JANET T. MILLS
GOVERNOR
MAJ GEN
DOUGLAS A.
FARNHAM
COMMISSIONER

MAINE OFFICE OF DAM SAFETY

PETER J. ROGERS
DIRECTOR

Certified Mail

Date: December 21, 2021

Bucksport Mill LLC
Attn: Dave Bryant
PO Box 1874
Bucksport, ME 04416

SUBJECT: Dam Inspection Report for MEMA #111 – Toddy Pond Dam

Dear Mr. Bryant:

On behalf of Commissioner Douglas Farnham, thank you for your cooperation to facilitate the required inspection of your dam by the Maine Office of Dam Safety.

Per Title 37-B MRSA, Chapter 24: Dam Safety, your dam is required to be inspected every six (6) years for condition and every twelve (12) years for hazard. Your dam was inspected on October 12, 2021 by Tony Fletcher, PE. Please find attached the condition report with recommendations and downstream hazard reclassification recommendation.

Should you disagree with the findings and recommendations of this report you may respond in writing to this office within twenty (20) days of receipt of this letter. Further you must file the basis of your appeal within 3 months of receipt of this letter.

Should you have any queries, please do not hesitate to contact either the Dam Safety Administrator, Tara Ayotte at (207)-624-4400 or tara.ayotte@maine.gov or the Operations and Response Division Director Steven Mallory at steven.mallory@maine.gov.

Thank you again.

Sincerely,

Peter J. Rogers (Dec 21, 2021 15:11 EST)

Peter J. Rogers
Director

Enc: Distribution List
Dam Report

MAINE EMERGENCY MANAGEMENT AGENCY
72 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0072
PHONE: 207-624-4400/800-452-8735
FAX: 207-287-3178

DAM INSPECTION REPORT
ELECTRONIC DISTRIBUTION LIST

DEPARTMENT OF DEFENSE, VETERANS, AND EMERGENCY MANAGEMENT

Major General Douglas A. Farnham, Commissioner
Steven Mallory, Director of Operations and Response, MEMA
Tara Ayotte, Dam Safety Administrator, MEMA (MEMA Dam File)

OTHER
Andrew Sankey, Hancock County EMA Director
Town of Orland, 91 School House Street, Orland ME 04472
Kyle Nenninger, Bucksport Generation LLC, 2 River Road, Bucksport ME 04416

State of Maine
Department of Defense, Veterans and Emergency Management
Maine Emergency Management Agency
Office of Dam Safety

#111 Toddy Pond Dam

Town of Orland, Hancock County, ME

Hazard & Condition Report

Date of Inspection – 10/12/2021

Prepared for:
The Operations Director
MEMA

Prepared by:
Tony Fletcher PE
Acting State Dam Inspector

MEMA, 45 Commerce Drive, Suite #2, 72 State House Station, Augusta, Maine 04333-0072
Phone: 207-624-4400/800-452-8735 Fax: 207-287-3178

Contents

Attachments

Memorandum

To: The Operations Director, MEMA
Copy: MEMA Dam Safety Office
From: Acting State Dam Inspector
Date: December 21, 2021

RE: Condition Assessment of #111 Toddy Pond Dam, Town of Orland, Hancock County, ME

Attached please find my hazard & condition report for Toddy Pond Dam, a 14' high, 196' long, 100-year-old, significant hazard, composite earth/concrete/masonry dam, located in the Town of Orland, Hancock County, ME. The dam is owned by Bucksport Mill LLC, represented by Mr. Dave Bryant, who, together with the dam operator, attended the inspection. Originally the dam was constructed to store water for downstream mills. Now that the mills are gone, the dam sustains Toddy Pond for recreation. The dam is located on the Narramissic Stream, 144' higher than & 3,800' upstream of Alamoosook Lake. The Narramissic Stream is hydraulically steep & the flow caused by a breach of Toddy Pond Dam would be fast & turbulent.

Regarding the dam's Hazard; I have reviewed the dam's emergency action plan (EAP) & the MEMA dam file. The dams EAP has been tested by the dam owner, however, the current "dam breach inundation map" (DBIM), compared to Attachment F, the DBIM from the MEMA "Toddy Pond Dam Breach Study", 02/07/20, has a considerably smaller dam breach flood line & lacks houses on the left bank of the Narramissic River which are within a the Studies breach flood line. The Study map requires confirmation by the dam owner. It is sufficiently accurate to reclassify Toddy Pond Dam a "high" hazard potential dam. One point to note is that if Toddy Pond Dam fails, Alamoosaook Lake rises about 3 times the rate Toddy Pond draws down, this is likely to cause shorefront flooding & should be noted by the Town EMA.

Regarding the dam's condition; The following dam components were inspected on the afternoon of 10/12/21. The upstream stone wave protection, both abutments, the top of the dam, the upstream surfaces, the embankments, the toe area along the road, the concrete spillway & gate structure & the walkway. Components not inspected were – the old outlet, the dam gate, the bridge under Hatchery Road, the road downstream toe area, the fishway & the Narramissic stream to its confluence with Alamoosook Lake. The Gate was not operated nor was leakage measured. Inspection findings: brush growing upstream of the dam, local minor settlement of the embankment, concrete deterioration including crazing & ASR, undercutting of the base of the gate piers, failure of mortar pointing in the stonework & gate leakage. No evidence of recent movement or incipient failure was observed.

Based in this inspection, I recommend that MEMA reclassify Toddy Pond Dam a "high" potential hazard dam & that you request the dam owner do the following.

1) Correct & update the EAP per paragraph 11) of this report.
2) Arrange a table-top exercise (TTX) to test the edited EAP before the 2022 spring runoff.
3) Write an "operation & maintenance plan" (O&M) for the dam before 2023.
4) Copy the O&M plan to MEMA, the Town & Shorefront property owners association.
5) Submit as-built construction records of the dam to MEMA for record purposes.
6) Root out all brush growing on the dam & downstream road embankment before 2023. Restore surface & lawn.
7) Rehabilitate all decayed concrete & mortar in the dam, especially at the base of the gate piers, before 2023.

If you have any questions about this report, please do not hesitate to contact me.

Sincerely,

Tony Fletcher

Tony Fletcher PE
Acting State Dam Inspector

Preface - Information for the Dam Owner & Operator.

The purpose of this report is to recommend "necessary remedial measures" to improve the safety of this dam per Title 37B MRSA c 24, "Dam Safety", a copy of which may be obtained from the Dam Safety Office, MEMA. The purpose of this law is to determine which dams are "jurisdictional" based on size dams in Maine are constructed, maintained & operated in a safe manner. The law mandates two types of dam assessment; "hazard" to estimate a dams "potential to cause damage" if it failed & a "condition" assessment to determine what "necessary remedial measures" are required to improve the safety of the dam which normally requires a field inspection. Only those dams classified a high & significant hazard dams require "condition" inspections every 6 years. Maine dam safety law does not authorize the Department to issue permits to construct or repair dams. This is the duty of the Maine Department of Environmental Protection.

The "hazard" classification of a dam is a measure of its "potential" to cause downstream damage if it failed. It is NOT a measure of its "condition". Dams classified a) "High hazard" threaten human life, b) "significant hazard" threaten downstream property damage, c) "low hazard" have a low potential to cause either loss of life or downstream property damage. The law requires "hazard" assessments every 12 years for all dams. The "hazard" of a dam may be assessed by inspection of the dam's basin and downstream watercourse, or it may be assessed using dam breach analysis. In terms of the law, dams which are classified "high hazard" (HH) or "significant hazard" (SH) require "emergency action plans" (EAP's), a plan intended to minimize the downstream impacts of dam failure. This plan must be exercised regularly by the dam owner to test its effectiveness.

The "condition" of a dam is determined by a visual inspection of components of a dam, such as the top, upstream & downstream faces, the toe & groin areas, all abutments, spillway & outlet structures & the reservoir shoreline. Other items considered are - gates, power features, mechanisms, security arrangements, dam operation & maintenance procedures, etc. A condition inspection seeks defects which would lead to failure or breach of the dam. Dam defects include - root penetration from vegetation & trees growing on or near the dam which also conceals dam surfaces, any movement observed (misalignment, settlement, cracks joint opening), leakage, seepage, piping, debris blocking gates & spillways, concrete conditions & ASR (see below) missing control features, toe scour, mis-operation & the like. During the condition assessment for this dam, its design, stability, foundation, construction, EAP, SOP's were not assessed. No surveys, material sampling or testing was done. The foundation was not investigated nor was the gate tested. Attachment A shows photograph taken during the inspection.

