



DEPARTMENT OF  
**ECOLOGY**  
State of Washington

## **Quality Management Plan**

---

**Washington State**  
**Department of Ecology**

October 2010

Publication No. 10-03-056

## Publication and Contact Information

This document is available on the Department of Ecology's website at [www.ecy.wa.gov/biblio/1003056.html](http://www.ecy.wa.gov/biblio/1003056.html)

This document replaces the 2005 version of the *Quality Management Plan*: [www.ecy.wa.gov/biblio/0503031.html](http://www.ecy.wa.gov/biblio/0503031.html).

The Activity Tracker Code for this document is 11-083.

For more information contact:

Publications Coordinator  
Environmental Assessment Program  
P.O. Box 47600, Olympia, WA 98504-7600  
Phone: (360) 407-6764

Washington State Department of Ecology - [www.ecy.wa.gov/](http://www.ecy.wa.gov/)

- Headquarters, Olympia (360) 407-6000
- Northwest Regional Office, Bellevue (425) 649-7000
- Southwest Regional Office, Olympia (360) 407-6300
- Central Regional Office, Yakima (509) 575-2490
- Eastern Regional Office, Spokane (509) 329-3400

*Any use of product or firm names in this publication is for descriptive purposes only and does not imply endorsement by the author or the Department of Ecology.*

*To ask about the availability of this document in a format for the visually impaired, call 360-407-6764.*

*Persons with hearing loss can call 711 for Washington Relay Service.  
Persons with a speech disability can call 877-833-6341.*

# **Quality Management Plan**

---

## **Washington State Department of Ecology**

Authored and edited by  
William R. Kammin  
Quality Assurance Officer

Environmental Assessment Program  
Washington State Department of Ecology  
300 Desmond Drive, P.O. Box 47600  
Olympia, Washington 98504-7600

*This page is intentionally left blank.*

## **Approvals by Director and Quality Assurance Officer**

Approved:

---

Ted Sturdevant, Agency Director

Date

Approved:

---

William R. Kammin, Agency Quality Assurance Officer

Date

## Concurrences by Deputy Director and Program Managers

Approved: \_\_\_\_\_  
Polly Zehm, Deputy Director Date

Approved: \_\_\_\_\_  
Stuart Clark, Manager, Air Quality Program Date

Approved: \_\_\_\_\_  
Rob Duff, Manager, Environmental Assessment Program Date

Approved: \_\_\_\_\_  
K Seiler, Manager, Hazardous Waste and Toxics Reduction Program Date

Approved: \_\_\_\_\_  
Jane Hedges, Manager, Nuclear Waste Program Date

Approved: \_\_\_\_\_  
Gordon White, Manager, Shorelands and Environmental Assistance Program Date

Approved: \_\_\_\_\_  
Laurie Davies, Manager, Waste 2 Resources Program Date

Approved: \_\_\_\_\_  
Dale Jensen, Manager, Spill Prevention, Preparedness, and Response Program Date

Approved: \_\_\_\_\_  
Jim Pendowski, Manager, Toxics Cleanup Program Date

Approved: \_\_\_\_\_  
Kelly Susewind, Manager, Water Quality Program Date

Approved: \_\_\_\_\_  
Ken Slattery, Manager, Water Resources Program Date

**Approval by  
Region 10, U.S. Environmental Protection Agency**

Approved:

\_\_\_\_\_  
Gina Grepo-Grove, Quality Assurance Manager

\_\_\_\_\_  
Date

*This page is intentionally left blank.*



# Table of Contents

	Page
Approvals by Director and Quality Assurance Officer.....	5
Concurrences by Deputy Director and Program Managers .....	6
Approval by Region 10, U.S. Environmental Protection Agency .....	7
Table of Contents .....	9
Purpose of This Document.....	11
Chapter 1. Introduction .....	13
1.1 Background.....	13
1.2 Graded Approach to Quality Management.....	13
1.3 Intended Audience .....	14
1.4 Period of Applicability.....	14
1.5 Supersession.....	14
1.6 Legal Basis for Ecology’s Quality Assurance Program .....	14
Chapter 2. Quality Management Plan Requirements.....	15
2.1 Policy .....	15
2.2 Purpose.....	15
2.3 Applicability .....	15
2.4 General Content and Detail Requirements .....	15
2.5 Preparation .....	16
2.6 Submission and Approval.....	16
2.7 Plan Revisions.....	16
Chapter 3. Quality Management Plan Elements .....	17
3.1 Content Requirements.....	17
3.2 Management and Organization.....	17
3.3 Quality System Components.....	22
3.4 Personnel Qualifications and Training.....	23
3.5 Procurement of Items and Services.....	24
3.6 Documents and Records .....	24
3.7 Information Management.....	25

3.8	Planning .....	26
3.9	Implementation of Work Processes .....	27
3.10	Assessment and Response.....	28
3.11	Quality Improvement.....	29
	References.....	31
	Acronyms.....	32
	Appendices.....	33
	Appendix A. Ecology Quality Assurance Glossary.....	35
	Appendix B. EAP Policy 1-14 (Quality Assurance Project Plan) .....	41
	Appendix C. EAP Policy 1-08 (Standard Operating Procedure).....	47
	Appendix D. Ecology Quality Assurance Management Structure .....	57
	Appendix E. Ecology Standard Operating Procedures .....	58
	Appendix F. Ecology Intra-Program Agreement on Data-Entry Practices.....	67
	Appendix G. Ecology Policy 22-01, Establishing Quality Assurance.....	73
	Appendix H. Ecology Policy 22-02, Requiring Use of Accredited Environmental Laboratories.....	75
	Addendum: National Estuary Program Grant Processes and Quality Assurance Oversight	

## Purpose of This Document

This *Quality Management Plan* is the Washington State Department of Ecology “blueprint” for applying the quality system to environmental programs.

The quality system is a structured and documented management system that provides the framework for (1) planning, implementing, documenting, and assessing environmental data operations, and (2) carrying out required quality assurance and quality control activities.

The quality system encompasses both managerial and technical activities. The active participation of all employees is required.

*This page is intentionally left blank.*

# Chapter 1. Introduction

## 1.1 Background

The Washington State Department of Ecology (Ecology) develops this *Quality Management Plan* as a cornerstone of its participation in the U.S. Environmental Protection Agency (EPA) quality system. Ecology's quality system is defined in the agency's previous *Quality Management Plan* (Ecology, 2005) and is formally established in Ecology policy 22-01 (Ecology, 2006).

The *Quality Management Plan* is based largely on requirements set out by EPA in their internal quality assurance (QA) system guidance (EPA, 2006a, 2006b).

Ecology's QA Officer, who is designated by Ecology's Director, coordinates QA activities throughout the agency. The QA Officer also is the chief QA liaison for extra-agency QA activities. The QA Officer is based in Ecology's Environmental Assessment Program (EAP).

All Ecology programs have designated one or more QA Coordinators who theoretically have a commitment of 0.25 FTE/program. The program QA Coordinators (1) oversee QA and quality control activities within their respective programs and (2) have a wide range of potential responsibilities.

Manchester Environmental Laboratory has an integral role in Ecology's quality system. Manchester Laboratory is the in-house Ecology laboratory and provides lab services for general chemistry, metals, organic chemistry, and microbiology. Laboratory QA practices are discussed in Ecology's *Quality Management Plan* and are formally described in the Manchester Laboratory *Quality Assurance Manual* (Ecology, 2007a).

Ecology's Lab Accreditation Unit provides accreditation services to help establish and document laboratory proficiency for the reporting of data to Ecology. Accreditation requirements for data produced by and submitted to Ecology are detailed in Ecology policy 22-02 (Ecology, 2008a). The Lab Accreditation Unit maintains a procedural manual (Ecology, 2010) and several standard operating procedures (SOPs) (Ecology 2007b, 2007c, 2008b) documenting the QA practices and procedures of the unit.

## 1.2 Graded Approach to Quality Management

The graded approach to quality management is straight-forward. Projects of different sizes, levels of risk, and rigor call for differing approaches to QA documentation. Generally speaking, the larger the project and the more risk the project carries, the more detailed and rigorous the quality documentation should be.

Notwithstanding these differences, Ecology Policy 22-01 and EAP Policy 1-14 call out the development of QA Project Plans (QAPPs) for almost all projects generating environmental data, including those projects using or evaluating secondary data. Ecology also requires that all field

sampling, field analytical, and laboratory activities be documented using formally approved SOPs. To this end Ecology has developed over 200 SOPs applicable to field, laboratory, data management, and accreditation activities. See Appendix B of this document for a listing of Ecology and program SOPs.

### **1.3 Intended Audience**

The intended audience for this *Quality Management Plan* is diverse. Ecology staff and management fulfill the noted responsibilities and authorities stated herein. Ecology's partners in grants, contracts and loans have a vital interest in adhering to the requirements of the plan. Ecology develops and maintains the plan to meet the requirements of the EPA quality system. Finally, other public and private sector environmental organizations and the general public may be interested in Ecology's plan to ensure quality in its data generation activities.

### **1.4 Period of Applicability**

The period of applicability for this *Quality Management Plan* is five years from the date of publication. At the end of that period, the plan will be reissued without changes, revised and reapproved, or rewritten.

### **1.5 Supersession**

This document supersedes all previous Ecology *Quality Management Plans* (e.g., Ecology, 2005).

### **1.6 Legal Basis for Ecology's Quality Assurance Program**

EPA requires Ecology to document its quality system in an approved *Quality Management Plan*. This requirement is communicated through several mechanisms including:

- 48 CFR Part 46, Federal Acquisition Regulations, for contractors.
- 40 CFR Parts 30, 31, and 35 for assistance agreement recipients.
- EPA Order 5360.1 CHG 1, which establishes a mandatory agency-wide quality system that applies to EPA as well as all organizations performing work for EPA.
- Other mechanisms, such as consent agreements in enforcement actions.

# Chapter 2. Quality Management Plan Requirements

## 2.1 Policy

Several aspects of Ecology's *Quality Management Plan* are dictated by either EPA or Ecology policy. The EPA document *EPA Requirements for Quality Management Plans* (EPA, 2001) states that any environmental data generation funded by EPA must be performed using an appropriate quality management plan. Ecology Policy 22-01 requires the development of QAPPs for all environmental data generation performed by Ecology or performed by Ecology grantees, contractors or loan recipients, when that data is submitted to Ecology. Ecology Policy 22-02 also requires the use of laboratories accredited by Ecology when Ecology performs the environmental data generation or when any entity submits environmental data to Ecology. Labs must be accredited for the specific parameter and method used to generate the data.

SOPs are required for all Ecology sampling as well as field and laboratory analytical operations. Additionally, SOPs may be required for processes involving data acquisition, entry, analysis, and interpretation. An example of this type of SOP is the Ecology stormwater SOP developed for guidance in the handling of non-detects in environmental data sets.

## 2.2 Purpose

The ultimate purpose of the *Quality Management Plan* is to ensure, to the extent possible, that data generated by Ecology or submitted to Ecology is of appropriate quality and usability. To this end, Ecology's quality system touches many aspects of agency operations including:

- Project planning (QAPPs).
- Document development (SOPs and reports).
- Internal laboratory operations.
- Laboratory accreditation.
- Data management.
- Field sampling and analytical procedures.

## 2.3 Applicability

The *Quality Management Plan* is applicable to all staff in Ecology.

## 2.4 General Content and Detail Requirements

The required contents of all *Quality Management Plans* are defined in EPA (2001). Every effort has been made to comply with these requirements with regard to both content and format.

## 2.5 Preparation

Preparation of the *Quality Management Plan* is the responsibility of Ecology's Executive Management Team (EMT). In practice, preparation is delegated to the Ecology QA Officer, who may also involve the Program QA Coordinators and other staff.

## 2.6 Submission and Approval

The *Quality Management Plan* must be approved by the following managers:

- Ecology Agency Director
- Ecology Deputy Director
- Ecology QA Officer
- Ecology Environmental Program Managers:
  - Air
  - Environmental Assessment
  - Hazardous Waste and Toxics Reduction
  - Nuclear Waste
  - Shorelands and Environmental Assistance
  - Waste 2 Resources
  - Spill Prevention, Preparedness and Response
  - Toxics Cleanup
  - Water Quality
  - Water Resources
- EPA Region 10 QA Manager

## 2.7 Plan Revisions

The *Quality Management Plan* is revised on a five-year cycle.



# Chapter 3. Quality Management Plan Elements

## 3.1 Content Requirements

*Requirements for Quality Management Plans* (EPA, 2001) contains requirements for *Quality Management Plan* content and format. This document strictly aligns with the stated topic areas in EPA (2001).

## 3.2 Management and Organization

The mission of Ecology is to protect, preserve, and enhance Washington's environment, and promote the wise management of our air, land, and water for the benefit of current and future generations.

Ecology Policy 22-01, *Establishing Quality Assurance*, was adopted on August 25, 1993 and revised in October 1999 and also in 2006. The policy applies to environmental data collection studies conducted or funded by Ecology. It is the responsibility of Ecology management to promote the consistent application of QA and quality control principles to the planning and execution of these studies and activities. A copy of the policy is included as Appendix G.

It is the intent of the policy that (1) the quality of all environmental data be documented, (2) the data satisfy the requirements for their intended use, and (3) the data are legally defensible. The policy is implemented by Ecology managers and staff. Appropriate QA and QC practices are used in all phases of environmental studies and activities, from developing the initial plan through sampling, measurement, assessment, and use of the data. The QA/QC requirements should be commensurate with the importance of the work, available resources, unique needs of Ecology, and the consequences of potential decision errors.

Ecology's QA organizational chart is included as Appendix D. The chart shows that the QA Officer reports to both the Manager of the Environmental Assessment Program and the Deputy Director, and does not have any direct responsibility for sampling or analysis (i.e., data acquisition).

Ecology programs with responsibilities for environmental data are listed in section 2.6. The following sections list the QA/QC roles, authorities, and responsibilities of the personnel involved in data QA.

### 3.2.1 QA/QC Responsibilities

#### 3.2.1.1 Management Responsibilities

Several Ecology managers are responsible and accountable for accomplishing the mission and conducting overall operations. These delegated managers are the signatories of this document and are listed in section 2.6 of this document. The resources necessary to implement the Ecology

QA policy are identified and budgeted by the Program Managers. The Director is responsible for designating the QA Officer, and Program Managers are responsible for designating QA Coordinators. In addition, delegated management is responsible for:

- Preparing and revising this *Quality Management Plan*. Preparation may be assigned to staff, with senior managers participating in and supporting the effort, as well as signing approval.
- Understanding fully the content of this plan and concurring with its implementation.
- Allocating resources to implement the QA policy and this plan.
- Ensuring that QA policy and this plan are implemented.
- Delegating responsibilities for implementing a quality system at appropriate levels of the organization.
- Building success measures into the quality system, in order to determine when it is working well.
- Assessing the adequacy of the quality system.
- Deciding whether to employ peer review in particular instances, in order to ensure that technical documents provide credible science and are reliable and readable.

### **3.2.1.2 Quality Assurance Officer**

The QA Officer is responsible for:

- Reviewing and approving QAPPs prepared by and for Ecology staff. QAPPs submitted to EPA must be approved by the QA Officer. Approval means that the QA Officer agrees that the QAPP reflects adequate planning and contains sufficient information to allow competent staff to acquire and document the quality of data necessary to meet the objectives of the project.
- Providing technical support to agency programs, and working with the QA Coordinators to provide this support.
- Acting as the liaison between Ecology and other agencies on QA/QC matters.
- Informing management of QA/QC issues and problems.
- Assisting management, as requested, in preparing QA/QC documents, including this agency *Quality Management Plan*.
- Providing technical assistance to Ecology staff in implementing QAPPs and assessing the quality of the results obtained.
- Preparing and maintaining *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* (Lombard and Kirchmer, 2004).
- Assisting Ecology staff with preparing documents involving the application of QA and QC principles.

- Coordinating training on QA and QC principles and practices to meet the needs of Ecology staff.
- Preparing a *Quality Report to Management* (Ecology, 2009) every three years.
- Coordinating and conducting, when necessary, audits of agency QA operations and project reports. The QA Officer has stop-work authority when reports contain demonstrable errors, or when field or laboratory QA processes are insufficiently documented or implemented.
- Reviewing and concurring on technical reports issued by Ecology's Water Quality Program and other programs when requested or required.
- Identifying agency needs regarding SOPs; coordinating the development of SOPs, and reviewing and approving SOPs.
- Designing and producing the content of the QA website.

### **3.2.1.3 Quality Assurance Coordinators**

Program QA Coordinators are responsible for:

- Acting as point of contact within their programs for data quality issues.
- Coordinating with the agency QA Officer to identify needs related to QAPP preparation, SOP preparation and maintenance, and QA/QC training.
- Reviewing and approving QAPPs submitted by and for their program staff.
- Coordinating the development of program field sampling and field analytical SOPs.
- Assisting project managers who review and approve QAPPs prepared within the program.
- Assisting project managers who oversee the preparation of QAPPs submitted to Ecology by responsible parties, contractors, and grant recipients.
- Providing technical assistance to program staff who implement QAPPs and assess the quality of the results obtained.
- Assisting with preparing and presenting QA/QC training for program staff.
- Assisting program staff and grant recipients in meeting QA/QC requirements.
- Providing information to the QA Officer for the *Quality Report to Management*.

Additional responsibilities may be defined in program-specific QA plans. For example, the *Air Monitoring Quality Assurance Plan* specifies some responsibilities of the QA Coordinator for the Air Quality Program.

#### **3.2.1.4 Project Managers and Project Leads**

Project managers and project leads have overall responsibility for (1) specific environmental studies and (2) activities conducted through grants or contracts. They are responsible for:

- Preparing QAPPs.
- Assisting contractors, grant recipients, and the regulated community with preparing QAPPs.
- Reviewing and approving QAPPs prepared by grant recipients and contractors.
- Implementing QAPPs.
- Assessing and reporting the quality of data, based on the quality objectives.

#### **3.2.1.5 Field Staff**

Staff collecting samples or data in the field have a vital role in the success of the projects. They are responsible for:

- Understanding and following the QAPP.
- Checking all equipment and supplies in advance of field operations.
- Ensuring that samples are properly collected, preserved, labeled, packaged, and shipped.
- Ensuring that all field data are recorded and preserved according to the QAPP.
- Following necessary chain-of-custody procedures and SOPs.

#### **3.2.1.6 Manchester Environmental Laboratory, Director**

Ecology's Manchester Laboratory Director is responsible for:

- Direction and oversight of QA/QC for the laboratory.
- Designating the laboratory QA Coordinator.
- Approving QAPPs that involve laboratory services.
- Participating in and approving the preparation and revision of the laboratory *Quality Assurance Manual* and the *Lab Users Manual*.
- Ensuring that the laboratory participates in all required external system assessments and proficiency testing studies.
- Ensuring that the laboratory maintains accreditation for all parameters and methods used to produce environmental data.

### **3.2.1.7 Manchester Environmental Laboratory, QA Coordinator**

The QA Coordinator for Manchester Laboratory is responsible for:

- Reviewing QAPPs to ensure that the procedures specified for sampling and analysis are appropriate and that the number, type, and schedule of analyses required can be accommodated.
- Coordinating the preparation and revision of the laboratory *Quality Assurance Manual* and the *Lab Users Manual*.
- Directing the preparation and maintenance of the administrative and technical SOPs.
- Reviewing data produced by the laboratory for compliance with QA/QC requirements.
- Performing internal system and performance audits to identify and correct problems affecting data quality.
- Coordinating the laboratory's participation in all external system and proficiency testing studies, including those required for accreditation.

