

Quality Assurance Report

Washington State Department of Ecology

July 2005

Approval

Approved by: _____
Bill Backous, Environmental Assessment Program Manager

Date August 15, 2005

Approved by: _____
Polly Zehm, Deputy Director

Date August 10, 2005

This report was prepared by Cliff Kirchmer, Agency Quality Assurance Officer, with input from the Program and Laboratory QA Coordinators. Questions and comments may be directed to Cliff at (360)407-6455 or by e-mail.

Table of Contents

	<u>Page</u>
Introduction.....	3
Overview of Data Quality Assurance in Ecology.....	3
Implementation of Previous Recommendations	5
Training.....	8
Technical Assistance and QA/QC Support.....	10
Accreditation Status of Manchester Laboratory	12
Quality Management Plan (QMP)	13
Data Quality Issues	14
Appendix A. Program and Laboratory QA Coordinators.....	17
Appendix B. Information for the QA Report Provided by QA Coordinators.....	18
Air Quality Program	19
Environmental Assessment Program	21
Environmental Assessment Program - Manchester Lab.....	28
Hazardous Waste and Toxics Reduction Program.....	30
Nuclear Waste Program, Richland.....	33
Shorelands and Environmental Assistance Program	35
Solid Waste and Financial Assistance Program.....	36
Spills Program.....	37
Toxics Cleanup Program.....	38
Water Quality Program	41
Appendix C. Laboratory Expenditures by Program	45

Introduction

Ecology's *Quality Management Plan* (QMP) directs the QA Officer to prepare a status report for management every two years. The QMP states that this report should contain, as a minimum, the following information:

- A description of Quality Assurance/Quality Control (QA/QC) training received by Ecology staff.
- A description of technical assistance and QA/QC support provided to Ecology staff.
- The accreditation status of the Manchester Environmental Laboratory.
- A review of the Ecology QMP to determine if the approved quality management practices continue to be both suitable and effective.
- Other information specifically requested by management.

This report was prepared with participation of the QA Coordinators, who provided information for their respective programs and the laboratory based on requirements in the Quality Management Plan. A list of the Program and Laboratory QA Coordinators is given in Appendix A, and the information they provided is included in Appendix B.

Overview of Data Quality Assurance in Ecology

Ecology needs data about the condition of the air, the water, and the land in order to achieve its goals to prevent pollution, clean up pollution and support sustainable communities and natural resources. Accurate environmental data are critical for understanding problems and taking corrective actions. Data quality assurance is important to ensure that the millions of dollars spent on environmental sampling and analysis provide the quality of data needed for decision-making.

Ecology's QMP identifies ten programs with responsibilities for environmental data. Programs that deal extensively with environmental data for decision-making include Air Quality, Environmental Assessment, Nuclear Waste, Toxics Cleanup, and Water Quality. Other programs that use environmental data for decision-making include Hazardous Waste and Toxics Reduction, Shorelands and Environmental Assistance (SEA), Solid Waste and Financial Assistance (SWFAP) and Spill Prevention, Preparedness and Response (Spills Program). The Water Resources Program uses hydrologic data for decision-making, but does not collect a significant amount of data. All of the above programs except Water Resources presently have a designated QA Coordinator.

Programs need accurate data to fulfill their missions. Activities in Ecology vary from extensive in-house environmental data collection to use and oversight of data collected by others.

The Air Quality Program (AQP) relies on monitoring data to evaluate and determine trends in air pollution and for research (e.g. on air toxics).

The Environmental Assessment (EA) Program calculates the “total maximum daily load” (TMDL) of a pollutant that a water body can assimilate without causing violations of water quality standards, and also monitors and assesses the current status of state waters.

An initiative on persistent, bioaccumulative toxins (PBTs), identified in the last report, has proposed a strategy to continually reduce PBTs in Washington State.

The Nuclear Waste Program (NWP) has emphasized its oversight role in reviewing and assessing the Department of Energy (DOE) and its contractor laboratories. This includes oversight for decisions on tank waste disposal, tank closure and waste storage at the Hanford Site.

The Toxics Cleanup Program (TCP) uses data to make certain that contaminated sites are cleaned up to state standards, and that precious resources are not expended on unnecessary cleanups.

The Solid Waste & Financial Assistance Program’s Industrial Section evaluates pollution (e.g. dioxin, mercury, air toxics) by permitted industrial dischargers.

The Water Quality Program (WQP) needs data for developing conditions in wastewater discharge permits; evaluating compliance with wastewater discharge permits; calculating TMDLs and the associated load and wasteload allocations; evaluating outcomes of grant and loan funding in the “Investing in the Environment Report”; and preparing the integrated Water Quality Assessment Report (satisfying the requirements of CWA sections 303(d) and 305(b)). The Water Quality Program is preparing the Water Quality Data Policy (Credible Data Policy), as required by The Water Quality Data Act (SSB 5957).

There are many other programmatic needs for accurate data, including public information, spill response, determining priorities for action, and monitoring pollution.

Ecology’s Grant and Loan Programs stress the need to achieve “Environmental Results.” A January 22, 2001, report of The Joint Legislative Audit and Review Committee (JLARC) found that “Environmental investments are intended to produce a return of quality improvements in water, land or species resources. Without measurable returns, it is impossible to determine if investments have been effective.” Accurate and representative environmental data are an important part of those measurable returns.

Implementation of Previous Recommendations

Several recommendations for action were made in the last Quality Assurance Report. The more significant of those recommendations are given below, along with the findings regarding implementation, with significant findings in *italics*.

1. Ecology should prepare for EPA's system audit by initiating implementation of the recommendations in this report, and confirming that all aspects of the Quality Management Plan are being correctly implemented.

Finding: EPA Region 10 did a Quality System Review of Ecology during the period of November 3-6, 2003. The results of the review were transmitted to Ecology in a letter to the Deputy Director, Linda Hoffman. *The review found no major deficiencies with regard to Ecology's overall Quality System, and made only a few observations. The most significant observation was that "The Quality Assurance Report of May 2003 prepared by WDOE's QAO is an excellent assessment of the Agency's Quality System progress and the recommendations described in the report should be seriously considered and implemented by program managers where appropriate."*

2. The Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies should be revised.

Finding: *The Ecology document Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies was revised in July 2004 (Publication No. 04-03-030).*

3. Training in project planning and implementation should be continued but emphasis should be given to providing training on assessment, since this area has been neglected in the past.

Finding: Training on use of the *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* revised guidelines was provided in 2004. However, training on assessment has not been provided and continues to be neglected. Requests for funding for agency-wide training in the assessment of data were submitted by EAP in 2004 and 2005, but funds for this training have not yet been obtained. *Training in quality assurance has not been adequate for staff implementing or overseeing environmental projects.*

4. In order to help ensure that the QA Policy and Quality Management Plan are implemented, it is recommended that a QA Section be included in the plans of all programs with responsibilities for environmental data/information. These QA Sections taken as a whole would constitute a QA work plan for the agency.

Finding: Some programs included QA Sections in their biennial program plans, but *overall compliance with this recommendation was too limited to allow these QA Sections to constitute a work plan for the agency.*

5. Sometimes there has not been enough time available for planning before the project must be implemented, and this is being addressed by identifying project needs early, allowing more time for planning, and simplifying the guidelines for preparing QAPPs.

Finding: This comment applies principally to the Environmental Assessment Program, where most of the QA Project Plans are prepared. Progress has continued in identifying project needs early, allowing more time for planning, and using templates for the preparation of QAPPs. Performance measures have been tracked to determine whether they have been peer-reviewed, completed before sampling, and posted to the internet. *Nearly 100% of EAP's environmental monitoring plans have met the completion target performance measure for the FY 03-05 biennium.*

6. There has been a significant increase in the number of QAPPs prepared by local governments receiving grants for conducting water quality studies, and submitted to Ecology for review and approval. There has been a problem in predicting the demand for these reviews, which would allow better scheduling of work load.