Note 1 - *Alkali-Silica Reaction (ASR) (also Alkali-Aggregate Reaction - AAR) is the decay of concrete that occurs under humid or wet conditions. ASR is an irreversible, internal chemical reaction, occurring within the body of the concrete, between un-hydrated sodium & potassium alkalis in the Portland cement & high silica aggregates (common in the north east USA). The products of this reaction expand & physically change the properties of the concrete. Indicators that ASR is occurring in concrete are; surface cracks, crumbling, spalling & discoloration. ASR can occur, at joints, pipe/concrete interfaces & at dam/foundation joints, where it can reduce the dam's resistance to sliding. When found, the extent of ASR degradation should be recorded & monitored. The depth ASR can be determined by coring & sampling. Decayed concrete should be cut out & replaced by new concrete.*

The Office of Dam Safety, Operations Division, Maine Emergency Management Agency (MEMA), are responsible for implementing Maine Dam Safety Program (MDSP) per MRCS Tittle 37B C24 "Dam Safety". This report was prepared by an independent contractor to the department. Queries regarding this report should be addressed the Director or Planning Associate.

Table 1 Contacts

General Enquiries	**Director of Operations**	**Acting State Dam Inspector**	**Dam Safety Emergency Planning.**
Office of Dam Safety. MEMA, 45 Commerce Drive, Suite #2, Augusta, ME 04333-0072 Tel: 207-624-4400 Fax: 207-287-3178	Steven Mallory Tel: (207) 624-4476 Fax: (207) 287-3178	Tony Fletcher Tel: (207) 624-4465	Tara Ayotte Tara.Ayotte@maine.gov Tel: (207) 624-4432 Fax: 207-287-3178

Note 2 – Right to appeal the findings of this report. Per Title 37b, C 24 "Dam Safety", if a dam owner disagrees with the findings of this report, the dam owner, lessee or other person in control of the dam, must notify the Commissioner, Maine Department of Defense, Veterans & Emergency Management (DVEM) within 20 days of receiving this report. The dam owner then must provide the "basis of disagreement" to the commissioner within 3 months of receipt of the inspector's report. The dam owner may apply for & be granted a further 3-months extension to this deadline for good cause, but no more.

#111 Toddy Pond Dam – Hazard & Condition Report

1) Purpose & Method

The purpose of this report is to recommend necessary remedial measures to improve the safety of Toddy Pond Dam. This report is based on; a review of the file, an assessment of the emergency action plan (EAP) & the 10/12/21 visual inspection of the dam. The inspection was based on the inspection checklist & guidelines directory in the dams MEMA file.

2) Attachments

The following documents are attached to this report for reference & information purposes. Please examine & read remarks.

Table 2. Attachments

Attachment	Pages	Description & Comments
A	2	11 Inspection photographs, with descriptions.
B	1	Figure 1 – Site Location Map by Kleinschmidt Associates copied from the dam EAP
B2	1	Lake Water System
C	1	Figure 2 – Site Plan by Kleinschmidt Associates copied from the dam EAP. Inspection Photograph Positions
D	1	Figure 3 – Downstream Elevation of Dam by Kleinschmidt Associates. Copird from the dam EAP showing elevation.
E	3	Stream Stats: E1- Location & Basin, E2 - 24 Hour Precipitation, E3 - Peak Flow/Return Interval
F	1	Dam Breach Inundation Map – Copied from MEMA draft dam beach study - 2/10/20

Note 3 – The MEMA "Dam Safety Assessment", done during this inspection, is not attached to this report, but is on file.

3) Emergency Contacts

Table 3 - Dam Owner, Contact, Town Fire & Police Safety & County EM Director

Dam Owner	**Dam Operator**	**Orland Fire Department**	**Hancock County EM**
Dave Bryant Bucksport Mill, LLC PO Box 1874 Bucksport, ME 04416 Phone 920-470-1061 Cell 920-470-1061 Fax 207-469-1704 jmcglin@aimrecyclinggroup.com	Kyle Nenninger Bucksport Generation, LLC 2 River Road Bucksport, ME 04416 Phone 207-469-1311 Cell 207-852-8844 Fax 207-469-1704 richard@buckgen.com	91 School House Street Orland, Maine 04472 Phone 207-469-3079 **Bucksport Fire/Police** Phone 207-469-7951	Director: Andrew Sankey 50 State St., Suite 4, Ellsworth, ME 04605 Office: (207) 667-8126 Cell 207-266-0743 Fax: (207) 667-1406

Note 4 – Dam owner must confirm that these contacts are correct & included in the dams EAP.

4) Previous Inspections

Table 4. Previous Inspections or reports on MEMA file

Rpt.	Date	By	Principal Defects
1	6/6/96	MEMA	Trees & brush / slope protection /
2	11/16/98	KA	Appendix A from the owner EAP by Kleinschmidt Assoc., located in the MEMA EAP file
3	6/8/11	MEMA	Depressions in embankment / Deterioration of Concrete /
4	5/8/15	MEMA	Spillway & sluice gate leakage / concrete deterioration / uneven embankments / inadequate spillway capacity
5	2/7/20	MEMA	Dam Breach Study
6	7/23/20	MEMA	Site security / concrete spalling / depression in left embankment / pier undercutting

Note 5 – Principal defects recorded in these reports concern, in the main, dam maintenance issues such as overgrowth, random minor settlement in the embankments & concrete deterioration. Also, the dam's spillway does not have the necessary capacity to pass the 50-year flood & must be considered inadequate for a significant of high potential hazard dam.

5) Description of the Dam

Toddy Pond Dam is a 100-year-old, significant hazard dam, located in the Town of Orland, Hancock County, Maine. The dam is 14-foot-high, 196-foot-long, composite mass gravity/earth dam structure fitted with a concrete fishway (Attachments A,B,C,D). The dam was built in 1921 as a mill dam to store water to supply downstream mills along the downstream Marramissic River. After the mills were closed, the dam still supplied Alamoosook lake, from which water was pumped across the watershed into Silver Lake for use in the Town of Bucksport. Since the closure of the Bucksport paper mill, the lake is used mainly for recreation. The dams last major repair was in 1947. The dam raises Toddy Pond, a glacial lake, by about 8' storing a substantial volume of water.

6) Reservoir (1,000-acre-feet = 340 million gallons)

At normal pool (NP elevation = 165.0'), Toddy Pond has an area of 2,360 acres & stores 18,000 acre-feet (af) of water. When the lake rises 2.4' & reaches the top of dam (TOD elevation = 167.4') pond storage increases to an estimated 22,300 af, all of which could theoretically flow into Alamoosook Lake if Toddy Pond Dam were to breach.

7) Basin & Runoff

Toddy Pond dam is at the outlet of a 25-square-mile (sm) basin of rolling, rural, wooded hills which show little sign of deforestation or urban development which may significantly increase storm runoff. The "Stream-Stats" 100-year precipitation in the Toddy Pond basin is estimated to be 6.6" & for the 500-year storm 8.8" (E1,2,3) which also show the statistical estimate of the unrouted 100-year return flood at the dam as 1,060-cubic-feet-a-second (cfs).

Note-6 One factor which can substantially increase runoff from this basin is the depth of snow & ice on the basin prior to a storm. If snow cover is effectively, say, 9", & a 6" storm occurs in mid-April, runoff will be substantially higher than from just the storm. The final runoff is difficult to estimate, however, the dam owner must know the water equivalent of snow & ice cover on the basin before the spring melt to anticipate when to operate the gate & the likelihood of a dam overtopping & importantly, what to do if the dam does overtop. Be prepared. These operating procedures must be written into dams O&M plan & the dams EAP.

8) Gate & Spillway Performance

The dam has the following outlets; one electrically operated (A9) 5'x 6' vertical gate straddled by two uncontrolled stone spillways, 9' & 10' long. The dam has no emergency spillway. Before the dam overtops, the maximum discharge of the spillways is 146 cfs & the sluice gate 394 cfs. The total capacity of dam outlets is 540 cfs.

The flood of record (FOR) which ostensibly occurred in December 1969, reportedly caused the lake to rise to elevation 166.8', flowing 1.8' over the spillway & over the west core wall. The maximum flow at the dam would have been slightly larger than the dam's outlet capacity of 540 cfs. The spillway cannot pass the probable Maximum flood (PMF) & is thus "inadequate".

