drainage is located about 25 miles east southeast of the Messalonskee drainage with a drainage area above the gage of 145 square miles. The Sheepscot drainage is generally flatter than the Messalonskee with lower hills and wider river valleys and the average elevation is about 250 ft lower than the Messalonskee drainage. The long-term average daily discharge of each gage is provided in Table 3 in terms of both flow rates and runoff volume per square mile.

While the Messalonskee drainage is more similar to the Nezinscot drainage in terms of terrain and relief, it is more similar to the Sheepscot drainage with respect to river valley geometry and wetland development. The Messalonskee Stream drainage is situated in the transition between the steeper and more rugged drainages to the west and the coastal drainages to the east.

Based on the similarities among these watersheds, it was determined that the long-term (unregulated) monthly inflow to Messalonskee Lake can be estimated by averaging the Nezinscot and Sheepscot River flow data. Therefore, the average monthly volume of inflow to Messalonskee Lake Dam was estimated by computing the mean monthly runoff volume in acre-feet per square mile of the Nezinscot and Sheepscot Rivers and multiplying the average of the monthly means for the two watersheds by the drainage area above the Messalonskee Lake Dam (177 mi^2). Table 4 provides the results of this process.

Using a similar methodology, ND&T also developed estimated flow duration characteristics of the inflow to Messalonskee Lake for

Table 3

Discharge Characteristics of the Nezinscot and Sheepscot Rivers

Month	Nezinscot River		Sheepscot River	
	Mean Daily Flow (cfs/mi^2)	Runoff Volume (ac-ft/mi^2)	Mean Daily Flow (cfs/mi^2)	Runoff Volume (ac-ft/mi^2)
Jan	1.29	79.3	1.52	93.5
Feb	1.46	81.0	1.62	90.0
Mar	2.91	179.0	2.94	180.8
Apr	5.71	339.8	5.22	310.6
May	2.57	158.0	2.39	147.0
Jun	1.27	75.6	1.16	69.0
Jul	0.68	41.8	0.53	32.6
Aug	0.48	29.5	0.33	20.3
Sep	0.50	29.8	0.35	20.8
Oct	0.97	59.6	0.57	35.1
Nov	1.73	102.9	1.66	98.8
Dec	1.91	117.4	2.25	138.3
Avg	1.79		1.71	
Annual Total		1,295.9		1,238.0

Source: USGS Gage records

Table 4

Long-Term Monthly Inflow to Messalonskee Lake

	Mean Daily Flow (cfs)	Volume (ac-ft)
Jan	250	15,372
Feb	273	15,139
Mar	518	31,834
Apr	967	57,559
May	439	26,120
Jun	215	12,797
Jul	107	6,584
Aug	72	4,407
Sep	75	4,476
Oct	136	8,380
Nov	300	17,852
Dec	368	22,637
Mean	310	
Total		224,250

Based on proration of Nezinscot and Sheepscot River gaged data.

each month. This was done by first developing monthly flow duration curves for each of the Nezinscot and Sheepscot drainages. The flow values used in these curves were in terms of cfs per square mile. Each monthly flow duration curve for both rivers was divided into 20 intervals. At each interval, the flow value in cfs per square mile of the Nezinscot and Sheepscot Rivers were averaged. The average value, so derived, was then multiplied by the drainage area above Messalonskee Lake Dam to arrive at the monthly flow duration curves for inflow to Messalonskee Lake.

Next, by applying the operating guidelines of Messalonskee Lake Dam to the estimated available volume of water in any given month, ND&T developed long-term monthly flow duration data for the outflow from Messalonskee Lake Dam.

The inflow and outflow duration curves derived in this manner are shown in Figures 4 through 15. These curves also account for the fact that the current minimum release at Messalonskee Lake Dam, which occurs by leakage through the gates and masonry dam, has been reported to be about 12 cfs.

The flow duration curves of Figures 4 through 15 are considered to be applicable to the Oakland and Rice Rips stations as well as Messalonskee Lake Dam. An additional 30 square miles of watershed drain to Messalonskee Stream between Messalonskee Lake Dam and Automatic Dam. This principally consists of Fish Brook. To account for this additional drainage, runoff factors derived as described above were applied to the intervening drainage area and new flow duration curves were developed. These are shown in Figures 16, 17 and 18.

The flow duration curves shown in Figures 4 through 18 were developed based on the similarities between the Messalonskee Lake watershed and the Nezinscot River and Sheepscot River watersheds. While similar in many respects, the Messalonskee Lake drainage differs from both the Nezinscot and Sheepscot River drainages in two significant ways. First, the regulation of the natural flow regime imposes changes to the distribution of the runoff. This was accounted for by adjusting the estimated natural inflow to reflect the regulation criteria used by CMP. Second, the proportion of drainage area dedicated to impoundments is very significant in the Messalonskee watershed. This has the effect of reducing the quantity of natural runoff due to evaporation losses, specifically during the months of July and August. The impact of evaporation losses is discussed below.

C. Analysis of the Effect of Evaporation on the Flow Duration Characteristics of Messalonskee Stream

As mentioned above, the Messalonskee Stream watershed is quite unique in that fully 17% of its drainage area is comprised of water bodies and an additional 2 to 3% consists of hydrophytic vegetation with continuous access to free water. Evaporation losses from reservoirs in the northeastern United States is generally believed to be of little significance when compared to evaporation losses from reservoirs in the more arid zones of the country. However, under certain circumstances, evaporation losses can be important. This is particularly true in watersheds where the lake surface area is high with respect to natural inflow. The Messalonskee Stream drainage meets these two criteria, particularly during the months of July and August.

It is recognized at the outset that reliable data on the evaporation rates of lakes in the northeast is not generally available. However, there are two basic tenets that will be applied to this analysis. First, evaporation from a free water surface of a given area is greater than evapotranspiration (ET) from that same area. ET is limited by the availability of soil moisture and the rate at which water can be transported through soil. Second, ET can be no greater than precipitation in a basin unless water is brought into the basin from an outside source.

While it is recognized that absolute data is not available to analyze the effect of evaporation with complete accuracy, sufficient data is available to develop rough estimates of the losses to be expected.

Based on evaporation data from Linsley and Franzini in Water Resources Engineering,[1] estimated evaporation rates for the months of July, August and September would be 4.1 inches, 3.5 inches, and 2.4 inches, respectively. Average precipitation for these months at Messalonskee Lake are approximately 3.4 inches, 3.3 inches, and 3.2 inches, respectively. Based on a review of USGS records for unregulated, wooded watersheds, approximately 15% of precipitation results in runoff during the month of August, which is the lowest month in this regard. Therefore, ET can be estimated to be 2.8 inches in August (85% of precipitation). The difference between the estimated evaporation in August of 3.5 inches and ET in August of 2.8 inches is 0.7

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1. R. K. Linsley and J. B. Franzini, "Water-Resources Engineering," Table 2-4, p. 36, McGraw-Hill, New York, 1972.

inches. This estimate of 0.7 inches is an approximation of the net loss of water to evaporation over a lake surface versus an upland drainage area.[1]

One can readily see that this represents a very small loss when considering a small impoundment or a larger watershed with a few large impoundments. However, in the case of the Messalonskee drainage basin above Messalonskee Lake Dam which has a total water surface area of 19,151 acres (not including adjacent wetlands), this loss amounts to over 1,100 acre-feet of water. This is equivalent to a continuous flow of about 18 cfs. In other words, the impact of the Belgrade Lakes on flow in Messalonskee Stream in August is to reduce stream runoff by about 18 cfs on the average. The importance of this is self-evident. Based on the flow duration curves developed as described in Section B, the median inflow to Messalonskee Lake Dam in August without evaporation losses is estimated to be 44 cfs (.25 cfs/mi^2). Including watershed evaporation losses, ND&T would estimate the actual median inflow to Messalonskee Lake in August to be about 26 cfs.[2]

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1. Data collected by the National Weather Service at New Gloucester, Maine indicate that the above values of evaporation are likely to be conservative, that is, they underestimate the actual evaporation rates. See R.K. Farnsworth and E.S. Thompson, Hydrologic Research Lab, National Weather Service, NOAA Silver Spring, MD, Table I, pg. 34.

2. Inclusive of evaporation losses from Messalonskee Lake.

Again, it is noted that these figures are not absolute values, but they do indicate the general significance of the evaporation losses. In addition, during shorter-duration dry periods, the evaporation losses may be higher and precipitation lower, thereby reducing further the runoff available at the outlet of the impoundments. Also, other data indicate evaporation rates may be greater than those used in this analysis.

Table 5 provides an estimate of the impact of evaporation losses on median flows for the months of July, August, and September applicable to the inflow to Messalonskee Lake.

D. Analysis of the Potential Impacts of the Belgrade Lakes Water Level Order on Availability of Flows at Messalonskee Lake Dam

As mentioned previously, the Maine DEP issued Water Level Order L-011097-36-A-N on October 30, 1985 which governs the operation of the dams at Salmon Lake, Great Pond, and Long Pond. One of the stipulations of the Order is that the minimum release from Long Pond shall be 8 cfs. There is no minimum release required from Great Pond. The Water Level Order also specifies that between June 1 and Labor Day, lake levels shall be maintained as close to the spillway crest as possible.

Figures 10, 11 and 12 show the estimated long-term flow duration characteristics of inflow to Messalonskee Lake for July, August, and September, respectively, without evaporation losses. Median flows for these three months were provided in Table 5 above.

Table 5

Effect of Evaporation on Median Inflows to Messalonskee Lake

Month	Median Inflow in cfs	
	Without Evap. Losses	With Evap. Losses
July	73	42
August	44	26
September	37	37

The flow values provided in Table 5 above do not reflect the potential impact of the Water Level Order enacted in October, 1985. It is recognized that Salmon Lake, Great Pond and Long Pond are managed strictly for recreation during the summer months and CMP has no control over the discharge of water from these lakes. When one also considers that the operating band of Messalonskee Lake is limited to a target of 0.5 ft, and that the minimum discharge from Long Pond may be 8 cfs for lengthy periods of time, then it is evident that the Water Level Order may impose significant limitations to water availability from Messalonskee Lake.

At first glance, the value of 8 cfs from Long Pond would appear to be exceeded virtually all of the time. However, three factors must be considered when evaluating the likelihood of achieving a continuous release of 8 cfs from Long Pond.

First, as considered above for the drainage area above Messalonskee Lake, evaporation losses can significantly reduce the availability of outflow from Long Pond. Applying evaporation losses, the median August flow from the exit of Long Pond is anticipated to be about 15 cfs.

Second, water use by hydrophytic, wetland vegetation, which was not considered in the above calculations, will also serve to reduce the availability of flow.

Finally, the goal to maintain levels in the Belgrade Lakes at spillway crest results in a lake management technique based on flow pulsing from impoundment to impoundment instead of continuous bypass with outflow equaling inflow less evaporation losses.

Giving due consideration to these three factors and the likelihood that conservative evaporation values have been used in the analysing, it is highly probable that the releases from Long Pond will be 8 cfs for significant periods of time. Figure 19 provides estimated flow duration curves with releases from Long Pond being limited to 8 cfs. ND&T recommends that these curves be used for planning purposes. Table 6 provides adjusted median inflows for July, August, and September derived by limiting the flow from Long Pond to 8 cfs.

The flow values in Table 6 are judged to represent reasonable values considering the significant effect that evaporation losses have on the Messalonskee watershed and the method of operating the Belgrade Lakes.

E. Use of Messalonskee Lake Storage for Low Flow Augmentation

There is no formal minimum release requirement at Messalonskee Lake Dam at present. The Maine DEP has established an expectation of a minimum release of 12 cfs as stated in its Water Level Order. CMP has estimated leakage losses at Messalonskee Lake Dam to be about 12 cfs to 15 cfs. The estimated median August inflow to Messalonskee Lake is 22 cfs. It is likely that this flow rate could be discharged 100% of the time from Messalonskee Lake Dam without impacting the sensitive lake level regime in Messalonskee Lake. However, it should also be recognized that evaporation rates could be somewhat higher than estimated during any given summer season. Therefore, some flexibility should be maintained by CMP in adjusting flows from Messalonskee Lake Dam to avoid impacts to Messalonskee Lake.

Table 6

Adjusted Median Inflows to
Messalonskee Lake Considering the Belgrade Lakes
Water Level Order

Month	Adjusted Median Inflow[1] (cfs)
July	31
August	22
September	20

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1. Values were arrived at by applying the median flow rate in cfs/mi^2 derived as described in Section III.B to the drainage area between Long Pond and Messalonskee Lake Dam (56 mi^2) then adding 8 cfs as outflow from Long Pond.

Available storage in Messalonskee Lake within the normal 0.5 ft operating band is estimated to be 1500 acre-feet. ND&T believes that the available storage in Messalonskee Lake could be used to maintain the 22 cfs when inflows are less than the August median value, but only to the extent that Messalonskee Lake is not drawn below elevation 234.9.

IV. CONCLUSIONS

Based on the hydrologic analysis presented in this report, Figures 4 through 15 represent the unregulated, long-term monthly flow characteristics of inflow and outflow from Messalonskee Lake without considering evaporation losses during the summer months. These curves were developed using flow data from similar, local drainages with little or no flow regulation and without significant impoundment area. The outflow curve is also considered representative of flows at the Oakland and Rice Rips Projects. Figures 16, 17, and 18 portray flow duration curve estimates for the Automatic and Union Gas Projects developed by the same technique with additional downstream drainage area contribution added.

These curves represent an overall, long-term perspective of flow characteristics for the drainage without intensive regulation. Using these data, the unregulated median August flow at Messalonskee Lake Dam is estimated at 44 cfs. This represents a local, site-specific estimate of the aquatic base flow (ABF) for an unregulated drainage without evaporation losses.

The Messsalonskee drainage however, is not typical of unregulated drainages, and is actually quite unique. Fully 17% of the drainage area consists of open surface waters (the Belgrade Lakes) and an additional 2 to 3% of the surface area consists of wetlands. This exceptionally large surface water area and extensive wetland area results in large evaporative losses during the summer months. Finally, water management on the drainage is focused on regulating water levels at or near full pond throughout the summer for recreational use on the Belgrade Lakes. Therefore, when significant precipitation occurs there is little or no capacity to capture and store it.

These unique drainage basin characteristics and water management practices result in a significant reduction of summer flows. Summer inflow to Messalonskee Lake is likely to be limited to only 8 cfs, the minimum release required by water Level Order L-011097-36-A-N, for weeks at a time. Adding the drainage basin contributions below Wings Mills Dam, this amounts to approximately 22 cfs at Messalonskee Lake Dam. These extended low flow periods will result in an actual median August flow of approximatley 22 cfs.

Acknowledging these flow restrictions, ND&T developed the curves presented in Figure 19, assuming only an 8 cfs discharge from Long Pond. These curves represent conservative, yet realistic, estimates of available flow at Messalonskee Lake Dam during critical low flow months, and are recommended for use when considering alternative flow regimes in Messalonskee Stream. A comparison of estimated unregulated versus actual (regulated) median inflows to Messalonskee Lake during July, August and September is presented in Table 7.