Finding: *The Environmental Assessment Program has improved the scheduling of work load. A performance measure of reviewing four monitoring plans from local government grant recipients each quarter was established and thus far this biennium an average of over seven monitoring plans have been reviewed each quarter.*

7. Publications corresponding to Standard Operating Procedures (SOPs) are widely dispersed, and should be compiled and made available in one or a few locations on the Intranet. There is also a need to establish a process for field SOP preparation, review, approval and document control, as well as a standard format for field SOPs.

Finding: *This recommendation applied primarily to the Environmental Assessment Program, and Cliff Kirchmer has prepared a technical memorandum analyzing the process for SOP preparation, and providing guidance for implementation of this recommendation. One of the SOPs used by the Environmental Monitoring & Trends Section has been reformatted for consideration by staff. There are plans to reformat existing SOPs and to post SOPs on Ecology's Intranet.*

8. There is a need for increased attention to assessment for data collected by or reported to Ecology. This should include increases in: third party validation of data, and technical assistance in data validation and data quality assessment for projects managed or overseen by Ecology.

Finding: *Fields to describe the level of assessment (i.e. data verification, data validation and data quality assessment) have been added to the Environmental Information Management System (EIM). The level of assessment must now be specified for all data entered in EIM. There is a need for training on the definitions and the development and implementation of consistent assessment procedures across all environmental programs. There continues to be a need for increased attention to assessment for data collected by or reported to Ecology.*

9. To meet the requirement for an external audit every three years, the Manchester Lab should coordinate with the Laboratory Accreditation Section to arrange for the next on-site system audit.

Finding: An audit of the Manchester Lab by the Lab Accreditation Section was done on February 10-11, 2004, and the report of the audit was completed on March 15, 2004.

10. Coordination with EPA on QA/QC matters is important to make certain that Ecology meets all requirements, including those for approval of QAPPs, and to take full advantage of the resources available from EPA for ensuring the quality of data. Ecology management needs to keep informed of developments in the implementation of EPA's Information Quality Guidelines and be prepared to respond to any challenges to the quality of data reported by Ecology.

Finding: The QA Officer maintains close communication with the QA Manager in EPA Region 10. The QA Officer and some of the QA Coordinators have also attended EPA's National Conferences on Managing Environmental Quality Systems in 2004 and 2005. EPA's web site for the Information Quality Guidelines is monitored for any news of importance to Ecology.

11. Ecology should determine the scope and implementation plan (specific activities by program, cost analysis, and timeline) to adopt a method to validate all data it uses for decision-making, not just field and laboratory data that it directly collects. This method should include proper validation of new data, and examination of existing data to determine if there is sufficient information to ensure that the quality of the data is adequate for its intended use.

Finding: There have been insufficient resources to determine the agency's scope and implementation plan to validate all data. However, the agency is required by the Water Quality Data Act of 2004 (SSB 5957) to develop and implement a policy that includes "describing the specific criteria that determine data credibility", and the development of this policy includes assessment procedures for single project data and multiple data event waterbodies. This information should be equivalent to a scope and implementation plan for water quality data, and provide the basis for determining a scope and implementation plan to validate all data used by Ecology. Ecology is required to report to the legislature by December 31, 2005, concerning the activities undertaken to comply with the Water Quality Data Act.

The summaries in the following five sections are based on the information in Appendix B, which was provided by the Program QA Coordinators and the Laboratory QA Coordinator. While the intent of the summaries is to provide a broad picture of the status of QA/QC in the agency, Appendix B should be read for detailed information. Several of the QA Coordinators recommended that this report mention that additional resources are needed, particularly for training and assessment activities.

Training

Some training in, or related to, QA/QC was received by staff in 7 of the 10 programs/laboratory. Most of the training was related to the programs' job related responsibilities (e.g. sampling). Individuals from several programs were able to attend EPA's National Conference on Managing Environmental Systems in 2004 and 2005, including the training provided prior to the conference. Ecology was one of the best represented state environmental agencies at the conference.

The number of individuals who have received in-house training on QA/QC has been limited by resources. In addition to limited funds designated for technical training, individuals capable of providing training within the programs must usually do so in addition to their primary job responsibilities. As a consequence, the amount of technical training provided on QA/QC has not met needs.

Five of the 10 programs report that they provided training in QA/QC. Most of this training was provided to staff within their program. Three programs report that they neither received nor provided any training on QA/QC.

Some training was provided by the QA Officer and QA Coordinators. The QA Officer explained the changes in the revision of the *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* at an EAP Seminar and made a presentation on "The Laboratory's Role in Preparing QA Project Plans for Environmental Studies" at the AOAC Workshop on Data Verification and Validation. Stew Lombard, QA Coordinator for EAP, made a presentation on "Data Verification and Data Validation" at the same workshop.

Additional training was provided by other program staff and details are given in Appendix B. An example is the training provided by Lynn Schneider and Jessica Archer on the collection and handling of water samples for bacteria analyses using EPA BEACH program protocols.

EPA Region 10 again collaborated with the Department of Energy to provide training in Seattle on *Managing Uncertainty with Systematic Planning for Environmental Decision Making*, which included an introduction to the *Visual Sample Plan* software developed by Battelle PNNL. Sebastian Tindall of Bechtel Hanford organized and presented this course. Unfortunately, the notification for this training from EPA was late and, as a result, attendance by Ecology employees was less than it could have been. DOE Hanford offered this training again for the Hanford community, including Ecology, from May 31-June 2, 2005. There were no tuition or registration fees for this training.

Sebastian Tindall also was contracted by Ecology's HWTR program to develop and provided training in General, Organic and Nuclear Chemistry at Ecology HQ. This training was in the spring and fall of 2003.

Funding has been limited for cross-program or agency level training on QA/QC. Requests for funding of QA/QC training through the Savings Incentive Account have been unsuccessful. The

need for training in QA/QC for project planning, implementation and assessment, recommended in the May 2003 report, is now even greater. Training in assessment (data verification, data validation and data quality assessment) continues to be a priority need, especially in light of the requirements of the Water Quality Data Act of 2004 (SSB 5957). The Environmental Information Management System (EIM) also requires that a Study QA Assessment Level be specified for all data, and staff using EIM need to understand the definitions of assessment. **It is recommended that Ecology establish a training program for quality systems, and that resources be designated to implement the program.** One reference that might be used in developing a program is EPA QA/G-10, *Guidance for Developing a Training Program for Quality Systems*, <http://www.epa.gov/quality/qs-docs/g10-final.pdf>

It is recommended that during the next biennium the agency offer the following training to agency staff in the following order of priority:

- ✓ **Data verification and validation**
- ✓ **Data quality assessment (Practical methods for data analysis)**
- ✓ **Procedures for field sampling and measurement**
- ✓ **Guidelines for preparation of QA Project Plans**
- ✓ **Systematic planning (including the use of Visual Sample Plan software)**
- ✓ **Laboratory control charting**

Technical Assistance and QA/QC Support

The amount of technical assistance and QA/QC support varied significantly among the programs, based on the requests received and resources to meet the need. The Nuclear Waste, Air Quality, Toxics Cleanup, and Environmental Assessment Programs reported that they provided extensive assistance and support for the review of QA Project Plans and environmental data, while the SEA Program reported that no technical assistance or QA/QC support was provided. The remaining programs report that they have provided some assistance and support. The information provided by the programs/laboratory indicates that assistance provided in planning projects, including the preparation and review of QA Project Plans, increased the last two years. Some of this was due to an increased need to review QA Project Plans submitted to Ecology by outside entities, including grantees and contractors. Less assistance and support was provided for the assessment of projects, including the assessment of data. Notable exceptions were the Nuclear Waste Program, which reported reviewing data packages for Hanford and other sites, and the Air Quality Program, which validates data and assists in the preparation of Data Quality Assessment Reports.

The Nuclear Waste Program has spent considerable time on reviewing and updating the Risk Assessment Plan for the Vitrification Plant at Hanford. A large inventory of QA/QC information is needed for decision making. That information relates the QA/QC to data usability for making risk decisions.

A recommendation of the Nuclear Waste Program is that more internal auditing be done within Ecology (cross program, regional, headquarters). These internal audits or assessments would help to identify problems and prepare Ecology for the assessments done by EPA Region 10 every 3 years.

