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**PEER REVIEW PLAN  
FOR  
LOWER WILLAMETTE RIVER, OREGON  
Ecosystem Restoration  
FEASIBILITY STUDY**

**PEER REVIEW PLAN**  
January 25, 2008

## 1. INTRODUCTION

The Willamette River arises in the Cascade Mountains and flows between the Cascade and Coastal Ranges in Northwest Oregon. The major forks merge and the main stem begins near Eugene, Oregon and travels north about 190 miles to Portland, where it empties into the Columbia River. The size of the Willamette Basin is about 11,500 square miles and contains the three largest cities in Oregon (Portland, Eugene, and Salem). The Willamette is unusual in the United States in that it predominantly flows in a northerly direction (Figure 1).

The Willamette River is a large river that has been important to the people of the area for thousands of years. It is the tenth largest river in the continental U.S. in total discharge, with 24 million acre-feet annually (US Environmental Protection Agency, EPA, 2003). Evidence of human presence goes back as far as 10,000 years ago. European settlement began in the early 1800's. Steamboats begin navigating the lower portion of the river in the 1850's (Dean Smith & Associates 1998). Today, the river is vital to both the State's and Nation's economy. It is important for navigation, fish and wildlife habitat, agriculture, water supply, and recreation. About 70 percent of the people in Oregon live within 20 miles of the river. There are also 13 multi-purpose water projects operated by the U.S. Army Corps of Engineers (Corps) in the Willamette basin.

The Lower Willamette River Basin, the focus of this study, is defined as the area downstream (north) of Willamette Falls at river mile (RM) 26.6 in Oregon City. More specifically, this report emphasizes the portion of the river within and immediately adjacent to the City of Portland (RMs 0 to 20).

The Lower Willamette River has experienced the effects of development and industrialization over the past 150 years. Historically, the Willamette River system in the Portland area was an extensive and interconnected system of active channels, open slack waters, emergent wetlands, riparian forests, and adjacent upland forests. Modifications to improve navigation and provide ship access to the Portland Harbor included construction and maintenance of a navigation channel between RM 0 and 11.6. Urban and industrial development created steep, armored shorelines through the construction of docking facilities and bulkheads. The development of navigational channels, along with shoreline development greatly reduced the amount and quality of open slack water areas, off-water channels, and wetland habitats. This in turn has had significant detrimental effects on fish and wildlife. In addition, the river became heavily polluted starting in the early 1900's from industrial and urban waste discharges, with it being considered almost biologically dead by the 1930's (Dean Smith & Associates 1998). It was not until the 1960's that the health of the river began to improve. The health of the river has come along way since the mid 1900's; however, the river still has major water and sediment quality problems. Portland Harbor (RM 3.5 to 9.5) was added to EPA's National Priorities List (Superfund) in December 2000.

