

**North Totten Inlet Mussel Culture EIS
Summary of Independent Technical Review Committee (ITRC) Process
1999–2008**

This document summarizes the independent technical review process used by Thurston County Development Services to confirm the sufficiency and objectivity of technical reports prepared by consultants to Taylor Shellfish to address the potential effects of a proposed mussel farm operation in North Totten Inlet.

PRECURSOR EVENTS TO THE ITRC PROCESS

11/13/96: Taylor Shellfish submitted application for Shoreline Substantial Development Permit
 9/14/98: Thurston County issued a SEPA Threshold Determination of Significance (DS) – Environmental Impact Statement required.
 9/28/98: Taylor Shellfish appealed the Determination of Significance.

THURSTON COUNTY HEARING EXAMINER FINDINGS AND CONCLUSIONS (6/21/99)

The Thurston County Hearing Examiner denied the SEPA Threshold Determination appeal, and upheld the requirement to prepare and EIS. In his written decision, the Hearing Examiner identified five issues to be evaluated in a limited-scope EIS:

1. Impacts to bottom-dwelling organisms (the benthic community)
2. Impacts to the surrounding water column
3. Impacts to the phytoplankton resource, and the effects this could have on other aquaculture and aquatic life in Totten Inlet.
4. Impacts that could be caused by escapement and propagation of mussels.
5. Impacts to marine navigation: lighting, and boat navigation around the proposed mussel rafts.

TEAM SELECTED TO ASSIST THURSTON COUNTY (2000–2001)

Members of an Independent Technical Review Committee (ITRC) were mutually selected and approved by Taylor Shellfish and Thurston County following the Hearing Examiner’s decision. The role of the ITRC has been to review the work of technical consultants to Taylor Shellfish and advise the County regarding the sufficiency and objectivity of this information for use in preparing the EIS. The ITRC consisted of the following members with the following areas of expertise:

<i>Independent Technical Reviewer</i>	<i>Area of Expertise</i>
J.E. Jack Rensel, Ph.D. Rensel Associates Aquatic Science Consultants	Phytoplankton, algal blooms, and effects on benthic organisms and finfish.
Mitsuhiro Kawase, Ph.D. University of Washington School of Oceanography	Physical oceanography: Flushing characteristics (circulation) and water quality (eutrophication).
Jan Newton, Ph.D. University of Washington, Applied Physics Lab	Biological oceanography: Water quality (nutrients, oxygen) and phytoplankton productivity.
Ralph Elston, Ph.D. AquaTechnics, Inc.	Mussel genetics: potential escapement and competition issues.
Roger Newell, Ph.D. University of Maryland Center for Environmental Science, Horn Point Laboratory	Phytoplankton, algal blooms, and effects on benthic organisms

In the same approximate time-frame, the EIS consultant was selected and mutually approved by Taylor Shellfish and Thurston County: Vicki Morris of Vicki Morris Consulting Services, with more than 20 years of experience preparing EISs under the Washington State Environmental Policy Act. Due to the lengthy review process for scopes of work, protocols, and draft documents, and the amount of work involved to schedule meetings, distribute communications, and prepare the written work products of the ITRC, Ms. Morris also served as the ITRC coordinator between 2001 and 2008.

An additional member of the EIS Team was needed to address potential impacts of the mussel farm proposal to finfish in North Totten Inlet, and to Federally-listed threatened and endangered species. Ms. Morris sought someone who could also co-author the EIS, with specific professional experience in the marine aquatic science issues that are the subjects of the technical studies, to assist with presenting this information in laymen’s terms in the EIS. Mark Pedersen, M.S., was selected and retained as a subcontractor to Vicki Morris Consulting Services in 2007. Mr. Pedersen is retired from a position as Deputy Assistant Director, Marine Fish and Shellfish, WDFW. Mark subsequently worked 15 years for environmental consulting firms, and is now self-employed, specializing in aquatic and marine environmental issues; the biology of economically-important marine fishes, salmon species, and shellfish; fishery characterization, fish habitat enhancement, and mitigation.