Other types of QA/QC support included developing and reviewing sampling and waste analysis plans, preparation and revision of standard operating procedures (SOPs), and the preparation of guidance documents. In general, programs have responded adequately to requests for assistance, but are limited in their capacity to promote assistance and support due to insufficient resources and insufficient training on QA/QC. The Laboratory Accreditation Section in EAP continues to provide technical assistance to laboratories they accredit. It has been challenging for EAP to respond to program and agency QA/QC requirements in the Quality Management Plan. TCP has indicated that additional funding is needed for QA staffing. SPILLS stated a need to reinforce the preparation of plans when sampling oil spills.

The EIM System has been changed to include a field for Study QA Assessment Level. Implementation of this change requires that everyone understand their responsibilities for data verification, data validation and data quality assessment, and that the QA Assessment Levels entered into EIM are consistent. There is one staff member who coordinates the entry of EAP water quality data into EIM, one who enters water quality data from external grant and loan recipients into EIM for the WQP, and two who share responsibility for entering externally-generated cleanup data for TCP. Additionally, HWTR is working on getting someone on board to enter their externally generated Corrective Action cleanup data.

It is recommended that programs increase resources available to promote and provide technical assistance and support, particularly for assessment of projects and data (e.g. EIM data).

Accreditation Status of Manchester Laboratory

Ecology Executive Policy 1-22 requires the use of accredited laboratories for all water quality data, and the Manchester Laboratory is included in this requirement. To maintain accreditation, the laboratory must undergo an on-site assessment every three years and twice annually successfully analyze proficiency testing (PT) samples, when available, for each of the parameters and methods accredited. *As of the date of this report, Ecology's laboratory in Manchester is accredited for all parameters and methods requested.* Accreditation for analysis of EDB & DBCP by EPA 8011 is interim, pending an on-site assessment of the laboratory's capability.

The Manchester Laboratory analyzes most of the samples taken by Ecology staff. However, there are some determinations that must be contracted, such as bioassays, radiochemistry and specialized chemical analyses (e.g. dioxins and speciation of metals). For marine water column monitoring, samples are sent to the University of Washington for nutrient analyses. And some analyses are done at the EAP Operations Center in Olympia, including chlorophyll a and dissolved oxygen.

Appendix C shows the laboratory expenditures by program. The Environmental Assessment Program has accounted for most of the expenditures, more than 70% of the total in recent years.

During the period of February 10-11, 2004, a team of assessors from Ecology's Lab Accreditation Section performed an on-site assessment of the Manchester Laboratory. The report for the on-site assessment was submitted on March 15, 2004. In response to the findings of the assessment, the laboratory prepared an action plan, with specified due dates for each of the actions, and all of the actions have now been completed.

In 2004 the Operations Center in Lacey applied for accreditation of their laboratory. While not part of the Manchester Laboratory, it provides essential laboratory services to EAP and, based on the intent of this section, the accreditation status of the Operations Center laboratory is also included in this report. All of the accreditation requirements were met, including an on-site assessment which was completed on February 28, 2005, and the Operations Center Laboratory was accredited on March 10, 2005. Parameters accredited include chlorophyll a and dissolved oxygen.

To meet the regulatory requirement for laboratories to undergo an on-site assessment every three years, the Manchester Laboratory should coordinate with the Laboratory Accreditation Section for an on-site assessment by February, 2007.

Quality Management Plan (QMP)

A requirement of this report is that the QMP be reviewed to determine if the approved quality management practices continue to be both suitable and effective.

The quality system described in the QMP provides a good framework for planning, implementing, documenting, and assessing environmental data operations, as well as for carrying out required QA and QC activities. The responsibilities of the QA Officer and the QA Coordinators are described in the QMP. At present, the QA Officer also needs to assume some responsibilities within EAP that correspond to a QA Coordinator, due to limited resources.

Senior Management's responsibilities include preparing and revising the QMP, allocating resources to implement the QA Policy and the QMP, and delegating responsibilities for implementation of a quality system at appropriate levels of the organization. The Director is responsible for designating the QA Officer, and Program Managers are responsible for designating QA Coordinators. All programs except Water Resources have a designated QA Coordinator. Depending on the program, QA Coordinators report spending from 1 to 66% of their time on the responsibilities described in the QMP. Management needs to ensure that there are sufficient resources for project planning, implementation and assessment. There is a particular need to strengthen the assessment of projects, including the assessment of data quality.

The May 2003 report, which was approved by program managers, recommended that a QA Section be included in the plans of all programs with responsibilities for environmental data/information. These QA Sections taken as a whole were to constitute a QA work plan for the agency. As can be seen in the individual program information in Appendix B, not all of the programs included a QA Section in their plans. **Managers should ensure that a QA Section be included in program work plans. An alternative approach would be for a separate Ecology QA work plan to be prepared.**

The QMP was prepared in June 2000 and some changes are now needed because some of the information is no longer correct, needs clarification, or needs to be updated. A revised QMP has been prepared for management's review and approval. The sections on Computer Hardware & Software and Quality Improvement have been completely revised. Additional updates and improvements have been made in other sections of the QMP.

Data Quality Issues

The programs and laboratory QA Coordinators were requested to list any significant QA/QC problems encountered, along with corrective actions taken or recommended. Responses varied greatly. Half reported no problems. TCP stated that sediment data is reviewed and rejected if proper QA/QC is not included, indicating that no corrective action was needed other than to accept or reject the data. WQP provided detailed descriptions of an assortment of data quality issues related to project planning, data entry, contracts, sampling locations, goals, objectives, data verification and validation, data quality assessment, and WET testing. This information should be helpful in the process for establishing policy required by the Water Quality Data Act (Credible Data Bill).

The Air Quality Program follows a systematic procedure for assessing the quality of the data, which is summarized annually in a Data Quality Assessment report. EAP reported on several significant data quality issues and how they were addressed, including the decision of the Marine Monitoring Unit to remove dissolved oxygen results of selected monitoring activities from their database and replace them with lab results when they are available. The Manchester Laboratory gave some examples of actions taken to correct analytical problems. The NWP reported on their responsibilities in identifying data quality issues in assessments of laboratories at Hanford and in two other laboratories that they assess every three years. SPILLS reported on the corrective action they took to ensure that their sampling plan template was used.

The Water Quality Data Act (SSB 5957) was passed by the legislature in 2004 (effective date 6/10/04). It is commonly referred to as the Credible Data Bill, since it requires Ecology to develop policy that includes describing the specific criteria that determine data credibility and to recommend the appropriate training and experience for collection of credible data. Ecology must report to the legislature by 12/31/05 concerning the status of activities undertaken to comply with the act, and by 12/31/06 concerning any rule-making or policy development required to implement the act. The introduction of this bill was supported by the American Farm Bureau, as part of their effort to involve “producers working with local and state authorities to accurately assess water quality and apply the necessary solutions to lessen their impact on their watershed.” The American Farm Bureau has supported the introduction of similar legislation in other states (including California, Kentucky, Ohio, Texas and Vermont).

The policy developed must also explain how Ecology uses scientific research and literature for developing and reviewing any water quality standard or technical model used to establish a total maximum daily load for any water of the state. The Water Quality and Environmental Assessment Programs are jointly developing the policy, with discussion topics relevant to the policy divided into two phases. A phase one draft of WQP Policy 1-11 has been prepared and distributed to Internal and External Advisory Committee members for comment. The second phase will be carried out during FY 2006 and is projected to cover the issues of how the data are used in decisions relating to the water quality standards, such as TMDL studies and 303(d) listings.

The 2003 QA Report to Management recommended that Ecology prepare and implement a plan to validate all of the data it uses for decision-making. As explained above in Finding 11, an agency plan for validating all data has not yet been prepared. However, Ecology is required by the Water Quality Data Act of 2004 (SSB 5957) to develop and implement a policy that includes “describing the specific criteria that determine data credibility”, and the development of the policy required by the Water Quality Data Act includes assessment procedures for single project data and multiple data event water bodies. The information in this policy should be useful for planning what else needs to be done to ensure that all data used by Ecology is validated.