9) The Downstream Watercourse. (Narramissic River)

Attachment F is a map which shows the course of the Narramissic river downstream from Toddy Pond Dam to Alamoosook Lake. This map has been copied from the dam breach inundation map (DBIM) developed for the MEMA "Toddy Pond Dam Breach Study", 02/07/20. This map shows the entire 3,800' course of the Narramissic River. The map also shows the Toddy Pond Dam breach (5,530 cfs) flood line & downstream infrastructure & houses likely to be flooded. Sections A&B show the breach data. Toddy Pond Dam id 144' higher than Alamoosook Lake, thus the Naramissic river is hydraulically steep (1:26) & discharges from the dam will be fast & turbulent. The breach flow is estimated to exceed 30 mph.

10) Hazard Assessment

To confirm the breach flow used in the MEMA flood study, a dam breach analysis was done for Toddy Pond Dam. The following breach criteria were used; height=14', width=28', position= through the dam & Hatchery Road embankments, development=6-hrs, starting when reservoir water level is TOD elevation=167.4'), estimated peak flow of 5,353 cfs. This estimated breach flow is 3.4% less than the study breach flow of 5,530 cfs which is 7.7 times the capacity of the dam's spillways & gate.

The MEMA 02/07/20 Study shows the following infrastructure which could be impacted by a breach of Toddy Pond Dam; Gully Brook Lane, Lake View Lane, & Powers Drive & about 8 residences, all located in the Town of Orland. The number of permanent residents endangered was not investigated for this report. The Study DBIM is the basis of my recommendation to reclassify Toddy Pond dam a high hazard potential dam.

11) Changes to the Dams Emergency Action Plan (EAP)

The Toddy Pond Dam EAP is incomplete & requires the following; a new downstream inundation map based on breach criteria assumed in this report. Further, the EAP must include a list of all houses & infrastructure impacted by the dam breach, the address of each, the number of house occupants & the house contact name & phone number.

12) Field Inspection 10/12/21

Regarding the condition of the dam. Dam components inspected on the afternoon of 10/12/21 - wave protection, the abutments, the top of the dam, the upstream surfaces where possible, the downstream surfaces, the embankments, the concrete spillway & gate structure & the walkway. Components not inspected - the bridge under Hatchery Road, the toe area of the Hatchery Road embankment, the fishway, Narramissic river to its confluence with Alamoosook Lake & the gate. The gate was not tested nor was gate leakage measured.

13) Inspection Findings

Inspection findings: brush growing upstream of the dam, debris on the spillway, irregular settlement on the embankments, scour & cracking of the gate piers, disintegration of mortar pointing in the stonework & gate leakage. No evidence of recent movement or incipient failure was observed. Attachment A describes the condition of this dam.

14) Conclusion

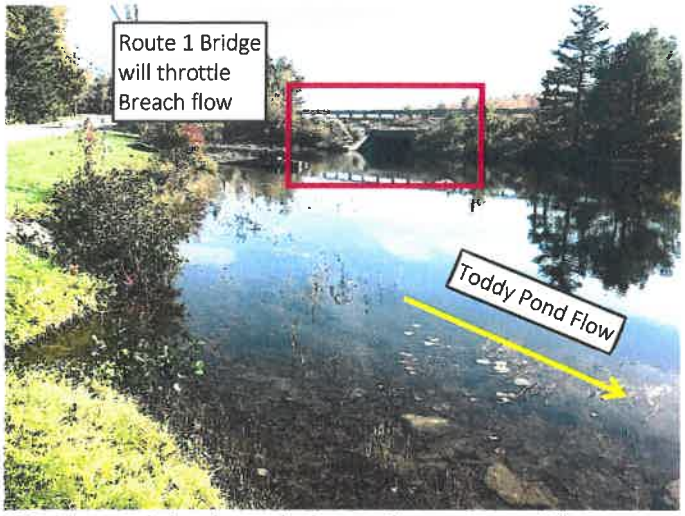
Despite its age & lack of maintenance, the dam does not show signs of imminent failure. It also shows no signs of excessive leakage from the outlet structure. Of concern is concrete deterioration & undercutting of the concrete gate piers. The maintenance & repairs specified in this report should be completed before 2023. An operation & maintenance plan (O&M) must be established for this dam & copied to the Town, people listed in the dam EAP & shorefront owners. The O&M plan must include dam inspection procedures. Consistent O&M records must be kept. A dam breach study, together with a dam breach inundation map suitable for use in the EAP & an EAP test (TTX) must replace those DBIM is the extant EAP before the 2022 spring runoff. The new dam breach inundation maps must show the entire Narramissic River all endangered infrastructure within the worst dam breach flood line.

15) Recommendations

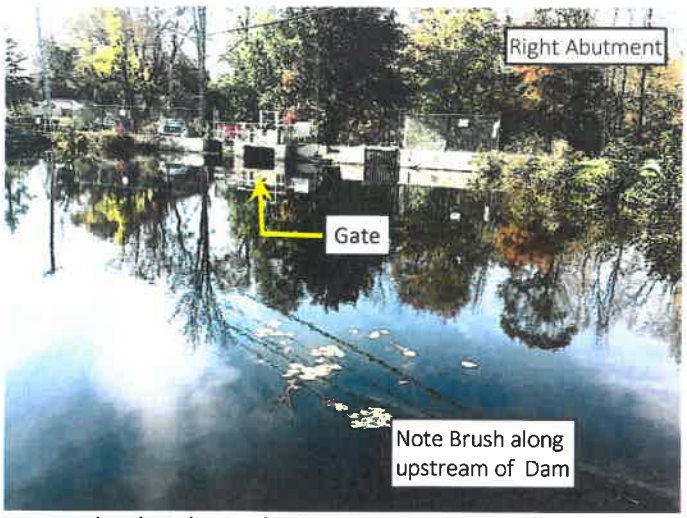
Based in this inspection, I recommend that MEMA reclassify Toddy Pond Dam a "high" potential hazard dam & that the dam owner do the following;

1) Correct & update the EAP per paragraph 11) of this report.
2) Arrange a table-top exercise (TTX) to test the edited EAP before the 2022 spring runoff.
3) Write an "operation & maintenance plan" (O&M) for the dam before 2023.
4) Copy the O&M plan to MEMA, the dam EAP, the Town & shorefront property owners association.
5) Submit as-built construction records of the dam to MEMA for record purposes.
6) Root out all brush growing on the dam & downstream road embankment before 2023. Replace with grass.
7) Rehabilitate all decayed concrete & mortar in the dam, especially at the base of the gate piers, before 2023.

Tony Fletcher PE
Acting State Dam Inspector



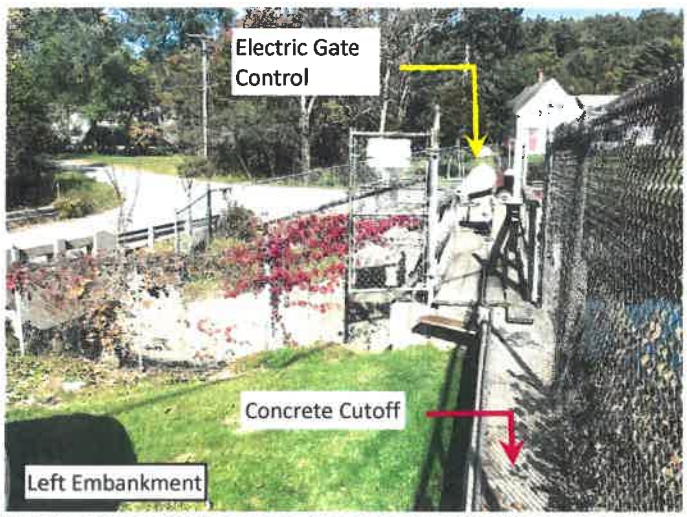
1.Toddy pond head pond drawn down about 12". No new development was seen in the basin that would increase runoff. No new development seen along Pond shoreline.



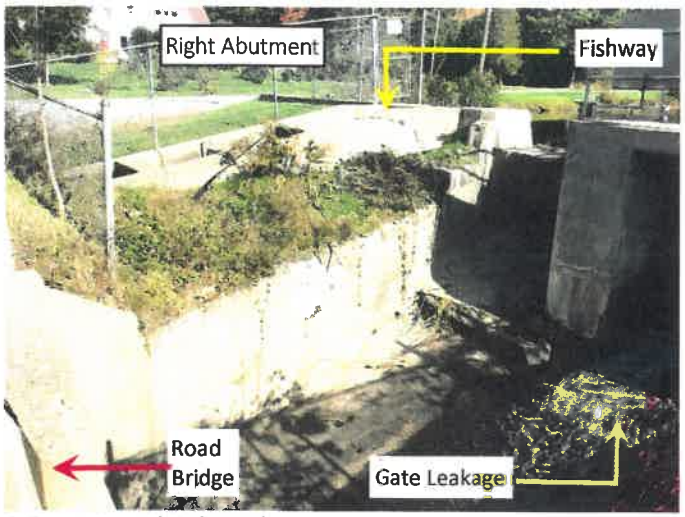
2. Dam headpond. No debris on screen. Concrete deteriorated throughout dam. Gate leaking. Fishway flowing & functional. Brush upstream on embankments left & right of concrete wall.