<i>EIS Team</i>	<i>Role</i>
Vicki Morris , Vicki Morris Consulting Services	Primary Author
Mark Pedersen , Margenex International	Co-Author, Fisheries Biologist and marine scientist.

TAYLOR CONSULTANTS SCOPE OF WORK AND PROTOCOLS (2001)

The first documents reviewed by the ITRC were the proposed scope of work and protocols for technical studies to be used to prepare the EIS:

- Aquatic Environmental Sciences (AES). August 29, 2001. *Scope of services to address aquatic environment issues, North Totten Inlet site proposed mussel culture.*
- AES. September 1, 2001. *Protocols for implementing the scope of services to address aquatic environment issues, North Totten Inlet site proposed mussel culture.*
- AES. June 22, 2000. *Literature review describing the environmental effects associated with the intensive culture of mussels (Mytilus edulis galloprovincialis).*¹
- Pacific Shellfish Institute (PSI). July 2001. *Ecological characteristics and carrying capacity of suspended shellfish culture systems.*

**ITRC WORK PRODUCT #1:
RECOMMENDATIONS RE: THE AES PROPOSED SCOPE OF WORK AND PROTOCOLS (11/01/01)**

A 15-page document of specific recommendations (with explanations) was provided to Taylor Shellfish and their consultants, Aquatic Environmental Sciences (AES) on November 1, 2001. The recommendations addressed the four biological issues in the Hearing Examiner’s Findings and Conclusions.

¹ The ITRC chose not to formally review the AES literature survey. The document is extremely lengthy, and not all of the ITRs had time to review it in detail. The document is potentially very useful, but the ITRC did not endorse its use or validity as a reference document for the North Totten Inlet Mussel Culture EIS.

Potential impacts to the benthic community. The AES sampling plan proposed to draw considerably from salmon net-pen research. Although there are many parallels between mussel rafts and salmon farms, the ITRC indicated that there are significant differences. The ITRs recommended refocusing the scope of work and protocols for several key components of the technical work to be performed, to result in a more appropriate and defensible work product. Methods were discussed and recommended for baseline sampling, selection of physicochemical parameters to be sampled, transect station orientation and positioning, canister studies, and suggestions for the approach to determine an acceptable level of impact.

Potential impacts to the surrounding water column. The ITRs acknowledged the potential value of synthesizing estimates of residence time in Totten Inlet from previous studies, Ecology data, and Ecology's South Sound circulation model (SPASM) runs; however, a need was identified to develop an upper and lower range estimate of flushing efficiency for the inlet as a whole, and for the proposed mussel raft location specifically.

Potential impacts to the phytoplankton resource. The AES (2001) Scope of Services deferred to the Pacific Shellfish Institute work to be performed in Totten Inlet to determine potential impacts to phytoplankton and other aquatic life in the inlet. The purpose of the PSI study, however, was to investigate physical, chemical, and biological conditions that would result in optimum mussel growth, not the impacts of mussel culture in the aquatic environment. The ITRC therefore identified a need for an additional document to "bridge the gap" between the PSI study and the North Totten Inlet mussel farm impact analysis.

Potential impacts caused by escapement and propagation of mussels. Relatively minor recommendations were made to the scope of work and protocols for investigating and evaluating potential impacts associated with escapement and propagation of mussels. Dr. Ralph Elston (ITRC member) subsequently participated in the selection and investigation of visual survey sites in July 2002. Dr. Elston also recommended the use of the nuclear DNA marker method of mussel species differentiation (rather than the allozyme method proposed by AES).

AES RESPONSE TO ITRC 11/01/01 COMMENTS AND RECOMMENDATIONS (12/14/01)

Dr. Kenn Brooks (AES) accepted some of the 11/01/01 direction from the ITRC, but took exception to most of the recommendations. He documented his arguments in a 32-page response to the ITRC. It is not uncommon for scientists to have different professional opinions, and to express these in a reply document. Dr. Brooks may have been unaware that this was not appropriate in a SEPA process, in which the ITRC was giving direction on behalf of Thurston County, SEPA Lead Agency.