Based upon these analyses, the flow available for continuous release for the critical summer months is about 22 cfs. The limited available storage in Messalonskee Lake (1,500 acre-feet) could be used to maintain the median flow during times when inflows are less than the median value. This assumes that water management on the Belgrade Lakes (including Messalonskee Lake) will continue to focus on the maintenance of stable near-full pond levels during the summer months. Given that the evaporation rates applied to the Belgrade Lakes are estimates only, ND&T recommends that CMP retain some flexibility in adjusting discharges from Messalonskee Lake Dam if target lake levels become threatened during any given period.

Table 7

Estimated Unregulated and Actual Median Inflows to Messalonskee Lake

	Median Inflow (cfs)	
	Estimated Unregulated	Estimated Actual
July	73	31
August	44	22
September	37	20

FIGURES

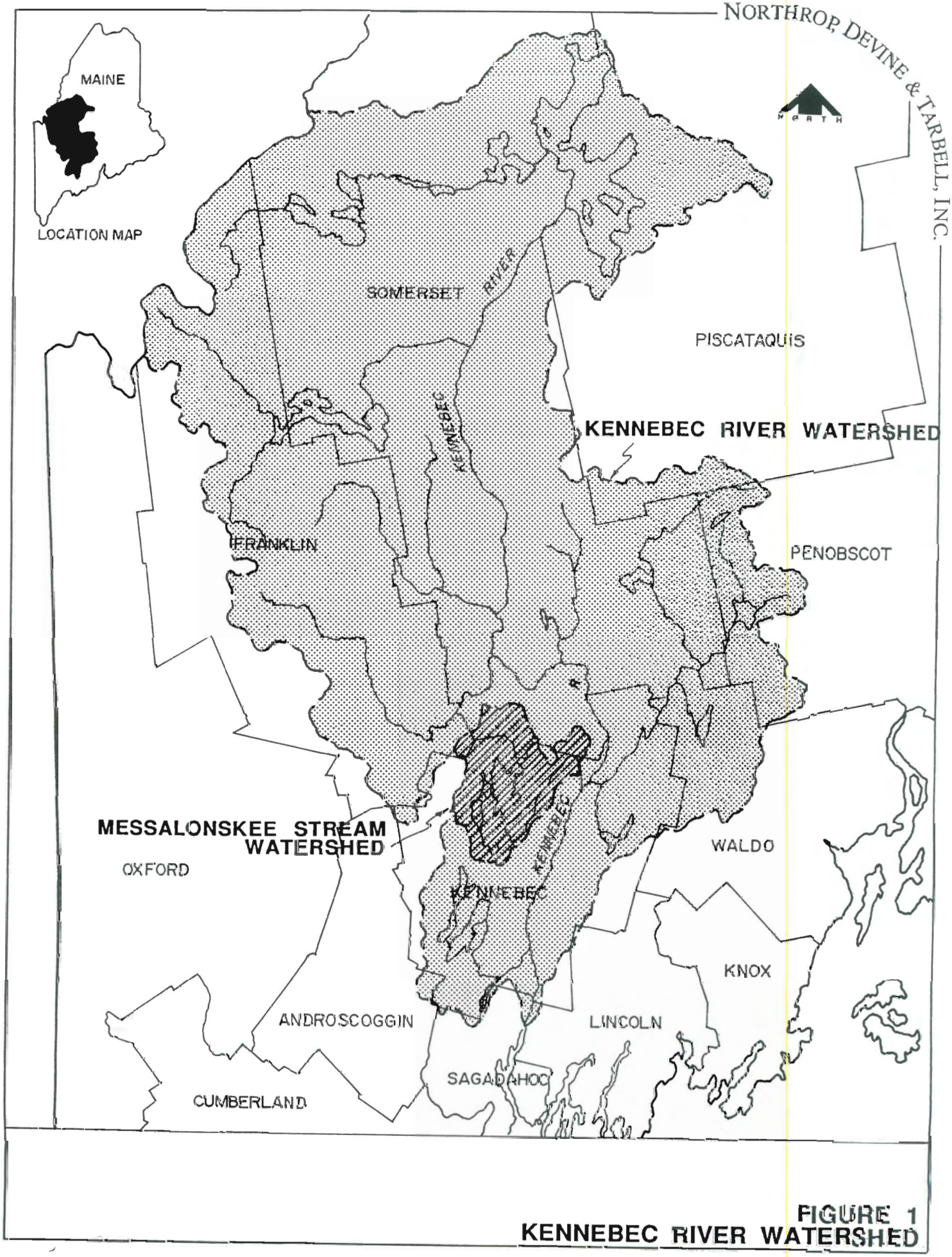


FIGURE 1
KENNEBEC RIVER WATERSHED

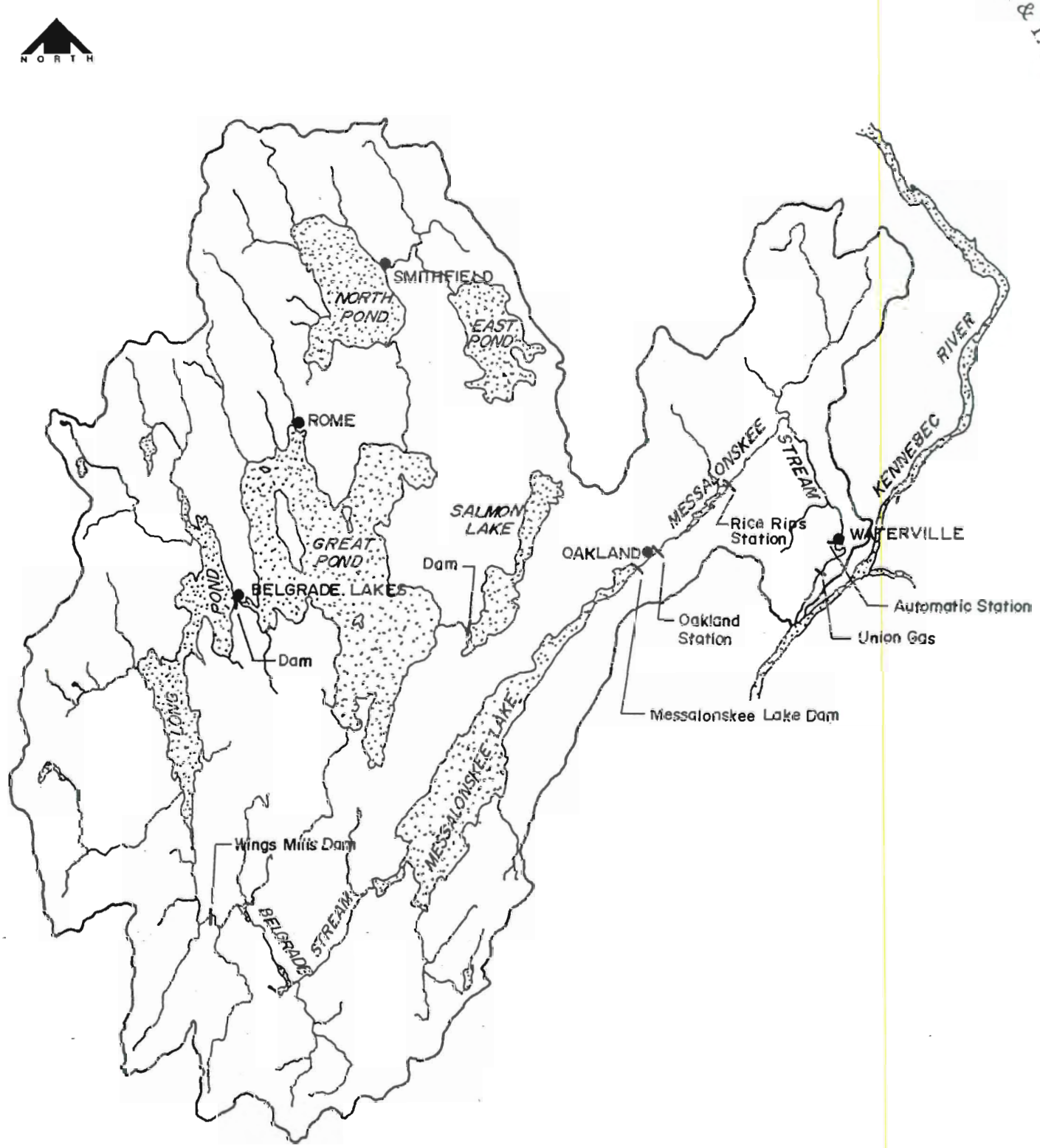


FIGURE 2
MESSALONSKEE STREAM WATERSHED

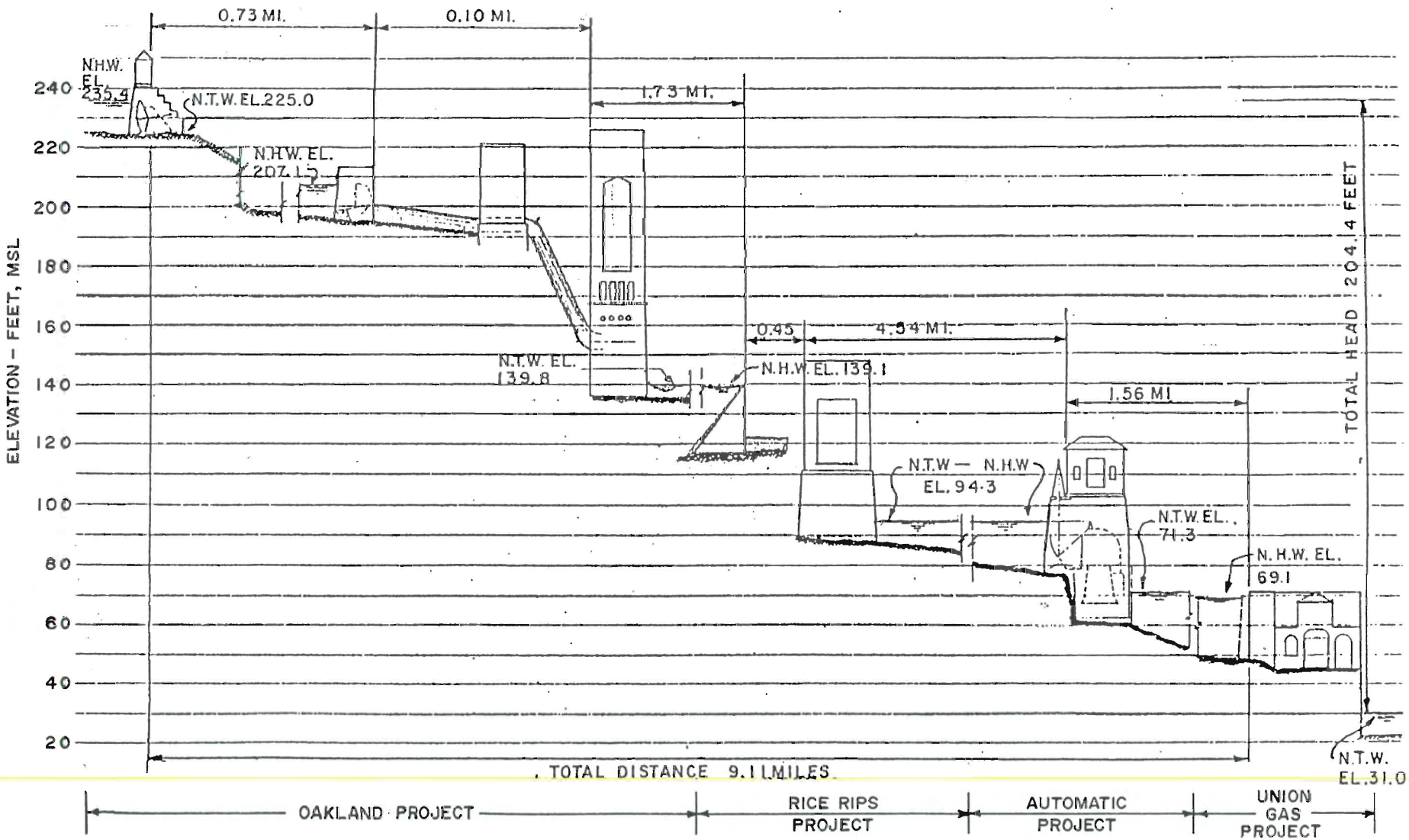


FIGURE 3
PROFILE
MESSALONSKEE STREAM

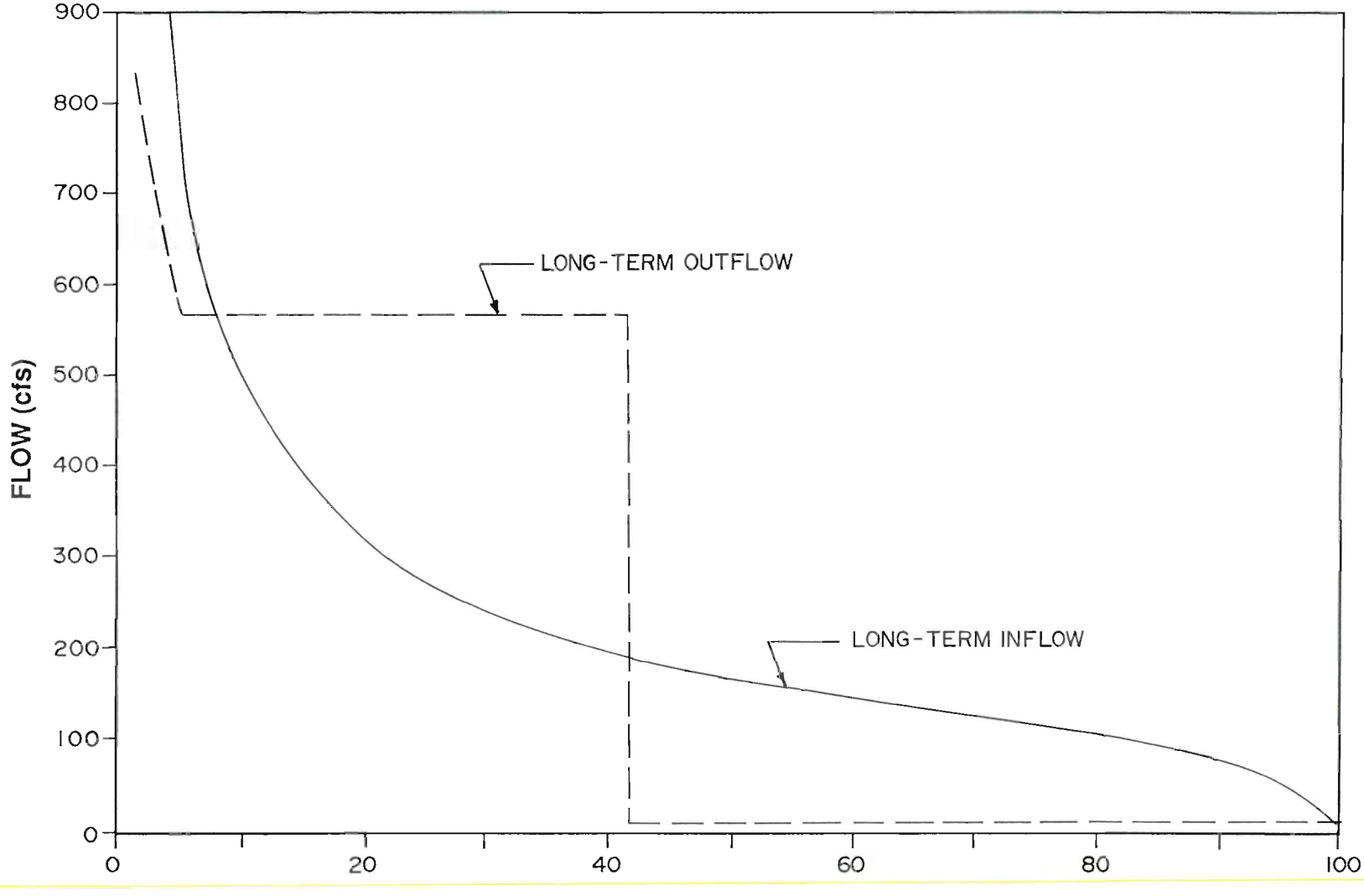


FIGURE 4
ESTIMATED FLOW DURATION CURVE
MONTH OF JANUARY
MESSALONSKEE LAKE DAM

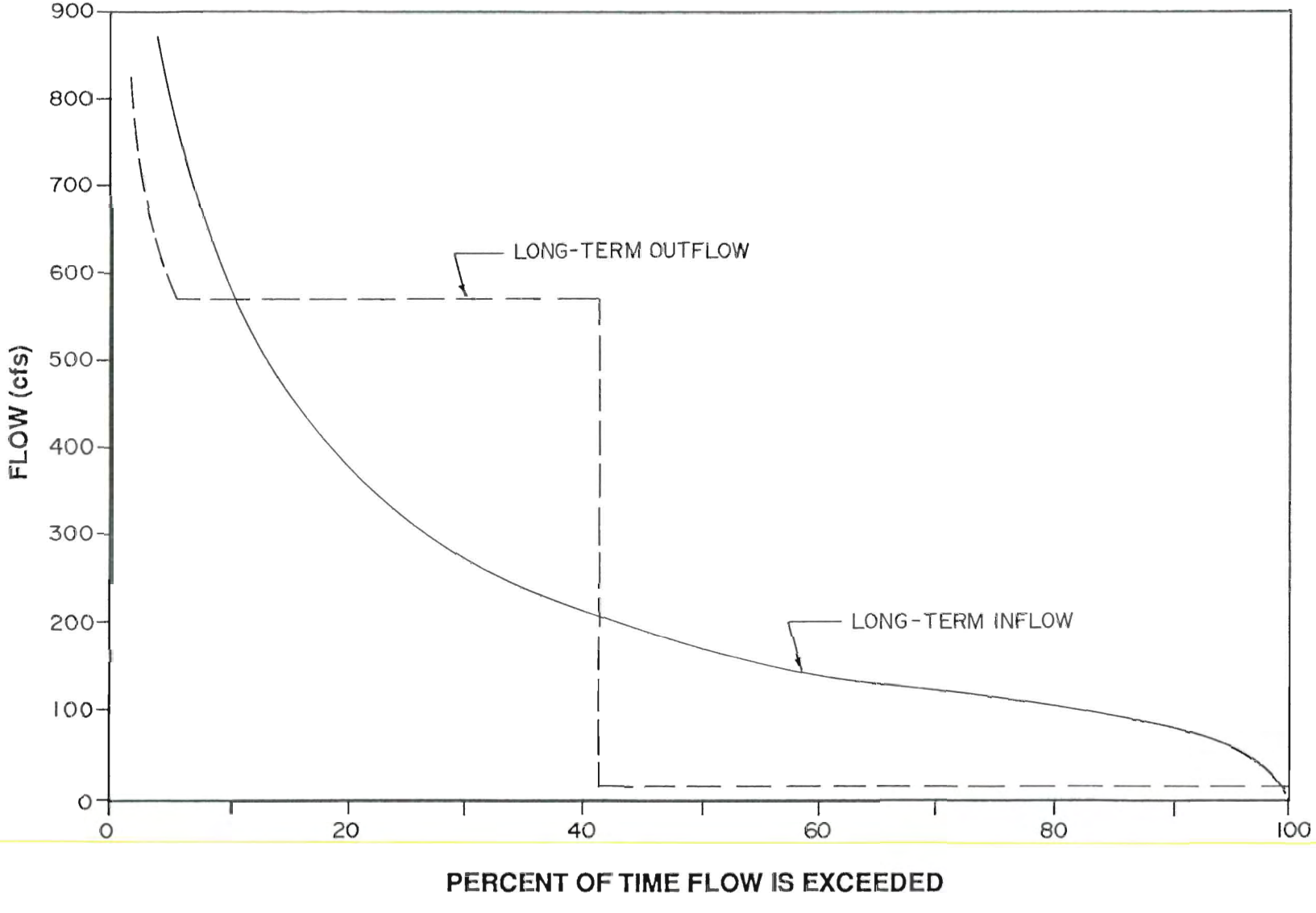


FIGURE 5
ESTIMATED FLOW DURATION CURVE
MONTH OF FEBRUARY
MESSALONSKEE LAKE DAM

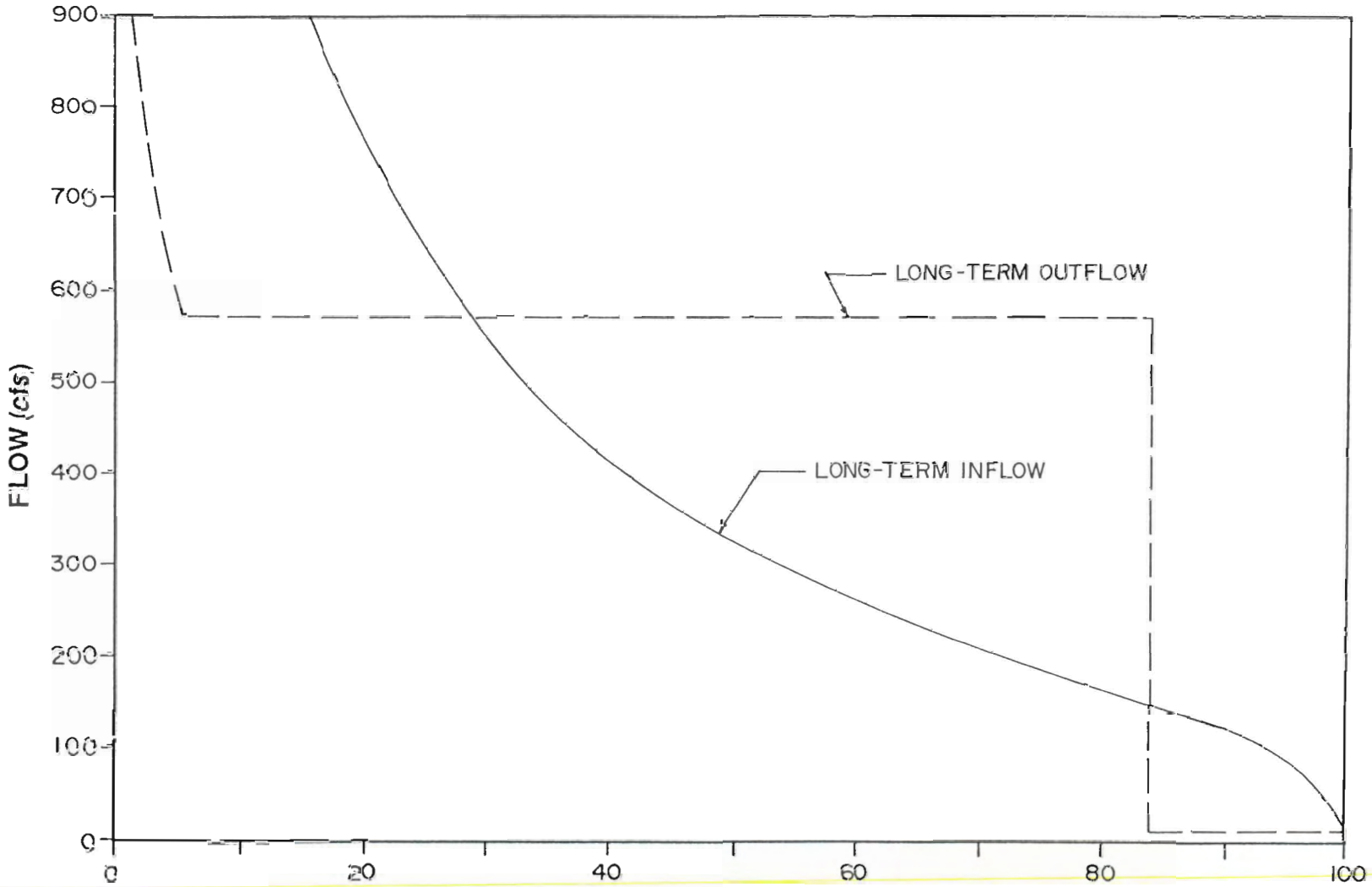


FIGURE 6
ESTIMATED FLOW DURATION CURVE
MONTH OF MARCH