The implementation of the Water Quality Data Act provides an opportunity for Ecology to strengthen its policy and procedures for collecting and using credible data to determine which water bodies are polluted and require cleanup plans (TMDLs). Managers should support and follow this process closely, and evaluate how the policies and procedures might apply to other programs, particularly the procedures for data validation.

A specific concern that has been raised by the WQP and discussed at a recent EIM Steering Committee meeting is the quality of the data entered into the EIM database. EIM includes fields for Study QA Planning Level, Study Implementation Status, and Study QA Assessment Level. These fields are intended to provide objective information on the status of QA for planning, implementing and assessing projects.

WQP staff made the following recommendations for addressing the quality of data in EIM: 1) require quality assurance data summary packages to be included for all data (including for 303(d) listed sites) submitted to Ecology for entry into EIM; 2) require staff performing verification (identify laboratories) and validation to be identified in contracts, data submittals and monitoring reports; 3) provide an adequate number of staff to assist on quality assurance/quality control of data; and 4) ensure that all data to be entered into EIM receive the appropriate level of QA/QC before the EIM process.

It may be necessary for Ecology to validate external data to ensure that the appropriate level of QA/QC is completed before entry into EIM.

Concerns expressed by EIM Steering Committee members included the quality of the data and the accuracy of the levels assigned to the planning and assessment fields. There was concern that not all grantee QA Project Plans have been reviewed and approved, and that the entries for the planning and assessment fields have not been consistent. For external data, complete data packages have not always been submitted. These include the reports required for determining the Study QA Assessment Level. While the fields are intended to provide objective information, it appears that because the data reports provided to Ecology have been incomplete, some subjective decisions have been made for the levels of QA planning and QA assessment entered into the database. Implementations of the recommendations for training in assessment will help address some of the inconsistencies in data entry.

For water quality data, these concerns will be fully addressed in the policies and procedures being developed to meet the requirements of the Water Quality Data Act, but immediate actions are necessary to address some of the problems that have been identified. While the problem was

identified for water quality data, the conclusions and recommendations also apply to other types of data in EIM.

The issues and concerns regarding the quality of data entered in EIM, particularly external data, should be further discussed among management and staff, and corrective actions taken.

Appendix A

Program and Laboratory QA Coordinators

AQP	Stan Rauh
EAP	Stew Lombard
EAP/MEL	Karin Feddersen
HWTR	Alex Stone
NWP	Jerry Yokel
SEA	Tom Hruby
Spills	Dale Davis
SWFA	Merley McCall
TCP	Michael Spencer
WQP	Patricia Brommer

Appendix B
Information for the QA Report
Provided by QA Coordinators

1) Name of Program – Air Quality Program

2) **Program QA Coordinator** – Stan Rauh

3) **Was a QA Section Included in your Biennial Program Plan?** No

4) **Provide the following information (since May 2003) based on requirements in the Quality Management Plan.**

a) Describe the QA/QC training:

(1) received by program staff

EPA's 23rd Annual National Conference on Managing Environmental Quality Systems (1staff)

Understanding and Evaluating Data Quality Assessments (EPA short course) (1staff)

Understanding and Evaluating Data Quality Objectives (EPA short course) (1staff)

EPA's 22 Annual National Conference on Managing Environmental Quality Systems (1staff)

Writing Quality Assurance Project Plans (EPA short course) (1staff)

EPA's APTI 470 Quality Assurance for Air Pollution Measurements (2 staff)

DQO Training: Managing Uncertainty and Systematic Planning for Environmental Decision-Making Department of Energy EM-3 Data Quality Objective training at Region 10 Headquarters in Seattle (2 staff)

(2) provided by program staff

AQP staff have provided training to 36 individuals as it relates to QC in operating air monitoring instruments in a formal setting (Annual Air Monitoring Operator Training) which is open to Ecology regional and HQ staff, local air pollution agency staff, tribal staff, USFS staff, and any other interested parties. In addition QA staff provides one-on-one individualized on site training for members of this same audience whenever requested.

b) Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):

QA staff prepares QAPPs and assists others in the preparation of QAPPs. QA staff prepares quarterly and annual Data Quality Assessment Reports. QA staff prepares new SOPs and revises existing SOP's which are located at http://www.ecy.wa.gov/programs/air/other/Air_Monitoring_Procedures.htm

c) List any significant QA/QC problems encountered, along with corrective actions taken or recommended:

While I wouldn't phrase them as significant they are listed individually within the Data Quality Assessment Report. The 2003 Report is attached. (Note – This report, authored by Sean Lundblad, was too long to include as an attachment in this appendix, and is available from the Air Quality Program or the agency QA Officer.)

d) After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:

e) Other QA/QC information not covered under previous categories or specifically requested by management:

5) Provide your ideas for conclusions and recommendations to be included in the QA Report to Management.

The AQP has consistently supported and provided adequate QA resources. Management should consider appropriate QA funding within the other programs.

1) Name of Program - Environmental Assessment Program

2) **Program QA Coordinator** - Stewart Lombard

3) **Was a QA Section Included in the Biennial Program Plan?** Yes

If yes, attach a copy of the QA Section from the plan, and describe the present status of plan implementation.

Recommendations in last QA Report

a) Continue Training in Planning and Implementation, Emphasize Training on Assessment, and Provide QA Training to Project Managers.

A presentation was made at an EAP Seminar on the changes in the revised QA project plan guidance document.

Additional resources were sought to meet training needs. An application for funding from the Savings Incentive Account to pay for training support from EPA was not successful.

b) Revise the QA Project Plan Guidance Document

The third edition of *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* (Publication No. 04-03-030) was published in July 2004. The revision addressed several issues prompted by comments from users and by the experience of the authors in reviewing QA project plans. Key changes were in the explanation of, and requirements for, defining measurement quality objectives and in the elements addressing data verification, validation and assessment.

c) Allow More Time for Planning

EAP managers moved up the timetable for project selection by client programs to allow more time for planning and preparation of QA project plans.

d) Increased Attention to Assessment

The third edition of *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* includes expanded discussions of data verification, data validation, and data quality assessment based on recent information and guidance provided by EPA and other federal agencies.

Cliff Kirchmer prepared a draft of *A Summary of Data Assessment Guidance* (March 2005) describing the various definitions and guidance available on this subject. The draft was submitted to the Watershed Ecology Section for review and comment.

e) Plan for Next Audit of MEL

Lab Accreditation Section staff conducted an on-site assessment of the Manchester Environmental Laboratory in February 2004 as required for accreditation under WAC 173-50. The purpose of the assessment was to provide a baseline assessment of laboratory capability and performance for reference in future assessments.

Several recommendations were made for improving laboratory procedures and the lab has responded to those recommendations.

f) Standard Operating Procedures (SOPs)

The Manchester Lab maintains 132 SOPs for their analytical and administrative procedures. Descriptions of many field procedures used by EAP staff are documented in a variety of formats.

Cliff Kirchmer wrote a Technical Memorandum dated January 13, 2005 on the status of SOPs in EAP and on plans for improving their quality and availability.

A working group has been established to develop a process for preparation, review, approval and maintenance of field SOPs and a standard format for them. Cliff Kirchmer has begun formatting some procedures used by the Marine Monitoring Unit of the Environmental Monitoring and Trends Section. The recommendations of the work group are due by end of FY05.

No progress has been made in getting any of these SOPs posted to the Ecology intranet.

EAP staff have published many of their field procedures in the following protocols and guidance:

Field Sampling and Measurement Protocols for the Watershed Assessment Section, November 1993

A compilation of procedures for routine field activities including in-situ measurements of pH, temperature, conductivity, dissolved oxygen and flow as well as the collection, preparation and preservation of surface waters samples for lab analysis.

Technical Guidance for Assessing the Quality of Aquatic Environments, February 1994 [Pub. No. 91-78]

Guidance and information on designing water quality assessment projects and conducting water quality studies. Techniques are described for water column, biota and sediment assessments. The document is intended for use by Ecology staff and grant recipients.

Stream Sampling Protocols for the Environmental Monitoring and Trends Section, October 2001 [Pub. No. 01-03-036]

Describes sample collection, shipment, and analysis procedures for long-term stream monitoring programs.