ITRC WORK PRODUCT #2:

FINAL DIRECTION RE: METHODS OF STUDY AND INFORMATION TO BE GENERATED (2/13/02)

The purpose of the second ITRC recommendations document was to establish without further debate the requirements of the ITRC, speaking on behalf of Thurston County as SEPA Lead Agency, for the technical studies to be performed by consultants to Taylor Shellfish. Consideration was given to the counter points raised by Dr. Brooks (12/14/01), and some modifications were made to the original ITRC recommendations issued 11/01/01.

SCOPING NOTICE AND REQUEST FOR COMMENTS, TO REFRESH THE SCOPE OF THE EIS (2/28/02)

It was anticipated in early 2002 that the technical studies might be completed by the end of that year. Given the further refinement and level of technical competence of having the ITRC provide guidance to the field work and studies to be performed, the County decided to "refresh" the EIS Scoping process by

circulating another Scoping notice and inviting public and agency comments before work was actually started to write the EIS. A total of 28 letters were received, all from individuals, none from Tribes or regulatory agencies. The majority of the letters expressed opposition to the project but did not comment on the EIS scope of work or the scope of the technical studies. The letter from the Association for the Protection of Hammersley, Eld and Totten Inlet (A.P.H.E.T.I.), consultants to A.P.H.E.T.I., and a few individual letters (8 letters total) did contain substantive comments and questions. The County asked the ITRC to respond to these.

ITRC WORK PRODUCT #3:

RESPONSE TO PUBLIC COMMENTS RECEIVED ON THE SCOPE OF THE EIS (8/20/02)

The ITRC reviewed and responded to the substantive comments received from the public during the process to “refresh” the EIS scope of work. The ITRC indicated their opinion concerning issues appropriate to be addressed in the EIS, some issues that were outside the scope of the EIS, what was anticipated in technical studies being performed at that time, and clarification concerning the purpose for the water column impact study to address flushing and circulation in Totten Inlet. The ITRC offered as an attachment to the 8/20/02 document a Suggested Experimental Set-up to Establish the Residence/Ventilation Time of Water in Totten Inlet.

Strong sentiment was expressed by members of A.P.H.E.T.I. that the Taylor Shellfish mussel farm location in Gallagher Cove be used as the reference site, rather than Deepwater Point. Gallagher Cove is quite dissimilar to the North Totten Inlet site in that it is within an enclosed cove with less circulation, more shallow, with fine sediments, with a smaller mussel raft operation. For these reasons, the ITRC expressed general agreement with the Deepwater Point site for study of the effects of an existing mussel farm, and indicated that it was not necessary to completely duplicate sampling at the Gallagher Cove site. The ITRC’s Work Product #3 did, however, recommend that the cumulative impact analysis address whether or not nutrient fluxes are likely to occur in Gallagher Cove as a result of the proposed mussel farm installation at the North Totten Inlet site.

The ITRC 8/20/02 response to Scoping comments received (Work Product #3) was provided to Taylor Shellfish for follow-up action with their technical consultants. One recommendation in this Work Product was addressed in a different manner than requested. The consultant retained by Taylor Shellfish to perform the Circulation Study (residence/ventilation time determination) used a different experimental set-up to obtain the requested information. One recommendation was not addressed at all. Sediment grain size characterization in Gallagher Cove and other data collection for a cumulative effects analysis was not done in the AES studies.²

AES LETTER REPORT ON THE STATUS OF TOTTEN INLET TECHNICAL STUDIES (7/28/02)

Dr. Brooks provided an interim letter report on field work completed for water column sampling, canister studies, baseline physicochemical and biological data collected at the North Totten Inlet site and the Deepwater Point reference site, drogue studies, benthic video, a benthic nutrient study, survey of the macrofaunal community on mussel lines at reference sites, the visual survey of beach sites, and mussel samples collected for genetic identification. He recommended at this time expanding the geographic area of some of the Totten Inlet studies: the sediment survey, water column nutrient and chlorophyll studies, and described his proposed methods. An ITRC response to this status report was not required.