3. Road over bridge immediately dowstream of dam.

4. Concrete wall between left abutment & bridge.

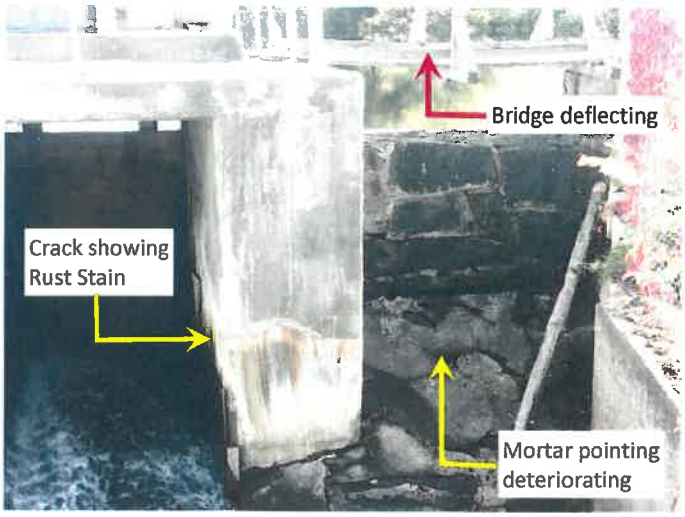


5. Gate opened for inspection. Concrete cutoff wall leads to bridge & gate control. Note fenced channel from spillway to bridge. The lawn is the left embankment.



6. Concrete outlet channel. Note close proximity of dam to Hatchery Road & bridge. All concrete serviceable but deteriorated.

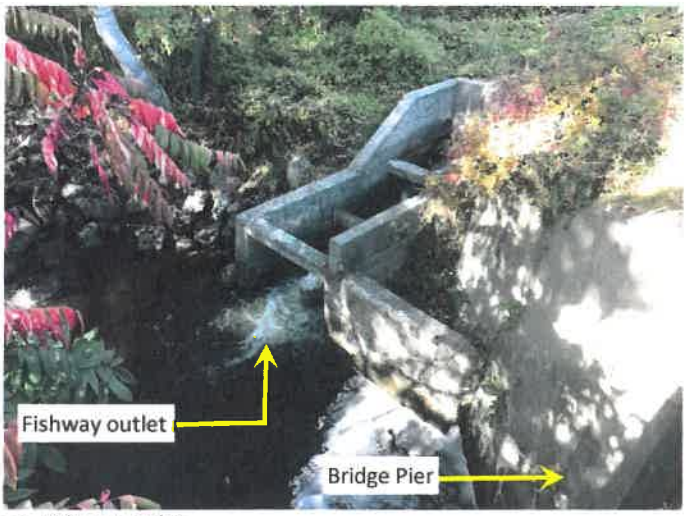
7. Right uncontrolled spillway. Concrete cracks show seepage but little movement



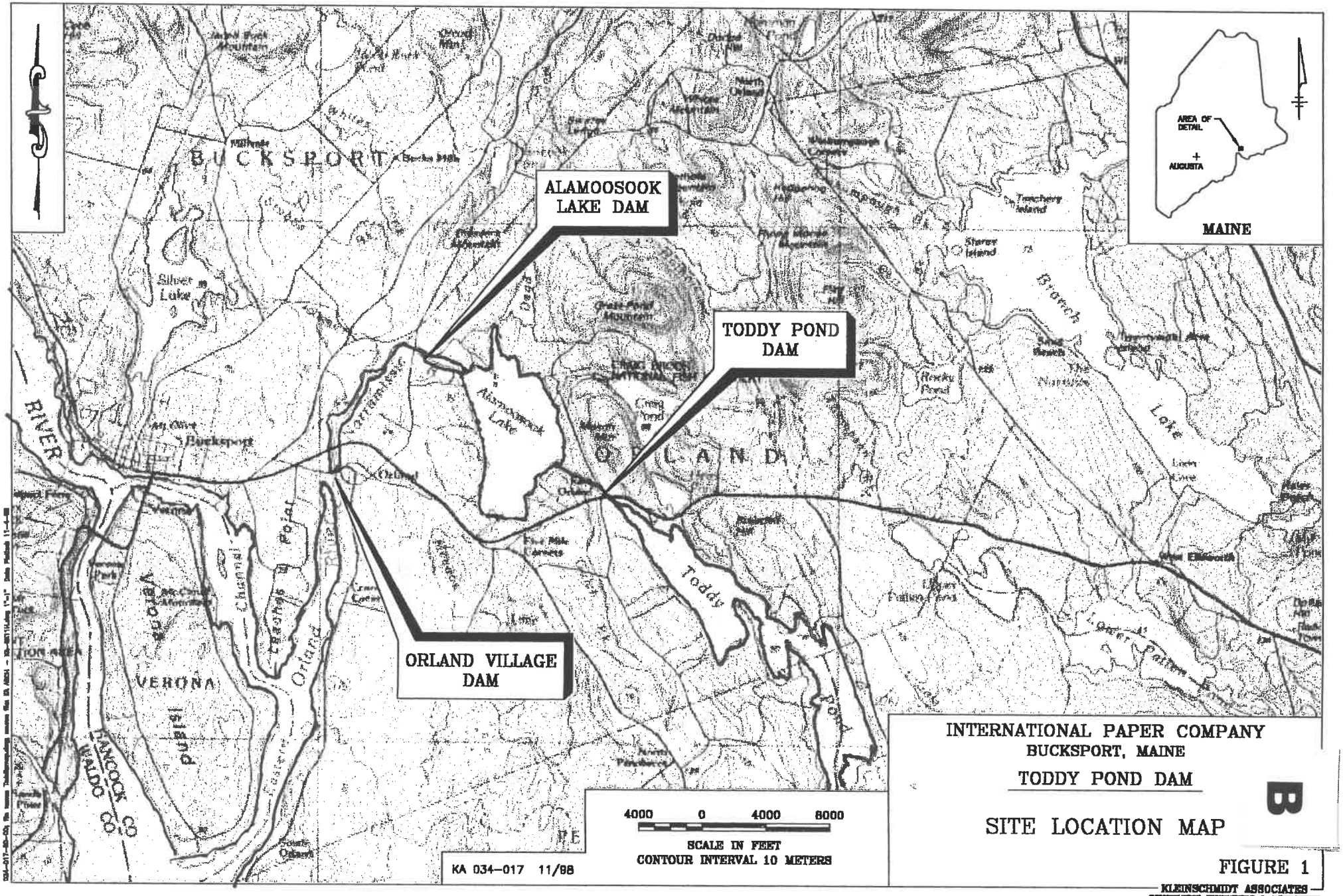
8. Gate & Left uncontrolled spillway. Concrete mortar at gate breaking up. Bridge deflecting. Gate opertional.

9. Concrete piers & slab housing sluice gate & electric hoist. Rust streaks are likely at construction joints.

10. Downstream road embankment which merges with the road embankment. Fishway outlet lower right. Toe of dam assumed at channel outlet to bridge.