MESSALONSKEE LAKE DAM

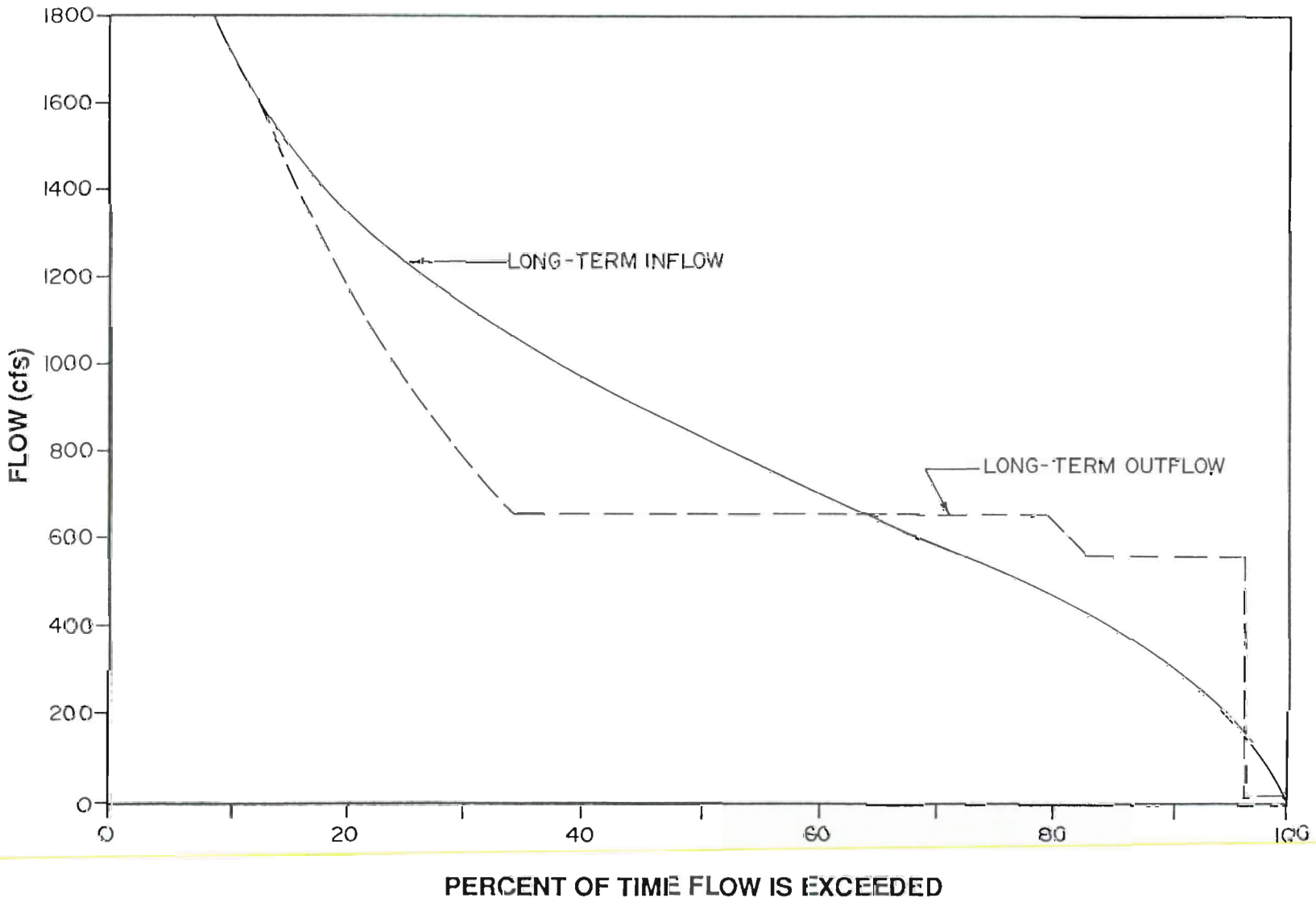


FIGURE 7
ESTIMATED FLOW DURATION CURVE
MONTH OF APRIL
MESSALONSKEE LAKE DAM

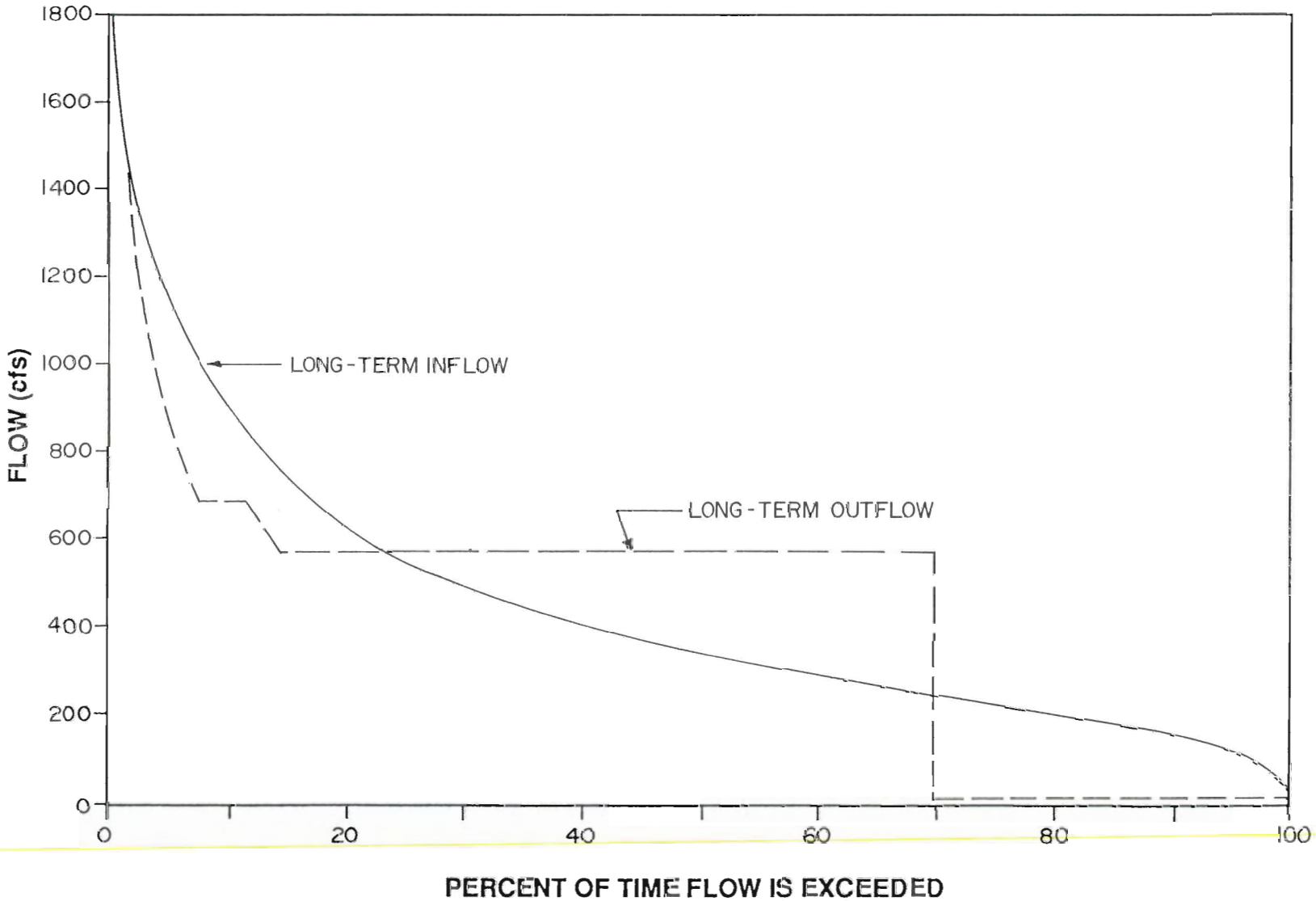


FIGURE 8
ESTIMATED FLOW DURATION CURVE
MONTH OF MAY
MESSALONSKEE LAKE DAM

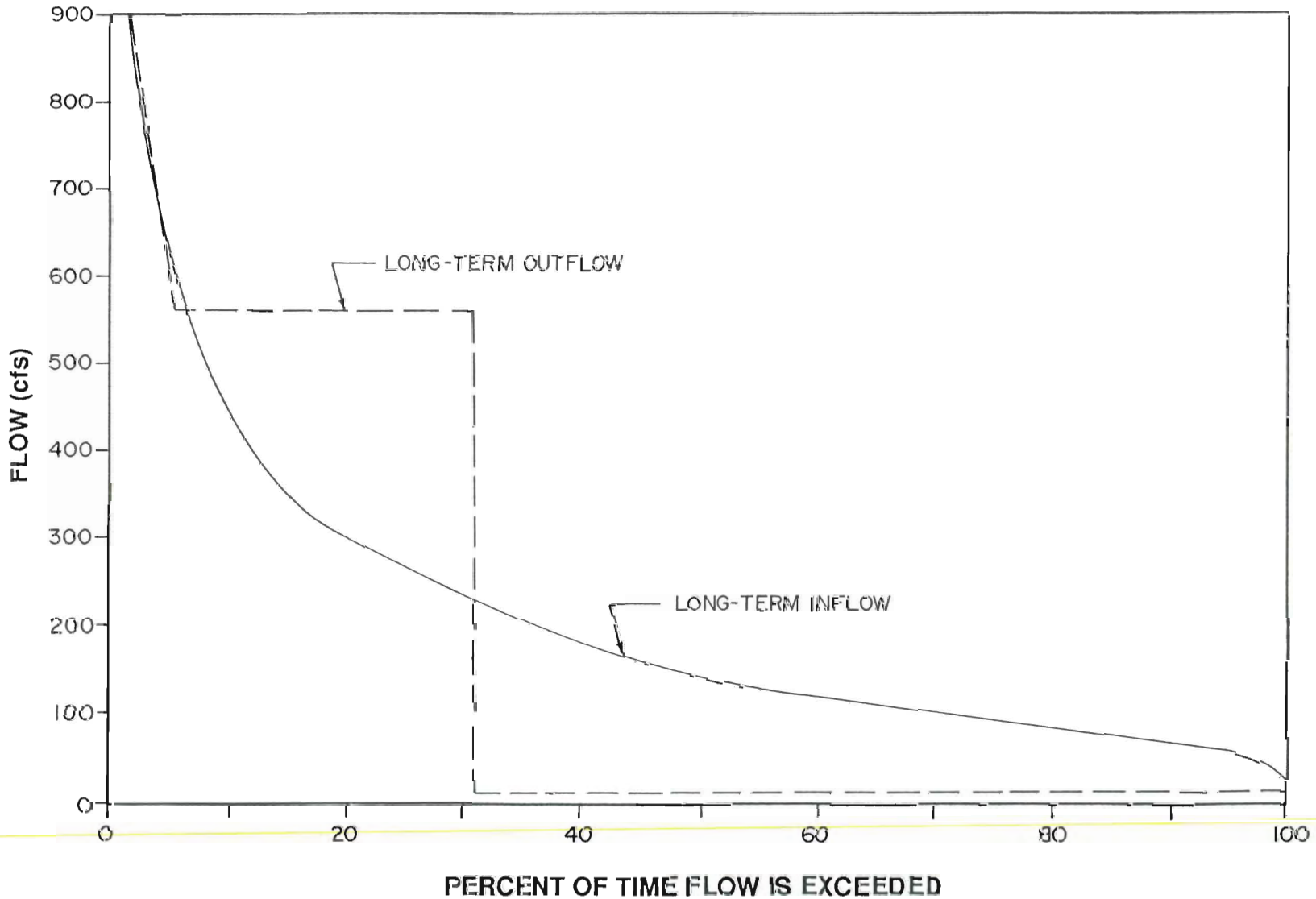
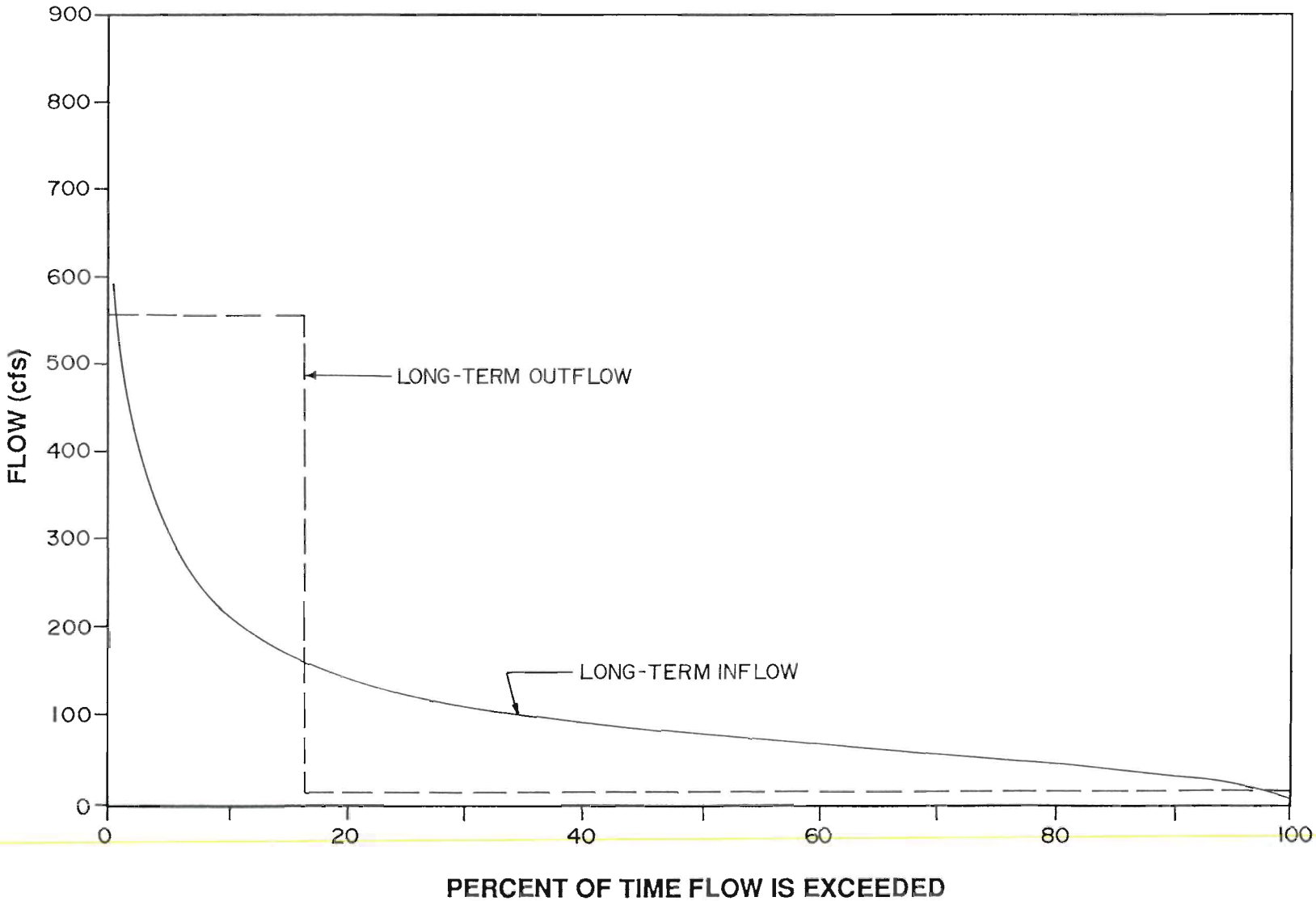


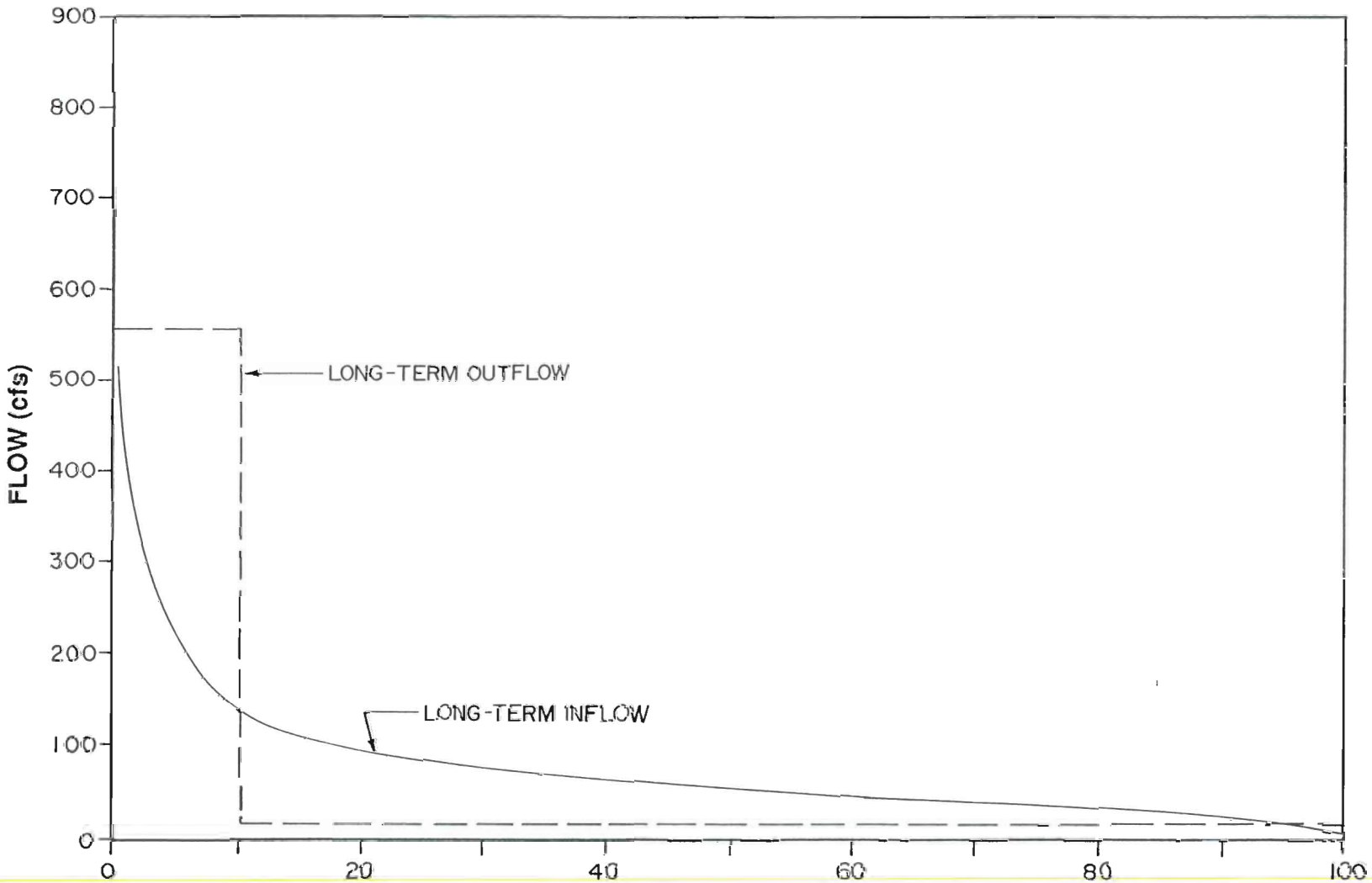
FIGURE 9
ESTIMATED FLOW DURATION CURVE
MONTH OF JUNE
MESSALONSKEE LAKE DAM

NOTE: DOES NOT INCLUDE EVAPORATION LOSS.
SEE TEXT, SECTION III.C.



NOTE: DOES NOT INCLUDE EVAPORATION LOSS.
SEE TEXT, SECTION III.C.

FIGURE 10
ESTIMATED FLOW DURATION CURVE
MONTH OF JULY
MESSALONSKEE LAKE DAM



NOTE: DOES NOT INCLUDE EVAPORATION LOSS. SEE TEXT, SECTION III.C.