² Based on information gathered and reported in the 2008 technical reports, it is now known that the radius of effect from the North Totten Inlet site would be unlikely to influence the Gallagher Cove site; therefore, sediment grain size characterization in Gallagher Cove is no longer needed.

FIELD WORK STUDIES PERFORMED, DRAFT TECHNICAL REPORTS COMPLETED 2002–2007

Between 2002 and 2007, Taylor Shellfish segregated some of the work originally proposed by Aquatic Environmental Sciences (Dr. Kenn Brooks) to be completed by other consultants. The consulting firm of NewFields Northwest (formerly M.E.C. Analytical) prepared the technical report on water column effects from data collected by AES and other sources in the scientific literature. This document fulfills the requirements of the “bridge the gap” document requested by the ITRC in their Work Product #2. The consulting firm of Evans-Hamilton performed the circulation study and prepared the technical report on this subject. Dr. Kenn Brooks wrote the reports on the benthic community, particulate organic matter, mussel genetics and escapement. Draft reports were provided by Taylor Shellfish in September 2007 to the ITRC for review and comment. Reports reviewed included the following:

- Brooks, K.M. Undated; received in September 2007. *Executive summary – Totten Inlet baseline studies completed by Aquatic Environmental Sciences in 2002 and 2003.*
- Brooks, K.M. 2003. *Measurement of nutrients in bottom water and adjacent to Deepwater Point mussel farm in Totten Inlet, Washington.* Prepared for the Pacific Shellfish Institute.
- Brooks, K.M. 2004a. *The epibenthic community observed in association with the intensive raft culture of M. edulis galloprovincialis in Totten Inlet, Washington.*
- Brooks, K.M. 2004b. *The frequency of M. edulis galloprovincialis alleles in Washington State marine waters where the species is commercially cultivated.*
- Brooks, K.M. 2005. *Risk analysis for the proposed NTI mussel farm.*
- Brooks, K.M. 2005a. *Baseline information describing sediment physiochemistry of Totten Inlet and the macrobenthos of the proposed North Totten Inlet mussel farm.*
- Brooks, K.M. 2005b. *Benthic response at the Deepwater Point mussel farm in Totten Inlet, Puget Sound, Washington State.*
- Brooks, K.M. 2006. *Literature review and model evaluation describing the environmental effects and carrying capacity associated with the intensive culture of mussels.*³
- Brooks, K.M. 2006. *Supplemental study of dissolved nutrient and particulate organic matter in the waters near the proposed mussel farm in North Totten Inlet, Washington State, USA.*
- Brooks, K.M. Undated; received in September 2007. *Totten Inlet baseline studies completed by Aquatic Environmental Sciences in 2002 and 2003.*
- Evans Hamilton Group. 2006. *Totten Inlet circulation study report.*
- NewFields Northwest. 2004. *An assessment of potential water column impacts of mussel raft culture in Totten Inlet.*

³ As previously stated, the Independent Technical Reviewers chose not to formally review the AES literature survey, and did not endorse its use or validity as a reference document for the North Totten Inlet Mussel Culture EIS. The version submitted in 2006 was not updated with the more recent site-specific studies listed above. Some of the errors and omissions identified by the ITRs in prior reviews and in the 2007 set of documents are also present in the Literature Review.

ITRC WORK PRODUCTS #4:

RESPONSE TO DRAFT TECHNICAL STUDIES RECEIVED IN SEPTEMBER 2007 (3/08/08)

Individual members of the ITRC prepared detailed comments on each of the draft technical reports in their respective areas of expertise. A 5-page Summary document identified key remaining issues to be resolved to provide information needed to write the EIS. These issues were identified on page 1 of the March 8, 2008 Summary as mandatory for identification and quantification of potential adverse impacts of the proposed project.