Benthic Macroinvertebrate Biological Monitoring Protocols for Rivers and Streams, August 2001 [Pub. No. 01-03-028]

Describes sampling design, site selection, field procedures, lab data processing and analysis and interpretation of data for benthic studies. Describes the content of the elements of a QA project plan for this type of study.

Continuous Temperature Sampling Protocols for the Environmental Monitoring and Trends Section, December 2003 [Pub. No. 03-03-052]

Describes the Ecology program for long-term in-situ temperature monitoring of streams. The goals of the program are trend analysis and documentation of compliance with water quality standards.

Y:\SEABIRD\SOPS

A shared file containing SOPs for the long-term marine monitoring programs.

The procedures in these documents do not follow a standard format and, since most are included in bound documents, updates to the procedures require revision of the entire document.

4) Provide the following information (since May 2003) based on Quality Management Plan Requirements

a) Describe the QA/QC Training:

(1) Received by program staff

Stewart Lombard:

EPA Quality Systems Training Conference - October 2003
Data Quality Assessment
Environmental Data Verification and Validation

EPA National Conference on Managing Environmental Quality Systems - April 2005
The Quality System as Applied to the Environmental Microbiology Lab
Understanding and Evaluating Data Quality Assessment

EPA Certification of Drinking Water Laboratories for Chemistry Parameters - June 2004

Twenty EAP and WQP staff:

Water Quality Modeling - August 2004
A three-day course presented by Steven Chapra

Coastal and Estuarine Assessment Unit (CEAU):

Unit staff are trained and/or refreshed on sample collection and handling and on chemical analysis procedures.

(2) Provided by program staff

AOAC Workshop on Data Verification and Validation - June 2004:

Cliff Kirchmer - "The Laboratory's role in Preparing QA Project Plans"

Stewart Lombard - "Data Verification and Data Validation"

EAP Seminar - July 2004:

Cliff Kirchmer described the changes in the third edition of *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies*.

Pacific Northwest Pollution Control Association Meeting - November 2003:

Lee Fearon gave a presentation on QC in the determination of Biochemical Oxygen Demand (BOD) in wastewater.

Local Health Department Staff and Volunteers:

Lynn Schneider and Jessica Archer provided training on the collection and handling of water samples for bacteria analyses using EPA BEACH program protocols.

Hood Canal Volunteer Monitors and Salmon Enhancement Group:

Julia Bos provided training on sample collection and on chemical analysis techniques.

b) Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):

Stewart Lombard:

Reviewed historical total phosphorus data obtained by several different analytical methods to identify possible bias among those methods. Conclusion is that the fully automated method used from May 2000 to October 2003 produced consistently high results in some waterbodies. Findings summarized in a memo to EAP staff dated February 7, 2005.

Reviewed 10 QAPPs by EAP staff and 1 by non-Ecology personnel.

Will Kendra:

Coordinates and documents the review by program staff of QA Project Plans and Technical Reports submitted by organizations which receive various grants administered by the Department of Ecology.

Mindy Roberts:

Reviewed data in support of a King County project.

Joe Joy:

Provides on-going technical assistance and data review to the Spokane County Conservation District on their Latah/Hangman Creek project.

Instructed WSU contract staff about the difference between laboratory and field QA procedures.

Became involved in discussions between Kittitas Water Purveyors and Laboratory Accreditation staff on turbidity QA results and QA expectations.

EAP Staff:

Published 41 QA Project Plans

Reviewed 52 QA Project Plans prepared by grant recipients

Provided technical reviews of 33 reports/models/protocols prepared by grant recipients

Manchester Lab:

Provided tables of method performance characteristics to assist project managers in describing quality objectives for their data.

Streamlining the Development of QA Project Plans:

At the EAP 2005 all-hands meeting, one of the break-out sessions considered this issue. Five specific problems were identified and solutions for each were proposed. Cliff Kirchmer distributed a response to the report from the break-out session to the Extended Management Team Meeting in support of strategic and biennial planning.

c) List any significant QA/QC problems encountered, along with corrective actions taken or recommended:

Dissolved Oxygen Data:

The CEAU is currently reviewing all marine water quality data collection and handling procedures. To improve the accuracy of chlorophyll-a and dissolved oxygen measurements, field instrument data should be verified using the analytical results from coincident samples collected at selected monitoring stations. The CEAU did not obtain equipment capable of collecting such coincident samples until Oct. 2001 and all marine

field water quality data reported prior to this date were not verified by laboratory analyses.

Some marine dissolved oxygen (DO) data obtained by field monitoring equipment after October 2001 was not supported by the results of lab analysis of selected discrete water column samples. Some of the data in question indicated exceedences of state marine water quality standards

The decision was made to remove DO results of selected monitoring activities from the database and replace them with lab results when they are available.

The CEAU will work closely with Water Quality staff to develop a more efficient process for data submission and will undertake the development of procedures for immediate flagging, verification, and reporting of water quality violations in its routine data processing procedures.

Suspect Data Policy (EA Procedure 4-02):

EAP maintains databases containing the results of environmental studies. Some of that data will inevitably be found to be deficient. A program policy describing a process for removing data defined as “suspect” from internet-linked databases has been prepared and distributed to program staff for review.

TP data:

Manchester Lab used several different analytical procedures over the years to determine total phosphorus in surface waters. Examination of some of the historical data suggests that one of the procedures used recently for routine total phosphorus analyses produced results that were biased significantly with respect to the results of other procedures. This bias appears only in certain water bodies and in certain concentration ranges.

A committee was formed to examine the details of this suspect data and try to determine whether all or some of the data in question can be used for their intended purpose. The committee will also attempt to determine the cause of the anomaly and to develop an improved procedure for documenting comparability of results of new or modified measurement procedures.

d) After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:

Page 1, 6th Para. - I think the last sentence is confusing. What are “data . . . collected from other sources”?

Page 3, 3rd Para. - In the 3rd bullet, I would replace “annual” with “periodic”.

Page 3, 3rd Para. - In the 5th bullet, and elsewhere in the plan (pp. 7, 11, 15,), the Data Quality Objectives Process is specified. Since this process is unfathomable and inapplicable to most Ecology projects, I recommend deleting reference to it or changing the wording to convey the idea that there are other means of systematic planning.

Page 5, I think there should be some mention to the “Credible Data Bill/Issue” here or somewhere in the plan.

Page 10, Top Para. - The current procedural manual is Publication No. 02-03-055, November 2002.

Page 13, 5th Para. - The wording of the first sentence seems to preclude the use of our guidelines for the preparation of QAPPs (see Para. 2).

Page 15, First Bullet - I recommend deleting “and *Guidelines . . .*” since our treatment of the DQO process hardly qualifies as a “description” on a par with QA/G4

Page 15, 3rd Bullet - The Publication No. is now 04-03-030.

Appendix A:

The URL for “Laboratories Accredited by Ecology” is now

http://www.ecy.wa.gov/programs/eap/labs/labs_main.html

The URL for “Quality Assurance Links” is now

<http://www.ecology.ecy.wa.gov/programs/eap/qa/QA.htm>

The URLs for “Ecology Quality Improvement Plan” and “Standards . . .” are not there.

Appendix C: The organization chart is seriously out of date.

Appendix D: 2nd Para. - Does EAP still do any “compliance inspections of permitted municipal and industrial facilities”? Also, the last sentence is confusing. How about, “. . . all laboratories that submit data to Ecology.” This won’t confuse anyone who reads this plan.

e) Other QA/QC information not covered under previous categories or specifically requested by management:

None

5) Provide your ideas for conclusions and recommendations to be included in the QA Report to Management.

In order to advance training on project assessment and other QA topics needed by Ecology staff, additional resources will be necessary.

To avoid future problems with method comparability, the project managers need training in the assessment phase so they can deal more effectively with comparability issues as they arise.

1) Name of Program – Environmental Assessment Program - Manchester Lab

2) Program QA Coordinator – unit QA Coordinator: Karin Feddersen

3) Was a QA Section Included in your Biennial Program Plan? Yes or No (circle)

If Yes, attach a copy of the QA Section from the plan, and describe the present status of plan implementation.