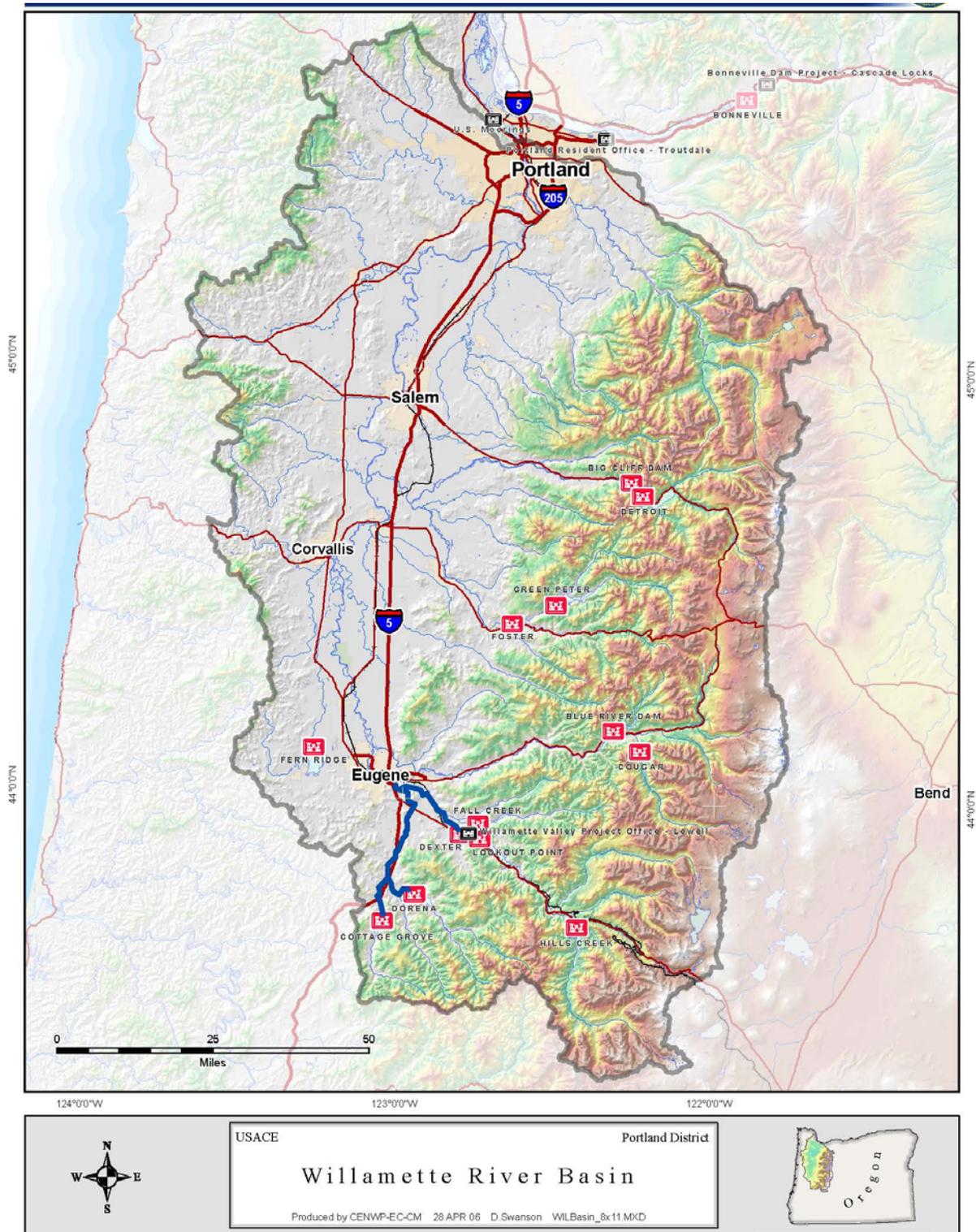


Figure 1 – Willamette River Basin

## **2. PROJECT BACKGROUND**

Numerous studies of the Lower Willamette River have been conducted or are currently being conducted relative to endangered species, fisheries, habitat, water and sediment quality, and environmental cleanup. In order to have a watershed or holistic approach to ecosystem restoration, this feasibility study is being conducted under the authority of House Resolution Docket 2687, adopted June 26, 2002 by the U.S. House of Representatives, Committee on Transportation and Infrastructure, and entitled *Lower Willamette River Watershed, Oregon*. The text of the resolution is as follows:

*Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, that the Secretary of the Army is requested to review the report of the Chief of Engineers on the Columbia and Lower Willamette Rivers below Vancouver, Washington and Portland, Oregon published as House Document Number 452, 87<sup>th</sup> Congress, 2<sup>nd</sup> Session, and other pertinent reports, to determine the feasibility of providing ecosystem restoration measures in the Lower Willamette River watershed from the Willamette Falls Locks to confluence of the Willamette River with the Columbia River through the development of a comprehensive restoration strategy development in close coordination with the City of Portland, Port of Portland, the State of Oregon, local governments and organizations, Tribal Nations and other Federal agencies.*

The fiscal year 2006 Energy and Water Development Appropriations Act (HR 2419), provided funding to initiate work on the Lower Willamette River Ecosystem Restoration General Investigation Feasibility Study.