11. Fishway outlet.



INTERNATIONAL PAPER COMPANY
BUCKSPORT, MAINE

TODDY POND DAM

B

SITE LOCATION MAP

FIGURE 1

KLEINSCHMIDT ASSOCIATES
CONSULTING ENGINEERS & SCIENTISTS

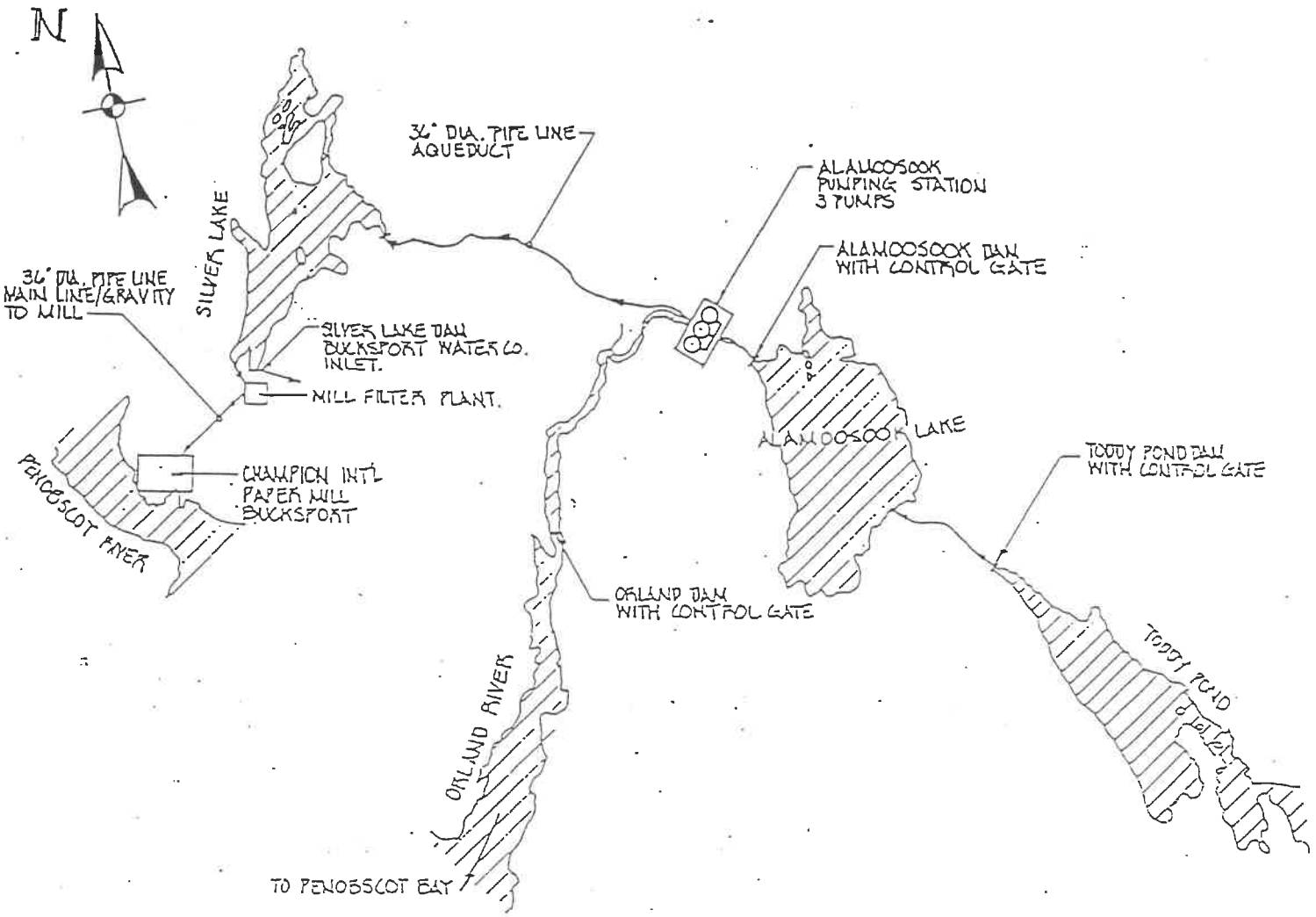
Champion
BUCKSPORT . MAINE

SCALE - NTS	M	D	Y	F
DRAWN - W.A. SMITH	7	19	94	
APPD -				
JOB CHARGE 5-875				

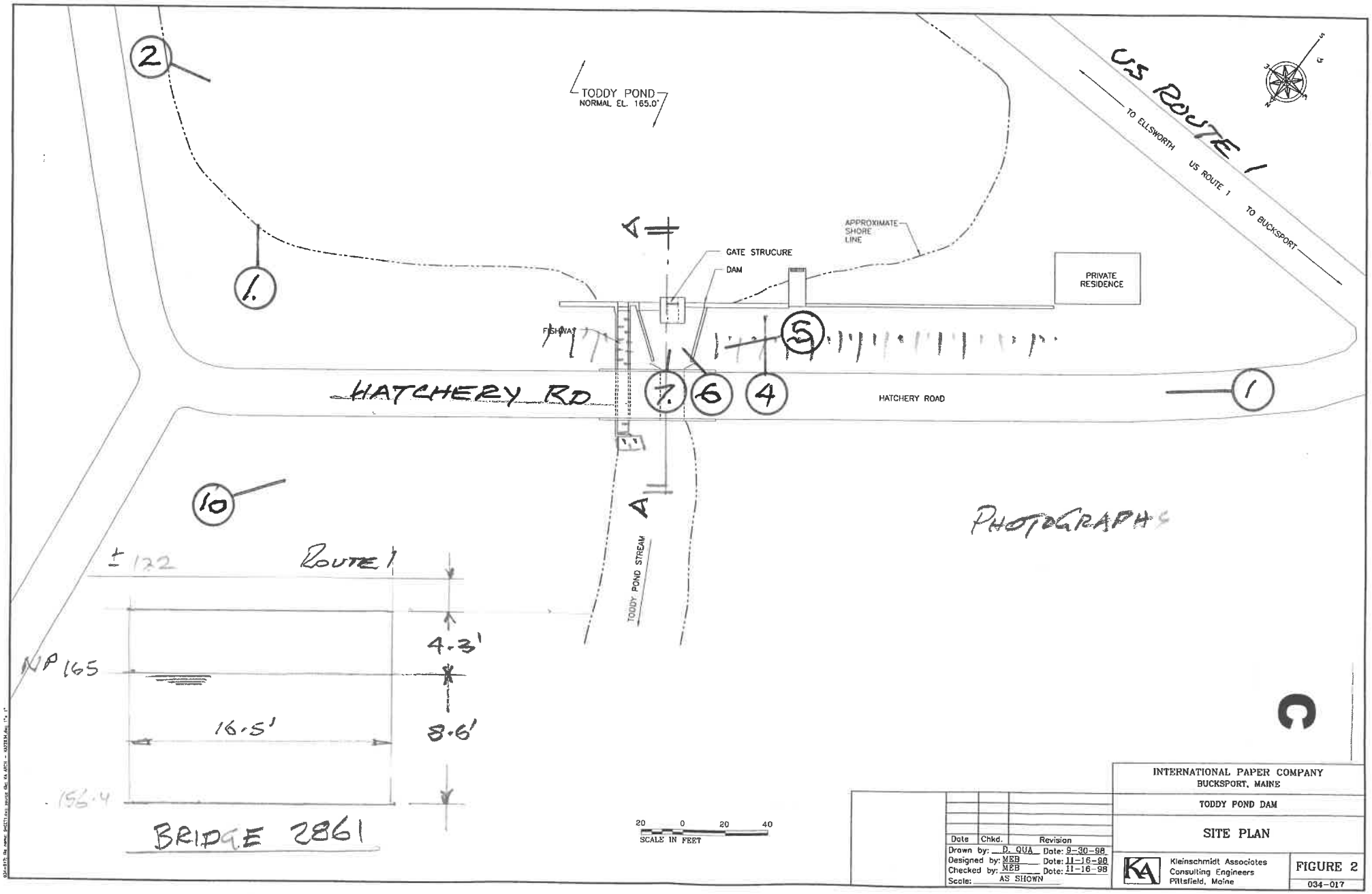
B2

WATER SERVICE LAKE WATER SYSTEM SCHEMATIC

DWG. NO.	REV.
5-15272	



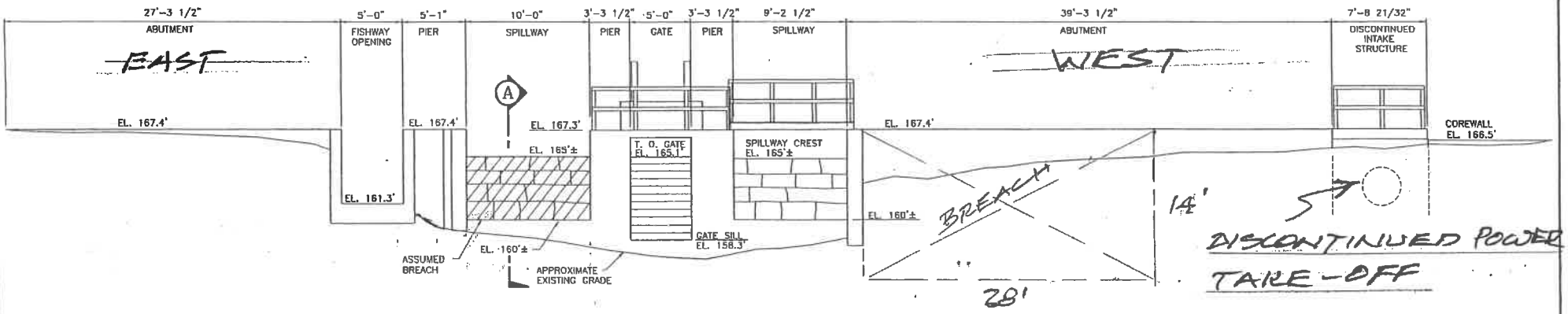
LAKE WATER SYSTEM


TODDY POND
NORMAL EL. 165.0'
US ROUTE 1
TO ELLSWORTH
US ROUTE 1
TO BUCKSPORT
APPROXIMATE SHORE LINE
GATE STRUCURE
DAM
PRIVATE RESIDENCE
FISHWAY
HATCHERY RD
HATCHERY ROAD
TODDY POND STREAM
PHOTOGRAPHS
± 122
ROUTE 1
4.3'
NP 165
16.5'
8.6'
156.4
BRIDGE 2861
20 0 20 40
SCALE IN FEET
INTERNATIONAL PAPER COMPANY
BUCKSPORT, MAINE
TODDY POND DAM
SITE PLAN
Date Chkd. Revision
Drawn by: D. QUA Date: 9-30-98
Designed by: MEB Date: 11-16-98
Checked by: MEB Date: 11-16-98
Scale: AS SHOWN
Kleinschmidt Associates
Consulting Engineers