FIGURE 11
ESTIMATED FLOW DURATION CURVE
MONTH OF AUGUST
MESSALONSKEE LAKE DAM

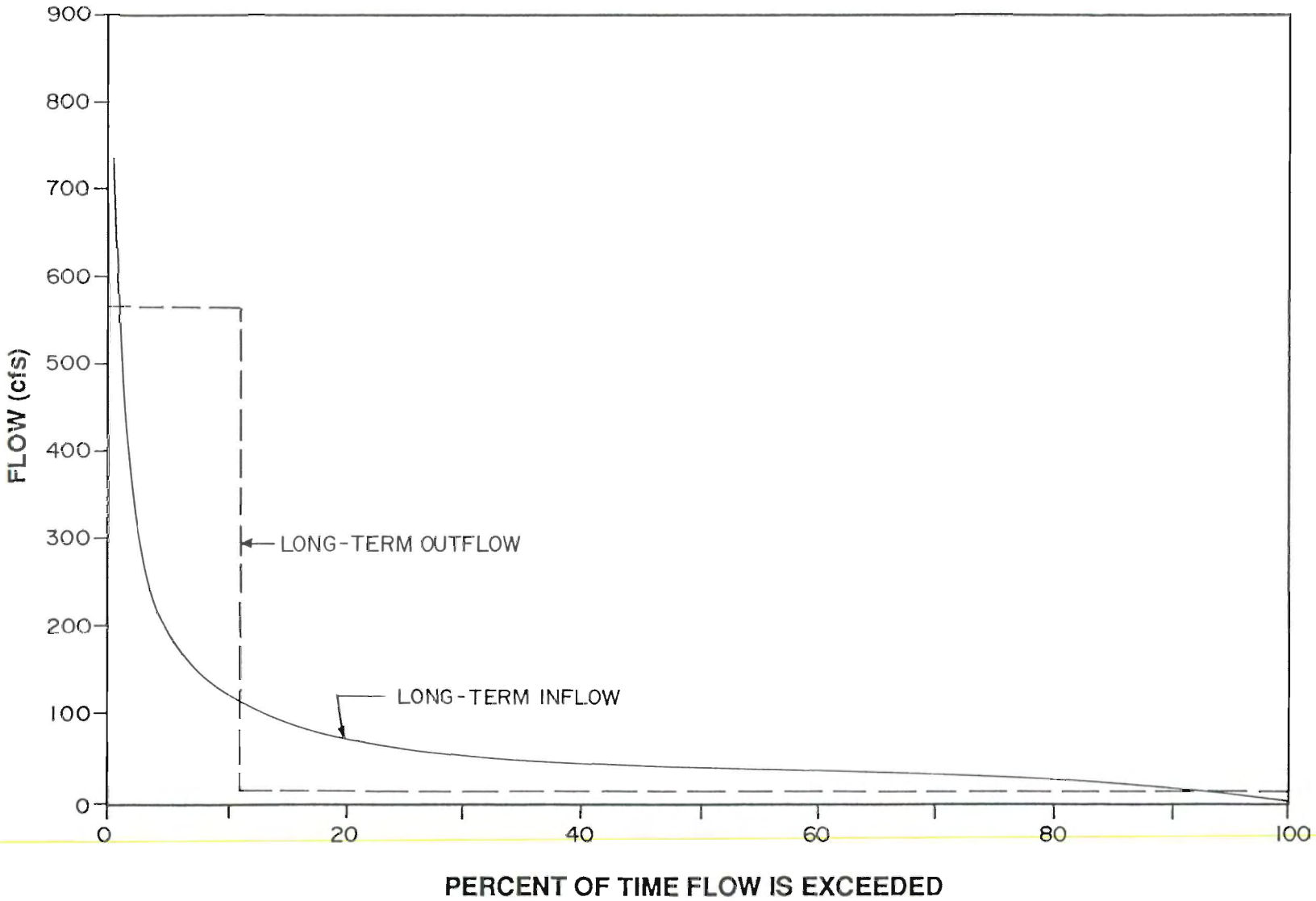


FIGURE 12
ESTIMATED FLOW DURATION CURVE
MONTH OF SEPTEMBER
MESSALONSKEE LAKE DAM

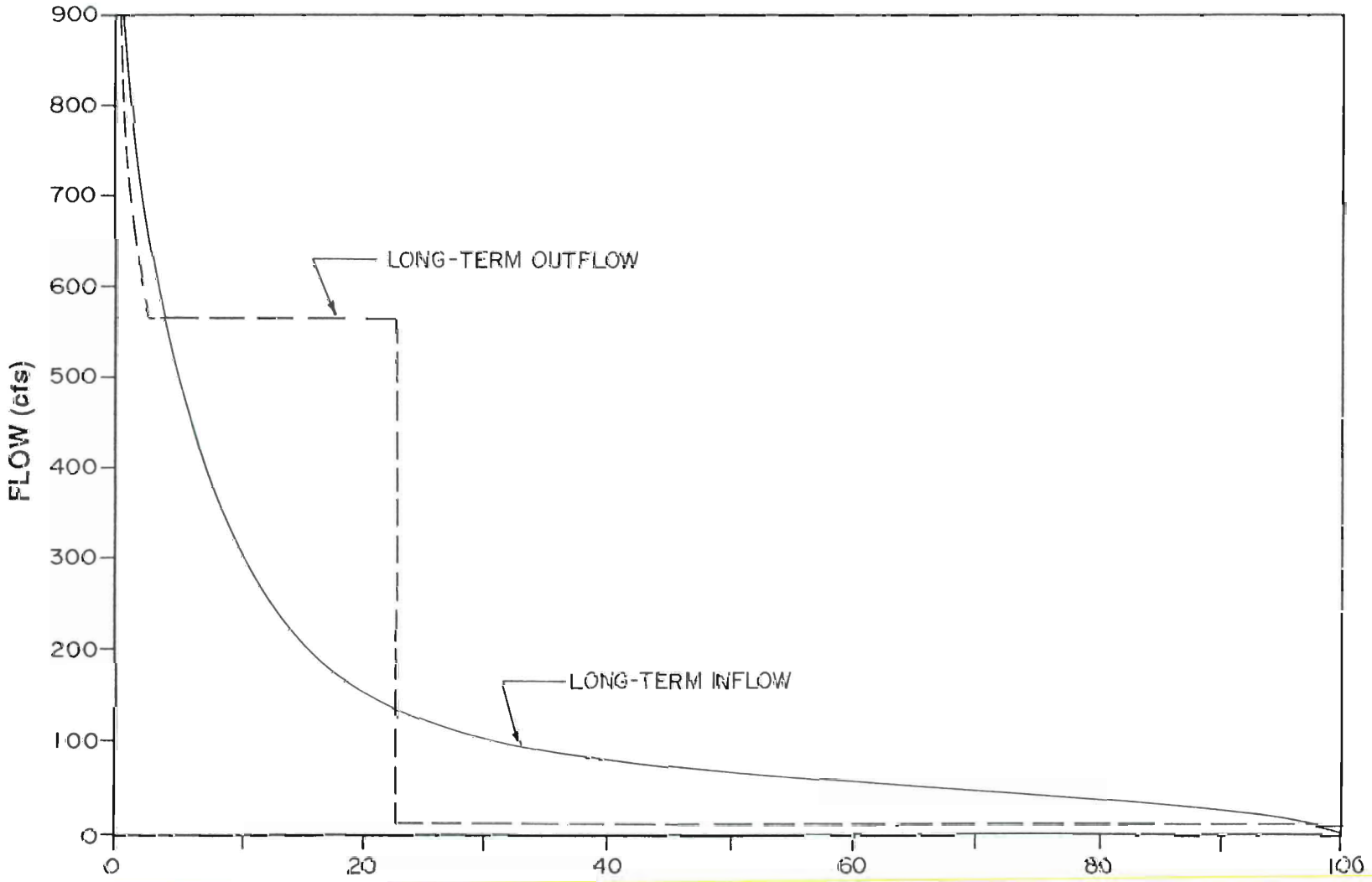


FIGURE 13
ESTIMATED FLOW DURATION CURVE
MONTH OF OCTOBER
MESSALONSKEE LAKE DAM

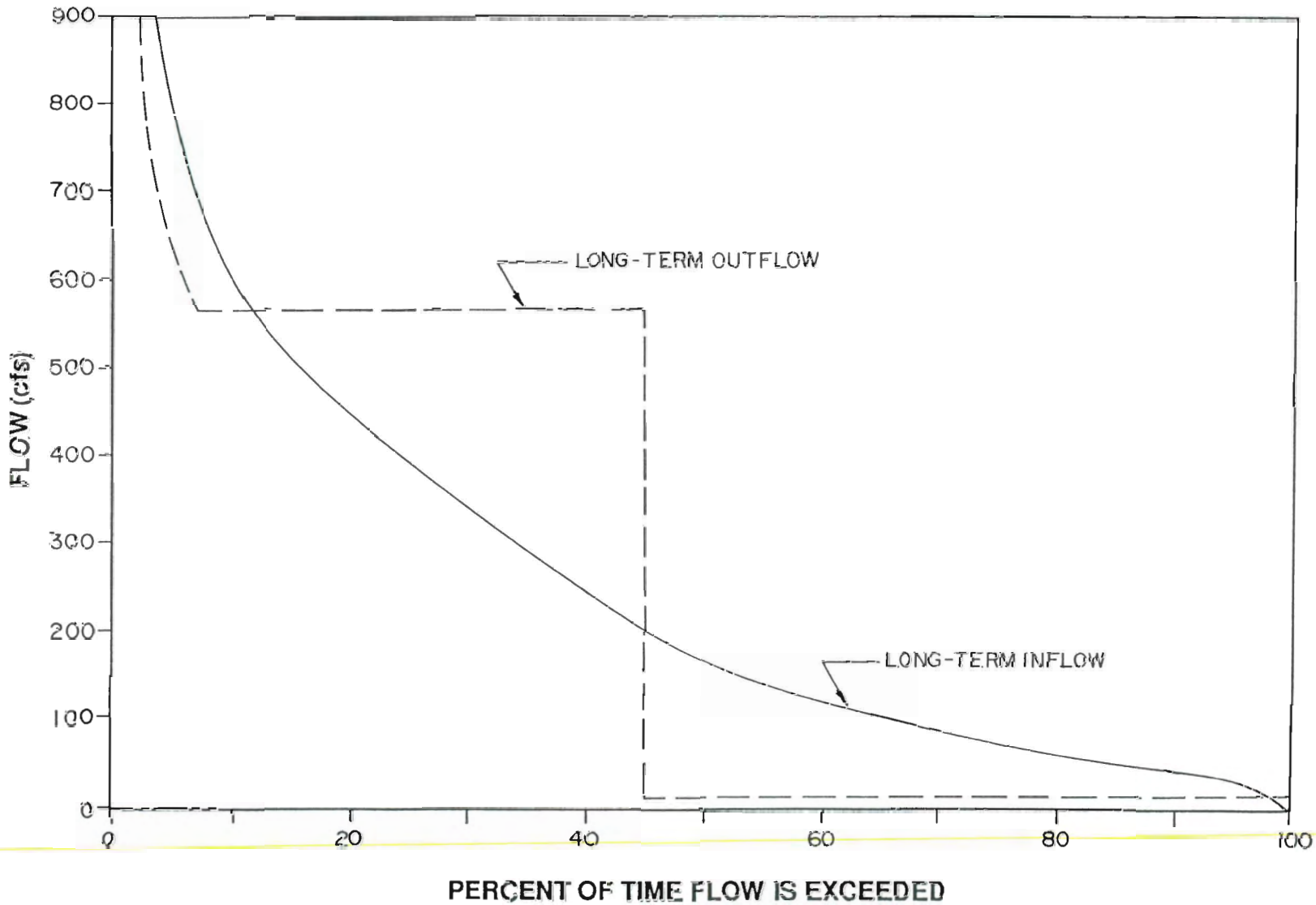


FIGURE 14
ESTIMATED FLOW DURATION CURVE
MONTH OF NOVEMBER
MESSALONSKEE LAKE DAM

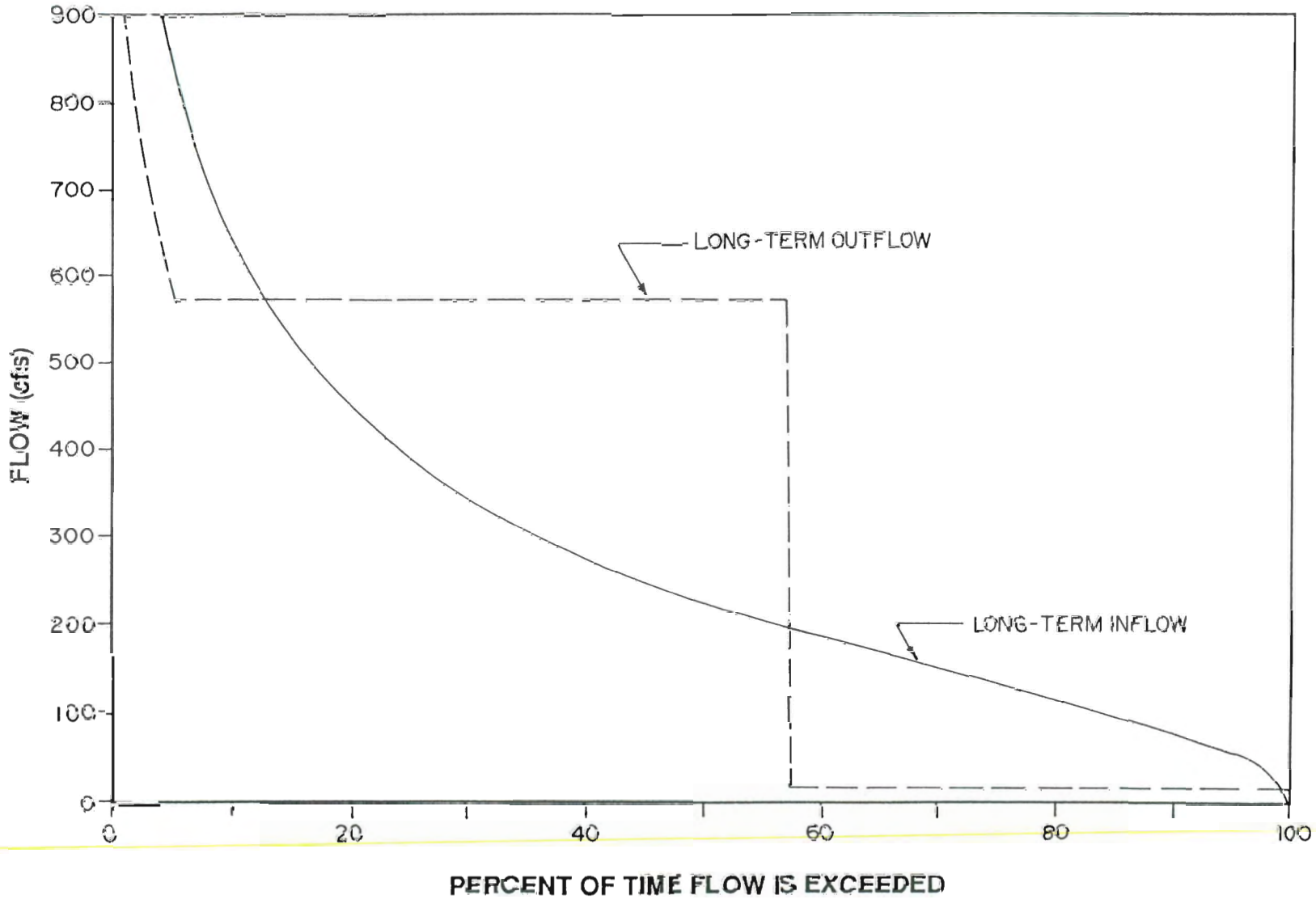
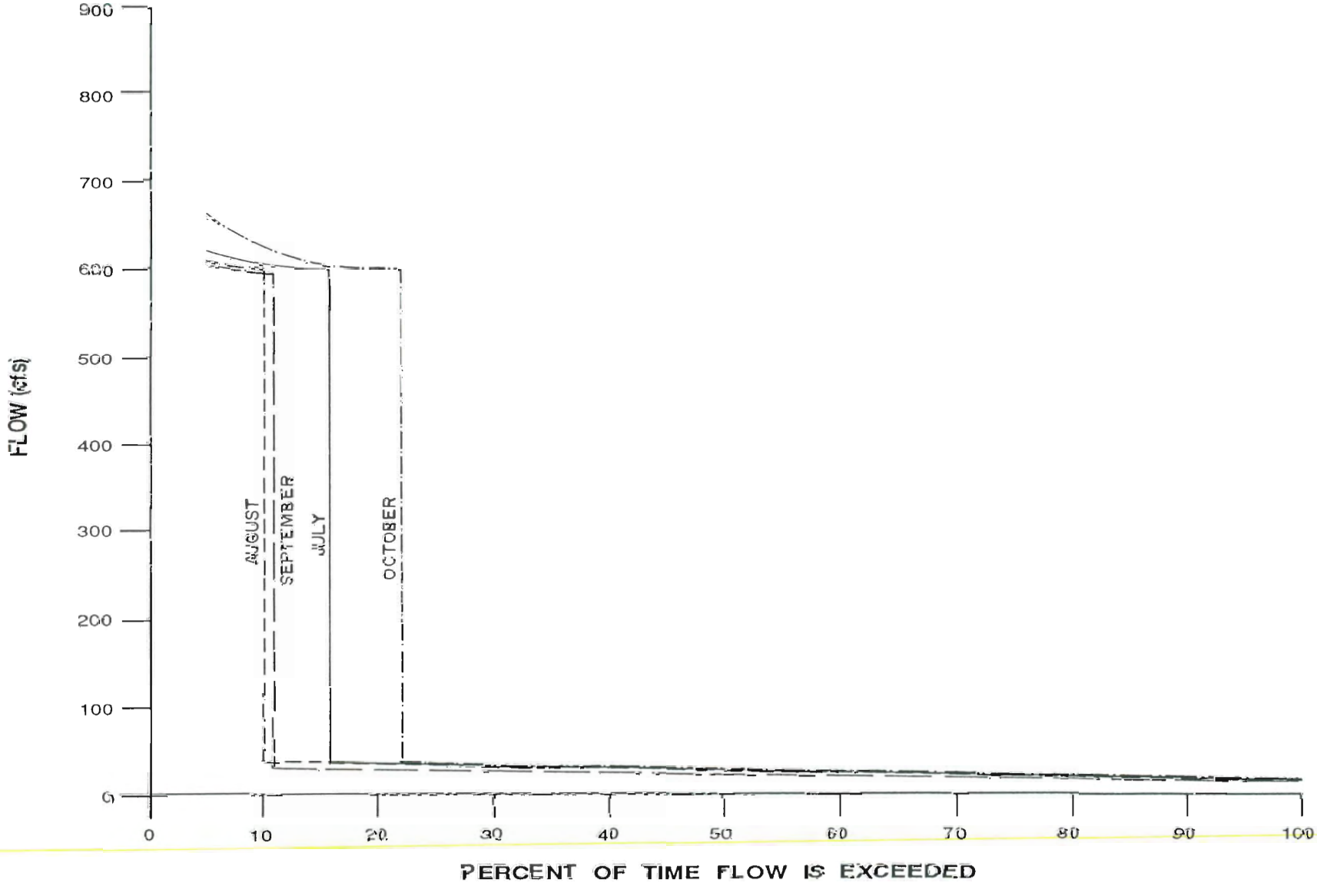


FIGURE 15
