

# Quality Assurance Project Plan

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2020 Forest Practices Act Audit



**State of Idaho  
Department of Environmental Quality**

**Office of Technical Services**

**Version 1.0**

**May 1, 2020**



# 1 Title and Approval Page

## Quality Assurance Project Plan

**Title:** 2020 Forest Practices Act Audit

**Region/Division:** Office of Technical Services

**Version Number:** 1.0

**Date:** May 1, 2020

### Approval Signatures

Note: This QAPP becomes effective on the date of the last approval signature.

#### Project Manager/Author

Signature:  \_\_\_\_\_ 5/1/2020  
Name: Hawk Stone, Senior Water Quality Scientist, State Office \_\_\_\_\_ Date

#### Project Quality Assurance Officer

Signature:  \_\_\_\_\_ 4/26/2020  
Name: Ian Wigger, Water Quality Standards Analyst, State Office \_\_\_\_\_ Date  
\*Note: At the time of QAPP signature, the project QAO is required to update the DEQ QAO project document tracker, found at EDMS # 2012AEB8.

#### Program or Regional Manager

Signature:  \_\_\_\_\_ 05/06/2020  
Name: Jason Pappani, Surface Water Bureau Chief, State Office \_\_\_\_\_ Date

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## 2 Table of Contents

1 Title and Approval Page .....	3
2 Table of Contents .....	5
3 Distribution List .....	7
4 Project/Task Organization .....	7
5 Problem Definition/Background .....	9
5.1 Problem Statement .....	9
5.2 Intended Use of Data .....	9
6 Project/Task Description .....	10
6.1 General Overview of Project .....	10
6.2 Project Timetable .....	12
7 Quality Objectives .....	12
7.1 Data Quality Objectives .....	12
7.2 Measurement Quality Objectives .....	12
7.2.1 Targets for Precision, Bias, and Sensitivity .....	12
7.2.2 Precision .....	12
7.2.3 Comparability, Representativeness, and Completeness .....	13
8 Special Training/Certification .....	14
9 Documentation and Records .....	14
10 Sampling Process Design .....	15
10.1 Rationale for Selection of Sampling Sites .....	15
10.2 Sample Design Logistics .....	16
11 Sampling Methods .....	16
12 Sample Handling and Custody .....	17
13 Analytical Methods .....	17
14 Quality Control .....	17
14.1 Field QC Checks .....	17
14.2 Laboratory Quality Control Checks .....	18
14.3 Data Analysis Quality Control Checks .....	18
15 Instrument/Equipment Testing, Inspection, and Maintenance .....	18
16 Instrument/Equipment Calibration and Frequency .....	18
17 Inspection/Acceptance of Supplies and Consumables .....	18
18 Non-direct Measurements and External Data Acquisition .....	19
19 Data Management .....	19
20 Assessment and Response Actions .....	19
21 Reports to Management .....	19

22 Data Review, Verification, and Validation..... 20

23 Review, Verification, and Validation Methods ..... 20

24 Reconciliation with User Requirements ..... 23

25 References..... 25

**List of Tables**

Table 1. Project QAPP distribution list..... 7

Table 2. Key project personnel and associated responsibilities..... 8

Table 3. Analytes and laboratories..... 16

Table 4. Analytical method, container types, preservation method, and sampling holding times. .... 17

**List of Figures**

Figure 1. Project organizational chart..... 9

**List of Equations**

**List of Appendices**

Appendix A. Project Checklists

Appendix B. Appendix B: Audit Form

### 3 Distribution List

At a minimum, the following personnel and analytical laboratory contacts will receive either an electronic or hard copy of the final signed quality assurance project plan (QAPP) (Table 1).

**Table 1. Project QAPP distribution list.**

Name	Project Affiliation	Organization and Address/Location	Contact Number
Gerry Smith	DEQ Quality Manager	Idaho Department of Environmental Quality, 1410 N. Hilton, Boise ID 83706	(208) 373-0405
Jason Pappani	Program Manager		(208) 373-0515
Ian Wigger	Project Quality Assurance Officer		(208) 373-0147
Hawk Stone	Project Manager		(208) 373-0588
Gary Hess	Project Partner	Idaho Department of Lands, 3284 Industrial Loop, Coeur d'Alene, Idaho 83815	(208) 866-8636
Michael Young, USFS	Analytical Laboratory	National Genomics Center for Fish and Wildlife Conservation, 800 East Beckwith Avenue, Missoula MT 59801	406-542-3254

### 4 Project/Task Organization

Key project personnel and their responsibilities are defined in Table 2. An organizational chart is provided in Figure 1.