### **3.2.1.8 Manchester Environmental Laboratory, Staff**

Laboratory staff provides analytical services, support services, and technical consultation, each of which includes QA responsibilities. Laboratory staff responsibilities include:

- Following the administrative and technical SOPs.
- Analyzing samples according to methods specified in the QAPPs and documenting any necessary changes in the methods.
- Analyzing quality control samples according to guidance provided in their laboratory *Quality Assurance Manual* and the QAPPs.
- Assuring that samples are analyzed within specified holding times, as well as providing complete and accurate data reports in a timely manner.
- Contributing to the preparation of the laboratory *Quality Assurance Manual*, the *Lab Users Manual*, and SOPs in their area of expertise.
- Reviewing, verifying, and/or validation the results of analyses, including results from other laboratories when arrangements have been made for this service.
- Operating and maintaining the Laboratory Information Management System (LIMS).

### **3.2.1.9 Lab Accreditation Unit**

Ecology's Lab Accreditation Unit staff administer the Environmental Laboratory Accreditation Program. This program is authorized by law in RCW 43.21A. Applicable rules are presented in WAC 173-50. Accreditation is granted to laboratories after assessing them to determine that they have a demonstrated capability to accurately analyze environmental samples. Details of the

responsibilities for accrediting laboratories are given in the *Procedural Manual for the Environmental Laboratory Accreditation Program* (Ecology, 2010).

### **3.2.1.10 Dispute Resolution**

Oversight responsibilities for QA/QC may result in disagreements between the oversight group and the program reviewed. Such disputes may occur in situations involving technical issues (e.g., quality requirements, assessments, audits, surveillance, data quality (usability) assessments, publications) and management issues (e.g., *Quality Management Plan* reviews, management system reviews).

Disputes should be resolved at the lowest management level possible.

All parties should make every effort to resolve disputes through discussion and negotiation. If the parties are unable to resolve the dispute, this dispute resolution process should be followed:

The process begins when either disagreeing party declares an issue to be irresolvable and sends a memorandum to the other party invoking this dispute resolution process, defining the disputed issue, and presenting supporting arguments for the first party's position on the issue.

Within 15 days, the second party must send a draft dispute resolution package to the first party. As soon as possible after this, the two parties, working together, must submit a dispute resolution package to the EAP Program Manager and the agency QA Officer. This package would contain all relevant arguments, relevant rebuttals, and any supporting materials.

The EAP Program Manager and the agency QA Officer shall schedule a meeting for resolving the dispute within 15 days from receipt of the dispute resolution package, and notify both parties of this date. Both parties are invited to attend the resolution meeting to present arguments and answer questions. Management may get advice from a third party. If the issue cannot be resolved at this level, the agency Deputy Director, in consultation with the EAP Program Manager and the Ecology QA Officer, will make the final decision on disposition of the issue. If the quality dispute involves the QA Officer, he will not participate in the final management decision. The final decision of management shall be binding on both parties.

## **3.3 Quality System Components**

The quality system is a structured and documented management system that provides the framework for (1) planning, implementing, documenting, and assessing environmental data operations, and (2) carrying out required QA and QC activities.

The quality system encompasses both managerial and technical activities. The active participation of all employees is required.

Quality assurance is primarily a management activity; quality control is primarily a technical activity. However, there is no sharp division between these two functions.

Quality assurance is a system for assuring the reliability of measurement data and is sometimes considered to encompass quality control. Quality control involves applying statistical procedures to evaluate and control the accuracy of measurement data.

The principal components of Ecology's quality system and the corresponding tools for implementing them include:

- Quality Assurance policy (Ecology policy 22-01)
- Laboratory Accreditation policy (Ecology policy 22-02)
- EAP QAPP and SOP policies (EAP policies 1-14 and 1-08)
- Field and laboratory SOPs
- Ecology stormwater-related SOPs
- Project-specific quality documentation (QAPPs)
- Quality system documentation (*Quality Management Plan*)
- Periodic reviews and planning (*Quality Report to Management*)
- Training in QA and QC (Training Plans)
- Systematic planning of projects (Data Quality Objectives Process)
- Project and data assessments (Data Verification/Validation and Data Quality Assessment)
- Management assessments (quality systems assessments)

Other tools for implementing Ecology's quality system include:

- *Air Monitoring Quality Assurance Plan*
- *Manchester Laboratory Quality Assurance Manual*
- *Manchester Laboratory Lab Users Manual*
- *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies*
- *Procedural Manual for the Environmental Laboratory Accreditation Program*
- Spills Program sampling SOP
- HWTR Program generic QAPP

### **3.4 Personnel Qualifications and Training**

The QA Officer and program staff, supported by the QA Coordinators and other designated staff, are responsible for QA/QC training of Ecology personnel. Those responsible for training shall maintain competence in QA/QC principles and practices through (1) the literature, (2) training offered by outside sources, and (3) participating in relevant regional and national conferences.

Ecology staff shall have sufficient education and training in QA/QC practices to carry out their assigned responsibilities. Training is designed to raise the awareness of and competence in good QA/QC practices. Training is provided on subjects such as sampling, statistics, the data quality objectives process, preparing QAPPs, environmental measurements, and analytical quality control.

The QA Officer and program staff identify and make use of resources from inside and outside of Ecology in providing training. Many Ecology staff have extensive experience in their areas of specialization that can be incorporated into the training.

Ecology programs may have unique requirements for QA and QC training, and program QA Coordinators help identify training needs. They arrange for training by using resources within their programs or by securing assistance from the QA Officer or external resources.

At the agency level, training resources are primarily directed toward “Core” requirements. Technical training is addressed program by program, on an as-needed basis.

### **3.5 Procurement of Items and Services**

Ecology’s Purchasing Office, located in the Fiscal Section of Financial Services, is responsible for procuring all supplies, equipment, and services used by the agency statewide. Chapter 13 of the *Ecology Policy and Procedure Manual* includes the policies and procedures on purchasing/inventory/payables.

Ecology’s Manchester Laboratory contracts with other laboratories to perform analyses that Manchester Laboratory is unable to perform. Such laboratories must be accredited by Ecology, in accordance with Ecology Policy 22-02. Analyses of samples are contracted in accordance with WAC 236.48 and RCW 43.19.1906 and as described in the memo “Office of State Procurement Specific Authority Delegated to Department of Ecology, July 1, 1990.” Laboratory Standard Operating Procedures related to contracting include SOP 770003 “Purchasing Analytical Services”, and SOP 770005, “Data Quality Validation.” Data from analyses performed by contracted laboratories are reviewed by Manchester Laboratory to determine if the quality of data meets Ecology’s needs and complies with the contract requirements.

### **3.6 Documents and Records**

Chapter 20 of the *Ecology Policy and Procedure Manual* includes the policies and procedures on records/forms/public disclosure.

Two principal forms of quality system documentation are required by the EPA quality system: an agency *Quality Management Plan* and program QAPPs.

Manchester Laboratory prepares a *Quality Assurance Manual* and a *Lab Users Manual*.

Standard Operating Procedures are prepared for laboratory and field activities. See Appendix E of this document for a comprehensive listing of current program and agency SOPs.

EPA QA requirements and QA guidance documents are used to supplement the information in Ecology publications when preparing quality system documents. These requirements and guidance documents can be found at EPA’s *Quality System* website: [www.epa.gov/quality/qa\\_docs.html](http://www.epa.gov/quality/qa_docs.html).



Documents and records, including revisions, must be reviewed for conformance with the quality system requirements and be approved by authorized Ecology personnel.

## **3.7 Information Management**

Chapter 16 of the *Ecology Policy and Procedure Manual* contains guidance documents and procedures for many aspects of the Information Technology (IT) infrastructure at Ecology. Some of the covered topics include:

- Software development
- Computer security
- Software piracy
- Phone and voicemail services

### **3.7.1 Environmental Information Management System**

Ecology's Environmental Information Management (EIM) database is the agency repository for the great majority of environmental information generated by Ecology. The database is a robust and powerful web-based, GIS-friendly reporting tool for analysis and production of reports and maps detailing environmental conditions throughout Washington State.

The EIM database implements several levels of QA. First, each project is evaluated and assigned a QA planning level. This is a numerical score representing the rigor of the quality planning process: from no QAPP (a common occurrence in pre-1980 work) to an approved QAPP implemented before any field work. There is also a QA assessment level, which evaluates the level of assessment finished projects attained: from no assessment to full verification, validation, and data usability determination.

Result qualifiers submitted by Manchester Laboratory are incorporated into the results stored in the EIM system. Contract data validated by Manchester Laboratory are assessed for usability and qualified as per EPA functional guidelines before submittal into EIM.

Data entry standardization is an important concern for EIM managers and staff. Training on the EIM system, for both Ecology staff and external users, is conducted periodically. Ecology also uses an inter-program agreement which commits all EIM user programs to QA protocols for EIM data-entry processes. This agreement is provided as Appendix F.

### **3.7.2 Laboratory Information Management System (LIMS)**

Manchester Environmental Laboratory has a long history and involvement with data management. The lab maintains a commercial-off-the-shelf (COTS) LIMS system with electronic interfaces to both lab instrumentation and the EIM system.

### 3.7.3 Laboratory Accreditation Database

The Lab Accreditation Unit maintains a database to track accreditation status of the labs in the program. This database tracks accredited parameters and status and also issues renewals and accreditation certificates.

### 3.7.4 Quality Assurance Website

The QA website is a key component of Ecology's quality system. The website helps ensure transparency of Ecology's quality operations. A number of key documents are found here, including:

- Quality reports to management
- Current and historical quality management plans
- QAPP guidance
- QA glossary
- Field SOPs
- Stormwater SOPs
- QAPP templates
- Various EPA SOPs

## 3.8 Planning

Data QA begins with careful planning. The goal and specific objectives for the environmental project are clearly defined, including how the data will be used. Then quality objectives, as well as qualitative and quantitative statements about the data needed to support decisions or regulatory actions, are developed. Finally, the methods to collect samples, make measurements, document data quality, and interpret and report results are selected or developed.

A systematic planning process is recommended. Systematic planning is a process in which we identify the problem to be studied and/or the decision to be made. We then define the project's objectives; the type, quantity, and quality of information needed; the technical and QC activities; and the level of oversight that will ensure project criteria are satisfied. Additional information on systematic planning processes can be found in the following documents: *Guidance for the Data Quality Objectives Process* (EPA, 2006) and *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* (Lombard and Kirchmer, 2004).

Preparing a QAPP helps ensure that the project manager follows a systematic planning process. The completed plan (1) facilitates communication among managers, field personnel, and laboratory personnel who implement the project, (2) promotes consistency in data collection activities, and (3) provides the basis for project reports.

*Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* provides the project manager with guidance for preparing QAPPs suited to Ecology projects. The guidelines, which follow and expand upon EPA Requirements and Guidance (EPA Documents QA/R-5 and QA/G-5), describe the elements to be considered for inclusion in a QAPP.

QAPPs are developed in advance for emergency response situations. Templates are prepared for projects that are repetitive in nature, such as compliance inspections. For samples of opportunity, a QAPP can be prepared after sampling, if necessary.

Program-specific guidance documents are prepared, when needed, to address the unique QA requirements of Ecology programs.

### 3.9 Implementation of Work Processes

Ecology maintains an extensive *Policy and Procedure Manual* used to formalize routine work processes. The manual contains the following chapters:

- Chapter 1: Non-Discrimination
- Chapter 2: Hiring and Appointments
- Chapter 3: Hours of Work and Overtime
- Chapter 4: Training and Employee Development
- Chapter 5: Leave/Payroll
- Chapter 6: Travel
- Chapter 7: Workplace Safety: Health: and Security
- Chapter 8: Discipline
- Chapter 9: Grievances and Investigations
- Chapter 10: Reasonable Accommodation
- Chapter 11: Layoff/Reduction In Force
- Chapter 12: Classification and Compensation
- Chapter 13: Purchasing and Contracts
- Chapter 14: Facilities and Vehicles
- Chapter 15: Ethics/Use of State Resources
- Chapter 16: Information Technology
- Chapter 17: Organization and Authority
- Chapter 18: Sustainability and Walking Our Talk
- Chapter 19: Rules and Legislative Information
- Chapter 20: Public Information: Records: and Publications
- Chapter 21: Financial Operations
- Chapter 22: External Environmental Operations

This manual helps standardize many work processes. It can be viewed as a set of SOP-like documents covering work activities ranging from purchasing and contracting to environmental laboratory accreditation and QA at Ecology. The *Policy and Procedure Manual* can be found at [http://aww.ecology/pol\\_proc/ppm\\_toc.htm](http://aww.ecology/pol_proc/ppm_toc.htm).

### 3.10 Assessment and Response

The effectiveness of the quality system is continuously evaluated. Available assessment tools include data quality assessments, peer reviews and technical reviews, proficiency testing studies, and technical systems audits. Technical audits and assessments (1) provide management with tools to determine whether data collection activities are implemented as planned, and (2) are the basis for taking action to correct any deficiencies that are identified.

The project manager is responsible for assuring that data quality (or usability) assessment is done for each project that involves environmental data. Data quality assessment is a statistical and scientific analysis and evaluation of data to determine if data are of the right type, quality, and quantity to support their intended use. A recommended reference is EPA Document QA/G-9, *Guidance for Data Quality Assessment: Practical Methods for Data Analysis*.

Manchester Laboratory is responsible for reviewing the results of sample analyses to ensure that the quality control requirements, as stated in the laboratory *Quality Assurance Manual* and the QAPP, have been met. Corrective actions are taken when these requirements are not met.

As part of its accreditation requirement, Manchester Laboratory participates in proficiency testing and on-site assessments. Proficiency testing studies involve the analyses of unknown samples. On-site assessments correspond to assessments of the laboratory's managerial and technical capability by an outside assessor. Internal system assessments are also performed periodically.

The purposes of internal assessments include: (1) improving the quality systems and (2) providing valid feedback to management on the adequacy, implementation, and effectiveness of the quality system.

Prior to initiating internal assessments, Ecology management is responsible for identifying goals, choosing the assessors, defining acceptance criteria, determining the assessment procedures to be used, and approving check lists. Senior management shall assess (at least annually) the adequacy of the quality system.

The Lab Accreditation Unit is responsible for performing on-site assessments and tracking the results of proficiency-testing studies from participating laboratories.

Reports of assessments are prepared and submitted to management. When the assessment findings identify conditions needing corrective action, management responds promptly and appropriately. Corrective actions are documented by the responsible persons in order to confirm the implementation and effectiveness of the response action. Senior management is responsible for addressing any disputes concerning the assessments.

The QA Officer keeps the Program Manager for the Environmental Assessment Program informed of QA accomplishments and any problems that arise. The QA Officer discusses any relevant QA issues or problems with the appropriate Program Manager and/or program QA Coordinator.

The QA Officer prepares a status report, *Quality Report to Management*, every three years. This report contains, as a minimum, the following information:

- A description of QA/QC training received by Ecology staff.
- A description of technical assistance and QA/QC support provided to Ecology staff.
- Significant problems related to data quality and recommended corrective actions.
- The accreditation status of the Manchester Environmental Laboratory.
- A description of the status and needs of documented information on QA/QC.
- A description of the status and needs of human resources to implement the quality system.
- A review of Ecology's *Quality Management Plan* to determine if the approved quality management practices continue to be both suitable and effective.
- Other information specifically requested by management.

The EAP Freshwater Technical Coordination Team conducts, on occasion, side-by-side comparisons for field measurement techniques. These comparisons are used to assess both Ecology and external organizations, and usually occur in the field at an actual sampling location. The assessments provide important data regarding the technical competence of various sampling organizations in Washington State.

### 3.11 Quality Improvement

The QA/QC responsibilities of management and staff are specified in the *Management and Organization* section of this document. Quality improvement requires the active participation of all employees. Continuous quality improvement is an integral part of the quality system.

Quality improvement is achieved by (1) assessing the effectiveness of the processes for collection and use of environmental data, and (2) taking preventive and corrective actions to improve those processes.

A triennial *Quality Report to Management* provides an assessment of the effectiveness of the quality system. Program and laboratory specific assessments evaluate the effectiveness of quality improvement activities. This helps ensure that conditions adverse to quality are:

- Prevented.
- Identified promptly, including determination of the nature and extent of the problem.
- Corrected as soon as possible.

All corrective actions will be documented and tracked until closure.

*This page is intentionally left blank.*

## References

- Ecology, 2005. Quality Management Plan. Washington State Department of Ecology. Olympia, WA. Publication No. 05-03-031. [www.ecy.wa.gov/biblio/0503031.html](http://www.ecy.wa.gov/biblio/0503031.html).
- Ecology, 2006. Policy 22-01, Establishing Quality Assurance. Washington State Department of Ecology, Olympia, WA. [http://aww.ecology/pol\\_proc/ppm\\_toc.htm](http://aww.ecology/pol_proc/ppm_toc.htm).
- Ecology, 2007a. Manchester Environmental Laboratory Quality Assurance Manual. Washington State Department of Ecology, Manchester, WA.
- Ecology, 2007b. Standard Operating Procedure for Accreditation of Environmental Laboratories. Washington State Department of Ecology, Olympia, WA. [www.ecy.wa.gov/programs/eap/qa/docs/ECY\\_EAP\\_SOP\\_LAU001LabAccreditation.pdf](http://www.ecy.wa.gov/programs/eap/qa/docs/ECY_EAP_SOP_LAU001LabAccreditation.pdf).
- Ecology, 2007c. Standard Operating Procedure for On-site Audits of Environmental Laboratories. Washington State Department of Ecology, Olympia, WA. [www.ecy.wa.gov/programs/eap/qa/docs/ECY\\_EAP\\_SOP\\_LAU002OnSiteAudits.pdf](http://www.ecy.wa.gov/programs/eap/qa/docs/ECY_EAP_SOP_LAU002OnSiteAudits.pdf).
- Ecology, 2008a. Policy 22-02, Requiring Use of Accredited Environmental Laboratories. Washington State Department of Ecology, Olympia, WA. [http://aww.ecology/pol\\_proc/ppm\\_toc.htm](http://aww.ecology/pol_proc/ppm_toc.htm).
- Ecology, 2008b. Standard Operating Procedure for Renewal of Accreditation. Washington State Department of Ecology, Olympia, WA. [www.ecy.wa.gov/programs/eap/qa/docs/ECY\\_EAP\\_SOP\\_LAU003LabAccredRenewals.pdf](http://www.ecy.wa.gov/programs/eap/qa/docs/ECY_EAP_SOP_LAU003LabAccredRenewals.pdf).
- Ecology, 2009. Quality Report to Management, November 2006 through June 2009: Quality System Structure, Activities, and Assessment. [www.ecy.wa.gov/biblio/1003009.html](http://www.ecy.wa.gov/biblio/1003009.html).
- Ecology, 2010. Laboratory Accreditation Procedural Manual. Washington State Department of Ecology, Olympia, WA. Publication No. 02-03-055. [www.ecy.wa.gov/biblio/0203055.html](http://www.ecy.wa.gov/biblio/0203055.html).
- EPA, 2001. EPA Requirements for Quality Management Plans. U.S. Environmental Protection Agency. [www.epa.gov/quality/qs-docs/r2-final.pdf](http://www.epa.gov/quality/qs-docs/r2-final.pdf).
- EPA, 2006a. Quality Documentation Homepage. U.S. Environmental Protection Agency. [www.epa.gov/quality/qa\\_docs.html](http://www.epa.gov/quality/qa_docs.html).
- EPA, 2006b. Statistical Tools for Practitioners. U.S. Environmental Protection Agency. [www.epa.gov/quality/qs-docs/g9s-final.pdf](http://www.epa.gov/quality/qs-docs/g9s-final.pdf).
- Lombard, S. and C. Kirchmer, 2004. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies. Washington State Department of Ecology, Olympia, WA. Publication No. 04-03-030. [www.ecy.wa.gov/biblio/0403030.html](http://www.ecy.wa.gov/biblio/0403030.html).