Consequently, a without project conditions report was completed as the first step in developing the feasibility study. This report: (1) included an inventory and forecast information on the basin; (2) defined relevant information in the planning area that included historic conditions, existing conditions, and likely future conditions without a project(s); and (3) provided a description of baseline and without-project conditions that will be used in the evaluation of potential solutions to ecosystem degradation problems. The without-project condition can be thought of as a baseline picture of the future if no Corps' action is taken. Every alternative developed for the study will be compared to this without-project condition in order to assess the potential benefits of taking an action.

For this Lower Willamette River Ecosystem Restoration General Investigation Feasibility Study, the City of Portland, Bureau of Environmental Services, is the cost-sharing local sponsor. A Feasibility Cost Sharing Agreement was executed on September 22, 2003.

## **3. STUDY PURPOSE**

The feasibility study will be used to examine and prioritize ecosystem restoration opportunities in the study area. The purpose of the study is to (1) identify and evaluate

substantial ecosystem degradation problems in the Lower Willamette River Basin; (2) to formulate, evaluate, and screen potential solutions to these problems; and (3) to recommend solutions that are in the Federal interest and are supported by a local entity willing to provide the items of local cooperation (i.e., a cost-sharing sponsor). The recommended plan will contribute to the identified restoration objectives of restoring fish and wildlife habitat and natural processes of the basin. The Lower Willamette River Ecosystem Restoration project is from Willamette Falls to its confluence with the Columbia River. The study will assess the feasibility of ecosystem restoration, including remediation of contaminated sediments over a portion of a 25-mile reach of the Willamette River in Portland, Oregon.

The City of Portland and the Corps of Engineers are committed to natural resource protection and sustainable development. While the Lower Willamette River will not be like it was 150 years ago, substantial improvements can be achieved for fish and wildlife habitat, human uses, and aesthetics through careful planning and project implementation. Working together, resources can be leveraged to achieve tangible results. Federal action is required to be able to implement large-scale projects that make significant improvements. However, it will take more than just the City and the Corps to restore the ecosystem of the Lower Willamette River. Restoration will only be successful with the collaborative efforts of everyone to include local citizens, property owners, businesses, and local, state and Federal governments. A synergistic approach is necessary for success.

The City of Portland has already taken action in restoring the Lower Willamette River. In March of 2006, they released *Actions for Watershed Health, 2005 Portland Watershed Management Plan* (PBES 2006a), which is guiding City decisions and projects by providing a comprehensive approach to restoring watershed health. In addition, a project screening process is being developed to help guide this feasibility study (PBES 2005e).

The City's Watershed Management Plan objectives were used to develop specific objectives for aquatic and riparian restoration activities that would be candidates for a Corps' feasibility study. These specific objectives are:

- Reduce stormwater inflows and move tributary stream flows towards a normative hydrograph to protect instream habitat, minimize channel erosion and limit impacts on water quality.
- Restore floodplain function by reestablishing key components of bank configuration and floodplain connectivity while continuing to support river dependent activities, where applicable.
- Improve aquatic and riparian habitat conditions to support the quality and diversity of biological communities. Reestablish communities of native plants in the floodplain and riparian areas.

- Restore healthy, self-sustaining populations of native fish and wildlife.

These objectives are consistent with the Corps of Engineers policies for ecosystem restoration. Fulfillment of these objectives would help restore significant ecosystem function, structure, and dynamic processes that have been degraded. Ecosystem restoration initiatives are being conceived in the context of a broader watershed or regional plan, and for this particular study, utilizing engineering and other technical solutions to water and related land resource problems.

The purpose of the peer review plan is to assign the appropriate level and review independence, establish the procedures, and assign responsibilities for conducting the independent technical reviews (ITRs) of all applicable decision documents to ensure the quality and credibility of all decision documents developed during the GI. This plan is compliant with EC 1105-2-408 *Peer Review of Decision Documents*, 31 May 2005, section 6, parts a. through j. This plan also is compliant with the 20 April 2007 USACE Northwestern Division memorandum *Peer Review Process*.