The project staff duties and responsibilities described in Table 2 are not intended to be all inclusive; see sections 1.2.5 through 1.2.7 of the DEQ *Quality Management Plan* (QMP) (DEQ 2017) for a more detailed description.

**Table 2. Key project personnel and associated responsibilities.**

Name	Project Title/Responsibility
Jason Pappani	<p><b>Program or Regional Manager:</b></p> <ul style="list-style-type: none"> <li>• Assists in the review of the QAPP and signs the final QAPP as an approver.</li> <li>• Confirms the project QAPP meets the needs of the program/region.</li> <li>• Ensures the QAPP is approved prior to the start of project work.</li> <li>• Ensures the program/regional procedures and policies referenced in the QAPP are current and approved for use.</li> <li>• Performs all duties and responsibilities as assigned in the project QAPP.</li> <li>• Selects and assigns a project quality assurance officer (QAO), who meets the criteria for independence defined in the DEQ QMP (see QAO duties below).</li> </ul>
Ian Wigger	<p><b>Project Quality Assurance Officer:</b></p> <ul style="list-style-type: none"> <li>• Assists in the review of the QAPP, verifies the QAPP meets the requirements of the DEQ QMP, and signs the QAPP as an approver.</li> <li>• <i>When the project QAO signs the QAPP for approval, the QAO is required to update the DEQ QAO project document tracker found at the electronic document system (EDMS) # 2012AEB8.</i></li> <li>• Provides data validation per the project QAPP, using the appropriate checklist located in Appendix A, and may also participate in final project report review.</li> <li>• Conducts a field audit.</li> <li>• Documents all audit and data validation activities in the DEQ EDMS</li> <li>• Performs all other duties and responsibilities as assigned in the project QAPP.</li> </ul>
Hawk Stone	<p><b>Project Manager:</b></p> <ul style="list-style-type: none"> <li>• Serves as the primary author of the project QAPP, and signs the final QAPP as an approver.</li> <li>• Performs overall project planning, document development and approval, sample planning and coordination, laboratory coordination, reporting functions, project report/summary development, and project file maintenance in the EDMS.</li> <li>• Ensures each project involving activities not covered in the <i>General Safety Manual</i> (DEQ 2018a) has an approved health and safety plan (HASP) as required in the <i>Safety Program Plan</i> (DEQ 2018b).</li> <li>• Enters the approved and current project QAPP in the EDMS, including a copy of the signed approval page.</li> <li>• Ensures all project work is conducted in accordance with the DEQ QMP, the approved QAPP, and the applicable standard operating procedures.</li> <li>• Ensures personnel assigned to this project are appropriately trained and qualified, with the corresponding training records on file in human resources.</li> <li>• Performs data review and verification per the project QAPP, using the appropriate checklists located in Appendix A.</li> <li>• Reviews the project QAPP/FSP and standard operating procedures (SOPs) annually to determine if revision is necessary</li> <li>• Documents all audit and data review/verification activities in the DEQ EDMS</li> <li>• Performs all other duties and responsibilities as assigned in the project QAPP.</li> </ul>
Michael Young, USFS	<p><b>Laboratory Contact/Manager:</b> This person is the primary contact at the laboratory for DEQ project staff</p>