TECHNICAL STUDIES REVISED, “FINAL” REPORTS SUBMITTED TO ITRC (October/November 2008)

Revised reports, identified as “Final,” were submitted to the ITRC by Taylor Shellfish in October and November 2008:

Aquatic Environmental Sciences. October 2008. *Measurement of nutrients in bottom water under and adjacent to the Deepwater Point mussel farm in Totten Inlet, Washington.*

Aquatic Environmental Sciences. October 2008. *The frequency of Mytilus edulis galloprovincialis alleles in Washington State marine waters where the species is commercially cultivated.*

Aquatic Environmental Sciences. October 2008. *Supplemental study of dissolved nutrients and particulate organic matter in the waters near the proposed mussel farm in North Totten Inlet, Washington State, USA.*

Evans-Hamilton Group. May 2008. *Totten Inlet circulation study.*

NewFields Northwest. October 2008. *An assessment of potential water column impacts of mussel raft culture in Totten Inlet.* (Received in November 2008).

ITRC WORK PRODUCTS #5

RESPONSE TO “FINAL” TECHNICAL REPORTS RECEIVED OCTOBER/NOVEMBER 2008 (12/04/08)

Once again, individual members of the ITRC prepared detailed comments on each of the “Final” technical reports in their respective areas of expertise. There were some relatively small-scope but significant issues in the reports prepared by NewFields and Evans-Hamilton, for which ITRC members identified specific corrective actions. Dr. Brooks (AES) submitted somewhat revised reports, but once again prepared a lengthy response document (13 pages, 10/06/08), disagreeing with two-thirds of the ITRC requests for final actions needed to address issues, comments and corrections in the AES reports. The ITRC found that the AES data collected were useful as a supplement to the NewFields Northwest report that is the primary water column effects document; however, the ITRC disagreed with the AES interpretation of some of the data on two topics: overall nutrient sensitivity of Totten Inlet, and the degree to which nitrogen exchanges between Totten Inlet and other areas of South Puget Sound. The ITRC determined that it was not necessary to debate these topics further, noting that the Newfields Northwest report does not cite or rely on the AES conclusions regarding these matters, but rather uses the field data in their own analyses.

The ITRC 2-page summary dated 12/04/08 identifies the last remaining revisions considered mandatory by the ITRC in order for these documents to be used to prepare the EIS for the North Totten Inlet Mussel Farm proposal. All elements of ITRC Work Products #5 were provided to Taylor Shellfish on 12/04/08 (confirmed final 12/31/08), for their use in working with their consultant team to make these revisions. Final reports to be accepted by Thurston County are anticipated in early 2009.

A meeting was held on 12/11/08 in the Thurston County Auditor's conference room to discuss a summary of the 8-year ITRC process, and substantial completion of the technical reports in 2008. Meeting participants included:

Roger Giebelhaus, <i>Planner in Charge</i>	Thurston County Water & Waste Management
Robert Smith, <i>Senior Planner</i>	Thurston County Development Services
Jeff Fancher, <i>Deputy Prosecuting Attorney</i>	Office of the Thurston County Prosecutor
Diane Cooper, <i>Project Development</i>	Taylor Shellfish
Gordon King, <i>Mussel Department Manager</i>	Taylor Shellfish
Billy Plauché, <i>Legal Counsel to Taylor Shellfish</i>	Gordon Derr
Dr. Jack Rensel, <i>ITRC Member</i>	Rensel Associates Aquatic Science Consultants
Vicki Morris, <i>EIS Consultant</i>	Vicki Morris Consulting Services
Mark Pedersen, <i>EIS Co-Author</i>	Margenex International

Based on clear direction given by the ITRC in documents assembled 12/04/08 for where corrections and clarifications are to be made, Thurston County representatives present at the meeting gave verbal authorization to the EIS Team to proceed with using the technical reports to prepare the EIS, subject to incorporating final revisions forthcoming in final reports. Separate written confirmation of this authorization was subsequently prepared.