# Acronyms

Following are acronyms used frequently in this document.

CFR	Code of Federal Regulations
EAP	Environmental Assessment Program
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information System
MEL	Manchester Environmental Laboratory
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
RCW	Revised Code of Washington
SOP	Standard Operating Procedure
WAC	Washington Administrative Code



# Appendices

*This page is intentionally left blank.*

## Appendix A. Ecology Quality Assurance Glossary

Edited by William Kammin, Ecology Quality Assurance Officer

**Accreditation:** A certification process for laboratories, designed to evaluate and document a lab's ability to perform analytical methods and produce acceptable data. For Ecology, it is "Formal recognition by (Ecology)...that an environmental laboratory is capable of producing accurate analytical data." [WAC 173-50-040] (Kammin, 2010)

**Accuracy:** The degree to which a measured value agrees with the true value of the measured property. EPA recommends that this term not be used, and that the terms precision and bias be used to convey the information associated with the term accuracy. (USGS, 1998)

**Analyte:** An element, ion, compound, or chemical moiety (pH, alkalinity) which is to be determined. The definition can be expanded to include organisms (e.g., fecal coliform, Klebsiella). (Kammin, 2010)

**Bias:** The difference between the population mean and the true value. Bias usually describes a systematic difference reproducible over time, and is characteristic of both the measurement system and the analyte(s) being measured. Bias is a commonly used data quality indicator (DQI). (Kammin, 2010; Lombard and Kirchmer, 2004)

**Blank:** A synthetic sample, free of the analyte(s) of interest. For example, in water analysis, pure water is used for the blank. In chemical analysis, a blank is used to estimate the analytical response to all factors other than the analyte in the sample. In general, blanks are used to assess possible contamination or inadvertent introduction of the analyte during various stages of the sampling and analytical process. (USGS, 1998)

**Calibration:** The process of establishing the relationship between the response of a measurement system and the concentration of the parameter being measured. (Lombard and Kirchmer, 2004)

**Check standard:** A substance or reference material obtained from a source independent from the source of the calibration standard; used to assess bias for an analytical method. This is an obsolete term, and its use is highly discouraged. See Continuing Calibration Verification Standard (CCV), Lab Control Sample (LCS), and/or Spiked Blanks. These are all check standards, but should be referred to by their actual designator (e.g., LCS, CRM). (Kammin, 2010; Lombard and Kirchmer, 2004)

**Comparability:** The degree to which different methods, data sets, and/or decisions agree or can be represented as similar; a data quality indicator. (EPA, 1997)

**Completeness:** The amount of valid data obtained from a data collection project compared to the planned amount. Completeness is usually expressed as a percentage. A data quality indicator. (EPA, 1997)

**Continuing Calibration Verification Standard (CCV):** A quality control sample analyzed with samples to check for acceptable bias in the measurement system. The CCV is usually a midpoint calibration standard that is re-run at an established frequency during the course of an analytical run. (Kammin, 2010)

**Control chart:** A graphical representation of quality control results demonstrating the performance of an aspect of a measurement system. (Kammin, 2010; Lombard and Kirchmer 2004)

**Control limits:** Statistical warning and action limits calculated based on control charts. Warning limits are generally set at +/- 2 standard deviations from the mean, action limits at +/- 3 standard deviations from the mean. (Kammin, 2010)

**Data integrity:** A qualitative data quality indicator that evaluates the extent to which a dataset contains data that is misrepresented, falsified, or deliberately misleading. (Kammin, 2010)

**Data quality indicators (DQI):** Commonly used measures of acceptability for environmental data. The principal DQIs are precision, bias, representativeness, comparability, completeness, sensitivity, and integrity. (EPA, 2006)

**Data quality objectives (DQO):** Qualitative and quantitative statements derived from systematic planning processes that clarify study objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions. (EPA, 2006)

**Dataset:** A grouping of samples, usually organized by date, time, and/or analyte. (Kammin, 2010)

**Data validation:** An analyte-specific and sample-specific process that extends the evaluation of data beyond data verification to determine the usability of a specific data set. It involves a detailed examination of the data package, using both professional judgment and objective criteria, to determine whether the MQOs for precision, bias, and sensitivity have been met. Data validation may also include an assessment of completeness, representativeness, comparability and integrity, as these criteria relate to the usability of the dataset. Ecology considers three key criteria to determine if data validation has actually occurred. These are:

- Use of raw or instrument data for evaluation.
- Use of third-party assessors.
- Use of EPA Functional Guidelines or equivalent for review.

Examples of data types commonly validated are:

- Gas Chromatography (GC).
- Gas Chromatography-Mass Spectrometry (GC-MS).
- Inductively Coupled Plasma (ICP).

The end result of a formal validation process is a determination of usability that assigns qualifiers to indicate usability status for every measurement result. These qualifiers include:

- No qualifier: Data are usable for intended purposes.
- J (or a J variant): Data are estimated, may be usable, and may be biased high or low.
- REJ: Data are rejected and cannot be used for intended purposes.

(Kammin, 2010; Lombard and Kirchmer, 2004).

**Data verification:** Examination of a dataset for errors or omissions, and assessment of the data quality indicators related to that dataset for compliance with acceptance criteria (MQOs). Verification is a detailed quality review of a dataset. (Lombard and Kirchmer, 2004)

**Detection limit** (limit of detection): The concentration or amount of an analyte which can be determined to a specified level of certainty to be greater than zero. (Lombard and Kirchmer, 2004)

**Duplicate samples:** Two samples taken from and representative of the same population, and carried through the steps of the sampling and analytical procedures in an identical manner. Duplicate samples are used to assess variability of all method activities including sampling and analysis. (EPA, 1997)

**Field blank:** A blank used to obtain information on contamination introduced during sample collection, storage, and transport. (Lombard and Kirchmer, 2004)

**Initial Calibration Verification Standard (ICV):** A quality control sample prepared independently of calibration standards and analyzed along with the samples to check for acceptable bias in the measurement system. The ICV is analyzed prior to the analysis of any samples. (Kammin, 2010)

**Laboratory control sample (LCS):** A sample of known composition prepared using contaminant-free water or an inert solid that is spiked with analytes of interest at the midpoint of the calibration curve or at the level of concern. The LCS is prepared and analyzed in the same batch of regular samples using the same sample preparation method, reagents, and analytical methods employed for regular samples. (EPA, 1997)

**Matrix spike:** A quality control sample prepared by adding a known amount of the target analyte(s) to an aliquot of a sample to check for bias due to interference or matrix effects. (Lombard and Kirchmer, 2004)

**Measurement quality objectives (MQOs):** Performance or acceptance criteria for individual data quality indicators, usually including precision, bias, sensitivity, completeness, comparability, and representativeness. (EPA, 2006)

**Measurement result:** A value obtained by performing the procedure described in a method. (Lombard and Kirchmer, 2004)

**Method:** A formalized group of procedures and techniques for performing an activity (e.g., sampling, chemical analysis, data analysis), systematically presented in the order in which they are to be executed. (EPA, 1997)

**Method blank:** A blank prepared to represent the sample matrix, prepared and analyzed with a batch of samples. A method blank will contain all reagents used in the preparation of a sample, and the same preparation process is used for the method blank and samples. (Lombard and Kirchmer, 2004; Kammin, 2010)

**Method detection limit (MDL):** This definition for detection was first formally advanced in 40CFR 136, October 26, 1984 edition. MDL is defined there as the minimum concentration of an analyte that, in a given matrix and with a specific method, has a 99% probability of being identified, and reported to be greater than zero. (Federal Register, October 26, 1984)

**Parameter:** A specified characteristic of a population or sample. Also, an analyte or grouping of analytes. (e.g., benzene, nitrate+nitrite, and anions are parameters.) (Kammin, 2010; Lombard and Kirchmer, 2004)

**Percent relative standard deviation (%RSD):** A statistic used to evaluate precision in environmental analysis. It is determined in the following manner:

Percent relative standard deviation,  $\%RSD = (100 * s)/x$   
where s = sample standard deviation, and x = sample mean. (Kammin, 2010)

**Population:** The hypothetical set of all possible observations of the type being investigated. (Lombard and Kirchmer, 2004)

**Precision:** The extent of random variability among replicate measurements of the same property; a data quality indicator. (USGS, 1998)

**Quality assurance (QA):** A set of activities designed to establish and document the reliability and usability of measurement data. (Kammin, 2010)

**Quality Assurance Project Plan (QAPP):** A document that describes the objectives of a project and the processes and activities necessary to develop data that will support those objectives. (Kammin, 2010; Lombard and Kirchmer, 2004)

**Quality control (QC):** The routine application of measurement and statistical procedures to assess the accuracy of measurement data. (Lombard and Kirchmer, 2004)

**Relative Percent Difference (RPD):** Commonly used to evaluate precision. The following formula is used:

$$\text{Abs}(a-b)/((a+b)/2) * 100$$

where a and b are 2 sample results, and abs() indicates absolute value.

RPD can be used only with two values. For more values, use %RSD. (Lombard and Kirchmer, 2004)

**Replicate samples:** Two or more samples taken from the environment at the same time and place, using the same protocols. Replicates are used to estimate the random variability of the material sampled. (USGS, 1998)

**Representativeness:** The degree to which a sample reflects the population from which it is taken; a data quality indicator. (USGS, 1998)

**Sample (field):** A portion of a population (environmental entity) that is measured and assumed to represent the entire population. (USGS, 1998)

**Sample (statistical):** A finite part or subset of a statistical population. (EPA, 1997)

**Sensitivity:** In general, denotes the rate at which the analytical response (e.g., absorbance, volume, meter reading) varies with the concentration of the parameter being determined. In a specialized sense, sensitivity has the same meaning as the detection limit. (Lombard and Kirchmer, 2004)

**Spiked blank:** A specified amount of reagent blank fortified with a known mass of the target analyte(s); usually used to assess the recovery efficiency of the method. (EPA, 1997)

**Spiked sample:** A sample prepared by adding a known mass of target analyte(s) to a specified amount of matrix sample for which an independent estimate of target analyte(s) concentration is available. Spiked samples can be used to determine the effect of the matrix on a method's recovery efficiency. (EPA, 1997)

**Split sample:** Denotes when a discrete sample is further subdivided into portions, usually duplicates. (Kammin, 2010)

**Standard operating procedure (SOP):** A document which describes in detail a reproducible and repeatable organized activity. (Kammin, 2010)

**Surrogate:** For environmental chemistry, a substance with properties similar to those of the target analyte(s). Surrogates are unlikely to be native to environmental samples. They are added to environmental samples for quality control purposes, to track extraction efficiency, and/or measure analyte recovery. Deuterated organic compounds are examples of surrogates commonly used in organic compound analysis. (Kammin, 2010)

**Systematic planning:** A step-wise process which develops a clear description of the goals and objectives of a project, and produces decisions on the type, quantity, and quality of data that will be needed to meet those goals and objectives. The data quality objective process is a specialized type of systematic planning. (EPA, 2006)

### ***References for this Glossary***

EPA, 1997. Glossary of Quality Assurance Terms and Related Acronyms. U.S. Environmental Protection Agency. [www.ecy.wa.gov/programs/eap/qa.html](http://www.ecy.wa.gov/programs/eap/qa.html).

EPA, 2006. Guidance on Systematic Planning Using the Data Quality Objectives Process. U.S. Environmental Protection Agency. EPA QA/G-4. [www.epa.gov/quality/qs-docs/g4-final.pdf](http://www.epa.gov/quality/qs-docs/g4-final.pdf).

Kammin, W., 2010. Definition developed or extensively edited by William Kammin, Quality Assurance Officer, Washington State Department of Ecology, Olympia, WA.

Lombard and Kirchmer, 2004. Guidance for the Preparation of Quality Assurance Project Plans for Environmental Studies. Washington State Department of Ecology, Olympia, WA. [www.ecy.wa.gov/biblio/0403030.html](http://www.ecy.wa.gov/biblio/0403030.html).

USGS, 1998. Principles and Practices for Quality Assurance and Quality Control. Open-File Report 98-636. <http://ma.water.usgs.gov/fhwa/products/ofr98-636.pdf>.



## Appendix B. EAP Policy 1-14 (Quality Assurance Project Plan)

Resource Contact: Ecology Quality Assurance Officer    Effective: December 15, 2009  
References: See Section 5

### **Environmental Assessment Program Policy for Applicability, Use, and Development of Quality Assurance Project Plans (QAPPs)**

---

Purpose: This policy defines the types of projects that require QAPPs, and provides key references related to QAPP scope, content, and timing.

---

#### **1. Definitions**

**POLICY:** A written expression of a management decision.

**PROCEDURE:** Steps taken by program staff to accomplish an objective.

**QA:** Quality Assurance.

**QUALITY ASSURANCE PROJECT PLAN (QAPP):** This is a planning document used to document all activities in a project. In it, project objectives are defined and project activities are aligned with the Ecology quality system.

**RESOURCE CONTACT:** The person most knowledgeable about the activity or procedure.

**EPA:** United States Environmental Protection Agency

---

#### **2. Scope**

This policy applies to all Environmental Assessment Program (EAP) staff.

---

#### **3. Background**

The preparation of QAPPs for Ecology projects is mandated by EPA. Because Ecology submits environmental data to and receives grant funding from EPA, Ecology has a mandatory requirement to prepare QAPPs for all projects generating and/or interpreting environmental data. Ecology formalizes this requirement in Ecology Policy 1-21, "Establishing Quality Assurance." (See reference 1.)

---

#### **4. QAPP Development Requirements**

**QAPPs are required for most projects** – QAPPs will be prepared for all projects generating environmental data (See reference 2). Additionally, QAPPs are required for

all data analysis projects using secondary data (data generated by an entity outside of Ecology). See Appendix 1 of this document for this EPA requirement. Nearly all the projects EAP undertakes are required to have an associated QAPP. EAP management allows a possible exception to this requirement for a simple literature review project where no interpretive work occurs.

**QAPP format is strictly defined** – All QAPPs are required to have a uniform and consistent format. Document design and formatting are covered in detail at (See references 3 and 4.). Reference 4 contains the following design documents:

- QAPP Publication Guidelines
- QAPP Addendum Template and Procedures
- QAPP Template – Non-TMDL
- QAPP Template – TMDL
- QAPP Template – TMDL Effectiveness Monitoring

Project managers should familiarize themselves with these documents in order to avoid rework in the project documentation process.

**Requirements for QAPP content** – The required QAPP content is documented in reference 2. Authors are cautioned to review this document thoroughly before beginning work on their project documentation.

**QAPP timeline process** – This is detailed in the QAPP Publication Guidelines in reference 4. QAPPs should be completed and ready for review six weeks before any field sampling is scheduled to occur.

**QAPP Addendum process** – A QAPP addendum is used to document minor changes to a project, like the addition of new sampling locations or other small changes. It should be a short document. Addenda over three pages long should be recast as QAPPs. Similarly, any changes in project objectives, major additions of analytical methods, etc., indicate that the addendum process should not be used, and that a QAPP should be prepared. Review the *QAPP Addendum Template and Procedures* document in reference 4 for more detail. The QA Officer approves the use of an addendum in lieu of a QAPP.

---

## 5. References

1. *Establishing Quality Assurance*. Ecology Policy 1-21.  
[www.ecy.wa.gov/programs/eap/qa/docs/policy\\_01-21.pdf](http://www.ecy.wa.gov/programs/eap/qa/docs/policy_01-21.pdf)
2. *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies*. Washington State Department of Ecology.  
[www.ecy.wa.gov/biblio/0403030.html](http://www.ecy.wa.gov/biblio/0403030.html)
3. *EPA Requirements for Quality Assurance Project Plans*. EPA.  
[www.epa.gov/quality/qs-docs/r5-final.pdf](http://www.epa.gov/quality/qs-docs/r5-final.pdf)

4. *Ecology/EAP QAPP Publication Guidelines*  
[http://aww.ecologydev/programs/eap/Publications/ea\\_pub1.htm](http://aww.ecologydev/programs/eap/Publications/ea_pub1.htm)
  5. *QAPP requirements for Secondary Data Research Projects*. EPA  
[www.epa.gov/quality/qs-docs/found-data-qapp-rqts.pdf](http://www.epa.gov/quality/qs-docs/found-data-qapp-rqts.pdf)  
Appendix 1
- 

Approved: \_\_\_\_\_ Date \_\_\_\_\_  
Robert Duff  
Environmental Assessment Program Manager  
Department of Ecology

## **Appendix to QAPP Policy**

### **QAPP REQUIREMENTS FOR SECONDARY DATA RESEARCH PROJECTS**

#### *Example Guidance by the QA Managers in EPA's National Risk Management Research Laboratory*

A secondary data research project involves the gathering and/or use of existing environmental data for purposes other than those for which they were originally collected. These secondary data may be obtained from many sources, including literature, industry surveys, compilations from computerized databases and information systems, and computerized or mathematical models of environmental processes. For these projects, a QAPP shall be prepared to include the requirements identified below. If primary data will also be generated as part of the project, then the information below can be incorporated into the associated QAPP to address the secondary data. The Divisional QA Manager should be consulted if necessary.

#### **SECTION 1.0, PROJECT OBJECTIVES, ORGANIZATION, AND RESPONSIBILITIES**

The purpose of study shall be clearly stated in the QAPP.

Project objectives shall be clearly stated in the QAPP.

The secondary data needed to satisfy the project objectives shall be identified in the QAPP. Requirements relating to the type of data, the age of data, geographical representation, temporal representation, and technological representation, as applicable, shall be specified.

The planned approach for evaluating project objectives (i.e., data analysis), including formulas, units, definitions of terms, and statistical analysis, if applicable, shall be included in the QAPP.

Responsibilities of all project participants shall be identified in the QAPP, meaning that key personnel and their organizations shall be identified, along with the designation of responsibilities for planning, coordination, data gathering, data analysis, report preparation, and quality assurance, as applicable.

#### **SECTION 2.0, SOURCES OF SECONDARY DATA**

The required source(s) of the secondary data must be specified in the QAPP. If a hierarchy of sources exists for the gathering of secondary data, that hierarchy must be specified in the QAPP.

The rationale for selecting the source(s) identified shall be discussed in the QAPP.

The QAPP shall state that the sources of secondary data gathered will be identified in any project deliverable.

### **SECTION 3.0, QUALITY OF SECONDARY DATA**

Quality requirements of the secondary data must be specified in the QAPP. These Requirements must be appropriate for their intended use. Accuracy, precision, representativeness, completeness, and comparability need to be addressed, if applicable. (If appropriate, a related QAPP containing this information can be referenced.)

The procedures for determining the quality of the secondary data shall be described in the QAPP.

If no quality requirements exist, this shall be stated in the QAPP. If no quality requirements exist or if the quality of the secondary data cannot be determined, the QAPP shall require that a disclaimer be added to any project deliverable to indicate that the quality of the secondary data is unknown. The wording for the disclaimer shall be included in the QAPP.

### **SECTION 4.0, DATA REPORTING, DATA REDUCTION, AND DATA VALIDATION**

Data reduction procedures specific to the project shall be described, including calculations and equations.