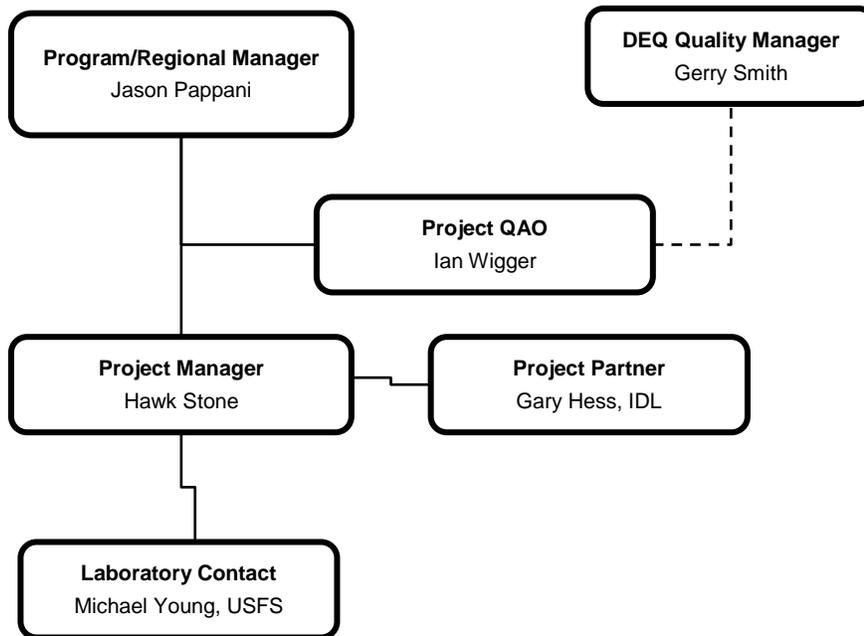


Figure 1. Project organizational chart.

## 5 Problem Definition/Background

### 5.1 Problem Statement

The Idaho Department of Environmental Quality (DEQ) and Idaho Department of Lands (IDL) are responsible for ensuring that surface water is protected during and after forestry activities. IDL applies and enforces the ‘Idaho Forest Practices Act’ (title 38, chapter 13 Idaho Code), and the rules associated with it (IDAPA 20.02.01)

Once every four years, DEQ audits 40-60 timber sales to ensure that the rules are being followed and enforced. A secondary purpose of the audits is to observe and recommend improvements to the rules.

Timber sales are selected from federal, state and private lands, and the audits are conducted by staff from both DEQ and IDL, with the assistance of landowners, foresters and other agencies.

### 5.2 Intended Use of Data

The data collected during the audits will be used to assess overall compliance levels with the Forest Practices Act rules. The data will also be used to suggest improvements to the rules, if appropriate.

The final report will be publically available, and shared directly with the Idaho Forest Practices Advisory Committee (FPAC) and IDL.

The audits are expressly *not* to be used as enforcement tools for individual timber sales. Enforcement activity rests with IDL, which it conducts as part of the routine timber sale process.

Individual audit data may be shared with the landowner and other directly interested parties.

## 6 Project/Task Description

### 6.1 General Overview of Project

The audit sites will be comprised of two panels:

1. A main panel of about 50 sites that will be used to assess overall rule compliance. This will include:
  - a. 40 randomly selected sites that have been harvested since January 2018 (the two-year cutoff is used to maintain consistency with previous audits), and
  - b. 10 sites that were previously audited in 2016 will be revisited to confirm replanting has occurred and that sediment prevention mechanisms are working.
2. An investigative panel of sites that are of particular interest, but which will not be included in any overall assessments. This may include:
  - a. 5 sites with known problems, typically identified by their receipt of an ‘unsatisfactory condition’ or ‘notice of violation’ from IDL.
  - b. 1 cable-assisted harvesting operation.
  - c. 1 completed shade-rule variance operation.
  - d. 1 fire salvage operation
  - e. 1 completed heavy-equipment fire task force operation.
  - f. 1 ‘good neighbor authority’ sale

#### **Main Panel**

To select the 40 new sites, DEQ and IDL will compile a list of every timber sale exceeding 5 acres that has the potential to affect a Class I (fish-bearing) stream in Idaho since January 2018. The audit panel will be selected randomly from this list, and will feature ten from each ownership class (federal, state, private industrial and private non-industrial), and from a variety of IDL supervisory areas. This maintains consistency with the site selection process of previous audits.

Class I and II streams are defined in IDAPA 20.02.01.010.60, and are typically noted on IDL forms and maps.

Working in a two-member team, staff from DEQ and IDL will visit each audit site and assess compliance with every applicable rule. Land owners, operators and other interested parties will be invited to accompany the audit team. The auditors will look at, amongst other things, roads, culverts, landings, skid trails, equipment, and chemical storage areas. Audits will take place between May and October 2020, and each audit will usually take one field day.

The list of sites audited in 2016 will be used to select 10 sites for revisiting. Any applicable rule will be assessed, with a focus on replanting and road stabilization. These sites will be selected based on their proximity to the main audit panel sites.

All the reports from the main audit panel will be combined to assess overall compliance with the Forest Practices Act rules. A final report will be completed by the end of 2020 that explains the findings and highlights any problem areas. The report may make suggestions for improvements to the process or rules.

