APPENDIX B.
AGENCY CONSUTLATIONS

OLD TOWN FUEL&FIBER

July 20, 2010

Ms. Patricia Kirk
National Marine Fisheries Service
17 Godfrey Drive
Orono, ME 04473

Subject: Endangered Species Request for Technical Assistance
Old Town Fuel and Fiber Biorefinery, Old Town, Penobscot County, ME

Dear Ms. Kirk:

Old Town Fuel and Fiber (OTFF) is an operating pulp mill located in Old Town, Maine. OTFF applied for and received a grant for renewable energy projects from the U.S. Department of Energy (DOE) for installation of a demonstration biorefinery that proposes to use woody biomass for conversion to biofuel. Because the proposed Project is receiving federal funds, the project must comply with the National Environmental Policy Act (NEPA 40 CFR Parts 1500 to 1508) and as such, we are in the initial stages of preparing an Environmental Assessment (EA). As part of the EA preparation we are seeking input from the National Marine Fisheries Service (NMFS) regarding our proposed Project and its potential affect on species listed under the Endangered Species Act (ESA).

Proposed Project:

The proposed Project will be located within the existing OTFF mill site located at 24 Portland Street, Old Town, Maine. The Demonstration scale biorefinery and all associated facilities are proposed to be located within an existing building with the exception of one or two storage tanks which may be located outside the building. If storage tanks are constructed outside the building, they would be located on existing asphalt/un-vegetated disturbed ground, and therefore are not anticipated to remove or affect any upland habitats. Additionally, all storage tanks whether inside the building or outside, would comply with Spill Prevention Pollution Control (SPCC) Act requirements for containment in the event of a leak. The proposed Project is anticipated to utilize their existing Title V Air Quality permit, with minor modifications and would not increase water usage over the existing permitted quantity of 30 million gallons per day (MGD). The proposed Project also anticipates utilizing their existing waste water treatment facility which has capacity for treatment of 24 MGD and operates under an existing National Pollutant Discharge Elimination System (NPDES) permit. Currently the facility is utilizing approximately half of its full capacity (approximately 12 MGD).

The proposed Project is currently conducting small, bench and pilot scales research and development (R&D) with DOE oversight, which will assist in determining by-products,

waste stream, emissions, etc. that would result from operation of the demonstration scale biorefinery. At this time, it is believed that the OTFF facility will have more than enough capacity to treat waste stream from the biorefinery and that constituents will fall within existing thresholds and parameters in their NPDES permit.

Listed Species:

As a result of the decommissioning project to remove the Great Works Dam adjacent to OTFF that is being lead by the Penobscot River Restoration Trust, OTFF needs to relocate their water supply intake. The Penobscot River Restoration Trust submitted an application to the U.S. Army Corps of Engineers (USACE) on behalf of OTFF in May 2010, for moving the water intake downstream. It is our understanding that an ESA Section 7 consultation with your office is underway for this activity and includes extensive information on existing conditions and habitat potential of the Penobscot River in the vicinity of OTFF. Additionally, the Biological Opinion issued by your office in December 2009 for the decommissioning of the Great Works Project (FERC No. 2312) and Veazie Project (FERC No. 2403) and surrender license and construct a fish bypass at the Howland Project (FERC No. 2721) (hereinafter "NMFS BO"),[1] has been relied upon in making this technical assistance request of NMFS. The BO provides a great deal of background information related to listed species and habitat conditions in this reach of the Penobscot River. Therefore, we have not gone into a great deal of detail regarding the habitat and potential for listed fish herein, but incorporate by reference the extensive documentation prepared as part of the decommissioning and pending USACE permit application for moving OTFF's water intake.

Atlantic Salmon (*Salmo salar*):

The current status of Atlantic salmon is as follows:

> The Gulf of Maine (GOM) Distinct Population Segment (DPS) of anadromous Atlantic salmon was initially listed by the USFWS and NMFS (collectively, the Services) as an endangered species on November 17, 2000 (65 FR 69459). A subsequent listing as an endangered species by the Services (74 FR 29344; June 19, 2009) included an expanded range for the GOM DPS of Atlantic salmon. The decision to expand the geographic range of the GOM DPS was largely based on the results of a Status Review (Fay *et al.* 2006) completed by a Biological Review Team (BRT) consisting of federal and state agencies and Tribal interests. Fay *et al.* (2006) concluded that the DPS delineation in the 2000 listing designation was largely appropriate, except in the case of large rivers that were excluded in the 2000 listing determination. Fay *et al.* (2006) concluded that the salmon currently inhabiting Maine's larger rivers (Androscoggin, Kennebec, and Penobscot) are genetically similar to the rivers included in the GOM DPS as listed in 2000, have similar life history characteristics, and/or occur in the same zoogeographic region (NMFS BO, page 23).

In 2004, electrofish surveys conducted in and around the Great Works dam detected a single Atlantic salmon. Because the Great Works Dam slated for decommissioning and

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[1] NMFS Biological Opinion *Surrender of Licenses for the Veazie, Great Works and Howland Projects, Nos. 2403, 2312,2721F/NER/2009/01515.* December 2009.

removal, it is likely that numbers of Atlantic salmon that utilize this reach of the Penobscot River would increase after removal has been completed (Multi-Project Environmental Analysis, Veazie Project FERC No. 2430, Great Works Project FERC No. 2312 and Howland Project FERC No. 2721, prepared by Kleinschmidt, October 2008 [hereinafter Multi-Project EA]).

Shortnose Sturgeon (*Acipenser brevirostrum*)

No shortnose sturgeon have been documented in the fish passage facilities at Veazie (NMFS, 2009). As such, it is presumed that any current attempts to migrate upstream of the Veazie Dam are precluded by a lack of suitable fish passage. Shortnose sturgeon have rarely been documented to attempt to use fishways (other than fish lifts) (NMFS, 2009). Little historic information on shortnose sturgeon use of the Penobscot River is available. However, MNFS has determined that based on migration patterns of shortnose sturgeon in other river systems, it is reasonable to expect that historically shortnose sturgeon would have accessed the additional 22 km of habitat between Veazie and Milford falls (just upstream of the Great Works impoundment) absent the existing barriers and that this habitat would have been used for overwintering, spawning, and as nursery grounds for juveniles (NMFS 2009).

Because the Great Works project lies between Veazie and Milford Falls, it is reasonable to assume that removal of the Veazie and Great Works dams would allow this portion of the Penobscot River to provide potentially suitable habitat for shortnose sturgeon for various periods of their life cycle and shortnose sturgeon could occur adjacent to the OTFF Mill site.

Existing Conditions:

Because the proposed Project does not include in-water activities and upland construction would be confined to inside the existing structures or in upland areas that are developed, it is believed that potential effects to listed fish as a result of the biorefinery would relate to the NPDES compliant waste water treatment discharge. Based on this, the following discussion will focus on existing water quality in the vicinity of the proposed Project.

According to the Multi-Project EA, waters in the proposed Project area have been classified as Class B[2] which are of sufficient quality to support drinking water supply (after treatment), fishing, contact recreation and as unimpaired habitat for fish and other aquatic life (PPL Great Works, LLC, 2000). However, the Penobscot River at Old Town and Milford is designated Class B Category 5-B due to contamination by *E. coli* (MDEP, 2006; MDEP, 2008). Sampling conducted above the Great Works Dam by MDEP in 2001 as part of their basin-wide water quality sampling program indicated that (Mitnik, 2002):

- Average daily and daily maximum dissolved oxygen levels met standards for Class B waters of 7 parts per million and 75 percent oxygen saturation.
- Daily minimum dissolved oxygen concentrations fell slightly below (approximately 6.75 parts per million) standards for Class B waters of 7 parts per million and 75 percent oxygen saturation in 2001.

[2] Class B General-purpose waters that are managed to attain good quality water.

- Because data were collected during a heat-spell, the three day average water temperature for all Penobscot River sampling stations, including the Great Works site, ranged from 25° to 27.3° C (Mitnik, 2002). Min, max, and average values at Great Works ranged from approximately 26° to 28° C. In 1999, as part of relicensing efforts for the Great Works Project, and pursuant to a request from the Maine DEP, PPL Great Works, LLC conducted a macroinvertebrate study in the Great Works project area to assess water quality as it pertains to established aquatic life standards.

The PPL study documented that the Great Works Project bypass reach and impoundment met Class B water quality standards for aquatic life. Maine DEP verified and concurred with this assessment on January 18, 2000 (PPL Great Works, 2000).

Overall, pollution beyond sewer treatment has been a problem for the Penobscot River system, and paper production facilities have resulted in higher concentrations throughout the system of metals, dioxin, dissolved solids, phenols, and hydrocarbons. NMFS currently reviews and comments on all NPDES permits issued by Maine Department of Environment below Veazie Dam.

The shortnose sturgeon long life span, tendency to spend extended periods in estuarine habitats, and their diet, predispose this species to long term, repeated exposure to environmental contaminants and bioaccumulation oftoxicants may affect its ability to handle environmental and physiological stressors (Dadswell 1979 {NMFS, 2009}). Although concerted efforts to improve water quality ion the Penobscot River system have been underway for many years, discharges to this system contribute various chemical contaminants as well as heated effluent to the river (NMFS, 2009). The watershed is considered impaired for fish consumption and recreational uses. The cumulative effects of discharges into the river is unknown and may be negatively impacting or delaying the potential for shortnose sturgeon to recover in this system

While we realize there may need to be some additional sampling, especially at the waste water treatment point of discharge, based on the foregoing, it appears that the greatest concern to water quality in this reach of the Penobscot River is *E. coli*. The OTFF waste water treatment facility is used exclusively for mill operations and does not treat sanitary sewer waste. The facility is directly hooked up to the municipal sanitary sewer system and all non-industrial mill facilities (office kitchens, bathrooms, etc.) are directed to the municipal system and this would not change with installation of the biorefinery. A modification to the existing NPDES permit may be required based upon the results of the small pilot-scale research and analyses currently underway. Results of the pilot-scale activities would be included in the EA for NMFS review and comment.

Conclusion:

As part of early coordination for the NEPA process, we would appreciate any feedback or guidance you may be able to offer related to our proposed Project and any potential affects to NMFS listed species.

Please contact Whitney Fiore at 310.387.7755 or wfiore@icfi.com with any questions.

Sincerely,

Richard Arnold
President, Old Town Fuel & Fiber

cc: J. Atwell, SME
G. Doyle, DOE
K. Kerwin, DOE
W. Fiore, ICFI
B. Marcus, DWM

RED SHIELD ACQUISITION LLC
Phone: 207-827-7711 • Fax: 207-827-8888
P.O. Box 564 • 24 Portland Street • Old Town, Maine 04468

A LYNN TILTON COMPANY

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

JUL 30 2010

Richard Arnold
Old Town Fuel and Fiber
24 Portland Street
Old Town, Maine 04468

Dear Mr. Arnold:

This correspondence is in response to your request for technical assistance concerning installation of a demonstration biorefinery at the Old Town Fuel and Fiber mill complex in Old Town, Maine. According to your letter dated July 20, 2010, Old Town Fuel and Fiber has received a grant from the U.S. Department of Energy (DOE) to conduct small bench and pilot scale research and development activities that will include the installation of a biorefinery to use woody biomass for conversion to biofuel at the Old Town mill. While no in-water work is involved in the proposed project, the proposed biorefinery will discharge process water to the Penobscot River via the existing Old Town Fuel and Fiber wastewater treatment facility.

Listed Species and Critical Habitat in the Action Area
Two species of federally endangered fish (Atlantic salmon and shortnose sturgeon) occur in the Penobscot River in the vicinity of the Old Town Fuel and Fiber discharge. The Gulf of Maine (GOM) Distinct Population Segment (DPS) of anadromous Atlantic salmon (*Salmo salar*) was initially listed by the U.S. Fish and Wildlife Service (USFWS) and NOAA's National Marine Fisheries Service (NMFS), as an endangered species on November 17, 2000 (65 FR 69459). A subsequent listing as an endangered species by the Services (74 FR 29344; June 19, 2009) included an expanded range for the GOM DPS of Atlantic salmon. The GOM DPS includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Included are all associated conservation hatchery populations used to supplement these natural populations; currently, such conservation hatchery populations are maintained at Green Lake National Fish Hatchery (GLNFH) and Craig Brook National Fish Hatchery (CBNFH). The proposed project in Old Town, Maine is located within the range of the GOM DPS of Atlantic salmon. Critical habitat for listed Atlantic salmon has been designated pursuant to section 4(b)(2) of the ESA. The critical habitat designation for the GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 km of perennial river, stream, and estuary habitat and 799 square km of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species. The entire occupied range of the GOM DPS in which critical habitat is designated is within the State of Maine. The Penobscot River, including the area where discharges from Old

Town Fuel and Fiber occur, has been designated as critical habitat for Atlantic salmon. Shortnose sturgeon (*Acipenser brevirostrum*) were listed as endangered on March 11, 1967 (32 FR 4001), and the species remained on the endangered species list with the enactment of the ESA in 1973. NMFS has sole jurisdiction over listed shortnose sturgeon. A population of the federally endangered shortnose sturgeon occurs in the Penobscot River (NMFS 1998). Between May 2006 and October 2009, over 500 shortnose sturgeon were captured in the Penobscot River by the University of Maine (UM). A preliminary population estimate generated by UM in 2008 based on the 2006-2001 capture data indicates a population size of 1,049 individuals (Lincoln Peterson, 95% CI 673-6939, UM unpublished data). At this time, the extent of this species' range in the Penobscot is likely from the lower estuary to the area downstream of the Veazie Dam. As you may know, the removal of the Great Works Dam in Old Town, Maine is currently proposed. When the dam is removed, NMFS expects that shortnose sturgeon could occur in the vicinity of the Old Town Fuel and Fiber mill discharge.

Section 7 Consultation

The proposed action may affect Atlantic salmon and shortnose sturgeon. Under Section 7(a)(2) of the ESA, each Federal agency is required to insure that any action they authorize, fund or carry out is not likely to jeopardize the continued existence of any endangered or threatened species.

For projects occurring in freshwater, NMFS and USFWS have agreed that all comments and correspondence will be channeled through USFWS. Therefore, as the action area for this project is in freshwater, USFWS will be the lead agency and point of contact for any consultation involving Atlantic salmon pursuant to Section 7 of the Endangered Species Act (ESA), of 1973, as amended. Please contact Wende Mahaney in the USFWS' Maine Field Office regarding any additional questions related to Atlantic salmon and the proposed action (207-827-5938). Any consultation necessary to consider effects of the action on shortnose sturgeon would be conducted with NMFS.

As the proposed project is being funded by DOE, the DOE will be the Federal action agency for purposes of Section 7 consultation. NMFS recommends that DOE coordinate with NMFS and USFWS to complete necessary section 7 consultations.

Technical Assistance for Candidate Species

Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the *Federal Register*.

Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) occur in the Penobscot River. While the range of this species in the river is currently restricted by the Veazie Dam, when the Veazie and Great Works dams are removed, Atlantic sturgeon may occur in the action area for this project.

In 2006, NMFS initiated a status review for Atlantic sturgeon to determine if listing as threatened or endangered under the ESA is warranted. The Status Review Report was published on February 23, 2007. NMFS is currently considering the information presented in the Status Review Report to determine if any listing action pursuant to the ESA is warranted at this time. If

it is determined that listing is warranted, a final rule listing the species could be published within a year from the date of publication of the proposed rule. Currently, NMFS expects to publish a finding as to whether any listing action is appropriate by the Fall of 2010. As a candidate species, Atlantic sturgeon receive no substantive or procedural protection under the ESA; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on Atlantic sturgeon from any proposed project. Please note that once a species is proposed for listing the conference provisions of the ESA apply (see 50 CFR 402.10). As the listing status for this species may change, NMFS recommends that the project proponent and DOE obtain updated status information from NMFS prior to the submittal of any request for Section 7 consultation.

NMFS understands that DOE is in the initial stages of preparing an Environmental Assessment under the National Environmental Policy Act for the proposed biorefinery project. To facilitate our review of the proposed project, NMFS will require an assessment of the wastewaters that will be discharged by the project into the Penobscot River. This assessment should include the type and amount of pollutants as well as potential affects to water quality and aquatic organisms in the Penobscot River.

Thank you for seeking our assistance with the proposed project. Please contact Jeff Murphy at (207) 866-7379 should you have any questions regarding these comments or the Section 7 consultation process.

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

EC: Crocker, Murphy, F/NER3
Wende Mahaney, USFWS
Norm Dube, MDMR

Sec 7: tech assist 2010 – Old Town Fuel and Fiber

OLD TOWN FUEL & FIBER

July 20, 2010

Ms. Wende Mahany
U.S. Fish and Wildlife Service
17 Godfrey Drive
Orono, ME 04473

Subject: Endangered Species Request for Technical Assistance
Old Town Fuel and Fiber Biorefinery, Old Town, Penobscot County, ME

Dear Ms. Mahaney:

Old Town Fuel and Fiber (OTFF) is an operating pulp mill located in Old Town, Maine. OTFF applied for and received a grant for renewable energy projects from the U.S. Department of Energy (DOE) for installation of a demonstration biorefinery that proposes to use woody biomass for conversion to biofuel. Because the proposed Project is receiving federal funds, the project must comply with the National Environmental Policy Act (NEPA 40 CFR Parts 1500 to 1508) and as such, we are in the initial stages of preparing an Environmental Assessment (EA). As part of the EA preparation we are seeking input from the U.S. Fish and Wildlife Service (USFWS) regarding our proposed Project and its potential affect on species listed under the Endangered Species Act (ESA).

Proposed Project:

The proposed Project will be located within the existing OTFF mill site located at 24 Portland Street, Old Town, Maine. The Demonstration scale biorefinery and all associated facilities are proposed to be located within an existing building with the exception of one or two storage tanks which may be located outside the building. If storage tanks are constructed outside the building, they would be located on existing asphalt/un-vegetated disturbed ground, and therefore are not anticipated to remove or affect any upland habitats. Additionally, all storage tanks whether inside the building or outside, would comply with Spill Prevention Pollution Control (SPCC) Act requirements for containment in the event of a leak. The proposed Project is anticipated to utilize their existing Title V Air Quality permit, with minor modifications and would not increase water usage over the existing permitted quantity of 30 million gallons per day (MGD). The proposed Project also anticipates utilizing their existing waste water treatment facility which has capacity for treatment of 24 MGD and operates under an existing National Pollutant Discharge Elimination System (NPDES) permit. Currently the facility is utilizing approximately half of its full capacity (approximately 12 MGD).

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As a result of the decommissioning project to remove the Great Works Dam adjacent to OTFF that is being lead by the Penobscot River Restoration Trust, OTFF needs to relocate their water supply intake. The Penobscot River Restoration Trust submitted an application to the U.S. Army Corps of Engineers (USACE) on behalf of OTFF in May 2010, for moving the water intake downstream. It is our understanding that an ESA Section 7 consultation with your office is underway for this activity and includes extensive information on existing conditions and habitat potential of the Penobscot River in the vicinity of OTFF. Additionally, the National Marine Fisheries Service (NMFS) issued a Biological Opinion in December 2009 for the decommissioning of the Great Works Project (FERC No. 2312) and Veazie Project (FERC No. 2403) and surrender license and construct a fish bypass at the Howland Project (FERC No. 2721) (hereinafter "NMFS BO").[1] As a result of the dam removal and fish bypass effort, a great deal of biological and habitat assessment work has been conducted along the reach of the Penobscot River directly adjacent to the OTFF mill site. Therefore, we have not gone into a great deal of detail regarding the habitat and potential for listed fish herein, but incorporate by reference the extensive documentation prepared as part of the decommissioning and pending USACE permit application for moving OTFF's water intake.

Atlantic Salmon (*Salmo salar*):

The current status of Atlantic salmon is as follows:

> stated that the Gulf of Maine (GOM) Distinct Population Segment (DPS) of anadromous Atlantic salmon was initially listed by the USFWS and NMFS (collectively, the Services) as an endangered species on November 17, 2000 (65 FR 69459). A subsequent listing as an endangered species by the Services (74 FR 29344; June 19, 2009) included an expanded range for the GOM DPS of Atlantic salmon. The decision to expand the geographic range of the GOM DPS was largely based on the results of a Status Review (Fay *et al.* 2006) completed by a Biological Review Team (BRT) consisting of federal and state agencies and Tribal interests. Fay *et al.* (2006) concluded that the DPS delineation in the 2000 listing designation was largely appropriate, except in the case of large rivers that were excluded in the 2000 listing determination. Fay *et al.* (2006) concluded that the salmon currently inhabiting Maine's larger rivers (Androscoggin, Kennebec, and Penobscot) are genetically similar to the rivers included in the GOM DPS as listed in 2000, have similar life history characteristics, and/or occur in the same zoogeographic region (NMFS BO, page 23).

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[2] Class B General-purpose waters that are managed to attain good quality water.

recreational uses and cumulative effects of discharges into the river are unknown at this time.

While we realize there may need to be some additional sampling, especially at the waste water treatment point of discharge, based on the foregoing, it appears that the greatest concern to water quality in this reach of the Penobscot Riveris *E.* coli. The OTFF waste water treatment facility is used exclusively for mill operations and does not treat sanitary sewer waste. The facility is directly hooked up to the municipal sanitary sewer system and all non-industrial mill facilities (office kitchens, bathrooms, etc.) are directed to the municipal system and this would not change with installation of the biorefinery. A modification to the existing NPDES permit may be required based upon the results of the small pilot-scale research and analyses currently underway. Results of the pilot-scale activities would be included in the EA for USFWS review and comment.

Conclusion:

As part of early coordination for the NEPA process, we would appreciate any feedback or guidance you may be able to offer related to our proposed Project and any potential affects to USFWS listed species.

It should be noted, as part of the EA we prepare for this project, we will describe the potential impacts to biological resources, including terrestrial species, state-listed species, eagles and other migratory birds, but do not believe that they will be adversely affected by the proposed Project.

Please contact Whitney Fiore at 310.387.7755 or wfiore@icfi.com with any questions.

Sincerely,

Richard Arnold
President, Old Town Fuel & Fiber

cc: J. Atwell, SME
G. Doyle, DOE
K. Kerwin, DOE
W. Fiore, ICFI
B. Marcus, DWM

RED SHIELD ACQUISITION LLC
Phone: 207-827-7711 • Fax: 207-827-8888 Box 564 • 24 Portland Street • Old Town, Maine 04468

Mr. Jeff Murphy
National Marine Fisheries Service
17 Godfrey Drive
Orono, ME 0447

Subject: Effluent Report for the Old Town Fuel and Fiber Biorefinery, Old Town, Penobscot County, ME

Dear Mr. Murphy:
As you may recall, in July 2010, Old Town Fuel and Fiber (OTFF) requested technical assistance from your office. The request was related to potential impacts to federally listed Endangered Atlantic salmon (*Salmo salar*), federally-listed Endangered shortnose sturgeon (*Acipenser brevirostrum*) and Candidate species Atlantic sturgeon (*Acipenser oxyrhynchus*) resulting from installation of a demonstration scale biorefinery at the existing OTFF pulp mill. OTFF concurrently requested technical assistance from the U.S. Fish and Wildlife Service (USFWS) for Atlantic salmon.

During a conference call with the National Marine Fisheries Service and the USFWS subsequent to the request from OTFF, it was suggested that OTFF pursue development of a technical report that analyzed both the existing effluent from the OTFF pulp mill wastewater treatment plant as well as the proposed biorefinery effluent.

We have attached that report for your review. If you have any questions or require any additional information, please contact me at 310.387.7755 or wfiore@icfi.com.

Sincerely,

Whitney Fiore

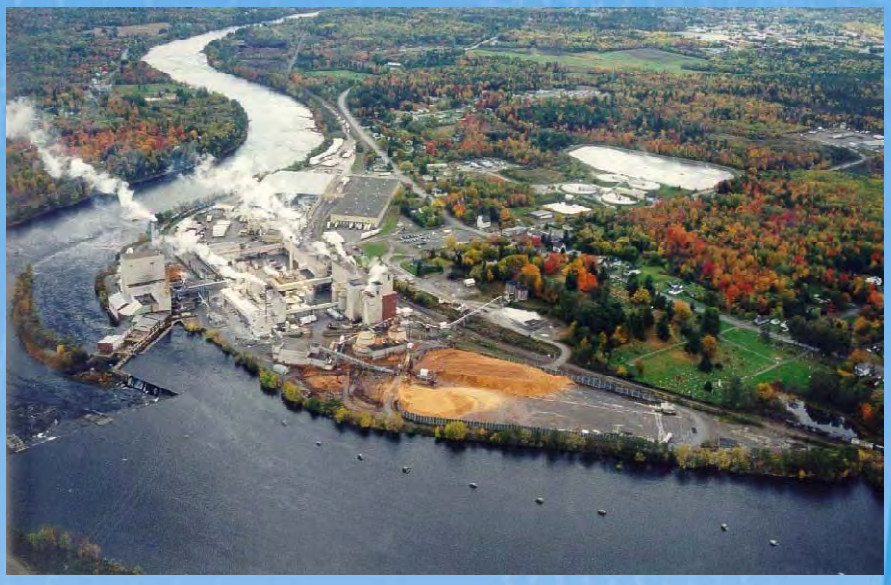
Enclosure: Effluent Report

cc: Wende Mahany (via regular mail w/ enc.)
J. St Pierre, OTFF (via email w/ enc.)
J. Atwell, SME (via email w/ enc.)
G. Doyle, DOE (via regular mail w/ enc.)
K. Kerwin, DOE (via regular mail w/ enc.)

Old Town Fuel and Fiber Proposed Biorefinery Effluent Analysis

Revised April 20, 2011

Prepared for:
U.S. Department of Energy,
U.S. Fish and Wildlife Service, and
National Marine Fisheries Service



Prepared by:
ICF International
9300 Lee Highway
Fairfax, VA 22031

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Figures

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Appendices

Acronyms and Abbreviations

A-NOEL	acute (short-term) no-observed-effect level
A-RQ	risk quotient for acute exposures
BOD	biochemical oxygen demand
BODu	ultimate biochemical oxygen demand
CBODu	carbonaceous fraction of BODu
cfs	cubic feet per second
C-NOEL	chronic (long-term) no-observed-effect level
C-RQ	risk quotient for chronic exposures
MEDEP	Maine Department of Environmental protection
DO	dissolved oxygen
DOC	dissolved organic carbon
DPS	Distinct Population Segment
FR	Federal Register
IBR	integrated biorefinery
LC_{50}	concentration lethal to 50% of the animals for a specified exposure duration
MEPDES	Maine Pollutant Discharge Elimination System
mg/L	milligrams per liter
mgd	million gallons per day
MOE	margin of exposure
MSRA	Maine Revised Statutes Annotated
NBODu	nitrogenous fraction of BODu
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OTFF	Old Town Fuel and Fiber
PCB	polychlorinated biphenyls
PCEs	Primary Constituent Elements
ppb	parts per billion
ppm	Parts per million
RQ	risk quotient
SD	standard deviation
SDS	sodium dodecyl sulfate
TSS	total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WET	whole effluent toxicity
WQS	water quality standards

1. Introduction

Red Shield Associates, LLC (dba Old Town Fuel and Fiber; hereinafter, OTFF) proposes to install and operate a demonstration-scale integrated biorefinery (IBR) at their existing pulp mill in Old Town, Maine, to demonstrate the production of n-butanol from lignocellulosic (wood) extract. OTFF intends to use U.S. Department of Energy (DOE) grant funds to construct and install this demonstration-scale biorefinery. To comply with the National Environmental Policy Act (NEPA; 40 Code of Federal Regulations Parts 1500 to 1508), DOE is preparing an Environmental Assessment (EA) for the proposed action. This report has been prepared in anticipation of preparation of the EA and provides an assessment of the existing effluents from the mill's wastewater treatment plant discharged to the Penobscot River and any potential effects on fish in the river, and estimated changes in the effluent that would result from installing and operating the proposed integrated biorefinery (IBR) at the mill.

As part of a public and private effort led by the Penobscot River Trust, two large dams on the Penobscot River, Veazie and Great Works, are slated for removal to provide upstream passage to fish. Once the two dams are removed, the federally listed Endangered Gulf of Maine Distinct Population Segment (DPS) of Atlantic salmon (*Salmo salar*), and the Endangered shortnose sturgeon (*Acipenser brevirostrum*) and the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) (a Candidate species for listing), will have access to portions of the Penobscot River upstream of the dam locations, including the reach of the river adjacent to the pulp mill and the mill's wastewater treatment effluent discharges.

This report summarizes baseline and potential future characteristics of discharges from the mill's wastewater treatment plant to the Penobscot River as they pertain to fish and other aquatic life. Data characterizing baseline discharges include data from chemical and aquatic toxicity testing of current and past effluents from the pulp mill performed pursuant to the discharge permit issued by the Maine State Pollutant Discharge Elimination System (MEPDES). This report discusses effluent discharges anticipated from a proposed demonstration-scale biorefinery at the site as well as existing effluent discharges from the operating pulp mill.

1.1 OTFF Pulp Mill and Proposed Biorefinery

The proposed project site is within the existing OTFF pulp mill site at 24 Portland Street, Old Town, Penobscot County, Maine (approximately 120 miles northeast of Portland and 15 miles north of Bangor; see Figure 1, Site Location Map. OTFF owns the property, which is currently zoned for industrial use.

OTFF operates a pulp mill on a bend on the western side of the Penobscot River (see Figure 2, Site Aerial Photo). The site covers approximately 180 acres and extends from the chip storage and conveying facility at the northern end to the former tissue converting and warehouse facilities at the southern end. The property is bounded on the east by the Penobscot River and on the west by South Main Street. Operations at this property include chip storage and handling, pulping, bleaching, drying, maintenance, warehousing, fuel storage, and black-liquor storage. The OTFF wastewater treatment plant is directly west of the OTFF pulp mill across South Main Street along Penny Road on approximately 23 acres of land OTFF owns. The treatment system consists of an aeration pond, spill pond, four clarifiers, sludge dewatering, and a control building.

Although the OTFF pulp mill is located on approximately 180 acres, the proposed biorefinery would require 0.9 acre (40,000 square feet) in the 5.7-acre (250,000-square-foot) former, and

Figure 1. Site Location Map.

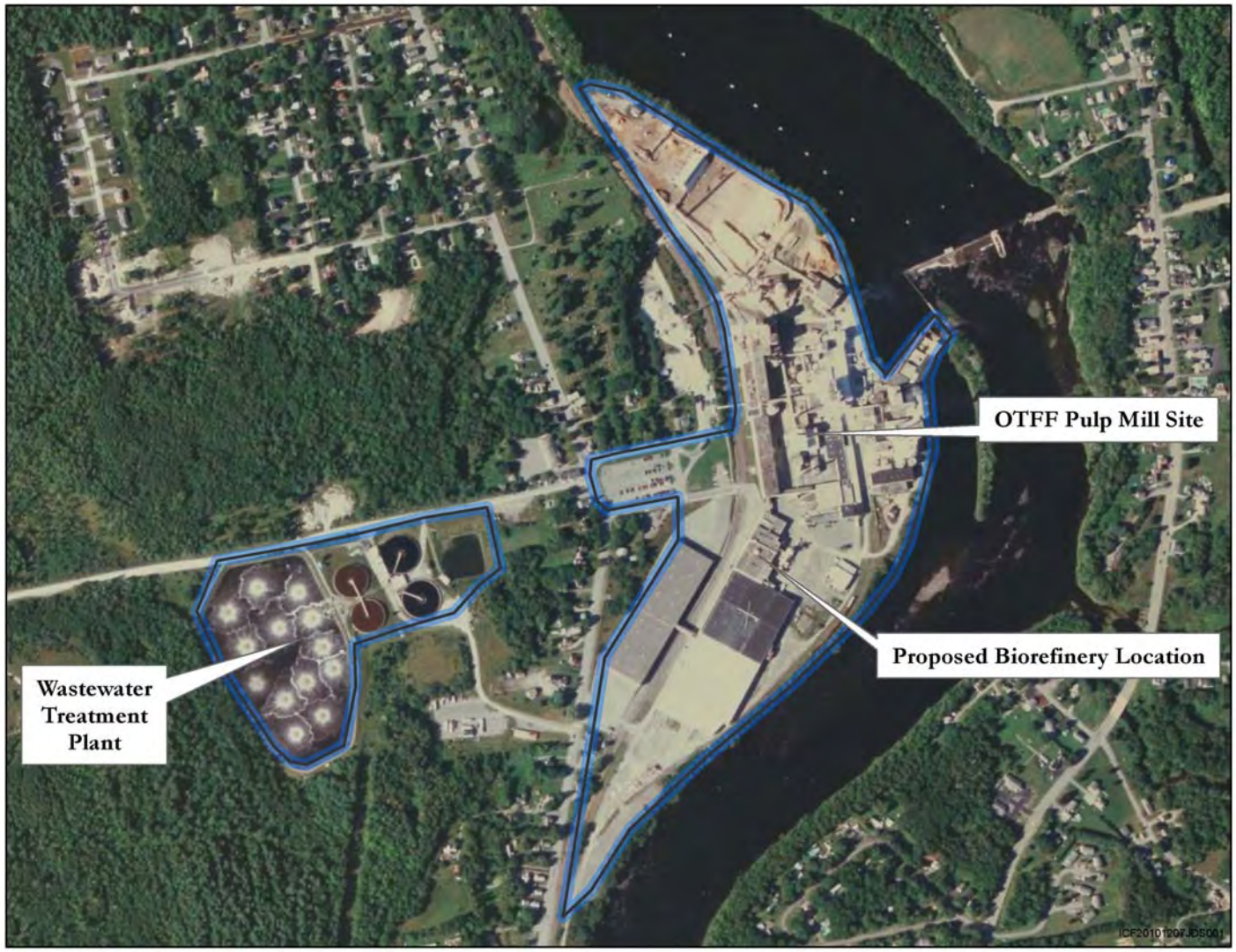


Figure 2. Site Aerial Photo.

now vacant, tissue paper machine building. No in-water work is proposed as part of the IBR project.

Most of the proposed IBR project would be in the former tissue paper machine building, except as described below.

- The extraction vessel would remain at its present location in the pulp mill where the feedstock pretreatment and extraction processes would occur
- A series of aboveground pipelines would be installed between the pulp mill and the biorefinery to facilitate the movement of products to and from the biorefinery.
- One to two storage tanks are expected to be installed outside the former tissue paper machine building.
- A Heat Recovery Steam Generator would be added adjacent to the existing gas-fired turbogenerator, outside and next to the biorefinery building.
- Five to 10 distillation columns would extend above the roofline of the former tissue paper machine building. These distillation towers would range in diameter from 3 feet to 8 feet, and the tallest could extend 40 feet above the roofline.

To produce n-butanol, currently processed hardwood woodchips would be subjected to an additional treatment step (extraction) before entering the pulp process. This process, which would be completed in the existing pulp mill, produces extract consisting of the following;

- Hemicelluloses (a long polymer molecule of connected sugars that is part of the plant cell wall)
- Acetic acid
- Formic acid
- Furfural
- Lignin (a glue-like substance that keeps plant cell walls from falling apart)

The extract from the partially processed chips would be sent via pipeline to the biorefinery for further processing. Additional steps prior to fermentation involve reducing solids by concentration, adding sulfuric acid to remove lignin (a fermentation inhibitor), adding calcium hydroxide to remove acetic and formic acids, and the removal of gypsum and lime. The acid recovery process would facilitate the removal of acetic acid, formic acid, and furfural using an extraction process. Expected recovery would be 2.13 million gallons per year of acetic acid. Formic acid would be produced at 740,000 gallons per year and furfural at 80,000 gallons per year. Due to the smaller quantities present, furfural would not be sold; instead, it would be sent to the boiler to recover its heat value. To remove the remaining inhibitors, a final processing step would remove the remaining salts and acids prior to fermentation. Membrane electro-dialysis would be used to remove these materials. N-butanol would be produced in the acetone-n-butanol-ethanol fermentation process. Sugar would ferment in a continuous process in five fermenters operating in series, with the extract being continuously recycled. The beer from the fermentation process would go to the distillation column to separate n-butanol and ethanol. Ethanol would be produced at a rate of 40,000 gallons per year and would be sent to the boiler to be burned along with black liquor to recover its heat value. N-butanol would be produced at a rate of 1.32 million gallons per year.

1.2 Action Area

The proposed project's action area is defined by the geographic extent of potential environmental effects from the project. For the proposed biorefinery, this includes both upland and aquatic areas. The proposed biorefinery would be constructed in the existing tissue facility, with the exception of storage tanks, which would be constructed on existing asphalt and unvegetated and disturbed areas. The storage tanks would be equipped with adequate spill prevention and containment berms to ensure that potential spills would be contained and would not reach vegetated areas or the Penobscot River. The biorefinery would rely on and utilize existing infrastructure (e.g., the chip loading dock, boiler, piping system, and wastewater treatment facility) and would not require construction of new facilities or conversion of undeveloped areas. The aquatic action area is defined by the effluent discharges from the existing wastewater treatment facility to the point downstream where full mixing occurs. There are no data from which to determine this exact location, but a conservative estimate based on the annual average flow of approximately 11,000 cubic feet per second (cfs) indicates that full mixing of project discharges would occur approximately 0.25 mile downstream of the lower outfall (Outfall No. 001) (see Figure 3, Action Area). Therefore, the aquatic portion of the action area is delineated as the Penobscot River from the point of discharge for Outfall No. 002 to 0.25 mile downstream of Outfall No. 001 (see Figure 3, Project Action Area).

2. Background

Both the Veazie and the Great Works dams on the Penobscot River have been authorized by the Federal Energy Regulatory Commission for decommissioning and removal. The Penobscot River Trust led the effort by many stakeholders to have the dams removed as part of restoring habitat to the Atlantic salmon in the State of Maine. The Veazie Dam is approximately 7 miles downstream from the OTFF pulp mill, and the Great Works Dam is directly adjacent to the mill.

2.1 Fisheries in the Vicinity of the OTFF Pulp Mill

Removing the Veazie and Great Works dams will provide unimpeded access to the portions of the Penobscot River adjacent to the OTFF mill site for the diadromous Atlantic salmon and the shortnose sturgeon. The U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) first listed the Gulf of Maine DPS) of Atlantic salmon as Endangered on November 17, 2000 (65 *Federal Register* [FR] 69459). A subsequent listing of critical habitat on June 19, 2009, expanded the range of the Gulf of Maine DPS of Atlantic salmon (74 FR 29344) as a federally listed Endangered species under the joint jurisdiction of the USFWS and the NMFS.

2.1.1 Atlantic Salmon

The Atlantic salmon Gulf of Maine DPS encompasses all naturally spawned and conservation hatchery populations of diadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River and wherever these fish occur in the estuarine and marine environment. The upstream extent of the freshwater range of the Gulf of Maine DPS is delimited by seven impassable natural falls in the Androscoggin, Kennebec, and Penobscot drainages. Also included in the Gulf of Maine DPS are all associated conservation hatchery populations used to supplement these natural populations. Landlocked salmon (also *Salmo salar*) and salmon raised in commercial

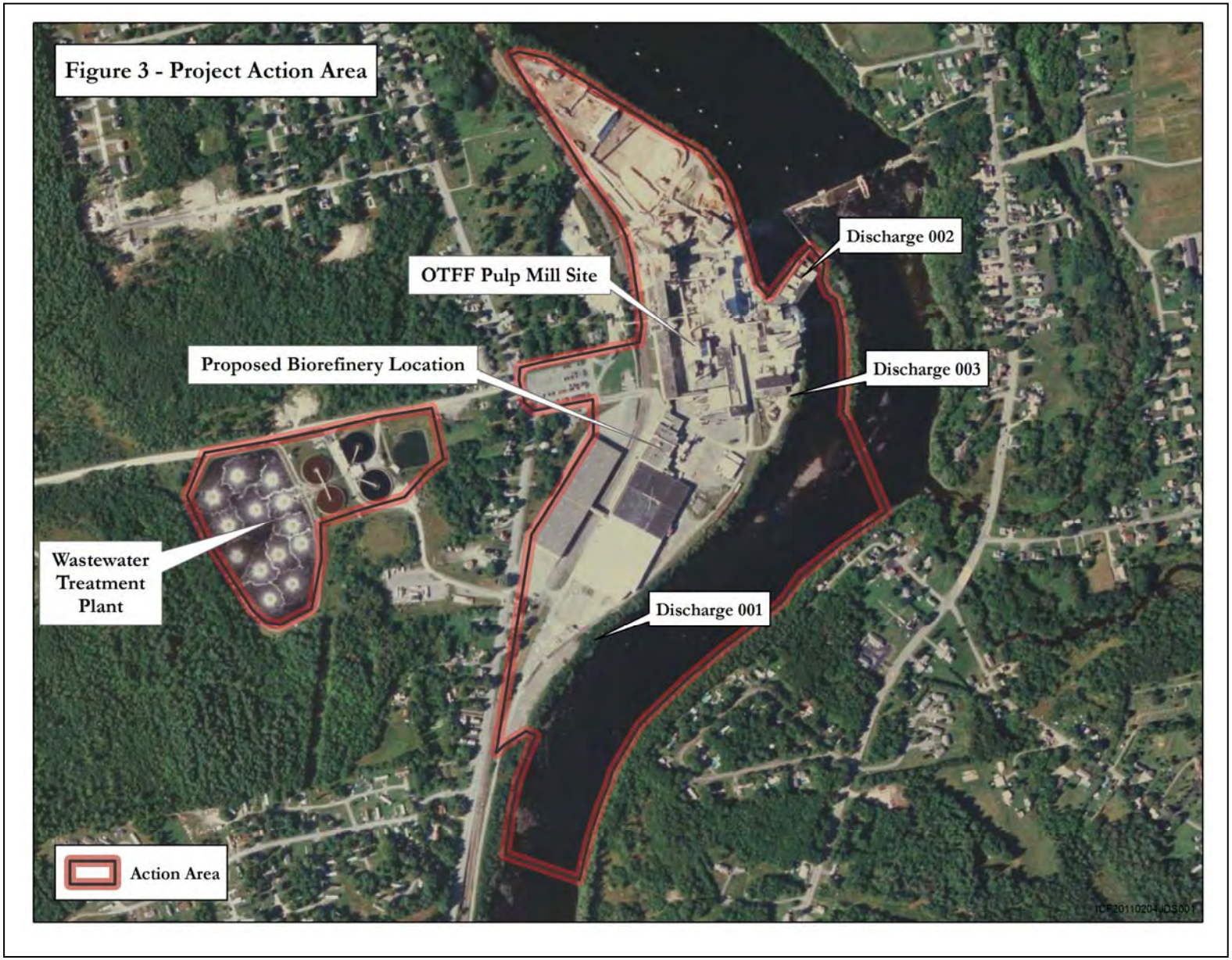


Figure 3. Action Area.

hatcheries for aquaculture are excluded. The OTFF IBR project (action area) is within the geographic range of the Gulf of Maine DPS. An assessment of salmon lies" (areas with sufficient depth and cover to serve as resting locations for upstream migrating adult salmon) for the EA for the Great Works Dam Removal Project (Kleinschmidt 2008) was limited to the areas immediately downstream of Great Works Dam (in the vicinity of outfalls 002 and 003) and found several suitable areas. The reach between Great Works and Veazie dams has 44 areas suitable for salmon lies (Kleinschmidt 2008).

On June 19, 2009, the NMFS designated critical habitat for listed Atlantic salmon pursuant to section 4(b)(2) of the Endangered Species Act. The critical habitat designation for the Gulf of Maine DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 kilometers (12,161 miles) of perennial river, stream, and estuary habitat and 799 square kilometers (309 square miles) of lake habitat within the range of the Gulf of Maine DPS and in which are found those physical and biological features essential to the conservation of the species.

The OTFF IBR project would be in the Great Works Stream-Penobscot River HUC-10 watershed, which has been designated as critical habitat for the Atlantic salmon Gulf of Maine DPS. The Primary Constituent Elements (PCEs) of Atlantic salmon critical habitat are (1) spawning and rearing habitat and (2) migration habitat. According to information provided in the Letter of Concurrence issued for the OTFF mill water supply intake relocation (issued September 8, 2010, USFWS/Region5/ES/MEF; USFWS 2010), Atlantic salmon could be present in the Penobscot River adjacent to the OTFF IBR project, primarily because:

1. Atlantic salmon spawn and rear infrequently and in limited numbers in Great Works Stream, a tributary of the Penobscot River approximately 500 feet downstream of the project area on the left bank of the Penobscot River.
2. Approximately 13,500 fry were stocked in Great Works Stream in 2008 as part of a study, and these fish are now rearing in Great Works Stream or the Penobscot River.
3. Adults migrate through the action area from May through November during their upstream migration period.
4. Downstream migrating post-spawned adults pass through the action area, primarily in spring during run-off.
5. Downstream migrating smolts pass through the action area, typically in May as high flows recede.

Table 1 summarizes the general life-history timing and location of Atlantic salmon.

2.1.1 Sturgeon

Shortnose sturgeon were initially listed as Endangered on March 11, 1967 (32 FR 4001), before the Endangered Species Act was enacted in 1973. The NMFS has sole jurisdiction over shortnose sturgeon. According to the July 30, 2010, letter from the NMFS to OTFF in response to the OTFF request for technical assistance, there is a population of the Endangered shortnose sturgeon in the Penobscot River. Between May 2006 and October 2009, the University of Maine captured more than 500 shortnose sturgeon in the Penobscot River. The NMFS July 30, 2010, letter stated that the Penobscot River population is estimated to be 1,049 individuals. Although the portion of the Penobscot River identified as the action area is not available to shortnose sturgeon at this time, once the Veazie Dam (approximately 7 miles downstream of

Table 1. Life-History Timing and Location of Atlantic Salmon.

Stage of Life History	Timing	Location
Adult upstream migration	May to November (mostly May to mid July)	Ocean to upper river and tributaries
Adult oversummering	May to November	Cool areas in upper river and tributaries
Spawning	Fall	Upper river and tributaries
Adult downstream migration	December to April (primarily during spring runoff period)	Upper river and tributaries to ocean
Smolt downstream migration	May (as high flows recede)	Upper river to ocean and estuaries

Sources: Saunders et al. (2006); NMFS (2009); USFWS (2010).

the OTFF mill site) and the Great Works Dam are removed, it is anticipated that shortnose sturgeon would have the opportunity to enter the action area. (Sturgeon will be able to enter the action area as soon as the Veazie Dam is removed. Great Works Dam removal would have no effect in this regard because it is upstream of the action area). Historically, shortnose sturgeon ranged up to river kilometer 62 (mile 38.5) (Fernandes et al. 2010), which is just upstream of the action area. Table 2 summarizes the life-history timing of shortnose sturgeon is summarized, although note that behavior is variable and the patterns do not apply to all individuals.