The data validation procedures used to ensure the reporting of accurate project data shall be described.

The expected product document that will be prepared shall be specified (e.g., journal article, final report, etc.).

*This page is intentionally left blank.*

## Appendix C. EAP Policy 1-08 (Standard Operating Procedure)

Resource Contact: Ecology Quality Assurance Officer      Effective: December 26, 2007  
Reference: EAP SOP for Technical SOPs (Attachment 1) Revised: November 10, 2009

### **Development, Adoption, Use, and Revision of Technical Standard Operating Procedures (SOPs)**

---

**Goal:** To ensure major program technical activities are documented by SOPs. This policy requires that SOPs are written to a standard format, archived in both electronic and hard-copy formats, and kept in a convenient location easily accessed by Program staff.

---

#### **1. Definitions**

**EIM:** Environmental Information Management System – This is an Ecology database that is a major repository for the Agency’s environmental data.

**MEL:** Manchester Environmental Laboratory

**QAPP:** Also known as a Quality Assurance Project Plan. It is a key planning document for projects producing environmental data.

**POLICY:** A written expression of a management decision.

**PROCEDURE:** Steps taken by program staff to accomplish an objective.

**REFERENCE:** Authority which dictates the policy's form, content, or scope.

**RESOURCE CONTACT:** The person most knowledgeable about the activity or procedure.

**SOP:** Also known as a standard operating procedure. It’s a document which describes in organized detail a standardized business activity of the Environmental Assessment Program (EAP).

---

#### **2. Program SOPs will follow a standard format**

The Ecology Quality Assurance (QA) Officer will retain a master copy of the approved format for SOPs and will be responsible for ensuring that all SOPs conform to that format. The approved format is documented in the SOP entitled “Standard Operating Procedure for the Documentation of Technical Standard Operating Procedures.” This document is provided as an attachment to this policy. MEL uses a slightly different SOP format, which is documented in both the MEL QA Manual, and the MEL SOP for Analytical Methods. The actual template for technical SOPs can be found at: x:\EA Program\ECYEAPSOP\SOPTemplate.dot

---

### **3. SOPs will be prepared for all important technical activities**

SOPs will be developed for all Program technical activities, including sampling and field measurement techniques. SOP development for a technical activity is required when an activity involves:

- Hazardous waste generation
- Personal hazard
- Use of toxic reagents
- Data entry into EIM
- Data published in any manner
- Regulatory requirement for SOP
- Potentially controversial data

Additionally, SOPs will be developed for technical activities such as data validation and verification, EIM data entry, and QAPP review.

---

### **4. SOP Use is Mandatory**

Once SOPs are developed for a defined technical activity, their use is mandatory. Additionally, no deviations from the SOP are allowed without timely approval by the QA officer. For technical activities that may involve decision trees or that may require flexibility in the field, the SOPs will be prepared to indicate the allowable range of decisions and/or options. If for some rare reason the deviations cannot be documented in the SOP, use the QAPP and report process to document ad hoc changes to a technical activity.

---

### **5. All EAP sections will develop SOPs for their important technical activities**

SOPs are applicable Program-wide. This includes Manchester Environmental Laboratory, Lab Accreditation Unit, Western Operations Section, Statewide Coordination Section, Eastern Operations Section, and Program Administrative Group. However, the immediate applicability of this policy is to the technical activities of the EAP technical staff. Additionally, the various units and sections will identify technical activities that overlap or apply to several groups, and develop one SOP to meet the needs of all users.

---

### **6. SOP Development Process**

Typically, program staff, the QA officer, or PMT will identify technical activities that require SOP development. The initiator will request development of a new SOP through the program's Activity Tracker database system. PMT will prioritize development of those SOPs. The QA Officer will maintain the master list of SOPs, both finalized and in development.



---

## 7. SOP Adoption Process

SOP adoption consists of a signature approval process. As per the U.S. Environmental Protection Agency (EPA) SOP guidance, typical signatories will include:

- SOP author.
- SOP reviewer.
- Agency QA Officer.

If an SOP applies to more than one section, then signature approval may include all managers impacted by the SOP.

SOP status will be tracked. SOPs will be in one of four statuses:

- Draft – The SOP is being prepared, under revision, or needs signature approval.
- Provisional - Provisional status designates an SOP that has been through signature approval, but is being held pending comparison with other program SOPs on the same or similar subject areas.
- Final - Final SOP status designates signature approval, SOP number assignment, and when appropriate, posting on the internet.
- Withdrawn - Withdrawn status means the document has been removed from use, and is stored as a historical record only.

---

## 8. SOP Revision\Review Process

SOP revisions will occur as needed; primarily as technical activities change or new instrumentation is deployed. Revisions will go through the same development process as new SOPs (Step 6.)

SOPs will be reviewed and reapproved every three years. The QA officer will coordinate these document reviews. The Ecology SOP Recertification Form will be utilized to document review and approval. This form can be found at: X:\EA Program\ECYEAPSOP\EcologySOPRecertForm.doc.

---

## 9. SOP Archiving and Naming Conventions

SOPs will be archived in both electronic and hard-copy formats. Hard-copy archiving is detailed in Sections 10 and 11 of this policy. SOPs will be electronically archived on the x-drive at X:\EA PROGRAM\ECYEAPSOP\. SOPs will be archived in both read-only .pdf and .doc formats.

SOPs will be named in the following manner. Originating Agency-level organization i.e. ECY; then Agency Program i.e. EAP; then SOP; then SOP abbreviated title i.e. FreshWaterFecalColiformSampling; then version number i.e. v1\_0, then EAP SOP number. So in this case the full SOP name is -

ECY\_EAP\_SOP\_FreshWaterFecalColiformSampling\_v1\_0EAP###

Use underscores to separate SOP naming elements. Use this SOP designation in the SOP footer.

SOPs will be numbered sequentially as they reach final approval. The Ecology QA Officer is responsible for numbering the SOPs, which will be designated EAP###, where the number sign stands for a digit.

---

## **10. SOP Manual**

The Agency QA Officer will maintain a master SOP manual which contains current versions of all HQ SOPs, and will post appropriate finalized and provisional SOPs to the QA internet website. Approved or provisional SOPs having only internal Ecology usage will be posted on the EAP intranet site.

---

## **11. SOP Retention**

SOPs are intended to be permanently linked to Program Project activities, i.e. “what happened when and where.” Retention of all Program SOPs and revisions will be indefinite. Under no circumstances are approved SOPs or versions to be discarded or deleted.

---

## **12. Withdrawn SOPs**

SOPs are frequently revised, and in some cases, completely removed from use. These SOPs are termed “withdrawn,” and are archived on the Ecology QA internet site for historical use. To assure that withdrawn SOPs are not inadvertently used, the SOP will have a watermark word of “Withdrawn” on the SOP when it is archived.

---

## **13. Referencing SOPs**

The appropriate format for referencing SOPs in QA Project Plans or other documents is shown below. Note that the version number of the SOP must be included in the reference.

E.g. Swanson, T., 2007. Standard Operating Procedure (SOP) for Hydrolab® DataSonde® and MiniSonde® Multiprobes, Version 1.0. Washington State Department of Ecology, Olympia, WA.  
[www.ecy.wa.gov/programs/eap/qa/docs/ECY\\_EAP\\_SOP\\_033Hydrolab.pdf](http://www.ecy.wa.gov/programs/eap/qa/docs/ECY_EAP_SOP_033Hydrolab.pdf)

Approved: \_\_\_\_\_

Robert Duff Environmental Assessment Program Manager  
Department of Ecology

## **SOP for SOPs**

Washington State Department of Ecology

Environmental Assessment Program

Standard Operating Procedure for the Documentation of Technical Standard Operating Procedures

Version 1.5

Author –

Date -

Reviewer –

Date -

QA Approval – William R Kammin, Ecology Quality Assurance Officer

Date –

EAP###

### **SOP Disclaimer Language**

The Washington State Department of Ecology (Ecology) Standard Operating Procedures (SOPs) are adapted from published methods or developed by in-house technical experts. Their primary purpose is for internal Ecology use, although SOPs may have a wider utility. Ecology's SOPs do not supplant official published methods. Distribution of these SOPs does not constitute an endorsement of a particular procedure or method.

Any reference to specific equipment, manufacturer, or supplies is for descriptive purposes only and does not constitute an endorsement of a particular product or service by the author or by Ecology.

Although Ecology follows the SOP in most instances, there may be instances in which Ecology uses an alternative methodology, procedure, or process.

## SOP Revision History

Following is an example of an SOP revision history:

Revision date	Revision number	Summary of changes	Sections revised	Reviser(s)
12/5/2005	1.0	Rewrite of Laboratory SOP for Headquarters use	all	Bill Kammin
1/4/2006	1.1	Added revision page, disclaimer page, safety language, reagent language	0.5, 0.6, 5.1, 9.1	Bill Kammin
1/17/2006	1.2	Changed title to “technical” SOP; replaced admin/sampling with technical throughout document	title	Bill Kammin
3/23/2006	1.3	Removed Perry Brake as signatory	0	Bill Kammin
8/8/2006	1.4	Removed other signatures	0	Bill Kammin
10/20/2009	1.5	Updated as part of policy revision; added EAP SOP number to footer	footer	Bill Kammin

## **Environmental Assessment Program**

### **Standard Operating Procedure for the Production of Technical SOPs**

#### **0. SOP Format**

0.1 The guidelines in this SOP will apply to all technical SOPs.

0.2 All Program SOPs will be prepared, approved and archived according to the EAP Policy on SOP Development and Use.

0.3 The SOP will consist of a cover page, disclaimer page, revision history page, and the SOP body, which are specified in Sections 1-10.

0.4 The cover page will consist of organization headers, the title of the SOP, the name of the author, the date completed by the author, the names of the approvers/reviewers, and the dates of approval or review.

0.5 The disclaimer language page is always Page 2 of an SOP. The disclaimer language is derived from language used in Manchester Environmental Laboratory SOPs, and has been reviewed by the State Attorney General's office. See Page 2 of this document for the disclaimer language.

0.6 The revision history page contains a table with the following information:

- Date of revision approval
- Revision number
- Summary of changes
- Sections revised
- Revision author editor

Track minor editing changes in the decimal i. e. 1.1 to 1.2. Major SOP changes, such as the introduction of new sampling equipment, merit a change in the version number i. e. 1.2 to 2.0.

The revision history page will always be Page 3 of the SOP. Use Timer New Roman 10 as the font for the revision page.

0.7 All pages except the Title page will contain a footer with the following information: drive file location and file name, date of publication, the abbreviated title of the SOP, version number, EAP SOP number (format EAP####) and page number. See the page footer for this SOP for an example of appropriate page footer.

0.8 Use legal type outlining, i.e., 1.0, 1.1, 1.1.1, 1.1.2, ad infinitum. Use a non-indented outline format, as demonstrated in this SOP.

0.9 Use a Times New Roman 12 point boldface font for outline headers, and Times New Roman 12 point regular font for SOP body. Use Times New Roman 12 point regular font for all text on the title page. Use Times New Roman 8 point regular for the footer text.

0.10 Margins specifications

0.10.1 Use a top and bottom margin of one inch.

0.10.2 Use left and right margins of 0.8 inch. If less than 0.8 inch is used, holes punched in the hard copy will obliterate some text.

0.10.3 Use normal rather than mirror margins, which could interfere with Acrobat conversion.

0.10.4 Use a one-inch tab between the SOP text and the outline number.

0.10.5 Print SOPs in double-sided format.

## **1. Purpose and Scope**

1.1 This document is the Environmental Assessment Program (EAP) Standard Operating Procedure (SOP) for the preparation of technical SOPs.

1.2 Expand on the description of the procedure name for the beginner or casual reader.

## **2. Applicability**

2.1 Identify when the procedure is to be followed.

## **3. Definitions**

3.1 Define any words, phrases, or acronyms having special meaning or application. Do not assume the reader has special knowledge of acronyms. Fully state all acronyms before further use.

## **4. Personnel Qualifications/Responsibilities**

4.1 Identify any special qualifications users must have such as certification or training experience.

4.2 List job class (es) to indicate typical level(s) performing the SOP.

## **5. Equipment, Reagents, and Supplies**

5.1 Provide a list of all materials and equipment used in the procedure. Include descriptions of specialized equipment, sampling bottles, preservation reagents, and other items used in the technical process. For reagents, state final concentration, preparation techniques, and expiration dates. Include explicit descriptions of any health and safety concerns with reagents, including

toxicity, carcinogenicity, and teratogenicity. Also include relevant Material Safety Data Sheets (MSDS) for any toxic materials handled in sampling or field activities.

## 6. Summary of Procedure

6.1 If the procedure is performed in several discrete steps, describe the steps or outline the procedure succinctly.

6.2 Provide a procedure flow chart if necessary or appropriate.

6.3 Attach example forms if necessary or appropriate. Label as attachments and number sequentially.

6.4 Use the active voice for describing step-by-step procedures. Using active voice is instructional; e.g.: “Add \_\_\_\_\_”, “Dilute \_\_\_\_\_” or “Perform \_\_\_\_\_”.

6.5 Acronyms: Write out all abbreviations the first time each is used.

6.5.1e.g.: Manchester Environmental Laboratory (MEL), Hydrochloric acid (HCl).

6.6 Use Microsoft conventions for keyboard command typeface:

6.6.1 Use small font capital letters when spelling out the names of keys on the keyboard.

6.6.1.1e.g.: “Press ENTER.” “Press” is font size 12, while ENTER is font size 10.

6.6.2 Use capital letters and a plus sign (+) when pressing two keys simultaneously.

6.6.2.1e.g.: “Press SHIFT+X.”

6.6.3 Use **BOLD** text for words or characters that the user is to type. Use lowercase letters unless capital letters must be typed.

6.6.3.1e.g.: “To change to the WORD directory, type **cd word.**”

6.6.4 Use *italicized* text for specialized text and placeholder names.

6.6.4.1e.g.: “Name the file using the parameter and today's date: *parameter/date*. Thus, a TKN analyzed on March 31, 1997, would be ‘**TKN033197**’.”

6.7 Instruct the user to “Press keys”; not “Hit”, “Punch”, etc.

6.7.1 Instruct the user to “Press ENTER [or RETURN]” rather than instruct the user to “Enter” after typing in data.

6.7.2 Instruct the user to “Press ESC to escape” to exit a program, etc.

6.8 Mouse Conventions: “Click” means to press and then immediately release the mouse button without moving the mouse. “Double Click” means to press and release the mouse button twice in quick succession.

## **7. Records Management**

7.1 Specifically list forms to be used and locations of files.

## **8. Quality Control and Quality Assurance Section**

8.1 Describe any control steps and provisions for review or oversight prior to acceptance of the product or deliverable. This can include test plans such as verification and validation plans for software or running a “spell-check” program on the finished document.

## **9. Safety**

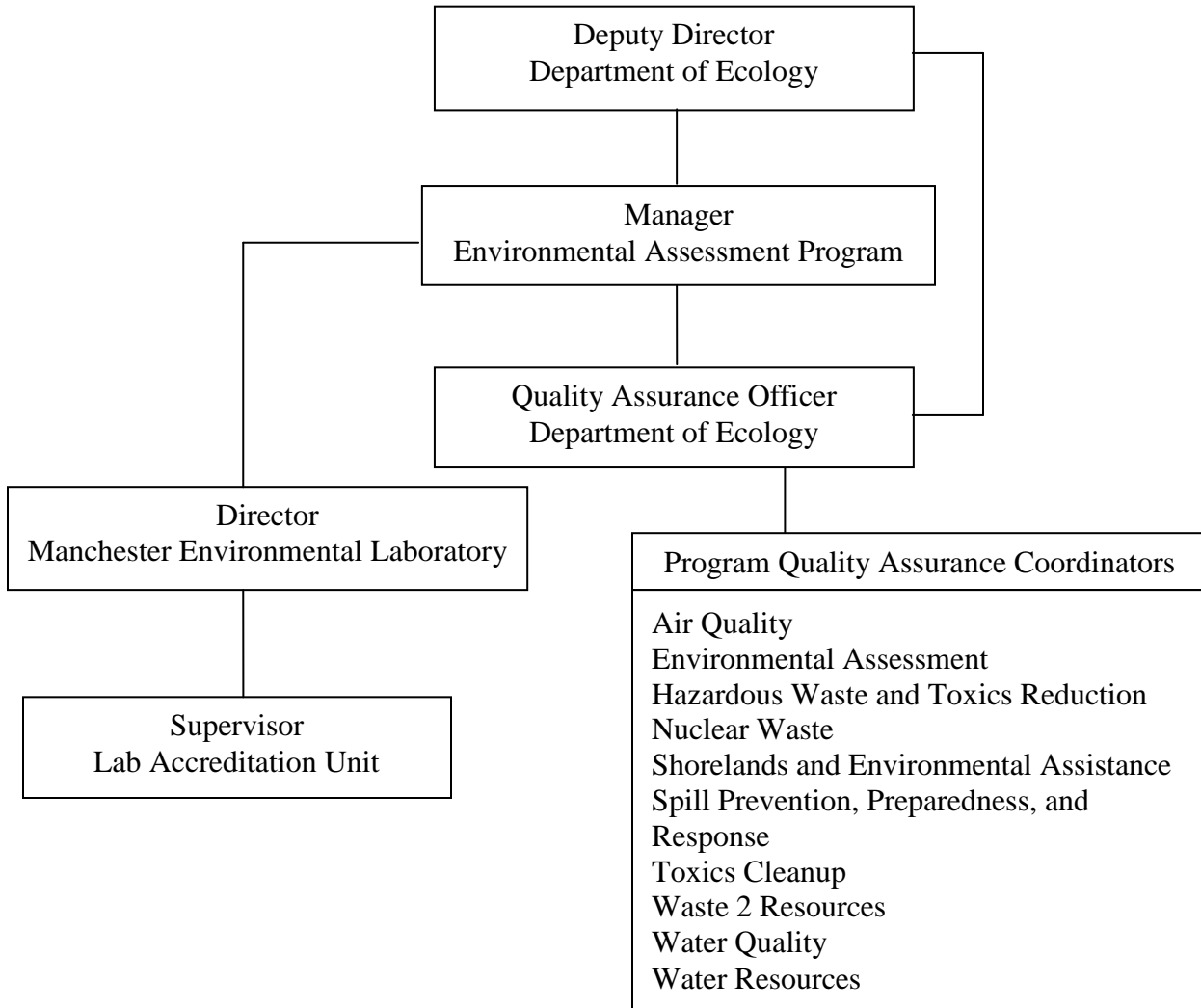
9.1 Identify products, supplies, reagents, and activities that pose a safety hazard of any kind. Reference to EAP HQ Safety Manual when appropriate.