### **Investigative Panel**

Each site will be inspected for evidence of actual or potential water quality pollution. The data will not be part of the overall compliance metric, but may be used to suggest improvements to the rules. Cable-assisted harvesting is a new forestry technique used on extremely steep slopes, which has the potential to cause hillside erosion. Conversion and fire salvage operations often occur on particularly vulnerable soils and streams. The heavy-equipment fire task force builds firebreaks in response to the imminent threat of fire. It operates under emergency authority, and is not subject to the usual inspections, even though the timber it removes may be later sold. The shade rule governs harvesting in the riparian area. Variances are sometimes given for extra harvesting. ‘Good neighbor authority’ sales are those on federal ground, contracted by the state, and represent a new type of partnership.

### **All Sites**

IDL provides information to foresters about the nature of streams and geology in their proposed harvest areas. The classification of stream (fish-bearing or not) has significant consequences on the intensity of ground disturbance, meaning this is an important piece of information. A new technology, environmental DNA (eDNA) is able to identify the presence of fish upstream of a water sample. It will be deployed at up to 40 locations at the discretion of the auditors, typically in larger class II streams that may be misclassified.

The IDL soil-stability map is used to warn foresters of highly erodible soils, and affects the application of a rule regarding skid trails. It will be field-verified at the discretion of the auditors.

## 6.2 Project Timetable

Estimated Dates	
February – April 2020	Prepare list of audit sites, inform IDL regions of visits
May -October 2020	Audits, including data review (project staff)
	Field Audit (QAO)
October 2020	Data Verification (project staff)
	Data Validation (QAO)
December 2020	Project report (Hawk Stone)

## 7 Quality Objectives

### 7.1 Data Quality Objectives

The main data quality objective (DQO) for this project is to visit 50 forestry operations and to assess them for compliance with a suite of about 150 rules. Each rule will be given a ‘pass/fail’ answer, with notes being made if necessary.

Concurrently, up to 40 eDNA samples will be taken from class II streams in the project areas, and analyzed for the presence of any trout or sculpin DNA markers.

### 7.2 Measurement Quality Objectives

#### 7.2.1 Targets for Precision, Bias, and Sensitivity

The audit of rules is generally not suitable for these types of laboratory analytical comparisons. The eDNA laboratory will provide its own quality control results to the QAO.

#### 7.2.2 Precision

**Precision** is a measure of agreement between two measurements of the same property under prescribed conditions.

Precision will be measured by a duplicate audit of one site. On a separate audit form, the QAO will conduct a contemporaneous audit. The data will be compared with the official audit team’s report. For compliance, each ‘yes/no’ question will be compared with the QAO report. **The goal for compliance precision is 80%.**

The National Genomics Center for Fish and Wildlife Conservation has analyzed over 5,000 eDNA samples, and provides a rigorously tested protocol. Precision in collection will be confirmed by carefully studying and using their field-guide “A Protocol for Collection

Environmental DNA Samples From Streams” (USFS General Technical Report RMRS-GTR-355, August 2016)

### **7.2.2.1 Bias**

Bias will be minimized by careful creation of the audit forms, such that they address and clearly state every applicable forest practices act rule. If questions of interpretation arise, the plain text of the rule will be consulted, followed by the IDL guidance. Furthermore, each audit will be conducted with at least two auditors, who shall agree on each decision, or document their disagreement.

For eDNA samples, the use of clean sampling equipment and proper technique will ensure each sample accurately represents the stream.

### **7.2.2.2 Sensitivity**

The auditors will personally inspect every class 1 stream crossing, and attempt to visit every road segment and landing. This will ensure maximum sensitivity.

eDNA methods are sensitive to species at very low densities in streams. Wilcox et al (2013) estimated that the detection probability of a single sub-adult fish in 100m of stream was 84%. This is two or three times as sensitive as the traditional method – electrofishing.

## **7.2.3 Comparability, Representativeness, and Completeness**

Comparability is the confidence with which one data set can be compared to another data set. Forest practices act audits have been occurring every four years since 1988. Except where there are new rules, every effort is made to keep the process similar to past years. This is achieved by working closely with the staff who conducted the audits and ensuring that the audit questions closely follow the text of the rules. Use of a standard eDNA protocol ensures the results are comparable to other eDNA studies.