ESTIMATED FLOW DURATION CURVE
MONTH OF DECEMBER
MESSALONSKEE LAKE DAM



NOTE: DOES NOT INCLUDE EVAPORATION LOSS.
SEE TEXT, SECTION III.C.

FIGURE 15
ESTIMATED FLOW DURATION CURVES
AUTOMATIC AND UNION GAS PROJECTS FOR
JULY, AUGUST, SEPTEMBER, OCTOBER

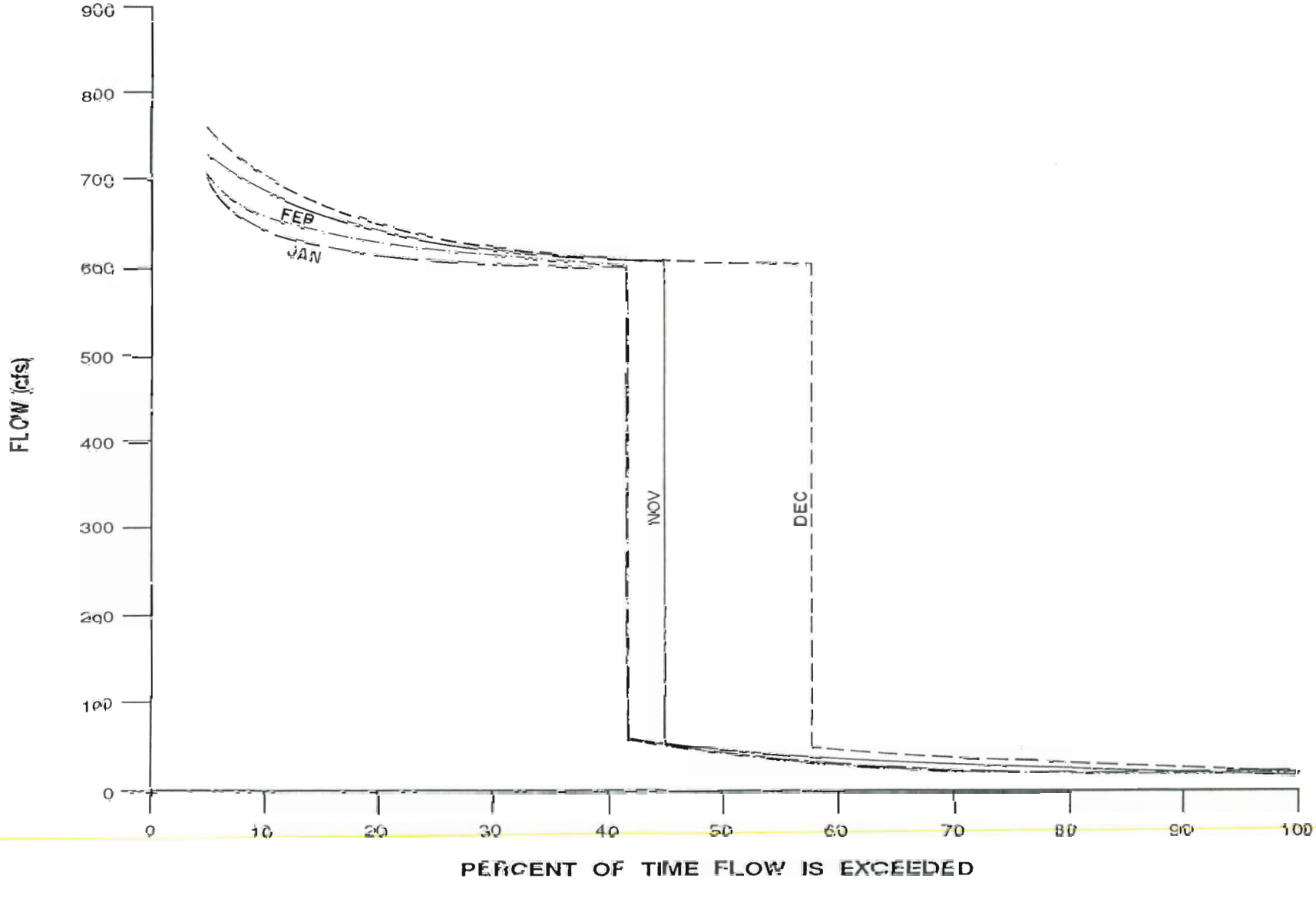
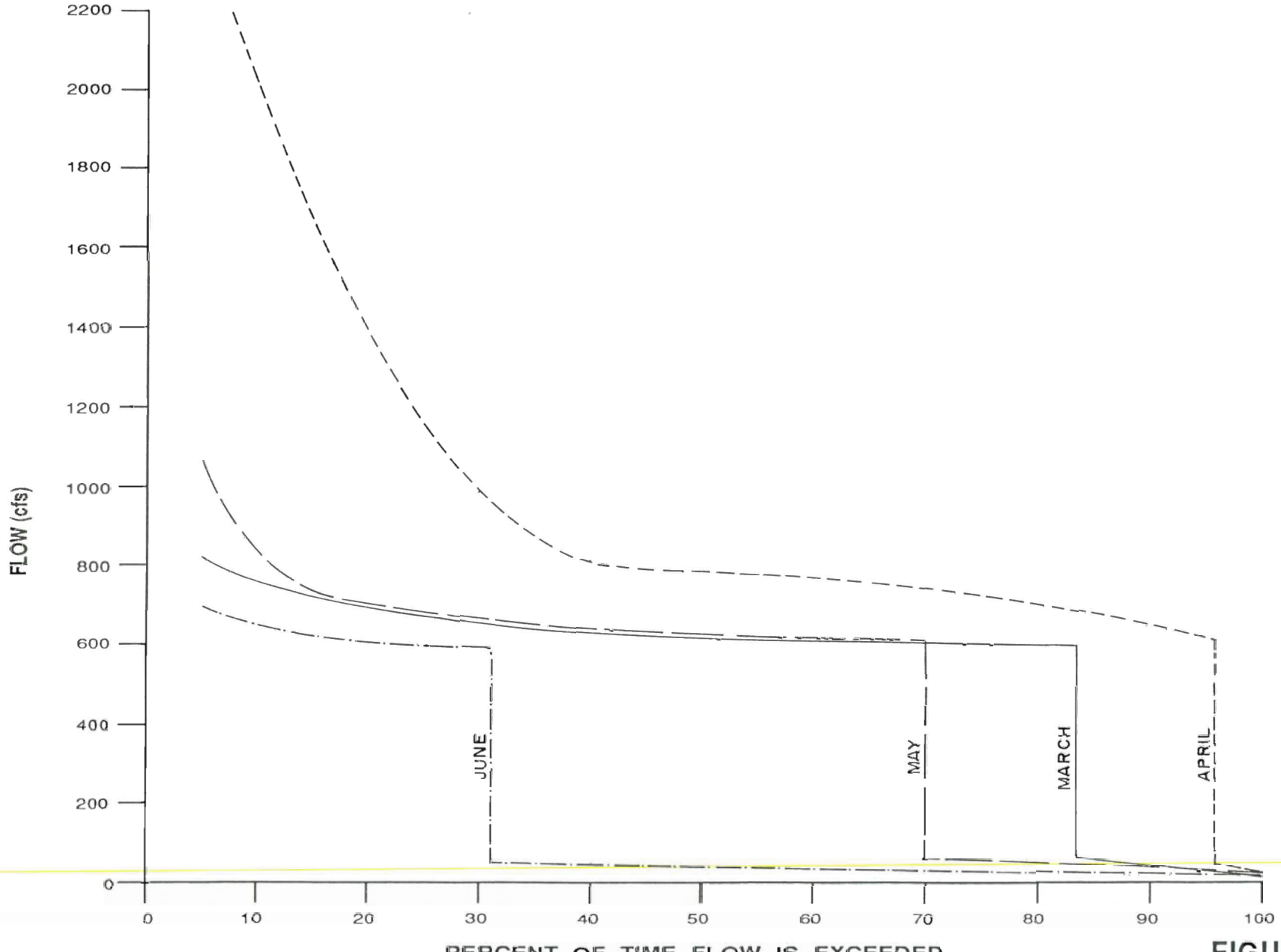
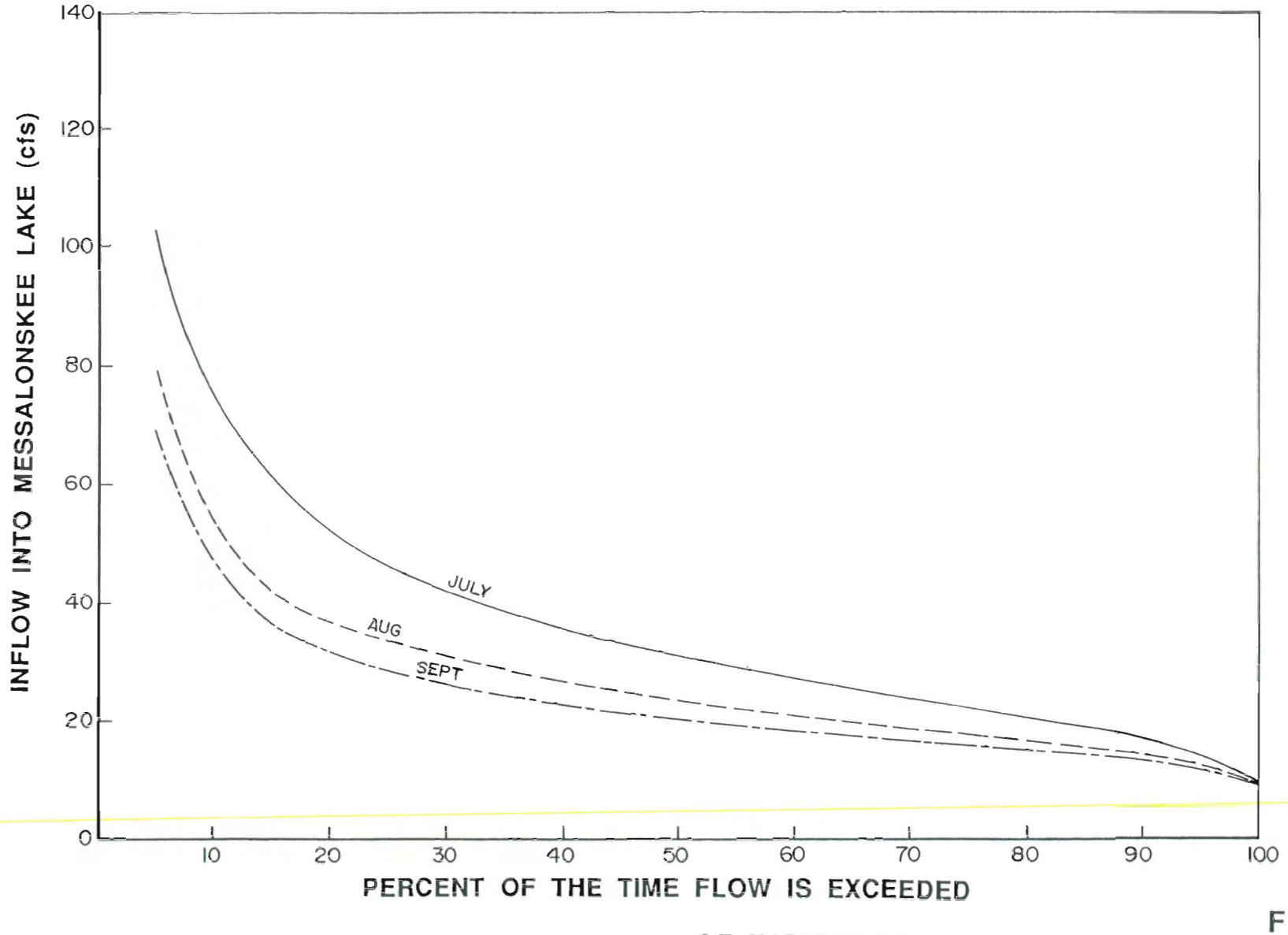


FIGURE 17
ESTIMATED FLOW DURATION CURVES
AUTOMATIC AND UNION GAS PROJECTS FOR
NOVEMBER, DECEMBER, JANUARY, FEBRUARY



NOTE: DOES NOT INCLUDE EVAPORATION LOSS. SEE TEXT, SECTION III.C.