Table 2. Life-History Timing and Location of Shortnose Sturgeon and Atlantic Sturgeon.

Stage of Life History	Shortnose Sturgeon		Atlantic Sturgeon	
	Timing	Location	Timing	Location
Adult upstream migration	July and August	Estuary to lower river	April and May	Sea/estuary to lower river
Overwintering	September or October until spring	Lower river	Late fall or winter	Lower estuary/coastal ocean
Spawning	Mid to late spring, when water is warmer than 8°C	Lower river	April and May	Generally between salt front and fall line (i.e., approximately up to Bangor in the Penobscot River)
Adult downstream migration	Shortly after spawning	Lower river to estuary	After spawning	Lower river to estuary/sea
Early-juvenile downstream migration	A few weeks after spawning (early summer)	Lower river to estuary	A few weeks after spawning	Lower river to estuary

Sources: NMFS (1998); NMFS (2007); Fernandes et al. (2010).

Although detailed data on riverbed substrates in the vicinity of the OTFF discharges are limited, it appears that existing conditions are somewhat suitable for species such as salmon and sturgeon. The EA for the Great Works Dam Removal Project (Kleinschmidt 2008) describes substrates within the existing Great Works impoundment (bedrock, boulders, cobble, and gravel) as being similar to those in the contiguous free-flowing reaches, including the area downstream of the discharge points. The EA for the Great Works Dam Removal Project suggests that future access to these areas will likely provide spawning opportunities for Endangered shortnose sturgeon and Candidate Atlantic sturgeon. More detailed substrate

characterization would be required to confirm the presence of spawning areas for sturgeon in the vicinity of the discharges.

Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) has been petitioned as a Candidate species for listing under the Endangered Species Act. The Status Review Report for Atlantic sturgeon was issued in February 2007. The NMFS anticipated determining if listing is warranted in 2010, but has not made a final determination. Because Atlantic sturgeon is a Candidate species and has the potential to enter the action area after the dams are removed, they have been included in this assessment. As for the shortnose sturgeon, Atlantic sturgeon historically ranged upstream to river mile 38.5 (Fernandes et al. 2010), just upstream of the action area. Table 2 also summarizes the life-history timing of Atlantic sturgeon, although note that behavior is variable and the patterns do not apply to all individuals.

2.2 OTFF IBR and Pulp Mill Effluent Discharge Permit

The OTFF proposed IBR in Old Town, Maine, is expected to produce 1.32 million gallons of n-butanol, 2.13 million gallons of acetic acid, 740,000 gallons of formic acid, and 410,000 gallons of acetone annually. The project would be used to demonstrate the technical and economical feasibility of converting lignocellulosic extract to n-butanol that would form the basis for a series of commercial-scale biorefineries. The pulp mill currently produces approximately 12 million gallons per day (mgd) of wastewater that is treated in the mill's existing wastewater treatment facility, which is approximately one half of the permitted discharge of 24.4 mgd.

Currently, the pulp mill's wastewater treatment plant discharges its effluent to the Penobscot River under MEPDES Permit No. ME0002020 (attached as Appendix A), which specifies allowed effluent discharge rates and characteristics to safeguard water quality in the Penobscot River and to protect aquatic life. The system is permitted to release 24.4 mgd of secondary treated process waters (including storm water and landfill leachate) and other wastewaters associated with the pulp and papermaking process, non-contact cooling waters, turbine condensing waters, and filter backwash waters from three separate outfalls to the Penobscot River. In addition to the routine wastewater discharge, this permit authorizes discharges associated with or resulting from essential maintenance, regularly scheduled maintenance during startup and shutdown, and spills and releases (whether anticipated or unanticipated) from anywhere in the permitted facility. As noted above, for many years, the mill has been discharging approximately half of its discharge permit limit.

OTFF is authorized to discharge from four outfalls in accordance with their current MEPDES permit issued in 2002 (see Figure 4, Wastewater Treatment Plant and Outfall Locations). Secondary treated process wastewaters are discharged into the Penobscot River via Outfall No. 001. Bleach plant effluent (an internal waste stream), is discharged from Outfall No. 100 and routed to the wastewater treatment system. Non-contact cooling waters are discharged to the Penobscot River from Outfall No. 002, which is not currently used. Filter backwash is discharged to the Penobscot River from Outfall No. 003 (see Figure 4, Wastewater Treatment Plant and Outfall Locations). The permit specifies limits to the discharge rates and characteristics of the effluent for each outfall that discharges into the Penobscot River, including:

- Seasonal daily maximum and monthly average mass limits for biochemical oxygen demand (BOD) and total suspended solids (TSS) from the outfalls
- Daily maximum temperature, thermal loading, and pH range limits for the outfalls

- Limits for chemical contaminants, including metals and organic pollutants (e.g., dioxins and furans)
- Requirements for whole effluent toxicity (WET) and chemical specific (priority pollutant) testing for Outfall No. 001.
- It should be noted that due to changes in ownership that resulted in disruption of operations at some times during the past several years, there are some data gaps in the water quality testing. These gaps correspond to periods when the mill was idle. The operational disruptions and corresponding data gaps do not affect this analysis. Table 3 summarizes mill ownership changes, and Table 4 lists the dates operations were interrupted or changed.

Table 3. OTFF Operations from 2006 to Present.

Event	Date
Georgia-Pacific Corporation mill shut down	March 2006
Red Shield Environmental (RSE), LLC, purchased mill	October 2006
Biomass boiler restarted	November 2006
Red Shield Pulp & Chemical (RSP&C), LLC, created to operate pulp mill	March 2007
Pulp mill started up; first pulp made	June 2007
Mill shut down	June 2008
RSE and RSP&C filed for bankruptcy	June 2008
Red Shield Acquisition, LLC (aka Old Town Fuel and Fiber), acquired mill	November 2008
Biomass boiler restarted	November 2008
Pulp mill restarted	March 2009

Table 4. Wastewater Discharges from 2006 to Present.

Dates	Action	Wastewater Flows
Before March 2006	Georgia Pacific operates mill	Typical wastewater flows
March 2006 to June 2007	Georgia Pacific shuts mill down; RSE buys mill	Minimal wastewater generated
June 2007 to June 2008	RSE and RSP&C operate mill	Typical wastewater flows
June 2008 to March 2009	Red Shield Acquisition buys mill in November 2008	Minimal wastewater generated
March 2009 to present	Red Shield Acquisition operates mill	Typical wastewater flows

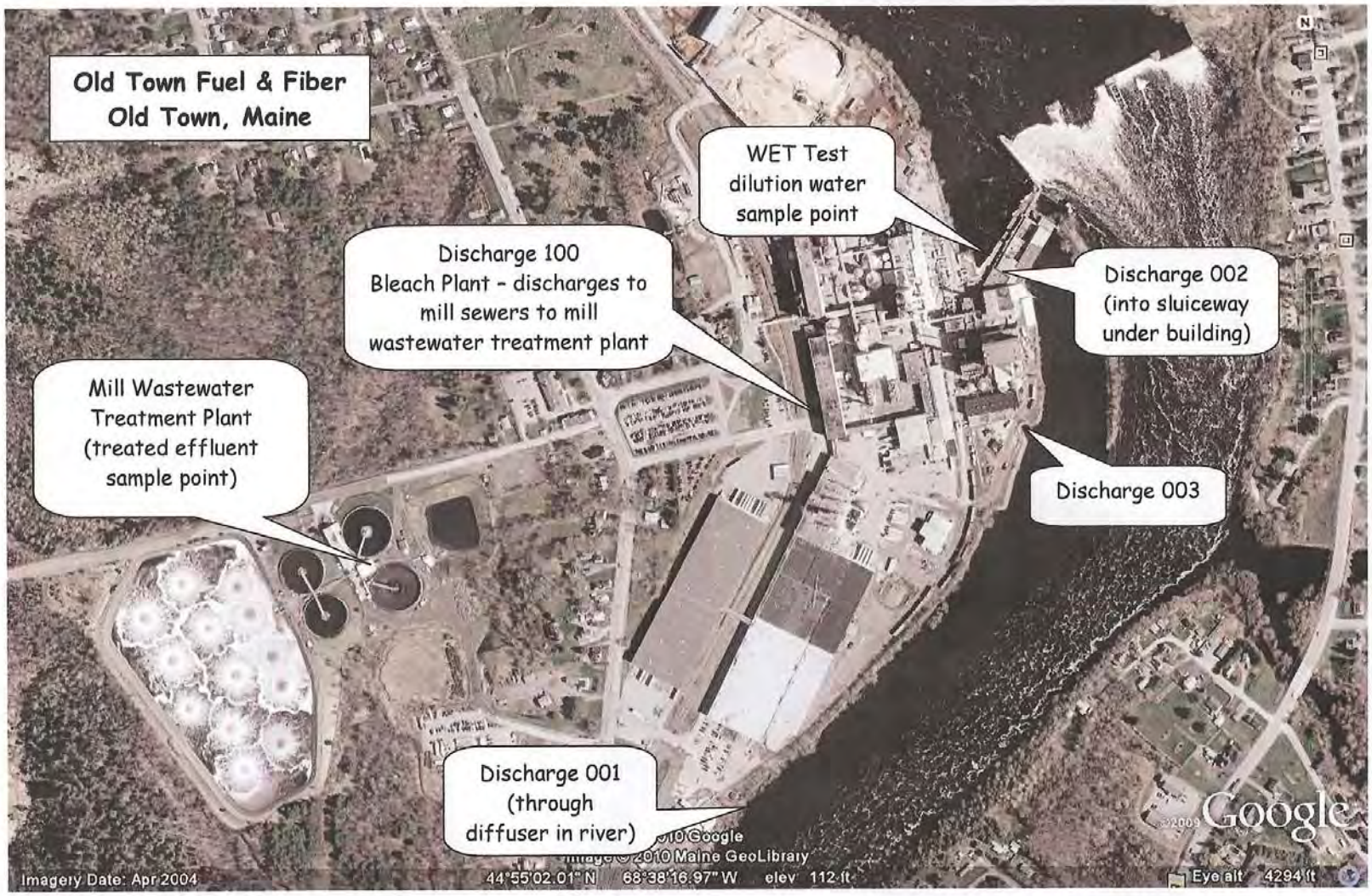


Figure 4. Wastewater Treatment Plant and Outfall Locations.

2.3 WET Testing

The current permit (Appendix A) limits for effluent discharge quantity and characteristics, including WET to aquatic organisms, are estimated by the State of Maine using dilution factors expected for low-flow conditions in the Penobscot River to ensure that the State's water quality standards (WQSs) for the river are met and that water quality is not impaired for its designated uses at or downstream from the mixing zones. State WQSs specify pH, BOD, TSS, and other characteristics that relate to aesthetic quality (e.g., color) and ability of the water to support aquatic life. The WQSs also specify concentration limits for individual contaminants, including metals and a variety of organic contaminants. Because the WQSs cannot specify potential interactions among water quality characteristics and combinations of chemical contaminants, meeting individual standards is not a guarantee that the water will support aquatic life, particularly the more sensitive or more at-risk (i.e., Threatened and Endangered) species in the aquatic community. Therefore, the permit also requires WET testing to evaluate the toxicity of the effluent mixture as a whole.

The current permit for Outfall No. 001 requires that surveillance-level WET testing be performed once per year beginning in calendar year 2002 and lasting through 2005. Surveillance-level WET testing was to be performed on two species – the freshwater invertebrate *Ceriodaphnia dubia* (water flea) and a freshwater fish, *Pimephales promelas* (fathead minnow). Chemical analysis of the effluent for content of priority pollutants is required at approximately the same time.

In addition, the permit for Outfall No. 001 requires that screening-level WET testing begin 12 months before the permit expires. For the screening level, the toxicity of the effluent to the water flea is to be tested four times in the final year of the permit at 3-month intervals. Screening-level WET testing for fish is to be assessed twice during the final year of the permit using two fish species – *Salvelinus fontinalis* (brook trout) and *P. promelas* (fathead minnow). It should be noted that recent data suggest that fathead minnows, commonly used as standard toxicity test organisms, might not adequately predict the sensitivity of shortnose sturgeon (Cope et al, 2011). Brook trout were used in all but two years between 2002 and 2011 for OTFF screening-level WET testing (see Table 8).

WET testing assesses effluent toxicity using a dilution series of the effluent that ranges from 1% to 100% effluent in a geometric series. The bioassays are to determine acute (short-term) no-observed-effect levels and chronic (long-term) no-observed-effect levels, referred to as A-NOEL and C-NOEL values, respectively. Results of the WET testing are reported as two values for each species tested – the percent effluent that resulted in the (1) A-NOEL and (2) C-NOEL. The A-NOEL, expressed as percent effluent, is the highest concentration at which there is no significant increase in mortality compared with the controls. For the water flea, the C-NOEL concentration, expressed as percent effluent, is the highest concentration at which there is no significant impairment of reproduction. For the fish species, the C-NOEL is the highest concentration at which growth is not significantly different from that of the control fish.

The acute toxicity test for both the water flea and the fish species is a 48-hour exposure with a mortality count at 24 and 48 hours for control and test groups. The water flea chronic test runs for 8 days, with the number of offspring produced in each of 10 replicates as the endpoint monitored daily. The total number of offspring produced by day 8 in each replicate depends on the laboratory, but tends to be on the order of 200 to 250 for control groups.

The chronic toxicity test for fish generally uses a 10-day exposure, with weight gain per fish as the endpoint assessed at the end of the exposure period for the surviving fish. Fish fry are introduced to the control and test solutions and the surviving fish are weighed at the end of the 10-day period.

For each test, two control groups are used – (1) a group of the test species maintained in water of known quality and characteristics prepared by the testing laboratory and (2) a group maintained in water collected from the receiving waters upstream of the effluent outfall. For OTFF, water is collected from the Penobscot River at a location approximately 1,000 feet upstream, an area considered free from toxicity and effluents from other sources of contamination. The river water also is used as the dilution water to create the series of effluent concentrations for toxicity testing.

The U.S. Environmental Protection Agency requires use of a concurrent positive control series of concentrations of a reference toxicant, specifically, sodium dodecyl sulfate (SDS). The LC_{50} value (the concentration that is lethal to 50% of the animals for a specified exposure duration) determined in the laboratory for the positive control must be within two standard deviations (± 2 SD) of the average LC_{50} value from all previous tests in the laboratory using SDS on the test species.

Compliance of toxicity test results with the discharge permit accounts for the dilution provided by the receiving waters. For the discharge limit of 24.4 mgd provided in the MEPDES permit for Outfall No. 001, the dilution factor used for the Penobscot River when assessing acute toxicity is 16.7, which represents low-flow conditions providing a more conservative (more species-protective) analysis. The dilution factor for assessing chronic toxicity is 74.2. (Section 2.4 discusses the derivation of dilution factors.) Therefore, the effluent toxicity limits are specified as 5.99% to avoid mortality from acute exposures and 1.35% to avoid adverse sub-lethal effects from chronic exposures.

To assess compliance with the permit, the A-NOELs for each species tested are compared to 5.99% and the C-NOELs for each are compared to 1.35%. If the A-NOELs and C-NOELs are higher than the permit values of 5.99% and 1.35%, respectively, the effluent is not expected to adversely affect aquatic life upon dilution by the flow and volume of the Penobscot River in the area of the outfall. If the A-NOELs and C-NOELs are lower than their respective permit values, the effluent is not in compliance with the permit.

2.4 Dilution Factors

Maine Department of Environmental Protection Regulation Chapter 530, *Surface Water Toxics Control Program,* section 4.B(1), states that analyses using numeric acute criteria for aquatic life must be based on one-quarter of the 1Q10 flow to prevent substantial acute toxicity *within any mixing zone.* The regulation also states that where it can be demonstrated that a discharge achieves rapid and complete mixing with the receiving water by way of an efficient diffuser or other effective method, analyses can use a greater proportion of the 1Q10 stream design flow, up to including the full 1Q10.

The acute dilution factor used to set the effluent toxicity limit is calculated based on one-quarter of 1Q10:

$$\text{Acute limit} = [(1Q10 \times 0.25)\ (0.6464) + (RF)] / (RF)$$

where:

RF = river flow (mgd)

1Q10 = lowest 1-day flow that occurs on average once every 10 years (cfs)

0.6464 = units conversion factor from cfs to mgd

Calculation of the acute dilution factor when there is complete mixing at the outfall is by the same equation, but using the full 1Q10 instead of one-quarter of the 1Q10. The current MEPDES permit, issued in 2002, indicates that the discharge from Outfall No. 001 does *not* receive rapid and complete mixing with the receiving water (Penobscot River).

The chronic dilution factor is calculated by the same equation, but using the 7Q10 instead of the 1Q10, where

7Q10 = lowest 7-day average flow that occurs on average once every 10 years (cfs)

The lowest 1-day and 7-day average flows for the Penobscot River at the OTFF mill cited in the 2002 permit were:

1Q10 = 2,678 cfs
7Q10 = 3,151 cfs

For comparison, the 1Q10 and 7Q10 flows for the Penobscot River at Veazie, as cited in the 2007 MEPDES Permit No. ME0100706 for the Veazie municipal wastewater treatment facility, were similar:

1Q10 = 2,871 cfs
7Q10 = 3,183 cfs

3. Evaluation of WET Data

To characterize the baseline (current and past) effluent toxicity, an analysis of the data, test results and documentation for WET testing and priority pollutant evaluation performed as part of the surveillance-level and screening-level programs required by the OTFF MEPDES permit issued in 2002 was conducted. This included a review of the following:

- Summarized results, as submitted to MEDEP
- Original toxicity test data records (handwritten laboratory observations)
- Statistical tests performed on the data
- Original water quality measurements (e.g., dissolved oxygen [DO], pH, and temperature)

- Chain of custody documentation for samples of effluent
- Miscellaneous other relevant information

Spot checks for concordance between original, handwritten laboratory record results and the reported data were performed. Statistical test reports were reviewed and deemed complete and consistent with the reported results. WET testing results and chemical analyses were compiled and evaluated. Section 4 summarizes the data relevant to Penobscot River water quality for the Atlantic salmon and shortnose sturgeon.

In addition, the daily recorded flow, TSS, BOD_5, temperature, and pH of the effluent at the point where the pipe for Outfall No. 001 leaves the OTFF mill site were reviewed for the period of record at the time the data set was received (May 25, 2002, through September 14, 2010). The values for those parameters for the dates of effluent collection for WET testing were compared with the overall average, median, minimum, and maximum values for the period of record and for the dates during which the 2-day effluent sampling occurred.

4. Results of Effluent Testing

4.1 Analysis and Reporting

A review of the correspondence of laboratory and reported data and the input and output of statistical tests for the 2002 through 2005 and 2007 and 2008 WET analyses found no reporting irregularities or discrepancies. Reviewers determined that appropriate documentation of deviations from protocol and documentation of other issues (e.g., percent chemical recovery and contamination of blanks) with retesting as needed. Reasonable explanations were provided for unusual responses (e.g., death of one organism at an intermediate exposure level).

The species to be used for WET testing from 2002 through 2005 as specified in the MEPDES permit for OTFF mill were the water flea and the fathead minnow, both of which are cultured and tested at 25 degrees Celsius (°C). In 2002, before the permit was issued, in addition to the water flea, the WET testing laboratory used the brook trout (*Salvelinus fontinalis*), which is maintained at 12°C. In 2003, all three species were tested. WET tests for 2004 and 2005 used the fathead minnow only, and in 2007 and 2008, only the brook trout was used as the test fish species.

Test and control vessel temperatures and pH values were generally recorded once daily and DO was measured twice daily, as documented in copies of original laboratory records (no summary statistics). Temperatures were measured daily in every test and control vessel and appeared to be well maintained at 12°C for brook trout and at 25°C for the water flea and fathead minnow, with no variation at that level of measurement. For the trout assays, values for pH generally ranged from 7.0 to 7.7, although some measurements were as low as 6.5 and a few were as high as 8.3. DO was always adequate, generally ranging between 8.0 and 9.9 milligrams per liter (mg/L) for the trout at 12°C (approximately 75% to 93% saturation). For *C. daphnia,* pH ranged from 6.5 to 7.7, and for the fathead minnow, pH ranged from 6.8 to 7.7, with some values as high as 8.5 and some as low as 6.5. DO generally ranged from 8.0 to 10.4 mg/L at 25°C (approximately 100% saturation and higher) for both water flea and the fathead minnow tests. There was no evidence of pH or DO varying according to effluent concentration or duration of the test.

There was one anomalous result that was not discussed with one water flea reproduction test. The mean number of offspring produced for the two control groups (upstream Penobscot River water and laboratory water controls) across 10 replicates each were 165 and 247, respectively. Water fleas exposed to 1.35%, 25%, and 50% effluent produced similar numbers of offspring (211, 218, and 264 offspring, respectively). However, for water fleas exposed to 100% effluent, reproduction was significantly higher (not lower as expected), with an average of 354 offspring across the 10 replicates. That value also is higher than typical for the laboratory controls in other WET tests. Why water fleas held in 100% effluent for 8 days would produce more young than water fleas exposed to only 50% effluent or less is unknown.

4.2 Sampling Dates and WET Results

Effluent for toxicity testing was composited from several effluent samples taken over 2 days at the point where treated effluent leaves the wastewater treatment plant before the pipe is routed under the Penobscot River to Outfall No. 001 at the bottom of the river. At that point in the facility, a small pipe splits off the main large effluent pipe. Effluent samples are collected from the split and tested daily for certain characteristics (e.g., DO, pH, and TSS). When WET testing occurs, multiple effluent samples from the split collected over 2 days are composited and mixed to create a single composite for testing. On the second day of effluent collection, an upriver grab water sample is taken from the surface of the Penobscot River for use as dilution water for the effluent and for one of the two control groups in the WET tests. That sampling location is approximately 1,000 feet upstream of the facility outfall and is considered to be free of influence from the facility or other point sources on the river.

4.2.1 Sampling Dates and WET Testing

The following paragraphs identify the effluent and dilution water sample collection dates; the dilution series and species in the WET testing; and the similarity of effluent characteristics on the sampling dates, as indicated by TSS, BOD_5, and bleached production rates, to the overall mean and median values for those parameters for the period of record.

2002: For the 2002 WET testing, samples of effluent were collected on August 18 and 19, 2002, and the upriver dilution water was obtained from the Penobscot River on August 19. Additional sampling of both the final effluent and the Penobscot River upriver from the OTFF mill was performed on August 22, 25, and 27 for the chemical analyses, including analysis for priority pollutants. For WET testing, the dilution series was 1.2%, 5%, 25%, 50%, and 100% effluent. Toxicity tests using the brook trout and the water flea were performed between August 20 and September 3. On August 18 and 19, TSS levels in the effluent were similar to the overall mean and median for the period of record, BOD_5 was just below the overall mean and similar to the overall median, and there were no recorded data for bleached production (see Table 5).

2003: The effluent for WET testing was composited from samples taken on August 17 and 18 and Penobscot upriver dilution water collected on the August 18. Additional samples were collected for chemical analysis, as follows: final effluent samples on August 19 and 20, upriver water collected on August 20, final effluent samples on August 21 and 22, upriver water collected on the August 22, and final effluent on August 24 and 25, with upriver water collected on August 25. The dilution series was 1.35%, 5%, 25%, 50%, and 100%. Water flea and brook trout tests ran from August 19 through 29. Samples were collected during a period when TSS measurements were well below the overall mean and median for the period of record, BOD_5

was not recorded, and bleached production was well above the overall mean and median (see Table 5).

Additional effluent samples were taken on October 5 and 6 to use in testing the fathead minnow; that toxicity test began on October 7. The dilution series was 1.2%, 5%, 25%, 50%, and 100%.

2004: WET tests were performed August 24 through 31, 2004, on composites of effluent samples collected on August 22 and 23 at the facility and dilution water collected from the upriver Penobscot on August 23. Samples were collected during a period when TSS and BOD_5 were well below the overall means and medians for the period of record and bleached production was well above the overall mean and median (see Table 5).

2005: WET tests were performed on both the water flea and the fathead minnow on August 23 through 31 using composite samples of final effluent collected at the facility on August 21 and 22 and dilution water collected upriver on August 22. The brook trout was not tested in 2005. The dilution series was the same as used in 2003 and 2004. However, the tests vessels with 1.35%, 5.0%, and 25% effluent showed contamination with a biological growth that caused significant mortality in the water fleas, but reproduction at the 50% and 100% effluent concentrations were similar to that of the laboratory water control and greater than that of the Penobscot River water control. Similarly, the final weights of minnows were highest in the 50% and 100% effluent exposure groups (differences not significant). Therefore, the biological contamination, did not compromise conclusions from the WET tests. Samples were collected during a period when TSS and bleached production were both well above the overall means and medians, and BOD_5 was above the overall mean and median (see Table 5).

Table 5. Comparison of Mean TSS, BOD_5, and Bleached Production During Sample Collection Periods to Overall Means and Medians.

Period	TSS (pounds per day)	BOD_5 (pounds per day)	Bleached Production (ADT per day)
Overall Mean for Period of Record	3,534	1,675	407
Overall Median for Period of Record	2,877	1,444	535
2002, August 18 and 19	3,256	1,362	0
2003, August 17 and 18	2,134	NR	609
2003, October 5 and 6	2,512	1,049	642
2004, August 22 and 23	1,697	1,093	650
2005, August 21 and 22	6,954	1,850	559
2007, October 7 and 8	2,134	1,447	274
2008, April 20 and 21	8,671	3,780	537

NR = not recorded.

2007: Samples of final effluent were collected on October 7 and 8, and upriver dilution water was collected on the October 8. Bioassays were performed on water fleas and brook trout starting on October 9. The dilution series was 1.4%, 6%, 25%, 50%, and 100%. The fathead minnow was not tested. Samples were collected during a period when TSS and bleached production were both well below the overall means and medians, and BOD_5 was below the overall mean and similar to the overall median (see Table 5).

2008: Samples of final effluent were collected on April 20 and 21 and upriver dilution water presumably was collected on April 21. The water flea and brook trout were tested with a dilution series of 1.4%, 6%, 25%, 50%, and 100% effluent. Samples were collected during a period when TSS and BOD_5, which were 8,671 and 3,780 pounds per day, respectively, were both well above the overall means and medians, and bleached production was above the overall mean and similar to the overall median (see Table 5).

2011: Samples of final effluent were collected between January 16 and 17, 2011, and upriver dilution water on January 17. Bioassays were performed on water fleas and brook trout with the same dilution series used in 2007 and 2008. Samples were collected when the flow for the day was 9.97 mgd, and the average flow for the month was 10.72 mgd. Data on TSS and BOD_5 for those days were not requested because the flow rates were lower than in previous years when there was WET testing.

4.2.2 Summary of WET Testing and Chemical Analyses

Surveillance-level WET testing was performed for the OTFF mill from 2002 through 2005 and screening-level WET testing performed in 2007 and 2008 in anticipation of the MEPDES permit expiration. Additional WET testing was performed in January 2011. To provide operational and seasonal context for the WET test results, Table 6 summarizes descriptors of the general effluent flow rate and particle and carbon content for the month in which the samples for WET testing were collected. Table 6 summarizes the monthly average value, its standard deviation (SD), median, minimum, and maximum values for flow rate, TSS, and BOD_5 of the wastewater treatment.

To examine the levels of possibly toxic chemicals in the effluent, Table 7 summarizes the results of testing for metals, chloride, and ammonia, which are considered the chemicals most likely to be of potential concern to fish when released into the Penobscot River. Table 7 also lists the measured concentrations of individual chemicals, including total metal concentrations, of the effluent sampled concurrently with the samples taken for WET testing for 2007, 2008, and 2011. MEDEP established the individual chemical limits using the Maine WQS's for Class B waters, as that reach of the Penobscot is classified. Class B waters in Maine should support all aquatic species indigenous to the receiving waters without detrimental changes in the resident biological community. To evaluate how close the measured concentrations of the individual chemicals are to the wastewater effluent limits for Outfall No. 001, a risk quotient (RQ) is calculated for both acute (A-RQ) and chronic (C-RQ) exposures for 2007, 2008, and 2011. The effluent is in compliance with the permit limits if the RQ is less than 1.0. Table 7 lists the A-RQ and C-RQ values for 2007 and the A-RQ values for 2008 and 2011.

All RQ values in Table 7 are below 1.0, indicating compliance with the permit. In addition, all C-RQ values for 2008 and 2011 were below 1.0. Moreover, almost all RQ values are less than 0.1, which is an adequate margin of safety. With effluent flow rates approximately half that allowed (24.4 mgd), the RQ values would be approximately half the values listed in Table 7. Therefore, almost all RQ values would be less than 0.05 when flow is 12 mgd or less.

Table 6. Summary of Flow, TSS, and BOD_5 Measurements for Effluent for Month of Effluent Sampling for WET Testing.

Parameter	Mean	Standard Deviation	Median	Minimum	Maximum
August 2002					
Flow (mgd)	18.6	0.8	18.8	16.8	20.3
TSS (lb/day)	4,080.4	1,697.9	3,648.8	1,687.3	8,273.0
BOD_5 (lb/day)	1,408.9	362.2	1,353.3	736.4	2,264.0
August 2003					
Flow (mgd)	15.7	0.8	15.7	14.3	17.4
TSS (lb/day)	2,014.0	675.7	1,914.0	885.0	3,675.4
BOD_5 (lb/day)	799.0	137.7	796.0	497.1	1,006.8
August 2004					
Flow (mgd)	16.0	0.5	15.8	15.0	17.8
TSS (lb/day)	2,623.0	944.0	2,716.2	603.8	4,877.2
BOD_5 (lb/day)	1,360.0	384.8	1,261.8	830.7	2,149.4
August 2005					
Flow (mgd)	15.8	1.1	15.9	11.5	17.4
TSS (lb/day)	3,465.0	1,927.5	3,112.9	765.6	9,685.7
BOD_5 (lb/day)	1,459.0	910.6	1,233.0	483.0	4,768.0
October 2007					
Flow (mgd)	12.0	0.6	12.0	10.3	12.8
TSS (lb/day)	4,089.0	2,181.0	3,503.0	941.0	9,271.0
BOD_5 (lb/day)	2,324.0	966.0	2,072.0	836.0	5,022.0
April 2008					
Flow (mgd)	12.8	0.6	12.6	11.5	14.4
TSS (lb/day)	7,338.5	1,691.2	7,408.9	3,631.2	10,941.7
BOD_5 (lb/day)	3389.1	943.6	3,436.8	1,714.7	5,250.0
January 2011					
Flow (mgd)	10.72	NR	NR	NR	NR

TSS = total suspended solids; BOD_5 = 5-day biological oxygen demand; WET = whole effluent toxicity; mgd = million gallons per day; lb/day = pounds per day; NR = data not requested.

Exceptions include the April 2008 A-RQ values for copper, silver, and zinc, and the 2008 C-RQ values for ammonia and lead (not shown). These RQ values were low – between 0.1 and 0.2 – which, considering the flow, are 0.05 and 0.1, an adequate margin of safety. In 2011, the A-RQ value for total residual chlorine was 0.21, for cadmium was 0.37, for copper was 0.24, and for zinc was 0.26, while the C-RQ values (not shown) were 0.45 for cadmium and 0.17 for lead; all the remaining RQ values for 2011 were less than 0.1. With flow of 11 mgd or less, these RQ values are well within the permit limits.

Table 8 summarizes the WET testing of the effluent dilution series and the results of the concurrent positive control tests with the toxic chemical SDS to determine if the protocol, waters, and groups of organisms used in the WET testing performed as expected. Table 9 provides the effluent limits established using the acute and chronic dilution factors for the Penobscot River as specified in the MEPDES permit. As described in Section 2.3, if the bioassays indicate that the acute and chronic NOELs for the water flea and the fish species

Table 7. Measured Effluent Chemical Concentrations for Chemicals of Potential Ecological Concern 2007-2008, and 2011, Old Town Fuel and Fiber (µg/L for all analytes except residual chlorine, which is in mg/L)

Analyte	Report-ing Limit	Effluent Limits		October 2007 Samples Effluent Concentration			April 2008 Samples Effluent Concentration		January 2011 Samples Effluent Concentration	
		Acute	Chronic	Measure	A-RQ	C-RQ	Measure	A-RQ	Measure	A-RQ
Total Residual Chlorine (mg/L)	0.05	0.2427	0.6149	<0.02	<0.1	0.03253	<0.02	<0.1	<0.05	0.20602
Ammonia	NA	307,900	16,700	1,200	0.00390	0.07186	2,200	0.00715	1500	0.00487
Aluminum	NA	9,581	4,863	275	0.02870	0.05655	365	0.03810	470	0.04906
Arsenic	5	4,344	8,385	2	0.00046	0.00024	1	0.00023	2.1	0.00048
Cadmium	1	5.366	4.472	0.3	0.05591	0.06708	0.3	0.05591	2	0.37272
Chromium	10	6,170	1,291	<2	0.00032	0.00155	3	0.00049	6.3	0.00102
Copper	3	39.22	131.9	3	0.07649	0.02274	8	0.20398	9.3	0.23712
Cyanide	5	281	290.7	7	0.02491	0.02408	4	0.01423	<3	0.01068
Lead	3	134.4	22.92	1	0.00744	0.04363	3	0.02232	3.8	0.02827
Nickel	5	1,536	749.1	4	0.00260	0.00534	<2	0.00130	4.8	0.00313
Silver	1	2.938	NA	<0.3	≤0.1	NA	0.3	0.10211	0.003	0.00102
Zinc	5	390.9	1,710.5	32	0.08186	0.01871	74	0.18931	103	0.26349

Note: Effluent limits are calculated from water quality standards using dilution factors for the Penobscot River at Old Town of 16.7 and 74.2 for acute and chronic toxicity evaluations.

A-RQ = Acute Risk Quotient (effluent concentration/acute effluent limit); C-RQ = Chronic Risk Quotient (effluent concentration/chronic effluent limit); µg/L = micrograms per liter; mg/L = milligrams per liter; < = less than; NA = not applicable.

Table 8. Results of WET Testing of Effluent Composite Samples from Old Town Fuel and Fiber from 2002 through 2008, and in 2011.

Date Effluent Sample Collected	Dates of WET testing (toxicity bioassays)		Effluent Bioassay Test Results				Fish Species Tested	Daphnia		Fish	
			C. dubia	*C. dubia*	Fish	Fish		SDS Acute Limits	LC_{50} (% Effluent)	SDS Acute Limits	LC_{50} (% Effluent)
	Start	End	A-NOEL	C-NOEL	A-NOEL	C-NOEL					
01/16/11	01/18/11	01/28/11	>100%	50%	>100%	25%	trout	10.5-12.8	11.9	30.5-37.5	35.4
04/20/08	04/22/08	05/02/08	>100%	100%	70%	50%	trout	9.9-13.7	10.7	30.8-37.8	31.1
10/07/07	10/12/07	11/20/07	50%	6%	65%	50%	trout	9.3-13.9	11.3	31.0-37.8	31.1
08/21/05	08/23/05	08/31/05	100%	100%	100%	100%	fathead	8.4-14.4	12.3	26.6-57.0	49.3
08/22/04	08/24/04	08/31/04	75%	50%	100%	100%	fathead	7.7-14.5	10.4	26.0-58.1	32.5
08/17/03	08/10/03	08/29/03	100%	100%	100%	100%	trout	7.8-14.5	13.2	30.7-37.8	35.4
10/05/03	10/07/03	10/17/03	NA	NA	100%	100%	fathead	NA	NA	27.2-56.2	46.9
08/18/02	08/20/02	08/30/02	100%	50%	100%	100%	trout	7.3-15.5	13.2	30.8-37.9	32.6

WET = whole effluent toxicity; SDS = sodium dodecyl sulfate; A-NOEL = acute no-observed-effect level; C-NOEL = chronic no-observed-effect level; > = greater than; NA = not applicable; LC_{50} = lethal concentration to 50% of the test organisms.

Table 9. Effluent Limits Specified in MEPDES Permit.

Effluent limits (percent)	Daphnia	Acute	5.99
	Daphnia	Chronic	1.35
	Fish	Acute	5.99
	Fish	Chronic	1.35

(brook trout or fathead minnow), expressed as percent effluent, are higher than the effluent limits in Table 9, the effluent is in compliance with the MEPDES permit.All of the WET tests were within permit effluent limits.

Table 10 compares the WET results with the permit effluent limits listed in Table 9. RQs are calculated as the permit limit (from Table 9) divided by the respective NOEL values (from Table 8). The permit limit is reached if the RQ reaches or exceeds 1.0. Margin of exposure (MOE, often called margin of safety for human health risk assessments) is calculated by dividing the NOEL values by the permit limit (inverse of RQ).

Table 10. Risk Quotients and Margin of Exposure (or Safety) for WET Results.[a]

Date Initial Sample Collected	Risk Quotients (RQ)				Margin of Exposure/Safety (MOE)			
	Daphnia		Fish		Daphnia		Fish	
	A-NOEL	C-NOEL	A-NOEL	C-NOEL	A-NOEL	C-NOEL	A-NOEL	C-NOEL
01/16/11	<0.060	0.120	<0.086	0.054	>17	37	17	19
04/20/08	< 0.060	0.014	0.086	0.027	>17	74	12	37
10/07/07	0.120	0.225	0.092	0.027	8	4	11	37
08/21/05	< 0.060	<0.014	< 0.060	<0.014	17	74	17	74
08/22/04	0.080	0.027	< 0.060	<0.014	13	37	17	74
08/17/03	< 0.060	<0.014	< 0.060	<0.014	17	74	17	74
10/05/03	NA	NA	< 0.060	<0.014	NA	NA	17	74
08/18/02	< 0.060	0.027	< 0.060	<0.014	17	37	17	74

[a] With current effluent flow (12 mgd) at approximately half the permitted value (24.4 mgd), for Outfall No. 001 of the Old Town Fuel and Fiber mill, the RQ values are approximately half the values listed in the table and the MOE is approximately twice that listed in the table.
A-NOEL = acute no-observed-effect level; C-NOEL = chronic no-observed-effect level; > = greater than; NA = not applicable.

The RQ values are all less than 1.0, and considering the current flow rate of approximately 11 to 12 mgd, instead of the permitted limit of 24.4 mgd, the RQ values are approximately half of the values listed in Table 6. At a flow of 12 mgd, all of the RQ values are 0.1 or less. Except for the tests on effluent collected on October 7 and 8, 2007, the MOE values are generally a factor of 10 or more.

Based on Tables 7 through 10, the WET tests and individual chemical releases do not indicate concern for aquatic life for the current effluents from the OTFF mill.

4.3 Thermal Load Restrictions

Maine Department of Environmental Protection (MEDEP) Regulation Chapter 582, *Regulations Relating to Temperature*, limits thermal discharges to an instream temperature increase of 0.5

degrees Fahrenheit (°F) above the ambient receiving-water temperature when the weekly average temperature of the receiving water is equal to or greater than 66°F or when the daily maximum temperature is greater than or equal to 73°F (Old Town MEPDES Permit No. ME0002020). The temperature thresholds are based on the MEDEP water quality criterion for the protection of brook trout and Atlantic salmon. The weekly average temperature of 66°F was derived to ensure normal growth of brook trout, and the daily maximum threshold temperature of 73°F protects survival of juveniles and adult Atlantic salmon during summer months. The 7-day or weekly average temperature is a 7-day rolling average value (Appendix A, page 11 of 25 – FACT SHEET attached to the MEPDES permit).

5. Water Quality in the Penobscot River

The Penobscot River Basin is in northeastern Maine and is the second largest river basin in New England. The main stem of the Penobscot River forms at the confluence of the east and west branches in the Town of Medway, approximately 80 miles upriver from the head of tide in Bangor. The discharge points from the OTFF mill are just below the Great Works Dam in Old Town, Maine, approximately 10 miles upriver from the head of tide.

Major industrial dischargers upriver from the OTFF mill in 2002 included Lincoln Pulp & Paper Company on the main stem of the river in Lincoln, and two Great Northern Paper Company mills that discharge to the West Branch of the Penobscot River in Millinocket and in East Millinocket.

Maine law, 38 Maine Revised Statutes Annotated (MSRA) section 465(7)(A)(4), classifies the segment of the main stem of the Penobscot River from the confluence of the Piscataquis River, including the Stillwater Branch, to the Veazie Dam, including all impoundments, as a Class B waterway. The OTFF mill is in the approximate middle of this segment, and effluent discharges are assumed to affect an area from Outfall No. 002 to 0.25 mile downstream of Outfall No. 001 (see Figure 4, Wastewater Treatment Plant and Outfall Locations). Class B waters should be suitable for designated uses – drinking water supply after treatment; fishing; recreating in and on the water; industrial process and cooling water supply; hydroelectric power generation (except as prohibited under title 12, section 403); navigation; and as habitat for fish and other aquatic life. Class B waters should support all aquatic species indigenous to the receiving waters without detrimental changes in the resident biological community. Therefore, discharges to receiving waters should not adversely affect aquatic life in those waters. Numeric minimum DO criteria are 7 mg/L and 75% saturation.

The most recent draft Maine Integrated Water Quality Report (2010) categorized the segment described above as 5D (impaired by legacy pollutants, polychlorinated biphenals [PCBs]). Fish tissue monitoring has revealed legacy PCBs. A Total Maximum Daily Load (TMDL) report is to be prepared for this segment by 2020. 4-b Dioxin license limits are provided in 38 MRSA section 420. Compliance is measured by (1) no detection of dioxin in any internal waste stream (at 10 picograms per liter detection limit) and (2) no detection in fish tissue sampled below a mill's outfall greater than upstream reference. Discharging dioxin into Maine rivers was prohibited as of December 31, 2002 by the dioxin law of 1997 [38 MRSA section 420(2)(I)].

Water chemistry in the Penobscot River is influenced by geology, atmospheric inputs, land cover, and land use (Kahl et al., 1991). The Penobscot River is pH-neutral, moderately buffered, and relatively oligotrophic compared to other major rivers in eastern North America (Jackson et al., 2005) (see Table 11). However, recent studies by the MEDEP and Penobscot Indian Nation suggest that biological oxygen demand, nutrients, and chlorophyll-a levels in the mainstem of the river could be approaching a more eutrophic state (Mitnik, 2002, 2003).

Table 11. Water Quality Characteristics of the Mainstem Penobscot River.

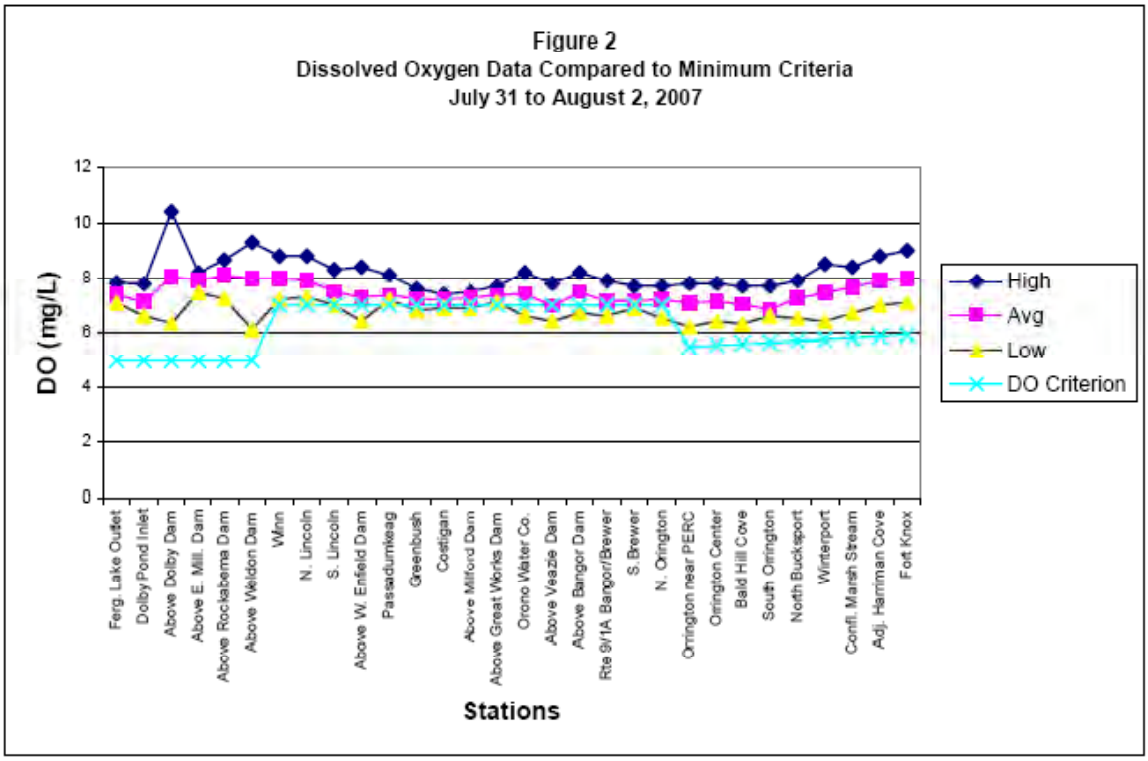
Parameter	Mean Value	Range
pH (closed-cell field pH)	6.8	6.2 to 7.6
Acid neutralizing capacity (ANC) µeq/L	218	113 to 310
Conductivity (µS/cm)	46	27 to 78
Color (apparent; unfiltered) (CPU)	70	9.0 to 126
Dissolved organic carbon (ppm)	8.3	0.4 to 13.9
Calcium (ppm)	5.0	2.4 to 6.2
Total nitrogen (ppm)	0.4	0 to 0.6
Total phosphorus (ppb)	25	3.6 to 129

Source: Data from the Penobscot River south of the Milford Dam from 1993 to 2001 collected by the George Mitchell Center.
µeq/L = microequivalents per liter; µs/cm = microsiemens per centimeter.

The MEDEP monitors water quality the Penobscot River in partnership with the Penobscot Indian Nation, which began its monitoring program in 1992. There now are 47 sampling sites on the mainstem and tributaries affected by pulp and paper mill effluent, including sites on the Piscataquis and Mattawamkeag rivers. Sampling occurs every 5 years to coincide with the National Pollutant Discharge Elimination System (NPDES) licensing schedule. Although much of the Penobscot River was upgraded to Class B in 2003, the mainstem of the river is still Class C for some reaches. The following information was obtained from the Website www.pearl.maine.edu/windows/penobscot and from the MEDEP (2008) Penobscot River 2007 Data Report.