Representativeness is the degree to which the audit data accurately and precisely represent general timber sale conditions. This will be achieved by spreading the audit sites across all four ownership categories. If possible, at least two private or state sites should come from each IDL supervisory area. Federal sites should be spread among the National Forests and BLM regions. Within these strata, timber sale selection will be random. Sales may be excluded from the audit panel based on accessibility concerns.

Completeness is the percentage of valid data relative to the total possible data points. For data to be considered valid, it must meet all of the acceptance criteria, including accuracy and bias, and any other criteria specified by the analytical method used. The overall data quality objective for completeness for the sampling events conducted under this QAPP is 50%, with a goal of 80% (i.e. 25 and 40 audits, respectively). If the sampling does not meet the 50% quality assurance objective the data will be discussed with the quality assurance officer and a course of action agreed upon. Any departure from this objective will be justified and explained in the project records in accordance with the QMP.

## 8 Special Training/Certification

All specialized or non-routine training, qualifications, or certifications necessary for project or laboratory staff is listed below.

The project manager is responsible for ensuring personnel assigned to this project are appropriately trained and qualified, with the appropriate training records on file with DEQ human resources.

All work performed by DEQ personnel will be conducted in accordance with the *DEQ General Safety Manual* (DEQ 2018a) and the *Safety Program Plan* (DEQ 2018b). Additional health and safety information is available in the *Idaho General Safety and Health Standards* (Division of Building Safety 2006).

Training for audit staff will consist of:

1. Required reading of entire FPA rules booklet.
2. Instruction in use of audit field forms.
3. For new audit staff, if any, a visit to a mock audit site in advance of field season.

## 9 Documentation and Records

Project documents will be filed electronically in the EDMS in accordance with applicable program filing procedures. The project manager is responsible for ensuring that a copy of the current approved (and signed) QAPP is available in the EDMS. A copy of the signed signature page for the project QAPP is to be filed in the EDMS by the project manager. Preferably, the approved document, including the signed signature page, is attached to the EDMS record in PDF format.

Field personnel shall use the field note form located in Appendix B, or an electronic equivalent, to document each day's activities. Information is to be recorded directly, promptly, and legibly.

All documentation necessary to support the objectives of the project and the validity of project data—chain-of-custody forms, audit reports, laboratory reports, field notes, field logbooks, etc.—shall be entered into the project EDMS files, including the supporting document record numbers. Annual project audit and assessment documentation, per the DEQ QMP, shall also be entered into the EDMS by the project QAO and/or the project manager, as applicable.

All project documentation and records shall be retained in the EDMS in accordance with the current approved DEQ records retention schedule (DEQ undated).

## 10 Sampling Process Design

This section describes the project data collection activities, assumptions, sampling site selection, general descriptions of the number of samples to be taken, the number of sampling locations, if samples are to be individually handled or composited, and any other relevant project-specific information.

### 10.1 Rationale for Selection of Sampling Sites

The sites will be selected randomly within geographic and administrative stratifications, so that the results will be generalizable to the entire state. Following is the method used:

1. Obtain, from IDL, all the notifications from 2018 and 2019 calendar years that had ‘class I stream’ checked and ‘harvesting of forest tree species’ checked. These include all private and state sales.
2. Remove all sites that had, as a slash management option ‘The contractor attests that he will not cut an amount of timber sufficient to cause a fire risk’. This is the only piece of information available to indicate the size of the sale, and loosely correlates to 5-10 acres. This is the pool of candidates sites for state and private sales.
3. The USFS and BLM sent a list of their timber sales that had more than 5 acres harvested, and contained a class I stream. This is the pool of federal sales.
4. Both pools were merged, and a random number assigned to each.
5. Starting from the smallest numbered site, 40 sites were chosen that met the following criteria:
  - a. Each BLM District and National Forest must have a site, if available (BLM: Boise, Cottonwood, Coeur d’Alene, Salmon & Challis, USFS: Boise, Payette, Sawtooth, Caribou-Targhee, Panhandle, Nez-Perce Clearwater, Salmon-Challis).
  - b. Each IDL supervisory area (there are 10) must have at least two private or state sites. This is to check on administrative enforcement of the FPA, and to distribute the workload.
  - c. There must be a total of 10 federal, 10 industrial private, 10 non-industrial private and 10 state sales.
6. If the list did not meet the above requirements, the lowest numbered site that met the requirement was added (if it existed), and exchanged with the highest numbered site from the first-cut list that would not cause one of the above requirements to be skipped.
7. Sites may be rejected based on accessibility and logistical considerations.
8. DEQ is responsible for selecting the audit sites.