## **10. References**

10.1 List references on which the procedure is based. Include references to all EAP safety documents.



## Appendix D. Ecology Quality Assurance Management Structure



*This page is intentionally left blank.*

## Appendix E. Ecology Standard Operating Procedures

### 1. Air Quality Program

SOP Title	Status
Aethalometer Operations	Final
Automated Method Data Documentation and Validation	Final
Carbon Dioxide Monitoring	Final
Nephelometer Operations	Final
Nitrogen Dioxide Monitoring	Final
Ozone Monitoring	Final
PM 10 Tapered Element Oscillation Microbalance	Final
PM 2.5 Single Channel Sampler Operations	Final
PM 2.5 Tapered Element Oscillation Microbalance	Final

### 2. Environmental Assessment Program - General

Project Code	Index Number	SOP Title	Status	Author	Due date
	EAP001	Use of Semi-Permeable Membrane Devices	Final	Johnson	NA
	EAP002	Determination of Total Dissolved Gas	Final	Pickett	NA
	EAP003	Pesticide Sampling in Fresh Water	Final	Burke	NA
	EAP004	Weekly/Monthly Procedures - EAP Operations Center	Final	Strong	NA
	EAP005	New Employee Orientation - EAP Operations Center	Final	Strong	NA
	EAP006	Daily and Emergency Procedures - EAP Operations Center	Final	Strong	NA
	EAP007	Resecting Finfish Whole Body, Body Parts or Tissue Samples	Final	Sandvik	NA
	EAP008	Resecting DNA Samples and Aging for Finfish	Final	Sandvik	NA
	EAP009	Collection, Processing and Preservation of Finfish Samples	Final	Sandvik	NA
	EAP010	Field Measurement of Conductivity/Salinity	Provisional	Ahmed	NA
	EAP011	Instantaneous Measurement of Temperature in Water	Provisional	Nipp	NA
	EAP012	Sampling Bacteria in Water	Provisional	Mathieu	NA
	EAP013	Determining Global Positioning System Coordinates	Final	Janisch	NA
	EAP014	Surveying Morphology and Surface Flow of Headwaters Channels	Final	Janisch	NA
	EAP015	Grab Sampling – Fresh Water	Final	Joy	NA
	EAP016	Freshwater Drift Collection, Processing and Analysis	Final	Estrella	NA
	EAP017	Litterfall Collection, Processing, and Analysis	Final	Estrella	NA
	EAP018	Turbidity Threshold Sampling	Final	Estrella	NA
	EAP019	Estimating Stream Flows Using a Flume	Final	Estrella	NA
	EAP020	Bedload Collection, Processing and Analysis	Final	Estrella	NA
	EAP021	Estimating Large Woody Debris Loads Intersecting Headwaters	Final	Janisch	NA
	EAP022	Estimating and Delineation of Headwaters Wetlands	Final	Janisch	NA
	EAP023	Winkler Determination of Dissolved Oxygen	Provisional	Ward	NA
	EAP024	Estimating Streamflow	Provisional	Sullivan	NA

Project Code	Index Number	SOP Title	Status	Author	Due date
	EAP025	Seawater Sampling	Final	Stutes/Bos	NA
	EAP026	Analysis of Chlorophyll a	Final	Stutes/Bos	NA
	EAP027	Seawater Dissolved Oxygen Analysis (Dosimat)	Final	Stutes/Bos	NA
	EAP028	Reagent Preparation	Final	Stutes/Bos	NA
	EAP029	Metals Sampling	Final	Ward	NA
	EAP030	Fecal Coliform Sampling	Provisional	Ward	NA
	EAP031	Collection and Analysis of pH Samples	Provisional	Ward	NA
	EAP032	Collection and Analysis of Conductivity Samples	Provisional	Ward	NA
	EAP033	Hydrolab DataSonde and MiniSonde Multiprobes	Final	Swanson	NA
	EAP034	Collection, Processing, and Analysis of Stream Samples	Final	Ward	NA
	EAP035	Measurement of Dissolved Oxygen in Surface Water	Provisional	Mathieu	NA
	EAP036	Benthic Flux Chambers	Final	Roberts	NA
08-503	EAP037	Time of Travel Dye Studies	Final	Carroll	NA
08-504	EAP038	Collection of Fresh Water Sediment Cores	Final	Furl	NA
08-505	EAP039	Sampling Marine Sediment	Final	Aasen	NA
08-506	EAP040	Obtaining Fresh Water Sediment Samples	Final	Blakely	NA
08-507	EAP041	Collecting Freshwater Suspended Particulate matter samples using in-line filtration	Final	Meredith	NA
08-508	EAP042	Stream Stage Height Determination	Final	Shedd	NA
08-509	EAP043	Benthic Infaunal Rescreening, Tracking, Sorting and Taxonomic Identification	Final	Aasen	NA
04-502	EAP044	Continuous Temperature Monitoring Of Fresh Water Rivers And Streams Conducted in a TMDL study	Final	Stohr	NA
08-514	EAP045	Hemispherical Digital Photography Conducted for a Temperature TMDL study	Final	Stohr	NA
08-515	EAP046	Analysis of Hemispherical Digital Photography Conducted for a Temperature TMDL study	Final	Stohr	NA
08-516	EAP047	Channel Geometry Studies Conducted for a Temperature TMDL study	Needed	Stohr	9/30/09
04-503	EAP048	Riparian Vegetation Surveys Conducted for a Temperature TMDL study	Needed	Stohr	9/30/09
	EAP049	Maintaining EAP's Internet and Intranet Web Sites	Final	Lord	NA
	EAP050	Marine Currents using ADCPs SOP (Acoustic Doppler Current Profiler)	Needed	Albertson	11/30/08
	EAP051	Field Service and Maintenance of Sea-Bird Electronics © (SBE) 16 and 16+ Mooring Stations	Final	Holt/Jaeger	NA
	EAP052	Manual Depth-to-Water Level Measurements	Final	Marti	NA
	EAP053	Groundwater Sampling	Needed	Marti	10/31/09
	EAP054	Collecting Gaging Data from Campbell Scientific Instruments	Final	Watt	NA
	EAP055	Use of StreamPro Acoustic Doppler Current Profiler	Final	Shedd	NA
	EAP056	Measuring and Calculating Stream Discharge	Final	Shedd	xx
	EAP057	Conducting Stream Hydrology Site Visits	Final	Myers	NA
	EAP058	Operation of SonTek® FlowTracker® Handheld ADV®	Final	Burks	NA
	EAP059	Operation of Mechanical Velocity Indicators	Final	Holt	NA
	EAP061	Operation of In-stream Piezometers	Final	Sinclair	NA
10-176	EAP062	Determine Channel Dimensions in Streams and Rivers for the Extensive Riparian Status and Trends (S & T) Monitoring Program	Final	Werner	NA

Project Code	Index Number	SOP Title	Status	Author	Due date
10-187	EAP063	Measuring Sediment Size and Channel Dimensions: 11 count method	Final	Clinton	NA
10-188	EAP064	Determining Canopy Closure using a Concave Spherical Densimeter - Model C	Final	Werner	NA
10-189	EAP065	Counting Large Woody Debris for the Extensive Riparian S &T Monitoring Program	Final	Kennedy	NA
10-190	EAP066	Establish Reach Length for the Extensive Riparian S &T Monitoring Program	Final	Werner	NA
10-177	EAP067	Visual Characterization of Riparian Vegetation Structure for the Extensive Riparian Status and Trends Monitoring Program	Final	Roberts	NA
10-191	EAP068	Assessing Storm Damage for the Extensive Riparian S &T Monitoring Program	Final	Roberts	NA
	EAP070	Minimizing the Spread of Aquatic Invasive Species from areas of Extreme Concern	Final	Hallock et al	NA
	EAP 071	Minimizing the Spread of Aquatic Invasive Species from areas of Moderate Concern	Final	Hallock et al	NA
	EAP 072	Basic use and maintenance of Design Analysis® Data Loggers and Peripheral Equip.	Final	Fisher	NA
10-190	EAP066	Establish Reach Length for the Extensive Riparian S &T Monitoring Program	Final	Werner	NA

### 3. Environmental Assessment Program – Lab Accreditation Unit

Project Code	Index Number	SOP Title	Status	Author	Due date
	LAU001	Assessment (Audit) of Environmental Laboratories	Final	Lombard	NA
	LAU002	Accreditation of Environmental Laboratories	Final	Lombard	NA
	LAU003	Generation and Mailing of Renewal Applications	Final	Schreiber	NA
	LAU004	PrintScopes Backup Procedures	Final	Lombard	NA
	LAU005	Revocation of Accreditation	Needed	Lombard	6/30/08

### 4. Environmental Assessment Program – Manchester Laboratory

Index Number	SOP Title
<b>Microbiology</b>	
710001	%KES Membrane Filter Technique, G. Jay Vasconcelos, EPA Region 10 Microbiologist, "The Detection and Significance of <i>Klebsiella</i> in Water", Modified
710005	Autoclave
710013	Microbiology Dishwasher
710014	Escherichia coli Detection by Most Probable Number, EPA 1104
710015	Escherichia coli Detection Membrane Filter Technique, EPA 1105
710017	Enterococcus in Water by Most Probable Number, Standard Method 9230 B
710018	Fecal Coliforms Membrane Filter Technique, Standard Method 9222 D, Modified
710021	Fecal Coliforms in Water by Most Probable Number, Standard Method 9221 E

Index Number	SOP Title
710022	Fecal Streptococcus Membrane Filter Technique, Standard Method 9230 C
710039	Total Coliforms Membrane Filter Technique, Standard Method 9222 B, Modified
710042	Total Coliforms in Water by Most Probable Number, Standard Method 9221 B, Modified
710073	Fecal Coliforms in Water by Most Probable Number Using A-1 Media, Standard Methods 9221 E-2
710075	Heterotrophic Plate Count & Nuisance Organisms Iron & Sulfate
710076	EPA Method 1600: Membrane Filter Test Method for Enterococci in Water
710079	Total Nonvolatile Solids (Fixed) and Volatile Solids ignited at 550°C, Standard Method 2540 E
710081	pH for Microbiology section
710083	Membrane Filter Test Method for Escherichia coli in Water (mTEC2), EPA Method 1103.1
710084	Microbiology Quality Assurance Procedures
<b>General and Physical Chemistry</b>	
710002	Alkalinity, SM 2320B
710004	Ash Free Weight, SM 10300 C, Modified
710007	Biochemical Oxygen Demand Using the Dissolved Oxygen Probe EPA Method 415.1
710008	Fluoride/Chloride/Sulfate by Ion Chromatography, EPA Method 300.0
710009	Conductivity, SM 2510B
710012	Fluorometric Determination of Chlorophyll <i>a</i> in Saltwater and Freshwater Samples, Standard Method 10200 H, Modified
710028	Total Organic Carbon and Dissolved Organic Carbon EPA Method 415.1 (Combustion and NDIR Detection)
710029	Ammonia (phenolate) Method by Colorimetric Flow Injection Analysis, Standard Methods 4500-NH3 H
710030	Nitrogen, Nitrate-Nitrite, SM 4500-NO3 I, Modified (Colorimetric, Automated, Cadmium Reduction)
710031	Nitrogen, Nitrite, SM 4500-NO <sub>3</sub> I, Modified (Colorimetric, Automated)
710032	Oil and Grease EPA Method 1664: N-Hexane Extractable Material (HEM; Oil and Grease), by extraction and Gravimetry, Modified
710033	Orthophosphate in Waters by Colorimetric Flow Injection Analysis, SM 4500 P G
710034	pH (Electrometric), EPA Method 150.1
710038	Settleable Solids (Settleable Matter), SM 2540 F
710043	Total Dissolved Solids (Residue, Filterable), SM 2540 G
710045	Total Non-Volatile Solids and Percent Total Volatile Solids, SM 2540E, Modified
710046	Total Non-Volatile Suspended Solids (Residue, Volatile), SM 2540E, Modified
710047	Total Solids and Total Percent Solids (Total Residue, Sediment or Water Samples), SM 2540B
710048	Total Nitrogen in Waters by Colorimetric Flow Injection Analysis, Standard Method 4500-N B.
710050	Total Phosphorus, SM 4500 P I, Modified (Colorimetric, Automated, Ascorbic Acid Two Reagent)
710052	Total Suspended Solids (Residue, Non-Filterable), SM 2540D, Modified
710054	Turbidity, SM 2130 B, Modified
710055	Ultimate Biochemical Oxygen Demand (UBOD)
710056	Analysis of Bulk Asbestos, Federal Register, 40 CFR 763, Appendix A to Subpart F, Modified
710057	Asbestos Fiber Counting by the NIOSH 7400 Method, Modified

Index Number	SOP Title
710058	Gravimetric Analysis of High Volume Air Filters, Federal Register, 40 CFR 50, Appendix J, Modified
710059	Metal Analysis of Air Filters, Federal Register, 40 CFR 50, Appendix G, Modified
710060	Spiking Filter Strips with Lead
710068	Soil and Waste pH Electrometric SW846 Method 9045C
710070	Total Organic Carbon in Soil/Sediment, PSEP-TOC
710071	Determination of Salinity by Refractometer
710074	Low level Total Phosphorus by Manual Digestion and Lachat
710078	Gravimetric Analysis of PM <sub>2.5</sub> Fine Particulate Air Filters, Federal Register, 40 CFR 50, Appendix L, Modified
710080	Percent Total Solids for TOC PSEP samples at 70 °C and 104 °C
710085	Suspended Sediment Concentration; ASTM Method D3977-97 (re-approved 2002), Test Method B - Filtration
710086	Alkalinity in Seawater; Fisheries Research Board of Canada; Bulletin 167, Second Edition, I.4.I.2
<b>Metals</b>	
720002	Metals Water Sample Preparation, EPA Method 200.2
720004	ICP: TJA Solutions IRIS Advantage, EPA Method 200.7
720009	Determination of Mercury in Water by Cold Vapor Atomic Absorbance, EPA Methods 245.1, Modified and SW846 7470, Modified
720011	Metals Low Level Cold Vapor Mercury Analysis of Water Samples Using Bromine Oxidation, U.S. EPA Method 245.7, Modified
720012	Metals Sediment Sample Preparation by Hotblock Digestion, SW846 Method 3050B, Modified
720013	Metals Water Sample Preparation, EPA method 200.2
720015	Sediment Preparation by Microwave Digestion, SW846 Method 3051
720016	Toxicity Characteristic Leaching Procedure for Metals SW846 Method 1311
720017	Metals Data Review
720018	ICP Mass Spectrometer VG PQ ExCell, EPA Method 200.8
720021	Determination of Mercury by Cold Vapor Atomic Absorbance in Sediment, SW846 7471 Modified, and EPA Method 245.5, Modified
720022	Solid Preparation by Microwave Digestion, SW846 Method 3052
720024	Low Level Phosphorus by ICP-MS, EPA Method 200.8
720025	Metals Water Sample Preparation, EPA method 3010A
720026	Metals Water and Aqueous Waste Sample Preparation for Analysis by ICP/MS, EPA SW-846 Method 3020
720027	Determination of Mercury by Cold Vapor Atomic Absorbance in Tissues by EPA SW-846 Method 7471B, Modified, and EPA Method 245.6, Modified
<b>Organics</b>	
730002	Analysis of Water/Soil/Sediment/Fish Tissue Samples for Organochlorine Pesticides and Polychlorinated Biphenyls by GC/ECD SW846, Methods 8081 and 8082
730003	Analysis of EDB (Ethylene Dibromide), DBCP (Dibromochloropropane) and Trichloropropane in Drinking Water and Waste Water by Liquid/Liquid Extraction, EPA 504 and 504.1, Modified
730005	Butyltin Analysis
730009	Determination of Percent Lipids in Tissue
730011	Extraction of Semivolatile Organic Analytes (BNAs), Dinoseb and PCP in Water

Index Number	SOP Title
730012	Extraction of BNAs/Pesticides/PCBs/Op-Pesticides in Soils, Sediments and Sludges, SW-846 Method 3540
730013	Analysis of Chlorinated Acid Herbicides from Soils and Sediments (EPA Method 8151B)
730018	Florisil® Column Cleanup
730021	Semivolatile Base/Neutral/Acid (BNA) Organic Compounds by Gas Chromatograph Mass Spectrometer (GC/MS): Capillary Column
730022	GC/MS Data Final Review
730024	Gel Permeation Chromatography Treatment
730028	Hydrocarbon Identification
730049	Silica Gel Column Cleanup (SW846 Method 3630B)
730061	Volatile Organic Analysis - Method 8260A
730065	Water, Sludge, Sediment, Soil WTPH-D <sub>x</sub> Extraction, Oil Preparation Methods [Total Petroleum Hydrocarbons as Diesel in Soil]
730066	Analysis of WTPH-D <sub>x</sub> Semivolatile Petroleum Products in Environmental Soil, Sediment and Water Extracts
730067	Analysis of NWTPH-G <sub>x</sub> and BTEX Analysis Methods for Soil and Water
730069	Water, sludge, Sediment, Soil NWTPH-HCID Analysis Methods
730070	Polynuclear Aromatic Hydrocarbons (PAH) by Gas Chromatography/Selective Ion Monitoring Mass Spectroscopy (GC/SIM-MS)
730072	Extraction of Fish Tissue for Semi-Volatile Analytes, including Pesticides, PCBs and BNAs by GC/AED, GC/ECD and/or GC/MS
730073	Fish Tissue Florisil Column and Acetonitrile Back Extraction Cleanup (Macro)
730080	Extraction and GC/MS Analysis of 1-Naphthol and Carbaryl in Soil/Sediment
730081	Accelerated Solvent Extraction of Solid Samples
730082	Determining Flash Point by Pensky – Martens Closed Cup Tester
730083	Isotopic Dilution Polynuclear Aromatic Hydrocarbons (PAH) by Gas Chromatography/Selective Ion Monitoring Mass Spectrometry (GC/ID-SIM-MS)
730085	Extraction of PAH only, Pesticides and/or PCBs in Water
730087	Butyltin in Tissue Analysis
730088	Sulfur Removal by SW-846 Method 3660B
730091	Micro-Florisil® Column Cleanup
730092	Micro-Florisil® Cleanup for Phthalate Esters, by Method 3620B
730093	Acid-Base Partition Cleanup, by Method 3650B
730096	PBDE Tissue Analysis by GC/MS/MS
730097	Analyzing Chlorinated, Organophosphorus, and Nitrogenous Pesticides by GC/MS, Method 8270
730098	Methoprene by GC/MS, USGS Method O-2134-01
730095	Herbicide Analysis by Gas Chromatography/Mass Spectrometry (GC/MS)
730096	PBDE Tissue Analysis by GC/MS/MS
730097	Analyzing Chlorinated, Organophosphorus, and Nitrogenous Pesticides by GC/MS, Method 8270
730098	Methoprene by GC/MS, USGS Method O-2134-01
730099	Solid Phase Extraction (SPE) of Semi-Volatile Petroleum Products (NWTPH-D <sub>x</sub> ) in Water by EPA SW-846 Method 3535



Index Number	SOP Title
730100	Solid Phase Extraction (SPE) of Herbicides in Water by EPA SW-846 Method 3535
730101	Extraction of BNA's/Pesticides/PCB's/Op-Pesticides in Soils, Sediments and Sludges by Soxtherm, SW 846 Method 3541
730102	Solid Phase Extraction of Carbamates for High Performance Liquid Chromatography Mass Spectrometer Analysis (HPLCMS), EPA SW 846 Method 3535M
730103	Micro-acetonitrile back extraction cleanup
730104	PBDE Analysis by GC/MS Selective ion Monitoring (SIM)
730105	Fish Tissue Florisil Column and Acetonitrile Back Extraction Cleanup (Micro)
730106	Carbamate Analysis by EPA Method 8321A, Modified
730107	Solid Phase Extraction (SPE) of Pesticides in Water by EPA SW-846 Method 3535
730108	Solid Phase Extraction (SPE) of PBDEs in Water by EPA SW-846 Method 3535
<b>Sample and Data Management</b>	
770001	Sample Check-In
770003	Purchasing Analytical Services
770005	Reviewing Contract Laboratory Data
770009	Filling Sample Container Orders
770014	Processing Purchases for Payment
770016	Radiation Screening of Samples Entering the Manchester Laboratory
770017	Sample Data Filing System
770018	Documentation of Administrative Standard Operating Procedures
770019	Documentation of Analytical Standard Operating Procedures
770020	Use of the OHS Material Safety Data Sheets on CD-ROM Software
770023	Waste Collection, Storage and Pickup
770026	Sample Disposal
770027	Construction and Use of Precision Control Charts
770028	LIMS Log in of Samples
770029	Cleaning Sample Containers with a Laboratory-Grade Dishwasher
770030	Laboratory Balances in the General Chemistry Section

SM = Standard Method (APHA, 2005).