Acidity (pH). The Penobscot River is well-buffered (acid neutralizing capacity [ANC] = 218 microequivalents per liter [µeq/L]) and near-neutral pH (average field pH 6.8). Owing to differences in hydrology and the relative abundance of wetlands, the Penobscot River runs at the boundary between the well-buffered, relatively clear water systems of west-central Maine and the acidic, highly colored surface waters of eastern Maine (Johnson and Kahl, 2005).

Dissolved oxygen (DO). The MEDEP and the Penobscot Indian Nation Natural Resources Department measure DO at sample locations on the West Branch and mainstem of the Penobscot River. The minimum limit set for DO varies by water classification – Class B requires more than 7 mg/L and 75% saturation. The Penobscot River attains its DO criteria, except for that the segment from Winn to the Milford Dam (48 miles), which might not attain Class B minimum DO during periods of low flow and high temperature (Mitnik, 2002). The MEDEP intensively sampled water quality in the Penobscot River in 2001 and in 2007. The relationship of measured DO to DO criteria for the 2007 sampling effort is shown in Figure 2 (copy on next page) of the MEDEP (2008) Penobscot River 2007 Data Report. Figures 2 shows the high, average, and low DO measurements, at each location, during this period, compared to the DO criterion.



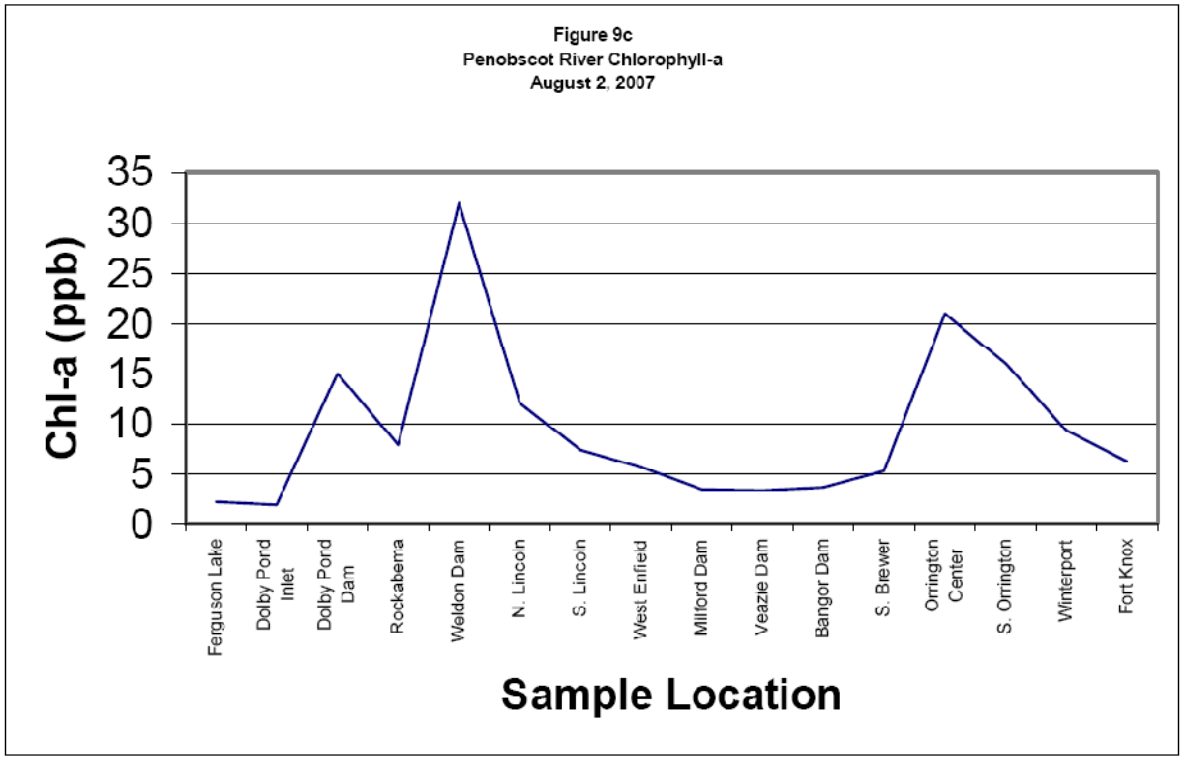
DO measurements were taken in the Penobscot River from July 31 to August 2, 2007. DO was slightly lower than the minimum criterion for Class B waters at several stations from above the Enfeld Dam to north Orrington, including the stations at the Milford Dam, the Great Works Dam, and at the Orono Water Company.

Dissolved organic carbon (DOC). Natural sources of DOC include wetlands, leaf litter, and overland runoff. Wastewater discharges to the river also contribute significant amounts of DOC. High levels of DOC can result in clear brown coloration, similar to tea. Average DOC in the mainstem of the Penobscot River is 8.3 mg/L. The potential influence of DOC on BOD is discussed below under BOD.

Nutrients (nitrogen and phosphorus). Total nitrogen in the Penobscot River ranges from 0.2 to 0.4 ppm (Mitnik, 2002). Sources include municipal wastewater treatment plants, pulp and paper mills, stormwater runoff, septic systems, agriculture, and atmospheric deposition. Phosphorus is a limiting nutrient in fresh water. The MEDEP measured average total phosphorus levels below point-source discharges between 20 and 30 micrograms per liter (µg/L) (MEDEP, 2008). Total nitrogen for all riverine and estuarine locations ranged from 0.2 to 0.5 mg/L, with average ammonia nitrogen less than 0.001 mg/L (i.e., 1 µg/L) at all locations. These are considered relatively low levels of nitrogen (MEDEP, 2008).

Chlorophyll-a. Elevated chlorophyll-a levels indicating algal blooms (8 to 13 µg/L or parts per billion [ppb]) have been detected above Dolby, Rockabema, and Weldon dams and in the estuary near Orrington (Mitnik, 2002). Measurements of chlorophyll-a from the 2007 sampling

effort are shown in Figure 9c of the MEDEP (2008) Penobscot River 2007 Data Report (copy below). Algal levels are relatively low in the vicinity of Old Town (between the Veazie Dam and West Enfield)



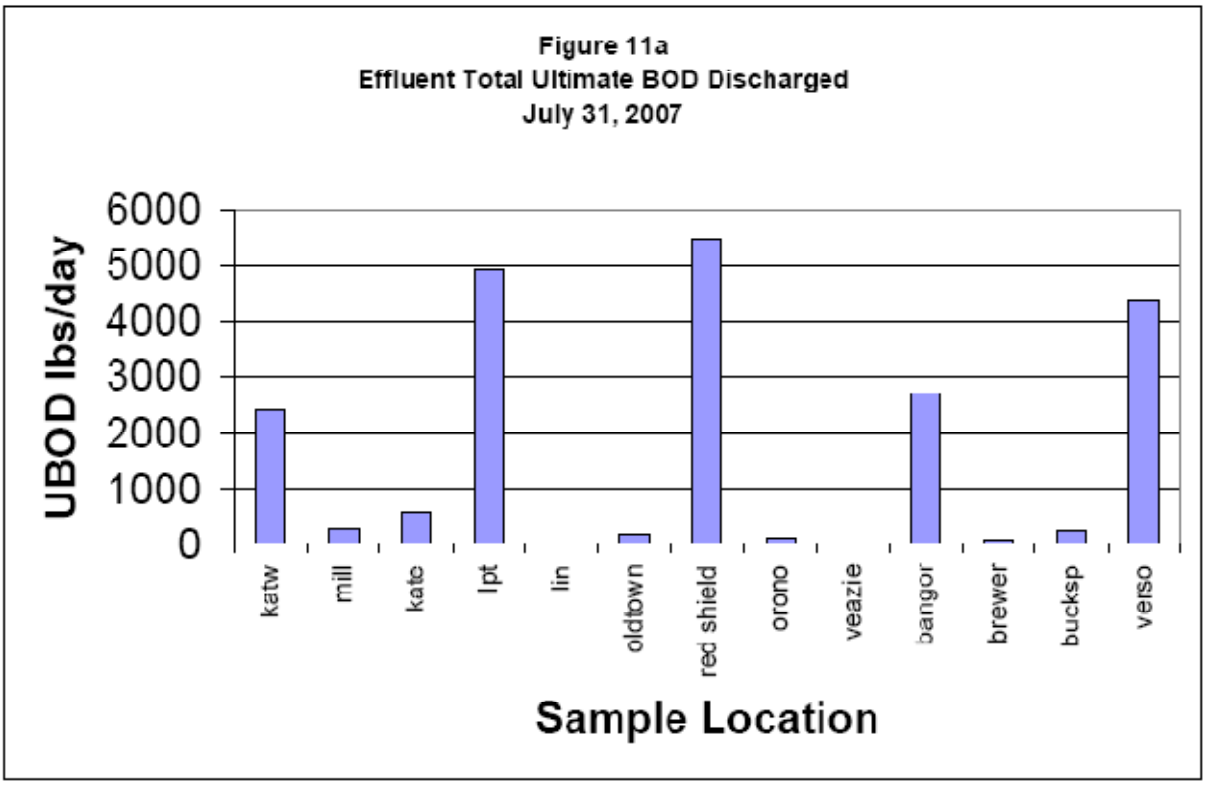
Water flow. Water flow in the Penobscot River basin varies seasonally, with high flows in early spring and late fall and low flows generally in summer and early fall. The U.S. Geological Survey (USGS) maintains monitoring stations on the lower Penobscot River at Eddington and West Enfield. The 102-year average flow at West Enfield is 11,880 cfs (7,700 mgd[1]); the highest flow on record was 153,000 cfs (99,000 mgd) in May 1923. The lowest flow on record was 1,630 cfs (1,050 mgd) in October 1905 (Stewart et al., 2006).

Temperature. Water temperature ranges from 0°C in February to 22°C in July, with an annual mean of 9.3°C (Jackson et al., 2005). Temperatures in the Penobscot River between July 31 and August 2, 2007, were relatively high for the river because they were taken during a heat wave in which air temperatures generally exceeded 32°C during the afternoon sampling run. River temperatures were lowest at upstream boundaries and most inland stations, and increased in the downstream direction, reaching a maximum temperature in the Bangor area. The 3-day average temperature for all sampling locations varied from a low of 24°C at the Ferguson Lake outlet to a high of 27.4°C in Bangor.

Ultimate BOD. Ultimate biochemical oxygen demand (BODu) testing is similar to BOD_5 testing, but tests are run for at least 60 days or until there is no more significant depletion of DO. The BODu is partitioned into a carbonaceous fraction (CBODu) and a nitrogenous fraction (NBODu). For the Penobscot River, more than 80% of the BODu was carbonaceous. CBODu levels ranged from 3 to 6 mg/L, and NBODu levels were always less than 1.2 mg/L. The highest

[1] 11,880 cfs × 0.646317 = 7,700 mgd.

BODu readings occurred between North Lincoln and the Dolby Pond Inlet, well upstream of Old Town. Effluent BODu (or UBOD) discharges to the Penobscot River on July 31, 2007, are illustrated in Figure 11a below from the MEDEP 2008 report. The pattern of effluent releases on August 1 and 2 were similar.



6. Baseline Effluent Discharges in Relation To Primary Constituent Elements of Atlantic Salmon Designated Critical Habitat

The NMFS (2009) described the essential features of the PCEs of Atlantic salmon Designated Critical Habitat. Those that have potential to be affected by the OTFF IBR include DO and temperature for upstream migrating adults and temperature and pH for downstream migrating juveniles (see Table 12).

Dissolved oxygen (DO). For adult Atlantic salmon, DO data from the Penobscot River 2007 Data Report (MEDEP, 2008) indicate that the Penobscot River, including the reaches in the vicinity of the OTFF mill, were fully functioning (i.e., DO greater than 5 mg/L) for migration (see Figure 2 from MEDEP, 2008, provided in Section 5 above). During the survey period, July 31 through August 2, 2007, flows in the Penobscot River at the USGS West Enfield Gage averaged just under 4,300 cfs (an approximately 7th-percentile flow for the USGS period of record from 1902 through 2010), and effluent flows from the OTFF mill were 23.7 cfs (an approximately 89th-percentile flow for the OTFF mill 2002 through 2010 period of record). The OTFF mill had the highest ultimate BOD (BODu, an indication of potential impact to the river) load of all effluent discharges assessed on July 31 and August 1 (just over 5,000 pounds per day), and had the

Table 12. Selected Primary Constituent Elements (PCEs) and Essential Features for Life Stages of Migratory Atlantic Salmon that Pass Through the Action Area.

Parameter	Fully Functioning	Limited Function	Not Properly Functioning
PCE: Adult migration (April 15-December 14)			
Dissolved oxygen	>5 mg/L	4.5-5.0 mg/L	<4.5 mg/L
Temperature	14-20°C	Sometimes >20°C, never >23°C	>23°C
PCE: Juvenile migration (April 15-June 14)			
Temperature	8-11°C	5-11°C	<5°C or >11°C
pH	>6	5.5-6.0	<5.5

Source: NMFS (2009).

> = greater than; < = less than; mg/L = milligrams per liter; °C = degrees Celsius.

third highest BODu on August 2 (just under 5,000 pounds) (July 31, 2007, BODu from MEDEP, 2008, Figure 11a, provided in Section 5 above).

The BOD_5 of the effluent from the OTFF mill during these days was approximately 10.5% of permitted licensed mass loads (MEDEP, 2008). Mean BOD_5 from the OTFF mill from July 31 to August 2 was 258 pounds per day, or approximately the 7^{th}-percentile value among the data available. The sampling period coincided with a heat wave, resulting in water temperatures higher than in most summers (MEDEP, 2008). Given the inverse relationship between temperature and DO, and the relationship between low-flow conditions with high BODu and low DO, the results of the MEDEP 2007 survey indicate adequate DO for salmon, and that under baseline conditions, the OTFF mill effluent does not impair the functioning of the Penobscot River for adult Atlantic salmon migration.

Temperature. There are very few data with which to assess potential effects of OTFF mill effluent flows on temperature during adult or juvenile migration in the Penobscot River. Although temperature is measured daily for the OTFF mill, there are few ambient temperature data. However, Holbrook et al. (2009) developed regression equations relating flows at the closest USGS gage at West Enfield, Maine, to June and July water temperatures in the Great Works Dam Reservoir, just upstream of the action area, during an assessment of adult salmon passage in relation to temperature and other factors. Although the study included data from 2005 and 2006, only 2005 data are considered here because OTFF mill flow data were not available in 2006. There is an apparent error in the published equation for 2005:

$$\text{Log}_{10}(\text{temperature, °C}) = -0.38 \times (\text{log}_{10}(\text{discharge, m}^3/\text{s}) + 6.58)$$

r^2 for regression equation = 0.82 (period covering June 1 through July 31, 2005)

This equation does not give sensible results. Upon further examination, it appears that the equation should be:

$$\text{Log}_e(\text{temperature, °C}) = -0.38 (\text{log}_e(\text{discharge, cfs}) + 6.58)$$

The above equation was used to estimate the water temperature upstream of the OTFF mill effluent. It was assumed that the flows at the West Enfield gage provided a reasonable approximation of the flows entering the action area, minus 30% of flow assumed to flow through the Stillwater River segment (up to 30% of flow can be allocated to the Stillwater River; see page A9 of Lower Penobscot Conceptual Agreement 2004) west of the OTFF mill. The

potential increase in temperature attributable to the OTFF mill effluent was then estimated by calculating a weighted average temperature given the assumed flow and estimated temperature of the ambient river water and the known flow and temperature of the OTFF mill effluent. These calculations suggest that the average temperature increase attributable to the OTFF mill effluent would be 0.033°C (range: 0.011 to 0.057°C).

Field monitoring data for the intensive survey during summer 2007 (MEDEP, 2008) provide a 3-day snapshot with which to estimate the effects of OTFF mill effluent on temperature in the river. Ambient temperatures below Great Works Dam ranged from 27.2 to 27.4°C (only afternoon values were recorded). Penobscot River flows entering the action area were again assumed to be represented by West Enfield flows (minus the 30% assumed to go down the Stillwater River). Note that effluent temperatures during this period were only available for 1 day (July 31) and were unusually low (8.9°C). For July 31, the effluent might have contributed to a decrease in river water temperature by 0.14°C.

Regardless of the effluent temperature, the change in temperature attributable to the OTFF mill effluent is extremely small, which would expected given the relative rates of effluent flow and river flow. The temperature change attributable to the OTFF mill is considerably below the thermal load permit terms described in Section 4.3.

pH. Regarding pH requirements for juvenile downstream migrating Atlantic salmon (see Table 12), effluent data for OTFF mill indicate that the mean minimum daily effluent pH ranged from 6.7 to 8.2, and that the maximum daily effluent pH ranged from 6.8 to 8.2. These results indicate that the effluent does not affect the full functioning of the Penobscot River for juvenile Atlantic salmon migration regarding pH.

7. Anticipated Effluent from the Proposed Biorefinery

Appendix B (SME, 2011) details the anticipated effluent from the proposed biorefinery. Verification of those estimates would be required through monitoring of the effluent following completion of the biorefinery.

7.1 Changes to Effluent Characteristics from the Proposed Biorefinery

Of greatest relevance to the aquatic environment and listed fish species in the Penobscot River are the projected changes to wastewater being discharged to the river, as described below.

- SME (2011) estimates that the wastewater treatment plant's effluent discharges to the Penobscot River will be increased by 0.585 mgd, which is less than 5% of the current discharge flows of 12 to 13 mgd.
- SME (2011) also estimates that BOD from the biorefinery to the OTFF wastewater treatment plant would not be likely to exceed 10,250 pounds per day. Assuming a BOD removal efficiency of 85% in the existing treatment system, the increase in BOD discharged to the Penobscot River would not be likely to exceed 1,500 pounds per day.
- The increases in BOD to the river of up to 1,500 pounds per day represents an increase of 60% to 40% from the average monthly and maximum average BOD for any single month of 2,500 and 3,780 pounds per day, respectively, measured from August 2009 through July 2010. SME (2011) estimates that the existing wastewater treatment system can treat the water from the biorefinery without exceeding the 2002 permit discharge limits of 7,500 pounds per day in summer and 8,850 pounds per day BOD in winter. In other words, the maximum likely daily discharges from the existing paper mill and the proposed biorefinery

combined are estimated to remain below 5,500 pounds per day in summer, which is well within the permitted limit of 7,500 pounds per day.

- Total suspended solids discharged to the river will increase by no more than 5% (i.e., the increase in the whole effluent discharge to the river in relation to current levels). The basis for this estimate is that the composition of the biorefinery effluent entering the wastewater treatment plant will be similar in composition to the existing mill effluent.
- Ammonia and metals, including heavy metals, will not increase in concentration.
- Water temperature of the biorefinery effluent will be similar to that of the existing mill effluent.
- The pH of the biorefinery effluent will be similar to that of the existing mill effluent.

Based on discussions with MEDEP, SME (2011) believes that the "new mill discharge license will include a phosphorous limit of 0.5 mg/L" and that the wastewater treatment system, including wastewater from the biorefinery, will be able to meet that limit. Phosphorus levels in the Penobscot River have been measured from 0.0036 to 0.129 mg/L (see Table 11). Assuming dilution factors of 16.7 for acute exposures to 74.2 for chronic exposures (Section 2.3), the stated limit of 0.5 mg/L would result in phosphorous short-term and longer-term concentrations of 0.030 and 0.0068 mg/L, respectively, in the mixing zone immediately downriver of the discharge. The MEDEP has measured average total phosphorus levels below point-source discharges of between 0.020 and 0.030 mg/L (MEDEP, 2008). Therefore, the IBR might result in similar phosphorus levels at the OTFF mill outfall in the Penobscot River as measured below other point-source discharges.

7.2 Anticipated Effluent Discharges in Relation to Primary Constituent Elements of Atlantic Salmon Designated Critical Habitat

The PCEs of Atlantic salmon critical habitat and the effects of baseline effluent discharge are described in Section 6. The treatment of biorefinery effluent in the OTFF wastewater treatment plant would slightly alter the effluent discharge to the Penobscot River, but the changes are not anticipated to affect the PCEs of Atlantic salmon critical habitat.

Dissolved oxygen (DO). The increase in BOD from the anticipated biorefinery effluent would remain within the 2002 permit limits. Although DO in the river likely would decrease because of the 40 to 60% increase in BOD from the biorefinery, the change would not be likely to decrease ambient DO to below fully functioning (greater than 5 mg/L) for adult Atlantic salmon migration.

Temperature. Following the same estimating procedures described in Section 6, but incorporating an additional 5% effluent of similar water temperature to account for the biorefinery, the estimated increase in mean July through August 2005 water temperature downstream of the OTFF mill would be 0.035°C (0.062°F; range: 0.012 to 0.060°C, 0.021 to 0.107°F). This is well below the 2002 permit-allowed increase of 0.5°F.

pH. There would be no anticipated change in the pH of wastewater effluent caused by the biorefinery. Therefore, the mean daily effluent pH would range from 6.2 to 8.2, and would not affect the full functioning of the Penobscot River for juvenile Atlantic salmon migration in relation to pH.

8. Conclusions

Sections 8.1 and 8.2 summarize the potential for existing effluent from the OTFF wastewater treatment plant and possible future effluent, following installation of a demonstration IBR, to adversely affect Atlantic salmon, shortnose sturgeon, or Atlantic sturgeon.

8.1 Baseline – Current Effluents

The WET testing of effluent from the OTFF mill from 2002 through 2005 and 2007 through 2008 indicated compliance with the 2002 MEPDES permit for the facility. In addition, estimated RQs for all WET tests were found to be at least one order of magnitude lower than the "level of concern" value of 1.0. RQ values greater than 1.0 indicate that there is some chance of an adverse effect on aquatic life under low-flow conditions, but provide no information about the likelihood or magnitude of potential effects. The acute effluent toxicity limits established in the MEPDES permit for the OTFF mill are based on the 1Q10 flow divided by a factor of 4. The chronic effluent toxicity limits are based on the 7Q10 flow. Therefore, the effluent toxicity limits are intended to be protective most of the time, but not necessarily for unusually low river flows expected on average once in a decade.

One strength of WET testing is that it assesses the combination of chemicals present in the effluent and the effect of the effluent on other water quality parameters. However, there are several weaknesses. Samples of effluent are collected over a single 2-day period in a year, which might or might not be representative of the effluent. Under the assumption that TSS, BOD_5, and bleached production are reasonable indicators of the representativeness of the overall effluent, it appears that the effluent testing performed from 2002 to 2010 has included reasonably representative samples. Another weakness of WET testing for purposes of risk assessment is that only two or three species are tested. Although the permit specified the fathead minnow as the test fish species for 2002-2005, the brook trout tested in all but two of the years is more closely related to Atlantic salmon and provides a more suitable species to predict the sensitivity of shortnose sturgeon (Cope et al., 2011) and likely Atlantic sturgeon. To provide better predictability, future screening-level WET testing should utilize brook trout in all years.

There is no evidence that baseline OTFF mill effluent would limit the function of the pH essential feature of the juvenile migration PCEs of Atlantic salmon critical habitat. There are limited data by which to assess the potential effects of OTFF mill effluent on temperature and DO for PCE of Atlantic salmon critical habitat. The available data suggest that in general the change in temperature attributable to OTFF mill current and recent discharges to the river is considerably less than 0.1°C, and therefore arguably of little biological significance. The most recent ambient DO monitoring data show that although not all of the surveyed reaches of the Penobscot River attained designated-use numeric DO criteria, the adult migration PCE for adult salmon would remain fully functioning.

The analyses presented here focus on Atlantic salmon because, with removal of the Veazie and Great Works dams, this species is certain to pass through the action area and Designated Critical Habitat. With the removal of the two dams, shortnose and Atlantic sturgeon would be more likely to enter the action area and would be able to reach the full upstream extent of their historic range, above the action area. Although the same conclusions apply to the sturgeon species as to Atlantic salmon regarding effluent effects on water quality, sturgeon are long-lived benthic feeders and have more potential to bioaccumulate pollutants (NMFS, 2009). The extent to which current OTFF mill effluents might contribute to this phenomenon is not known.

8.2 Anticipated Effluents for the Biorefinery

As with baseline conditions, there is no evidence that the anticipated effluents from the OTFF wastewater treatment plant would limit the function of the pH essential feature of the juvenile migration PCE of Atlantic salmon critical habitat. The available estimates of effluent composition for the biorefinery suggest that, in general, the change in temperature attributable to the OTFF IBR would be in proportion to the increase in discharged effluent (5%), and therefore considerably less than 0.1°C. That level of thermal loading, as with baseline conditions, is arguably of little biological significance.

Although all of the surveyed reaches of the Penobscot River did not attain designated-use numeric DO criteria during the most recent ambient monitoring, it is likely that the adult migration PCE for adult salmon would remain fully functioning regardless of the increase in BOD attributable to the change in OTFF wastewater treatment plant effluent following addition of the biorefinery. The DO measured along the Penobscot River is relatively consistent along the full length of the stations assessed in 2007 (see Figure 2 from MEDEP 2008 reproduced in Section 5). The nonattainment of DO, upriver and downriver of the OTFF mill, indicates that nonattainment of the numeric DO does not originate with the OTFF mill in the middle of the segment. The river between Winn and North Orrington is designated as Class B, with more stringent DO and other criteria to support more uses than the Class C designated waters upriver of Winn and downriver of North Orrington.

Considering the uncertainties associated with the projections of increased BOD, nonattainment of the numeric DO criteria, both upriver and downriver of the OTFF mill, periodic monitoring of DO is recommended as a precautionary measure. The periodic monitoring of ambient DO, upriver and downriver of the effluent discharge, would help confirm the full functioning of the adult Atlantic salmon migration PCE and sturgeon habitat in relation to DO during and after construction of the biorefinery. Such monitoring also would help the MEDEP determine, or plan, actions to address nonattainment of the DO criteria along the Class B waters of the Penobscot River from Winn to North Orrington.

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Appendix A

Maine Pollutant Discharge Elimination System

Permit No. ME0002020

August 9, 2002

Mr. Michael W. Curtis
Environmental Manager
Georgia Pacific Corporation
One Portland Street
P.O. Box 547
Old Town, ME. 04468

RE: Maine Pollutant Discharge Elimination System (MEPDES) Permit #ME0002020
Maine Waste Discharge License #W002226-5N-F-R
Final Permit

Dear Michael:

Enclosed please find a copy of your **final** MEPDES permit and Maine WDL which was approved by the Department of Environmental Protection. Please read the permit/license modification and its attached conditions carefully. You must follow the conditions in the order to satisfy the requirements of law. Any discharge not receiving adequate treatment is in violation of State Law and is subject to enforcement action.

Any interested person aggrieved by a Department determination made pursuant to applicable regulations, may appeal the decision following the procedures described in the attached DEP FACT SHEET entitled "*Appealing a Commissioner's Licensing Decision*."

If you have any questions regarding the matter, please feel free to call me at 287-7693.

Sincerely,

Gregg Wood
Division of Water Resource Regulation
Bureau of Land and Water Quality

Enc.

cc: Tanya Hovell, DEP/EMRO
David Cochrane, USEPA
Norm Dube, ASC
Gordon Russell, USFWS
Nicole Remillard, NMFS
Thomas Saviello, IP
Jerry Schwartz, AFPA
Steve Timpano, MIF&W

IN THE MATTER OF

FORT JAMES OPERATING COMPANY	)	MAINE POLLUTANT DISCHARGE
OLD TOWN, PENOBSCOT COUNTY, MAINE	)	ELIMINATION SYSTEM PERMIT
PULP & PAPER MANUFACTURING FACILITY	)	AND
ME0002020	)	WASTE DISCHARGE LICENSE
W002226-5N-F-R **APPROVAL**	)	**RENEWAL**

Pursuant to the provisions of the Federal Water Pollution Control Act, Title 33 USC, Section 1251, et. seq., and Maine Law 38 M.R.S.A., Section 414-A et. seq., and all applicable regulations, the Department of Environmental Protection (Department) has considered the application of the FORT JAMES OPERATING COMPANY (FJOC), with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

APPLICATION SUMMARY:

The FJOC has filed an application with the Department to renew State Waste Discharge License (WDL) #W002766-44-D-R that was issued on February 11, 1994 and expired on February 11, 1999. It is noted the February 11, 1994 WDL was modified by the issuance of WDL #W002766-5N-E-M dated October 13, 1998.

The FJOC mill (a subsidiary of the Georgia Pacific Corporation) located in Old Town, Maine manufactures bleached kraft pulp and bleached kraft tissue products. The FJOC has applied to the Department for the issuance of combination Maine Pollutant Discharge Elimination System (MEPDES) permit and Waste Discharge License (WDL) to routinely discharge up to a monthly average of 24.4 million gallons per day (MGD) of treated process waters (including storm water and landfill leachate) and other waste waters associated with the pulp and papermaking process, non-contact cooling waters, turbine condensing waters and filter backwash waters from three outfalls to the Penobscot River. In addition to the routine waste waters discharged , this permit authorizes discharges associated with or resulting from essential maintenance, regularly scheduled maintenance during start-up and shutdown, spills and release (whether anticipated or unanticipated) from anywhere in the permitted facility. Standard Condition 5, *Bypasses*, of this permit authorizes discharges that are necessary to prevent loss of life, personal injury or severe property damage as long as there are no feasible alternatives available. It is noted that Outfall #005 (discharging oil cooling waters and bearing seal and housing waters from hydroelectric turbine generators) in the

APPLICATION SUMMARY (cont'd)

previous licensing action is not included in this permitting action as the facility was sold by the FJOC to Pennsylvania Power and Light and is regulated under a separate waste discharge license issued by the Department. The mill produces approximately 257 tons/day of bleached kraft tissue products. The mill produced an average of 566 tons/day of bleached kraft market pulp for the period calendar years 1999 – 2001 inclusively.

PERMIT SUMMARY

On January 12, 2001, the Department received authorization from the U.S. Environmental Protection Agency (EPA) to administer the National Pollutant Discharge Elimination System (NPDES) permitting program in Maine. From this point forward, the program will be referenced as the MEPDES program and will utilize a permit number of #ME0002020 (same as the NPDES permit) as a reference number for the FJOC's MEPDES permit. It is noted that the effective NPDES permit issued by the EPA on August 19, 1992 will be replaced by the MEPDES permit upon issuance and all terms and conditions of the NPDES permit will be null and void.

This permit is significantly different than the effective NPDES permit issued by the EPA in 1992 and the effective WDL issued by the State of Maine in 1994 (subsequently modified on October 13, 1998) due to new regulations promulgated by EPA in April of 1998 for the pulp and paper industry. The new regulation may be found at 40 Code of Federal Regulation (CFR) Part 430 and is often referred to as the "Cluster Rule."

This permit is carrying forward from WDL #W002226-44-D-R dated February 11, 1994 and or WDL modification cited above:

1. The monthly average flow limit of 24.4 MGD for Outfall #001.

2. The seasonal daily maximum and monthly average mass limits for biochemical oxygen demand (BOD_5) and total suspended solids (TSS) for Outfall #001 and the year-round monthly average and daily maximum mass limits for TSS for Outfall #003.

3. The daily maximum temperature limits of 105°F and 115°F for Outfall #001 and Outfall #002 respectively.

4. The pH range limitation for all outfalls.

5. The quarterly average color limit of 175 lbs/ton of unbleached pulp produced for Outfall #001.

PERMIT SUMMARY (cont'd)

6. The daily maximum concentration limit of <10 pg/L for 2,3,7,8 TCDD (dioxin) and 2,3,7,8 TCDF (furan) at the end of the bleach plant, Outfall #100, an internal waste stream for the mill.

7. The annual testing requirement for whole effluent toxicity (WET) and chemical specific (priority pollutant) testing for Outfall #001.

8. The daily maximum concentration limit for total residual chlorine for Outfall #003.

This permit is different from WDL #W002226-44-D-R dated February 11, 1994 and or WDL modification previously cited in that it:

9. Establishes monthly average and daily maximum mass limits for adsorbable organic halogens (AOX) for Outfall #001.

10. Establishes daily maximum concentration limits for 12 chlorinated phenolic compounds for the bleach plant, Outfall #100.

11. Establishes monthly average and daily maximum mass limits for chloroform for the bleach plant, Outfall #100.

12. Requires the permittee to demonstrate compliance with Maine's dioxin law by requiring fish tissue sampling in addition to monitoring the bleach plant effluent.

13. Requires the permittee to monitor bald eagle nests, collect bird samples and conduct analytical analyses and band chicks.

14. Requires the permittee to maintain, implement, and periodically update a Best Management Plan (BMP) for the mill operations.

15. Establishes a reporting requirement for flow, establishes monthly average and daily maximum mass limits for TSS and removes monthly average and daily maximum concentration limits for TSS for Outfall #003.

16. Eliminates Outfall #005 (discharges oil cooling waters and bearing seal and housing waters from hydroelectric turbine generators) from the permit as the facility is no longer owned by the FJOC.

17. Establishes seasonal weekly average and daily maximum thermal limits for Outfall #001 and #002 collectively.

CONCLUSIONS

BASED on the findings in the attached Fact Sheet dated April 2, 2002 and revised on August 6, 2002 and subject to the Conditions listed below, the Department makes the following CONCLUSIONS:

1. The discharge, either by itself or in combination with other discharges, will not lower the quality of any classified body of water below such classification.

2. The discharge, either by itself or in combination with other discharges, will not lower the quality of any unclassified body of water below the classification which the Department expects to adopt in accordance with state law.

3. The provisions of the State's antidegradation policy, 38 M.R.S.A., Section 464(4)(F), will be met, in that:

   (a) Existing in-stream water uses and the level of water quality necessary to protect and maintain those existing uses will be maintained and protected;

   (b) Where high quality waters of the State constitute an outstanding national resource, that water quality will be maintained and protected;

   (c) The standards of classification of the receiving water body are met or, where the standards of classification of the receiving water body are not met, the discharge will not cause or contribute to the failure of the water body to meet the standards of classification;

   (d) Where the actual quality of any classified receiving water body exceeds the minimum standards of the next highest classification, that higher water quality will be maintained and protected; and

   (e) Where a discharge will result in lowering the existing quality of any water body, the Department has made the finding, following opportunity for public participation, that this action is necessary to achieve important economic or social benefits to the State.

4. The discharge will be subject to effluent limitations that require application of best practicable treatment.

ACTION

THEREFORE, the Department APPROVES the above noted application of the FORT JAMES OPERATING COMPANY, to discharge treated process waste waters (including storm water and landfill leachate) and other waste waters associated with the pulp and papermaking process, non-contact cooling waters, turbine condensing waters and filter backwash waters from three outfalls to the Penobscot River, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations including:

1. "Maine Pollutant Discharge Elimination System Permit Standard Conditions Applicable To All Permits," revised January 16, 2001, copy attached.

2. The attached Special Conditions, including effluent limitations and monitoring requirements.

3. The term of this permit is five (5) years from the date of signature.

DONE AND DATED AT AUGUSTA, MAINE, THIS 6th DAY OF August, 2002.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____
MARTHA KIRKPATRICK, Commissioner

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application February 10, 1999 .

Date of application acceptance February 10, 1999 .

Date filed with Board of Environmental Protection _____

This order prepared by GREGG WOOD, BUREAU OF LAND AND WATER QUALITY
W22265nf 8/6/02

SPECIAL CONDITION

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning with the effective date of this permit and lasting through permit expiration, the permittee is authorized to discharge secondary treated process waste waters from **Outfall #001,** bleach plant effluent (internal waste stream) from **Outfall #100**, non-contact cooling waters from **Outfall #002** and filter backwash from **Outfall #003** to the Penobscot River. Such discharges shall be limited and monitored by the permittee as specified below. The italicized numeric values in brackets in the table below and the tables that follow are not limitations but are code numbers used by Department personnel to code Discharge Monitoring Reports (DMR's).

OUTFALL #001 – Secondary treated waste waters

Effluent Characteristic	Discharge Limitations				Monitoring Requirements		
	Monthly Average lb/day	**Daily Maximum** lb/day	**Monthly Average** as specified	**Weekly Average** as specified	**Daily Maximum** as specified	**Measurement Frequency** as specified	**Sample Type** as specified
Flow (MGD) *[50050]*	---	---	24.4 MGD *[03]*	---	Report MGD *[03]*	Continuous *[CN]*	Recorder*[RC]*
BOD_5 *[00310]*							
June 1 – October 31	7,500 #/day	18,000 #/day	---	---	---	1/Day	Composite
November 1 – May 31	8,850 #/day *[26]*	18,000 #/day *[26]*	---	---	---	1/Day *[01/01]*	Composite *[24]*
TSS *[00530]*							
June 1 – October 31	20,000 #/day	35,000 #/day	---	---	---	1/Day	Composite
November 1 – May 31	22,475 #/day *[26]*	42,000 #/day *[26]*	---	---	---	1/Day *[01/01]*	Composite *[24]*
Temperature *[00011]*							
June 1 – September 30	---	---	---	---	105°F *[15]*	1/Day *[01/01]*	Grab *[GR]*
October 1 – May 31	---	---	---	---	105°F *[15]*	1/Week *[01/07]*	Grab *[GR]*
Thermal Load *[00017]*							
June 1 – September 30	---	---	---	8.49 EE9(1,2) Btu's/Day *[34]*	8.49 EE9(1,3) Btu's/Day *[34]*	1/Day*[01/01]*	Calculate *[CA]*
Temperature Difference *[70013]*							
June 1 – September 30	---	---	---	---	0.5°F**(2,3)** *[15]*	1/Day *[01/01]*	Calculate *[CA]*
pH (Std. Unit) *[00400]*	---	---	---	---	5.0 – 9.0 SU *[12]*	1/Day *[01/01]*	Grab *[GR]*

SPECIAL CONDITIONS

A. OUTFALL #001 – Secondary treated waste waters (cont'd)

Effluent Characteristic **Discharge Limitations** **Monitoring Requirements**

	Monthly Average lb/day	Daily Maximum lb/day	Monthly Average as specified	Weekly Average as specified	Daily Maximum as specified	Measurement Frequency as specified	Sample Type as specified
Color[4] *[00084]*	175 lbs/ton *[42]*	---	---	---	---	3/Week *[03/07]*	Composite *[24]*
Adsorbable Organic Halogen[5] (AOX) *[03594]*	989 #/Day *[26]*	1,510 #/Day *[26]*	---	---	---	3/Week *[03/07]*	Composite *[24]*
Arsenic (Total) *[01002]*	0.82 #/Day *[26]*	---	Report ug/L *[28]*	---	---	1/Year *[01/YR]*	Composite *[24]*
Copper (Total) *[01042]*	---	10.8 #/Day *[26]*	---	---	79 ug/L *[28]*	1/Year *[01/YR]*	Composite *[24]*

SURVEILLANCE LEVEL TESTING – Beginning calendar year 2002 and lasting through calendar year 2005.

Effluent Characteristic **Discharge Limitations** **Monitoring Requirements**

	Monthly Average as specified	Daily Maximum as specified	Monthly Average as specified	Daily Maximum as specified	Measurement Frequency as specified	Sample Type as specified
Whole Effluent Toxicity (WET)[6]						
A-NOEL						
Ceriodaphnia dubia *[TDA3B]*	---	---	---	Report % *[23]*	1/Year *[01/YR]*	Composite *[24]*
Pimephales promelas *[TDA6C]*	----	---	---	Report % *[23]*	1/Year *[01/YR]*	Composite *[24]*
C-NOEL						
Ceriodaphnia dubia *[TBP3B]*	---	---	---	Report % *[23]*	1/Year *[01/YR]*	Composite *[24]*
Pimephales promelas *[TBP6C]*	---	---	---	Report % *[23]*	1/Year *[01/YR]*	Composite *[24]*
Chemical Specific[7] *[50008]*	---	---	---	Report ug/L *[28]*	1/Year *[01/YR]*	Composite/ Grab *[24/GR]*

SPECIAL CONDITIONS

A. OUTFALL #001 – Secondary treated waste waters (cont'd)

SCREENING LEVEL TESTING – Beginning twelve months prior to expiration date of the permit.

Effluent Characteristic	Discharge Limitations				Monitoring Requirements	
	Monthly Average as specified	**Daily Maximum** as specified	**Monthly Average** as specified	**Daily Maximum** as specified	**Measurement Frequency** as specified	**Sample Type** as specified
Whole Effluent Toxicity (WET) [6]						
A-NOEL						
Ceriodaphnia dubia *[TDA3B]*	---	---	---	Report % *[23]*	1/Quarter *[01/90]*	Composite *[24]*
Salvelinus fontinalis *[TDA6F]*	---	---	---	Report % *[23]*	2/Year *[02/YR]*	Composite *[24]*
Pimephales promelas *[TDA6C]*	---	---	---	Report % *[23]*	2/Year *[02/YR]*	Composite *[24]*
C-NOEL						
Ceriodaphnia dubia *[TBP3B]*	---	---	---	Report % *[23]*	1/Quarter *[01/90]*	Composite *[24]*
Salvelinus fontinalis *[TBQ6F]*	---	---	---	Report % *[23]*	2/Year *[02/YR]*	Composite *[24]*
Pimephales promelas *[TBP6C]*	---	---	---	Report % *[23]*	2/Year *[02/YR]*	Composite *[24]*
Chemical Specific[7] *[50008]*	---	---	---	Report ug/L *[28]*	1/Quarter *[01/90]*	Composite/ Grab *[24/GR]*

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (cont'd)

Outfall #001 – Secondary treated waste waters

Footnotes:

(1) **Thermal Load** – The thermal load limitation is a limitation of the combined thermal load from Outfall #001 and #002. See Special Condition M of this permit.

(2) **Thermal Load** –This is a weekly rolling average thermal load limitation (expressed as BTU's/Day) when the receiving water temperature is ≥66°F and <73°F. For Discharge Monitoring Report (DMR) reporting purposes, report the highest seven (7) consecutive day thermal load during a calendar month. See Special Condition M of this permit for the equation to calculate the thermal load.

(3) **Thermal Load** - This is a daily maximum thermal load limitation (BTU's/Day) when the receiving water temperature is ≥73°F. For DMR reporting purposes, report the highest daily thermal load (expressed as BTU's/Day) during a calendar month. When the receiving water temperature is ≥73°F and the receiving water flow is <7Q10 (3,151 cfs), the permittee is limited to a predicted river temperature increase (PRTI or ΔT) of 0.5°F. See Special Condition M of this permit for the equation to calculate the PRTI.

(4) **Color** – The limitation is a calendar quarterly average limitation. Quarterly results shall be reported in the monthly DMR's for the months of March, June, September and December of each calendar year. The permittee shall monitor the true color (at a pH of 7.6 S.U) in the effluent from Outfall #001 at a minimum of three (3) times per week. See Special Condition I of this permit for reporting requirements. The calculated mass discharged, expressed as lbs/ton of unbleached pulp produced (calculated by multiplying the bleached tonnage by a factor of 1.05% to account for shrinkage), shall be based on air-dried tons of brown stock entering the bleach plant. A color pollution unit is equivalent to a platinum cobalt color unit as described in NCASI Technical Document #803. A pound of color is defined as the number of color pollution units multiplied by the volume of effluent discharged in million gallons per day multiplied by 8.34.

(5) **AOX** - The analytical method to be used to determine adsorbable organic halogens shall be EPA Method 1650 for which a ML (Minimum Level) of 20 ug/l shall be attained. The ML is defined as the level at which the analytical system gives recognizable signals and an acceptable calibration point. The mass discharged shall be based on air-dried tons of brown stock (calculated by multiplying the bleached tonnage by a factor of 1.05% to account for shrinkage), entering the bleach plant at the stage where chlorine or chlorine based compounds are first added.

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (cont'd)

Outfall #001 – Secondary treated waste waters

Footnotes**:**

(6) **WET** - Definitive WET testing is a multi-concentration testing event (a minimum of five dilutions set at levels to bracket the acute and chronic critical water quality thresholds dilution factors of 5.6% and 1.2 % respectively), which provides a point estimate of toxicity in terms of No Observed Effect Level, commonly referred to as NOEL or NOEC. A-NOEL is defined as the acute no observed effect level with survival as the end point. C-NOEL is defined as the chronic no observed effect level with survival, reproduction and growth as the end points.

Beginning upon issuance of the permit and lasting through twelve months prior to the expiration date of the permit, the permittee shall initiate surveillance level WET testing at a frequency of 1/Year (any calendar quarter) on the water flea (*Ceriodaphnia dubia*) and the fathead minnow (*Pimephales promelas*). Results shall be submitted to the Department within thirty (30) days of the permittee receiving the data report from the laboratory conducting the testing.

Beginning twelve months prior to the expiration date of the permit, the permittee shall initiate screening level WET tests at a frequency of 1/Quarter (four consecutive calendar quarters). Testing shall be conducted on the water flea (*Ceriodaphnia dubia*) and the fathead minnow (*Pimephales promelas*) in two of the four calendar quarters and conducted on the water flea (*Ceriodaphnia dubia*) and the brook trout (*Salvelinus fontinalis*) in the remaining two of the four calendar quarters. Results shall be submitted to the Department within thirty (30) days of the permittee receiving the data report from the laboratory conducting the testing.

Toxicity tests must be conducted by an experienced laboratory approved by the Department. The laboratory must follow procedures as described in the following U.S.E.P.A. methods manuals.

a. Lewis, P.A. et al., Short Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Water to Freshwater Organisms, Third Edition, July 1994 EPA/600/4-91/002.

b. Weber, C.I. et al., Methods for Measuring the Acute Toxicity of Effluent and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition, August 1993 EPA/600/4-90/027F.

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (cont'd)

Outfalls #001 – Secondary treated waste waters

Footnotes**:**

c. Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing, July 2000 (40 CFR Part 136), EPA 821-B-00-004.

Should the laboratory WET testing not meet all testing protocols, the test is considered to be invalid and the permittee must re-test as soon as possible**.**

The permittee is also required to analyze the effluent for the parameters specified in the analytic chemistry on the form in Attachment A of this permit each and every time a WET test is performed.

When a permittee certifies the accuracy of any information submittal for WET testing submissions pursuant to federal regulations 40 CFR Part 122.22(d), the permittee does not certify the accuracy of the measurement system. When the permittee certifies that the submission of WET testing information is "accurate" to the best of their knowledge and belief, the permittee certifies that the results obtained using the WET testing procedures are faithfully and truthfully transcribed on the information submission and that the results were in fact, results that were obtained using the specified testing procedures.