## 10.2 Sample Design Logistics

Sampling logistics for this project, such as sample locations and handling, will be determined as needed.

## 11 Sampling Methods

An audit shall consist of field observation of a timber sale, usually after the harvesting is complete. The audit team, consisting of one DEQ and one IDL staff person, shall observe the entire substantive area of the timber sale. The team should attempt to walk every road and skid trail, and inspect every culvert. The team must visit every Class I stream crossing.

At each location where a rule is applicable, the audit team will decide whether the rule has been complied with. The team will discuss each situation, and attempt to be unanimous in their opinion. Disagreements will be noted on the field form. If disagreements are not resolved, the DEQ staff member's opinion will be used in the final audit report, but the dissenting opinion will be noted and elaborated.

Gradient will be measured using a professional-grade clinometer, such as the Suunto PM-5.

Distance will be measured using a measuring tape or laser rangefinder. Distance measurements may be approximated by pacing or visually estimating.

Personal protective equipment (PPE) necessary to perform the field work for this project shall be consistent with the requirements of the *Idaho General Safety and Health Standards* (Division of Building Safety 2006) and all project-specific health and safety plans associated with the project.

In addition to these PPE requirements, the following specific PPE is required for field work associated with this project:

- Sturdy footwear
- Hard hat and high-visibility vest for active timber sales
- First aid kit, to be kept in the vehicle

Fieldwork quality will be controlled by following the audit form during each sampling event, and using consistent guidance for evaluating each question.

**Table 3. Analytes and laboratories.**

Analytes	Analyzing Laboratory	Shipping Address
eDNA	National Genomics Center for Wildlife and Fish Conservation	US Forest Service Rocky Mountain Research Station 800 East Beckwith, Missoula, MT 59801

## 12 Sample Handling and Custody

Samples will be collected by DEQ personnel using laboratory-supplied sampling containers, labeled, placed in cool dark place (ice is not necessary), and shipped to the laboratory or frozen within two weeks.

DEQ personnel will oversee proper storage and handling of all samples collected until transferred to the appropriate analytical facility or properly discarded by DEQ. Chain-of-custody forms will be used to document sample custody and transfer. Chain-of-custody forms will accompany the samples from sample collection throughout the shipping process and shall be filed in the project EDMS files by the project manager.

## 13 Analytical Methods

Table 4 lists the analytical method, container type, preservative, and holding time applicable to all samples obtained under this project. Samples must be preserved and analyzed within the holding times. All sample collection and preparation instructions provided by the analytical laboratory will be followed throughout the duration of each project.

**Table 4. Analytical method, container types, preservation method, and sampling holding times.**

Compounds	Parameter	Analytical Method	Sample container	Preservative	Holding Time
eDNA	eDNA	National Genomics Center standards	Filter paper and plastic bag.	Keep cool and dry.	2 weeks until frozen, then 6 months

## 14 Quality Control

Generally speaking, quality control (QC) is a means of measuring or estimating the potential variability involved with sample collection, analysis, or measurement activities in the field and laboratory. This section will discuss the various QC activities associated with this project.

### 14.1 Field QC Checks

Field QC will consist of two events, which may occur concurrently:

1. The QAO will oversee at least one audit to ensure that the audit crew is evaluating every applicable forest rule. Any departures from the protocol will be investigated and discussed.
2. The QAO will conduct a duplicate parallel audit of one site. This will include independent observation, and participation in the final discussion. This audit form will not be shared with the audit crew until the site is complete. The QAO should informally debrief the audit team immediately following the audit, and note any areas of concern.

The QAO shall provide his/her audit form to the project manager to calculate the overall precision, as detailed in section 7.1.

## **14.2 Laboratory Quality Control Checks**

Laboratory QC checks are routinely performed as part of the analysis process. The frequency and type of QC samples are often analysis method-dependent and include reagent blanks, matrix spikes, and internal laboratory splits. Analyzing laboratories will report any variance from QC limits impacting the quality of sample results and may report details of internal laboratory QC if requested. Laboratory QA/QC and data reports will be filed in the EDMS following applicable filing protocols.