FIGURE 18
ESTIMATED FLOW DURATION CURVES AUTOMATIC AND UNION GAS PROJECTS FOR MARCH, APRIL, MAY, JUNE



NOTE: ADJUSTED FOR 8 cfs INFLOW FROM LONG POND TO SIMULATE CURRENT WATER MANAGEMENT PRACTICES.

FIGURE 19
ADJUSTED FLOWS INTO MESSALONSKEE LAKE FOR JULY, AUGUST, SEPTEMBER

APPENDIX

Appendix 1

Water Level Order #L-011097-36-A-N

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

BOARD ORDER
IN THE MATTER OF

SALMON LAKE Oakland and Belgrade	)	MAINE DAM INSPECTION, REGISTRATION and ABANDONMENT ACT
GREAT POND Rome and Belgrade	)	
LONG POND Rome Belgrade and Mt. Vernon Kennebec County	)	
WATER LEVEL ORDER #L-011097-36-A-N	)	FINDINGS OF FACT AND ORDER

Pursuant to the provisions of Title 38, M.R.S.A., Section 840, the Board of Environmental Protection has considered a public petition to establish a water level regime for SALMON LAKE, GREAT POND and LONG POND, with its supportive data, staff summary, agency review comments, public hearing transcript, comments from the public, and other related materials on file and finds the following facts:

1. PETITION AND HEARING

On May 30, 1985, the Board received a petition from the selectpersons of Belgrade, owners of the dams to establish a water level regime for Salmon Lake, Great Pond and Long Pond. A public hearing, in response to this petition was held in Belgrade, Maine on August 7, 1985.

2. SETTING

Salmon Lake, Great Pond and Long Pond water levels are controlled by outlet dams (State ID#'s 457, 455, 452 respectively). All three dams are jointly owned by the Towns of Belgrade and Rome. A summary of the dams' characteristics is provided in Table 1. None of the dams have fish passage facilities.

In addition to Salmon Lake and Great and Long Ponds, other major water bodies in the Belgrade Lakes watershed, include East and North Ponds, and Messalonskee Lake (Snow Pond) (see Figure attached). The entire watershed drains via Messalonskee Stream into the Kennebec River at Waterville. Being a chain of lakes, water levels on these water bodies are best controlled when they are managed as a system and operated in a coordinated manner. The watershed is primarily forest with some agriculture and rural residential and village areas. There are over 800 residences around the three lakes, the vast majority of which are seasonal, and numerous commercial establishments including marinas and fishing camps.

3. HISTORIC WATER LEVELS

The three dams were built in the late 1800's - early 1900's. Central Maine Power Company had ownership until 1980, when all three dams were sold to the Belgrade Development Corp., of which Thomas Blackburn was the sole stockholder. Between 1983 and 1985 the towns of Belgrade and Rome jointly acquired ownership of the three dams. The dams are currently operated and maintained by the Belgrade Area Dams Committee (BADC) established by the Interlocal Agreement for the management of the Belgrade Area dams.

TABLE I

BELGRADE LAKES DAMS

	Surface Area (acres)	Watershed Area (sq. mi.)	Spillway Elevation (above msl, feet)	Dam height (feet)	Dam length (feet)	Dam type	Gate type(#)	Gate dimensions (feet)
SALMON LAKE	667	8.5	278.0	9	160 (10 foot spillway)	concrete/ earth	taintor(1)	9' 10" x 7'6"
GREAT POND	8,228	82.9	247.7	14	212 (66 foot spillway)	concrete/ stone/earth	taintor(2)	9' x 9' 7" 9' x 9' 7"
LONG POND	2,718	121.0	238.1	7	190 (107 foot spillway)	stone/wood	lift(2)	6'10" x 6'7" 6'10" x 6'1

SALMON LAKE Oakland and Belgrade	)	2 MAINE DAM INSPECTION, REGISTRATION and ABANDONMENT ACT
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For the last 30 - 40 years of their ownership CMP was operating the dams principally for recreational uses and to prevent flooding. They accomplished this goal by maintaining water levels at or near the spillway crest during the summer months and drawing the lake down semi-annually, usually achieving lowest levels during mid to late October and again in mid to late March. The degree of drawdown was dependent on weather and other factors, but was typically in the range of 1.3, 2.4, and 1.1 feet below spillway for Salmon Lake, Great Pond and Long Pond respectively.

In August, 1980, in response to a petition signed by greater than 10% of the littoral proprietors on the three lakes, and after conducting a public hearing, the Soil and Water Conservation Commission established a water level regime for Salmon Lake and Great and Long Ponds. The Commission's orders are summarized as follows:

a. The dam owner shall attain a maximum water level on June 1. Once this level is reached, the dam should not be manipulated between June 1 and September 10th except to assure the maximum level is not exceeded. Maximum levels (corrected) are:

Salmon Lake	278.25 feet above msl	.25 feet above spillway
Great Pond	247.95 feet above msl	.25 feet above spillway
Long Pond	238.35 feet above msl	.25 feet above spillway

b. On September 15th, the dam owner will commence a drawdown to a level of one foot below spillway height. This level should be stable by October 31st and maintained as stable as possible through ice out.

During the Blackburn years the dams were not as actively managed as during CMP's ownership. The result was widely fluctuating water levels, culminating with water levels on Great Pond in June, 1984 equivalent to a 100 year flood.

Since taking over the operation and maintenance of the dams, the Belgrade Area Dams Committee has developed a water levels management plan for the three lakes. The BADC's Management Plan was developed after reviewing historical water levels data, flow discharge curves, flood studies, precipitation and evaporation data, etc. and after consultation with the Department of Environmental Protection and the Department of Inland Fisheries & Wildlife among others. The Plan was promulgated at three public meetings, including the DEP sponsored public hearing and has received almost unanimous public support. The BADC's management plan is

more comprehensive than the SWCC order and the Committee feels will serve the residents of Belgrade and Rome with more responsible water level management. The BADC would like to be able to implement more extensive drawdowns during the fall/winter period; provide for minimum flow out of Salmon Lake; manage summer water levels; and set minimum level summer goals.

Therefore, the BADC, through the offices of the Selectpersons of Belgrade and Rome, has requested that the Board of Environmental Protection revise the SWCC order to accommodate their proposed management plan.

Caculated flood levels are presented below:

	SPILLWAY	FLOOD		
		10 YR.	50 YR.	100 YR.
SALMON	278.0	278.7	279.1	279.2
GREAT POND	247.7	248.4	248.8	249.0
LONG POND	238.1	240.0	241.2	241.8

4. WATER LEVEL CONSIDERATION

A. Public Rights of Access and Use

SALMON LAKE

Salmon Lake is connected via a thoroughfare to McGrath Pond. Public access to both water bodies is via McGrath Pond. Water levels lower than 1 foot below spillway might interfere with passage between the two ponds.

GREAT POND

The Bureau of Parks and Recreation maintains a public boat launching facility on Great Pond. It is located in a relatively shallow area. Extreme lowering of water levels could make this facility unusable. The U.S. Postal Service operates a mail boat on Great Pond. The delivery route has 86 stops and runs from June 1 until September 30th. At 8 inches below spillway the mailboat would not be able to land at several docks. After Labor Day, the mail carrier can switch to a smaller craft due to fewer deliveries, thereby gaining access to the shallower docks. The mail carrier finds the BADC proposal acceptable.

SALMON LAKE Oakland and Belgrade	)	4 MAINE DAM INSPECTION, REGISTRATION and ABANDONMENT ACT
GREAT POND Rome and Belgrade	)	
LONG POND Rome Belgrade and Mt. Vernon Kennebec County	)	
WATER LEVEL ORDER #L-011097-36-A-N	)	FINDINGS OF FACT AND ORDER

LONG POND

Long Pond is divided into north and south basins by a constriction of the lake in what is known as Castle Island. Castle Island is the site of a commercial fishing establishment renting boats and cabins. It is also an area much affected by both flooding and low water conditions. At 1 foot above spillway, docks begin to be inundated; at the 1.4 foot level the lowest cabin has water at its doorstep. At the 10 year flood level most of the island has water on it. The Bureau of Parks and Recreation has a boat launch facility south of the Castle Island causeway. At times of low water, passage at the throroughfare is very difficult. The owner of Castle Island claims that at 0.5 feet below spillway propellers are damaged and other problems arise.

B. Public Safety

Public safety was not found to be an issue of significant impact.

C. Fish and Wildlife Habitat; Water Quality

The primary focus of fishery management is for brown trout/black bass/white perch at Salmon Lake, and landlocked salmon/black bass/white perch for both Great and Long Ponds. Since sufficient, high quality spawning and nursery habitat is lacking, the cold water sport fisheries of these waters are based on an annual stocking program. The warmwater sport fisheries are sustained through natural reproduction. Maintenance of stable water levels (±1 foot) in the spring and early summer is important to successful fishery management of all three of these waters. The water level management plan proposed by BADC does not threaten the gamefish populations of the Belgrade Lakes.

A primary focus regarding wildlife is the maintenance and stabilization of water levels during the nesting and brood rearing season for waterfowl, including loons. To this end, water levels should become stabilized as soon after ice out as reasonably possible and maintained stable until at least July 1.

Relative to fall drawdown, it is desirable to achieve a stable water level a few weeks prior to ice-in if possible. This allows aquatic furbearers such as muskrat and beaver to establish lodges and food stockpiles before mobility is restricted by ice cover. Water level stability should be maintained through the winter.

SALMON LAKE Oakland and Belgrade	)	5 MAINE DAM INSPECTION, REGISTRATION and ABANDONMENT ACT
GREAT POND Rome and Belgrade	)	
LONG POND Rome Belgrade and Mt. Vernon Kennebec County	)	
WATER LEVEL ORDER #L 011097-36-A-N	)	FINDINGS OF FACT AND ORDER

Both Great and Long Ponds have good to excellent water quality. Salmon Lake has had periodic algal blooms in recent years. Extreme high water would mean increased shoreline erosion and possible inundation of septic systems in low lying areas. In each case the results would be increased movement of nutrients into the lake.

Salmon Lake was the recipient of a federal lake restoration grant to reverse a cultural eutrophication problem. Virtually all the restoration effort went toward reducing non-point runoff of phosphorus into the lake. When water quality in the lake is eutrophic, generally from August into October, flushing is virtually nonexistant; therefore, no net export of nutrients occurs to improve lake water quality. Flushing of eutrophic water would accelerate Salmon Lake's recovery. Removal of large amounts of nutrients could be accomplished if the dam gate were opened any time significant amounts of nutrients accumulate in the epilimnion of the lake.

D. Erosion

In all three lakes erosion is only a problem at extremely high water levels. Within the ranges proposed in the BADC management plan, erosion will not be a significant problem.

E. Accommodation of Precipitation and Runoff

Twenty years of data (1969-1980) show that CMP used to drawdown Salmon Lake and Great and Long Ponds in the fall/winter period an average maximum of 1.3, 2.4 and 1.1 feet below spillway respectively.

The SWCC water level order currently restricts drawdown to 1 foot below spillway for each of the dams.

The public concensus is that during CMP's ownership flooding was not a serious problem. Since the time of the SWCC Order (1980), flooding has been a much more serious problem. The BADC management plan calls for a maximum drawdown potential of 1.5, 2.5, 2.5 feet below spillway for Salmon Lake, Great Pond and Long Pond respectively. The requested drawdown period would be from Labor Day to April of the following year.

F. Public and Private Water Supplies

None of the lakes serves as a public water supply. However, numerous lake residents do use lake water for domestic purposes. There are no known problems with water supplies on Salmon Lake. Water supply problems are expected if water levels should drop under 2.5 feet below spillway in both Great and Long Ponds.

G. Hydropower Considerations

CMP owns and operates four hydropower stations on Messalonskee Stream, below the Belgrade Lakes, including Snow Pond. CMP's only concern relative to water levels in the upstream lakes is that personnel in their dispatching department be notified whenever the gates are to be opened or closed so that they can maintain the level of Snow Pond accordingly.

H. Downstream Flows

Salmon Lake is connected to Great Pond by Hatchery Brook, a small outlet stream approximately 1/2 mile in length. In order to maintain aquatic life in the stream, a minimum instantaneous of 1 CFS is required at all times.

Great Pond and Long Pond are separated by a water stretch that is really more an extension of Long Pond than it is a distinct stream. Given this physical arrangement there is no need for establishing a minimum flow from Great Pond.

Long Pond drains into Messalonskee Lake via Belgrade Stream. However water levels in Messalonskee Lake are such that Belgrade Stream is primarily an extension of the lake back up to the Long Pond dam. As such minimum flows are not necessary for aquatic life in Belgrade Stream. Minimum flows are needed, however, further down the watershed due to the presence of the Oakland Sewage Treatment Plant which is located on Messalonskee Stream downstream from the Belgrade Lakes. The Environmental Protection Agency has requested State Certification of a draft NPDES Permit for the Oakland Wastewater Treatment Facility to discharge 0.48 MGD of treated municipal and industrial wastewater to Messalonskee Stream.

The existing draft permit requires continued secondary treatment of Oakland's wastewater. The permit limitations contain a sliding scale to maintain a minimum stream flow wastewater dilution ratio of 16.9:1. This action was specified to avoid instream toxicity induced by the discharge as determined by a DEP effluent toxicity test. At the allowable discharge of 0.48 MGD, a stream flow of 11.8 cfs is required to avoid instream toxicity. On a proportional watershed area basis, a minimum release of 8 CFS from the Long Pond watershed (121 square miles), combined with an additional 4 CFS from the Snow Pond watershed (121+56 square miles) will give the necessary 12 CFS.