Pittsfield, Maine
FIGURE 2
034-017

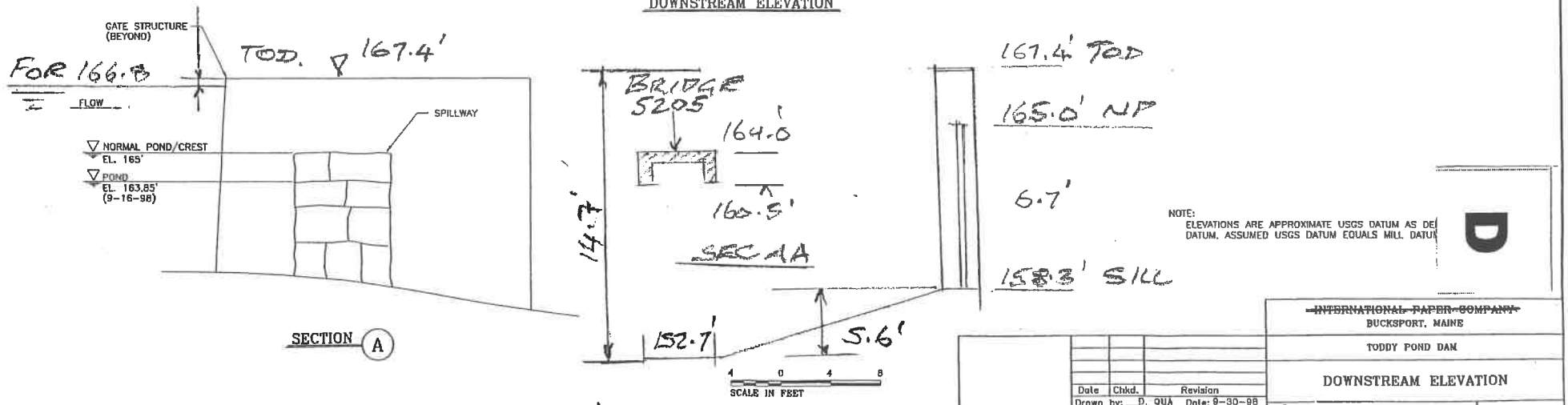
FLOOD OF RECORD FOR = 166.8'

TOP OF DAM TOD = 167.0'

NORMAL POOL NP = 165.0'



DOWNSTREAM ELEVATION



NOTE:
ELEVATIONS ARE APPROXIMATE USGS DATUM AS DE
DATUM. ASSUMED USGS DATUM EQUALS MILL DATU

~~INTERNATIONAL PAPER COMPANY~~
BUCKSPORT, MAINE

TODDY POND DAM

DOWNSTREAM ELEVATION

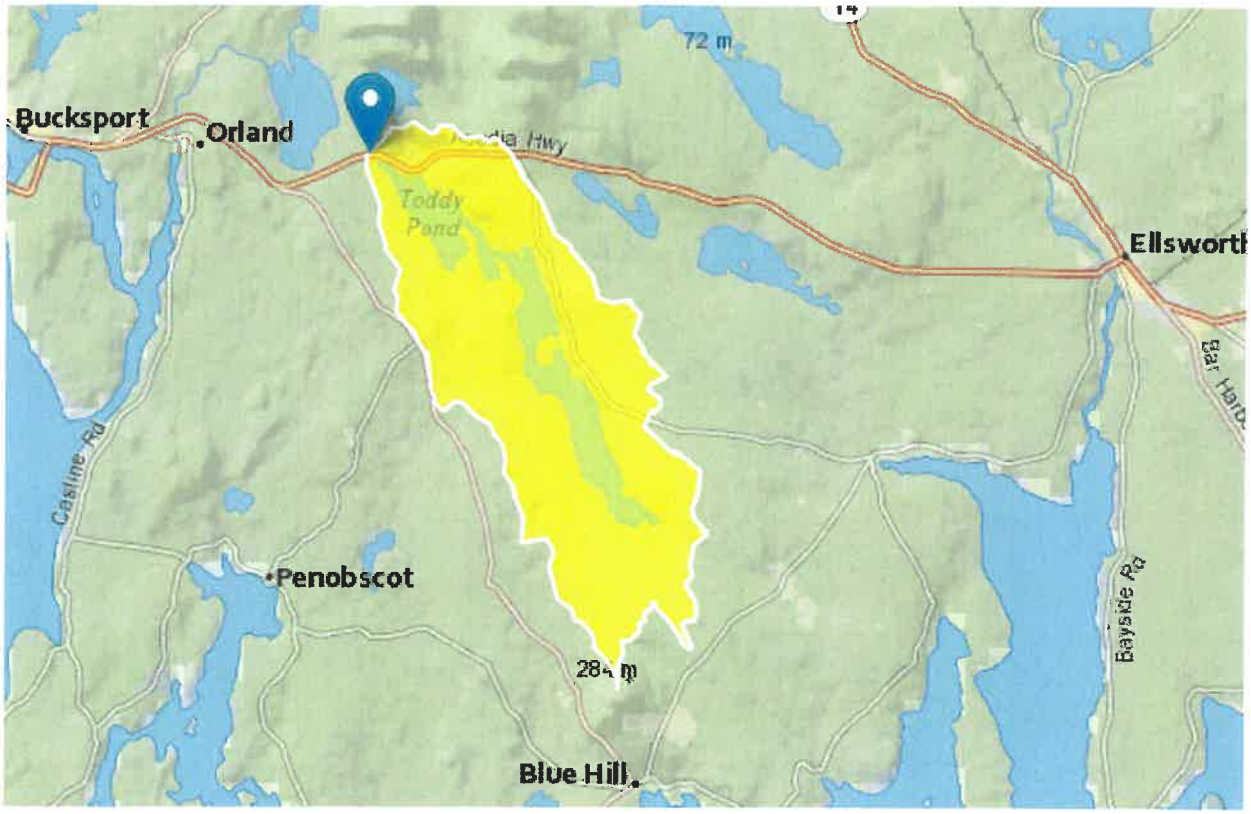
Date	Chkd.	Revision
Drawn by: D. QUA	Date: 9-30-98	
Designed by: MEB	Date: 11-16-98	
Checked by: MEB	Date: 11-16-98	
Scale: AS SHOWN		

FIGURE 3
034-017

E1

StreamStats Report for #111 Toddy Pond dam

Region ID: ME
Workspace ID: ME20211108165324212000
Clicked Point (Latitude, Longitude): 44.56803, -68.67811
Time: 2021-11-08 11:53:48 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	25.19	square miles
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	3.12	inches
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	24.4	percent
I24H5Y	Maximum 24-hour precipitation that occurs on average once in 5 years	3.85	inches