(7) Chemical specific (priority pollutant) testing are those parameters listed by the USEPA pursuant to Section 307(a) of the Clean Water Act and published a 40 CFR Part 122, Appendix D, Tables II and III.

Beginning upon issuance of the permit and lasting through twelve months prior to the expiration date of the permit, surveillance level chemical specific testing shall be conducted at a frequency of once per year (any calendar quarter). **Beginning twelve months prior to the expiration date of the permit**, screening level chemical specific testing shall be conducted at a frequency of four per year (four consecutive calendar quarters). Chemical specific testing shall be conducted on samples collected at the same time as those collected for whole effluent toxicity tests, where applicable. Chemical specific testing shall be conducted using methods that permit detection of a pollutant at existing levels in the effluent or that achieve minimum reporting levels of detection as specified by the Department. Results shall be submitted to the Department within thirty (30) days of the permittee receiving the data report from the laboratory conducting the testing. For the purposes of DMR reporting, enter a "0" for no testing done this monitoring period or "1" for yes, testing done this monitoring period.

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (cont'd)

Outfalls #001 – Secondary treated waste waters

Footnotes**:**

All mercury sampling shall be conducted in accordance with EPA's "clean sampling techniques" found in EPA Method 1669, Sampling Ambient Water For Trace Metals At EPA Water Quality Criteria Levels. All mercury analysis shall be conducted in accordance with EPA Method 1631, Determination of Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Fluorescence Spectrometry.

SPECIAL CONDITIONS ***Revised 7/16/04***

OUTFALL #100- (Bleach Plant) – Internal Waste Stream

Effluent Characteristic **Discharge Limitations** **Monitoring Requirements**

	Monthly Average as specified	**Daily Maximum** As specified	**Monthly Average** as specified	**Daily Maximum** as specified	**Measurement Frequency** as specified	**Sample Type** as specified
Flow[(1)] *[50050]*	---	---	Report MGD *[03]*	Report MGD *[03]*	1/Week *[01/07]*	Calculate *[CA]*
2,3,7,8 TCDD (Dioxin) [(2)] *[34675]*	---	---	---	<10 pg/L[(3)] *[3L]*	1/Month *[01/30]*	Composite *[24]*
2,3,7,8 TCDF (Furan) [(2)] *[38691]*	---	---	---	<10 pg/L[(3)] *[3L]*	1/Month *[01/30]*	Composite *[24]*
Trichlorosyringol[(4)] *[73054]*	---	---	---	<2.5 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
3,4,5-Trichlorocatechol[(4)] *[73037]*	---	---	---	<5.0 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
3,4,,6- Trichlorocatechol[(4)] *[51024]*	---	---	---	<5.0 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
3,4,5-Trichloroguaiacol[(4)] *[61024]*	---	---	---	<2.5 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
3,4,6-Trichloroguaiacol[(4)] *[51022]*	---	---	---	<2.5 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
4,5,6-Trichloroguaiacol[(4)] *[73088]*	---	---	---	<2.5 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
2,4,5-Trichlorophenol[(4)] *[61023]*	---	---	---	<2.5 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
2,4,6-Trichlorophenol[(4)] *[34621]*	---	---	---	<2.5 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
Tetrachlorocatechol[(4)] *[79850]*	---	---	---	<5.0 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
Tetrachloroguaiacol[(4)] *[73047]*	---	---	---	<5.0 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
2,3,4,6-Tetrachlorophenol[(4)] *[77770]*	---	---	---	<2.5 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
Pentachlorophenol[(4)] *[39032]*	---	---	---	<5.0 ug/L[(3)] *[28]*	1/Month *[01/30]*	Composite *[24]*
Chloroform[(5)] *[32106]*	6.56 #/day *[26]*	11.0 #/day *[26]*	---	---	---	---

SPECIAL CONDITIONS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (cont'd)

Outfalls #100 – Bleach plant effluent – internal waste stream

Footnotes**:**

(1) **Bleach plant flow**- Shall be calculated on the same day(s) of the month that the bleach plant effluent is sampled for 2,3,7,8 TCDD (Dioxin), 2,3,7,8 TCDF (Furan), twelve (12) chlorinated phenolic compounds or chloroform.

(2) **2,3,7,8 TCDD (Dioxin) & 2,3,7,8 TCDF (Furan)** – The analytical method to be used to determine the concentrations of dioxin and furan shall be EPA Method 1613B. Each composite sample shall consist of a minimum of six (6) grab samples taken every four (4) hours from both the acid and alkaline sewers or one flow proportioned composite sample from a continuous automatic sampling device.

(3) **Minimum Levels (ML's)** - The limitations established in this permitting action for dioxin, furan and the 12 chlorinated phenolic compounds are equivalent to the ML's established for EPA Methods 1613 and 1653 respectively. Compliance will be based on the ML's as listed in Special Condition A of this permit. For the purposes of reporting test results for on the monthly DMR, the following format shall be adhered to:

Detectable results - All detectable analytical test results shall be reported to the Department including results which are detected below the respective ML.

Non-detectable results - If the analytical test result is below the respective ML, the concentration result shall be reported as <X where X is the detection level achieved by the laboratory for each respective parameter.

Any level of TCDD/TCDF reported below the ML is not quantifiable and is considered an estimate.

(4) **12 Chlorinated phenolic compounds** - The analytical method to be used to determine the concentrations of these compounds shall be EPA Method 1653.

(5) **Chloroform** – There are several approved EPA analytical methods for chloroform testing. Those methods include: EPA Method 1624B [for which a minimum level (ML) of 10 ug/L shall be attained], EPA Methods 601 and 626, and Standard Methods 6210B and 6230B. The FJOC may use any of these approved methods. The permittee must collect separate grab samples from the acid and alkaline bleach plant filtrates for chloroform analysis. Samples to be analyzed for chloroform may be taken over a 32 hour period where a minimum of six (6) grab samples are collected, each grab sample being at least four (4) hours apart but no more than 16 hours apart.

SPECIAL CONDITIONS

OUTFALL #002 – Non-contact cooling waters and steam condensate(1)

Effluent Characteristic **Discharge Limitations** **Monitoring Requirements**

	Monthly Average lb/day	Daily Maximum lb/day	Monthly Average as specified	Weekly Average as specified	Daily Maximum as specified	Measurement Frequency as specified	Sample Type as specified
Flow (MGD) *[50050]*	---	---	Report MGD *[03]*	---	Report MGD *[03]*	1/Day *[01/01]*	Estimate *[ES]*
Temperature *[00011]* *June 1 – September 30* *October 1 – May 31*	 --- ---	 --- ---	 --- ---	 --- ---	 115°F *[15]* 115°F *[15]*	 1/Day *[01/01]* 1/Week *[01/07]*	 Grab *[GR* Grab *[GR]*
Thermal Load *[00017]* *June 1 – September 30*	---	---	---	8.49 EE9(2) Btu's/Day *[34]*	8.49 EE9(2) Btu's/Day *[34]*	1/Day *[01/01]*	Calculate *[CA)*
Temperature Difference *June 1 – September 30 [70013]*	---	---	---	---	0.5°F(2) *[15]*	1/Day *[01/01]*	Calculate *[CA)*
pH (Std. Unit) *[00400]*	---	---	---	---	5.0 – 9.0 SU *[12]*	1/Day *[01/01]*	Grab *[GR)*

Footnotes:

(1) The permittee is authorized to discharge any combination of non-contact cooling water, non-contact condensing water, including discharges from turbine generators, chlorine dioxide plant cooling waters and evaporation cooling waters within the limitations specified above. The permittee must identify the sources of the waters being discharged as an attachment to the monthly Discharge Monitoring Report.

(2) The thermal load and temperature difference limitations are a combined thermal load from Outfall #001 and #002. See Special Condition A – Outfall #001, footnotes 1-3 and Special Condition M of this permit.

OUTFALL #003 – Filter backwash waters(1)

Effluent Characteristic **Discharge Limitations** **Monitoring Requirements**

	Monthly Average as specified	**Daily Maximum** as specified	**Monthly Average** As specified	**Daily Maximum** as specified	**Measurement Frequency** as specified	**Sample Type** as specified
Flow *[50050]*	---	---	Report MGD *[03]*	Report MGD *[03]*	1/Month *[01/30]*	Estimate *[ES]*
Total Suspended Solids *[00530]*	336 lbs/Day *[26]*	1,001 lbs/Day *[26]*	Report mg/L *[19]*	Report mg/L *[19]*	1/Month *[01/30]*	Composite *[24]*
Total Residual Chlorine *[00560]*	---	---	---	0.5 mg/L *[19]*	1/Month *[01/30]*	Grab *[GR]*
pH (Standard Units) *[00400]*	---	---	---	5.0 – 9.0 SU *[12]*	1/Month *[01/30]*	Grab *[GR]*

Footnotes:

(1) Filter backwash waters include backwashes from media filters and incidental waters from the water treatment plant clearwell and filters.

SPECIAL CONDITIONS

B. NARRATIVE EFFLUENT LIMITATIONS

1. The effluent shall not contain a visible oil sheen, foam, or floating solids at any time which would impair the usages designated by the classification of the receiving waters.

2. The effluent shall not contain materials in concentrations or combinations which are hazardous or toxic to aquatic life, or which would impair the usages designated by the classification of the receiving waters.

3. The effluent shall not cause visible discoloration or turbidity in the receiving water which would impair the usages designated by the classification of the receiving waters.

4. Notwithstanding specific conditions of the permit, the effluent must not lower the quality of any classified body of water below such classification, or lower the existing quality of any body of water if the existing quality is higher than the classification.

5. The permittee shall not use chlorophenolic-containing biocides.

C. TREATMENT PLANT OPERATOR

The waste water treatment facility must be operated by a person holding a **Grade V** certificate pursuant to Title 32 M.R.S.A., Section 4171 et Seq. All proposed contracts for facility operation by any person must be approved by the Department before the permittee may engage the services of the contract operator.

D. NOTIFICATION REQUIREMENT

In accordance with Standard Condition D, the permittee shall notify the Department of the following:

1. Any substantial change (realized or anticipated) in the volume or character of pollutants being introduced into the waste water collection and treatment system.

2. For the purposes of this section, adequate notice shall include information on:

   a. The quality and quantity of waste water introduced to the waste water collection and treatment system; and

   b. Any anticipated change in the quality and quantity of the waste water to be discharged from the treatment system.

SPECIAL CONDITIONS

E. UNAUTHORIZED DISCHARGES

The permittee is authorized to discharge only in accordance with the terms and conditions of this permit and only from the treatment plant Outfalls #001, #002, #003. Discharges of waste water from any other point source are not authorized under this permit, but shall be reported in accordance with Standards Condition B(5)(Bypass) of this permit.

F. EMERGENCY POWER

Pursuant to Standard Condition E(1)(a) of this permit**, within thirty (30) days after the effective date of this permit**, the permittee shall notify the Department in writing of facilities and plans to be used in the event the primary source of power to its waste water pumping and treatment facilities fails.

G. REOPENING OF PERMIT FOR MODIFICATIONS

Upon evaluation of the tests results specified by the Special Conditions of this permitting action, new site specific information, or any other pertinent test results or information obtained during the term of this permit, the Department may, at anytime and with notice to the permittee, modify this permit to: 1) include effluent limits necessary to control specific pollutants or whole effluent toxicity where there is a reasonable potential that the effluent may cause water quality criteria to be exceeded: (2) require additional monitoring if results on file are inconclusive; or (3) change monitoring requirements or limitations based on new information.

H. MONITORING AND REPORTING

Monitoring results obtained during the previous month shall be summarized for each month and reported on separate Discharge Monitoring Report (DMR) forms provide by the Department **and postmarked on or before the thirteenth (13th) day of the month** such that the DMR's are received by the Department on or before the fifteenth (15th) day of the month following the completed reporting period. A signed copy of the DMR and all other reports required herein shall be submitted to the following address:

Maine Department of Environmental Protection
Eastern Maine Regional Office
Bureau of Land & Water Quality
106 Hogan Road
Bangor, ME. 04401

SPECIAL CONDITIONS

I. COLOR

The permittee is required to report daily average color discharged for a calendar quarter expressed as pounds per day. The permittee is required to report the daily average color discharged for a calendar quarter expressed as pounds of color per ton of unbleached pulp produced. Supporting calculations, in the format illustrated below must accompany the DMR reports for March, June, September and December of each calendar year.

Quarter Sample Date	#001 Flow (mgd)	Color Conc (cpu)	Mass (lbs/day)	Unbleached Pulp Production tons/day
xx/xs/xx	35	716	201,000	1,400
xx/xs/xx	38	700	201,844	1,450
.....				
xx/xs/xx	37	695	204,463	1,425
Quarterly Average			X=205,102	X=1,425

Quarterly average mass per ton = 205,102/1,425 = 144 lbs color/ton

J. OPERATION & MAINTENANCE (O&M) PLAN

This facility shall have a current written comprehensive Operation & Maintenance (O&M) Plan. The plan shall provide a systematic approach by which the permittee shall at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit.

By December 31 of each year, or within 90 days of any process changes or minor equipment upgrades, the permittee shall evaluate and modify the O&M Plan including site plan(s) and schematic(s) for the waste water treatment facility to ensure that it is up-to-date. The O&M Plan shall be kept on-site at all times and made available to Department and EPA personnel upon request.

Within 90 days of completion of new and or substantial upgrades of the waste water treatment facility, the permittee shall submit the updated O&M Plan to their Department inspector for review and comment.

K. TOXICITY REDUCTION EVALUATION (TRE)

Within thirty (30) days of the effective date of this permit, the permittee shall submit to the Department for review and approval, a TRE plan which outlines a strategy to identify the source(s) and action items to be implemented to mitigate or eliminate exceedences of ambient water quality criteria associated with arsenic.

SPECIAL CONDITIONS

L. DIOXIN – FISH TISSUE

After December 31, 2002, FJOC's Old Town mill may not discharge dioxin into its receiving waters and must demonstrate so through monitoring of the bleach plant effluent and fish tissue sampling. Pursuant to Maine law, 38 M.R.S.A., §420(2)(I)(3), a mill is considered to have discharged dioxin into its receiving waters if 2, 3, 7, 8 - tetrachlorodibenzo-p-dioxin or 2, 3, 7, 8 - tetrachlorodibenzo-p-furan is detected in any of the mill's internal waste streams of its bleach plant and in a confirmatory sample at levels exceeding 10 picograms per liter, unless the Department adopts a lower detection level by rule, which is a routine technical rule pursuant to Title 5, chapter 375, subchapter II-A, or a lower detection level by incorporation of a method in use by the United States Environmental Protection Agency, or if levels of dioxin, as defined in section 420-A, subsection 1 detected in fish tissue sampled below the mill's wastewater outfall are higher than levels in fish tissue sampled at an upstream reference site not affected by the mill's discharge or on the basis of a comparable surrogateprocedure acceptable to the commissioner. The commissioner shall consult with the technical advisory group established in section 420-B, subsection 1, paragraph B, subparagraph (5) in making this determination and in evaluating surrogate procedures. The fish-tissue sampling test must be performed with differences between the average concentrations of dioxin in the fish samples taken upstream and downstream from the mill measured with at least 95% statistical confidence. If the mill fails to meet the fish-tissue sampling-result requirements in this subparagraph and does not demonstrate by December 31, 2003 to the commissioner's satisfaction that its wastewater discharge is not the source of elevated dioxin concentrations in fish below the mill, then the commissioner may pursue any remedy authorized by law.

M. THERMAL LOAD

During the period June 1 to September 30, the permittee is limited to a weekly rolling average thermal load of 8.49×10^9 BTU's/Day when the receiving water is $\geq$66°F and <73°F, and limited to a daily maximum thermal load of 8.49×10^9 BTU's/Day when the receiving water temperature is $\geq$73°F. For each operating day during the applicable limitation period, the permittee shall calculate the thermal load rejected from Outfall #00l and Outfall #002 (collectively) to the receiving waters according to the following equation:

$$\text{Thermal Load (Btu/day)} = [(Qe_{001})(Te_{001}-Tr) + (Qe_{002})(Te_{002}-Tr)](8.34 \text{ lbs/gal})$$

where,

Qe = Effluent flow in gpd for each outfall
Te = Effluent temperature in ^oF for each outfall.
Tr = Upstream river water (intake) temperature in ^oF

When the receiving water temperature is $\geq$73°F and the flow is below the 7Q10 of 3,151 cfs, the permittee is limited to a daily thermal load that will not increase the receiving water temperature (ΔT) by more than 0.5°F. The permittee shall monitor the discharge from Outfall #001 and Outfall #002 and the receiving water on a daily basis for the parameters in the equations below. Receiving water flow measurements (Qr) shall be obtained from Pennsylvania Power and Light's (PPL's) Veazie Station located in the Town of Veazie. In

SPECIAL CONDITIONS

M. THERMAL LOAD (cont'd)

the event that flow data is not available from the Veazie Station, flow information from the Eddington Station can be used. For each operating day during the applicable limitation period, the permittee shall calculate the Predicted River Temperature Increase (PRTI) from Outfall #00l and Outfall #002 (collectively) to the receiving waters according to the following equation:

$$PRTI\ (^{o}F) = \frac{(Qe_{001})\ (Te_{001}\text{-}Tr) + (Qe_{002})\ (Te_{002}\text{-}Tr)}{Qr}$$

where,

Qr = River flow in gpd
Qe = Effluent flow in gpd from each outfall
Te = Effluent temperature in ^{o}F for each outfall
Tr = Upstream river water (intake) temperature in ^{o}F

The daily recorded and calculated values shall be reported to the Department as an attachment to the Discharge Monitoring Reports (DMR's) for the months of June, July, August and September of each year.

Example DMR Reporting Form Attachment

Date	Qr (gpd)[(1)]	Qe (MGD)	Tr(°F)	Te(°F)	PRTI(°F)[(1)]	Heat(BTU's)
6/1/02	2×10^{9}	19.3_{001}	73	91_{001}	----	----
		2.1_{002}	73	82_{002}	0.18°F	2.90×10^{9}

Footnotes:

(1) Applicable only when the receiving water is ≥73°F and the flow is below the 7Q10 of 3,151 cfs (2,037 MGD).

N. BIOLOGICAL MONITORING PROGRAM

The permittee is required to develop and implement an annual biological monitoring plan to monitor the bird species cited in paragraph N(1)(a) below. Except as specified below, the monitoring plan will remain in effect until the Department, after consultation with the USF&W and the State's IF&W, formally (in writing) relieves the permittee of their obligation to continue to carry out the plan.

1. **On or before October 1, 2002**, the permittee shall submit to the Department for review and approval, a biological monitoring plan to monitor the bird species listed in paragraph N(1)(a) below. The permittee shall consult with USFWS's Maine Field Office, the USEPA's Region I Maine State Ecosystem Office and the State of Maine Department of Inland Fish & Wildlife's (IF&W) Bangor Office when preparing the monitoring plan. The permittee must receive written approval of said plan from the Department prior to commencing the monitoring. The biological monitoring plan shall include the following items:

SPECIAL CONDITIONS

N. BIOLOGICAL MONITORING PROGRAM (cont'd)

a. Bird samples (non-viable eggs and dead young sub-adults or adults) of bald eagles, ospreys, great blue herons and common loons shall be collected when available from nests on the main stem of the Penobscot River and on major tributaries within twenty five (25) miles of the permittee's mill and in reference/background areas;

b. The following environmental contaminants shall be measured in each sample: standard PCDD/F analysis, congener-specific PCB analysis, organochlorine pesticides analysis, and standard metals analysis including lead and mercury;

c. Aerial and ground based monitoring of eagle nests shall begin during eagle nest occupation followed by sequential visits to determine the day of egg laying. Aerial surveys shall resume once the eggs are expected to hatch. To identify dead chicks, subsequent flights shall continue until all chicks have fledged;

d. If encountered during sample collection, surviving eagle chicks (at least five weeks old) shall be banded; (*Note: sample collectors and analytical laboratories shall have the appropriate federal and state scientific and ESA possession permits*.)

e. Complete copies of sample analytical reports with QA/QC results will be made available promptly to the Department, USFWS, IF&W and the permittee if the reports are conducted by an entity other than the permittee.

2. **Beginning thirty (30) days after written approval from the Department of the biological monitoring plan**, the permittee shall commence implementation of said plan by conducting the biological sample collection and analysis as specified in paragraph N(1)(a-e) above.

3. **By December 31st of each calendar year**, the permittee shall prepare and provide an annual report to the Department and entities identified in paragraph N(1) above, describing the results of the previous years biological monitoring activities.

4. Alternatively, the permittee may provide funding annually to the Maine IF&W and or USFWS to reimburse said agencies for the cost of surveys, bird sample collections, sample preparations, sample analysis and generation of the report as specified in paragraphs N(1)(a-e), N(2), and N(3) above . The permittee is responsible for submitting the annual report to the Department.

5. The total cost to the permittee for the monitoring program shall not exceed an annual cap of $10,000.

SPECIAL CONDITIONS

N. BIOLOGICAL MONITORING PROGRAM (cont'd)

6. The permittee must meet annually with the Department and entities identified in paragraph N(1) above to discuss results of the previous year's monitoring, plans for the upcoming year's monitoring, the need for continuance of the program and to evaluate progress made by the permittee's mill to reduce loadings consistent with its technology based permit limitations. This special condition expires on the expiration date of the permit thereby limiting the monitoring to a five-year term. Any data/information collected during the term of this permit may be considered during the subsequent permit renewal.

O. BEST MANAGEMENT PRACTICES PLAN

1. SPECIALIZED DEFINITIONS.

   a. **Action Level**: A daily pollutant loading that when exceeded triggers investigative or corrective action. Mills determine action levels by a statistical analysis of six months of daily measurements collected at the mill. For example, the lower action level may be the 75th percentile of the running seven-day averages (that value exceeded by 25 percent of the running seven-day averages) and the upper action level may be the 90th percentile of the running seven-day averages (that value exceeded by 10 percent of the running seven-day averages).

   b. **Equipment Items in Spent Pulping Liquor, Soap, and Turpentine Service**: Any process vessel, storage tank, pumping system, evaporator, heat exchanger, recovery furnace or boiler, pipeline, valve, fitting, or other device that contains, processes, transports, or comes into contact with pulping liquor, soap, or turpentine. Sometimes referred to as "equipment items."

   c. **Immediate Process Area**: The location at the mill where pulping, screening, knotting, pulp washing, pulping liquor concentration, pulping liquor processing, and chemical recovery facilities are located, generally the battery limits of the aforementioned processes. "Immediate process area" includes spent pulping liquor storage and spill control tanks located at the mill, whether or not they are located in the immediate process area.

   d. **Intentional Diversion**: The planned removal of spent pulping liquor, soap, or turpentine from equipment items in spent pulping liquor, soap, or turpentine service by the mill for any purpose including, but not limited to, maintenance, grade changes, or process shutdowns.

   e. **Mill**: The owner or operator of a direct or indirect discharging pulp, paper, or paperboard manufacturing facility subject to this section.

SPECIAL CONDITIONS

O. BEST MANAGEMENT PRACTICES PLAN (cont'd)

f. **Senior Technical Manager**: The person designated by the mill manager to review the BMP Plan. The senior technical manager shall be the chief engineer at the mill, the manager of pulping and chemical recovery operations, or other such responsible person designated by the mill manager who has knowledge of and responsibility for pulping and chemical recovery operations.

g. **Soap**: The product of reaction between the alkali in kraft pulping liquor and fatty acid portions of the wood, which precipitate out when water is evaporated from the spent pulping liquor.

h. **Spent Pulping Liquor**: For kraft and soda mills "spent pulping liquor" means black liquor that is used, generated, stored, or processed at any point in the pulping and chemical recovery processes. For sulfite mills "spent pulping liquor" means any intermediate, final, or used chemical solution that is used, generated, stored, or processed at any point in the sulfite pulping and chemical recovery processes (e.g., ammonium-, calcium-, magnesium-, or sodium-based sulfite liquors.

i. **Turpentine**: A mixture of terpenes, principally pinene, obtained by the steam distillation of pine gum recovered from the condensation of digester relief gases from the cooking of softwoods by the kraft pulping process. Sometimes referred to as sulfate turpentine.

2. REQUIREMENT TO IMPLEMENT BEST MANAGEMENT PRACTICES.

The permittee must implement the Best Management Practices (BMPs) specified in paragraphs 2(a) through 2(j) (below). BMPs must be developed according to best engineering practices and must be implemented in a manner that takes into account the specific circumstances at each mill. The BMPs are as follows:

a. The permittee must return spilled or diverted spent pulping liquors, soap, and turpentine to the process to the maximum extent practicable as determined by the mill, recover such materials outside the process, or discharge spilled or diverted material at a rate that does not disrupt the receiving wastewater treatment system.

b. The permittee must establish a program to identify and repair leaking equipment items. This program must include:

(i) Regular visual inspections (e.g., once per day) of process areas with equipment items in spent pulping liquor, soap, and turpentine service;

(ii) Immediate repairs of leaking equipment items, when possible. Leaking equipment items that cannot be repaired during normal operations must be identified, temporary means for mitigating the leaks must be provided, and the leaking equipment items repaired during the next maintenance outage;

SPECIAL CONDITIONS

O. BEST MANAGEMENT PRACTICES PLAN (cont'd)

(iii) Identification of conditions under which production will be curtailed or halted to repair leaking equipment items or to prevent pulping liquor, soap, and turpentine leaks and spills; and

(iv) A means for tracking repairs over time to identify those equipment items where upgrade or replacement may be warranted based on frequency and severity of leaks, spills, or failures.

c. The permittee must operate continuous, automatic monitoring systems that the mill determines are necessary to detect and control leaks, spills, and intentional diversions of spent pulping liquor, soap, and turpentine. These monitoring systems should be integrated with the mill process control system and may include, e.g., high level monitors and alarms on storage tanks; process area conductivity (or pH) monitors and alarms; and process area sewer, process wastewater, and wastewater treatment plant conductivity (or pH) monitors and alarms.

d. The permittee must establish a program of initial and refresher training of operators, maintenance personnel, and other technical and supervisory personnel who have responsibility for operating, maintaining, or supervising the operation and maintenance of equipment items in spent pulping liquor, soap, and turpentine service. The refresher training must be conducted at least annually and the training program must be documented.

e. The permittee must prepare a brief report that evaluates each spill of spent pulping liquor, soap, or turpentine that is not contained at the immediate process area and any intentional diversion of spent pulping liquor, soap, or turpentine that is not contained at the immediate process area. The report must describe the equipment items involved, the circumstances leading to the incident, the effectiveness of the corrective actions taken to contain and recover the spill or intentional diversion, and plans to develop changes to equipment and operating and maintenance practices as necessary to prevent recurrence. Discussion of the reports must be included as part of the annual refresher training.

f. The permittee must establish a program to review any planned modifications to the pulping and chemical recovery facilities and any construction activities in the pulping and chemical recovery areas before these activities commence. The purpose of such review is to prevent leaks and spills of spent pulping liquor, soap, and turpentine during the planned modifications, and to ensure that construction and supervisory personnel are aware of possible liquor diversions and of the requirement to prevent leaks and spills of spent pulping liquors, soap, and turpentine during construction.

SPECIAL CONDITIONS

O. BEST MANAGEMENT PRACTICES PLAN (cont'd)

g. The permittee must install and maintain secondary containment (i.e., containment constructed of materials impervious to pulping liquors) for spent pulping liquor bulk storage tanks equivalent to the volume of the largest tank plus sufficient freeboard for precipitation. An annual tank integrity testing program, if coupled with other containment or diversion structures, may be substituted for secondary containment for spent pulping liquor bulk storage tanks.

h. The permittee must install and maintain secondary containment for turpentine bulk storage tanks.

i. The permittee must install and maintain curbing, diking or other means of isolating soap and turpentine processing and loading areas from the wastewater treatment facilities.

j. The mill must conduct wastewater monitoring to detect leaks and spills, to track the effectiveness of the BMPs, and to detect trends in spent pulping liquor losses. Such monitoring must be performed in accordance with paragraph 7.

3. AMENDMENT OF BMP PLAN.

a. The permittee must amend its BMP Plan whenever there is a change in mill design, construction, operation, or maintenance that materially affects the potential for leaks or spills of spent pulping liquor, turpentine, or soap from the immediate process areas.

b. **The permittee must complete a review and evaluation of the BMP Plan five years after the first BMP Plan is prepared and, except as provided in paragraph D(1) (above), once every five years thereafter.** As a result of this review and evaluation, the permittee must amend the BMP Plan within three months of the review if the mill determines that any new or modified management practices and engineered controls are necessary to reduce significantly the likelihood of spent pulping liquor, soap, and turpentine leaks, spills, or intentional diversions from the immediate process areas, including a schedule for implementation of such practices and controls.

4. REVIEW AND CERTIFICATION OF BMP PLAN.

The BMP Plan, and any amendments, must be reviewed by the senior technical manager at the mill and approved and signed by the mill manager. Any person signing the BMP Plan or its amendments must certify to the Permitting Authority under penalty of law that the BMP Plan (or its amendments) has been prepared in accordance with good engineering practices and in accordance with this regulation. The mill is not required to obtain approval from the Permitting Authority of the BMP Plan or any amendments.

SPECIAL CONDITIONS

O. BEST MANAGEMENT PRACTICES PLAN (cont'd)

5. RECORD KEEPING REQUIREMENTS

   a. The permittee must maintain on its premises a complete copy of the current BMP Plan and the records specified in paragraph 5(b) (below) and must make such BMP Plan and records available to the Permitting Authority or his or her designee for review upon request.

   b. The mill must maintain the following records for three years from the date they are created:

      (i) Records tracking the repairs performed in accordance with the repair program described in paragraph 2(b);

      (ii) Records of initial and refresher training conducted in accordance with paragraph 2(d);

      (iii) Reports prepared in accordance with paragraph 2(e) of this section; and

      (iv) Records of monitoring required by paragraphs 2(j) and 7.

6. ESTABLISHMENT OF WASTEWATER TREATMENT SYSTEM INFLUENT ACTION LEVELS.

   a. The permittee must conduct a monitoring program, described in paragraph 6(b), for the purpose of defining wastewater treatment system influent characteristics (or action levels), described in paragraph 6(c), that will trigger requirements to initiate investigations on BMP effectiveness and to take corrective action.

   b. The permittee must employ the following procedures in order to develop the required action levels:

      (i) Monitoring parameters. The permittee must collect 24-hour composite samples and analyze the samples for a measure of organic content (e.g., Chemical Oxygen Demand (COD) or Total Organic Carbon (TOC)). Alternatively, the permittee may use a measure related to spent pulping liquor losses measured continuously and averaged over 24 hours (e.g., specific conductivity or color). The permittee currently measures color to determine organic content which is acceptable to the Department. All sampling and analysis shall be conducted in accordance approved test methods cited in federal regulations found at 40 CFR, Part 136.

SPECIAL CONDITIONS

O. BEST MANAGEMENT PRACTICES PLAN (cont'd)

(ii) Monitoring locations. For direct dischargers, monitoring must be conducted at the point influent enters the wastewater treatment system. For indirect dischargers monitoring must be conducted at the point of discharge to the POTW. For the purposes of this requirement, the permittee may select alternate monitoring point(s) in order to isolate possible sources of spent pulping liquor, soap, or turpentine from other possible sources of organic wastewaters that are tributary to the wastewater treatment facilities (e.g., bleach plants, paper machines and secondary fiber operations).

c. The permittee must complete an initial six-month monitoring program using the procedures specified in paragraph 6(b) and must establish initial action levels based on the results of that program. A wastewater treatment influent action level is a statistically determined pollutant loading determined by a statistical analysis of six months of daily measurements. The action levels must consist of a lower action level, which if exceeded will trigger the investigation requirements described in paragraph 7, and an upper action level, which if exceeded will trigger the corrective action requirements described in paragraph 7.

d. The permittee must complete a second six-month monitoring program using the procedures specified in paragraph G(2) of this section and must establish revised action levels based on the results of that program. The initial action levels shall remain in effect until replaced by revised action levels.

e. Action levels developed under this paragraph must be revised using six months of monitoring data after any change in mill design, construction, operation, or maintenance that materially affects the potential for leaks or spills of spent pulping liquor, soap, or turpentine from the immediate process areas.

7. MONITORING, CORRECTIVE ACTION, AND REPORTING REQUIREMENTS.

a. The permittee must conduct daily monitoring of the influent to the wastewater treatment system in accordance with the procedures described in paragraph 6(b) for the purpose of detecting leaks and spills, tracking the effectiveness of the BMPs, and detecting trends in spent pulping liquor losses.

b. Whenever monitoring results exceed the lower action level for the period of time specified in the BMP Plan, the permittee must conduct an investigation to determine the cause of such exceedence. Whenever monitoring results exceed the upper action level for the period of time specified in the BMP Plan, the permittee must complete corrective action to bring the wastewater treatment system influent mass loading below the lower action level as soon as practicable.

SPECIAL CONDITIONS

O. BEST MANAGEMENT PRACTICES PLAN (cont'd)

c. Although exceedence of the action levels will not constitute violations of the permit, failure to take the actions required by paragraph 7(b) as soon as practicable will be a violation.

d. The permittee must maintain up-to-date records of the results of the daily monitoring conducted pursuant to paragraph 7(a). The records shall be kept on site at all times and made available to EPA and Department personnel upon request. A summary of the monitoring results, the number and dates of exceedence of the applicable action levels, and brief descriptions of any corrective actions taken to respond to such exceedence must be documented. **The reports shall be submitted to the Department no later than January 31 of the following year**.

MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT
AND
MAINE WASTE DISCHARGE LICENSE

FACT SHEET

Date: **April 2, 2002**
Revised: **August 6, 2002**

PERMIT NUMBER: **ME0002020**
LICENSE NUMBER: **W002226-5N-F-R**

NAME AND ADDRESS OF APPLICANT

Fort James Operating Company
Old Town Mill
Portland Street
Old Town, Maine 04468

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Fort James Operating Company
Old Town Mill
Portland Street
Old Town, Maine 04468

COUNTY: **Penobscot County**

RECEIVING WATER/CLASSIFICATION: **Penobscot River/Class B**

COGNIZANT OFFICIAL AND TELEPHONE NUMBER: **Michael Curtis**
(207) 827-0671

1. APPLICATION SUMMARY:

a. Application: The Fort James Operating Company (FJOC), a subsidiary of the Georgia Pacific Corporation**,** has filed an application with the Department (filed under the name of the Fort James Operating Company) to renew State Waste Discharge License (WDL) #W002766-44-D-R that was issued on February 11, 1994 and expired on February 11, 1999. It is noted the February 11, 1994 WDL was modified by the issuance WDL #W002766-5N-E-M dated October 13, 1998.

1. APPLICATION SUMMARY (cont'd)

The FJOC mill (a subsidiary of the Georgia Pacific Corporation) located in Old Town, Maine manufactures bleached kraft pulp and bleached kraft tissue products. The FJOC has applied to the Department for the issuance of combination Maine Pollutant Discharge Elimination System (MEPDES) permit and Waste Discharge License (WDL) to routinely discharge up to a monthly average of 24.4 million gallons per day (MGD) of treated process waters (including storm water and landfill leachate) and other waste waters associated with the pulp and papermaking process, non-contact cooling waters, turbine condensing waters and filter backwash waters from three outfalls to the Penobscot River**.** In addition to the routine waste waters discharged, this permit authorizes discharges associated with or resulting from essential maintenance, regularly scheduled maintenance during start-up and shutdown, spills and release (whether anticipated or unanticipated) from anywhere in the permitted facility. Standard Condition 5, *Bypasses*, of this permit authorizes discharges that are necessary to prevent loss of life, personal injury or severe property damage as long as there are no feasible alternatives available. See Attachment A for a schematic of flows contributing to the three outfalls.

It is noted that Outfall #005 (discharging oil cooling waters and bearing seal and housing waters from hydroelectric turbine generators) in the previous licensing is not included in this permitting action as the facility was sold by the FJOC to Pennsylvania Power and Light and is regulated under a separate waste discharge license issued by the Department. The mill's produces approximately 257 tons/day of bleached kraft tissue products from hardwood pulp. The mill produced an average of 566 tons/day of bleached kraft market pulp from hardwood for the period calendar years 1999 – 2001 inclusively. The FJOC's mill modified its bleaching sequence and replaced elemental chlorine with chlorine dioxide as the bleach agent such that the mill has been considered elemental chlorine free (ECF) since December of 1999.

2. PERMIT SUMMARY

a. Regulatory: On January 12, 2001, the Department received authorization from the U.S. Environmental Protection Agency (EPA) to administer the National Pollutant Discharge Elimination System (NPDES) program in Maine. From this point forward, the program will be referenced as the MEPDES program and will utilize a permit number of #ME0002020 (same as the NPDES permit) as a reference number for FJOC's MEPDES permit. It is noted that the effective NPDES permit issued by the EPA on December 27, 1983 will be replaced by the MEPDES permit upon issuance and all terms and conditions of the NPDES permit will be null and void.

2. PERMIT SUMMARY (cont'd)

b. Terms and Conditions: This permit is significantly different than the effective NPDES permit issued by the EPA in 1983 and the effective WDL issued by the State of Maine in 1994 (subsequently modified on October 13, 1998) due to new regulations promulgated by EPA in April of 1998 for the pulp and paper industry. The new regulation may be found at 40 Code of Federal Regulation (CFR) Part 430 and is often referred to as the "Cluster Rule."

This permit is carrying forward from WDL #W002226-44-D-R dated February 11, 1994 and or WDL modification cited above:

1. The monthly average flow limit of 24.4 MGD for Outfalls #001.

2. The seasonal daily maximum and monthly average mass limits for biochemical oxygen demand (BOD_5) and total suspended solids (TSS) for Outfall #001 and the year-round monthly average and daily maximum mass limits for TSS for Outfall #003.

3. The daily maximum temperature limits of 105°F and 115°F for Outfall #001 and Outfall #002 respectively.

4. The pH range limitation for all outfalls.

5. The quarterly average color limit of 175 lbs/ton of unbleached pulp produced for Outfall #001.

6. The daily maximum concentration limit of <10 pg/L for 2,3,7,8 TCDD (dioxin) and 2,3,7,8 TCDF (furan) at the end of the bleach plant, Outfall #100, an internal waste stream for the mill.

7. The annual testing requirement for whole effluent toxicity (WET) and chemical specific (priority pollutant) testing for Outfall #001.

8. The daily maximum concentration limit for total chlorine residual for Outfall #003.

This permit is different from WDL #W002226-44-D-R dated February 11, 1994 and or WDL modification previously cited in that it:

9. Establishes monthly average and daily maximum mass limits for adsorbable organic halogens (AOX) for Outfall #001.

2. PERMIT SUMMARY

10. Establishes daily maximum concentration limits for 12 chlorinated phenolic compounds for the bleach plant, Outfall #100.

11. Establishes monthly average and daily maximum mass limits for chloroform for the bleach plant, Outfall #100.

12. Requires the permittee to demonstrate compliance with Maine's dioxin law by requiring fish tissue sampling in addition to monitoring the bleach plant effluent.

13. Requires the permittee to monitor bald eagle nests, collect bird samples and conduct analytical analyses and band chicks.

14. Requires the permittee to maintain**,** implement, and periodically update a Best Mangement Plan (BMP) for the mill operations.

15. Establishes a reporting requirement for flow and monthly average and daily maximum mass limits for TSS and removes monthly average and daily maximum concentration limits for TSS for Outfall #003.

16. Eliminates Outfall #005 (discharges oil cooling waters and bearing seal and housing waters from hydroelectric turbine generators) from the permit as the facility is no longer owned by the FJOC.

17. Establishes seasonal weekly average and daily maximum thermal limits for Outfall #001 and #002 collectively.

c. History: The most current and relevant permitting and licensing actions include:

December 27, 1983 – The EPA issued a renewal of NPDES permit #ME0002020 for a five year term. The permit was issued in the name of the James River Paper Company Inc.

August 19, 1992 – The EPA issued a renewal of NPDES permit #ME0002020 for a five year term. The permit was issued in the name of the James River Paper Company Inc.

September 18, 1992 -The James River Paper Company Inc. appealed the EPA's August 19, 1992 permit and requested an evidentiary hearing in regard to limitations and monitoring requirements for dioxin, furan, color, AOX, pH, whole effluent toxicity, fish analysis, a narrative condition regarding PCB discharges, and the narrative description for Outfall #002 contained in the permit. EPA neither denied nor granted such a hearing and thus the permit never became effective and the permit and the appeal have since expired. It is noted that the EPA and FJOC reached a settlement agreement in 1995 to

2. PERMIT SUMMARY (cont'd)

address the appeal but the EPA never modified the NPDES permit to reflect the settlement agreement prior to the State of Maine receiving authorization to administer the NPDES permitting program. In order to resolve the appeal that was pending before the EPA's Environmental Appeals Board and to ensure the contested conditions of the NPDES permit remained in abeyance until the State of Maine issued a MEPDES permit, the EPA withdrew the contested permit conditions pursuant to federal regulation, 40 CFR Part 124.19(d). The remaining terms and conditions of 9/18/92 NPDES permit remained in effect until the MEPDES permit is issued by the State. The Order to accept the removal of the contested permit conditions from FJOC's 1992 NPDES permit was accepted by the federal Environmental Appeals Board judge on May 30, 2001.

February 14, 1994– The Department issued WDL #W002226-44-D-R for a five year term.

December 1, 1995 – The EPA issued a formal draft permit modification for a 30-day public comment period. On January 3, 1996, the Department issued a Section 401 water quality certification of the permit. Due to comments received from the USF&WS, the Natural Resources Council of Maine (NRCM) and the Penobscot Indian Nation (PIN) on the draft permit, the permit modification was never issued as a final document.

June 27, 1997 – The James River Corporation submitted an application to the EPA to renew NPDES permit #ME0002020 for the Old Town mill. On July 9, 1997, the EPA issued a letter to the James River Corporation indicating the application was deemed complete for processing.

October 13, 1998 - The Department modified the 2/14/94 WDL by issuing WDL Modification #W002226-5N-E-M. The modification was initiated by the Department and was necessary to implement new legislation regarding color, dioxin and furan limitations found at Maine law, 38 M.R.S.A., §414-C and §420.

February 9, 1999 – The Fort James Operating Company submitted a timely application to the Department to renew the WDL for the Old Town mill.

May 23, 2000 – The Department administratively modified the WDL for the FJOC's Old Town mill by establishing interim limits for mercury pursuant to Maine law, 38 M.R.S.A., §420. The modification established a monthly average limit of 18.5 ng/L and a daily maximum limit of 27.8 ng/L.

d. Source Description and Waste Water Treatment: The FJOC is engaged in the manufacturing of pulp and paper products at its Old Town, Maine mill. The permittee has reported that for the three year period 1999-2001, the mill has produced an average of 794 tons/day of unbleached kraft hardwood pulp from which 566 air dried tons/day of bleached kraft market pulp and 257 air dried tons/day of bleached kraft tissue products are produced.

2. PERMIT SUMMARY (cont'd)

The FJOC has requested to routinely discharge treated production process waste waters (including treated storm water runoff and treated landfill leachate, non-contact cooling waters and filter backwash waters from three (3) separate outfalls. Sanitary waste water generated at the mill is directed to Old Town's municipal waste water treatment facility which is also permitted by the Department. The FJOC's production process waste waters discharge through Outfall #001 and receive a secondary level of treatment by way of an activated sludge process. The waste waters receive best practicable treatment via a bar screen, two primary clarifiers (each 150 feet in diameter), an aeration basin ($\underline{\sim}$ 50 million gallons of capacity) and two secondary clarifiers (each 170 feet in diameter) before being discharged to the receiving waters. In addition to the routine waste waters discharged, this permit authorizes discharges associated with or resulting from essential maintenance, regularly scheduled maintenance during start-up and shutdown, spills and release (whether anticipated or unanticipated) from anywhere in the permitted facility. Standard Condition 5, *Bypasses*, of this permit authorizes discharges that are necessary to prevent loss of life, personal injury or severe property damage as long as there are no feasible alternatives available**.**

Non-contact cooling waters**,** non-contact condensing waters including discharges from turbine generators, chlorine dioxide plant cooling water and evaporation cooling waters are discharged from Outfall #002 and do not receive any formal treatment as the only pollutant of concern is heat. Waters discharged from Outfall #003 consist of filter backwash waters from 16 gravity sand filters used to filter raw water extracted from the Penobscot River for process make-up water and boiler feedwater. The discharge from Outfall #003 does not receive any formal treatment prior to discharge to the receiving water.

3. RECEIVING WATER STANDARDS

The Penobscot River Basin is located in the northeast part of the State of Maine and is the second largest river basin in New England. The main stem of the Penobscot River forms at the confluence of the East and West Branches in the Town of Medway, approximately 80 miles upriver from the head of tide in Bangor. The discharge points from the FJOC mill are located just below the Great Works dam in Old Town, approximately 10 miles upriver from the head of tide. Major industrial dischargers upriver from the FJOC mill include Lincoln Pulp & Paper Company on the main stem of the river in Lincoln and two Great Northern Paper Company mills in Millinocket and East Millinocket which discharge to the West Branch of the Penobscot River.

Maine law, 38 M.R.S.A. § 465(7)(A)(4) classifies the segment of the main stem of the Penobscot River, from the confluence of the Piscataquis River, including the Stillwater Branch, to the Veazie dam, including all impoundments, as a Class B waterway.

3. RECEIVING WATER STANDARDS (cont'd)

From the Veazie Dam, but not including the Veazie Dam, to the Maine Central Railroad bridge in Bangor-Brewer is classified as a Class B waterway. Further, the Legislature finds that the free-flowing habitat of this river segment provides irreplaceable social and economic benefits and that this use must be maintained.

From the Maine Central Railroad bridge in Bangor to a line extended in an east-west direction from the confluence of Reeds Brook in Hampden is classified as a Class B waterway. Further, the Legislature finds that the free-flowing habitat of this river segment provides irreplaceable social and economic benefits and that this use must be maintained.

Maine law, 38 M.R.S.A. §465(3) contains the classification standards for Class B waters and states in part that Class B waters shall be suitable for the designated uses of; drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under title 12, Section 403; navigation; and as a habitat for fish and other aquatic life. Discharges to Class B waters shall no cause adverse impact to aquatic life in that the receiving water shall be of sufficient quality to support all aquatic species indigenous to the receiving waters without detrimental changes in the resident biological community.