SALMON LAKE Oakland and Belgrade	)	MAINE DAM INSPECTION, REGISTRATION and ABANDONMENT ACT
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LONG POND Rome Belgrade and Mt. Vernon Kennebec County	)	
WATER LEVEL ORDER #L-011097-36-A-N	)	FINDINGS OF FACT AND ORDER

THEREFORE, the Board ORDERS that water level regimes be established for Salmon Lake, Great Pond and Long Pond, and that all necessary actions be undertaken by the owner, lessee of the dams to insure compliance with the water level regimes with the following conditions:

SALMON LAKE

1. The dam owner shall drawdown the lake following Labor Day to achieve a water level of between 1 and 1.5 feet below spillway crest (277.0 - 276.5 msl) by November 1st.

   Drawdown may begin prior to Labor Day to enhance water quality restoration of Salmon Lake. Commencement of drawdown shall not begin unless secchi disk transparencies due to algae are less than 2.0 meters, or total average phosophorus levels in the upper two meters in the main basin of the lake exceed 15 mg/l. Any drawdown prior to Labor Day to enhance Water Quality restoration must receive approval from the DEP's Division of Environmental Evaluation and Lakes Studies before it may begin.

2. Between November 1 and April 1, the dam shall be managed to mitigate seasonal flooding by maintaining sufficient in-lake capacity to accommodate winter/spring runoff. During this period water levels should be maintained as close to between 1.0 and 1.5 feet below spillway crest as possible. Water levels shall not go below 1.5 feet below spillway crest.

3. Following April 1, the lake level shall be gradually raised to a target level of between 0.0 and 0.2 feet above spillway crest, on June 1st. During this time the water level shall not exceed 0.5 feet above spillway crest.

4. Between June 1 and Labor Day, the lake shall be maintained as close to the spillway crest as possible, and shall not exceed 0.3 feet above spillway crest.

5. A minimum instantaneous flow of 1 cfs shall be maintained in the outlet stream at all times. This condition shall have precedence over all others in the order.

6. A permanently mounted lake level gauge, marked in tenths of a foot (0.1) shall be installed at the dam. The gauge shall be placed such that the spillway crest corresponds to either 0.0 or 278.0 on the gauge. The gauge shall be installed by November 30, 1985.

7. The dam owner shall include in their written Water Management Plan the following:

SALMON LAKE Oakland and Belgrade	)	8 MAINE DAM INSPECTION, REGISTRATION and ABANDONMENT ACT
GREAT POND Rome and Belgrade	)	
LONG POND Rome Belgrade and Mt. Vernon Kennebec County	)	
WATER LEVEL ORDER #L-011097-36-A-N	)	FINDINGS OF FACT AND ORDER

A. The designation of a person or persons to be responsible for the operation of the dam. This person(s) will open and close the dam gates and will maintain a written record of lake levels and gate opening status. The record shall be maintained on a daily basis during time of rapid water level change and on a weekly basis at all other times.

B. A procedure whereby downstream riparian landowners will be alerted as far in advance as possible to likely flooding or sudden releases of water.

C. A procedure for obtaining advance meteorological and runoff information relative to lake levels.

D. A protocol describing how the dam is to be operated under a variety of likely water level/meteorological occurrences. The protocol should take into account the ability of the dam to pass water and downstream capacities. The protocol should be updated continuously as experience is gained in managing the Salmon Lake water levels. As the plan is updated copies of any change will be sent to the Department of Environmental Protection.

E. A procedure for maintaining the required minimum downstream flow.

The Water Management Plan shall be submitted for review and approval of the Commissioner no later than February 1, 1986.

8. The owner of a dam shall be responsible for securing and complying with all applicable federal, state and local licenses, permits, authorizations, conditions, agreements and orders required for any activities undertaken in compliance with the terms of this order.

9. A copy of this order, and any amendments or modifications thereto, shall be incorporated as part of the deed for any dam impounding the body of water for which a water level regime as established by this order, and shall be henceforth transferred as part of said deed.

10. Any dam repairs, modifications or remedial actions which may result in conditions temporarily in violation of this order may be performed with prior written approval of the Commissioner of the Department of Environmental Protection.

GREAT POND

1. The dam owner shall drawdown the lake following Labor Day to achieve a water level of between 1.5 and 2.0 feet below spillway crest (246.2 - 245.7 msl)., by November 1st.

SALMON LAKE
Oakland and Belgrade

GREAT POND
Rome and Belgrade

LONG POND
Rome Belgrade and Mt. Vernon
Kennebec County

WATER LEVEL ORDER
#L-011097-36-A-N

9 MAINE DAM INSPECTION, REGISTRATION and ABANDONMENT ACT

FINDINGS OF FACT AND ORDER

2. Between November 1 and April 1, the dam shall be managed to mitigate seasonal flooding by maintaining sufficient in-lake capacity to accommodate winter/spring runoff. During this period water levels should be maintained as close to between 1.5 and 2.0 feet below spillway crest as possible. Water levels shall not go below 2.5 feet below spillway crest.

3. Following April 1, the lake level shall be gradually raised to a target level of between 0.0 and 0.2 feet above spillway crest, on June 1st. During this time the water level shall not exceed 0.7 feet above spillway crest.

4. Between June 1 and Labor Day, the lake level shall be maintained in coordination with the levels on Long Pond and as close to the spillway crest as possible. Lake levels shall not exceed 0.3 feet above spillway crest during this period.

5. A permanently mounted lake level gauge, marked in tenths of a foot (0.1) shall be installed at the dam. The gauge shall be placed such that the spillway crest corresponds to either 0.0, or 247.7 on the gauge. The gauge shall be installed by November 30, 1985.

6. The dam owner shall include in their written Water Management Plan the following:

   A. The designation of a person or persons to be responsible for the operation of the dam. This person(s) will open and close the dam gates and will maintain a written record of lake levels and gate opening status. The record shall be maintained on a daily basis during time of rapid water level change and on a weekly basis at all other times.

   B. A procedure whereby downstream riparian landowners will be alerted far in advance as possible to likely flooding or sudden large releases of water.

   C. A procedure for obtaining advance meteorological and runoff information relative to lake levels.

   D. A protocol describing how the dam is to be operated under a variety of likely water level/meteorological occurances. The protocol should take into account the ability of the dam to pass water and downstream capacities. The protocol should be updated continuously as experience is gained in managing the Great Pond water levels. As the plan is updated copies of any change will be sent to the Department of Environmental Protection.

SALMON LAKE
Oakland and Belgrade

GREAT POND
Rome and Belgrade

LONG POND
Rome Belgrade and Mt. Vernon
Kennebec County

WATER LEVEL ORDER
#L-011097-36-A-N

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FINDINGS OF FACT AND ORDER

The Water Management Plan shall be submitted for review and approval of the Commissioner no later than February 1, 1986.

7. The owner of a dam shall be responsible for securing and complying with all applicable federal, state and local licenses, permits, authorizations, conditions, agreements and orders required for any activities undertaken in compliance with the terms of this order.

8. A copy of this order, and any amendments or modifications thereto, shall be incorporated as part of the deed for any dam impounding the body of water for which a water level regime as established by this order, and shall be henceforth transferred as part of said deed.

9. Any dam repairs, modifications or remedial actions which may result in conditions temporarily in violation of this order may be performed with prior written approval of the Commissioner of the Department of Environmental Protection.

LONG POND

1. The dam owner shall drawdown the lake following Labor Day to achieve a water level of between 1.5 and 2.0 feet below spillway crest (236.6 - 236.1 msl), by November 1st.

2. Between November 1 and April 1, the dam shall be managed to mitigate seasonal flooding by maintaining sufficient in-lake capacity to accommodate winter/spring runoff. During this period water levels should be maintained as close to between 1.5 and 2.0 feet below spillway crest as possible. Water levels shall not go below 2.5 feet below spillway crest.

3. Following April 1, the lake level shall be gradually raised to a target level of between 0.0 and 0.3 feet above spillway crest, on June 1st. During this time the water level shall not exceed 1.4 feet above spillway crest.

4. Between June 1 and Labor Day, the lake shall be maintained as close to the spillway crest as possible, and shall not exceed 0.5 feet above spillway crest.

5. A minimum instantaneous flow of 8 cfs shall be maintained at all times, below the Long Pond (Wings Mills) Dam, to mitigate toxicity problems in Messalonskee Stream. This flow may be provided by leakage and/or discharge over or through the dam. Stream flow in Messalonskee Stream will be checked periodically by the DEP to verify the presence of 12 cfs in the stream.

6. A permanently mounted lake level gauge, marked in tenths of a foot (0.1) shall be installed at the dam. The gauge shall be placed such that the spillway crest corresponds to either 0.0 or 238.1 on the gauge. The gauge shall be installed by November 30, 1985.

SALMON LAKE Oakland and Belgrade	)	11 MAINE DAM INSPECTION, REGISTRATION and ABANDONMENT ACT
GREAT POND Rome and Belgrade	)	
LONG POND Rome Belgrade and Mt. Vernon Kennebec County	)	
WATER LEVEL ORDER #L-011097-36-A-N	)	FINDINGS OF FACT AND ORDER

7. The dam owner shall include in their written Water Management Plan the following:

   A. The designation of a person or persons to be responsible for the operation of the dam. This person(s) will open and close the dam gates and will maintain a written record of lake levels and gate opening status. The record shall be maintained on a daily basis during time of rapid water level change and on a weekly basis at all other times.

   B. A procedure whereby downstream riparian landowners, and the Central Maine Power Company will be alerted far in advance as possible to likely flooding or sudden large releases of water.

   C. A procedure for obtaining advance meteorological and runoff information relative to lake levels.

   D. A protocol describing how the dam is to be operated under a variety of likely water level/meteorological occurances. The protocol should take into account the ability of the dam to pass water and downstream capacities. The protocol should be updated continuously as experience is gained in managing the Long Pond water levels. As the plan is updated copies of any change will be sent to the Department of Environmental Protection.

   E. A procedure for maintaining the required minimum downstream flow.

   The Water Management Plan shall be submitted for review and approval of the Commissioner no later than February 1, 1986.

8. The owner of a dam shall be responsible for securing and complying with all applicable federal, state and local licenses, permits, authorizations, conditions, agreements and orders required for any activities undertaken in compliance with the terms of this order.

9. A copy of this order, and any amendments or modifications thereto, shall be incorporated as part of the deed for any dam impounding the body of water for which a water level regime as established by this order, and shall be henceforth transferred as part of said deed.

SALMON LAKE Oakland and Belgrade GREAT POND Rome and Belgrade LONG POND Rome Belgrade and Mt. Vernon Kennebec County WATER LEVEL ORDER #L-011097-36-A-N	)	12 MAINE DAM INSPECTION, REGISTRATION and ABANDONMENT ACT FINDINGS OF FACT AND ORDER

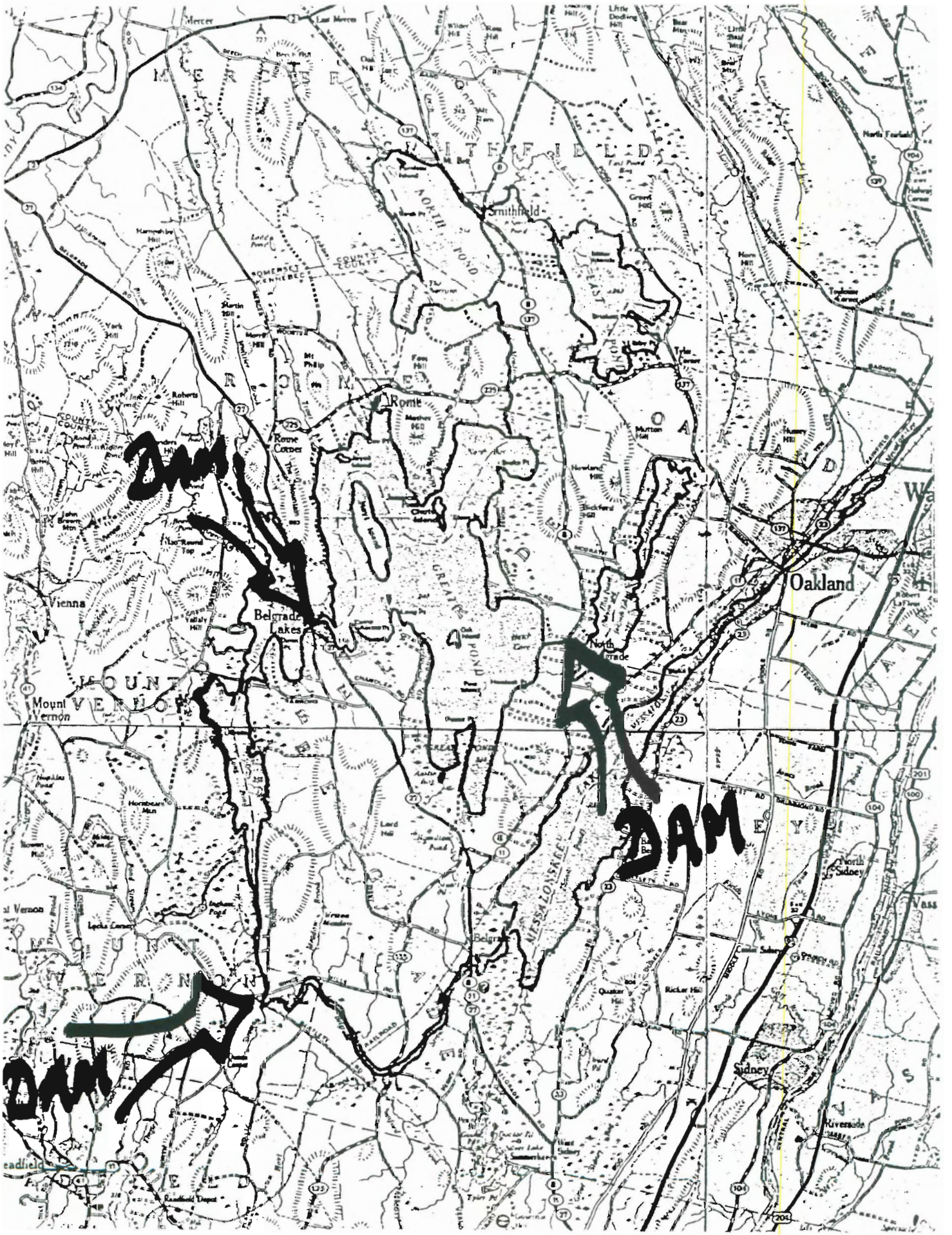
10. Any dam repairs, modifications or remedial actions which may result in conditions temporarily in violation of this order may be performed with prior written approval of the Commissioner of the Department of Environmental Protection.

DONE AND DATED AT AUGUSTA, MAINE, THIS 30TH OF OCTOBER, 1985.

BOARD OF ENVIRONMENTAL PROTECTION

BY: _____
Samuel Zaitlin, Chairman

PLEASE NOTE ATTACHED SHEET FOR APPEALS PROCEDURES....


Smithfield
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