Since January, 1999, Ecology's laboratory in Manchester has maintained accreditation for all parameters and methods requested, as is required by the QMP and Ecology Executive Policy 1-22.

Manchester Laboratory's Laboratory Information Management System (LIMS) has a control charting function available to all staff.

An on-site assessment of laboratory systems and quality assurance audit of Manchester Laboratory was scheduled and conducted by the Lab Accreditation Section (LAS). Analysts were noted to be knowledgeable, conscientious and strongly committed to quality. Recommendations from the assessment final report have been implemented. SOPs have been reviewed and updated to comply with the recommendations.

4) Provide the following information (since May 2003) based on requirements in the Quality Management Plan.

a) Describe the QA/QC training:

(1) received by program staff

Seven new lab personnel have been trained in how to use the LIMS control charting function.

QA Coordinator attended EPA Conference on Quality Systems in April 2005.

(2) provided by program staff

b) Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):

Review of QA Project Plans; Peer and supervisory review of lab data; Review of contract lab data.

c) List any significant QA/QC problems encountered, along with corrective actions taken or recommended:

The following information was extracted from the laboratory's monthly reports:

January 2005 The ultraviolet (UV) light used in the digestion module for the Total Persulfate Nitrogen analysis caused some poor reproducibility among blanks. Troubleshooting was a bit more challenging than normal because the UV light was not completely burned out and therefore check standards used to check the digestion process were not affected. After the light was replaced, a method detection limit determination was conducted to confirm that sensitivity changes did not affect the reporting limit. The new light source fixed the blank reproducibility problem and analysis of samples resumed. EAP-MANLAB/Ginder

February 2005 Michelle Aylward performed an IDC for BOD and had very precise but low results which did not fall in the technically allowed framework applied to other parameters, due to issues with seed that are being resolved. Data quality was not affected, and performance evaluation samples were within acceptable limits. After showing Perry the control chart, he determined that Michelle's IDC should be accepted. Karin has added this information to the records. The old BOD probe was sent for evaluation and it was discovered the probe was missing some of the silvering. A new probe was ordered. EAP-MANLAB/Richmond

February 2005 A sample arrived for a sand and gravel project with a one day quick turnaround requested for TDS, conductivity and pH. Aileen completed the analyses in the allotted time. There was not sufficient time for dishes taken from the oven to cool prior to analysis as per the TDS method. Clean dishes were used straight from the drawer. Therefore the TDS result was reported as an estimate. The result was high enough to not have been significantly affected by this modification. A set of pre dried and pre weighed dishes will be held in reserve to prepare for such unplanned sampling events that may happen in future. EAP-MANLAB/Richmond

April 2005 The lamp in the turbidimeter was changed in hopes that the calibration would meet the NIST traceable standard level. Recalibration set the secondary standards lower, but the check standard still read high. A new set of check standards was ordered and the results were acceptable. EAP-MANLAB/Richmond

d) After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:

e) Other QA/QC information not covered under previous categories or specifically requested by management:

5) Provide your ideas for conclusions and recommendations to be included in the QA Report to Management.

1) Name of Program – Hazardous Waste and Toxics Reduction Program

2) Program QA Coordinator – Alex Stone

The following assisted in providing the information given below: Pinky Feria, Leatta Dahlhoff, members of Used Oil Team (Michelle Underwood, Jim Pearson, Jim Sachet, Kerry Graber, Barb Smith, and Jerry French).

3) Was a QA Section Included in your Biennial Program Plan? Yes

If Yes, attach a copy of the QA Section from the plan, and describe the present status of plan implementation.

QA/QC was part of Priority #5 for the program (see attached). The program committed to providing training to staff on QA/QC and to work towards improving QAPP use throughout the program.

4) Provide the following information (since May 2003) based on requirements in the Quality Management Plan.

a) Describe the QA/QC training:

(1) received by program staff

October 2003: Conducted sampling training for field staff. Included presentation on importance of QA/QC and applicability of QAPPs to field staff

April 2005: Conducted a large sample training event for program compliance inspectors at the HAMMER training facility in Richland, WA. In addition to hands-on sampling training, it included a presentation on QA/QC basics, use of QAPP and started the process of introducing field staff to the benefits of QAPP either before or after sampling event. Provided aides which will help field staff in the QAPP development process.

(2) provided by program staff

Training events described above were conducted by internal HWTR staff with assistance from program and/or agency experts.

b) Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):

Reviewed and provided input on the QAPP for program sampling initiative dealing with state-only dangerous waste persistence criteria. Wrote, provided for review, edited and implemented the QAPP used for the HWTR Used Oil Study. This sampling

event is on-going. These are the only HWTR planned sampling events during the last year. All other samples sent for analysis by the program were samples of opportunity collected by field compliance staff.

c) List any significant QA/QC problems encountered, along with corrective actions taken or recommended:

None: Our program does very little sampling compared with other programs within Ecology.

d) After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:

One minor suggestion: add statement in plan which emphasizes the need for field staff to complete a QAPP either before or after obtaining a sample of opportunity.

e) Other QA/QC information not covered under previous categories or specifically requested by management:

None.

5) Provide your ideas for conclusions and recommendations to be included in the QA Report to Management.

Only a repeat of 4 d: Add recommendation to plan which emphasizes the need for field staff to complete a QAPP for a sample of opportunity

Priority 5: Improve Community Access to Hazardous Waste Information and Quality Data

HWTR is responsible for collecting, compiling, analyzing and reporting data on hazardous waste generation, transportation, treatment, storage and disposal. The program also collects data on toxic chemicals released and chemicals stored by Washington businesses.

Our automated data systems are designed to: Help collect and organize program information for planning, compliance and technical assistance visits; measure pollution prevention and compliance progress; track information on hundreds of facilities that prepare pollution prevention plans; and track thousands of facilities that pay fees. Analysis of this data in ways that allow us to measure the success and efficiency of our activities in achieving our objectives and mission is an ongoing process. Additionally, we continually try to improve public access to information. In particular, we continue to make more information and data available on the internet and to package it in ways that makes it more useful.

Program Quality Assurance and Quality Control

The *Quality Assurance Report to Management* (Cliff Kirchmer, May 2003) gave specific recommendations for quality assurance/control improvements within Ecology, as they apply to each Ecology program. A primary recommendation of the report was that any programs with responsibility for environmental data/information should include in its biennial Program Plan a Quality Assurance Section detailing future actions the program will take to implement the recommendations in the report. Specific to the HWTR Program, the report recommends:

- Ongoing training in project planning and implementation;
- Emphasis given to training in general project assessment, which includes data verification, validation and assessment;
- Quality assurance training for site managers; and,
- Allocation of 0.25 FTE for QA Coordinator technical assistance to staff.

Because the Hazardous Waste and Toxics Reduction Program is rarely involved in environmental studies affecting the public, Quality Assurance Project Plans (QAPPs) seldom need to be prepared. All Corrective Action staff review QAPPs prepared for major clean-ups primarily at the Remedial Investigation and Feasibility Study stage. Other staff occasionally need to collect samples for compliance purposes, or review data collected by others both inside and outside the agency. Consequently, most program staff have limited need for extensive QA training. Some training is needed though for the few staff occasionally involved in sampling and environmental data review projects that may have policy, corrective action or compliance implications.

1) Name of Program – Nuclear Waste Program, Richland

2) Program QA Coordinator – Jerry Yokel

3) Was a QA Section Included in your Biennial Program Plan? Yes

QA is discussed in the Chemistry Implementation plan which is a part of the Biennial plan.