4. RECEIVING WATER QUALITY CONDITIONS

The 1998 State of Maine Water Quality Assessment (305b) Report, published by the Department states that a ten mile segment of the Penobscot River between Orono and Bangor is not attaining the standards of its assigned classification due to toxics associated with industrial activities and bacteria associated with the presence of combined sewer overflows (CSO's). There is also a fish consumption advisory in place on this segment of the river due to the presence of dioxin and mercury in fish tissue.

It is noted that a preliminary review of data from ambient water quality sampling conducted by the Department in the summer of 2001 (not during CSO events) indicates that the Penobscot River, several miles below the City of Bangor's and Brewer's outfalls, may not be attaining the dissolved oxygen standards of its assigned classification at actual treatment plant flows and loadings from municipal and industrial dischargers. Upon a comprehensive evaluation and modeling of all the data collected during the summer of 2001, the Department may require this permit to be re-opened in the future, per Special Condition G of this permit, to impose more stringent limitations to meet the dissolved oxygen standards.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS

OUTFALL #001 (Final Effluent)

a. Regulatory Basis: The discharge from the FJOC's Old Town mill is subject to National Effluent Guidelines (NEG) found in 40 Code of Federal Regulations (CFR) Part 430 – *Pulp, Paper and Paperboard Manufacturing Point Source Category*. The regulation was promulgated on April 15, 1998 and reorganized 26 sub-categories in the previous regulation into 12 sub-catergories by grouping mills with similar processes. Applicable Subparts of the new regulation for the Old Town facility are limited to Subpart B, *Bleached Papergrade and Soda*. The NEG's establish applicable limitations representing; 1) best practicable control technology currently available (BPT) for toxic and conventional pollutants for existing dischargers, 2) best conventional pollutant technology economically achievable (BCT) for conventional pollutants for existing dischargers, and 3) best available technology economically achievable (BAT) for toxic and non-conventional pollutants for existing dischargers. The regulation establishes limitations and monitoring requirements on the final outfall to the receiving waterbody as well as internal waste stream(s) such as the bleach plant effluent. The regulation also establishes limitations based on several methodologies including monthly average and or daily maximum mass limits based on production of pulp and paper produced or concentration limitations based on BPT, BCT or BAT.

Maine law, 38 M.R.S.A. Section 414-A, requires that the effluent limitations prescribed for discharges require application of best practicable treatment, be consistent with the U.S. Clean Water Act, and ensure that the receiving waters attain the State water quality standards as described in Maine's Surface Water Classification System. In addition, 38 M.R.S.A., Section 420 and Department Regulation Chapter 530.5, *Surface Water Toxics Control Program*, requires the regulation of toxic substances at the levels set forth for Federal Water Quality Criteria as published by the U.S. Environmental Protection Agency pursuant to the Clean Water Act.

b. Production: This permitting action is utilizing production figures of 794 tons/day of unbleached kraft pulp produced (566 air dried tons/day as market pulp) and 257 tons/day of bleached kraft tissue product for calculating technology based mass figures in this permitting action. It is noted the bleached kraft pulp produced is 756 air dried tons/day. The production figures are based on actual production figures provided by the FJOC for the period January 1, 1999 through December 31, 2001.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final Effluent)

c. Dilution Factors: Dilution factors associated with the discharge from the mill's waste water treatment facility were derived in accordance with freshwater protocols established in Department Rule Chapter 530.5, *Surface Water Toxics Control Program*, October of 1994. With a permitted treatment plant flow of 24.4 MGD, dilution calculations are:

$$\text{Dilution Factor} = \frac{\text{River Flow (cfs)(Conv. Factor)}}{\text{Plant Flow}}$$

Acute: 1Q10 = 2,678 cfs $\Rightarrow \frac{(2{,}678 \text{ cfs})(0.6464)}{24.4 \text{ MGD}} = 71.0{:}1$

Modified Acute[(1)]
¼1Q10 = 670 cfs $\Rightarrow \frac{(670 \text{ cfs})(0.6464)}{24.4 \text{ MGD}} = 17.7{:}1$

Chronic: 7Q10 = 3,151 cfs $\Rightarrow \frac{(3{,}151 \text{ cfs})(0.6464)}{24.4 \text{ MGD}} = 83.5{:}1$

Harmonic Mean: = 8,404 cfs $\Rightarrow \frac{(8{,}404 \text{ cfs})(0.6464)}{24.4 \text{ MGD}} = 223{:}1$

(1) Chapter 530.5 (D)(4)(a) states that analyses using numeric acute criteria for aquatic life must be based on 1/4 of the 1Q10 stream design flow to prevent substantial acute toxicity within any mixing zone. The 1Q10 is lowest one day flow over a ten year recurrence interval. The regulation goes on to say that where it can be demonstrated that a discharge achieves rapid and complete mixing with the receiving water by way of an efficient diffuser or other effective method, analyses may use a greater proportion of the stream design, up to including all of it. Based on Department information as to the mixing characteristics of the discharge with the receiving water and a dye study conducted by the permittee in 1996, the Department has made the determination that the discharge does not receive rapid and complete mixing with the receiving water. Therefore, the default stream flow of 1/4 of the 1Q10 is applicable in acute statistical evaluations pursuant to Department Rule Chapter 530.5.

d. Flow: The previous licensing action established a monthly average limit of 24.4 MGD that is being carried forward in this permitting action that represents the design flow of the waste water treatment facility. A review of the Discharge Monitoring Report (DMR) data for the period January 1, 1999 through December 31, 2001 indicates the actual monthly average flows have averaged approximately 14.1 MGD with the highest daily maximum flow being 19.64 MGD.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final Effluent)

e. Biochemical oxygen demand (BOD_5) & Total suspended solids (TSS):

The following table contains the monthly average and daily maximum BOD and TSS limitations as calculated utilizing the BPT effluent limitations in 40 CFR Part 430, Sub-part B.

Final Prod. (t/d)	Subpart B	BOD Mon. Avg.		BOD Daily Max.		TSS Mon. Avg.		TSS Daily Max.	
		kg/kkg	lbs/day	kg/kkg	lbs/day	kg/kkg	lbs/day	kg/kkg	Lbs/day
257	Kraft Tissue Paper	7.1	3,649	13.65	7,016	12.9	6,631	24	12,336
566	B-Mkt Bl Kft	8.05	9,113	15.45	17,489	16.4	18,565	30.4	34,412
	Totals		12,762		24,505		25,196		46,748

Reissued permits/licenses must also conform with EPA's anti-backsliding regulation. Section 402(o) of the CWA and EPA's regulations 40 CFR 122.44(l) prohibits issuance of a new permit/license with limits less stringent than in a previously issued permit/license except in certain circumstances. The NPDES permit issued on August 15, 1992, and the effective State WDL #W002226-44-D-R issued on February 11, 1994, and subsequently modified on October 13, 1998 limit the discharge of BOD and TSS to the following:

BOD-5 (lb/day)		TSS (lb/day)	
Monthly Average	Daily Maximum	Monthly Average	Daily Maximum
8,850[(1)]	18,000[(1)]	22,475[(1)]	42,000[(1)]
7,500[(2)]	18,000[(2)]	20,000[(2)]	35,000[(2)]

Footnotes:

(1) November 1 to May 31 (2) June 1 to October 31

Derivation of the seasonal BOD and TSS limitations as illustrated above were based on a past demonstrated performance evaluation of the facilities wastewater treatment plant at the mill. The evaluation conducted by the Department used monitoring data for the time period of October 1, 1987 to April 30, 1990 in developing the 95% probable average

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final Effluent)

monthly values of 10,430 lb/day and 24,100 lb/day for BOD and TSS respectively. The Department established the existing more stringent seasonal permit limits based upon best professional judgement (BPJ) of best practicable treatment. This permitting action is carrying forward all seasonal BOD and year-round TSS limits from the previous licensing action.

A review of the Discharge Monitoring Report (DMR) data for the period January 1, 1999 through December 31, 2001 indicates the actual year-round monthly average BOD discharged has been 1,527 lbs/day and highest daily maximum discharge of BOD has been 14,017 lbs/day, and the actual year-round monthly average TSS discharged has been 3,448 lbs/day and the highest daily maximum discharges of TSS has been 25,500 lbs/day.

f. Temperature: The previous permitting action established a year year-round daily maximum effluent temperature limit of 105 ^{o}F that is being carried forward in this permitting action. A review of the Discharge Monitoring Report (DMR) data for the period January 1, 1999 through December 31, 2001 indicates the maximum effluent temperature for the last three years averages 90 ^{o} F during the summer period and 74 ^{o} F during the winter.

g. Thermal load – Department Rule Chapter 582, *Regulations Relating To Temperature*, limits thermal discharges to an in-stream temperature increase (ΔT) of 0.5° F above the ambient receiving water temperature when the weekly average temperature of the receiving water is greater than or equal to 66° F or when the daily maximum temperature is greater than or equal to 73° F. The temperature thresholds are based on EPA water quality criterion for the protection of brook trout and Atlantic salmon (both species indigenous to the Penobscot River). The weekly average temperature of 66° F was derived to ensure normal growth of the brook trout and the daily maximum threshold temperature of 73° F protects for the survival of juveniles and adult Atlantic salmon during the summer months. As a point of clarification, the Department interprets the term "weekly average temperature" to mean a seven (7) day rolling average. To promote consistency, the Department also interprets the ΔT of 0.5° F as a weekly rolling average criterion when the receiving water temperature is $\geq$66° F and <73° F. When the receiving water temperature is $\geq$73°F, compliance with the ΔT of 0.5° F is evaluated on a daily basis. Compliance with the weekly rolling average and daily maximum ΔT of 0.5° F is determined by calculating the thermal load (expressed in BTU's/day) associated with the 7Q10 river flow (3,151 cfs), actual river temperature, actual discharge flow and actual discharge temperature from the mill. When the receiving water temperature is $\geq$73° F and

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final effluent)

the receiving water flow is below the 7Q10 of 3,151 cfs, compliance with the ΔT of 0.5° F is evaluated on a daily basis and compliance is determined by calculating the predicted river temperature increase (PRTI) (expressed in °F) using the actual receiving water flow, actual receiving water temperature, actual discharge flow and actual discharge temperature from the mill. See Special Condition M, *Thermal Load*, for the equations to calculate thermal load and PRTI.

Maine law, 38 M.R.S.A., §451 states that after adoption of any classification by the Legislature for surface waters or tidal flats or sections thereof, it is unlawful for any person, firm, corporation, municipality, association, partnership, quasi-municipal body, state agency or other legal entity to dispose of any pollutants, either alone or in conjunction with another or others, in such manner as will, after reasonable opportunity for dilution, diffusion or mixture with the receiving waters or heat transfer to the atmosphere, lower the quality of those waters below the minimum requirements of such classifications, or where mixing zones have been established by the Department, to lower the quality of those waters outside such zones, notwithstanding any exemptions or licenses which may have been granted or issued under sections 413 to 414-B.

Section 451 also states that, after opportunity for hearing, the Department may establish by order a mixing zone with respect to any discharge for which a license has been issued pursuant to section 414.

Section 451 also states that the purpose of a mixing zone is to allow a reasonable opportunity for dilution, diffusion or mixture of pollutants with the receiving waters before the receiving waters below or surrounding a discharge will be tested for classification violations. In determining the extent of any mixing zone to be established under this section, the Department may require from the applicant testimony concerning the nature and rate of the discharge; the nature and rate of existing discharges to the waterway; the size of the waterway and the rate of flow therein; any relevant seasonal, climatic, tidal and natural variations in such size, flow, nature and rate; the uses of the waterways in the vicinity of the discharge, and such other and further evidence as in the Department's judgment will enable it to establish a reasonable mixing zone for such discharge. An order establishing a mixing zone may provide that the extent thereof varies in order to take into account seasonal, climatic, tidal and natural variations in the size and flow of, and the nature and rate of, discharges to the waterway.

In 1995, the FJOC conducted a dye study to determine the mixing characteristics of the mill's discharge in the Penobscot River. The dye study determined that the effluent from the mill completely mixed with receiving water approximately three miles downstream of the mill outfall and is considered by the Department to be the zone of initial dilution. No formal mixing zone outside of the zone of initial dilution has been established in this permitting action.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final Effluent)

To comply with the most stringent criterion of Department rule Chapter 582 (when the receiving water is $\geq$73 ^{o}F, the FJOC mill would be limited to a daily thermal load of 8.49 x 10^{9} BTU's/day based on the following calculation:

(2.037 x 10^{9} gallons)(0.5 ^{o} F)(8.34 lbs/gal) = 8.49 x 10^{9} BTU's/day

The limit is calculated according to the 0.5 ^{o} F criteria rise at the 7Q10 river flow of 2,037 MGD (3,151 cfs).

h. pH Range: The previous licensing action established a pH range limit of 5.0 – 9.0 standard units that was based on federal regulation 40 CFR, Part 430. This permitting action is carrying the limit forward and continues to be consistent with the federal effluent guidelines.

i. Adsorbable organic halogens (AOX): The previous licensing action established a 1/Month monitoring requirement for AOX. This permitting action is establishing monthly average and daily maximum mass limits for AOX based on federal regulation found at 40 CFR Part 430. The regulation establishes production based BAT monthly average and daily maximum allowances of 0.623 and 0.951 kg/kkg (lbs per 1000 pounds or metric tons) respectively, of unbleached pulp production. With an unbleached kraft production to be 794 tons/day the limits are calculated as follows:

[794 tons/day] [0.623 lbs/1000 lbs] [2000 lbs/ton] = 989 lbs /day
[794 tons/day] [0.951 lbs/1000 lbs] [2000 lbs/ton] = 1,510 lbs /day

A review of the Discharge Monitoring Report (DMR) data for the period beginning when the mill became ECF (December 1999) to the present, indicates the mean monthly average and mean daily maximum AOX concentration discharged has been 0.132 kg/kkg and 0.220 kkg respectively, and the mean monthly average and daily maximum mass discharged has been 210 lbs/day and 348 lbs/day respectively based on 26 data points. The federal regulations require 1/Day monitoring for AOX on the final outfall. However, given the fact that permittee has demonstrated that the monthly average and daily maximum AOX discharged has been 79% and 77% respectively, lower than the levels established in the federal regulation, this permitting action is establishing a monitoring frequency of 3/Week for AOX based on a best professional judgment of the monitoring frequency necessary to determine on-going compliance with the BAT thresholds in the federal regulation.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final effluent)

j. COD: The previous licensing action did not establish final effluent limitations or monitoring requirements for COD. Federal regulation 40 CFR Part 430 has reserved promulgating of specific final effluent limits for COD. The EPA's Permit Guidance Document for implementing 40 CFR Part 430 recommends "… monitoring of effluent for COD to develop baseline data for developing a COD limit for mills in the future and to provide COD data for helping the mill develop a pollution control strategy." The FJOC has submitted daily COD test results for the period December 1999 (beginning of ECF) to the present which indicates consistent monthly average results. Therefore, this permit does not establish limitations or monitoring requirements until the EPA formally promulgates a performance standard for COD.

k. Color: For the FJOC mill, applicable sections of Maine law, 38 M.R.S.A., §414-C states that:

2) Best practicable treatment; color pollution. For the purposes of Section 414-A, Subsection 1, best practicable treatment for color pollution control for discharges of color pollutants from the kraft pulping process is:

A) For discharges licensed and in existence prior to July 1, 1989:

1) On July 1, 1998 and until December 31, 2000, 225 pounds or less of color pollutants per ton of unbleached pulp produced, measured on a quarterly average basis: and

2) On and after January 1, 2001, 150 pounds or less of color pollutants per ton of unbleached pulp produced, measured on a quarterly average basis.

A discharge from a kraft mill that is in compliance with this section is exempt from provisions of subsection 3.

3) An individual waste discharge may not increase the color of any water body by more than 20 color units. The total increase in color pollution units caused by all dischargers to the water body must be less than 40 color pollution units. This subsection applies to all flows greater than the minimum 30-day low flow that can be expected to occur with a frequency of once in 10 years (30Q10). A discharge that is in compliance with this subsection is exempt from the provisions of subsection 2. Such a discharge may not exceed 175 pounds of color pollutants per ton of unbleached pulp produced after January 1, 2001.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final effluent)

The previous licensing action established two tiers of limits for color. Beginning July 1, 1998 and December 31, 2000, a calendar quarterly average water quality based mass limit of 391,400 pounds per day was established and beginning January 1, 2001, the facility was limited to a technology based limit of 175 pounds per ton of unbleached pulp.

The FJOC mill is currently in compliance with the best practicable treatment standard of 175 lbs/ton. Since the first quarter of 1998, the FJOC mill has been discharging approximately 111 pounds of color per ton of air dried tons of unbleached pulp produced on a quarterly basis since operating in an ECF mode beginning December of 1999. This permitting action is carrying forward the technology based limit of 175 pounds per ton of unbleached pulp produced.

l. Whole Effluent Toxicity (WET) and Chemical Specific Testing - The Department issued a Fact Sheet to the FJOC on 2/1/95 which outlined the WET testing requirements under Department Rule Chapter 530.5, *Surface Water Toxics Control Program*. The regulation placed the facility in the high frequency category for WET testing as the facility discharges industrial process waste waters. The 2/1/95 Fact Sheet also outlined the chemical specific (priority pollutant) testing requirement under Chapter 530.5. The regulation placed the facility in the high frequency category as the facility was licensed to discharge greater than 1.0 MGD and the facility discharges industrial process waste waters.

The Department's database for WET and chemical specific test results for the FJOC mill indicates the facility has fulfilled the WET testing and chemical specific testing as required by Department rule Chapter 530.5. See Attachment B of this Fact Sheet for a summary of the WET test results and Attachment C of this Fact Sheet for a summary of the chemical specific test dates. Department Regulation Chapter 530.5 and Protocol E(1) of a document entitled *Maine Department of Environmental Protection, Toxicity Program Implementation Protocols*, dated July 1998, states that statistical evaluations shall be periodically performed on the most recent 60 months of WET and chemical specific data for a given facility to determine if water quality based limitations must be included in the permit.

Whole Effluent Toxicity:

On March 18, 2002, the Department conducted a statistical evaluation on the aforementioned tests results in accordance with the statistical approach outlined in EPA's March 1991 document *entitled Technical Support Document (TSD) for Water Quality Based Toxics Control*, Chapter 3.3.2 and Maine Department of Environmental Protection Guidance, July 1998, entitled *Toxicity Program Implementation Protocols*. The 3/18/02 statistical evaluation indicates the discharge does not exceed or have a reasonable

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final effluent)

potential to exceed the critical ambient water quality thresholds (based on the mathematical inverse of the applicable dilution factors) of acute – 5.6% (based on ¼1Q10) or chronic – 1.2% for any of the vertebrate and invertebrate species tested to date. Therefore, this permitting action is establishing a surveillance level (1/Year) monitoring requirement for WET testing for calendar years 2002, 2003, 2004 and 2005. Beginning twelve months prior to the expiration date of the permit, the Department's Chapter 530.5 regulation requires the permittee to revert back to a screening level (1/Quarter) of testing for four consecutive calendar quarters.

Chemical specific:

The 3/18/02 statistical evaluation indicates that a 8/6/00 data point of 47 ug/L for copper has a reasonable potential to exceed the acute ambient water quality criteria for copper and an 8/15/99 data point of 10 ug/L for arsenic exceeds the human health criteria (water & organisms). A more in depth review of the data (Attachment C) indicates that the 47 ug/L data point for copper is three times higher than any of the other eight (8) data points for copper and the most recent result is 5 ug/L. As for arsenic, the 10 ug/L data point is the only value of the eight (8) data points that has ever been detected (reporting limit of 5 ug/L) and the two (2) most recent test results are <1 ug/L.

Chapter 530.5 §C(2) states when a discharge "...contains pollutants at levels that have a reasonable potential to cause or contribute to an ambient excursion in excess of a numeric or narrative water quality criterion, appropriate water quality based limits must be established in the license upon issuance."

Chapter 530.5 §C(3) states that if data indicates that a discharge is causing an exceedence of applicable AWQC, then:"(1) the Department must notify the permittee of the exceedence; (2) the permittee must submit a toxicity reduction evaluation (TRE) plan for review and approval within 30 days of receipt of notice and implement the TRE after Department approval; (3) the Department must modify the waste discharge permit to specify effluent limits and monitoring requirements necessary to control the level of pollutant and meet receiving water classification standards within 180 days of the Department's approval of the TRE. This final permitting action is formal notification to the FJOC that the discharge has exceeded the human health (water & organisms) AWQC for arsenic and that Special Condition K of this permit requires the submission of a TRE.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final effluent)

Monthly average and daily maximum mass and concentration limits may be calculated as follows:

Parameter	HH[1] Criterion	Harmonic Mean Dilution Factor	Calculated EOP[2] Concentration	Mon. Avg. Mass Limit
Arsenic	0.018 ug/L	223.0:1	4.0 ug/L	0.82 #/Day

Parameter	Acute[3] Criterion	Acute Dilution Factor	Calculated EOP[2] Acute Concentration	Daily Max. Mass Limit
Copper	2.99 ug/L	17.7:1	52.9 ug/L	10.8 #/Day

Example calculation: Arsenic - $\frac{(0.018 \text{ ug/L})(223)(8.34)(24.4 \text{ MGD})}{1000} = 0.82$ lbs/day

Footnotes:

1. Human health criteria (water & organisms)
2. End of discharge pipe calculations.
3. Based on EPA's 1986 ambient water quality criteria (AWQC).

The TSD recommends that "background" concentrations of toxic pollutants in the receiving water should be used in calculating permit limits for those pollutants**.** The Department does not have sufficient information at this time to factor in ambient levels of these pollutants in the receiving waters. Therefore a "background" concentration of zero was used.

The Department has adopted a policy that all permits must contain concentration limits as well as mass limits. Chapter 5, Section 5.7 of EPA's TSD recommends that permit limits on both mass and concentration be specified for effluents discharging into waters with less than 100 fold dilution to ensure attainment of water quality standards. As not to penalize facilities for operating at flows less than the permitted design flow of the treatment plant, the TSD recommends allowing the concentration-based limits to vary in

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #001 (Final effluent)

accordance with flow reductions. In addition, Code of Federal Regulations (40 CFR) Part 133.101(f) authorizes a permit writer to increase the allowable end-of-pipe concentration limits by a factor of 1.5, which represents effluent concentration limits that are achievable through proper operation and maintenance of the treatment plant.

Parameter	Calculated EOP Concentration	Monthly Avg. Concentration Limit	Daily Max. Concentration Limit
Arsenic	4.0 ug/L	---(1)	---
Copper	52.9 ug/L	---	79 ug/L

Footnotes:

(1) No concentration limit has been established for arsenic as the harmonic mean dilution factor is greater than 100:1.

In the event future statistical evaluations demonstrate that the reasonable potential to exceed AWQC for copper or the result(s) in question fall outside the 60 month evaluation period, this permit may be reopened pursuant to Special Condition G of this permit to remove the limitation(s).

This permitting action is establishing the monitoring frequencies for the parameters that exceed or have a reasonable to exceed AWQC based on a best professional judgment given the timing, frequency and severity of the exceedence or reasonable to exceed AWQC. As for the remaining parameters on the chemical specific list, the 3/18/02 statistical evaluation indicates the parameters do not exceed or have a reasonable potential to exceed acute, chronic or human health AWQC. Therefore, this permitting action establishes a surveillance level of testing of 1/Year for calendar years 2002 – 2005 and a screening level of testing of 1/Quarter for four consecutive quarters beginning twelve months prior to the expiration date of the permit.

It is noted that on May 23, 2000, the Department administratively modified the WDL for the FJOC's Old Town mill by establishing interim limits for mercury pursuant to Maine law, 38 M.R.S.A., §420. The modification established a monthly average limit of 18.5 ng/L and a daily maximum limit of 27.8 ng/L. Compliance with the limits is being tracked by the Department outside of this permitting action.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #100 (Bleach Plant)

In accordance with federal regulation 40 CFR Part 430, this permitting action is establishing limitations and monitoring requirements for an internal point source, the combined bleach plant filtrates.

m. Flow: The previous licensing action established a monthly average reporting requirement for flow from the bleach plant. The license required estimating the flow when sampling for pollutants was required as the licensee demonstrated at that time that installing continuous flow measurement was disproportionate to EPA's cost estimates proposed in the draft regulation due to the age of mill, and the configuration of the bleach plant sewers. This permitting action is carrying forward the monthly average reporting requirement along with calculating the flow at a minimum frequency of 1/week. Calculating the flow shall be performed on the same day whenever sampling for the parameters for Outfall #100 of this permit.

n. 2,3,7,8-TCDD (Dioxin): The previous licensing action established a daily maximum concentration limit of <10 ppq (pg/L) with a monitoring frequency of 2/Quarter for dioxin based on Maine law, 38 M.R.S.A., §420. The limit of 10 pg/L is also the ML (Minimum Level - the level at which the analytical system gives recognizable signals and an acceptable calibration point) for EPA Method 1613B. Federal regulation 40 CFR Part 430 establishes the same limitation and is therefore being carried forward in this permitting action. The monitoring frequency is being increased from 2/Quarter to 1/Month based on the federal regulation.

o. 2,3,7,8 TCDF (Furan): The previous licensing action established two tiers of daily maximum concentration limits for furan. The license established a limit of <100 ppq (pg/L) through December 31, 1999 and then was reduced to <10 ppq (pg/L) beginning January 1, 2000, based on Maine law, 38 M.R.S.A., §420. The monitoring frequency was established at 2/Quarter like dioxin. The limit of 10 pg/L is also the ML for furan for EPA Method 1613B. Federal regulation 40 CFR Part 430 establishes a daily maximum concentration limit of 31.9 pg/L. Being that Maine law is more stringent, the limit of <10 pg/L is being carried forward in this permitting action. As with dioxin, the monitoring frequency for furan is being increased from 2/Quarter to 1/Month based on the federal regulation.

It is noted, Maine law 38 M.R.S.A., §420(2)(I)(3) states that - *After December 31, 2002, a mill may not discharge dioxin into its receiving waters. For purposes of this subparagraph, a mill is considered to have discharged dioxin into its receiving waters if 2, 3, 7, 8 - tetrachlorodibenzo-p-dioxin or 2, 3, 7, 8 - tetrachlorodibenzo-p-furan is detected in any of the mill's internal waste streams of its bleach plant and in a confirmatory sample at levels exceeding 10 picograms per liter, unless the Department*

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #100 (Bleach Plant)

adopts a lower detection level by rule, which is a routine technical rule pursuant to Title 5, chapter 375, subchapter II-A, or a lower detection level by incorporation of a method in use by the United States Environmental Protection Agency, or if levels of dioxin, as defined in section 420-A, subsection 1 detected in fish tissue sampled below the mill's wastewater outfall are higher than levels in fish tissue sampled at an upstream reference site not affected by the mill's discharge or on the basis of a comparable surrogate procedure acceptable to the commissioner. The commissioner shall consult with the technical advisory group established in section 420-B, subsection 1, paragraph B, subparagraph (5) in making this determination and in evaluating surrogate procedures. The fish-tissue sampling test must be performed with differences between the average concentrations of dioxin in the fish samples taken upstream and downstream from the mill measured with at least 95% statistical confidence. If the mill fails to meet the fish-tissue sampling-result requirements in this subparagraph and does not demonstrate by December 31, 2003 to the commissioner's satisfaction that its wastewater discharge is not the source of elevated dioxin concentrations in fish below the mill, then the commissioner may pursue any remedy authorized by law.

It is noted the FJOC's Old Town mill has been participating in fish tissue sampling specified in the Dioxin Monitoring Program pursuant to Maine law 38 M.R.S.A., §420.

p. Twelve Chlorophenolics: The previous licensing did not establish limitations or monitoring requirements for the chlorophenolic compounds specified in this permitting action. Federal regulation 40 CFR Part 430 establishes said parameters and limitations. The limitations vary from 2.5 ug/L to 5.0 ug/L and are equivalent to the ML for each parameter using EPA Method 1653. A 1/Month monitoring requirement has also been established based on the federal regulation.

q. Chloroform: The previous licensing action did not establish limitations or monitoring requirements for chloroform. This permitting action is establishing monthly average and daily maximum mass limits for chloroform based on federal regulation found at 40 CFR Part 430. The regulation establishes production based BAT monthly average and daily maximum allowances of 4.14 g/kkg and 6.92 g/kkg respectively, of unbleached pulp production. With an unbleached kraft pulp production to be 794 tons/day the limits are calculated as follows:

[794 tons/day] [4.14 g/kkg] [0.907 kkg/ton] [1.0 lbs/ 454g] = 6.56 lbs /day
[794 tons/day] [6.92 g/kkg] [0.907 kkg/ton] [1.0 lbs/ 454g] = 10.9 lbs /day

A monitoring requirement of 1/Week has been established based on the federal regulation. The permittee may qualify for a reduction in chloroform testing after two years of data collection (inclusive of testing completed to date) once the EPA has published the final rule for chloroform monitoring certification.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

OUTFALL #002 (Non-Contact Cooling, Condensate)

r. Flow: The previous licensing action established a monthly average limit of 3.0 MGD that is being replaced with a reporting requirement in this permitting action. The limit is being removed to provide the permittee with the flexibility to route additional non-contact cooling waters to this outfall if need be. A review of the Discharge Monitoring Report (DMR) data for the period January 1, 1999 to the present indicates actual flows have averaged approximately 3.0 MGD.

s. Temperature: The previous permitting action established a year year-round daily maximum effluent temperature limit of 115 ^{o}F that is being carried forward in this permitting action and remains representative of the discharge.

t. Thermal load – See the discussion under section 5(g) above.

OUTFALL #003 (Filter Backwash)

u. pH Range: The previous licensing action established a pH range limit of 5.0 – 9.0 standard units that was based on federal regulation 40 CFR, Part 430. This permitting action is carrying the limit forward and continues to be consistent with the federal effluent guidelines.

v. Flow: The previous licensing action did not establish any limitations or monitoring requirements for flow. This permitting action is establishing a monthly average and daily maximum reporting requirement in an effort to obtain flow information necessary to calculate mass loadings for total suspended solids (TSS).

w. Total Suspended Solids: The previous licensing action established monthly average and daily maximum concentration limits of 20 mg/L and 60 mg/L respectively, that are being replaced with a reporting requirement in this permitting action. The Department expects that the normal operation of the filter backwash plant will achieve concentration levels within the range of 20 mg/L as a monthly average and 60 mg/L as a daily maximum. If the permittee's testing indicates consistent values outside of this range, appropriate concentration limits may be established in this permit in the future. This permitting action establishing new monthly average and daily maximum mass limitations for mass to be consistent with federal regulation 40 CFR, Part 122.45(f), that states parameters such as TSS must be limited by mass in permits. The monthly average limit of 336 lbs/day was derived based on a daily maximum flow of 2.0 MGD and 20 mg/L and the daily maximum limit of 1,001 lbs/day was derived based on a monthly average flow of 2.0 MGD and 60 mg/L. Monthly average and daily maximum flow of 2.0 MGD used in the calculations are representative of the flows currently being discharged for the three period 1999 – 2001.

5. EFFLUENT LIMITATIONS & MONITORING REQUIREMENTS (cont'd)

x. pH Range - The previous licensing action established a pH range limit of 5.0 – 9.0 standard units that was based on federal regulation 40 CFR, Part 430. This permitting action is carrying the limit forward and continues to be consistent with the federal effluent guidelines.

6. BEST MANAGEMENT PRACTICES PLAN

Best Management Practices (BMPs) are specified at 40 CFR 430.03(d). The primary objective of the Best Management Practices is to prevent leaks and spills of spent pulping liquors, soap, and turpentine. The secondary objective is to contain, collect, and recover at the immediate process area, or otherwise control, those leaks, spills, and intentional diversions of spent pulping liquor, soap and turpentine that do occur. Toward those objectives, the permittee must implement the Best Management Practices (BMPs) specified in 40 CFR 430.03 (c). The BMP conditions established in Special Condition O of the permit are recommended by EPA Headquarters via a May 2000 Permit Guidance Document for the Pulp, Paper and Paperboard Manufacturing Point Source Category.

7. BIOLOGICAL MONITORING PROGRAM

Special Condition N, Biological Monitoring Program, of this permit requires the permittee to monitor bald eagles within 25 miles of the FJOC's Old Town, Maine mill. Other fish eating birds including, but not limited to, ospreys, great blue herons and common loons may be sampled as surrogates for dead young, sub-adult or adult eagles or non-viable bald eagle eggs. State and federal agencies with jurisdiction over fish and wildlife submitted comments to the Department pursuant to Department Rule Chapter 523, Waste Discharge License Conditions, requesting additional information regarding eagles and other fish-eating birds in the vicinity of pulp and paper mills. The permittee has agreed to conduct the biological monitoring program.

8. DISCHARGE IMPACT ON RECEIVING WATER QUALITY

As permitted, the Department has determined the existing water uses will be maintained and protected and the discharge will not cause or contribute to the failure of the Penobscot River to meet standards of its assigned Class B classification.

9. PUBLIC COMMENTS

Public notice of this application was made in the Bangor Daily newspaper on or about February 9, 1999**.** The Department receives public comments on an application until the date a final agency action is taken on that application. Those persons receiving copies of draft permits shall have at least 30 days in which to submit comments on the draft or to request a public hearing, pursuant to Chapter 522 of the Department's rules.

10. DEPARTMENT CONTACTS

Additional information concerning this permitting action may be obtained from and written comments should be sent to:

Gregg Wood
Division of Water Resource Regulation
Bureau of Land and Water Quality
Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017
Telephone: (207) 287-3901
Electronic mail : gregg.wood@state.me.us.

11. RESPONSE TO COMMENTS

During the period of April 2, 2002 through May 2, 2002, the Department solicited comments on the proposed draft Maine Pollutant Discharge Elimination System Permit to be issued for the discharge from the Fort James Operating Company's (FJOC) Old Town, Maine mill. The Department received written comments from the Georgia Pacific Corporation (GP being the parent company of FJOC), the American Forest and Paper Association (AFPA), The State of Maine Atlantic Salmon Commission (ASC), National Marine Fisheries Service (NMFS), U.S. Fish & Wildlife Services (USFWS), Maine Inland Fisheries & Wildlife (IF&W) and International Paper (IP). Response to substantive comments submitted have been categorized as a number of entities submitted comments on the same topic/subject. Responses to comments are as follows:

Biological Monitoring

Comment #1: The AFPA, GP and IP submitted comments on the legal obligation of the State of Maine to incorporate biological monitoring requirements based on a USFWS Biological Opinion issued on August 18, 2000 following a formal consultation between EPA and the USFWS under the federal Endangered Species Act (ESA). The three parties contend that the EPA has no authority to require the State of Maine to include provisions intended to implement the ESA in MEPDES permits. The parties cited a U.S. Court of Appeals decision that confirms that the ESA applies to federal actions, not actions by state agencies, and that the EPA cannot condition its approval of a state's NPDES program under section 402(b) of the federal Clean Water Act (CWA) on the state's implementation of ESA-based procedures.

11. RESPONSE TO COMMENTS (cont'd)

Response #1: The Department is retaining the Special Condition N, Biological Monitoring Program, in the permit based on written correspondence from the USWFS and State IFW requesting additional biological information on bird species cited in the Special Condition. The Department has revised the language on page 22 of the Fact Sheet indicating that monitoring is based on "State and federal agencies with jurisdiction over fish and wildlife submitting comments to the Department pursuant to Department Rule Chapter 523, Waste Discharge License Conditions, requesting additional information regarding eagles and other fish-eating birds in the vicinity of pulp and paper mills." It is the Department's understanding that as of the effective date of this permit, the permittee has agreed to conduct the monitoring.

Atlantic Salmon & Shortnose Sturgeon

Comment #2: The ASC submitted comments regarding potential effects of the discharge on the Atlantic salmon including endocrine disruptors, spawning and nursery habitat, migration and elevated temperature in the zone of initial dilution. The ASC indicated that with the limited information available or presented to them to date, it is unknown if issuance of the permit would impair the viability of the existing population or significantly impair the growth and or reproduction of the existing population of Atlantic salmon. The ASC indicated it would be difficult for them to predict what specific permit conditions would be necessary to avoid substantial impairment to the Atlantic salmon resource.

Response #2: The Department and the FJOC are willing to continue to work with the ASC to provide additional effluent temperature data, chemical specific data, whole effluent toxicity test results, and dye study information as it relates to the effluent plume characteristics to assist them in their evaluation of the potential (if any) impact on the viability, growth and reproduction of the existing population of Atlantic salmon. Should additional information lead the ASC to recommend additional monitoring requirements, Special Condition G, Reopening of Permit For Modifications, may be utilized to reopen the permit to incorporate said requirements.

Comment #3 The NMFS commented on the shortnose sturgeon stating that the habitat in the Penobscot River below the Veazie Dam is consistent with the preferred habitat of shortnose sturgeon and that the NMFS' opinion is that based on existing information and provided the effluent is in compliance with the most stringent water quality criteria, the issuance of the permit would not adversely affect shortnose sturgeon in the lower portion of the river system.

Response#3 No response.

11. RESPONSE TO COMMENTS (cont'd)

Operations & Maintenance Plan

Comment #4: The FJOC submitted a comment objecting to the inclusion of Special Condition J, *Operations & Maintenance (O&M) Plan*. The FJOC contends the requirement to prepare the manual and provide an annual certification indicating the manual is up-to-date is arbitrary in the absence of information that significant and recurring non-compliance related to the operation and maintenance of the waste water treatment facility. The FJOC suggesting allowing them to manage operations and maintenance issues through the use of standard operating procedures (SOP's) or other management methods rather than a formal O&M manual.

Response #4: The Department agrees with the FJOC that an O&M plan as opposed to a manual is sufficient to provide for a systematic approach by which the permittee shall at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Special Condition J of the permit has been revised accordingly. The plan shall be written and include all references to SOP's, process control measures, equipment maintenance manuals and schedules, schematics etc., such that an outside contract operator or other entity not intimately familiar with the waste water treatment facility could assume responsibility of the treatment facility and comply with all limitations and monitoring requirements of this permit.

It is noted the Department is requiring all permittee's/licensee's to prepare O&M plans for their facilities. The Department does not agree with the FJOC that said plans are only necessary when a facility has significant and recurring non-compliance related to the operation and maintenance of the waste water treatment facility. Preparation of an O&M plan based on what is currently working (in compliance) is preferred as to avoid the non-compliance situation from occurring and resulting in potential enforcement action(s) to correct the problem(s).

Appendix B

Wastewater Characterization for Use in the Biological Assessment for Old Town Fuel and Fiber Biorefinery (SME, 2011)

SME
Sevee & Maher Engineers, Inc.

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

January 26, 2011

110126-wastewatercharac.docx

Mr. James St. Pierre, Sr. Project Engineer
Old Town Fuel & Fiber
P.O. Box 564, 24 Portland Street
Old Town, Maine 04468

Subject: Wastewater Characterization for Use in Biological Assessment
Old Town Fuel and Fiber Biorefinery

Dear Jim:

The following information summarizes the wastewater loads from the proposed Old Town Fuel and Fiber (OTFF) biorefinery project for the purpose of estimating the incremental increase in the discharge from the OTFF wastewater treatment system to the Penobscot River. The wastewater loads from the proposed biorefinery have been developed using the process flow diagrams and mass balances that have been prepared by AMEC for submittal to the Department of Energy (DOE) as part of the FEL 2 submittal.

The following sections: a) describe and summarize the biorefinery wastewater characteristics, b) estimate the removal efficiency in the mill's wastewater treatment system, and c) estimate of the incremental increase in the amount of key parameters in the wastewater treatment system effluent as a result of the biorefinery operation.

BIOREFINERY WASTE LOAD SUMMARY

The following information summarizes the character of the wastewater discharge from the proposed biorefinery.

- The continuous wastewater discharges from the biorefinery will come from three unit processes as shown on the attached figure. The three unit processes are: Foul Evaporator Condensate, Acid Recovery and Butanol Fermentation.

- The total wastewater flow from the biorefinery will be approximately 585,000 gallons per day (GPD)(410 gallons per minute). This flow is divided among the four unit processes as follows:

  - Foul Evaporator Condensate: 125,000 GPD
  - Acid Recovery: 127,000 GPD
  - Butanol Fermentation: 333,000 GPD

4 Blanchard Road, PO Box 85A, Cumberland Center, Maine 04021 • Phone 207.829.5016 • Fax 207.829.5692 • www.smemaine.com

- In addition to the flows described above, small quantities of system washwater will be discharged on an intermittent basis. These flows will represent less than 10,000 GPD and will not represent a significant loading to the wastewater treatment system.

- The foul evaporator condensate wastewater will have characteristics that are similar to the wastewater discharged from similar sources at the existing pulp mill. The biorefinery foul condensate will be blended with the foul condensate from the pulp mill and sent to the wastewater treatment system in the foul condensate line.

- Salts from the biorefinery process are removed from the wastewater stream and processed to recover the salts. Only small amounts of sodium and calcium salts will reach the wastewater treatment system.

- Table 1, which provides a list of the primary constituents of the three wastewater streams, was developed based on the biorefinery mass balance. This table also provides the BOD loading contributed from each of the four wastewater streams. The BOD contribution from each stream is summarized below:

    - Foul Evaporator Condensate: 202 Pounds BOD per Day
    - Acid Recovery: 507 Pounds BOD per Day
    - Butanol Fermentation: 9550 Pounds BOD per Day

- The total BOD loading from the biorefinery is estimated to be approximately 10,259 pounds per day.

- Based on our review of the biorefinery's unit processes, the mass balance, and the process chemicals used in the biorefinery, no heavy metals are added to the process and no heavy metals (other than naturally occurring trace levels) are anticipated to be contributed to the waste stream from the biorefinery.

- Based on the process flow diagram and the mass balance, nutrient loading in the biorefinery wastewater is expected to be minimal. MEDEP has indicated that the new mill discharge license will likely include a phosphorous limit of 0.5 mg/L. We do not expect any problem meeting the anticipated limit.

ESTIMATED BIOREFINERY IMPACT ON WASTEWATER TREATMENT PLANT EFFLUENT

Based on our review of the capacity of the existing OTFF wastewater treatment plant and the estimated quantity and character of the wastewater from the biorefinery, we believe that the existing system has adequate capacity to treat the additional wastewater from the biorefinery while maintaining the system's effluent well within the limits of the existing wastewater discharge license. The reasons for this conclusion are summarized below. Also included below are estimates of the incremental increase in key wastewater parameters.

- The existing OTFF wastewater treatment system has a licensed capacity of approximately 24.4 million gallons per day (MGD). Based on mill operating data for 2010, the treatment system is currently processing approximately 12 – 13 MGD.

- It is estimated that the proposed biorefinery will produce 0.585 MGD, which is less than 5% of the treatment system's hydraulic capacity.

- Based on data from the mass balance for the biorefinery, it is conservatively estimated that the BOD loading from the proposed biorefinery will be approximately 10,250 pounds of BOD per day.

- Assuming a BOD removal efficiency of 85% in the existing wastewater treatment system, the BOD in the wastewater to be discharged to the Penobscot River will increase by 1,500 pounds per day as a result of the biorefinery operation.

- Based on a review of the discharge monitoring reports from the existing wastewater treatment facility, the average monthly BOD discharge for the period from August 2009 through July 2010 was approximately 2,500 pounds per day. The maximum average BOD discharge for any month was approximately 3,780 pounds per day in July 2010.

- Therefore, when considering the highest monthly average BOD discharge in 2010 and a conservatively high assumption for the BOD loading from the biorefinery, the existing wastewater treatment system can treat the wastewater from the biorefinery without exceeding the existing discharge license; 7,500 pounds of BOD in the summer and 8,850 pounds of BOD in the winter. Based on conservative assumptions, the BOD loading to the River, during the summer months, when the biorefinery is operating, will be less than 5,500 pounds of BOD per day, which is well below the summer license limit of 7,500 pounds per day.

- Although reliable data is not available regarding the total suspended solids (TSS) loading from the biorefinery, it is anticipated that the TSS loading would be similar to the loading from the existing pulp mill. Therefore, an increase in flow to the treatment system of 0.585 MGD will result in an increase in the TSS loading of less than 5% and it is projected that the mass loading of TSS discharged to the river will increase no more than 5% from the most recent discharge data. Based on recent data, the treatment system is discharging an average of approximately 7,500 pounds of TSS per day. Therefore, it is estimated that the increased TSS discharge resulting from the biorefinery will be less than 500 pounds per day. The total discharge of TSS from the wastewater treatment system, once the biorefinery is in operation, will be less than 8,000 pounds per day, which is less than the existing license monthly average limit of 20,000 pounds per day during the period from June 1 to October 31.

- Based on the review of the biorefinery unit processes, mass balance, process chemicals and feedstock, there are no components of the biorefinery process that are expected to increase the concentrations of ammonia of the metals, which

are included in Table 4 of the Draft Biological Assessment dated November 2010.

- It is expected that the temperature of the wastewater from the biorefinery will be no higher than the temperature of the wastewater currently produced by the pulp mill. Based on a review of temperature data for the wastewater treatment system effluent for the past 12 months, the temperature of the effluent is well below the license limit of 105 degrees F. It does not appear that the effluent temperature will exceed the license requirements when processing the biorefinery wastewater.

- The pH of the biorefinery wastewater will be in a range similar to that of the existing pulp mill effluent. For the past several years the pH of the effluent from the wastewater treatment system has been in the range of 7 to 8, which is well within the license limits of 5 to 9.

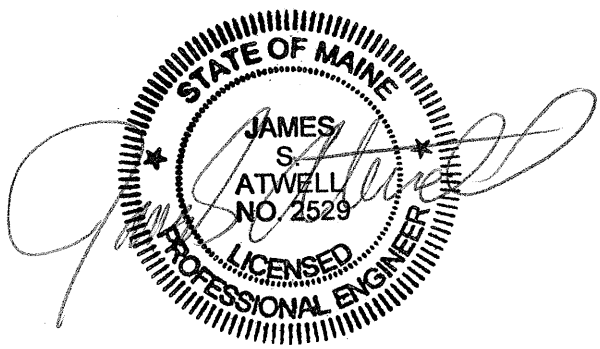
If you have any questions concerning this information presented, please let me know.

Sincerely yours,

SEVEE & MAHER ENGINEERS, INC.

James S. Atwell, P.E.