The PDT is presented in Table 1. The project manager, Eric Bluhm, is the main point of contact at Portland District for more information about this project and the peer review plan.

**TABLE 1**  
**FEASIBILITY PHASE PROJECT DELIVERY TEAM**

<u>Discipline</u>	<u>Name</u>	<u>Office/Agency</u>
Project Manager	Eric Bluhm	CENWP-PM-FP
Program Manager (GI)	Beth McDowell	CENWP-PM-PD
Program Analyst	Karen Trojano	CENWP-PM-PD
Plan Formulation	Eric Bluhm	CENWP-PM-FP
Environmental Coordinator	Carol Schneider	CENWP-PM-E
Cultural Resources	TBD	CENWP-
Environmental Eng/HTRW	TBD	CENWP-
Civil Design	Michael Gross	CENWP-EC-DC
Survey/ CADD Mapping/GIS	Gregg Bertrand	CENWP-EC-TG
Geotechnical	TBD	CENWP-
Hydraulics & Hydrology	James Crain	CENWP-EC-HY
Economic Evaluation	Pat McCrae	CENWP-PM-FE
Cost Engineering	Pat Jones	CENWP-EC-RC
Real Estate	TBD	CENWP-RE
Public Affairs Office	TBD	CENWP-
Sponsor PM	Rick Applegate	Portland
Sponsor PM	Chris Prescott	Portland
PCX POC	David Vigh	CEMVD-RV-T

#### **4. PROJECT SIGNIFICANCE**

The ongoing Feasibility Report (FR)/ Environmental Assessment (EA) is developing ecosystem restoration projects with the Lower Willamette River Basin. The challenge the Corps faces in this study is to develop a systems based plan that effectively integrates the many water resources demands while incorporating the existing programs and ongoing efforts of the multiple levels of government agencies and stakeholders in the region. To meet this challenge, the Portland District recognized that a highly collaborative approach would be necessary to produce a quality product that would achieve broad acceptance and facilitate the actual implementation of the plan.

The Lower Willamette River Ecosystem Restoration Study has been under way for almost four years. By focusing on an integrated and collaborative approach towards planning, the Portland District is successfully working to develop broad acceptance of a blueprint for managing the water resources into the future. Thanks to this approach, the district developed the trust and support of the government agencies and local communities involved in this challenging effort.

#### **5. PROPOSED PLANNING MODELS**

The primary expected output of alternatives developed and evaluated in this feasibility study will be ecosystem restoration benefits. The PDT is currently working on a framework for combining several existing habitat models to produce quantitative estimates of ecological outputs as a single floodplain restoration “index” that captures the ecological outputs (benefits) of the proposed alternatives. The combined model is being developed based on previous recommendations of expert panels regarding the types of indicators that should be used to represent natural floodplain functions. Indicators include species, plant communities, and hydrogeomorphic functions. Indicator attributes to be considered include the actual physical or biological features or processes that can be measured either in the field or via GIS analysis, including features such as channel length, area of cottonwood community, temperature, pieces of large woody debris, etc.

The proposed model will integrate an existing Ecosystem Diagnosis and Treatment (EDT) model which provides an indicator of the existing and potential future conditions for spring chinook salmon populations and their habitat, with other existing Habitat Evaluation Procedure (HEP) models that estimate ecological outputs for other aquatic and terrestrial species.

The resulting outputs of the combined model will be used as the basis of the incremental cost analysis/cost effectiveness (ICA/CE) for all ecosystem restoration and mitigation plans. This analysis compares the potential costs of each proposed alternative to the potential ecological benefits. This analysis is facilitated by developing a single numeric value for the ecological benefits for each alternative. Thus, the general framework of the

model, as shown above, results in a single “score” for each alternative. Such a single numeric value is most certainly an oversimplification of a highly complex ecosystem. However, if the model is completely transparent so that both users and decision-makers can view the relationships and equations used in each part of the model; the inputs and outputs of the model; and understand how each score is derived, it will be a highly useful tool for comparing the relative benefits of potential restoration alternatives. It is not intended to be a rigorous prediction of fish and wildlife production or geomorphic rates of change.