4) Provide the following information (since May 2003) based on requirements in the Quality Management Plan.

a) Describe the QA/QC training:

(1) received by program staff

EPA 7 step DQO process – Sebastian Tindall	40 staff
EPA Quality Management Conference	1 staff
Multi-increment sampling course – Chuck Ramsey	2 staff
EPA Region X Incinerator Training – Cathy Massimino	30 staff
Radiochemistry Methods – Washington DOH	10 staff

(2) provided by program staff

WAP, SAP, QAPP review	15 staff
Hanford contractor and NWP contracted laboratory data package review	3 staff
Risk assessment data usability	10 staff

b) Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):

Review of:

Hanford Analytical Services Quality Assurance Requirements Document

QA project plans

Air, soil, water, chemical and radiochemical data packages from Hanford and non-Hanford permitted facilities

DQO documents, SAP's, WAP's

Hanford contractor and NWP contracted laboratory data package

Technical Assistance:

Field sampling and sample shipping

Analytical test plans, mixed waste methods development

Laboratory and field sampling and analysis auditing

Visual Sample Plan, MTCASat, 3-phase model

RESRAD (radiochemical dose assessment model)

c) List any significant QA/QC problems encountered, along with corrective actions taken or recommended:

Every three years NWP audits Paragon Analytics and Southwest Research Institute laboratories. Deficiencies and corrective actions are discussed in the audit reports. NWP chemistry staff are also involved in assessments of Hanford laboratories.

d) After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:

More emphasis on internal auditing. Perhaps direction to management on purpose and future benefits. Does EPA routinely audit internally?

e) Other QA/QC information not covered under previous categories or specifically requested by management:

One arena of QA/QC that is extensive, at least here at Hanford, is Risk assessments. Extensive NWP staff time has been expended on review and meetings with EPA region 10 and Hanford contractor staff reviewing and updating the Risk Assessment Workplan for the Vitrification Plant. Method selection and development, contaminant of concern selection, data evaluation, risk modeling, trial burn engineering scale tests data, air modeling, etc. A large inventory of QA/QC information is needed for decision making. The information relates radiochemistry and organic, metal, general chemistry QA/QC to data usability for making process, engineering and risk decisions.

5) Provide your ideas for conclusions and recommendations to be included in the QA Report to Management.

Maybe add something on internal auditing within Ecology...cross program, regional and headquarters, etc.

1) Name of Program – Shorelands and Environmental Assistance Program

2) **Program QA Coordinator** – Thomas Hruby

3) **Was a QA Section Included in your Biennial Program Plan?** No

4) **Provide the following information (since May 2003) based on requirements in the Quality Management Plan.**

a) **Describe the QA/QC training:**

(1) **received by program staff** - none

(2) **provided by program staff** - none

b) **Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):**

none

c) **List any significant QA/QC problems encountered, along with corrective actions taken or recommended:**

QA/QC problems have not been monitored

d) **After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:**

e) **Other QA/QC information not covered under previous categories or specifically requested by management:**

5) **Provide your ideas for conclusions and recommendations to be included in the QA Report to Management.**

Need clarification on what is needed to prepare a QA project plan for using existing data (as per policy 1-21) rather than acquiring new data. The QA planning help in the document does not address what is needed to insure data quality when using data from outside sources, especially GIS data layers.

1) Name of Program – Solid Waste and Financial Assistance Program

2) Program QA Coordinator – Merley F. McCall

3) Was a QA Section Included in your Biennial Program Plan? No

4) Provide the following information (since May 2003) based on requirements in the Quality Management Plan.

a) Describe the QA/QC training: No QA/QC training was received or given.

(1) received by program staff

(2) provided by program staff

b) Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):

1. Reviewed two sediment sampling plans including QA/QC requirements.
2. Provided QA for temp probe deployment and data gathering for Columbia River study with Agrium. A QAPP was not initially required but project was reevaluated when turned over to the Industrial Section.
3. Reviewed the Columbia river pulp mill temperature study QAPP

c) List any significant QA/QC problems encountered, along with corrective actions taken or recommended:

None

d) After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:

A QAPP will be required from permittees when a receiving water study is included in Industrial Section NPDES Permits.

e) Other QA/QC information not covered under previous categories or specifically requested by management:

A letter was sent to waste water treatment plant operators and laboratories in the state requiring that accredited laboratories be used for biosolids data reported to Ecology.

5) Provide your ideas for conclusions and recommendations to be included in the QA Report to Management.

1) Name of Program – Spills Program

2) Program QA Coordinator – Dale Davis

3) Was a QA Section Included in your Biennial Program Plan? Yes

The Program Plan is on the Spills Intranet Site

If Yes, attach a copy of the QA Section from the plan, and describe the present status of plan implementation.

Program QA/QC protocols are being established and documented in the program SOP manual. A user manual for ERTS is available through the system help menu. The MIS manual is still under development.

4) Provide the following information (since May 2003) based on requirements in the Quality Management Plan.

a) Describe the QA/QC training:

(1) received by program staff

Incident command system sampling specialist training for 4 persons.

Basic oil spill sampling training for all spill response staff, about 45 persons

(2) provided by program staff

All of the above training is provided by program staff

b) Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):

The basic oil spill sampling training included a section on developing a sampling plan, using a plan template.

c) List any significant QA/QC problems encountered, along with corrective actions taken or recommended:

Minimal use of the sampling plan template. Its use was reinforced by reminders from Regional and Sectional managers.

d) After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:

e) Other QA/QC information not covered under previous categories or specifically requested by management:

5) Provide your ideas for conclusions and recommendations to be included in the QA Report to Management. Have proposed to program managers that there be enhanced sampling and data collection training.

1) Name of Program – Toxics Cleanup Program

2) **QA Coordinator** – Michael J. Spencer, working with a team representing our program’s regional offices and units: Valerie Drew, CRO; Phil Leinart, ERO; Joe Hickey, NWRO; Joyce Mercuri, SWRO; Kathryn DeJesus, Sediments; Chung Yee, Site Cleanup.

3) Was a QA Section Included in your Biennial Program Plan?

There was only one minor reference to QA: on page 23, out of 57 pages, under Information Management, it states: “Continuing efforts (to enhance analysis and reporting of Program data and information) include making our data more available and useful; improving data quality; and, providing scheduled as well as ad hoc data analysis and reporting.”

4) Provide the following information (since May 2003) based on requirements in the Quality Management Plan.

a) Describe the QA/QC training:

(1) received by program staff

Seven staff from SWRO TCP attended a 1-day training on “Soil VOC Sampling for EPA Method 5035A Analysis”, October, 2004.

SWRO TCP section QC coordinator (Joyce Mercuri) attended 1-day course on “QA/QC Management of Analytical Data”, April, 2004, as did Joe Hickey, NWRO.

Michael Spencer completed Advanced Investigator Training, which focused on QA of the interview technique for obtaining information during environmental investigations.

(2) provided by program staff – apparently none.

b) Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):

The Sediment Management Unit (SMU) staff routinely review sediment QAPPs for regional site managers, providing technical assistance on proper sediment sampling and analysis techniques to meet requirements of the Sediment Management Standards (SMS), Chapter 173-204 WAC. This includes ensuring the quality of generated data by consistently requiring sample collection, handling, storage, and analytical QA/QC. The SMU also clarifies and updates sampling and analysis protocols routinely through a public annual meeting process held each May. This includes posting of technical papers on the website as well as updating supporting guidance documents to the SMS, such as the *Sampling and Analysis Plan Appendix: Guidance on the Development of Sediment*

Sampling and Analysis Plans Meeting the Requirements of the Sediment Management Standards (Chapter 173-204 WAC) (Pub. No. 03-09-043, 04/03).

The SWRO QC coordinator provided review of one QAPP for a “clean sites initiative” project at Aladdin Plating. Clean Sites Initiative projects are investigations and cleanup projects funded carried out directly by Ecology through state Toxics Control Account Funds (as opposed to requiring the work to be conducted by a PLP). Also provided technical assistance to site manager for review of SAP and QAPP portion of RI/FS work plan for a cleanup site.

Joyce Mercuri prepared QAPP for Extended Footprint Study, to be conducted by Pierce, Thurston, King, and Kitsap County Health Departments under the Tacoma Smelter Plume Project, funded through the Local Toxics Control Account under a grant with Ecology.

HQ-TCP: Reviewed/commented on Limited Phase II Environmental Site Assessment Report for Turner Shell Site, Raymond; and the same for: Determining the Extent and Nature of Contamination Remaining at the Old Highway Garage, 103 First Street, Sprague, Washington.