Enclosure



EXTRACTION/CONDITIONING

Green Liquor
Wood Chips
Water

Extraction → Concentration → Acid Hydrolysis → Lignin Separation → Neutralization → Gypsum Separation

Extraction → Wood Chips (To Pulp Process)

Lignin Separation → Lignin To Recovery

Gypsum Separation → Gypsum To Solid Waste

Concentration → Evaporator Foul Condensate

125,000 GPD

ACID RECOVERY

Acid Evaporation → Desalination/ Detoxification

Acid Evaporation → Acid To Recovery

Desalination/ Detoxification → Salt To Recovery

Acid To Recovery → Acetic Acid

Acid To Recovery → Furfural To Recovery

Acid To Recovery → Formic Acid

From Acid Recovery

127,000 GPD

BUTANOL FERMENTATION

Fermentation/ Distillation

Fermentation/ Distillation → N-Butanol

Fermentation/ Distillation → Ethanol To Recovery

Fermentation/ Distillation → Acetone

From Butanol Fermentation

333,000 GPD

PROCESS WASTEWATER STREAM

NOTE: SEE TABLE FOR DESCRIPTION OF INDIVIDUAL WASTEWATER STREAMS.

PROCESS WASTEWATER STREAMS

SME
Sevee & Maher Engineers, Inc.
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

DWG: FLOW CHART LMN: CTB: SME-STD REV: 1/20/11

Old Town Fuel and Fiber BioRefinery
Wastewater Summary

Waste Streams to WWTP		Evaporator Foul Condensate	From Acid Recovery	From Butanol Fermentation	TOTAL WASTEWATER	
Total Flow	*gpd*	**125,280**	**126,720**	**332,640**	**FLOW**	**584,640** gpd
Component Flows						
Acids (*)	*lbs/day*	202	1,298	16,608		
Acetone	*lbs/day*	0	0	7		
Butanol	*lbs/day*	0	0	24		
Cell Mass	*lbs/day*	0	0	24,480		
CO2	*lbs/day*	0	0	0		
Dissolved Sugars	*lbs/day*	0	0	10,272		
Dissolved Solids (Inorganic)	*lbs/day*	0	0	49,848		
Ethanol	*lbs/day*	0	0	1		
Ethyl Acetate	*lbs/day*	0	9,600	0		
Water	*lbs/day*	0	984,281	2,762,160		
Water	*gpd*		118,019	331,194		
TOTAL	*lbs/day*	**202**	**995,179**	**2,863,400**		

BOD5	*lbs/day*	202	506	9,534	**BOD**	**10,243** lb/day
Temperature	*Deg. F*	120	213	94		

NOTE: The following intermittent flows will be sent to the wastewater treatment system:
Spent Cleaning Fluids
Hydrolyzer Drains
Product Storage Tank/Off Spec
These flows will represent less than 10,000 gpd.

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

May 11, 2011

Ms. Patricia Kirk
National Marine Fisheries Service
17 Godfrey Drive
Orono, ME 04473

Subject: Request for Informal Section 7 Consultation for the Proposed Old Town Fuel and Fiber Biorefinery, Old Town, Penobscot County, ME.

Dear Ms. Kirk:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Red Shield Acquisition, LLC d.b.a Old Town Fuel and Fiber (OTFF) to install and initially operate a demonstration scale integrated biorefinery (IBR) at their operating pulp mill in Old Town, Maine. The demonstration-scale IBR would convert woody biomass to biofuels. To comply with the National Environmental Policy Act (NEPA 40; Code of Federal Regulations Parts 1500 to 1508), DOE will prepare an Environmental Assessment (EA).

As part of the EA preparation, DOE is requesting informal consultation under Section 7 of the Endangered Species Act (ESA). In addition, DOE is requesting concurrence with the determination that the above-referenced action *may affect, but is not likely to adversely affect* the Gulf of Maine (GOM) Distinct Population Segment (DPS) of anadromous Atlantic salmon (*Salmo salar*), which is federally listed threatened, and shortnose Sturgeon (*Acipenser brevirostrum*), which is federally listed endangered. DOE has determined that the proposed action would not destroy or adversely modify Atlantic salmon critical habitat. DOE understands that, in accordance with the agreement between the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) (hereinafter together referred to as "the Services"), the USFWS will take the lead on the Section 7 consultation for Atlantic salmon. DOE is providing the same information to the USFWS regarding Atlantic salmon and the proposed project. Additionally, the Atlantic sturgeon (*Acipenser oxyrhynchus oxyrhynchus*) is a federal candidate species, and DOE requests concurrence from NMFS with the determination that the proposed action would not jeopardize the continued existence of Atlantic sturgeon or result in adverse modification of critical habitat.

DOE is aware that the OTFF, has previously requested technical assistance from the Services. As a result, OTFF has prepared the *OTFF Proposed Biorefinery Effluent Analysis* (ICF, 2011) (Effluent Report). OTFF submitted the Effluent Report to the Services in February 2011. The NMFS provided comments via email on April 4, 2011. The Effluent Report has been revised in response to the NMFS's comments,

and the revised report is attached hereto. (Note that all references cited in this letter are provided on the reference list in the revised Effluent Report)

Proposed Project:

The purpose of the proposed OTFF IBR (the proposed project) would be to demonstrate the technical and economical feasibility of converting lignocellulosic extract to n-butanol, which would form the basis for a series of commercial-scale biorefineries. The proposed project is expected to produce 1.32 million gallons of n-butanol, 2.13 million gallons of acetic acid, 740,000 gallons of formic acid, and 410,000 gallons of acetone annually. The proposed project would be located within the existing OTFF pulp mill site at 24 Portland Street in Old Town, Maine, 04468. The proposed project would require 0.90 acre (40,000 square feet) in the 5.7-acre (250,000-square-foot) former tissue paper machine building. The proposed project would be installed within the existing vacant building, which is adjacent to the operating paper mill. If necessary, one or two storage tanks may be located outside the building. If storage tanks are constructed outside the building, they would be constructed on existing asphalt/unvegetated disturbed ground, and therefore are not anticipated to remove or affect any upland habitats. Additionally, all storage tanks, whether inside or outside the building, would comply with Spill Prevention, Control and Countermeasure Act requirements for containment in the event of a leak.

The proposed project is anticipated to operate under the existing Title V Air Quality permit, with minor modifications. The proposed project would not result in an increase in water usage over the currently permitted quantity of 30 million gallons per day (mgd). The proposed project would not involve in-water work.

Currently, the pulp mill's wastewater treatment plant discharges its effluent into the Penobscot River under Maine Pollutant Discharge Elimination System (MEPDES) Permit No. ME0002020 (Appendix A of the Effluent Report). The MEPDES permit specifies the allowable effluent discharge rates and characteristics into the Penobscot River in order to safeguard water quality and protect aquatic life. The pulp mill currently produces approximately 12 mgd of wastewater that is treated in the pulp mill's wastewater treatment facility. The 12 mgd represents approximately one-half the allowable permitted discharge of 24.4 mgd. Under the MEPDES permit, the system is permitted to release 24.4 mgd of secondary treated process waters (including stormwater and landfill leachate) and other wastewaters associated with the pulp and papermaking process, non-contact cooling waters, turbine condensing waters, and filter backwash waters from three separate outfalls to the Penobscot River. No sanitary sewer waste is treated within the pulp mill's wastewater treatment plant. All sanitary sewer waste is routed to and treated by the municipal facility.

DOE has reviewed the proposed project and analyzed all available OTFF outfall discharge data and testing results, which included several recent years of screening-level whole effluent toxicity (WET) testing. The analysis is presented in the attached Effluent Report, and it was the basis for DOE's conclusion regarding effects on listed species.

Listed Species:

As a result of the decommissioning project to remove the Great Works Dam adjacent OTFF, an effort that is being led by the Penobscot River Restoration Trust, OTFF needs to relocate the pulp mill's water supply intake. In May 2010, the Penobscot River Restoration Trust submitted an application to the U.S. Army Corps of Engineers (USACE) on behalf of OTFF to move the water intake downstream. As part of ESA Section 7 consultation, a Biological Opinion was issued by the USFWS in September 2010. For that consultation extensive information on existing conditions and habitat potential of the Penobscot River in the vicinity of OTFF was analyzed by the USFWS. Additionally, the NMFS issued a Biological Opinion in December 2009 for the decommissioning of the Great Works Project (Federal Energy Regulatory Commission [FERC] No. 2312) and Veazie Project (FERC No. 2403) and surrender license and construct a fish bypass at the Howland Project (FERC No. 2721) (hereinafter the "NMFS BO"). As a result of the dam removal and fish bypass effort, extensive biological and habitat assessment work has been conducted along the reach of the Penobscot River directly adjacent to the OTFF pulp mill site. As part of the technical assistance discussions with OTFF, the Services indicated that any analysis for the proposed project would focus on the effluent discharge from the pulp mill's wastewater treatment plant as no in-water work or upland work adjacent to the Penobscot River is planned.

Atlantic Salmon:

The GOM DPS of anadromous Atlantic salmon was initially listed by the Services as endangered on November 17, 2000 (65 *Federal Register* [FR] 69459). A subsequent Services listing as endangered (74 FR 29344; June 19, 2009) included an expanded range for the GOM DPS of Atlantic salmon. The decision to expand the geographic range of the GOM DPS was largely based on the results of a Status Review (Fay, et al., 2006) completed by a Biological Review Team (BRT) consisting of federal and state agencies and Tribal interests. Fay et al. concluded that the DPS delineation in the 2000 listing designation was largely appropriate, except in the case of large rivers that were excluded in the 2000 listing determination. Fay, et al. concluded that the salmon currently inhabiting Maine's larger rivers (Androscoggin, Kennebec, and Penobscot) are genetically similar to the salmon inhabiting the rivers included in the GOM DPS as listed in 2000, have similar life history characteristics, and/or occur in the same zoogeographic region (NMFS BO).

In 2004, electrofish surveys in and around the Great Works Dam detected a single Atlantic salmon. Because the Great Works Dam is slated for decommissioning and removal, it is likely that numbers of Atlantic salmon that utilize this reach of the Penobscot River would increase after removal has been completed (Multi-Project Environmental Analysis, Veazie Project FERC No. 2430, Great Works Project FERC No. 2312 and Howland Project FERC No. 2721, prepared by Kleinschmidt, October 2008 [hereinafter Multi-Project EA]).

Shortnose Sturgeon:

No shortnose sturgeon have been documented in the fish passage facilities at Veazie (NMFS BO). Therefore, it is assumed that any current attempts to migrate upstream of the Veazie Dam are precluded by a lack of suitable fish passage. Shortnose sturgeon have rarely been documented to attempt to use

fishways (other than fish lifts) (NMFS BO). There is little historic information on shortnose sturgeon use of the Penobscot River. However, NMFS has determined that based on migration patterns of shortnose sturgeon in other river systems, it is reasonable to expect that historically shortnose sturgeon would have accessed the additional 22 kilometers (13.7 miles) of habitat between Veazie and Milford Falls (just upstream of the Great Works impoundment) absent the existing barriers, and that this habitat would have been used for overwintering, spawning, and as nursery grounds for juveniles (NMFS BO).

Because the Great Works project lies between Veazie and Milford Falls, it is reasonable to assume that removing the Veazie and Great Works dams would open this reach of the Penobscot River and provide suitable habitat for shortnose sturgeon for various periods of their life cycle; therefore, shortnose sturgeon could occur adjacent to the proposed project site.

Atlantic Sturgeon:

Atlantic salmon has been petitioned as a candidate species for listing under the ESA. The Status Review Report for Atlantic sturgeon was issued in February 2007. The NMFS anticipated determining if listing is warranted in 2010, but has not made a final determination. Because Atlantic sturgeon is a candidate species and has the potential to be present in the reach of the Penobscot River adjacent to the proposed project after the dams are removed, they have been included in this request for informal consultation. As for the shortnose sturgeon, Atlantic sturgeon historically ranged upstream to river mile 38.5 (Fernandes et al., 2010), just upstream of the proposed project.

Atlantic Salmon Critical Habitat:

On June 19, 2009, the NMFS designated critical habitat for listed Atlantic salmon pursuant to section 4(b)(2) of the ESA. The critical habitat designation for GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 kilometers (12,161 miles) of perennial river, stream, and estuary habitat and 799 square kilometers (309 square miles) of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species.

The proposed project would be in the Great Works Stream-Penobscot River HUC-10 watershed, which has been designated as critical habitat for the Atlantic salmon GOM DPS. The Primary Constituent Elements of Atlantic salmon critical habitat are (1) spawning and rearing habitat and (2) migration habitat. According to information provided in the Letter of Concurrence issued for the OTFF pulp mill water supply intake relocation (issued September 8, 2010, USFWS/Region5/ES/ MEF; USFWS, 2010), Atlantic salmon could be present in the Penobscot River adjacent to the proposed project primarily because:

1. Atlantic salmon spawn and rear infrequently and in limited numbers in Great Works Stream, a tributary of the Penobscot River approximately 500 feet downstream of the project area on the left bank of the Penobscot River.

2. Approximately 13,500 fry were stocked in Great Works Stream in 2008 as part of a study, and these fish are now rearing in Great Works Stream or the Penobscot River.
3. Adults migrate through the action area from May through November during their upstream migration period.
4. Downstream migrating post-spawned adults pass through the action area, primarily in spring during runoff.
5. Downstream migrating smolts pass through the action area, typically in May as high flows recede.

Existing Conditions at the Project Site:

Because the proposed project does not include in-water activities and upland construction would be confined to inside the existing structures or in upland areas that are developed, construction activities are not anticipated to affect listed fish species. Therefore, it is believed that potential effects to listed fish as a result of the proposed project would relate to the existing NPDES-compliant wastewater treatment discharge and any changes to that discharge that would result from operation of the proposed project that would utilize the wastewater treatment facility.

Existing water quality in the vicinity of the proposed Project.

According to the Multi-Project EA, waters in the proposed project area have been classified as Class B and are of sufficient quality to support drinking water supply (after treatment), fishing, and contact recreation and function as unimpaired habitat for fish and other aquatic life (PPL Great Works, LLC, 2000 [Kleinschmidt 2008]). However, the Penobscot River at Old Town and Milford is designated Class B Category 5-B due to *E. coli* contamination (MDEP, 2006; MDEP, 2008). Sampling above the Great Works Dam by MDEP in 2001 as part of their basin-wide water quality sampling program indicated that the following (Mitnik, 2002):

- Average daily and daily maximum dissolved oxygen levels met standards for Class B waters of 7 parts per million and 75 percent oxygen saturation.

- Daily minimum dissolved oxygen concentrations fell slightly below (approximately 6.75 parts per million) standards for Class B waters of 7 parts per million and 75 percent oxygen saturation in 2001.

Because data were collected during a heat spell, the 3-day average water temperature for all Penobscot River sampling stations, including the Great Works site, ranged from 25° to 27.3° C (Mitnik, 2002). Minimum, maximum, and average values at Great Works ranged from approximately 26° to 28° C. In 1999, as part of relicensing efforts for the Great Works Project, and pursuant to a request from the Maine Department of Environmental Protection, PPL Great Works, LLC, performed a macroinvertebrate study in the Great Works project area to assess water quality as it pertains to established aquatic life standards. The PPL study documented that the Great Works Project bypass reach and impoundment met Class B water quality standards for aquatic life. The Maine DEP verified and concurred with this assessment on January 18, 2000 (PPL Great Works, 2000 [Kleinschmidt 2008]).

Overall, pollution beyond sewer treatment has been a problem for the Penobscot River system, and paper production facilities have resulted in higher concentrations throughout the system of metals, dioxin, dissolved solids, phenols, and hydrocarbons. The NMFS currently reviews and comments on all NPDES permits issued by the Maine DEP below Veazie Dam, so the NMFS has not reviewed the OTFF NPDES permit in the past.

Effluent Report

Based on the analysis in the Effluent Report:

- The wastewater treatment plant's effluent discharges to the Penobscot River are estimated to increase by 0.585 mgd, which is less than 5 percent of the current discharge flows of 12 to 13 mgd.

- Acidity (pH) indicate that the mean minimum daily effluent pH ranged from 6.7 to 8.2, and that the maximum daily effluent pH ranged from 6.8 to 8.2, which is within an acceptable range and is not anticipated to change with operation of the proposed project.

- Dissolved oxygen levels in and around the proposed project area are slightly lower than the minimum criterion for Class B waters. Maximum likely daily discharges from the existing pulp mill and the proposed project combined are estimated to remain below 5,500 pounds per day in summer, which is well within the permitted limit of 7,500 pounds per day, and therefore are not anticipated to increase over existing conditions.

- Total suspended solids discharged to the river with the proposed project operation (i.e., the increase in the whole effluent discharge to the river in relation to current levels) would be no more than 5 percent. The basis for this estimate is that the composition of the biorefinery effluent entering the wastewater treatment plant would be similar in composition to the existing pulp mill effluent.

- The available estimates of effluent composition for the biorefinery suggest that, in general, the change in temperature attributable to operation of the proposed project would be in proportion to the increase in discharged effluent (5 percent), and therefore considerably less than 0.1° C.

- Ammonia and metals, including heavy metals, would not increase in concentration.

- The "new" pulp mill discharge license would include a phosphorous limit of 0.5 mg/L [milligrams per liter]" and the wastewater treatment system, including wastewater from the biorefinery, would be able to meet that limit. Phosphorus levels in the Penobscot River have been measured from 0.0036 to 0.129 milligrams. Assuming dilution factors of 16.7 for acute exposures to 74.2 for chronic exposures, the stated limit of 0.5 mg/L would result in phosphorous short-term and longer-term concentrations of 0.030 and 0.0068 mg/L, respectively, in the mixing zone immediately downriver of the discharge. The MEDEP has measured average total

phosphorus levels below point-source discharges of between 0.020 and 0.030 mg/L (MEDEP, 2008). Therefore, the proposed biorefinery might result in similar phosphorus levels at the OTFF pulp mill outfall in the Penobscot River as measured below other point-source discharges.

- Total nitrogen in the Penobscot River ranges from 0.2 to 0.4 parts per million (Mitnik, 2002). Sources include municipal wastewater treatment plants, pulp and paper mills, stormwater runoff, septic systems, agriculture, and atmospheric deposition. Phosphorus is a limiting nutrient in fresh water. Total nitrogen for all riverine and estuarine locations ranged from 0.2 to 0.5 mg/L, with average ammonia nitrogen less than 0.001 mg/L (i.e., 1 microgram per liter) at all locations. These are considered relatively low levels of nitrogen (MEDEP, 2008).

Although detailed data on riverbed substrates in the vicinity of the OTFF discharges are limited, it appears that existing conditions are somewhat suitable for species such as salmon and sturgeon. The Multi-Project EA (Kleinschmidt, 2008) describes substrates within the existing Great Works impoundment (bedrock, boulders, cobble, and gravel) as being similar to those in the contiguous free-flowing reaches, including the area downstream of the discharge points. The Multi-Project EA suggests that future access to these areas will likely provide spawning opportunities for the endangered shortnose sturgeon and candidate species Atlantic sturgeon.

The analyses presented in the Effluent report and summarized here focuses on Atlantic salmon because, with removal of the Veazie and Great Works dams, this species is certain to pass through the action area and Designated Critical Habitat. With the removal of the two dams, shortnose and Atlantic sturgeon would be more likely to enter the reach of the river in the vicinity of the proposed Project and would be able to reach the full upstream extent of their historic range, above the project site, following removal of the dams.

Screening-Level WET Testing Summary:

The WET testing of effluent from the OTFF pulp mill from 2002 through 2005 and 2007 through 2008 indicated compliance with the 2002 MEPDES permit for the facility. In addition, estimated risk quotient for all WET tests were found to be at least one order of magnitude lower than the "level of concern" value of 1.0.

The shortnose sturgeon long life span, tendency to spend extended periods in estuarine habitats, and diet, predispose these species to long-term, repeated exposure to environmental contaminants, and bioaccumulation of toxicants could affect its ability to handle environmental and physiological stressors (Dadswell, 1979 [NMFS BO]). Although concerted efforts to improve water quality in the Penobscot River system have been under way for many years, discharges to this system contribute various chemical contaminants and heated effluent to the river (NMFS BO). The watershed is considered impaired for fish consumption and recreational uses. The cumulative effects of discharges into the river is unknown and could be adversely affecting or delaying the potential for shortnose sturgeon to recover in this system

A minor modification to the existing NPDES permit would likely be required to include a phosphorous limit of 0.5 mg/L based on the results of the small pilot-scale research and analyses currently under way. Results of the pilot-scale activities would be included in the EA for NMFS review and comment.

Conclusion:

Based on the attached Effluent Report, DOE has concluded that the proposed project *may affect, but is not likely to adversely affect* the endangered Atlantic salmon and the threatened shortnose sturgeon. Additionally, DOE has concluded that the proposed Project would not result jeopardize or adversely modify critical habitat for the candidate species Atlantic sturgeon.

Please contact Kristin Kerwin at 720-356-1564 or kristin.kerwin@go.doe.gov with any questions.

Sincerely,

Kristin Kerwin
NEPA Compliance Officer

Cc: Jim St Pierre, OTFF
Whitney Fiore, ICF
Wende Mahaney, USFWS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

JUN 30 2011

Kristin Kerwin
Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, CO 80401-3393

Re: Old Town Fuel and Fiber Biorefinery-Section 7 Request for Informal Consultation

Dear Ms. Kerwin:

This responds to your May 11, 2011, request for consultation pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543), regarding Old Town Fuel and Fiber's (OTFF) proposed installation and operation of a demonstration scale integrated biorefinery at their operating pulp mill in Old Town, ME. This project will be funded by the Department of Energy (DOE). The DOE has made the preliminary determination that the proposed action is not likely to adversely affect any species or critical habitat listed by NOAA's National Marine Fisheries Service (NMFS) and has requested NMFS concurrence with this determination. Pursuant to the provisions outlined at 50 CFR§402.10, the DOE has also requested technical assistance from NMFS to determine if a conference regarding species proposed to be listed is necessary.

Proposed Action

The proposed project is within the existing OTFF pulp mill site in Old Town, Penobscot County, Maine, which discharges wastewater into the Penobscot River. The site covers approximately 180 acres and extends from the chip storage and conveying facility at the northern end to the former tissue converting and warehouse facilities at the southern end. The property is bounded on the east by the Penobscot River and on the west by South Main Street. Operations at this property include chip storage and handling, pulping, bleaching, drying, maintenance, warehousing, fuel storage, and black-liquor storage. The OTFF wastewater treatment plant is directly west of the OTFF pulp mill across South Main Street along Penny Road on approximately 23 acres of land OTFF owns. The treatment system consists of an aeration pond, spill pond, four clarifiers, sludge dewatering, and a control building. Although the OTFF pulp mill is located on approximately 180 acres, the proposed biorefinery would require 0.9 acre (40,000 square feet) in the 5.7-acre (250,000-square-foot) former, and now vacant, tissue paper machine building. No in-water work is proposed as part of the project.

OTTF proposes to install a demonstration scale biorefinery to produce N-butanol from wood products. To produce N-butanol, currently processed hardwood woodchips would be subjected

to an additional treatment step (extraction) before entering the pulp process. This process, which would be completed in the existing pulp mill, produces extract consisting of hemicelluloses, acetic acid, formic acid, furfural and lignin. The extract from the partially processed chips would be sent via pipeline to the biorefinery for further processing. In addition to 1.32 million gallons of N-butanol, the process will produce 2.13 million gallons of acetic acid, 740,000 gallons of formic acid, 80,000 gallons of furfural and 44,000 gallons of ethanol annually. Due to the smaller quantities present, furfural and ethanol would not be sold; instead, they would be sent to the boiler to recover the heat value.

The addition of a small-scale biorefinery to the OTFF will increase the amount of wastewater being discharged into the Penobscot River. Currently, the pulp mill's wastewater treatment plant discharges its effluent to the river under Maine Pollutant Discharge Elimination System (MEPDES) Permit No. ME0002020, which specifies allowed effluent discharge rates and characteristics to safeguard water quality in the Penobscot River and to protect aquatic life. The system is permitted to release 24.4 million gallons per day (MGD) of secondary treated process waters (including storm water and landfill leachate) and other wastewaters associated with the pulp and papermaking process, non-contact cooling waters, turbine condensing waters, and filter backwash waters from three separate outfalls to the Penobscot River. In addition to the routine wastewater discharge, this permit authorizes discharges associated with or resulting from essential maintenance, regularly scheduled maintenance during startup and shutdown, and spills and releases (whether anticipated or unanticipated) from anywhere in the permitted facility. For many years, the mill has been discharging approximately half of its discharge permit limit, around 12 MGD. It is anticipated that this project will increase discharge into the river by approximately 0.585 MGD, or less than 5%.

NMFS Listed Species and Designated Critical Habitat

Two species of endangered fish have been listed in this portion of the Penobscot River; Atlantic salmon (*Salmo salar*) and shortnose sturgeon (*Acipenser brevirostrum*).

Atlantic salmon

The Gulf of Maine Distinct Population Segment (GOM DPS) of Atlantic salmon includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Included are all associated conservation hatchery populations used to supplement these natural populations; currently, such conservation hatchery populations are maintained at Green Lake National Fish Hatchery and Craig Brook National Fish Hatchery. Critical habitat has been designated for listed Atlantic salmon pursuant to section 4(b)(2) of the ESA. The critical habitat designation for the GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 km of perennial River, stream, and estuary habitat and 799 square km of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species. The entire occupied range of the GOM DPS in which critical habitat is designated is within the State of Maine.

The GOM DPS of Atlantic salmon was jointly listed as endangered by NMFS and U.S. Fish and Wildlife Service (USFWS) (collectively referred to as the Services) on July 19, 2009. According

to the Statement of Cooperation between the Services, the USFWS has the lead on Section 7 consultations for Atlantic salmon that involve activities in freshwater. Therefore, this consultation will not address effects to the GOM DPS or to the species' critical habitat.

Shortnose sturgeon

On June 30, 1978, one shortnose sturgeon was captured in Penobscot Bay during finfish sampling conducted by the MDMR (Squiers and Smith 1979). As shortnose sturgeon were thought to rarely participate in coastal migrations and are known to complete their entire life history in their natal river, researchers concluded that this sturgeon was a member of a previously undocumented Penobscot River population of shortnose sturgeon. The river had long been suspected of supporting a shortnose sturgeon population based on anecdotal evidence of shortnose sturgeon capture and observation in combination with archeological data which suggested that sturgeon from the Penobscot River were used by native peoples (Knight 1985 and Petersen and Sanger 1986 in NMFS 1998; see also Fernandes et al. 2010).

Using mark-recapture data from 2006 and 2007 UM researchers used two different calculation methods to obtain a preliminary population estimate for the Penobscot River (Fernandes et al. 2008). Using a Lincoln/Peterson Index, an estimate of 1,049 fish was calculated (95% confidence interval of 673 and 6,939). A Schnabel estimate was also calculated yielding an estimate of 1,710 shortnose sturgeon. It must be noted that both models assume a closed population (no mortality, birth or migration takes place). Fernandes (2008) used capture data from 2006 and 2007 to calculate Peterson and Schnabel estimates of population size. The Peterson estimate of shortnose sturgeon abundance was 1,425 with a confidence interval of 203-2,647. The Schnabel estimate was 1,531 with a confidence interval of 885-5,681. As reported by Fernandes (2008), these two methods require a large number of recaptures for a precise estimate of abundance, and were likely affected by the low number of recaptures in this study. Additionally, several of the assumptions of these tests were violated, including the lack of a closed population and random sampling. A POPAN Jolly-Seber open population model completed in 2010 estimated approximately 1,654 (95%CI: 1,108-2,200) adult shortnose sturgeon using the Penobscot River. Robust design analysis with closed periods in the summer and late fall estimated seasonal adult abundance ranging from 636-1,285 (weighted mean), with a low estimate of 602 (95%CI: 409.6-910.8) and a high of 1,306 (95% CI: 795.6-2,176.4). Based on recaptures of tagged fish, the shortnose sturgeon population in the Penobscot is estimated to be modest is size, ranging from several hundred to a few thousand individuals (Fernandes 2008; Fernandes et al. 2010; Dionne 2010 in Maine DMR 2010).

Currently, shortnose sturgeon are limited to the area below Veazie Dam. Existing fish passage facilities at the Veazie Dam are not used by shortnose sturgeon and they are not known to occur upstream of the dam. Historically, the first natural obstacle to sturgeon migration on the Penobscot River may have been the falls at Milford, approximately rkm 70 (L. Flagg, MDMR, pers. comm 1998). If sturgeon were able to ascend the falls at Milford, they could have migrated without obstruction to Mattaseunk (rkm 171).

Spawning areas in the Penobscot River have not yet been identified. Researchers suspect that based on the literature, spawning likely occurs as far upriver as sturgeon can migrate. This allows larvae and juveniles the most freshwater habitat downriver before they enter estuarine

conditions. Based on life history information from other rivers, adult shortnose sturgeon in the Penobscot River would likely spawn downstream of the Veazie Dam when water temperatures are between 8 and 18°C. Based on studies of spawning shortnose sturgeon in other rivers, spawning areas likely have depths of 1-5m with water velocity between 50-125 cm/s and cobble/rubble substrate (101-300 mm diameter). In 2009, spawning mats and ichthyoplankton nets were used to detect potential spawning below Veazie Dam (Zydlewski 2009a). While no actual spawning activity was detected, suitable spawning areas were described, using data on bathymetry, water temperature and velocity (Zydlewski 2009a). Spawning habitat suitability (based on data on substrate and water velocity during predicted spawning periods) was much higher downstream in the vicinity of the former Bangor Dam, and essentially non-existent immediately below Veazie Dam (Zydlewski 2009a).

Adults are known to rapidly leave the area after spawning and move to downstream foraging areas. Adults may also briefly visit more saline reaches of the estuary as is seen in the Connecticut and Merrimack Rivers. Eggs and larvae are likely concentrated near the spawning area for up to 4 weeks post-spawning, after which larvae disperse into the tidal river. As juvenile sturgeon are believed to remain upstream of the salt wedge until they are about 45 cm long (Crance 1986), it is likely that juvenile sturgeon occur in the Penobscot River from the Veazie Dam downstream to the Town of Hampden, a stretch of river approximately 16 km long.

The OTFF mill is located between the first (Veazie) and second (Great Works) mainstem dams on the Penobscot River. As part of the Penobscot River Restoration Project (PRRP), both of these dams have been proposed to be removed, which would allow shortnose sturgeon to access the upstream extent of their historic range, which is located upstream of the proposed project at Milford Falls. It is possible that once the dams are removed, sturgeon will spawn downstream of Milford Falls and, therefore; both adults and juveniles could be found within the action area of this project at certain times of year. However, until the Veazie Dam in removed, shortnose sturgeon cannot access the action area of the proposed project.

Effects of the Action on Listed Species

Although shortnose sturgeon cannot currently access the area immediately downstream of the OTFF outfalls, the effluent still has the potential to affect fish and habitat downstream of the Veazie Dam, 7 miles downriver from the project. The effects of industrial discharge are significant factors in impairing water quality in Maine rivers and estuaries. According to the Maine Integrated Water Quality Report (DEP 2010), 223 miles of river and stream in Maine are considered impaired due to industrial permitted discharges. Although many of the more damaging pollutants (such as PCBs and dioxin) have been essentially eliminated from industrial discharges, other effects to water quality, such as reduced dissolved oxygen or increased temperature, can still impair river habitat and make it unsuitable to listed sturgeon. However, given the distance between the project and Veazie Dam, it is likely that discharges from the proposed project will be diluted significantly before shortnose sturgeon are exposed to it.

Biochemical Oxygen Demand

Biochemical Oxygen Demand (BOD) has the potential to affect dissolved oxygen (DO) concentrations in the vicinity of the facilities' outfall. The Maine Department of Environmental

Protection (MDEP) has classified the receiving waters at the point of discharge as Class B waters. Class B waters must attain minimum DO saturations of 75%, or 7 mg/L in order to support survival and growth of salmonids. Shortnose sturgeon are known to be adversely affected by DO levels below 5 mg/L.

The average DO in this section of the river is above 7.0 mg/l. Although DO in the river could decrease because of the 40 to 60% increase in BOD from the biorefinery, the maximum daily discharges from both the existing pulp mill and the proposed project are still likely to remain below 5,500 pounds per day in summer, which is well below the permitted limit of 7,500 pounds per day. Therefore, it is not anticipated that the increase in BOD would decrease the ambient DO in the river to below 7 mg/L.

Total Suspended Solids

TSS can affect fish directly by killing them or reducing growth rate or resistance to disease, by preventing the successful development of fish eggs and larvae, by modifying natural movements and migration, or by reducing the abundance of available food (EPA 1976). These effects are caused by TSS decreasing light penetration and by burial of the benthos. Eggs and larvae are most vulnerable to increases in solids.

Studies of the effects of turbid waters on fish suggest that concentrations of suspended solids can reach thousands of milligrams per liter before an acute toxic reaction is expected (Burton 1993). The studies reviewed by Burton demonstrated lethal effects to fish at concentrations of 580mg/L to 700,000mg/L depending on species. Sublethal effects have been observed at substantially lower turbidity levels. For example, prey consumption was significantly lower for striped bass larvae tested at concentrations of 200 and 500 mg/L compared to larvae exposed to 0 and 75 mg/L (Breitburg 1988 in Burton 1993). Studies with striped bass adults showed that pre-spawners did not avoid concentrations of 954 to 1,920 mg/L to reach spawning sites (Summerfelt and Moiser 1976 and Combs 1979 in Burton 1993). While there have been no directed studies on the effects of TSS on shortnose sturgeon, juveniles and adults are often documented in turbid water and Dadswell (1984) reports that they are more active under lowered light conditions, such as those in turbid waters. As such, shortnose sturgeon are assumed to be at least as tolerant to suspended sediment as other estuarine fish such as striped bass.

As noted above, shortnose sturgeon eggs and larvae are less tolerant to sediment levels than juveniles and adults. Several studies have examined the effects of suspended solids on fish larvae. Observations in the Delaware River indicated that larval populations may be decimated when suspended material settles out of the water column (Hastings 1983). Larval survival studies conducted by Auld and Schubel (1978) showed that striped bass larvae tolerated 50 mg/l and 100 mg/l suspended sediment concentrations and that survival was significantly reduced at 1000 mg/l. According to Wilber and Clarke (2001), hatching is delayed for striped bass and white perch eggs exposed for one day to sediment concentrations of 800 and 100 mg/l, respectively.

In a study on the effects of suspended sediment on white perch and striped bass eggs and larvae performed by the ACOE (Morgan et al. 1973), researchers found that sediment began to adhere

to the eggs when sediment levels of over 1000 parts per million (ppm) were reached. No adverse effects to demersal eggs and larvae have been documented at levels at or below 50mg/L (above the highest level authorized by this permit).

The proposed project is anticipated to increase TSS discharge in proportion to the increase of total discharge due to the similarity in composition of the biorefinery effluent and the effluent currently being discharged from the OTFF wastewater treatment plant. Therefore, it is anticipated that the biorefinery will increase TSS discharge by approximately 5%. The maximum monthly average TSS allowed by the MEPDES permit is 20 mg/l, significantly less than the 50 mg/l thought to effect sturgeon eggs and larvae. Therefore, NMFS believes that a 5% increase in TSS will be insignificant and will not adversely affect any shortnose sturgeon present 7 miles downstream.

pH

The MPDES permit requires that the discharge maintain a pH of 5.0 – 9.0. The mean minimum daily effluent ranges between 6.7 and 8.2, while the maximum daily effluent ranges between 6.8 and 8.2. A pH of 6.0 – 9.0 is harmless to most marine organisms (Ausperger 2004) and is within the normal range of pH for freshwater. The pH of the effluent is not anticipated to change significantly due to the proposed project.

Temperature

The additional effluent being produced by the biorefinery will be approximately the same temperature as the water being discharged from the secondary wastewater system associated with the pulp mill. The additional 5% of discharge volumes is not anticipated to drastically change the temperature of the river in action area. The estimated increase in mean July through August 2005 water temperature downstream of the OTFF mill would be 0.035°C (0.062°F; range: 0.012 to 0.060°C, 0.021 to 0.107°F). Such a small increase will likely be undetectable downstream of Veazie Dam, and is therefore unlikely to adversely affect shortnose sturgeon.

Whole Effluent Testing

The MPDES permit for the OTFF wastewater discharge into the Penobscot River, requires that whole effluent testing (WET) be conducted to determine the overall affect of the effluent on aquatic organisms in the river. Aquatic organisms were exposed to varying concentrations of effluent in the laboratory so that effects could be measured over the short (acute) and long (chronic) term. The standard organisms used in this type of testing are the water flea (*Ceriodaphnia dubia*), fathead minnow (*Pimephales promelas*) and brook trout (*Salvelinus fontinalis*). Although fathead minnow are commonly used as a standard toxicity test organism, Cope et al (2011) have indicated that they do not adequately predict toxicity to shortnose sturgeon. Brook trout are a better surrogate as they have a closer sensitivity level to shortnose sturgeon. Brook trout were used in the WET tests in all but two years between 2002 and 2011.

The WET tests conducted between 2002 and 2011 indicate that the acute no observed effect level (A-NOEL) for brook trout was between 65 and 100%, while the chronic no observed effect level

(C-NOEL) was between 25 and 100%. As these values are higher than the permit values of 5.99% and 1.35%, respectively, the OTFF effluent being discharged is not expected to adversely affect aquatic life upon dilution by the flow and volume of the Penobscot River in the area of the outfall. Dilution rates will be significantly greater 7 miles downstream of the outfall where shortnose sturgeon may occur; therefore, increasing discharge volumes by 5% is not anticipated to significantly affect the species.

To examine the levels of possibly toxic chemicals in the effluent, tests for metals, chloride, and ammonia, which are considered the chemicals most likely to be of potential concern to fish, were conducted concurrently with the WET. At current discharge rates (approximately 12 MGD) risk quotients for acute and chronic exposures for all contaminants are between .05 and .1 (>1.0 indicates potential affects to aquatic life). Given that the existing risk quotients are significantly below the permit thresholds, a 5% increase in effluent volume is not likely to cause significant effects to aquatic life.

Conclusion

Based on the above, NMFS determines that all effects, if adverse, will be insignificant or discountable, and concurs with the DOE's determination that the proposed project is not likely to adversely affect listed shortnose sturgeon present 7 miles downstream of the project. If the Veazie Dam is removed and shortnose sturgeon are able to access the area immediately downstream of the OTFF outfalls, NMFS will need to reassess the potential for effect to the species.

This concludes consultation pursuant to Section 7 of the ESA for this project. Re-initiation of consultation is required and shall be requested by the DOE or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) if the identified action is subsequently modified in a manner that causes an effect to listed shortnose sturgeon that was not considered in the consultation; or, (c) if a new species is listed or critical habitat designated that may be affected by the identified action.

Technical Assistance for the Proposed GOM DPS of Atlantic sturgeon

On October 6, 2010, NMFS published two proposed rules to list five distinct population segments (DPS) of Atlantic sturgeon *(Acipenser oxyrinchus oxyrinchus)* under the ESA. NMFS is proposing to list four DPSs as endangered (New York Bight, Chesapeake Bay, Carolina and South Atlantic) and one DPS of Atlantic sturgeon as threatened (Gulf of Maine DPS). Once a species is proposed for listing, as either endangered or threatened, the conference provisions of the ESA may apply (see 50 CFR 402.10 and ESA Section 7(a)(4)). As stated at 50 CFR 402.10, "Federal agencies are required to confer with NMFS on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat."

NMFS has reviewed the proposed action in order to provide guidance to the DOE as to whether a conference is required in this case. As described above for shortnose sturgeon, upstream movements of Atlantic sturgeon in the Penobscot River are blocked by the Veazie Dam. As

such, Altantic sturgeon cannot access the project site. Atlantic sturgeon are known to occur in the downstream area where they may be exposed to effluent associated with the facility. Based on the best available information, the proposed actions considered in this consultation are likely to have similar effects to Atlantic sturgeon as those effects analyzed above for shortnose sturgeon. As explained above, all effects to shortnose sturgeon resulting from the proposed projects will be insignificant and discountable. NMFS anticipates that effects to Atlantic sturgeon would be similar. As such, NMFS does not believe a conference is needed at this time for Atlantic sturgeon. Should project plans change, NMFS recommends that the DOE discuss the potential need for conference with NMFS.

Should project plans change or new information becomes available that changes the basis for this determination, or if you have any questions or concerns about these comments, please contact Dan Tierney at (207) 866-3755 or by e-mail at Dan.Tierney@noaa.gov.

Sincerely,

Patricia A. Kurkul
Regional Administrator

Cc: Dan Tierney-NMFS
Wende Mahaney-USFWS
Norm Dube-MDMR

File Code: Sec 7 DOE Maine-OTFF Biorefinery
PCTS: I/NER/2011/02040

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

May 11, 2011

Ms. Wende Mahaney
U.S. Fish and Wildlife Service
17 Godfrey Drive
Orono, ME 04473

Subject: Request for Informal Section 7 Consultation for the Proposed Old Town Fuel and Fiber Biorefinery, Old Town, Penobscot County, ME

Dear Ms. Mahaney:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Red Shield Acquisition, LLC d.b.a Old Town Fuel and Fiber (OTFF) to install and initially operate a demonstration scale integrated biorefinery (IBR) at their operating pulp mill in Old Town, Maine. The demonstration-scale IBR would convert woody biomass to biofuels. To comply with the National Environmental Policy Act (NEPA 40; Code of Federal Regulations Parts 1500 to 1508), DOE will prepare an Environmental Assessment (EA).

As part of the EA process, DOE is requesting informal consultation under Section 7 of the Endangered Species Act (ESA). In addition, DOE is requesting concurrence with the determination that the above-referenced action *may affect, but is not likely to adversely affect* the Gulf of Maine (GOM) Distinct Population Segment (DPS) of anadromous Atlantic salmon (*Salmo salar*). DOE has determined that the proposed action would not destroy or adversely modify Atlantic salmon critical habitat. DOE understands that, in accordance with the agreement between the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) (hereinafter together referred to as "the Services"), the USFWS will take the lead on the Section 7 consultation for Atlantic salmon. However, for consistency, DOE will be providing the same information to the NMFS regarding Atlantic salmon and the proposed project.

DOE is aware that OTFF has previously requested technical assistance from the Services. As a result OTFF has prepared the *OTFF Proposed Biorefinery Effluent Analysis* (ICF, 2011) (Effluent Report). OTFF submitted the Effluent Report to the Services in February 2011. The NMFS provided comments via email on April 4, 2011. The Effluent Report was revised in response to NMFS's comments, and is attached hereto. (Note that all references cited in this letter are provided on the reference list in the revised Effluent Report.)

Proposed Project

The purpose of the proposed OTFF IBR (the proposed project) would be to demonstrate the technical and economical feasibility of converting lignocellulosic extract to n-butanol, which would form the basis for a series of commercial-scale biorefineries. The proposed project is

expected to produce 1.32 million gallons of n-butanol, 2.13 million gallons of acetic acid, 740,000 gallons of formic acid, and 410,000 gallons of acetone annually. The proposed project would be located within the existing OTFF pulp mill site at 24 Portland Street in Old Town, Maine, 04468. The proposed project would require 0.90 acre (40,000 square feet) in the 5.7-acre (250,000-square-foot) former tissue paper machine building. The proposed project would be installed within the existing vacant building, which is adjacent to the operating paper mill. If necessary, one or two storage tanks may be located outside the building. If storage tanks are constructed outside the building, they would be constructed on existing asphalt/unvegetated disturbed ground, and therefore are not anticipated to remove or affect any upland habitats. Additionally, all storage tanks, whether inside or outside the building, would comply with Spill Prevention, Control and Countermeasure Act requirements for containment in the event of a leak.

The proposed project is anticipated to operate under the existing Title V Air Quality permit, with minor modifications. The proposed project would not result in an increase in water usage over the currently permitted quantity of 30 million gallons per day (mgd). The proposed project would not involve in-water work.

Currently, the pulp mill's wastewater treatment plant discharges its effluent into the Penobscot River under Maine Pollutant Discharge Elimination System (MEPDES) Permit No. ME0002020 (Appendix A of the Effluent Report). The MEPDES permit specifies the allowable effluent discharge rates and characteristics into the Penobscot River in order to safeguard water quality and protect aquatic life. The pulp mill currently produces approximately 12 mgd of wastewater that is treated in the pulp mill's wastewater treatment facility. The 12 mgd represents approximately one-half the allowable permitted discharge of 24.4 mgd. Under the MEPDES permit, the system is permitted to release 24.4 mgd of secondary treated process waters (including stormwater and landfill leachate) and other wastewaters associated with the pulp and papermaking process, non-contact cooling waters, turbine condensing waters, and filter backwash waters from three separate outfalls to the Penobscot River. No sanitary sewer waste is treated within the pulp mill's wastewater treatment plant. All sanitary sewer waste is routed to and treated by the municipal facility.

DOE has reviewed the proposed project and analyzed all available OTFF outfall discharge data and testing results, which included several recent years of screening-level whole effluent toxicity (WET) testing. The analysis is presented in the attached Effluent Report, and it was the basis for DOE's conclusion regarding effects on listed species.

Listed Species

Background

As a result of the decommissioning project to remove the Great Works Dam adjacent to OTFF, an effort that is being lead by the Penobscot River Restoration Trust, OTFF needs to relocate the pulp mill water supply intake. In May 2010, the Penobscot River Restoration Trust submitted an application to the U.S. Army Corps of Engineers (USACE) on behalf of OTFF to move the water intake downstream. As part of ESA Section 7 consultation with your office, a Biological

Opinion was issued in September 2010. For that consultation your office analyzed extensive information on existing conditions and habitat potential of the Penobscot River in the vicinity of OTFF. Additionally, the NMFS issued a Biological Opinion in December 2009 for the decommissioning of the Great Works Project (Federal Energy Regulatory Commission [FERC] No. 2312) and Veazie Project (FERC No. 2403) and construction of a fish bypass at the Howland Project (FERC No. 2721) (hereinafter "NMFS BO"). As a result of the dam removal and fish bypass effort biological and habitat assessment work has been performed along the reach of the Penobscot River directly adjacent to the OTFF pulp mill site. As part of the technical assistance discussions with OTFF, the Services indicated that any analysis for the proposed project would focus on the effluent discharge from the pulp mill's wastewater treatment plant because no in-water work or upland work adjacent to the Penobscot River is planned.