## 5. Hazardous Waste and Toxics Reduction Program

Generic

## 6. Nuclear Waste Program

SOP Title
Shipping samples to NWP Contracted Analytical Labs Draft

**7. Shorelands and Environmental Assistance Program**

None

**8. Solid Waste and Financial Assistance Program**

None

**9. Spills Program**

SOP Title
Spill Response Procedures Draft

**10. Toxics Cleanup Program**

None

**11. Water Quality Program**

None

**12. Water Resources Program**

None

## Appendix F. Ecology Intra-Program Agreement on Data-Entry Practices

This memorandum of understanding serves to document roles and responsibilities for data evaluation and data entry into the EIM system. It also establishes QA processes for EIM data entry.



### **Memorandum of Understanding**

### **EIM Data Coordinator and QA Officer Roles and Responsibilities**

**July 30, 2007 (updated March 4, 2008)**

The vision of the Environmental Information Management (EIM) System is to provide a central repository for Ecology and Ecology-affiliate environmental data, make it easily accessible to Ecology, affiliates, and the general public, and ensure that it contains the necessary elements to provide and gauge data credibility. This system serves a major support function within the agency and for agency affiliates. EIM has grown considerably in size, complexity, and usage with the addition of new functionality and data submittal requirements for all upland and sediment cleanup sites, water quality grant and loan recipients, and 303(d) data submitters.

There is also a growing need to ensure that the quality of the data in EIM can be accurately gauged for use in data analyses and rule-making. As a result, the need for collaboration with and support from Ecology's environmental programs and quality assurance (QA) officer is imperative. The program EIM data coordinators serve an essential function, working integrally with the agency EIM data coordinator to ensure the smooth flow of data into EIM. The QA officer helps ensure that the EIM protocols are in line with agency standards. This document describes the roles, responsibilities and collaboration of the EIM data coordinators and the advisory function of the agency quality assurance officer on EIM policies and procedures.

### **Agency EIM Data Coordinator**

This position resides within Ecology's Applications and Data Services section, reporting to the Environmental Systems Support Unit supervisor. This position serves as the agency EIM data coordinator, user support lead, and business lead.

As the agency data coordinator,

- Provides mentoring, training, and technical direction to data coordinators in Ecology programs.
- Serves as lead for oversight of agency affiliate data submittal activities.
- Coordinates with program data coordinators on data submittal and QA issues, assuring that such issues are addressed in a timely manner and that the resolution is understood by and, for major issues, acceptable to all data coordinators and the agency QA officer.

- Works with Ecology environmental programs to migrate legacy data and other datasets into EIM.
- Functions as technical expert in environmental data management.
- Provides cross-program and agency affiliate technical peer review and coordination of environmental data management activities.
- Has lead responsibility for monitoring incoming Manchester Laboratory Information System (LIMS) batches to minimize backlog.

As the user support and business lead,

- Acts as liaison between the EIM development team and Ecology scientists/hydrogeologists and external system users.
- Coordinates with EIM project manager on work load planning and priorities, etc.
- Works integrally with the EIM User's Group and data coordinators on database issues.
- Has lead responsibility for development and implementation of technical user procedures, guidelines and training relating to EIM and environmental data management. Includes maintenance of online help, data dictionaries, and user's manuals. Assists program data coordinators and others with training activities.
- Supports EIM maintenance, enhancement, and new development activities by participating in requirements gathering, usability and user interface design, application testing, and working with programs to develop and/or update business rules.
- Has lead responsibility for tracking and prioritizing bug fixes and enhancement requests through Ecology's Bug and Enhancement Reporting System (BERS).
- Serves as primary contact for environmental laboratories concerning EIM data submittals, electronic data deliverable format requirements, and reference table issues.
- Serves on the EIM Steering Committee, reporting status and/or results of environmental data issues.
- Performs as lead for system demonstrations and marketing.
- Maintains EIM reference tables.
- Identifies, facilitates, and participates in data cleaning.
- Administrates the EIM Intranet and Internet static Web sites.
- Writes custom queries for data extraction, data cleaning, and/or reporting.

### **Program EIM Data Coordinators**

The program EIM data coordinator positions reside within Ecology's environmental programs, including the Environmental Assessment Program as contract employees to the Toxics Cleanup and Hazardous Waste programs. The program data coordinators play a crucial role in developing accessible relationships with program staff and external clients where applicable, assisting them with all aspects of EIM data submittal. They also perform QA checks on data

submittals and upload the data into EIM. Additionally, they act as program resources for EIM questions and issues. The program EIM data coordinators work closely with the agency EIM data coordinator to direct and review the work of other staff assisting them. Specific duties are as follows:

- Act as the first point of contact and lead on assisting external clients and/or program staff with EIM data submittal requirements and process. Where applicable, help external clients with questions and issues concerning the EIM Import Module submittal process. Includes use of online software and spreadsheets. Primarily involves phone assistance.
- Respond promptly to requests or questions about data submittals from external clients and/or program staff. Use available staff and electronic resources. Includes familiarity with all EIM systems and resources as well as applicable associated program resources, such as the Toxics Cleanup Program's ISIS database.
- Prioritize tasks based on interactions with program staff, EIM staff, and the order data submittals are received. Includes design and maintenance of organizational systems such as email, electronic filing, and checklists to track EIM data submittal tasks and activities.
- Train and mentor interns and/or staff in EIM data management techniques. Includes EIM data loading.
- Process and load datasets received through the EIM Import Module. Specifics include:
  - Setting up the study, including making any necessary changes or additions.
  - Submitting bibliographic information to the appropriate publications coordinator.
  - QA'ing, loading, and verifying Location data. Use EIM Database Search or GIS to verify Locations.
  - QA'ing and loading Result data. Data quality will be determined through review prior to loading into EIM. An established process for data review will be followed that includes examination of data content in prepared spreadsheets for correctness of transcription into electronic form and comparison to EIM data acceptance protocols. Additionally, validation based on Data Quality Objectives described in the QA Project Plan or Sampling and Analysis Plan (SAP) *may* be performed. Any documentation describing the data collection procedure developed by the contractor may be examined in order to complete data review requirements.
  - Inventory and tracking of external data submittals shall be performed by using the data submittal tracking spreadsheet. Other methods of organization may be used in addition as described above.
  - Interacting with program staff and data submitters as necessary to clear up any issues surrounding the submittal.
  - Sending notification email to program staff and data submitters when the submittal process is complete.
- If applicable, process and load applicable LIMS (Laboratory Information Management System), contract lab, and/or field data batches in a similar fashion.

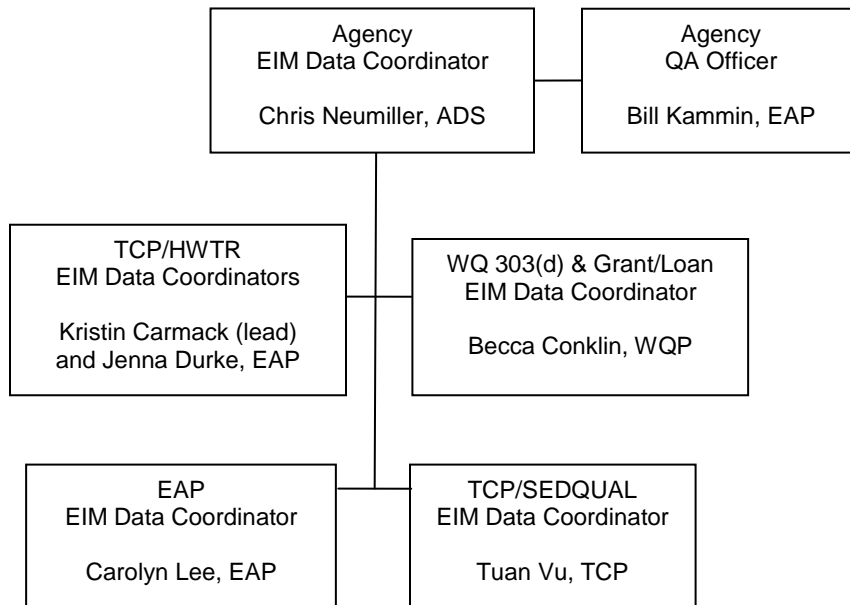
- Assist agency data coordinator in maintaining data dictionaries, the on-line help system, standard glossary of terms, and user instructions.
- Work with the agency EIM data coordinator and QA officer to develop and refine QA protocols for internal data and data acceptance protocols for QA'ing external data.
- For external data, run monthly comparative analyses between the EIM tracking system and program databases such as the TCP ISIS or Grantee database.
- Perform bi-yearly assessments of program LIMS batches to see if they should be processed or deleted.
- Assist and/or lead training or workshops on the EIM system for program staff and external data submitters.
- Work with program staff and agency data coordinator to migrate legacy datasets or historical data into EIM.
- Represent program interests in future EIM development activities (new software and improvements to existing software) as requested.
- Represent program interests in EIM User's Group (once monthly or less – primarily business issues).

### **Agency QA Officer**

This position resides in the Environmental Assessment Program. The agency QA officer plays an important advisory role in the EIM system. The agency QA officer works with the agency and program data coordinators in the following areas:

- Helps craft the language for the QA planning and assessment levels at the study level, ensuring that it reflects current agency policies and standards.
- Ensures essential metadata is captured to be able to adequately assess and support data quality.
- Reviews data acceptance protocols to make sure they comply with the agency QA policies and standards.
- Serves as overall advisor with respect to EIM data management practices.
- Serves on the EIM Steering Committee.

## Data Coordinator Organizational Structure



*This page is intentionally left blank.*



# Appendix G. Ecology Policy 22-01, Establishing Quality Assurance



## Chapter 22: External Environmental Operations

### Executive Policy 22-01

**Resource Contact:** Quality Assurance Officer

**Established:** August 25, 1993

**References:** Ecology Quality Management Plan

**Revisions Effective:** May 8, 2006

## Establishing Quality Assurance

---

**Purpose:** To ensure the consistent application of quality assurance principles to the planning and execution of all activities that acquire and use environmental measurement data.

**Application:** This policy applies to all Ecology employees, represented and non-represented, and to environmental data collection studies/activities conducted or funded by Ecology.

### 1. Establishing Definitions.

---

Quality Assurance (QA): The integrated program for assuring the reliability and quality of environmental data.

### 2. Quality Management Plan Provides Guidance.

---

This policy is the basis for QA management in Ecology and is the foundation for developing the Quality Management Plan. The plan describes the principles and practices that lead to effective planning and execution of environmental studies/activities that generate valid and useful data.

### 3. Assigning Quality Assurance Responsibilities.

---

The Director designates the agency's Quality Assurance Officer.

Program managers with responsibilities for environmental data designate a Quality Assurance Coordinator to provide QA support/oversight within their program.

**4. QA Project Plans for Environmental Studies/Activities are Prepared, Reviewed, and Approved.**

---

A Quality Assurance Project Plan is prepared for each environmental study/activity that acquires or uses environmental measurement data.

The Quality Assurance Project Plan lists the objectives of the study/activity; identifies the data needed to achieve those objectives; and describes the sampling, measurement, quality control, and data assessment procedures needed to obtain the data. The size and complexity of the project plan will be cost effective and in proportion to the magnitude of the study per Ecology Document "Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies."

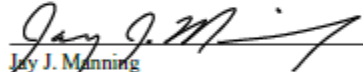
Quality Assurance Project Plans are developed, reviewed, and approved as specified in the Quality Management Plan, before data collection begins.

**5. Quality Assurance Staff Provide Technical Assistance and Training.**

---

The Quality Assurance Officer and staff provide technical assistance with quality assurance matters and coordinate quality assurance training for Ecology personnel.

Approved:

  
Jay J. Manning  
Director

[Return to Table of Contents](#)

# Appendix H. Ecology Policy 22-02, Requiring Use of Accredited Environmental Laboratories



## Chapter 22: External Environmental Operations

### Executive Policy 22-02

**Resource Contact:** Quality Assurance Officer      **Established:** January 23, 1990

**References:** Chapter 173-50 WAC      **Revisions Effective:** January 28, 2008  
[Ecology Form 070-152](#)  
[Ecology Form 070-152a](#)

## Requiring Use of Accredited Environmental Laboratories

**Purpose:** To ensure all environmental data used by Ecology for decision making is generated by laboratories capable of providing accurate and legally defensible data, shown by their successful participation in Ecology's Lab Accreditation Program.

**Application:** This policy applies to all Ecology employees, represented and non-represented, whenever they order or oversee submitting environmental data to Ecology from a laboratory providing environmental analytical services, or whenever environmental data is submitted to Ecology through a contractual process.

### 1. Lab Accreditation Unit Oversees Ecology's Lab Accreditation Program.

The Lab Accreditation Unit of the Environmental Assessment (EA) Program is responsible for determining whether a laboratory meets accreditation standards established in Chapter 173-50 of the Washington Administrative Code (WAC). Any laboratory, within or outside the state, may apply for accreditation. The Lab Accreditation Unit will maintain a list of currently accredited labs and the analytical parameters and methods for which each lab is accredited. Ecology employees and other interested parties may request this information from the Lab Accreditation Unit. It is also available by clicking [here](#) (<http://www.ecy.wa.gov/programs/eap/labs/documents/AllAccreditedLabListInternet.pdf>).

### 2. Managers Use Accredited Laboratories.

Ecology employees responsible for ordering or overseeing lab services or data submittal to Ecology through regulations, permits, or contractual agreements must ensure the laboratories performing these environmental analyses are accredited by the Lab Accreditation Unit for the specific analytical tests submitted to Ecology.


Applicable environmental data include, but are not limited to, results from analysis of water, sediment, sludge, air, soil, plant and animal tissue, and hazardous waste analyzed in a laboratory. Applicable analyses include chemical, physical, biological, microbiological, radiological, or other scientific determinations that provide recorded qualitative and/or quantitative results derived from laboratory analyses.

**3. Exceptions Require Approval of the Environmental Assessment Program Manager.**

---

The requirement to use accredited laboratories may be waived only by the EA Program Manager or the agency Deputy Director (use [Ecology Form 070-152, Request for Waiver to Required Use of Accredited Lab](#)). A program or section manager must consult with the agency Quality Assurance Officer, who reviews the request to deviate from this policy and makes a recommendation to the EA Program Manager, or Deputy Director if the EA Program Manager is not available. The EA Program Manager or Deputy Director informs the Quality Assurance Officer and requesting manager of the decision to either approve or disapprove the request. Waivers are not to be used by Ecology employees to circumvent the accreditation process or the intent of this policy.

Approved:

  
Jay J. Manning  
Director

[Return to Table of Contents](#)

October 2011

**Addendum to  
Washington State Department of Ecology  
Quality Management Plan**

Publication No. 10-03-056

October 2010

[www.ecy.wa.gov/biblio/1003056.html](http://www.ecy.wa.gov/biblio/1003056.html)

**Addendum for  
National Estuary Program  
Grant Processes and Quality Assurance Oversight**

## Approval Signatures

Signature: \_\_\_\_\_ Date: October 5, 2011

William R Kammin, Washington State Department of Ecology

Signature: \_\_\_\_\_ Date: October 5, 2011

Margen Carlson, Washington Department of Fish and Wildlife

Signature: \_\_\_\_\_ Date: October 5, 2011

Mary Knackstedt, Washington State Department of Health

Signature: \_\_\_\_\_ Date: October 12, 2011

Michael Cox, US Environmental Protection Agency

Signature: \_\_\_\_\_ Date: October 11, 2011

Ginna Grepo-Grove, US Environmental Protection Agency

Signature: \_\_\_\_\_ Date: October 6, 2011

Ken Currens, Puget Sound Partnership

Signature: \_\_\_\_\_ Date: October 5, 2011

Will Kendra, Washington State Department of Ecology

Signatures are not available on the Internet version.

## **Regarding: National Estuary Program (NEP) – Quality Assurance (QA) and Grant Processes**

Over the past 20+ years, Ecology has developed a quality system that has been documented by EPA to be fully compliant with EPA regulatory requirements. EPA has periodically assessed the Ecology quality system, and in the most recent two audits has determined no findings or corrective actions. EPA approved the most recent Ecology quality management plan (QMP) in October 2010; it will remain in place until 2015. This current Ecology QMP is incorporated into this document by reference and can be found at this web address: [www.ecy.wa.gov/programs/eap/quality.html](http://www.ecy.wa.gov/programs/eap/quality.html).

However, concurrent with the influx of National Estuary Program (NEP) grant money to Washington State, EPA identified concerns with quality assurance planning, especially in relationship to the Lead Organizations (LOs), who will be awarding NEP grants and tracking grant progress and completion. EPA identified Ecology QA oversight of the grants as the most efficient use of limited state agency QA resources.

Ecology has agreed to provide oversight over several QA processes for the NEP grants. To facilitate this process, the LOs listed below are jointly funding a position housed in Ecology and designated as the NEP Quality Coordinator (NEPQC).

- Washington State Department of Health (DOH), Mary Knackstedt, QA contact
- Washington State Department of Fish and Wildlife (DFW), Margen Carlson, QA contact
- Washington State Department of Ecology (Ecology), Bill Kammin, QA contact
- Puget Sound Partnership (PSP), Ken Currens, QA contact

This position will conduct reviews of Quality Assurance Project Plans (QAPPs) submitted to the LOs and PSP for compliance with EPA quality system requirements. The position will also provide technical support to LOs, PSP and grant recipients to facilitate QAPP development and review. This technical support includes:

- Technical assistance and development of QAPP templates and checklists to facilitate documentation
- Recommendation of QAPP approval, rejection, or intermediate status
- Periodic audits and assessment of project compliance with QAPP objectives
- Development of a waiver process and alternative documentation where traditional QAPPs are not appropriate
- Assessment of all submitted projects for clear project objectives, and assessing attainment of those objectives at project end
- Review and recommendation for approval of QAPPs and reports prepared by NEP subcontractors
- Coordinating with LOs and PSP when specialized program expertise is needed for assistance in reviewing QAPPs and reports
- Training of LOs, PSP, and subcontractors in quality assurance principles and practices.
- Data review, verification, and validation as necessary and appropriate

As grants are awarded, the LOs and PSP will submit the award documentation to the NEPQC for a determination of the type and scope of the quality documentation that will be required for the project. The NEPQC will communicate this decision to the LOs and PSP, who will advise the grant recipients on the scope of the documentation. The scope of documentation will include requirements for QAPP review and approval prior to data collection or assessment, and also for technical report review and approval prior to project completion. For projects that do not require a QAPP, a waiver process will be implemented that will document this decision and also provide documentation of the adequacy of project objectives and whether or not they were met.

The NEPQC will be responsible for providing quality assurance review of QAPPs, technical reports, and waiver documentation, and will make recommendations to LOs and PSP regarding final approval of these documents. LOs will be responsible for individual agency QA systems, including development of a Quality Management Plan (QMP) as required by EPA, and designation of a QA manager to implement the QMP and coordinate with the NEPQC. The NEPQC position description is attached to this document, and is part of this addendum.

As the LOs develop their individual QMPs, they each will designate a Quality Manager who will be the single point of contact for NEP quality-related issues and the interface with the Ecology quality management system.