(Also from SWRO): Data quality reviewed and technical assistance provided by Manchester Laboratory regarding interpretation and assessment of Polychlorinated Di-Benzo Dioxin/Furan compounds' homolog profile analysis.

c) List any significant QA/QC problems encountered, along with corrective actions taken or recommended:

None (Sediment Unit). Any sediment data submitted to the program without proper QA/QC documentation is rejected. PRPs collecting sediment data for regulatory purposes are required to use accredited laboratories and follow Puget Sound Protocols.

None (SWRO).

None (HQ)

None (NWRO)

d) After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:

No comments received.

e) Other QA/QC information not covered under previous categories or specifically requested by management:

Ecology's main repository for environmental monitoring data is the Environmental Information Management system (EIM). The Toxics Cleanup Program (TCP) has had Procedure 840: Handling Environmental Data Submittals in place since January 25, 2000; however, lacked sufficient in-house electronic infrastructure for adequate data submittal and retrieval in EIM.

Development and implementation of this necessary infrastructure, along with regional office staff training, has been moving to completion throughout the latter half of 2004 and first quarter of 2005. This process will enable TCP to better assess the current state of the environment by providing an integrated and comprehensive view of monitoring data.

Data submittal requirements for the study plan include selection of one of four levels of quality assurance (QA) running from informal QA to an approved QA Project Plan (QAPP), in accordance with Ecology Publication 04-03-030, and five levels of QA for the actual study data, ranging from data not verified up to data verified, validated, and assessed for usability in a peer-reviewed study report.

5) Provide your ideas for conclusions and recommendations to be included in the QA Report to Management.

Need to have more directive from upper management to all TCP staff, especially site managers, regarding the importance and necessity of maintaining good QA throughout the entire cleanup process. This involves allocation of sufficient funding for QA staffing and training.

1) Name of Program – Water Quality Program

2) Program QA Coordinator – Patricia Brommer

(the previous QA Coordinator, Cynthia Stonick, prepared the initial draft of this information)

3) Was a QA Section Included in your Biennial Program Plan? *Yes*

If yes, attach a copy of the QA Section from the plan, and describe the present status of plan implementation.

Quality Data and Information

A13 PDS

Actions: Educate WQ staff on WQ issues as needed. Serve as intermediary between WQ staff and EAP staff on QA issues. Prepare for QA audit. Implement QA report recommendations from the Agency's 2003 Quality Assurance Manual, as appropriate. Works with permit coordinators in each regional office to provide QA/QC review on data for permitted dischargers.

4) Provide the following information (since May 2003) based on requirements in the Quality Management Plan.

a) Describe the QA/QC training:

(1) received by program staff None

(2) provided by program staff

WET Coordinator - Training on "Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria" was provided to Ecology staff that wrote and enforced permits for the WET Criteria. Training covered the criteria as well as Data Management.

b) Describe the technical assistance and QA/QC support provided to program staff (including review of QA Project Plans):

EAP Assistance

Quality assurance feedback was provided on WQ QA Project Plans.

WET Coordinator

Provided technical assistance regarding WET Guidance document including data Management using computer software (CETIS) specifically designed for WET test data analyses and QA. Technical assistance on WET testing is strongly recommended in the new EPA Draft national Whole Effluent Toxicity (WET) Implementation Guidance under the NPDES program

QA Coordinator

Reviewed the 2004 QAPP Guidance document and provided extensive comments. Technical assistance was also provided to the SEA program and other external entities including WSDOT, and City of Tacoma under the Thea Foss Superfund.

The most frequent technical assistance provided to WQP staff was clarification regarding Laboratory Accreditation. Frequently asked questions included the following topics: appropriate analytical methods, contacts at MEL, and appropriate PQLs. Less frequently asked questions included: interpretation of data qualifiers, differences between MDLs and PQLs, method blank contamination, and specific questions on sample design.

c) List any substantial QA/QC problems encountered, along with corrective actions taken or recommended:

EAP Technical Assistance

Most WQ Program staff reported positively regarding EAP technical assistance with QAPP review, however timeliness of QAPP review and consistency among reviewers have been an issue.

Training Needs

The WQ Program staff need Quality Assurance training that is relevant to the Clean Water Act and beneficial use concerns.

WET Coordinator

WET test review is labor-intensive and inexact without computer support. Since the results of WET tests are derived using a large variety of statistical analyses and problems with the results can arise from improper use of statistics, it is impossible to thoroughly review WET test reports without the ability to run all of the statistical analyses. A data base to archive and retrieve data along with review comments is also needed. An automated ability to check for test acceptability criteria is helpful. Comprehensive Environmental Toxicology Information System (DETIS) was specifically designed to meet special needs for computer support of WET test data management.

The following recommendation will further improve WET testing and processing:

Teams

The success of the Program is dependent not only on the work of each individual staff, but also on integrated actions across activities and sections. In those Program areas where there is the greatest need for cross-representation and consistency, the Program

has established teams. This part of the Plan identifies and describes the primary PMT-sponsored standing teams that currently exist in the Program.

Whole Effluent Toxicity Data Management Team

Purpose: Enter and review WET data submitted by permittees. Setup and implement a QA process for each others data entry. Keep the Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria (canary book) document updated. Assist the Permit Writer's Workgroup in keeping the language in the permit shells current. Keep the Environmental Laboratory Accreditation Program informed of lab deficiencies and strive for a mutually supportive relationship between test reviews and lab audits.

Deliverable for FY05:

- Attend meetings and develop working relationships.
- Eliminate the backlog of WET test reports.
- Implement test reviews using the new tools in CETIS.

d) After reviewing the Quality Management Plan, list any recommended changes that would make it more suitable and effective:

Provide a specific process for training on various QA topics.

e) Other QA/QC information not covered under previous categories or specifically requested by management:

1) Provide your ideas for conclusions and recommendations to be included in the QA Report to Management.

Suggested training needs:

- 1) QAPP – How to write and implement a QAPP (provide a non-technical version for grant and loan managers and a more technical version for other users). Ideally the training for WQP would be to help with methodologies supportive of the Clean Water Act.
- 2) Sampling design – how to design a realistic and useful monitoring study
- 3) MQOs – emphasis on how to perform verification and validation of data
- 4) Bias – how to establish realistic bias goals for organic compounds and the trade offs from accepting higher levels of bias
- 5) Policy questions – how to design a QAPP to answer policy questions
- 6) Statistics –
 - a. power analysis to determine the required number of samples
 - b. qualitative and quantitative
 - c. how to know what tests to run and what software to use

- 7) Quality results – What does this mean? What types of problems would trigger concern?
- 8) Quality Assurance Data Summary package – What is it and how to review one
- 9) New QAPP Guidance – Special presentation for WQP staff (at both the general and technical levels).

Target Audiences

Internal Staff

- HQ Financial Managers
- Grant and loan Project Managers
- WQ Unit Supervisor's Workgroup
- TMDL Leads
- Permit Managers/Coordinators
- Permit Writers
- Staff performing monitoring and/or reviewing data

External Audiences

- Conservation districts
- Permittees
- General Public applying for Grants or Loans
- Jurisdictions Performing 303(d) or TMDL listed monitoring

Appendix C

Laboratory Expenditures by Program

**Laboratory Expenditures by Program
(FY 05 expenditures through April 2005)**

June 3, 2005

Program	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05
Administration	31,774	36,656	1,257	4,138	462	0	0
Air Quality	83,824	100,366	143,498	146,236	110,918	85,808	58,207
Environmental Assessment	636,439	637,502	760,274	548,870	1,089,918	889,352	727,434
Shorelands	433	885	0	0	0	0	24,206
Water Quality	37,283	24,459	75,480	48,452	59,018	40,493	52,192
Water Resources	0	0	64	0	43	0	0
Toxics Cleanup	196,311	117,653	102,489	45,235	93,061	40,851	91,280
Hazardous Waste	252,332	46,572	94,862	27,186	40,861	20,729	29,789
Solid Waste	32,404	30,249	33,279	15,763	12,870	13,222	5,447
Spills	26,343	54,530	25,656	51,905	46,929	39,034	143,977
Totals	1,297,143	1,048,872	1,236,859	887,785	1,454,080	1,129,489	1,132,532