Atlantic Salmon

The GOM DPS of anadromous Atlantic salmon was initially listed by the Services as endangered on November 17, 2000 (65 *Federal Register* [FR] 69459). A subsequent Services listing as Endangered (74 FR 29344; June 19, 2009) included an expanded range for the GOM DPS of Atlantic salmon. The decision to expand the geographic range of the GOM DPS was largely based on the results of a Status Review (Fay, et al., 2006) completed by a Biological Review Team (BRT) consisting of federal and state agencies and Tribal interests. Fay, et al. concluded that the DPS delineation in the 2000 listing designation was largely appropriate, except in the case of large rivers that were excluded in the 2000 listing determination. Fay, et al. concluded that the salmon currently inhabiting Maine's larger rivers (Androscoggin, Kennebec, and Penobscot) are genetically similar to the salmon inhabiting the rivers included in the GOM DPS as listed in 2000, have similar life history characteristics, and/or occur in the same zoogeographic region (NMFS BO).

In 2004, electrofish surveys in and around the Great Works Dam detected a single Atlantic salmon. Because the Great Works Dam is slated for decommissioning and removal, it is likely that numbers of Atlantic salmon that utilize this reach of the Penobscot River would increase after removal has been completed (Multi-Project Environmental Analysis, Veazie Project FERC No. 2430, Great Works Project FERC No. 2312 and Howland Project FERC No. 2721, prepared by Kleinschmidt, October 2008 [hereinafter Multi-Project EA]).

Critical Habitat

On June 19, 2009, the NMFS designated critical habitat for listed Atlantic salmon pursuant to section 4(b)(2) of the ESA. The critical habitat designation for GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 kilometers (12,161 miles) of perennial river, stream, and estuary habitat and 799 square kilometers (309 square miles) of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species.

The proposed project would be in the Great Works Stream-Penobscot River HUC-10 watershed, which has been designated as critical habitat for the Atlantic salmon GOM DPS. The Primary Constituent Elements of Atlantic salmon critical habitat are (1) spawning and rearing habitat and

(2) migration habitat. According to information provided in the Letter of Concurrence issued for the OTFF pulp mill water supply intake relocation (issued September 8, 2010, USFWS/Region5/ES/ MEF; USFWS, 2010), Atlantic salmon could be present in the Penobscot River adjacent to the proposed project, primarily because:

1. Atlantic salmon spawn and rear infrequently and in limited numbers in Great Works Stream, a tributary of the Penobscot River approximately 500 feet downstream of the project area on the left bank of the Penobscot River.
2. Approximately 13,500 fry were stocked in Great Works Stream in 2008 as part of a study, and these fish are now rearing in Great Works Stream or the Penobscot River.
3. Adults migrate through the action area from May through November during their upstream migration period.
4. Downstream migrating post-spawned adults pass through the action area, primarily in spring during runoff.
5. Downstream migrating smolts pass through the action area, typically in May as high flows recede.

Existing Conditions at the Project Site

Because the proposed project does not include in-water activities and upland construction would be confined to inside the existing structures or in upland areas that are developed, construction activities are not anticipated to affect listed fish species. Therefore, it is believed that potential effects to listed fish as a result of the biorefinery would relate to the existing NPDES-compliant wastewater treatment discharge and any changes to that discharge that would result from operation of the biorefinery that intend to utilize the wastewater treatment facility.

Existing Water Quality in the Vicinity of the Proposed Project

According to the Multi-Project EA, waters in the proposed project area have been classified as Class B and are of sufficient quality to support drinking water supply (after treatment), fishing, and contact recreation and function as unimpaired habitat for fish and other aquatic life (PPL Great Works, LLC, 2000 [Kleinschmidt 2008]). However, the Penobscot River at Old Town and Milford is designated Class B Category 5-B due to *E. coli* contamination (MDEP, 2006; MDEP, 2008). Sampling above the Great Works Dam by MDEP in 2001 as part of their basin-wide water quality sampling program indicated that the following (Mitnik, 2002):

- Average daily and daily maximum dissolved oxygen levels met standards for Class B waters of 7 parts per million and 75 percent oxygen saturation.

- Daily minimum dissolved oxygen concentrations fell slightly below (approximately 6.75 parts per million) standards for Class B waters of 7 parts per million and 75 percent oxygen saturation in 2001.

Because data were collected during a heat spell, the 3-day average water temperature for all Penobscot River sampling stations, including the Great Works site, ranged from 25° to 27.3° C (Mitnik, 2002). Minimum, maximum, and average values at Great Works ranged from

approximately 26° to 28° C. In 1999, as part of relicensing efforts for the Great Works Project, and pursuant to a request from the Maine Department of Environmental Protection, PPL Great Works, LLC, performed a macroinvertebrate study in the Great Works project area to assess water quality as it pertains to established aquatic life standards. The PPL study documented that the Great Works Project bypass reach and impoundment met Class B water quality standards for aquatic life. The Maine DEP verified and concurred with this assessment on January 18, 2000 (PPL Great Works, 2000 [Kleinschmidt 2008]).

Overall, pollution beyond sewer treatment has been a problem for the Penobscot River system, and paper production facilities have resulted in higher concentrations throughout the system of metals, dioxin, dissolved solids, phenols, and hydrocarbons. The NMFS currently reviews and comments on all NPDES permits issued by the Maine DEP below Veazie Dam, so the NMFS has not reviewed the OTFF NPDES permit in the past.

Effluent Report

Based on the analysis in the Effluent Report:

- The wastewater treatment plant's effluent discharges to the Penobscot River are estimated to increase by 0.585 mgd, which is less than 5 percent of the current discharge flows of 12 to 13 mgd

- Acidity (pH) indicate that the mean minimum daily effluent pH ranged from 6.7 to 8.2, and that the maximum daily effluent pH ranged from 6.8 to 8.2, which is within an acceptable range and is not anticipated to change with operation of the proposed project.

- Dissolved oxygen levels in and around the proposed project area are slightly lower than the minimum criterion for Class B waters. Maximum likely daily discharges from the existing pulp mill and the proposed project combined are estimated to remain below 5,500 pounds per day in summer, which is well within the permitted limit of 7,500 pounds per day, and therefore are not anticipated to increase over existing conditions.

- Total suspended solids discharged to the river with the proposed project operation (i.e., the increase in the whole effluent discharge to the river in relation to current levels) would be no more than 5 percent. The basis for this estimate is that the composition of the biorefinery effluent entering the wastewater treatment plant would be similar in composition to the existing pulp mill effluent.

- The available estimates of effluent composition for the biorefinery suggest that, in general, the change in temperature attributable to the proposed project would be in proportion to the increase in discharged effluent (5 percent), and therefore considerably less than 0.1° C.

- Ammonia and metals, including heavy metals, would not increase in concentration.

- The "new" pulp mill discharge license would include a phosphorous limit of 0.5 mg/L [milligrams per liter]" and the wastewater treatment system, including wastewater from the biorefinery, would be able to meet that limit. Phosphorus levels in the Penobscot River have been measured from 0.0036 to 0.129 milligrams. Assuming dilution factors of 16.7 for acute exposures to 74.2 for chronic exposures, the stated limit of 0.5 mg/L would result in phosphorous short-term and longer-term concentrations of 0.030 and 0.0068 mg/L, respectively, in the mixing zone immediately downriver of the discharge. The MEDEP has measured average total phosphorus levels below point-source discharges of between 0.020 and 0.030 mg/L (MEDEP, 2008). Therefore, the proposed project might result in similar phosphorus levels at the OTFF pulp mill outfall in the Penobscot River as measured below other point-source discharges.

- Total nitrogen in the Penobscot River ranges from 0.2 to 0.4 parts per million (Mitnik, 2002). Sources include municipal wastewater treatment plants, pulp and paper mills, stormwater runoff, septic systems, agriculture, and atmospheric deposition. Phosphorus is a limiting nutrient in fresh water. Total nitrogen for all riverine and estuarine locations ranged from 0.2 to 0.5 mg/L, with average ammonia nitrogen less than 0.001 mg/L (i.e., 1 microgram per liter) at all locations. These are considered relatively low levels of nitrogen (MEDEP, 2008).

Although detailed data on riverbed substrates in the vicinity of the OTFF discharges are limited, it appears that existing conditions are somewhat suitable for species such as salmon and sturgeon. The Multi-Project EA (Kleinschmidt, 2008) describes substrates within the existing Great Works impoundment (bedrock, boulders, cobble, and gravel) as being similar to those in the contiguous free-flowing reaches, including the area downstream of the discharge points.

The Multi-Project EA suggests that Atlantic salmon spawn infrequently in the Great Work's dam tributary, and pending dam removal, opportunities in the mainstem of the Penobscot River in this reach could be available.

Screening-Level WET Testing Summary

The WET testing of effluent from the OTFF pulp mill from 2002 through 2005 and 2007 through 2008 indicated compliance with the 2002 MEPDES permit for the facility. In addition, estimated risk quotient for all WET tests were found to be at least one order of magnitude lower than the "level of concern" value of 1.0.

A minor modification to the existing NPDES permit would likely be required to include a phosphorous limit of 0.5 mg/L based on the results of the small pilot-scale research and analyses currently under way. Results of the pilot-scale activities would be included in the EA for NMFS review and comment.

Conclusion

Based on the attached Effluent Report, DOE has determined that the proposed project *may affect, but is not likely to adversely affect* the endangered Atlantic salmon nor would it destroy or result in adverse modification of Atlantic salmon critical habitat.

Please contact Kristin Kerwin at 720-356-1564 or kristin.kerwin@go.doe.gov with any questions.

Sincerely

Kristin Kerwin
NEPA Compliance Officer

Cc: Jim St Pierre, OTFF
Whitney Fiore, ICF
Jeff Murphy, NMFS

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Maine Field Office – Ecological Services
17 Godfrey Drive, Suite 2
Orono, Maine 04473

July 21, 2011

In Reply Refer to:
FWS/Region5/ES/MEFO

REF: Section 7 Consultation Log #53411-2010-I-0360

Ms. Kristin Kerwin
Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, CO 80401-3393

RE: Request for Informal Section 7 Consultation for the Proposed Old Town Fuel and Fiber Biorefinery, Old Town, Penobscot County, ME

Dear Ms. Kerwin:

This letter responds to your May 11, 2011 letter requesting consultation pursuant to Section 7 of the Endangered Species Act (ESA) regarding the proposed installation and operation of a demonstration-scale integrated biorefinery at the Old Town Fuel and Fiber (OTFF) pulp mill in Old Town, Maine. The biorefinery project will be funded by the Department of Energy (DOE). DOE has determined that the proposed project may affect, but is not likely adversely affect the endangered Atlantic salmon (*Salmo salar*) nor would it destroy or result in adverse modification of Atlantic salmon critical habitat, and has requested U.S. Fish and Wildlife Service (Service) concurrence with this determination. The following comments are provided in accordance with the ESA of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Proposed Action

The proposed project involves the installation of a demonstration scale biorefinery at the OTFF mill to extract n-butanol from lignocellusosic extract. The OTFF facility discharges wastewater into the Penobscot River. The project is expected to annually produce 1.32 million gallons of n-butanol, 2.13 million gallons of acetic acid, 740,000 gallons of formic acid, and 410,000 gallons of acetone. In addition, 80,000 gallons of furfural and 44,000 gallons of ethanol would be produced and used on-site in the OTFF boilers.

The addition of a small-scale biorefinery to the OTFF facility will result in a small increase in the amount of wastewater being discharged into the Penobscot River. The pulp mill's wastewater

treatment plant discharges its effluent to the river under Maine Pollutant Discharge Elimination System (MEPDES) Permit No. ME0002020 and Maine Waste Discharge License (MEWDL) No. W002226-5N-H-R (both issued on May 19, 2011), which specifies allowed effluent discharge rates and characteristics to safeguard water quality in the Penobscot River and to protect aquatic life. The system is permitted to release 24.4 million gallons per day (MGD) of secondary treated process waters (including storm water and landfill leachate) and other wastewaters associated with the pulp and papermaking process, non-contact cooling waters, turbine condensing waters, and filter backwash waters from three separate outfalls to the Penobscot River. The pulp mill currently produces approximately 12 MGD of wastewater, or one-half the allowable permitted discharge limit, that is treated in the pulp mill's wastewater treatment facility prior to discharge. It is anticipated that the proposed project will increase treated wastewater discharge into the river by approximately 0.585 MGD. This amount represents nearly a 5% increase to the facility's current discharge flows of 12 to 13 MGD.

Listed Species and Critical Habitat in the Proposed Action Area

The Gulf of Maine Distinct Population Segment (GOM DPS) of Atlantic salmon is listed as a federally-endangered species under the joint jurisdiction of the Service and the National Marine Fisheries Service (NMFS) (74 FR 29344; June 19, 2009). The Atlantic salmon GOM DPS encompasses all naturally spawned and conservation hatchery populations of anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River and wherever these fish occur in the estuarine and marine environment. The upstream extent of the freshwater range of the GOM DPS is delimited by seven impassable natural falls located within the Androscoggin, Kennebec, and Penobscot drainages[1]. Also included in the GOM DPS are all associated conservation hatchery populations used to supplement these natural populations. Excluded are landlocked salmon (also *Salmo salar*) and those salmon raised in commercial hatcheries for aquaculture. The OTFF project occurs within the geographic range of the GOM DPS.

On June 19, 2009, NMFS designated critical habitat for listed Atlantic salmon pursuant to section 4(b)(2) of the ESA. The critical habitat designation for the GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 km of perennial river, stream, and estuary habitat and 799 square km of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species.

The OTFF project occurs in the Great Works Stream-Penobscot River HUC-10 watershed, which has been designated as critical habitat for the Atlantic salmon GOM DPS. The Primary Constituent Elements (PCEs) of Atlantic salmon critical habitat include 1) spawning and rearing habitat and 2) migration habitat. According to information provided by the Service, Atlantic salmon may be present in action area, primarily because:

[1] See the final rule listing the Gulf of Maine Distinct Population Segment as an endangered species for the specific locations of the seven impassable falls (74 FR 29346; June 19, 2009).

1. Atlantic salmon spawn and rear infrequently and in limited numbers in Great Works Stream, a tributary of the Penobscot River which is located approximately 500 feet downstream of the project area on the left bank of the Penobscot River;
2. Approximately 13,500 fry were stocked in Great Works Stream in 2008 as part of a study and these fish are now rearing in Great Works Stream or the Penobscot River;
3. Adults migrate through the action area from May through November during their upstream migration period;
4. Downstream migrating post-spawned adults pass through the action area, primarily in the spring during run-off; and
5. Downstream migrating smolts pass through the action area, typically in May as high flows recede.

Effects of the Proposed Action on Atlantic Salmon

As indicated above, this project occurs within the geographic range of the GOM DPS and thus has the potential to affect listed salmon. Endangered Atlantic salmon occur in the Penobscot River and its tributaries. In 2010, 1,316 adult Atlantic salmon were counted at the fish trap at the Veazie Dam, the first dam on the mainstem of the Penobscot River (which is located downstream of the action area). The next two dams on the Penobscot River are the Great Works and Milford Dams. The proposed action area occurs just downstream of the Great Works Dam. When achievable (based on run-size, age class proportion and sex ratio), approximately 650 adult salmon are collected each year at the Veazie Dam for transport to the federal salmon hatcheries in Maine; the remaining fish are allowed to pass upstream. The Veazie Dam and Great Works Dam are slated for decommissioning and removal. The removal of these dams will result in greater numbers of adult salmon utilizing the reach that includes outfalls from the OTFF facility.

The effects of industrial wastewater discharge are significant factors impairing water quality in Maine rivers and estuaries. According to the Maine Integrated Water Quality Report (MEDEP 2010), 223 miles of river and stream in Maine are considered impaired due to industrial permitted discharges. The segment of the Penobscot River that includes the OTFF facility is classified as Class B water with an additional categorization of 5D (i.e., impaired by legacy pollutants - polychlorinated biphenyls, PCBs) (MEDEP 2010).

Several water quality parameters with the potential of adversely affecting salmon are addressed below: biochemical oxygen demand, total suspended solids, pH, temperature, whole effluent toxicity testing, and chemical-specific testing.

Biochemical Oxygen Demand

Biochemical Oxygen Demand (BOD) has the potential to affect dissolved oxygen (DO) concentrations in the vicinity of the facility's outfalls. The Maine Department of Environmental Protection (MEDEP) has classified the receiving waters at the point of discharge as Class B waters. DO content of Class B waters may not be less than 7 mg/L or 75% saturation, whichever is higher, except for the period from October 1st to May 14th.

DO levels in and around the proposed project area are slightly lower than the minimum criterion for Class B waters (MEDEP 2008). Although DO in the river could decrease because of the 40 to 60% increase in BOD from the biorefinery, the maximum daily discharges from both the existing pulp mill and the proposed project are still likely to remain below 5,500 pounds per day in summer, which is well below the permitted limit of 7,500 pounds per day. Therefore, it is not anticipated that the increase in BOD would decrease the ambient DO in the river to below 7 mg/L.

Total Suspended Solids (TSS)

Elevated TSS concentrations have the potential to adversely affect adult and juvenile Atlantic salmon in the Penobscot River. According to Herbert and Merkens (1961), the most commonly observed effects of exposure to elevated TSS concentrations on salmonids include: 1) avoidance of turbid waters in homing adult anadromous salmonids, 2) avoidance or alarm reactions by juvenile salmonids, 3) displacement of juvenile salmonids, 4) reduced feeding and growth, 5) physiological stress and respiratory impairment, 6) damage to gills, 7) reduced tolerance to disease and toxicants, 8) reduced survival, and 9) direct mortality. Fine sediment deposited in salmonid spawning gravel can also reduce interstitial water flow, leading to depressed DO concentrations, and can physically trap emerging fry on the gravel.

Studies of the effects of turbid waters on fish suggest that concentrations of suspended solids can reach thousands of mg/L before an acute toxic reaction is expected (Burton 1993). The studies reviewed by Burton demonstrated lethal effects to fish at concentrations of 580 mg/L to 700,000 mg/L depending on species. However, sublethal effects have been observed at substantially lower turbidity levels. Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980; Birtwell *et al.* 1984; Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (McLeay *et al.* 1984, 1987; Sigler *et al.* 1984; Lloyd *et al.* 1987; Scannell 1988; Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987).

Exposure duration is a critical determinant of the occurrence and magnitude of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids appear to be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research indicates that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987; Lloyd *et al.* 1987; Servizi and Martens 1991). In a review of the effects of sediment loads and turbidity on fish, Newcombe and Jensen (1996) concluded that more than 6 days exposure to total suspended solids (TSS) greater than 10 mg/L is a moderate stress for juvenile and adult salmonids and that a single day exposure to TSS in excess of 50 mg/L is a moderate stress.

At moderate levels, turbidity has the potential to adversely affect primary and secondary productivity, and at high levels has the potential to injure and kill adult and juvenile fish. Turbidity might also interfere with feeding (Spence *et al.* 1996). Newly emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine re-deposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991). Larger juvenile and adult salmon appear to be little affected by ephemeral high concentrations of suspended sediments that occur during most storms and episodes of snowmelt. However, other research demonstrates that feeding and territorial behavior can be disrupted by short-term exposure to turbid water.

DOE estimates that since the composition of biorefinery effluent would be similar in composition to the existing pulp mill effluent the increase of TSS would be no more than 5%. The maximum monthly average TSS allowed by the MEPDES permit is 20 mg/L, which is substantially less than the 50 mg/L daily exposure suggested to cause moderate stress in adult salmonids (Newcombe and Jensen 1996). TSS from the OTFF facility is not expected to have a significant impact on salmon smolts which will move rapidly past the OTFF facility during spring flows. Similarly, Atlantic salmon adults encountering periodically elevated TSS levels in the vicinity of the OTFF facility are not expected to be significantly impacted because they are likely to relocate to downstream areas until conditions improve to resume their upstream migration.

pH

The MEPDES permit and MEWDL for the OTFF facility allow a pH discharge range of 5.0 to 9.0. Under current conditions and discharges, the mean minimum daily effluent pH ranges from 6.7 to 8.2, and the maximum daily effluent pH ranges from 6.8 to 8.2. The freshwater Criterion Continuous Concentration (CCC) for pH is 6.5 – 9.0 (USEPA 2011). NMFS (2009) has proposed a conservation status baseline pH value of > 6 for fully functioning habitat and a pH range of 5.5 – 6.0 for limited function habitat for juvenile salmon migration. According to DOE, the pH of the effluent is not anticipated to change significantly due to the proposed project.

Temperature

Maine rivers lie near the southern extent of the Atlantic salmon's range in North America, and are vulnerable to elevated water temperature regimes. Contributing factors to elevated temperatures include improper or unregulated land use practices, impoundment of free-flowing reaches, discharge of industrial processing or cooling water, and broad climatic changes. Relatively minor increases in water temperature may diminish habitat suitability for adult and juvenile salmon, lead to sub-lethal or lethal physiological responses, and have a profound negative effect on the production potential of a river or stream (Dill *et al.* 2002).

Atlantic salmon typically spawn in water with temperatures ranging from 39 – 50°F (4 - 10°C). Successful egg incubation generally occurs below 46°F (8°C) (Danie *et al.* 1984). Optimal

growth of juvenile salmon occurs when water temperature is between 59 and 66°F (15 and 19°C) with normal feeding patterns being disrupted when temperatures exceed 72.5°F (22.5°C) (Danie *et al.* 1984). Lethal temperatures for juvenile Atlantic salmon are 8.2°F (27.8°C) at seven days exposure, 85°F (29.5°C) at 1000 minutes, 88°F (31.1°C) at 100 minutes, and 91°F (32.9°C) at 10 minutes (Elliot 1991). The optimum range for migrating smolts is from 44.6 – 57.2°F (7 - 14°C) (LaBar *et al.* 1978, Jonsson and Ruud-Hansen 1985, Duston *et al.* 1991). Tolerances for adults have not been adequately studied, however, based on historical observations by Huntsman (1942), and observations by Maine DMR fishery scientists at adult salmon collection facilities such as on the lower Penobscot River, adult tolerances may be 2-3 degrees lower than juveniles (Dill R., Maine DMR. 2011. Personal communication). NMFS (2009) has proposed a conservation status baseline temperature range for adult salmon migration of 57.2 – 68°F (14 – 20°C).

Previous permits for the OTFF facility established a year-round daily maximum end-of-outfall effluent temperature limit of 105°F that was carried forward in the 2011 MEDEP permit. A review of the monthly Discharge Monitoring Report (DMR) data for the period January 2009 – November 2010 indicates OTFF effluent temperatures had a mean of 85°F (29.4°C) and a range of 73 – 99°F (22.8 – 37.2°C). After moving through a zone of initial dilution and a mixing zone, effluents are expected to closely match ambient river temperatures. Between June 1st and September 30th of each year when the ambient receiving water temperature is ≥ 66°F (18.9°C) and < 73°F (22.8°C), OTFF is limited by permit conditions to a thermal discharge that will not increase the ambient receiving water temperature by more than 0.5°F based on a weekly (7 days) rolling average calculation. When the ambient receiving water temperature is > 73°F (22.8°C), OTFF is similarly limited to a thermal discharge that will not increase the ambient receiving water temperature by more than 0.5°F based on a daily calculation. DOE states that discharge temperatures will rise proportionally to the amount of increased effluent (i.e., < 5%) or less than 0.1°F.

Smolts migrate from late April to early June moving rapidly from natal streams to estuaries in as little as two or three days (Kocik *et al.* 2009). OTFF effluent temperatures should be sufficiently ameliorated by mixing with seasonal flows combined with cool ambient water temperatures at that time of year and no significant impact to migrating smolts is anticipated. With the removal of the Veazie and Great Works dams, more migrating adult salmon are expected to pass the free-flowing project reach. Adult salmon migrate through this reach from May through October with more than half the run entering the river by the third week of June (Dube *et al.* 2011). As water temperatures increase in July, high water temperature may inhibit upstream salmon migration, particularly above 73.4°F (23°C) (Shepard 1995, Holbrook *et al.* 2009). Water temperatures above 73.4°F (23°C) cause salmon to slow or cease their migration and seek thermal refugia, few of which exist downstream of the OTFF discharge. Salmon resume their migration when temperatures abate in the summer, or in the fall. Salmon located downstream of the OTFF discharge during summer high temperature periods may seek refugia in tributaries or tidal waters. However, based on the migration timing and behavior, most adult salmon will encounter the OTFF thermal discharge when water temperatures are low and do not inhibit upstream movement.

Whole Effluent Toxicity (WET) Testing

Whole effluent toxicity (WET) tests are performed with two test organisms, the water flea (*Ceriodaphnia dubia*) and brook trout (*Salvelinus fontinalis*), to simulate the potential affect of effluent on riverine aquatic organisms. WET testing with varying dilutions of effluent provides a point estimate of toxicity in terms of a No Observed Effect Level (NOEL). A-NOEL is defined as the acute no observed effect level with survival as the end point. C-NOEL is defined as the chronic no observed effect level with survival, reproduction and growth as the end points.

Brook trout, the closest surrogate test species to Atlantic salmon, were used in WET tests in all but two years between 2002 and 2011. The acute and chronic WET test permit values are 5.99% (based on a dilution factor of 16.7) to avoid mortality and 1.35% (based on a dilution factor of 74.2) to avoid adverse sub-lethal effects, respectively. WET tests conducted between 2002 and 2011 indicate that A-NOEL for brook trout was between 65 and 100%, while the C-NOEL was between 25 and 100%. Since these test values are higher than the permit values of 5.99 and 1.35%, the OTFF effluent being discharged is not expected to adversely affect aquatic life upon dilution by the flow and volume of the Penobscot River.

Chemical-Specific Testing

Chemical-specific testing is performed with effluents to examine levels of metals, chloride, and ammonia, which are considered the chemicals most likely to be of potential concern to fish. The 2011 MEPDES permit and MEWDL establishes new or revised water quality based mass and concentration limits for total aluminum (Al), copper (Cu), and lead (Pb) as the most current statistical evaluation of test results on file at MEDEP indicates the OTFF discharge has a reasonable potential to exceed applicable AWQC found in MEDEP rule Chapter 584.

At current discharge rates (approximately 12 MGD, or one-half the permitted 24.4 MGD) risk quotients for acute (A-RQ) and chronic (C-RQ) exposures for all contaminants are between .05 and .10 (RQ >1.0 indicates potential affects to aquatic life). Given that the existing A-RQs and C-RQs are significantly below permit thresholds, a 5% increase in effluent volume is not likely to cause significant effects to aquatic life.

Conclusion

Based on our analysis that all effects of the proposed project will be insignificant and discountable, the Service concurs with DOE's determination that the proposed project may affect, but is not likely adversely affect the endangered Atlantic salmon (*Salmo salar*) nor would it destroy or result in adverse modification of Atlantic salmon critical habitat. This concludes consultation pursuant to Section 7 of the ESA for this project. Re-initiation of consultation is required and shall be requested by the DOE or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (a) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat

that was not considered in the consultation; or (c) if a new species is listed or critical habitat designated that may be affected by the identified action.

Thank you for your cooperation during this Section 7 consultation. Please contact Steve Mierzykowski at (207) 866-3344, Extension 112 if you have any questions regarding this consultation.

Sincerely,

Laury Zicari
Field Supervisor

cc: Dan Tierney, NMFS
N. Dube, MEDMR

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OLD TOWN FUEL&FIBER

July 20, 2010

Mr. Steven Timpano
Maine Department of Inland Fisheries & Wildlife
State House Station #41
Augusta, ME 04333

Subject: Special Status Species Request for Technical Assistance
Old Town Fuel and Fiber Biorefinery, Old Town, Penobscot County, ME

Dear Mr. Timpano:

Old Town Fuel and Fiber (OTFF) is an operating pulp mill located in Old Town, Maine. OTFF applied for and received a grant for renewable energy projects from the U.S. Department of Energy (DOE) for installation of a demonstration biorefinery that proposes to use woody biomass for conversion to biofuel. Because the proposed Project is receiving federal funds, the project must comply with the National Environmental Policy Act (NEPA 40 CFR Parts 1500 to 1508) and as such, we are in the initial stages of preparing an Environmental Assessment (EA). As part of the EA preparation we are seeking input from Maine Department of Imland Fisheries & Wildlife (MDIFW) regarding our proposed Project and its potential affect on State listed or Special Concern species.

Proposed Project:

The proposed Project will be located within the existing OTFF mill site located at 24 Portland Street, Old Town, Maine. The Demonstration scale biorefinery and all associated facilities are proposed to be located within an existing building with the exception of one or two storage tanks which may be located outside the building. If storage tanks are constructed outside the building, they would be located on existing asphalt/un-vegetated disturbed ground, and therefore are not anticipated to remove or affect any upland habitats. Additionally, all storage tanks whether inside the building or outside, would comply with Spill Prevention Pollution Control (SPCC) Act requirements for containment in the event of a leak. The proposed Project is anticipated to utilize their existing Title V Air Quality permit, with minor modifications and would not increase water usage over the existing permitted quantity of 30 million gallons per day (MGD). The proposed Project also anticipates utilizing their existing waste water treatment facility which has capacity for treatment of 24 MGD and operates under an existing National Pollutant Discharge Elimination System (NPDES) permit. Currently the facility is utilizing approximately half of its full capacity (approximately 12 MGD).

The proposed Project is currently conducting small, bench and pilot scales research and development (R&D) with DOE oversight, which will assist in determining by-products, waste stream, emissions, etc. that would result from operation of the demonstration scale biorefinery. At this time, it is believed that the OTFF facility will have more than

enough capacity to treat waste stream from the biorefinery and that constituents will fall within existing thresholds and parameters in their NPDES permit. Because the proposed Project does not include any in-water construction activities and all upland activities are confined to within existing buildings or on asphalt/unvegetated areas adjacent to the buildings at OTFF, the species discussion is limited aquatic species which may be affected by the waste water discharge and nesting bald eagle, which could be disturbed during construction activities.

As a result of the decommissioning project to remove the Great Works Dam adjacent to OTFF that is being lead by the Penobscot River Restoration Trust, OTFF needs to relocate their water supply intake. The Penobscot River Restoration Trust submitted an application to the U.S. Army Corps of Engineers (USACE) on behalf of OTFF in May 2010, for moving the water intake downstream for which an ESA Section 7 consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service is underway. The proposed intake move combined with the decommissioning of the Great Works impoundment by the Penobscot River Trust has provided extensive information on existing conditions and habitat potential of the Penobscot River in the vicinity of OTFF. This includes the Biological Opinion issued by NMFS in December 2009 for the decommissioning of the Great Works Project (FERC No. 2312) and Veazie Project (FERC No. 2403) and surrender license and construct a fish bypass at the Howland Project (FERC No. 2721) (hereinafter "NMFS BO"),[1] which has been relied upon in making this technical assistance request of MDIFW. The BO provides a great deal of background information related to listed species and habitat conditions in this reach of the Penobscot River. Therefore, we have not gone into a great deal of detail regarding the habitat and potential for listed fish herein, but incorporate by reference the extensive documentation prepared as part of the decommissioning and pending USACE permit application for moving OTFF's water intake.

State Species:

In 2007 surveys for freshwater mussels were conducted at the Great Works impoundment and two special-status mussel species were observed: yellow lampmussel State-listed Threatened and creeper State species of special concern (Multi-Project Environmental Analysis, Veazie Project FERC No. 2430, Great Works Project FERC No. 2312 and Howland Project FERC No. 2721, prepared by Kleinschmidt, October 2008 [hereinafter Multi-Project EA]). These two species were present in relatively low abundances as compared to the more common species, combined accounting for less than one percent of the observations in the Great Works impoundment study areas. Substrate types where these species were observed included cobble, gravel, sand and silt, and water depths ranged from 0-11 feet. Of the three yellow lampmussels observed during the cross channel transects, two were approximately 2.5 miles upstream from Veazie Dam south of Ayers Island (Stantec, 2008).

Fish Species of Special Concern that may be present within the Project area include American eel (*Anquilla rostrata*) and anadromous brook trout (*Salvelinus fontinalis*), also known as salters or searun brook trout.

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[1] NMFS Biological Opinion *Surrender of Licenses for the Veazie, Great Works and Howland Projects, Nos. 2403, 2312,2721F/NER/2009/01515.* December 2009.

According to the Multi-Project EA, there is no state-designated Significant Wildlife habitat between Great Works and Milford Dams, but a bald eagle nest site on the west bank of the Penobscot River approximately 1 mile downstream from Great Works Dam (Stantec, 2008). Additionally, although high quality waterfowl reproductive habitat is not present on the Great Works impoundment, mallards (*Anas platyrhynchos*), black ducks (*Anas rubripes*), and green-winged teals (*Anas crecca*) are expected, especially during the late summer and fall (PPL Great Works, 2000). Barrow's goldeneye, a species of waterfowl identified as a state species of Special Concern, has been reported to use the project area as part of its winter range (PPL Great Works LLC., 2000).

Other bird species typical of open water and emergent and scrub-shrub wetlands can include the red winged black bird (*Agelaius phoeniceus*), belted king fisher (*Ceryle alcyon*), wood duck (*Aix spo*nsa), hooded merganser (*Lophodytes cucull*atus), double-crested cormorant (*Phalacrocorax vociferous*), great blue heron (*Ardea herodius*), tree swallow (*Tachycineta bicolor*), and the yellow warbler (*Dendroica petechia*).
Other birds expected at the Project include the downy woodpecker (*Picoides pubescens*), black-capped chickadee (*Poecile atricapillus*), and the American goldfinch (*Carduelis tristas*). The project impoundment and tailwater provide habitat for several aquatic and semi-aquatic mammals such as the beaver (*Castor canadensis*), river otter (*Lutra canadensis*), and raccoon (*Procyon lotor*).

Atlantic Salmon (*Salmo salar*):

The current status of Atlantic salmon is as follows:

> stated that the Gulf of Maine (GOM) Distinct Population Segment (DPS) of anadromous Atlantic salmon was initially listed by the USFWS and NMFS (collectively, the Services) as an endangered species on November 17, 2000 (65 FR 69459). A subsequent listing as an endangered species by the Services (74 FR 29344; June 19, 2009) included an expanded range for the GOM DPS of Atlantic salmon. The decision to expand the geographic range of the GOM DPS was largely based on the results of a Status Review (Fay *et al.* 2006) completed by a Biological Review Team (BRT) consisting of federal and state agencies and Tribal interests. Fay *et al.* (2006) concluded that the DPS delineation in the 2000 listing designation was largely appropriate, except in the case of large rivers that were excluded in the 2000 listing determination. Fay *et al.* (2006) concluded that the salmon currently inhabiting Maine's larger rivers (Androscoggin, Kennebec, and Penobscot) are genetically similar to the rivers included in the GOM DPS as listed in 2000, have similar life history characteristics, and/or occur in the same zoogeographic region (NMFS BO, page 23).

In 2004, electrofish surveys conducted in and around the Great Works dam detected a single Atlantic salmon. Because the Great Works Dam slated for decommissioning and removal, it is likely that numbers of Atlantic salmon that utilize this reach of the Penobscot River would increase after removal has been completed (Multi-Project EA).

Existing Conditions:

It is believed that potential effects to listed fish or other aquatic species as a result of the biorefinery would relate to the NPDES compliant waste water treatment discharge. Based on this, the following discussion will focus on existing water quality in the vicinity of the proposed Project.

According to the Multi-Project EA, waters in the proposed Project area have been classified as Class B[2] which are of sufficient quality to support drinking water supply (after treatment), fishing, contact recreation and as unimpaired habitat for fish and other aquatic life (PPL Great Works, LLC, 2000). However, the Penobscot River at Old Town and Milford is designated Class B Category 5-B due to contamination by *E. coli* (MDEP, 2006; MDEP, 2008). Sampling conducted above the Great Works Dam by MDEP in 2001 as part of their basin-wide water quality sampling program indicated that (Mitnik, 2002):

- Average daily and daily maximum dissolved oxygen levels met standards for Class B waters of 7 parts per million and 75 percent oxygen saturation.
- Daily minimum dissolved oxygen concentrations fell slightly below (approximately 6.75 parts per million) standards for Class B waters of 7 parts per million and 75 percent oxygen saturation in 2001.
- Because data were collected during a heat-spell, the three day average water temperature for all Penobscot River sampling stations, including the Great Works site, ranged from 25° to 27.3° C (Mitnik, 2002). Min, max, and average values at Great Works ranged from approximately 26° to 28° C. In 1999, as part of relicensing efforts for the Great Works Project, and pursuant to a request from the Maine DEP, PPL Great Works, LLC conducted a macroinvertebrate study in the Great Works project area to assess water quality as it pertains to established aquatic life standards.

The PPL study documented that the Great Works Project bypass reach and impoundment met Class B water quality standards for aquatic life. Maine DEP verified and concurred with this assessment on January 18, 2000 (PPL Great Works, 2000).

Overall, pollution beyond sewer treatment has been a problem for the Penobscot River system, and paper production facilities have resulted in higher concentrations throughout the system of metals, dioxin, dissolved solids, phenols, and hydrocarbons. NMFS currently reviews and comments on all NPDES permits issued by Maine Department of Environment below Veazie Dam.

While we realize there may need to be some additional sampling, especially at the waste water treatment point of discharge, based on the foregoing, it appears that the greatest concern to water quality in this reach of the Penobscot River is *E. coli*. The OTFF waste water treatment facility is used exclusively for mill operations and does not treat sanitary sewer waste. The facility is directly hooked up to the municipal sanitary sewer system and all non-industrial mill facilities (office kitchens, bathrooms, etc.) are directed to the municipal system and this would not change with installation of the biorefinery. A modification to the existing NPDES permit may be required based upon the results of the small pilot-scale research and analyses currently underway. Results of the pilot-scale activities would be included in the EA for NMFS review and comment.

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[2] Class B General-purpose waters that are managed to attain good quality water.

Conclusion:

As part of early coordination for the NEPA process, we would appreciate any feedback or guidance you may be able to offer related to our proposed Project and any potential affects to state listed or special concern species listed above or that we may have overlooked.

Please contact Whitney Fiore at 310.387.7755 or wfiore@icfi.com with any questions.

Sincerely,

Richard Arnold
President, Old Town Fuel & Fiber

cc: J. Atwell, SME
G. Doyle, DOE
K. Kerwin, DOE
W. Fiore, ICFI
B. Marcus, DWM

RED SHIELD ACQUISITION LLC
Phone: 207-827-7711 • Fax: 207-827-8888 Box 564 • 24 Portland Street • Old Town, Maine 04468

A LYNN TILTON COMPANY

Diller, Elizabeth

Subject: FW: Request for Project Review

From: Timpano, Steve [mailto:Steve.Timpano@maine.gov]
Sent: Wednesday, July 21, 2010 11:58 AM
To: Fiore, Whitney
Cc: Caron, Mark; Kramer, Gordon; Swartz, Beth
Subject: RE: Request for Project Review

Whitney;

Thanks for sending this via electronic mail. Makes it easier for me to forward to MDIFW Regional biologists and species-specialist staff for their information and additional review.

As discussed with you, I do not anticipate MDIFW is likely to identify any inland fisheries or wildlife concerns with the project as proposed. To recap:
>As stated in your letter the project will be located entirely within an existing building or upon existing paved or un-vegetated, disturbed, non-habitat areas.
>No increased water use is planned above the current permitted quantity.
>Waste water discharge will be treated within limits of OTFF's current waste discharge license.
>Air emissions are expected to be in compliance with current license requirements, or with only minor license modifications.
>One Bald Eagle nest site is known to be located approximately 1 mile from the project area. Bald Eagles have been removed from the State's list of Endangered or Threatened species. The previous 1/4 mile Essential Habitat designation around the nest is no longer in effect. Overall, project construction and operation is not expected to result in disturbance to eagles.
>Occurrences of State-listed yellow lampmussel, tidewater mucket, brook floater (all State Threatened status), and creeper (Species of Special Concern) freshwater mussels have been identified within the adjacent segment of the Penobscot River. No alterations of mussel habitat or changes to water-use quantity or quality are proposed, no effects upon freshwater mussels are anticipated. (Note your letter identifies only yellow lampmussel and creeper. Please add tidewater mucket and brook floater.)
>No other Significant Wildlife Habitats (as defined under the Maine Natural Resources Protection Act) have been identified for the immediate project area.
>No inland (freshwater) fisheries management within the adjacent river segment is likely to be affected by development or operation of the proposed project (similar considerations as mussels above).

This constitutes a desktop review based upon available information only. No site visit was considered necessary or conducted. If I have overlooked something I will inform you if I receive any additional comments or concerns identified by our Regional biologists or species-specialists.

Steve T.

Steven A. Timpano
Environmental Coordinator
Maine Department of Inland Fisheries & Wildlife
41 SHS, 284 State Street
Augusta, ME 04333

Tel. (207) 287-5258
Fax (207) 287-6395
e-mail: Steve.Timpano@maine.gov

From: Fiore, Whitney [mailto:WFiore@icfi.com]
Sent: Wednesday, July 21, 2010 9:01 AM

To: Timpano, Steve
Cc: Diller, Elizabeth
Subject: Request for Project Review

Hello Steve, You may recall our discussion last week re: the proposed biorefinery at the Old Town Maine Fuel and Fiber Pulp Mill. I thought the letters to you, USFWS and NMFS were sent last week, but the folks that could sign were all on travel last week and could not get to them until yesterday. You will be receiving the original via US Mail, but attached is the PDF for your review. We would appreciate any feedback you can give us in writing for purposes of the NEPA EA we are preparing for the Department of Energy – the federal agency funding a potion of the project.

Thank you for taking the time to speak with me, we look forward to hearing from you.

Whitney

Whitney Fiore
Expert Consultant
ICF International
Environment, Planning & Infrastructure
9300 Lee Highway
Fairfax, VA 22031
Cell: 310-387-7755
Email: wfiore@icfi.com

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Mr. Earle G. Shettleworth, Jr.,
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
Maine State Historic Preservation Office
55 Capitol Street, 65 State House Station
Augusta, ME 04333-0065

SUBJECT: Section 106 Proposed Old Town Fuel and Fiber Demonstration-Scale Integrated Biorefinery, Old Town, Maine

Dear Mr. Shettleworth,

The U.S. Department of Energy (DOE) is proposing to authorize the expenditure of federal funding to the referenced project, thereby making said funding an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulation, "Protection of Historic Properties (36 CFR Part 800). Pursuant to 36 CFR § 800.3 and 800.4, DOE is initiating consultation with your office and proposing a finding of effect for the proposed undertaking.

DOE has transmitted project information and this finding of effect to the Penobscot Indian Nation, the Aroostook Band of Micmac Indians, the Houlton Band of Maliseet Indians, the Passamaquoddy Tribe, and the Pleasant Point Reservation of the Passamaquoddy.

Project Description: Old Town Fuel and Fiber (OTFF) proposes to install and operate a small scale biorefinery at their existing pulp mill located at 24 Portland Street, Old Town, Penobscot County, Maine. The pulp mill is currently in operation and zoned for industrial use. The entire pulp mill site is approximately 180 acres, located on the western side of the Penobscot River. The property is bounded to the east by the Penobscot River and to the west by South Main Street. Current operations at this property include chip storage and handling, pulping, bleaching, drying, pulp milling, maintenance, warehousing, fuel storage, and black liquor storage.

The proposed biorefinery would primarily be constructed within the former 5.7 acre (250,000 square foot) tissue paper machine building, which is now vacant. A majority of the equipment that composes a biorefinery, including tanks, evaporators, hydrolosis reactors, and a centrifuge, would be housed within the former tissue paper machine building.

Those project components that would extend outside the former tissue paper machine building include: a series of above-ground pipelines between the warehouse at the pulp mill, six storage tanks and a cooling tower cell immediately outside the building, a Heat Recovery Steam Generator installed adjacent to an existing gas fired turbogenerator outside the building, and five to ten distillation columns that would puncture the roof and extend beyond the roofline. The pipelines would be housed in an existing pipe bridge that currently contains similar sized pipelines. The distillation columns range in diameter from three to eight feet and would not exceed forty feet in height. The proposed above-ground pipelines, tanks, generators, and columns are in keeping with existing mill infrastructure currently in use for mill operations.

Area of Potential Effect (APE): The APE is limited to the biorefinery construction footprint, a 0.9 acre (40,000 square feet) vacant former tissue paper machine building and some associated areas covering 0.5 acre immediately outside the building. The majority of construction would take place within an existing building, and project components outside the building are in keeping with the existing mill infrastructure. There is no potential for visual effects as the size and scale of the biorefinery would be in keeping with the current mill infrastructure and construction would not introduce any visual elements into the setting that do not currently exist in a similar form.

Identification of Historic Properties: The Old Town pulp mill was originally a sawmill that began producing pulp in 1882, and by 1883, expanded into a sulfite pulp mill. The pulp mill has largely been in operation since that time and is currently owned and operated as the Old Town Fuel & Fiber pulp mill.

Most of the mill buildings and structures that comprise the pulp mill site are ca. 1970 industrial structures and warehouses with no architectural distinction. As a continually operating mill, there have been numerous modern additions to the site and the mill as it exists today does not retain any of the features of the original late 19th century mill.

Some buildings over fifty years of age remain However, the pulp mill site itself does not retain the historic integrity needed to be considered for inclusion in the National Register of Historic Places (NRHP).

The construction footprint of the biorefinery is within an area subject to previous and ongoing ground disturbance from extensive activities related to pulp manufacturing. A large building with a concrete foundation has already been built at the proposed biorefinery site and construction of the biorefinery would take place on land that has been previously disturbed. The potential for significant archaeological sites within the APE is limited given the extensive previous soil disturbance.

Given the scope and magnitude of the project, and its potential to affect historic properties, DOE proposes that no further effort is needed to identify historic properties pursuant to 36 CFR § 800.4(b)(1).

Effect Determination: The pulp mill site does not retain adequate historic integrity to assess its significance under the NRHP criteria. While there may be some buildings that are over fifty years of age within the mill complex, a majority of the complex dates to the 1970s and the site of the biorefinery is within a modern addition to the mill site. As there are no historic properties in the APE, DOE proposes a finding of "no historic properties affected" for this undertaking.