The Ecology QA Officer will retain approval authority of submitted QAPPs until the LOs demonstrate "mature" quality systems. Evidence of successful quality systems includes:

- EPA-approved QMP
- Functioning, as-built quality system
- Designated agency quality manager with appropriate experience in quality assurance
- Approval of the EPA Region 10 Quality Manager

An organization chart reflecting these new relationships is being developed and will be finalized after the LOs QMPs are approved by EPA. A draft organization chart is presented in this document, with the understanding that the NEPQC practical reporting functionality is to the Ecology Quality Assurance Officer, Bill Kammin.

### **NEP grant processes**

The LOs have developed a grant process and documentation for NEP which EPA has approved. The table below represents Ecology's grants management process flow for toxics/nutrients and watersheds.



## Lead Organization Grants Management Process Flow

MANAGEMENT STEP	INVOLVED PERSONNEL	REMARKS	Description of <b>Ecology's</b> LO Processes
RFP Development	Project Officer, administrative staff, Central Contracts office	RFP development, even in a noncompetitive solicitation requires identifying eligible applicant types; identifying eligible types of projects; developing proposal evaluation criteria; identifying the range of possible award sizes; developing instructions to potential applicants regarding the required content of the application; establishing schedules for the complete solicitation.	<p>See attached organizational description for the duties of the NEP Project Leads (NEPPL)-2 (Project Officer), and the Puget Sound Grant Coordinator (PSGC)- 1 (Grant Specialist).</p> <p>These personnel use Washington State's procurement best management practices to implement a process for both direct and competitive NEP sub awards, assisted by the Core Teams and Ecology's Contracts Office. For sub awards made to governmental entities, the primary vehicle will be an Interagency Agreement (IAA). Competitive sub awards will be initiated by an RFP.</p> <p>RFP content will be determined by the Core Teams who will refine areas of investment; draft evaluation criteria and a points system; and identify expected outputs, outcomes, and schedules.</p> <p>RFPs will be developed and posted on the Single Application website now under construction by RCO and PSP, as well as Washington's Electronic Bids Solution (WEBS), Washington State's central bid posting site.</p> <p>Ecology RFPs will be guided by the administrative and programmatic conditions in EPA's Cooperative Agreement and by the <i>State Administrative &amp; Accounting Manual (SAAM)</i>. For example:  <a href="http://www.ofm.wa.gov/contracts/resources/RFP_gen.doc">www.ofm.wa.gov/contracts/resources/RFP_gen.doc</a>  <a href="http://www.ofm.wa.gov/contracts/resources/rfp_personal_services.pdf">www.ofm.wa.gov/contracts/resources/rfp_personal_services.pdf</a></p> <p>Ecology's contracts officer is modifying the RFP and IAA templates (link provided above) to incorporate the General Terms and Conditions outlined in the cooperative agreement that will be passed on to sub awardees.</p>

MANAGEMENT STEP	INVOLVED PERSONNEL	REMARKS	Description of Ecology's LO Processes
			<p>Additional guidance is provided by SAAM 15.20.30:  <a href="http://www.ofm.wa.gov/policy/15.20.htm">www.ofm.wa.gov/policy/15.20.htm</a></p> <p>RFPs will be developed and designed to fit the specific solicitation.</p> <p>Although the above guides do not directly mention the new NEP sub awards, Ecology intends to manage Puget Sound NEP funding in accordance with internal procedures, the guidance referenced above, Washington State procurement laws, and best management practices. Documentation will be developed and refined as this new program evolves.</p>
Application Forms Development	Project Officer, Grants Specialist or Contracts Specialist, administrative staff	Forms must be designed or adopted that can be used by applicants to submit the required information. For sub awards to be made under an EPA assistance agreement, one will need the equivalent of an SF424, SF424A, SF424B, SF LLL and Form 4700-4. Also needed is a recommended format for applicants to use for detailed budgets and a format for the Project Officer and Grants Specialist to use to document costs.	<p>Forms and/or templates will be developed and posted on the Single Application Point website hosted by the Puget Sound Partnership (PSP).</p> <p>Application forms are now under development by RCO and PSP. Their design is being completed by the Lead Organization (LO) coordinating group which includes EPA. The objective is to design a single application form similar to one currently in use by Ecology.</p> <p>Where an application "form" is not pertinent, RFPs will contain specific instructions on the format for responses/proposals.</p> <p>Upon selection of a recipient, the provisions of Ecology's Yellow Book and other program guidelines will be used as guides to further develop applications or proposals and to assist in preparation of Interagency agreements (IAA) as discussed later.</p> <p>IAs will be used for sub awards to governmental entities. They include the detail of a SOW, QA, Special terms and conditions, and Detailed Budgets. Guidance on detailed budget formats will be checked to ensure equivalency with the federal forms listed at the left.</p>

MANAGEMENT STEP	INVOLVED PERSONNEL	REMARKS	Description of Ecology's LO Processes
RFP Issuance	Administrative staff, perhaps the Project Officer	The solicitation must be announced and made available to all potential applicants. A person on staff, identified in the RFP, should be available to answer questions from potential applicants. In a competitive solicitation, this person must be someone who will not be involved in evaluating proposals received under the solicitation.	<p>Solicitations will be prepared specifically for each sub award and announced by the NEPPL and PSGC on the Single Application Point website and WEBS (Washington's Electronic Bids Solution). Ecology will abide by the general rules jointly developed for the uses of the single portal site. The PSGC will provide technical assistance to potential applicants and perform administrative functions of RFP issuance. Applicants will complete and submit the forms/templates developed as discussed above. The PSGC will not be part of the formal evaluation process.</p> <p>SAAM 15.20.30 and The Yellow Book will be used as guides.  <a href="http://www.ofm.wa.gov/policy/15.20.htm">www.ofm.wa.gov/policy/15.20.htm</a></p>
Application Receipt	Administrative staff, Project Officer	Applications should be logged in. Applications should be screened to verify that they meet the threshold criteria specified in the RFP. They should also be screened to verify that they are complete and contain all of the required content.	<p>The PSGC will follow a checklist to initially screen all proposals and applications to ensure they are complete and responsive to the RFP and forward them to the NEPPL for the evaluation process. If responses come through the single application website, the PSGC will additionally ensure the application was properly routed.</p> <p>Due to the variety of potential projects, the NEPPL and PSGC will collaborate with EPA to complete a screening form specific to each solicitation guided by SAAM 15.20.30(f).  <a href="http://www.ofm.wa.gov/policy/15.20.htm">www.ofm.wa.gov/policy/15.20.htm</a></p> <p>Template for screening for RFP responsiveness is on OFM website:  <a href="http://www.ofm.wa.gov/contracts/resources/documents.asp">www.ofm.wa.gov/contracts/resources/documents.asp</a></p>
Application Evaluation	Project Officer, additional professional staff,	A team evaluates and scores the applications in light of the published criteria. The	Application evaluation, criteria, points, etc. will be in place at the time of the RFP. The PSGC will recommend a ranking/rating process and the NEPPL will select the method. The NEPPL will form the evaluation team

MANAGEMENT STEP	INVOLVED PERSONNEL	REMARKS	Description of Ecology's LO Processes
	Management	<p>team recommends a subset of proposals for funding. Management selects proposals for funding based on the recommendations from the evaluation team. Project Officer documents the evaluation process and results of the evaluation. (Even in a noncompetitive solicitation one evaluates the proposals received against a set of criteria. If a proposal fails to meet or exceed one or more of the criteria one either works with the applicant to correct the proposal's deficiencies or rejects the proposal.)</p>	<p>and process to score proposals and make final selections. The variety of potential projects dictates that each solicitation will require a separate evaluation process based on the criteria and points developed for that solicitation.</p> <p>The NEPPL and PSGC will be guided by the provisions of administrative and programmatic conditions within the cooperative agreement and Washington's SAAM 15.20.30(k-q): <a href="http://www.ofm.wa.gov/policy/15.20.htm">www.ofm.wa.gov/policy/15.20.htm</a> and SAAM 16.10.30: <a href="http://www.ofm.wa.gov/policy/16.10.htm">www.ofm.wa.gov/policy/16.10.htm</a></p> <p>Additional consultation by LO Coordinating Team and engagement with strategic advisory committee and broader Management Conference may be required before final awards are made. (This step is TBD by LO Team).</p>
Cost review	Project Officer, Grants Specialist, Contract Specialist	<p>Review detailed budget to verify applicant costs and confirm that all proposed costs are reasonable, allowable, and allocable. Obtain supplemental cost information from applicants. Verify that final detailed budget matches information in the SF424 and SF424A (or equivalent forms created by Lead Organization)</p>	<p>The NEPPL and PSGC will team to select eligible proposals/applications and accomplish the essential step of a detailed budget review and verification of cost data. To confirm that proposed costs are eligible, they will be guided by the cooperative agreement terms and conditions, the provisions of Part III of the Yellow Book, and generally supported by Washington's Ch 10 SAAM : <a href="http://www.ofm.wa.gov/policy/10.htm">www.ofm.wa.gov/policy/10.htm</a></p> <p>Also, see Part III- Eligible Costs- Yellow Book, pages 21-38.</p> <p>In addition, Ecology's internal fiscal policies and guidelines for other grants/loans, and Ecology's broad experience in managing grants and loans will help to perform cost review. Applicants will be asked how costs were derived and negotiations with applicants will produce the</p>

MANAGEMENT STEP	INVOLVED PERSONNEL	REMARKS	Description of Ecology's LO Processes
Work Plan negotiation	Project Officer	Negotiate any work plan revisions to ensure that project meets the objectives of the solicitation, has a reasonable schedule, has clear deliverables, and is severable if reduced funding from Congress prevents full funding of the project.	<p>final approved budget.</p> <p>The NEPPL and PSGC will work with the applicant/recipient to develop a detailed work plan. This process will be guided by the cooperative agreement strategies, work plan, linkages to the Action Agenda, general terms and conditions, and logic models. At times, collaboration with EPA or PSP may be required to solidify the final deliverables. An OFM guide is located at:  <a href="http://www.ofm.wa.gov/contracts/resources/contract_award.pdf">www.ofm.wa.gov/contracts/resources/contract_award.pdf</a></p>
Award document development	Project Officer, Grants Specialist, Contract Specialist, Legal Counsel	Develop a grant award document with the full set of legally required terms and conditions. These requirements include, but are not limited to, 40 C.F.R. Part 31, 40 C.F.R. Part 34, 2 C.F.R. Part 225, restrictions on international travel, restrictions on conferences, quality assurance, geospatial data requirements, entry of data into STORET, entry of data into equivalent Tribal and State data systems, FEATS progress reporting. (Note for States that the award document also needs to incorporate any requirements that are specified in applicable state law and regulation).	<p>The NEPPL is responsible for coordinating and developing the final award document, with assistance from the PSGC. This effort will be guided by the administrative and programmatic provisions of the cooperative agreement and Washington's SAAM:  <a href="http://www.ofm.wa.gov/contracts/resources/iaa_long_gen.doc">www.ofm.wa.gov/contracts/resources/iaa_long_gen.doc</a>  <a href="http://www.ofm.wa.gov/contracts/resources/contract_award.pdf">www.ofm.wa.gov/contracts/resources/contract_award.pdf</a>  <a href="http://www.ofm.wa.gov/contracts/resources/documents.asp">www.ofm.wa.gov/contracts/resources/documents.asp</a></p> <p>Also, Ecology's Yellow Book outlines general guidance about developing agreements (see pages 12-13). Boilerplates are currently available that remind about special conditions and regulatory requirements to include federal requirements such as:</p> <ul style="list-style-type: none"> <li>• Recipients must comply with applicable Federal law and regulation as well as applicable state and local laws and regulation.</li> <li>• Sub recipients must fully meet their obligations under the State Environmental Policy Act and the State Growth Management Act.</li> </ul> <p>The PSGC will work with Ecology's Contracts Manager to ensure the above is implemented and processed through management. Key Considerations for State Grants may be reviewed at:  <a href="http://www.ofm.wa.gov/contracts/icct/stategrantguidance.pdf">www.ofm.wa.gov/contracts/icct/stategrantguidance.pdf</a>  Also see Yellow Book page 12.</p>

MANAGEMENT STEP	INVOLVED PERSONNEL	REMARKS	Description of Ecology's LO Processes
			Ecology's contracts officer is developing a new interagency agreement and contract template that will incorporate all the general terms and conditions that apply to sub awardees.
Dispute resolution process	Project Officer, Grants Specialist, Grants Compliance specialist, Agency administrators	Agency should have a process to resolve any disputed competitive decisions.	<p><u>DISPUTES</u> - Ecology will follow OFM guidance:</p> <p>"In the event that a dispute arises under this Agreement, it shall be determined by a Dispute Board in the following manner: Each party to this Agreement shall appoint one member to the Dispute Board. The members so appointed shall jointly appoint an additional member to the Dispute Board. The Dispute Board shall review the facts, agreement terms and applicable statutes and rules and make a determination of the dispute. The determination of the Dispute Board shall be final and binding on the parties hereto. As an alternative to this process, either of the parties may request intervention by the Governor, as provided by RCW 43.17.330, in which event the Governor's process will control."</p>
Execute award to recipient	Grants Specialist, Contract Specialist	Send signed award to recipient, receive signed award back, and log into grants management system records.	<p>Ecology's FMS and Fiscal offices have internal procedures in place for routing, distributing, and entering grant information into the Contracts, Grants, and Loans payables system. The Yellow Book is a base guide. The Ecology router ensures that final agreements are checked through the Contracts Office, the Fiscal Office, and appropriate managerial layers. IAAs are signed by the recipients and returned for Ecology signatures, thus completing the agreement.</p> <p><a href="http://www.ofm.wa.gov/contracts/resources/contract_award.pdf">www.ofm.wa.gov/contracts/resources/contract_award.pdf</a></p> <p>See section on contract execution.</p>
"Kick off" meeting with recipients	Project Officer, Grants Specialist, Contract Specialist, Management Representative, NEPQC	Meet with recipients either individually and in groups to brief them on the contents of the award, walk them through the provisions (terms and conditions of the award), the provisions of	The purpose of the Single Application Point website hosted by Puget Sound Partnership is to provide continuous updated information. Also, Ecology's Financial Management Section (FMS) provides general information every year. FMS can incorporate special requirements for this Puget Sound program into its recipient training to include presentations by the NEPPL/PSGC.

MANAGEMENT STEP	INVOLVED PERSONNEL	REMARKS	Description of Ecology's LO Processes
		applicable regulations, FEATS reporting requirements, financial accounting requirements, record- keeping requirements, billing procedures and any other requirements of which they need to be aware.	<p>Post award, the NEPPL and the PSGC will meet individually with each recipient of a sub award to ensure a mutual understanding of the contents of the award, terms and special conditions, the SOW, QA, applicable regulations, and the applicability of FEATS reporting, and financial tracking. If applicable, this may be a collective meeting of recipients.</p> <p>NEPQC will at this point determine the project quality requirements, if a QAPP is necessary, and assess for adequate project objectives and deliverables. A timeframe for QAPP submittal and approval will be established, and grantee QA point-of-contact will be determined. If a QAPP is not necessary, the NEP QAPP Waiver form will be completed.</p>
Initiate Post-Award Monitoring	Project Officer  NEPQC	Call recipients to discuss how their projects are going and affirm that they are aware that you are available to answer questions. Confirm that they know that prior written approval by Project Officer is required for any changes in statement work/work plan or cumulative transfers among cost categories equal to more than 10% of the total budget.	<p>Post award monitoring is a continuous communication process with award recipients. The NEPPL and PSGC will team to make these contacts and review progress for deliverables and financial expenditures. This process will be guided by the agreement and Ecology's Yellow Book that includes steps for "Monitoring Project Progress" (page 18) and "Amendments" to agreements (pages 13-14). Routine reports to include FEATS will be required and reviewed. There is considerable expertise residing within Ecology's FMS group to properly monitor projects in progress.</p> <p><a href="http://www.ofm.wa.gov/contracts/resources/managing_monitoring.pdf">www.ofm.wa.gov/contracts/resources/managing_monitoring.pdf</a></p> <p>NEPQC will conduct as-needed assessments of project status and progress, and compliance with QAPP requirements.</p>
Baseline Post-Award Monitoring	Project Officer, Grants Specialist, Contract Specialist, administrative and financial staff, NEPQC/Ecology	Ensure Quality Assurance requirements are met. Process invoices from assistance recipients, monitor disbursements to recipients. Review periodic FEATS progress reports and	The NEPPL and PSGC will team to accomplish tracking of fiscal and deliverable performance (see attachment 1). Ecology's Yellow Book provides detailed procedures for financial management (pages 39-52), project management (pages 18-19), and contracts, property, and records management (pages 55-69). Invoices will be authenticated by the NEPPL prior to payment by Ecology's fiscal office, and financial data tracked. The NEPPL will review routine reports to include FEATS, make site visits,

MANAGEMENT STEP	INVOLVED PERSONNEL	REMARKS	Description of Ecology's LO Processes
	QAO	transmit them to the EPA. Work with recipients on any corrective actions indicated by review of progress reports. Conduct site visits, when appropriate. Process amendment requests, as necessary (changes in scope, budget, and performance period).	and negotiate necessary adjustments /amendments in the work plan or budget. There is considerable expertise within Ecology's FMS group to properly monitor projects in progress.  <a href="http://www.ofm.wa.gov/policy/15.40.htm">www.ofm.wa.gov/policy/15.40.htm</a> See managing and monitoring section.  Also see new addendum to Ecology's Quality Management Plan (QMP), October 2010. Ecology Publication # 10-03-056.
Advanced Post-Award Monitoring	Project Officer, Grants Specialist, Grants Compliance specialist	Review recipient files, verify compliance with grant requirements on-site, verify that any contracts were awarded in compliance with applicable law and regulations; perform transaction tracking to verify appropriate use of funds and that funds are being used for eligible costs.	The NEPPL and PSGC will team to accomplish tracking of fiscal and deliverable performance (see attachment 1).  Based on the procedures outlined in the "Yellow Book," Ecology financial and project managers and Fiscal staff review and approve transactions for all grants (see pages 21-38 and 55-63). The PSGC will be primarily responsible for maintaining tracking spreadsheets to track disbursement. The NEPPL will be primarily responsible for tracking the sub award performance including deliverables, site visits, and appropriate use of funds.
Dispute resolution process	Project Officer, Grants Specialist, Grants Compliance specialist, Agency administrators	Agency should have a process to resolve any contested issues identified through post award monitoring.	See Dispute Resolution Process above. The NEPPL will implement any post award contested issues using the process described above. Appeal processes will be governed by the contract terms and any additional general terms and conditions if added. General guidance may be found in the "Yellow Book", includes an "Appeals Process" section to help resolve issues (page 20).  <a href="http://www.ofm.wa.gov/policy/15.40.htm">www.ofm.wa.gov/policy/15.40.htm</a> (see contract dispute section)
Close-out	Project Officer, Grants Specialist,	Verify acceptable completion of all	The NEPPL and PSGC will team to accomplish close-outs guided by the "Yellow Book" that includes a "Close-Out" Section VI that addresses Final



MANAGEMENT STEP	INVOLVED PERSONNEL	REMARKS	Description of <b>Ecology's</b> LO Processes
	NEPQC	deliverables. Verify compliance with STORET data entry requirements. Verify compliance with Tribal and State data entry requirements. Review final FEATS report from recipient for any problems and discrepancies. Verify that grant file is complete. Store in appropriate place.	<p>Performance, reports, and Final Financial Adjustments (pages 71-72).</p> <p>All documents created in conjunction with a sub award will be managed in accordance with state records retention guidelines (available only on Ecology's intranet :  <a href="http://aww.ecology.ecy.wa.gov/services/records/records_management.htm">http://aww.ecology.ecy.wa.gov/services/records/records_management.htm</a>  <a href="http://www.ofm.wa.gov/policy/15.40.htm">www.ofm.wa.gov/policy/15.40.htm</a>            (see sections on review final product, evaluate performance, and documenting)</p> <p>NEPQC will assess project for completion of QA close-out requirements.</p>

Organizational Description of Ecology’s LO Sub award procedures.