Upon completion of the ICA/CE process, the NWW Cost Estimating Directory of Expertise will be consulted and review selected plan cost estimates as part of finalizing the FR/EA in FY 09 (contingent upon Federal funding).

Monitoring and evaluation of baseline versus post-implementation conditions can provide a valuable evaluation of the accuracy of the model in predicting benefits to specific species or ecosystems over time and within other reaches or subbasins of the Willamette River and will be considered for implementation as part of this project.

It is not anticipated that the feasibility report will disseminate influential scientific information or a highly influential scientific assessment.

The PDT is also developing a HEC-RAS model to describe baseline hydrologic conditions on the floodplain within the study area and to assist in evaluating the hydraulic effects of alternative ecosystem restoration measures considered in the alternatives. The outputs of the HEC-RAS model will provide important information about habitat effects and attributes that will be incorporated into the ecological models described above.

All models determined to require Center of Expertise certification will be formally provided for review.

## **6. REVIEW SCHEDULE**

ITRs will be conducted for all major GI phase documents (i.e, without-project report, feasibility scoping documents, plan selection report, and Draft FR/EA) and major engineering and scientific documents products (e.g., cultural resources overview, geomorphology report, and programmatic biological assessment). The review schedule is included in the Project Management Plan (PMP) and will be updated as reviews are scheduled.

<b><u>Review</u></b>	<b><u>Date</u></b>
Without-project condition Report	FY 06
Feasibility Scoping Meeting	May 2008
Conceptual Alternatives Review	September 2008
Public meeting	FY 09
Draft FR/EA	FY 09
Alternatives Formulation Briefing	FY 09
Selected alternative cost estimate review	FY 10
Final FR/EA	FY 10

## **7. EXTERNAL PEER REVIEW**

An external peer review is planned for the draft final FR and EA for the following reasons: (a) the large geographical scale of the project, (b) potential high urban construction cost in excess of \$100M, (c) vertical team consensus up through NWD (d) environmental importance of the project area, and (e) to ensure the continued public/agency trust of the Corps hydrologic and hydraulic modeling for the without-project condition.

## **8. PUBLIC REVIEW OPPORTUNITIES**

The public has and will continue to be provided many opportunities for external peer review, and will be encouraged to continue to provide input to the review process through scoping meetings and review periods programmed into the feasibility schedule. Furthermore, the public will be asked to participate in the recommendation of a Peer Review Panel for the review of the feasibility report and EA. Finally, all public comment during the feasibility study will be provided to the External Peer Review Panel.

## **9. AVAILABILITY OF PUBLIC COMMENTS TO ITR TEAM**

Public input from workshops and scoping meetings will be available to the ITR members to ensure that public comments were considered during development of the without-project conditions report, and will be considered during development of the plan formulation documents, and the draft FR/EA. In addition, the draft FR/EA will be independently reviewed prior to the conclusion of the public comment period, and, therefore, these comments will not be available to the ITR members. In the event that the final FR/EA is significantly revised from the draft, another ITR will be scheduled and public comment on the draft will be available to the reviewers.

## 10. ANTICIPATED NUMBER OF REVIEWERS

The current ITR plan is to include at least 10 independent reviewers. This number is based on the disciplines required to develop the feasibility products and the draft and final FR/EA.

## 11. PRIMARY DISCIPLINES AND EXPERTISE NEEDED FOR THE ITR

The disciplines and expertise required for the ITR team are presented in Table 2.