E2

Parameter Code	Parameter Description	Value	Unit
I24H10Y	Maximum 24-hour precipitation that occurs on average once in 10 years	4.46	inches
I24H25Y	Maximum 24-hour precipitation that occurs on average once in 25 years	5.31	inches
I24H50Y	Maximum 24-hour precipitation that occurs on average once in 50 years	5.94	inches
I24H100Y	Maximum 24-hour precipitation that occurs on average once in 100 years	6.6	inches
I24H200Y	Maximum 24-hour precipitation that occurs on average once in 200 years	7.34	inches
I24H500Y	Maximum 24-hour precipitation that occurs on average once in 500 years	8.4	inches

Peak-Flow Statistics Parameters [Statewide multiparameter peakflows SIR 2020 5092]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	25.19	square miles	0.26	5680
I24H2Y	24 Hour 2 Year Precipitation	3.12	inches	1.92	4.17
STORAGE	Percent Storage	24.4	percent	0	29.4
I24H5Y	24 Hour 5 Year Precipitation	3.85	inches	2.48	5.38
I24H10Y	24 Hour 10 Year Precipitation	4.46	inches	2.84	6.38
I24H25Y	24 Hour 25 Year Precipitation	5.31	inches	3.3	7.75
I24H50Y	24 Hour 50 Year Precipitation	5.94	inches	3.65	8.79
I24H100Y	24 Hour 100 Year Precipitation	6.6	inches	3.99	9.88
I24H200Y	24 Hour 200 YearPrecipitation	7.34	inches	5.26	11.1
I24H500Y	24 Hour 500 Year Precipitation	8.4	inches	5.95	13.1

Peak-Flow Statistics Flow Report [Statewide multiparameter peakflows SIR 2020 5092]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

E3

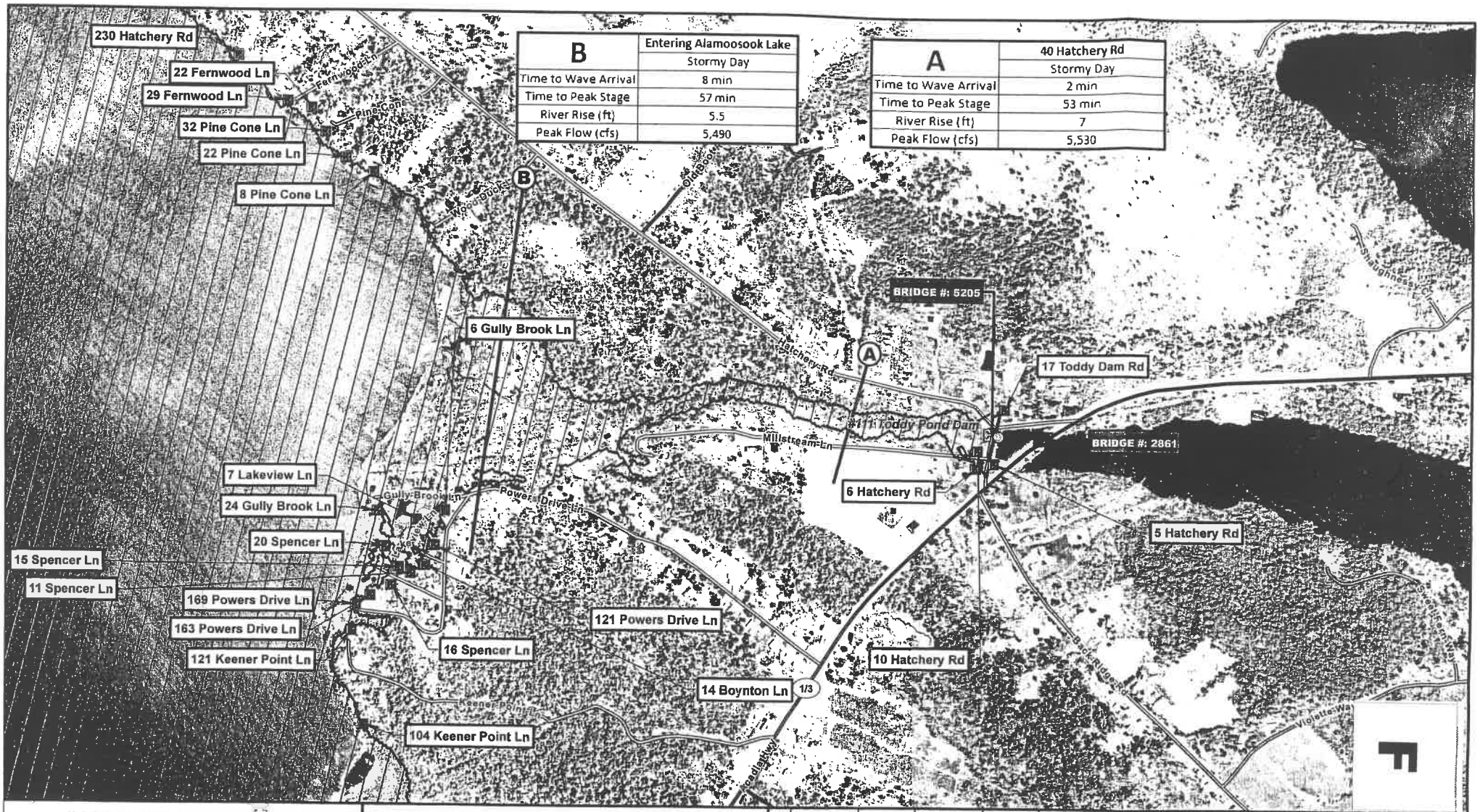
Statistic	Value	Unit	PII	Plu	ASEp
50-percent AEP flood	399	ft^3/s	213	749	39.1
20-percent AEP flood	563	ft^3/s	305	1040	38.1
10-percent AEP flood	679	ft^3/s	363	1270	38.9
4-percent AEP flood	831	ft^3/s	438	1580	39.9
2-percent AEP flood	946	ft^3/s	491	1820	39.7
1-percent AEP flood	1060	ft^3/s	553	2030	40.7
0.5-percent AEP flood	1200	ft^3/s	606	2380	42.8
0.2-percent AEP flood	1350	ft^3/s	672	2710	43.8

NOTE

Peak-Flow Statistics Citations

Lombard, P.J., and Hodgkins, G.A.,2020, Estimating flood magnitude and frequency on gaged and ungaged streams in Maine: U.S. Geological Survey Scientific Investigations Report 2020–5092, 56 p. (https://doi.org/10.3133/sir20205092)

Application Version: 4.6.2
StreamStats Services Version: 1.2.22
NSS Services Version: 2.1.2



B	Entering Alamoosook Lake
	Stormy Day
Time to Wave Arrival	8 min
Time to Peak Stage	57 min
River Rise (ft)	5.5
Peak Flow (cfs)	5,490

A	40 Hatchery Rd
	Stormy Day
Time to Wave Arrival	2 min
Time to Peak Stage	53 min
River Rise (ft)	7
Peak Flow (cfs)	5,530