Please review this project information and finding of effect pursuant to 36 CFR § 800.4(d)(1). If you have questions or comments please contact:

Christopher Carusona II
NEPA Document Manager
Department of Energy
1617 Cole Boulevard
Golden, Colorado 80401
Christopher.Carusona@go.doe.gov
Fax: 720-356-1560

Sincerely,

Christopher Carusona II
NEPA Document Manager

Attachment: *Old Town Fuel and Fiber Demonstration Scale Biorefinery*
Proposed Project Description and Location

Old Town Fuel and Fiber Demonstration Scale Biorefinery
Proposed Project Description and Location

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The OTFF biorefinery would be installed in the former tissue paper machine building (tissue building) within the existing OTFF pulp mill at 24 Portland Street, Old Town, Penobscot County, Maine (approximately 120 miles north-east of Portland, 15 miles north of Bangor); see Figure 1 and 2. The site is approximately 180 acres, the proposed biorefinery would require 0.9 acre (40,000 square feet) in the 5.7 acre (250,000 square foot) tissue building (now vacant). The property is owned by OTFF and is currently zoned for industrial use. Single family residences are located immediately adjacent to the property boundaries, the nearest being approximately 650 feet from the proposed project as well as across the river, approximately 1,300 feet from the proposed project. All construction activities would occur within the existing tissue building or immediately outside the tissue building in areas that are either asphalt or unvegetated, exposed compacted dirt.

The OTFF biorefinery would require steam, process water, electricity, natural gas, wastewater treatment, potable and non-potable water, and sanitary wastewater systems. This entire supporting infrastructure currently exists on site. An additional 2.5 MW of power would be required to operate the biorefinery. An existing gas turbine would be utilized to generate 9.5 MW of power. The additional power to the mill, 6.9 MW, would be sold on the open market.

The proposed project would annually produce the following saleable products; 1.32 million gallons of n-butanol, 2.13 million gallons of acetic acid, 740,000 gallons of formic acid, and 410,000 gallons of acetone.

Project location maps of the proposed site location are attached.

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Figure 2 - Proposed site aerial photo

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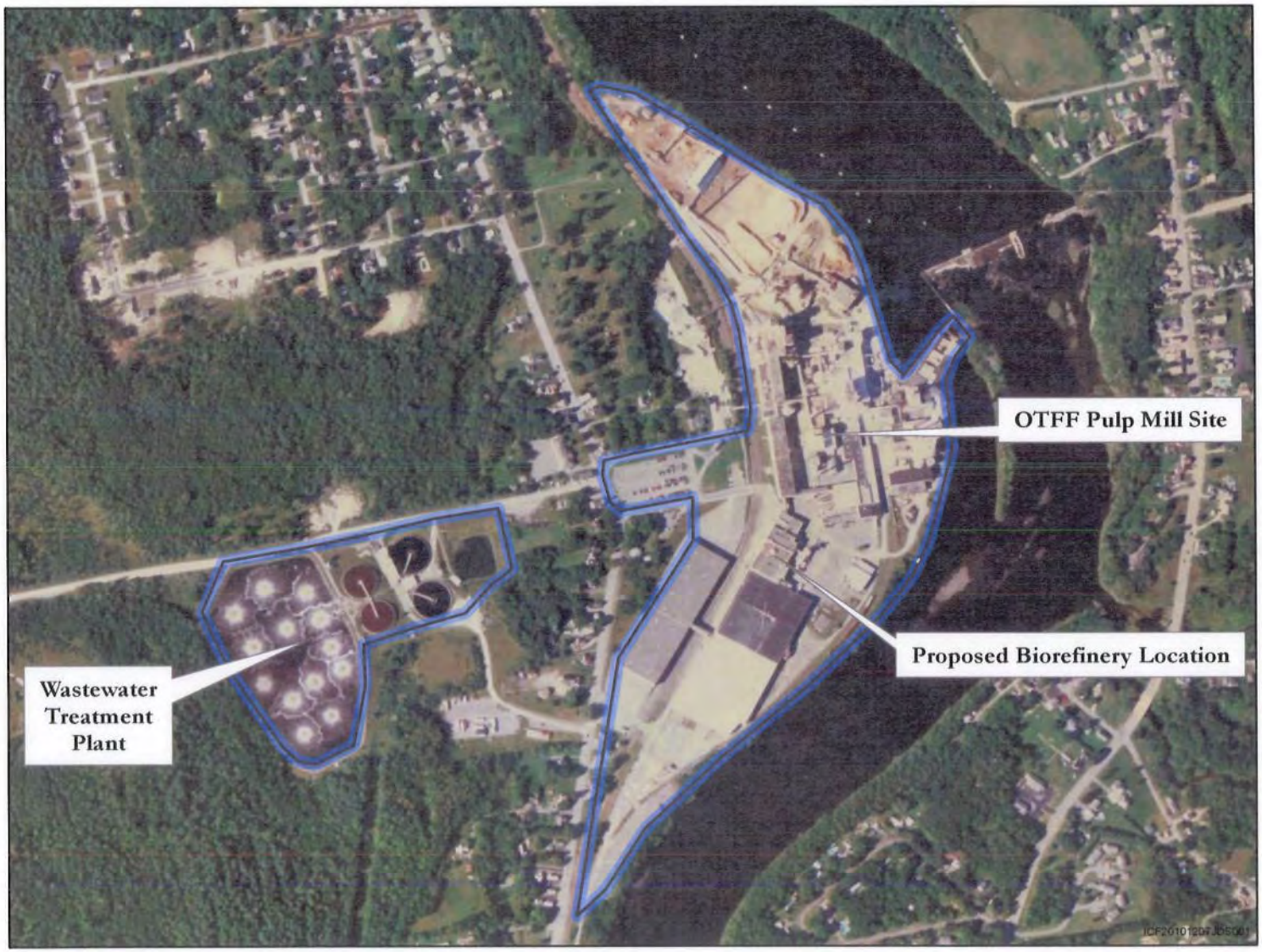

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Honorable William Phillips,
Chief
Aroostook Band of Micmac Indians
7 Northern Road
Presque Isle, ME 04769

SUBJECT: Section 106 Review and Consultation for Proposed Old Town Fuel and Fiber Demonstration-Scale Integrated Biorefinery, Old Town, Maine

Dear Chief Phillips,

The U.S. Department of Energy (DOE) is proposing to authorize the expenditure of federal funding to the referenced project, thereby making said funding an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulation, "Protection of Historic Properties) (36 CFR Part 800). Pursuant to 36 CFR § 800.3 and 800.4, DOE is initiating government-to-government consultation with your tribe and proposing a finding of effect for the proposed undertaking.

DOE has transmitted project information and this finding of effect to the Penobscot Indian Nation, the Houlton Band of Maliseet Indians, the Passamaquoddy Tribe, and the Passamaquoddy Tribe at Pleasant Point.

Project Description: Old Town Fuel and Fiber (OTFF) proposes to install and operate a small scale biorefinery at their existing pulp mill located at 24 Portland Street, Old Town, Penobscot County, Maine. The pulp mill is currently in operation and zoned for industrial use. The entire pulp mill site is approximately 180 acres, located on the western side of the Penobscot River. The property is bounded to the east by the Penobscot River and to the west by South Main Street. Current operations at this property include chip storage and handling, pulping, bleaching, drying, pulp milling, maintenance, warehousing, fuel storage, and black liquor storage.

The proposed biorefinery would primarily be constructed within the former 5.7 acre (250,000 square foot) tissue paper machine building, which is now vacant. A majority of the equipment that composes a biorefinery, including tanks, evaporators, hydrolosis reactors, and a centrifuge, would be housed within the former tissue paper machine building.

Those project components that would extend outside the former tissue paper machine building include: a series of above-ground pipelines between the warehouse at the pulp mill, six storage tanks and a cooling tower cell immediately outside the building, a Heat Recovery Steam Generator installed adjacent to an existing gas fired turbogenerator outside the building, and

five to ten distillation columns that would puncture the roof and extend beyond the roofline. The pipelines would be housed in an existing pipe bridge that currently contains similar sized pipelines. The distillation columns range in diameter from three to eight feet and would not exceed forty feet in height. The proposed above-ground pipelines, tanks, generators, and columns are in keeping with existing mill infrastructure currently in use for mill operations.

Area of Potential Effect (APE): The APE is limited to the biorefinery construction footprint, a 0.9 acre (40,000 square feet) vacant former tissue paper machine building and some associated areas covering 0.5 acre immediately outside the building. The majority of construction would take place within an existing building, and project components outside the building are in keeping with the existing mill infrastructure. There is no potential for visual effects as the size and scale of the biorefinery would be in keeping with the current mill infrastructure and construction would not introduce any visual elements into the setting that do not currently exist in a similar form.

Identification of Historic Properties: The Old Town pulp mill was originally a sawmill that began producing pulp in 1882, and by 1883, expanded into a sulfite pulp mill. The pulp mill has largely been in operation since that time and is currently owned and operated as the Old Town Fuel & Fiber mill.

Most of the mill buildings and structures that comprise the pulp mill site are ca. 1970 industrial structures and warehouses with no architectural distinction. As a continually operating mill, there have been numerous modern additions to the site and the mill as it exists today does not retain any of the features of the original late 19th century mill.

Some buildings over fifty years of age remain However, the pulp mill site itself does not retain the historic integrity needed to be considered for inclusion in the National Register of Historic Places (NRHP).

The construction footprint of the biorefinery is within an area subject to previous and ongoing ground disturbance from extensive activities related to pulp manufacturing. A large building with a concrete foundation has already been built at the proposed biorefinery site and construction of the biorefinery would take place on land that has been previously disturbed. The potential for significant archaeological sites within the APE is limited given the extensive previous soil disturbance.

Given the scope and magnitude of the project, and its potential to affect historic properties, DOE proposes that no further effort is needed to identify historic properties pursuant to 36 CFR § 800.4(b)(1).

Effect Determination: The OTTF mill site does not retain adequate historic integrity to assess its significance under the NRHP criteria. While there may be some buildings that are over fifty years of age within the mill complex, a majority of the complex dates to the 1970s and the site of the biorefinery is within a modern addition to the mill site. As there are no historic

properties in the APE, DOE proposes a finding of "no historic properties affected" for this undertaking.

Please review the enclosed project information and this finding of effect. If you have questions or comments please contact:

Christopher Carusona II
NEPA Document Manager
Department of Energy
1617 Cole Boulevard
Golden, Colorado 80401
Christopher.Carusona@go.doe.gov
Fax: 720-356-1560

Sincerely,

Christopher Carusona II
NEPA Document Manager

Attachment: *Old Town Fuel and Fiber Demonstration Scale Biorefinery*
Proposed Project Description and Location

Old Town Fuel and Fiber Demonstration Scale Biorefinery
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The OTFF biorefinery would be installed in the former tissue paper machine building (tissue building) within the existing OTFF pulp mill at 24 Portland Street, Old Town, Penobscot County, Maine (approximately 120 miles north-east of Portland, 15 miles north of Bangor); see Figure 1 and 2. The site is approximately 180 acres, the proposed biorefinery would require 0.9 acre (40,000 square feet) in the 5.7 acre (250,000 square foot) tissue building (now vacant). The property is owned by OTFF and is currently zoned for industrial use. Single family residences are located immediately adjacent to the property boundaries, the nearest being approximately 650 feet from the proposed project as well as across the river, approximately 1,300 feet from the proposed project. All construction activities would occur within the existing tissue building or immediately outside the tissue building in areas that are either asphalt or unvegetated, exposed compacted dirt.

The OTFF biorefinery would require steam, process water, electricity, natural gas, wastewater treatment, potable and non-potable water, and sanitary wastewater systems. This entire supporting infrastructure currently exists on site. An additional 2.5 MW of power would be required to operate the biorefinery. An existing gas turbine would be utilized to generate 9.5 MW of power. The additional power to the mill, 6.9 MW, would be sold on the open market.

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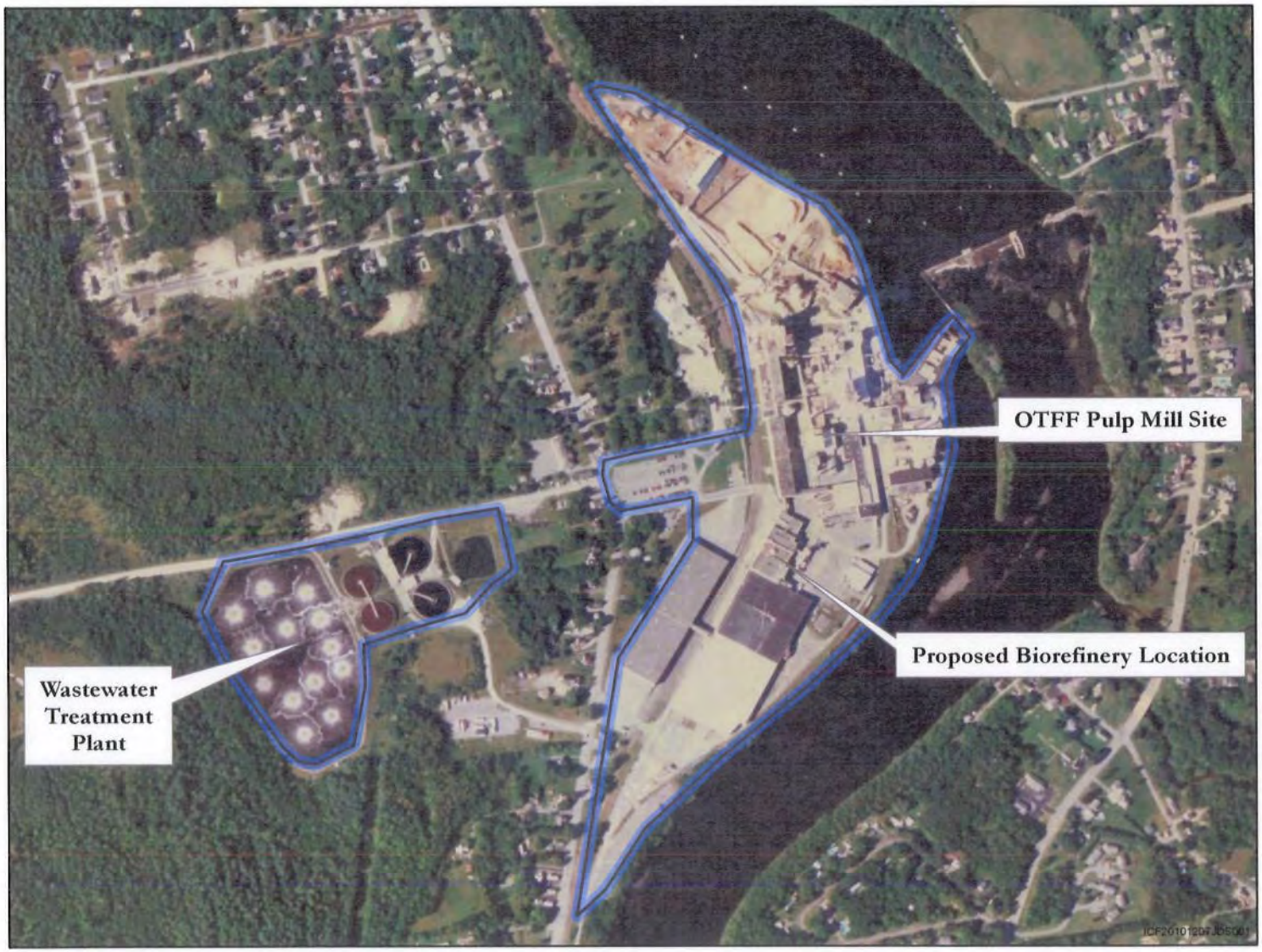

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Honorable Brenda Commander,
Tribal Chief
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, Maine 04730

SUBJECT: Section 106 Review and Consultation for Proposed Old Town Fuel and Fiber Demonstration-Scale Integrated Biorefinery, Old Town, Maine

Dear Chief Commander,

The U.S. Department of Energy (DOE) is proposing to authorize the expenditure of federal funding to the referenced project, thereby making said funding an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulation, "Protection of Historic Properties) (36 CFR Part 800). Pursuant to 36 CFR § 800.3 and 800.4, DOE is initiating government-to-government consultation with your tribe and proposing a finding of effect for the proposed undertaking.

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Sincerely,

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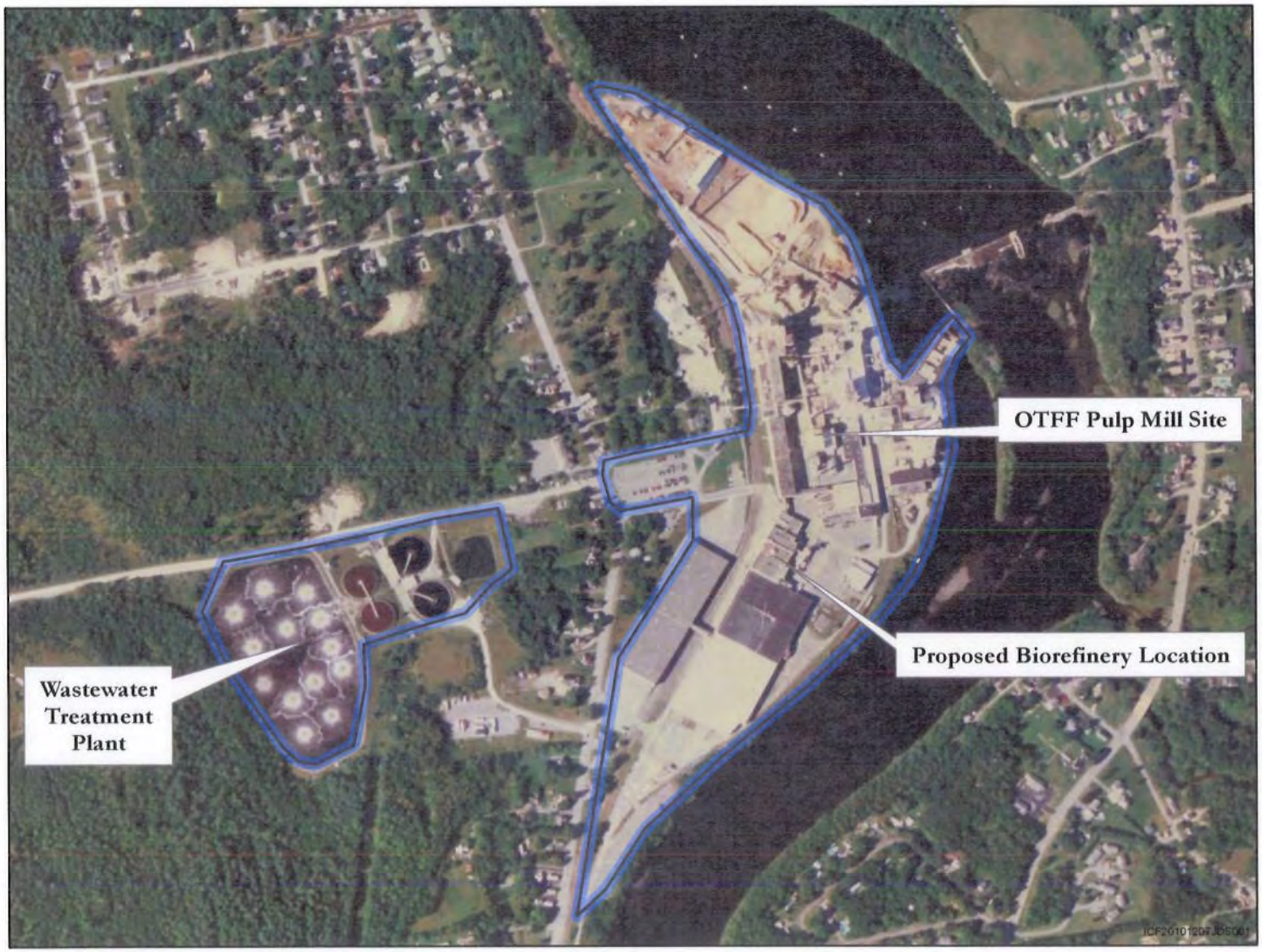

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Honorable Richard Doyle,
Governor
Passamaquoddy Tribe at Pleasant Point
P.O. Box 343
Perry, ME 04667

SUBJECT: Section 106 Review and Consultation for Proposed Old Town Fuel and Fiber Demonstration-Scale Integrated Biorefinery, Old Town, Maine

Dear Governor Doyle,

The U.S. Department of Energy (DOE) is proposing to authorize the expenditure of federal funding to the referenced project, thereby making said funding an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulation, "Protection of Historic Properties) (36 CFR Part 800). Pursuant to 36 CFR § 800.3 and 800.4, DOE is initiating government-to-government consultation with your tribe and proposing a finding of effect for the proposed undertaking.

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Those project components that would extend outside the former tissue paper machine building include: a series of above-ground pipelines between the warehouse on the pulp mill, six storage tanks and a cooling tower cell immediately outside the building, a Heat Recovery Steam Generator installed adjacent to an existing gas fired turbogenerator outside the building, and

five to ten distillation columns that would puncture the roof and extend beyond the roofline. The pipelines would be housed in an existing pipe bridge that currently contains similar sized pipelines. The distillation columns range in diameter from three to eight feet and would not exceed forty feet in height. The proposed above-ground pipelines, tanks, generators, and columns are in keeping with existing mill infrastructure currently in use for mill operations.

Area of Potential Effect (APE): The APE is limited to the biorefinery construction footprint, a 0.9 acre (40,000 square feet) vacant former tissue paper machine building and some associated areas covering 0.5 acre immediately outside the building. The majority of construction would take place within an existing building, and project components outside the building are in keeping with the existing mill infrastructure. There is no potential for visual effects as the size and scale of the biorefinery would be in keeping with the current mill infrastructure and construction would not introduce any visual elements into the setting that do not currently exist in a similar form.

Identification of Historic Properties: The Old Town pulp mill was originally a sawmill that began producing pulp in 1882, and by 1883, expanded into a sulfite pulp mill. The pulp mill has largely been in operation since that time and is currently owned and operated as the Old Town Fuel & Fiber mill.

Most of the mill buildings and structures that comprise the pulp mill site are ca. 1970 industrial structures and warehouses with no architectural distinction. As a continually operating mill, there have been numerous modern additions to the site and the mill as it exists today does not retain any of the features of the original late 19th century mill.

Some buildings over fifty years of age remain However, the pulp mill site itself does not retain the historic integrity needed to be considered for inclusion in the National Register of Historic Places (NRHP).

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Given the scope and magnitude of the project, and its potential to affect historic properties, DOE proposes that no further effort is needed to identify historic properties pursuant to 36 CFR § 800.4(b)(1).

Effect Determination: The OTTF mill site does not retain adequate historic integrity to assess its significance under the NRHP criteria. While there may be some buildings that are over fifty years of age within the mill complex, a majority of the complex dates to the 1970s and the site of the biorefinery is within a modern addition to the mill site. As there are no historic

properties in the APE, DOE proposes a finding of "no historic properties affected" for this undertaking.

Please review the enclosed project information and this finding of effect. If you have questions or comments please contact:

Christopher Carusona II
NEPA Document Manager
Department of Energy
1617 Cole Boulevard
Golden, Colorado 80401
Christopher.Carusona@go.doe.gov
Fax: 720-356-1560

Sincerely,

Christopher Carusona II
NEPA Document Manager

Attachment: *Old Town Fuel and Fiber Demonstration Scale Biorefinery*
Proposed Project Description and Location

Old Town Fuel and Fiber Demonstration Scale Biorefinery
Proposed Project Description and Location

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The OTFF biorefinery would be installed in the former tissue paper machine building (tissue building) within the existing OTFF pulp mill at 24 Portland Street, Old Town, Penobscot County, Maine (approximately 120 miles north-east of Portland, 15 miles north of Bangor); see Figure 1 and 2. The site is approximately 180 acres, the proposed biorefinery would require 0.9 acre (40,000 square feet) in the 5.7 acre (250,000 square foot) tissue building (now vacant). The property is owned by OTFF and is currently zoned for industrial use. Single family residences are located immediately adjacent to the property boundaries, the nearest being approximately 650 feet from the proposed project as well as across the river, approximately 1,300 feet from the proposed project. All construction activities would occur within the existing tissue building or immediately outside the tissue building in areas that are either asphalt or unvegetated, exposed compacted dirt.

The OTFF biorefinery would require steam, process water, electricity, natural gas, wastewater treatment, potable and non-potable water, and sanitary wastewater systems. This entire supporting infrastructure currently exists on site. An additional 2.5 MW of power would be required to operate the biorefinery. An existing gas turbine would be utilized to generate 9.5 MW of power. The additional power to the mill, 6.9 MW, would be sold on the open market.

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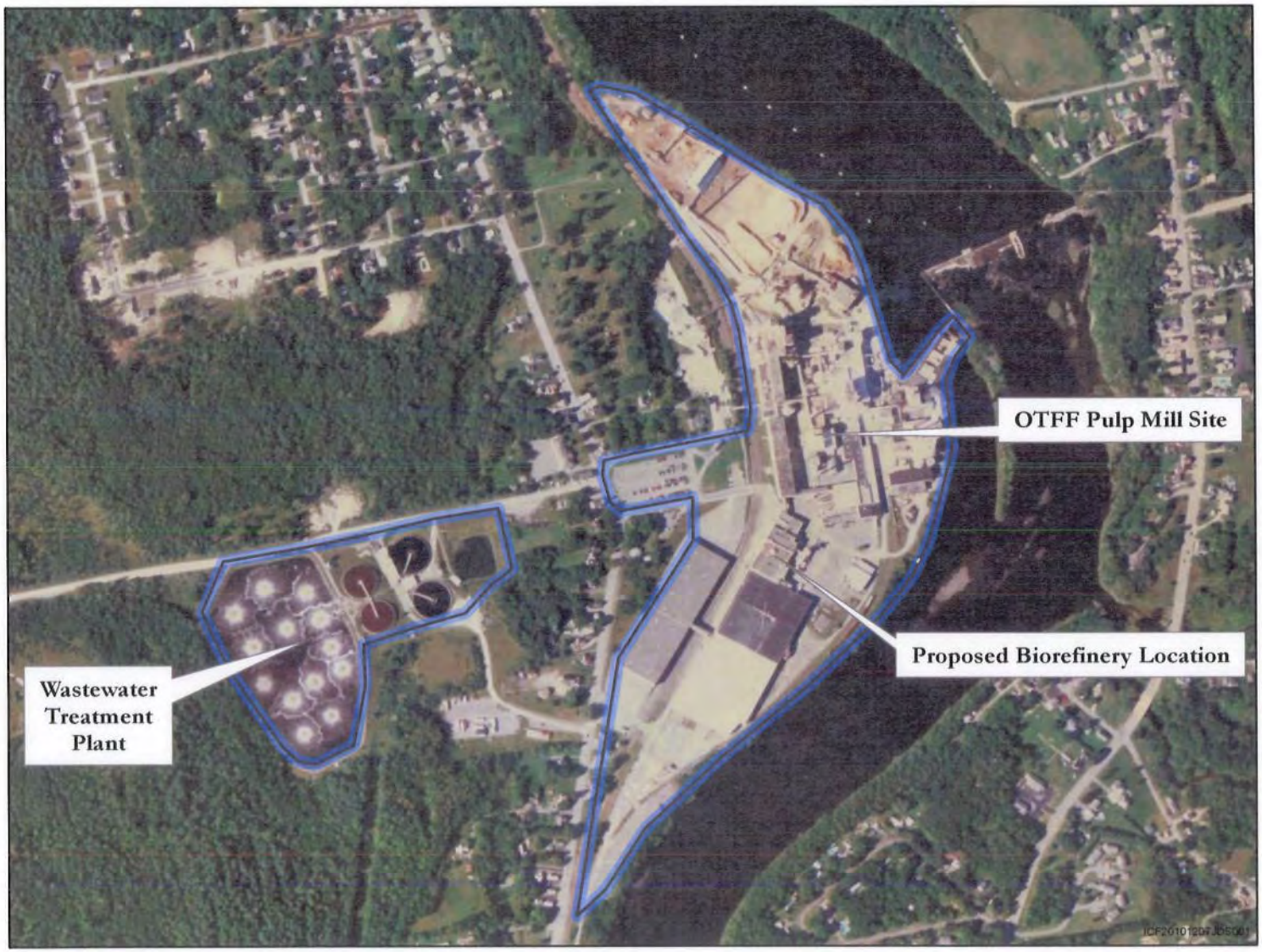

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Mr. Donald Soctomah,
THPO
Passamaquoddy Tribe
PO Box 159
Princeton, ME 04668

SUBJECT: Section 106 Review and Consultation for Proposed Old Town Fuel and Fiber Demonstration-Scale Integrated Biorefinery, Old Town, Maine

Dear Mr. Soctomah,

The U.S. Department of Energy (DOE) is proposing to authorize the expenditure of federal funding to the referenced project, thereby making said funding an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulation, "Protection of Historic Properties) (36 CFR Part 800). Pursuant to 36 CFR § 800.3 and 800.4, DOE is initiating government-to-government consultation with your tribe and proposing a finding of effect for the proposed undertaking.

DOE has transmitted project information and this finding of effect to the Aroostook Band of Micmac Indians, the Penobscot Indian Nation, the Passamaquoddy Tribe at Pleasant Point, and the Houlton Band of Maliseet Indians.

Project Description: Old Town Fuel and Fiber (OTFF) proposes to install and operate a small scale biorefinery at their existing pulp mill located at 24 Portland Street, Old Town, Penobscot County, Maine. The pulp mill is currently in operation and zoned for industrial use. The entire pulp mill site is approximately 180 acres, located on the western side of the Penobscot River. The property is bounded to the east by the Penobscot River and to the west by South Main Street. Current operations at this property include chip storage and handling, pulping, bleaching, drying, pulp milling, maintenance, warehousing, fuel storage, and black liquor storage.

The proposed biorefinery would primarily be constructed within the former 5.7 acre (250,000 square foot) tissue paper machine building, which is now vacant. A majority of the equipment that composes a biorefinery, including tanks, evaporators, hydrolosis reactors, and a centrifuge, would be housed within the former tissue paper machine building.

Those project components that would extend outside the former tissue paper machine building include: a series of above-ground pipelines between the warehouse at the pulp mill, six storage tanks and a cooling tower cell immediately outside the building, a Heat Recovery Steam Generator installed adjacent to an existing gas fired turbogenerator outside the building, and

five to ten distillation columns that would puncture the roof and extend beyond the roofline. The pipelines would be housed in an existing pipe bridge that currently contains similar sized pipelines. The distillation columns range in diameter from three to eight feet and would not exceed forty feet in height. The proposed above-ground pipelines, tanks, generators, and columns are in keeping with existing mill infrastructure currently in use for mill operations.

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Given the scope and magnitude of the project, and its potential to affect historic properties, DOE proposes that no further effort is needed to identify historic properties pursuant to 36 CFR § 800.4(b)(1).

Effect Determination: The OTTF mill site does not retain adequate historic integrity to assess its significance under the NRHP criteria. While there may be some buildings that are over fifty years of age within the mill complex, a majority of the complex dates to the 1970s and the site of the biorefinery is within a modern addition to the mill site. As there are no historic

properties in the APE, DOE proposes a finding of "no historic properties affected" for this undertaking.

Please review the enclosed project information and this finding of effect. If you have questions or comments please contact:

Christopher Carusona II
NEPA Document Manager
Department of Energy
1617 Cole Boulevard
Golden, Colorado 80401
Christopher.Carusona@go.doe.gov
Fax: 720-356-1560

Sincerely,

Christopher Carusona II
NEPA Document Manager

Attachment: *Old Town Fuel and Fiber Demonstration Scale Biorefinery*
Proposed Project Description and Location

Old Town Fuel and Fiber Demonstration Scale Biorefinery
Proposed Project Description and Location

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The OTFF biorefinery would be installed in the former tissue paper machine building (tissue building) within the existing OTFF pulp mill at 24 Portland Street, Old Town, Penobscot County, Maine (approximately 120 miles north-east of Portland, 15 miles north of Bangor); see Figure 1 and 2. The site is approximately 180 acres, the proposed biorefinery would require 0.9 acre (40,000 square feet) in the 5.7 acre (250,000 square foot) tissue building (now vacant). The property is owned by OTFF and is currently zoned for industrial use. Single family residences are located immediately adjacent to the property boundaries, the nearest being approximately 650 feet from the proposed project as well as across the river, approximately 1,300 feet from the proposed project. All construction activities would occur within the existing tissue building or immediately outside the tissue building in areas that are either asphalt or unvegetated, exposed compacted dirt.

The OTFF biorefinery would require steam, process water, electricity, natural gas, wastewater treatment, potable and non-potable water, and sanitary wastewater systems. This entire supporting infrastructure currently exists on site. An additional 2.5 MW of power would be required to operate the biorefinery. An existing gas turbine would be utilized to generate 9.5 MW of power. The additional power to the mill, 6.9 MW, would be sold on the open market.

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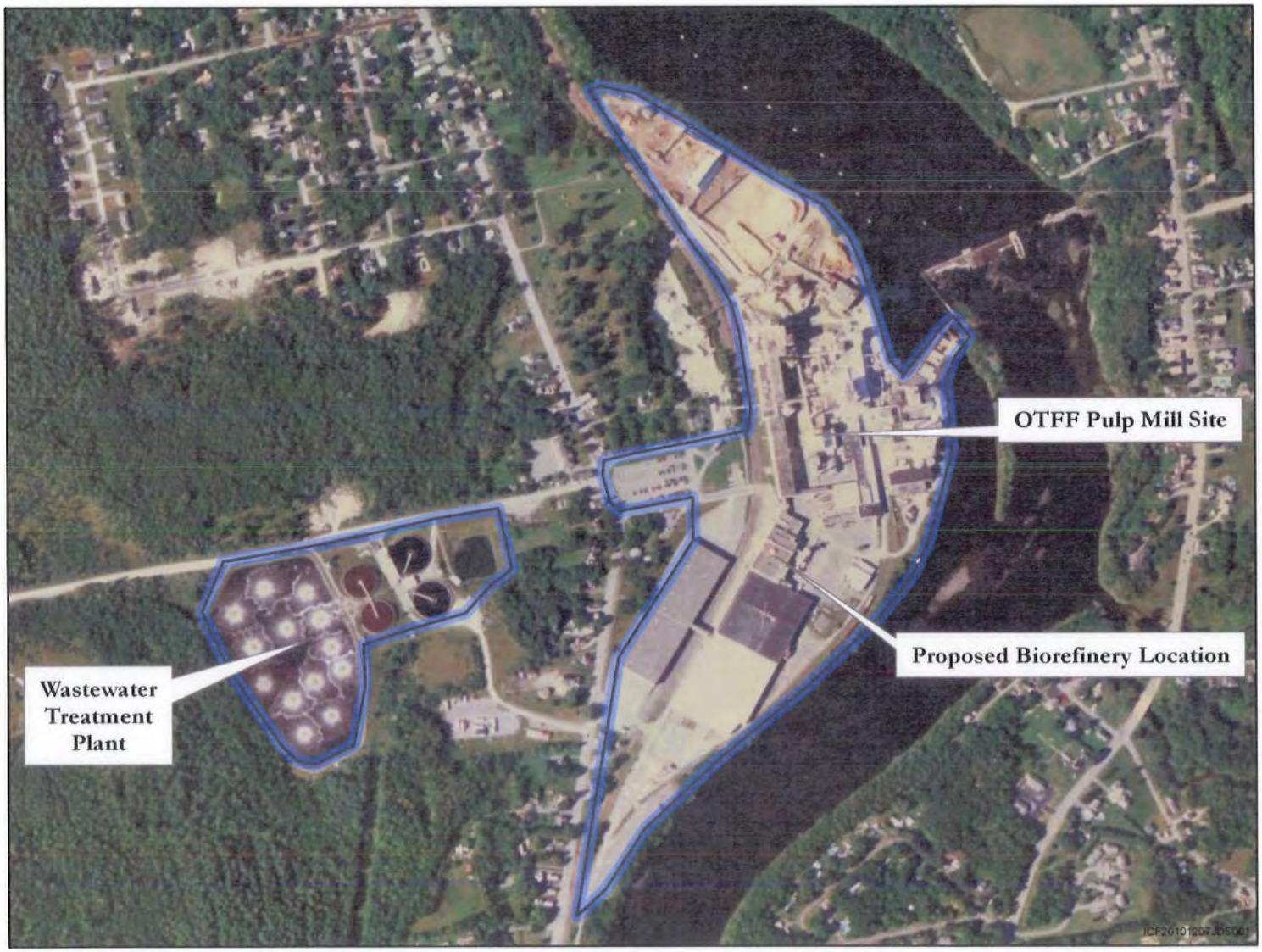

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Honorable James Sappier,
Chief
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

SUBJECT: Section 106 Review and Consultation for Proposed Old Town Fuel and Fiber Demonstration-Scale Integrated Biorefinery, Old Town, Maine

Dear Chief Sappier,

The U.S. Department of Energy (DOE) is proposing to authorize the expenditure of federal funding to the referenced project, thereby making said funding an undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulation, "Protection of Historic Properties) (36 CFR Part 800). Pursuant to 36 CFR § 800.3 and 800.4, DOE is initiating government-to-government consultation with your tribe and proposing a finding of effect for the proposed undertaking.

DOE has transmitted project information and this finding of effect to the Aroostook Band of Micmac Indians, the Houlton Band of Maliseet Indians, the Passamaquoddy Tribe, and the Passamaquoddy Tribe at Pleasant Point.

Project Description: Old Town Fuel and Fiber (OTFF) proposes to install and operate a small scale biorefinery at their existing pulp mill located at 24 Portland Street, Old Town, Penobscot County, Maine. The pulp mill is currently in operation and zoned for industrial use. The entire pulp mill site is approximately 180 acres, located on the western side of the Penobscot River. The property is bounded to the east by the Penobscot River and to the west by South Main Street. Current operations at this property include chip storage and handling, pulping, bleaching, drying, pulp milling, maintenance, warehousing, fuel storage, and black liquor storage.

The proposed biorefinery would primarily be constructed within the former 5.7 acre (250,000 square foot) tissue paper machine building, which is now vacant. A majority of the equipment that composes a biorefinery, including tanks, evaporators, hydrolosis reactors, and a centrifuge, would be housed within the former tissue paper machine building.

Those project components that would extend outside the former tissue paper machine building include: a series of above-ground pipelines between the warehouse at the pulp mill, six storage tanks and a cooling tower cell immediately outside the building, a Heat Recovery Steam Generator installed adjacent to an existing gas fired turbogenerator outside the building, and

five to ten distillation columns that would puncture the roof and extend beyond the roofline. The pipelines would be housed in an existing pipe bridge that currently contains similar sized pipelines. The distillation columns range in diameter from three to eight feet and would not exceed forty feet in height. The proposed above-ground pipelines, tanks, generators, and columns are in keeping with existing mill infrastructure currently in use for mill operations.

Area of Potential Effect (APE): The APE is limited to the biorefinery construction footprint, a 0.9 acre (40,000 square feet) vacant former tissue paper machine building and some associated areas covering 0.5 acre immediately outside the building. The majority of construction would take place within an existing building, and project components outside the building are in keeping with the existing mill infrastructure. There is no potential for visual effects as the size and scale of the biorefinery would be in keeping with the current mill infrastructure and construction would not introduce any visual elements into the setting that do not currently exist in a similar form.

Identification of Historic Properties: The Old Town pulp mill was originally a sawmill that began producing pulp in 1882, and by 1883, expanded into a sulfite pulp mill. The pulp mill has largely been in operation since that time and is currently owned and operated as the Old Town Fuel & Fiber mill.

Most of the mill buildings and structures that comprise the pulp mill site are ca. 1970 industrial structures and warehouses with no architectural distinction. As a continually operating mill, there have been numerous modern additions to the site and the mill as it exists today does not retain any of the features of the original late 19th century mill.

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Please review the enclosed project information and this finding of effect. If you have questions or comments please contact:

Christopher Carusona II
NEPA Document Manager
Department of Energy
1617 Cole Boulevard
Golden, Colorado 80401
Christopher.Carusona@go.doe.gov
Fax: 720-356-1560

Sincerely,

Christopher Carusona II
NEPA Document Manager

Attachment: *Old Town Fuel and Fiber Demonstration Scale Biorefinery*
Proposed Project Description and Location

cc: Bonnie Newsom, THPO, Tribal Historic Preservation Office, Penobscot Indian Nation

Old Town Fuel and Fiber Demonstration Scale Biorefinery
Proposed Project Description and Location

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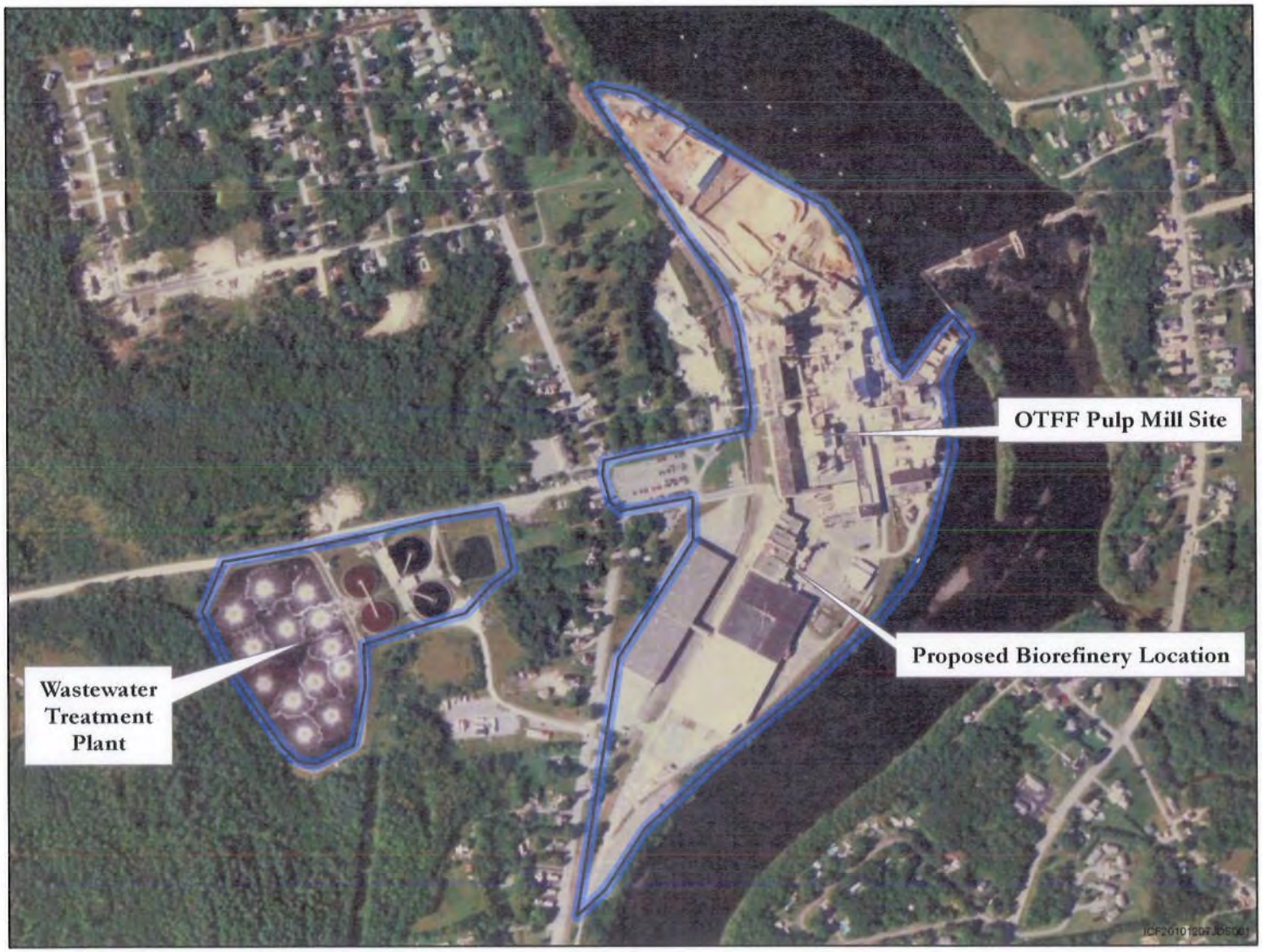

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

Bonnie Newsom,
THPO
Tribal Historic Preservation Office
Penobscot Indian Nation
12 Wabanaki Way
Indian Island, ME 04468

SUBJECT: Section 106 Review and Consultation for Proposed Old Town Fuel and Fiber Demonstration-Scale Integrated Biorefinery, Old Town, Maine

Dear Ms. Newsom

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Please review the enclosed project information and this finding of effect. If you have questions or comments please contact:

Christopher Carusona II
NEPA Document Manager
Department of Energy
1617 Cole Boulevard
Golden, Colorado 80401
Christopher.Carusona@go.doe.gov
Fax: 720-356-1560

Sincerely,

Christopher Carusona II
NEPA Document Manager

Attachment: *Old Town Fuel and Fiber Demonstration Scale Biorefinery*
Proposed Project Description and Location

Diller, Elizabeth

Subject: FW: Old Town Biorefinery, Maine

From: Carusona, Christopher (GO)
Sent: Monday, June 27, 2011 3:31:49 PM
To: john.banks@penobscotnation.org
Cc: Fiore, Whitney (CONTR)
Subject: FW: Old Town Biorefinery, Maine Auto forwarded by a Rule

Mr. Banks,
I'm contacting you in regard to the Department of Energy funding a Red Shield Acquisition Old Town Fuel and Fiber Biorefinery (DOE/EA 1888).
Please review the project at:
http://www.eere.energy.gov/golden/NEPA_DEA.aspx
under the title: " Red Shield Acquisition Old Town Fuel and Fiber Biorefinery (DOE/EA 1888)"

The scoping comment period closed 6/21/2011, however, DOE would accept any comments you may provide.

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******
Christopher P. Carusona II
Physical Scientist/NEPA Specialist
Department of Energy, Golden Field Office
1617 Cole Boulevard
Golden, CO 80101
Desk: 720-356-1563
Blackberry: 720-233-5767
Fax: 720-356-1560
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-----Original Message-----
From: Bonnie Newsom [mailto:Bonnie.Newsom@penobscotnation.org]
Sent: Monday, June 27, 2011 1:07 PM
To: Carusona, Christopher
Cc: John Banks
Subject: Old Town Biorefinery, Maine

Hello Mr. Carusona,

I'm writing to let you know that I've reviewed the information you submitted to us re: Old Town Fuel and Fiber Biorefinery. Our department does not have any objections to the project as it relates to historic properties, however I have forwarded the information to our Natural Resources Director, John Banks for his review. I would recommend you contact him directly to identify any potential Natural Resources concerns the Penobscots may have. He can be reached

at 207-817-7330 or john.banks@penobscotnation.org. Thank you for the opportunity to review this project.

Sincerely,
Bonnie Newsom
Tribal Historic Preservation Officer
Penobscot Indian Nation
207 817 7332