**TABLE 2**  
**INDEPENDENT TECHNICAL REVIEW TEAM**

<u>Discipline</u>	<u>Reviewer</u>
Review Team Leader	TBD
Plan Formulation	TBD
Environmental	TBD
Cultural Resources	TBD
Geotechnical	TBD
Economic Evaluation	TBD
Cost Engineering	TBD
Real Estate	TBD
Geomorphology	TBD
Civil Design	TBD
Structures	TBD
Hydraulics and Hydrology	TBD
HTRW	TBD
Sponsor – City of Portland	TBD

This information will be updated as the study progresses. These specific disciplines were selected based on the scope of the study and the expertise required to develop ecosystem restoration solutions.

Policy Review. Policy review of the FR/EA will be conducted primarily at the Division and Headquarters level. External peer review is for technical matters only, and is not used to resolve policy issues.

Quality Control will be maintained by the resource managers for the separate Seattle District technical offices. The PDT and the sponsor will also review products for technical excellence.

The Independent Technical Review Team will be selected on the basis of having the proper knowledge, skills, and experience necessary to perform the task and their lack of

affiliation with the development of the FR/EA and associated appendixes (through the NWD nomination and selection from all division districts). The review team will be approved by the Ecosystem Center of Expertise to ensure that the technical work and products from each discipline achieve a quality product. Funding of reviewers may include travel to Seattle District for the review conference. All ITRs will be completed through DRCHECKS where comments and comment resolution are captured.

Technical review will use appropriate analytical methods for each technical area. Technical review will rely on periodic technical review team meetings to discuss critical plan formulation or other project decisions, and on the review of the written feasibility report documentation and files. Independent technical review will ensure that:

- the FR/EA is consistent with current criteria, procedures and policy
- clearly justified and valid assumptions that are in accordance with established guidance and policy have been utilized, with any deviations clearly identified and properly approved
- concepts, features, analytical methods, analyses, and details are appropriate, fully coordinated, and correct
- problems/issues are properly defined and scoped
- conclusions and recommendations are reasonable and justified.

## **12. EXTERNAL PEER REVIEWERS**

External peer review is conducted by nationally recognized technical experts outside of the Corps of Engineers. They may be from the National Academy of Sciences, Oregon and Oregon State Universities, or other scientific institutions or other scientific institutions per recommendations by the local sponsor with Corps guidance.. Peer review is required when projects utilize new scientific methods, have high risk, are large in scale, or have significant controversy. A panel of peer reviewers will be selected with input from the general public, Corps Centers of Expertise, stakeholders, and the sponsor. External peer review will use appropriate analytical methods for each technical area. The Peer review panel will meet with the study PDT and the public to determine areas of controversy in the feasibility report, and will review the written feasibility report documentation and files, including the technical appendices. The panel will tour the study area and interview participants as needed. The external peer review team will ensure:

- Scientific data used in the study was accurate and complete.
- Modeling methods used were pertinent to the type of study results required, and sound modeling methodology was used
- The analysis contained clearly justified and valid assumptions
- concepts, features, analytical methods, analyses, and details are appropriate, fully coordinated, and correct
- Problems/issues are properly defined and scoped
- Conclusions and recommendations are reasonable and justified.

The disciplines and expertise required for the EPR panel are presented in Table 3. These areas of expertise will address the majority of comments and issues raised in similar multi-purpose studies. The areas of expertise are also responsive to the needs identified by the PDT and City of Portland Staff. Although controversy beyond these disciplines is not expected, the composition of the EPR panel will be flexible to respond appropriately.

**TABLE 3**  
**EXTERNAL PEER REVIEW PANEL**

<b><u>Discipline</u></b>	<b><u>Reviewer</u></b>
Hydraulic Engineer	TBD
Hydrologic Engineer	TBD
Environmental Specialist	TBD
Cultural Resources Expert	TBD
Geomorphologist	TBD

### **13. PUBLIC SELECTION OF PEER REVIEWERS**

The public will be asked to participate in the selection of external peer reviewers prior to the Alternative Formulation Briefing. The public will have an opportunity to review and comment on the revised Project Management Plan and Peer Review Plan prior to initial approval, and through out the study process.