#111 Toddy Pond Dam
Dam Breach Inundation Map

Project Location: **Orland, Hancock County, ME**

Owner: **Bucksport Generation LLC**

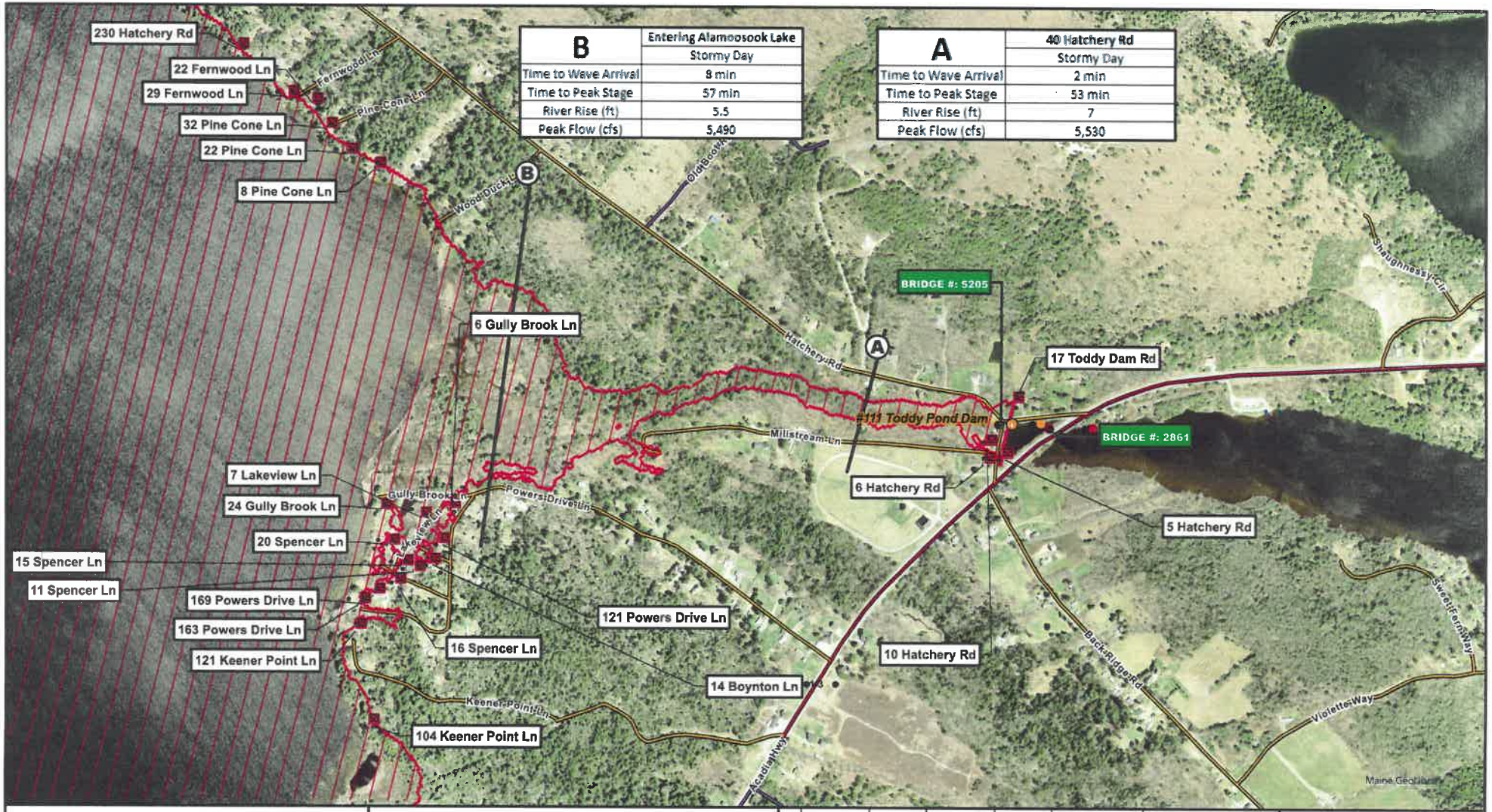
0 300 600 1,200 1,800 2,400

Map Scale: 1 inch = 600 feet

*Please note the assumptions and methods made and used while creating this inundation map are for guidance and evacuation purposes only. The information shown is approximate, and actual areas inundated will depend on failure conditions and may differ than what is shown.

Rev	Drawn By:	Drawn On:	CHK'd By:	CHK'd On:	Rev. Made:
1.0	Tara Ayotte	07/31/2017			Initial Draft
2.0	Andrew Manzi	02/10/2020	John Skelley	02/10/2020	Floodlines, Tileblock

Office of Dam Safety
at Maine Emergency
Management Agency
(207) 624-4400
45 Commerce Dr.
Suite #2
Augusta, ME 04330



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Office of Dam Safety
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Management Agency
(207) 624-4400
45 Commerce Dr.
Suite #2
Augusta, ME 04330

Sheet: 2 of 8

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING

June 3, 2024

AIM Development USA, LLC Bucksport Mill, LLC
Attn: Dave Bryant-Project Manager
2 River Road
Bucksport, Maine 04416
dbryant@aim-recycling.com

Re: Toddy Pond Dam | Orland, Maine

Dear Dave:

Pursuant to your request, a structural evaluation was undertaken on the morning of May 22, 2024, for the referenced structure. The purpose of our evaluation was to review the Dam structure and ancillary components and render an opinion on their current condition. Specifically, are there concerns/issues that would require immediate attention by AIM Development USA, LLC (AIM), and any recommendations we believe AIM needs to consider ensuring that the Dam remains functioning as designed. Our evaluation was visual in nature and limited to those areas/components accessible at the time. No sampling, testing, or analysis was done as part of the services rendered. Information provided for our review includes the Hazard and Conditions Report dated October 12, 2021, compiled by the State of Maine's Office of Dam Safety and the Emergency Action Plan (EAP) compiled for Bucksport Mill, LLC dated December 2022. Photographs were taken for documentation.

Our observations and a review of the information provided show the Dam to be a concrete gravity structure approximately 196 feet long with a center concrete head gate that supports the gate mechanism. On each side of the head gate structure are spillways that allow for uncontrolled overflow from Toddy Pond. The spillways and gate discharge on to a concrete apron the directs flow into the stream/river below. Attached to the Dam is a concrete fishway that allows passage of fish from the stream into Toddy Pond. Downstream of the Dam is a concrete bridge structure (deck, abutments, wingwalls) that ties into both the apron walls and fish passage. At the time of our evaluation, there was a fence that prevented access to the head gate mechanism and the pool area of Toddy Pond.

One Merchants Plaza, Suite 701, Bangor, ME 04401
T: 207.989.4824 | HALEYWARD.COM

Based on our observations, it is our opinion the Dam as currently operated is functioning as intended and shows no sign of imminent failure. While there are sections of the concrete components that are deteriorated, it has not created any instability to the overall structure. Furthermore, when comparing the photos taken as part of the 2021 inspection report to current conditions, it is our opinion items identified in that report do not appear to have changed or gotten any worse. However, we do recommend the following items be undertaken as part of maintenance and improvement operations:

1. Retain the services of a commercial diver to complete an underwater inspection of the dam structures and head gate, especially around the known leaking areas.
2. Complete coring of various concrete elements and test for ASR deterioration
3. Develop a design to repair deteriorated concrete elements and address the leakage around the head gate.
4. Remove vegetation and debris on the upstream face of the Dam and stabilize with stone riprap.

We hope this information serves your needs presently. If there are any questions, or should you require further assistance, please contact us at (207) 989-4824.

Sincerely,
Haley Ward, Inc.

Peter J. Tuell, P.E.
Senior Project Manager | Vice President

PJT/kmg
Enc.

Photo No. 1 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Fishway Retaining Wall **Photo By:** PJT	

Photo No. 2 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Fishway Concrete Structure **Photo By:** PJT	

Photo No. 3 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Concrete Bridge With Abutments and Wing Walls **Photo By:** PJT	

Photo No. 4 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Spalled Section of Fishway Retaining Wall **Photo By:** PJT	

Photo No. 5	
Photo Date: May 22, 2024	
Site Location: Toddy Pond Dam, Orland, Maine	
Description: Concrete Fishway and Concrete Wing Wall Showing Signs of Deterioration	
Photo By: PJT	

Photo No. 6	
Photo Date: May 22, 2024	
Site Location: Toddy Pond Dam, Orland, Maine	
Description: Concrete Fishway Showing Some Deterioration	
Photo By: PJT	

Photo No. 7 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Concrete Fishway at Entrance to the Stream **Photo By:** PJT	

Photo No. 8 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Concrete Spillway, Apron, Retaining Wall, and Head Gate with Elevated Deterioration **Photo By:** PJT	

Photo No. 9 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Concrete Spillway, Apron and Retaining Wall With Elevated Deterioration **Photo By:** PJT	

Photo No. 10 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Concrete Dam Section with Deterioration **Photo By:** PJT	

Photo No. 11 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Concrete Cutoff Wall with Deterioration **Photo By:** PJT	

Photo No. 12 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Vegetation on Upstream Side of Impoundment **Photo By:** PJT	

Photo No. 13 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Elevated Deterioration of Head Gate and Structure **Photo By:** PJT	

Photo No. 14 **Photo Date:** May 22, 2024 **Site Location:** Toddy Pond Dam, Orland, Maine **Description:** Elevated Deterioration of Head Gate Structure at Base **Photo By:** PJT	

Commercial Divers Inc. *Consulting*	Description Repair List: Toddy Pond Dam Maintenance & Repairs	Page of
Written by S. Kacer		Date 6/11/2024

1- Grease gate gear Box (gate)

2- Repair counter meter

3- Fence Repairs (Fallsover Fence 6' Tall)

4- Gate seal →

5- Clean gate area

6- Granite Pointing Repairs (surface) D/S (under water OK)

7- Cleaned Fishway 2-17 Bays 2' gravel

8- Fishway Pipes Screen 11 Pipes screens

9- 12"-24" Gravel In Fishway Bay 1 (Cleaned 6.11.24) Bay 2-17

*11-Rods 1.5" *BAD screens

10- Undermine Toe Bridge

1-3'- along toe