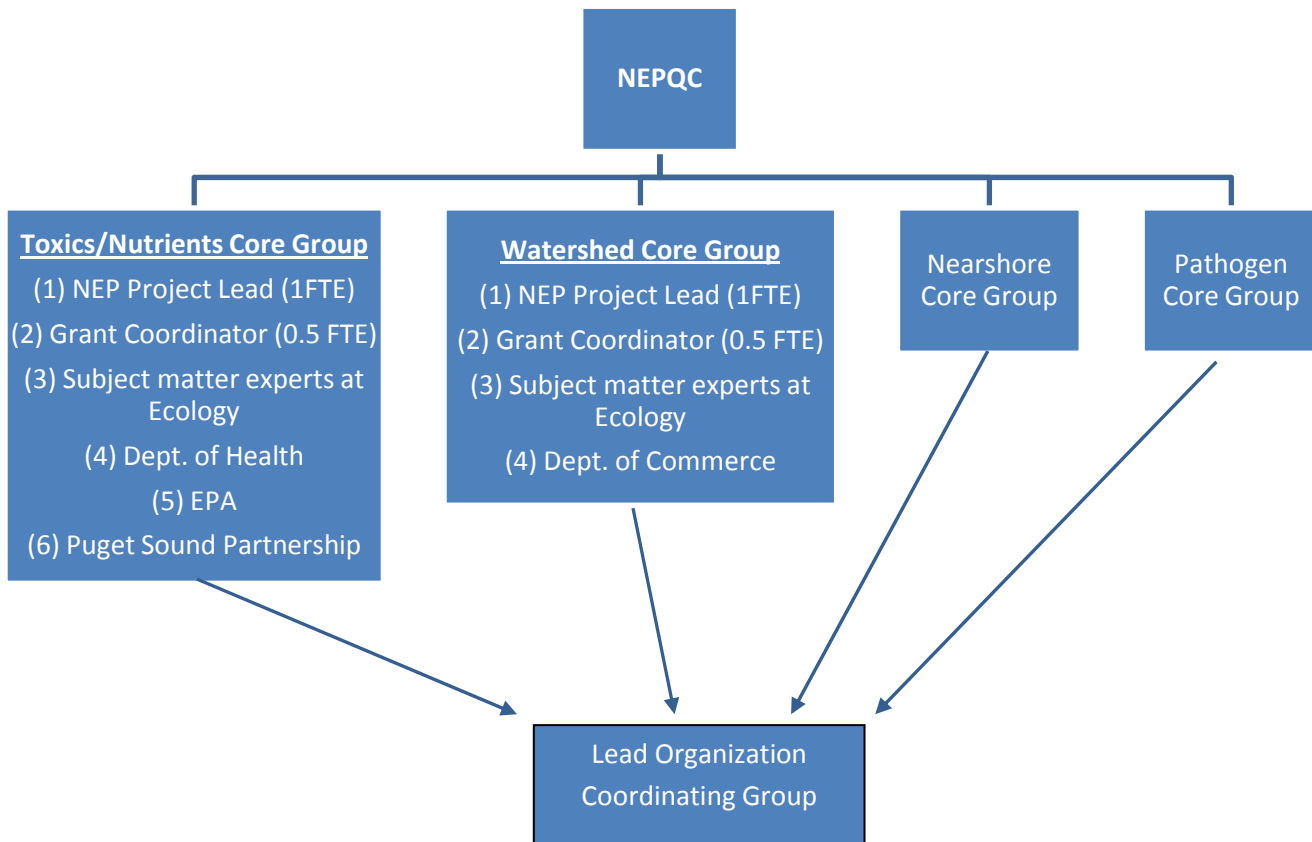
<b>Ecology’s Competitive Contracts and Interagency Agreements (IAA) Procedures:</b>	
<b>Initial Development</b>	<b>Reviews and Issuance</b>
Define a project with management	Management review
Develop a Scope of Work (SOW) and QA	Budget Analyst review
Select a recipient (competitive or direct)	Contracts Office review
Refine the SOW and coordinated detailed budget	Fiscal Office review
Insert requirements into an OFM format	Authentication by Ecology (x3)
Review by Contracts Office and Fiscal Office	Distribution: 1 copy to recipient, one copy to Project Manager, and one copy to Fiscal - payables
Obtain authentication from recipient (x 3)	

**Organization**

Ecology will hire two NEP Project Leads (NEPPLs) - (project managers): one each from Toxics/Nutrients and Watersheds. In addition, Ecology will hire one Puget Sound Grant Coordinator (PSGC) to support the two Leads.

The NEPPLs will have overall responsibility for the grant (cooperative agreement with EPA) and will, in coordination with the Executive Lead and the management conference, design and develop all the policy and coordination requisite to making investments as sub awards. This includes financial management and making decisions on sub awards, tracking expenditures, schedules, production, and signing invoices for payment. The NEPPLs will implement the grant by developing RFPs for competitive awards, designating direct awards, and initiating Interagency agreements (IAA) and contracts. This will require developing the statement of work, the schedule, outputs and outcomes, special terms and conditions, and allocation amounts. The NEPPLs will be responsible for the sub award selection process.

The NEPPLs will be administratively assisted by the PS Grants Coordinator (PSGC). This individual will facilitate the above work of the NEPPLs by preparing formats for RFPs, IAAs, contracts, and tracking systems for each award through to completion. The NEPQC will provide quality assurance for these items along with technical assistance to applicants. Appropriate items will be posted on the Single Application Point website hosted by the Puget Sound Partnership for use by all Lead Organizations. Potential applicants will also be provided a Common Application Form for use in proposing sub award projects. The PSGC will post RFPs and solicitations, gather proposals and recommend to the PSGC methods of rating and ranking for inclusion in the RFP. After the selection process, a recipient will be designated. The PSGC will then post the results, notify the recipient, develop a contract or IAA to make the award, number and coordinate IAA/contracts with Fiscal, and design a financial and reports tracking system. Both the NEPPLs and PSGC will work together to track the fiscal and deliverable performance of all sub awards.



**Figure 1. QA organization chart for National Estuary Program**



**Department of Ecology  
Washington General Service (WGS)  
POSITION DESCRIPTION**

**Pressing F11 will move you through the input fields on this form**

1. Position Action (Create or Maintain Position) <input checked="" type="checkbox"/> Establish <input type="checkbox"/> Reallocate <input type="checkbox"/> Update Data (Indicate Change)			
2. Position Staffing Status <input checked="" type="checkbox"/> Vacancy - Open <input type="checkbox"/> Vacancy - Occupied <input type="checkbox"/> Vacancy - On Hold		3. Date Last Reviewed (If Established Position)	
4. Object Abbreviation (Position #)	5. Current Class Title	6. Proposed Class Title <b>Chemist 3</b>	
7. Job - Working Title <b>National Estuary Program Quality Coordinator</b>		8. Assignment Pay (Capture In Essential Functions) <input type="checkbox"/> Dual Language <input type="checkbox"/> Other	
9. Pay Scale Type <b>01 Classified Gov</b>	10. Pay Scale Area (Non-Rep or Collective Bargaining Unit) <b>Collective Bargaining Unit</b>	11. Salary Range <b>60</b>	
12. Incumbent's Name (If Filled Position)	13. Business Area (Agency) <b>Department of Ecology</b>	14. Org Unit (Program/Section/Unit) <b>EAP Statewide Coordination Section</b>	
15. Address Where Position Is Located <b>300 Desmond Drive, Olympia WA 98504</b>			
16. Personnel Sub-Area <b>WFSE</b>	17. Employee Group <b>Project</b>	18. Indicate work schedule <input type="checkbox"/> Part Time <input checked="" type="checkbox"/> Full Time	19. Overtime Eligible <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
20. Supervisor's Object Abbreviation (Position #) <b>0334</b>	21. Supervisor's Name <b>Will Kendra</b>		22. Supervisor's Phone <b>(360) 407-6698</b>
<b>Position Objective</b>			
23. Describe in a few sentences what the position is required to accomplish. Summarize the scope of impact, responsibilities, and how the position supports/contributes to the mission of the organization. Include an organizational chart.  <b>The agency mission is to protect, preserve, and enhance Washington's environment, and promote the wise management of air, land, and water. The program mission is to measure and assess environmental conditions in Washington State. This position contributes to the program and agency missions by providing quality assurance coordination and support to Lead Organizations (LOs) and the Puget Sound Partnership on EPA's National Estuary Program grants for the protection and restoration of Puget Sound.</b>			

On behalf of the Lead Organizations, the incumbent is the senior scientist to oversee and coordinate quality assurance (QA) requirements associated with EPA's National Estuary Program (NEP) grant for the protection and restoration of Puget Sound. This position will:

1. Work with NEP LOs, the Puget Sound Partnership (PSP), and NEP subcontractors to ensure that EPA QA requirements for the NEP grant are met.
2. Review quality assurance project plans (QAPPs) and technical reports submitted to LOs and PSP for compliance with EPA quality system requirements.
3. Provide technical assistance to LOs, PSP, and NEP sub award recipients.

The incumbent will work in Department of Ecology's EAP Statewide Coordination Section and will serve the Lead Organizations and PSP in a variety of media and topic areas, including (but not limited to) the following Puget Sound recovery topic areas:

- Marine and nearshore protection and restoration (Departments of Fish & Wildlife and Natural Resources);
- Shoreline protection
- Salmon recovery, management, and restoration
- Watershed protection and restoration including aquatic and upland habitat, water quality, and water quantity (Departments of Ecology and Commerce)
- Toxics and nutrients pollution prevention, reduction and control (Department of Ecology)
- Pathogen prevention, reduction, and control Departments of Health and Ecology)

### Supervisory or Lead Worker Relationships

24 (a). Is this a lead position?  Yes  No      Is this a supervisory position?  Yes  No

If **supervisory**, list the subordinate employees by job classification and if full time or part time.

Job Classification (Name Optional)	Full Time or Part Time

24 (b). Check the boxes that apply to this position

Assigns Work     Instructs and Checks the Work of Others     Evaluates     Corrects

\*  Disciplines    \*  Hires    \*  Terminates Others    (\* Has the authority to effectively recommend these actions.)

Summarize the following information in narrative format.

- How is work assigned?

**Work is assigned to this position by the Ecology Quality Assurance Officer (lead worker) and the Statewide Coordination Section manager (supervisor).**

With whom does the position interact to accomplish work?

**NEP project managers from the four Lead Organizations and Puget Sound Partnership; Ecology's Puget Sound grant coordinator; quality assurance managers for the four Lead Organizations; and NEP sub awardees, other organizations, and EPA.**

Add any additional information that clarifies this position's lead or supervisory responsibilities.

## Essential Functions

Ecology Guidance on essential functions: <http://aww.ecology/services/es/EssentialFunctions.htm>

25. List the essential functions of this position. Functions listed in this section are primary duties and are fundamental to why the position exists. (Do not assign percentage of time in this section.)

See attached [Essential Functions Analysis Form](#) (if new position or essential functions have changed)

### Tools and Equipment

- Operate computer, telephone, photocopier, printer, and fax machine.
- Operate automobiles in various weather conditions and after dark.

### Physical Requirements

- Work with a computer at a desk for long periods of time.
- Read documents for accurate comprehension and action.

### Mental Requirements

- Communicate fluently and professionally in English, both for speaking and writing.
- Develop and maintain key relationships internally and externally.
- Assess, interpret, draw logical conclusions, and solve problems effectively and accurately.
- Manage workload to meet quality requirements and deadlines.
- Make appropriate decisions when necessary based on available information.
- Find and share information and resources.
- Recognize multiple viewpoints and seek compromise or consensus among diverse interests.
- Be receptive to new ideas and adaptable to new situations.

### Performance Requirements

- Establish and maintain professional working relationships with co-workers, peers, stakeholders, and the public that are inclusive, collaborative, and respectful.
- Be dependable, flexible, and willing to accept responsibilities.
- Readily take initiative to do assigned work without prompting.
- Understand and follow complex quality assurance procedures.
- Maintain a high degree of accuracy, timeliness, and completeness for all phases of assigned work.
- Accept supervisory and lead worker authority.
- Support teamwork and cooperation in the work environment.
- Maintain current knowledge of scientific methods through reading and workshops.

### Health and Safety

- Must not be a significant risk of harm to the health and safety of oneself or others when in the office or field.

### Work Place Conduct

- Must comply with internal policies and procedures governing conduct.
- Must maintain professional demeanor (calm, composed, and respectful) in stressful situations.

### Working Conditions

26. Describe working environment and anticipated variation in working hours. Some or all of these conditions may be noted under the essential functions section.

**This position works a 40-hour week; flexible day and hour schedules are negotiable. Must be able to travel as needed to accomplish assignments.**

## Key and Other Work Activities

Spreadsheet for calculating percentages on the Department of Personnel web site: [DOP Forms - calculating percentages](#)

27 (a). List and note percentage of time assigned to key work activities of the position and identify tasks performed in support of key activities.

**95% Oversees and coordinates quality assurance (QA) requirements associated with EPA's National Estuary Program (NEP) grants for the protection and restoration of Puget Sound. Works with NEP Lead Organizations (LOs), the Puget Sound Partnership (PSP), and NEP subcontractors to ensure that EPA QA requirements for the NEP grant are met. Reviews quality assurance project plans (QAPPs) and technical reports submitted to LOs and PSP for compliance with EPA quality system requirements. Provides technical assistance to LOs, PSP, and NEP sub awardees including:**

- **Developing QAPP templates and checklists to facilitate QA documentation.**
- **Assessing compliance periodically with QAPP objectives.**
- **Developing a waiver process and alternative documentation where traditional QAPPs are not appropriate.**
- **Assessing all submitted projects for clear project objectives and assessing attainment of those objectives at project end.**
- **Reviewing QAPPs and reports prepared by NEP sub awardees.**
- **Coordinating with LOs and PSP when specialized program expertise is needed for assistance in reviewing QAPPs and reports. See Section 28 (b) for topic areas of expertise coordination.**
- **Training LOs, PSP, and sub awardees in quality assurance principles and practices.**

27 (b). List and note percentage of time assigned to other work activities.

**5% Performs other duties as required.**



Placeholder for user to incorporate the in-training plan if appropriate for position

## General Qualifications

Link to DOP Guidance on Competencies and Qualifications:

[www.dop.wa.gov/strategichr/WorkforcePlanning/Competencies/Pages/default.aspx](http://www.dop.wa.gov/strategichr/WorkforcePlanning/Competencies/Pages/default.aspx)

Link to Ecology Core Competencies: <http://aww.ecology/services/es/CoreCompetencies.htm>

28 (a). Required Education, Experience, Skills and Abilities/Competencies

**A Bachelor's degree with a major in chemistry, or a Bachelor's degree with a minimum of 30 semester hours or 45 quarter hours of college level chemistry, and four years of experience performing chemical analysis in an analytical laboratory.**

**A Master's degree in chemistry will substitute for two years of the required experience, or a Ph.D. degree in chemistry will substitute for three years of the required experience.**

**Experience in implementing a quality assurance system outside of an analytical laboratory will substitute for up to two years of the required experience.**

### Core Competencies

- **Treat our fellow employees, our clients and the public as partners and collaborators who are equally committed to a healthy, prosperous Washington.**
- **Solve problems, consider different perspectives, and find new, creative ways to accomplish our work.**
- **Communicate clearly, accurately, and in a timely manner.**
- **Accept personal responsibility and accountability for the quality and timeliness of our work and for meeting workplace expectations.**
- **Remain objective at all times and ensure that professional judgment, rather than personal opinion, influences our work.**
- **Build and maintain cooperative relationships characterized by a high level of acceptance and cooperation.**

### **Job-specific Competencies**

- **Appropriately balance quality of work with ability to meet deadlines.**
- **Counsel and guide others to use their talents to achieve their best.**
- **Model success behaviors, high performance work ethic, and constant self-improvement.**
- **Excel at helping clients navigate through complex or sensitive issues, keeping the client's best interests in mind and advising on best practices.**
- **Provide motivation to staff through support, encouragement, and assistance.**
- **Demonstrate ethical behavior and impress its importance upon others.**
- **Recognize when others need assistance and offer to help.**
- **Establish clear, realistic, measurable goals and objectives to ensure others understand the direction, deadlines, and expected outcomes.**
- **Knowledge of the principles of analytical chemistry and laboratory quality assurance procedures.**
- **Skills to review and edit QAPPs and technical reports, and to present complex scientific material to management and the public.**
- **Ability to communicate, coordinate, and negotiate with employees, managers, clients, governmental agencies, tribes, stakeholders, and the public.**

28 (b). Preferred/Desired Education, Training, Skills and Abilities/Competencies for Recruiting Purposes

**Recent experience in developing and implementing a quality assurance system is desired.**

**Experience in analyzing environmental samples for organic chemicals is preferred.**

**Desired expertise also includes education and or training in:**

- **Statistics**
- **Habitat biology**
- **Population ecology**
- **Fisheries**
- **Marine and nearshore protection and restoration (Departments of Fish & Wildlife and Natural Resources)**
- **Shoreline protection**
- **Salmon recovery, management, and restoration**
- **Watershed protection and restoration including aquatic and upland habitat, water quality, and water quantity**
- **Toxics and nutrients pollution prevention, reduction and control**
- **Pathogen prevention, reduction, and control**

### **Special Requirements/Conditions of Employment**

29. List any licensing, certification, or other special requirements and/or conditions of employment which are beyond general qualifications.

**The job duties as defined above are an accurate reflection of the work to be performed by this position.**

Date	Supervisor's Phone Number <b>(360) 407-6698</b>	Supervisor's Title <b>Statewide Coordination Section Manager</b>	Supervisor's Signature
Date	Department Head or Approving Authority's Signature		

**As the incumbent in this position, I have received a copy of this position description.**

Date	Employee's Signature
------	----------------------

Position details and related action have been taken by Human Resources as reflected below.

For Human Resource/Payroll Office Use Only												
Effective Date		End Date		Position Short Description			Position Long Description					
EEO Category ▼		Employee Sub-Group ▼			Position Retirement Eligible <input type="checkbox"/> Yes <input type="checkbox"/> No			Position is <input type="checkbox"/> Funded <input type="checkbox"/> Non-funded				
Workers Comp. Code ▼		County Code ▼		Business Area ▼				Personnel Area (FEIN) ▼				
Cost Center Codes												
FUND	MSTR-IX	APP-IX	PGM-IX	ORG-IX	PROJECT	OBJECT	W-C	ALLOC	BUDGET UNIT	CNTY	CITY	PRORATION %
Date		HR Designee's Name				HR Designee's Title			HR Designee's Signature			
Date		Budget Designee's Name				Budget Designee's Title			Budget Designee's Signature			

The Public Records Act, RCW 42.17.250, et. seq., requires disclosure of public records unless they are exempt. If requested, non-exempt public records in the possession of the Department of Personnel will be released. Exempt records will be withheld from public disclosure or exempt portions of records will be redacted from records prior to release.