Laboratory QC checks include internal checks for sample analysis activities, duplicate samples, and blanks. The following paragraphs describe common components of laboratory QA/QC programs.

**The laboratory will provide a QC package explaining the results of their QC checks.**

## **14.3 Data Analysis Quality Control Checks**

The QC check data may be checked/reviewed for quality by the project manager or the project QAO at any time during the project and must be checked after all of the data are collected. Corrective actions, as needed, will be documented in the event control limits are exceeded. Data qualifiers will be assigned following appropriate data verification/validation procedures. Any qualifiers added will be defined in the project summary/technical report and will be consistent with EPA QA/G-8 (EPA 2002b).

## **15 Instrument/Equipment Testing, Inspection, and Maintenance**

Field instruments shall be operated and maintained in accordance with the individual instrument/equipment manual.

## **16 Instrument/Equipment Calibration and Frequency**

Each instrument will be visually inspected by field sampling personnel for damage and operability prior to each sampling event.

## **17 Inspection/Acceptance of Supplies and Consumables**

The supplies and consumable items required for monitoring projects will be consistent with the eDNA sampling procedure (USFS 2016). All sample containers will be obtained from a laboratory equipment provider. All sampling supplies and consumable items will be new,

inspected for acceptance by the project manager prior to use, and used once during each sample collection event.

## **18 Non-direct Measurements and External Data Acquisition**

No other non-direct data are expected to be acquired or used by this project.

## **19 Data Management**

An electronic copy of the audit report database will be kept in TRIM. The local copy of the database will be backed up at the end of each field day.

If paper forms are used, the data will be transferred to the database as soon as possible. If data transfer does not occur within one week, the paper form shall be kept and filed in TRIM; otherwise the paper copy may be discarded.

After review by the QAO and project manager, the final report will be published on the DEQ website and presented to the Forest Practices Act Advisory Committee.

## **20 Assessment and Response Actions**

Assessment of the project QAPP will be performed by reviewing field notes and audit reports and by conducting at least one field audit. This assessment will be completed or directed by the QAO. Any errors or inconsistencies identified in the field notes will be investigated and corrected to ensure the integrity of the data and conformance to the QAPP. The QAO will perform assessment of the project independently of the project manager.

A note to the file will be included with the field notes if any follow-up QA activities regarding field notes are required and conducted.

Audits and reports shall utilize the appropriate checklist forms located in Appendix A and will be documented in TRIM, indicating the date of the audit and listing identified issues or concerns in accordance with the QMP. If the project QAPP requires revision as a result of this audit or review, these actions will be taken and the revised QAPP submitted for approval prior to implementation, per the DEQ QMP (DEQ 2012a).

## **21 Reports to Management**

Project and sample results for the 2020 forest practices audits will be presented in a project-specific report. This report will be provided to the program manager, and also to the Idaho Forest Practices Advisory Council.

## 22 Data Review, Verification, and Validation

**Data review** is conducted (ideally by the project manager or project technical staff) to ensure that project data have been recorded, transmitted, and processed correctly. Data review is normally performed by the unit/staff generating the data.

**Data verification** is generally conducted (ideally by the project manager or project technical staff) following initial data review and is performed to evaluate the completeness, correctness, conformance, and compliance of the data against the QAPP-specified method, procedural, or contractual requirements. The purpose of data verification is to evaluate the extent to which the sample collection requirements, analytical processes prescribed in the QAPP, and specified project procedures were followed. Data verification essentially evaluates the actual project performance against the requirements established in the QAPP. The output from this process is considered and evaluated during the reconciliation with user requirements (assessment) phase. Data verification is normally performed by the unit/staff generating the data.

**Data validation** shall be conducted by the project QAO or a subject matter expert not otherwise assigned to the project or unit generating data. This process shall follow data review and verification and is an analyte- and sample-specific process that extends the data evaluation beyond method, procedure, or contractual compliance to determine the quality of a specific data set relative to the end use. This effort should focus on the project-specific data needs and note any potentially unacceptable departures from the QAPP. The output from this process is considered and evaluated during the reconciliation with user requirements (assessment) phase.

**Data review, verification, and validation tasks are assigned to specific project staff, such as the project manager or project QAO, in section 23 of the project QAPP.**

The level of documentation required for a specific project data review, verification, validation, and reconciliation effort is specified below. This level of documentation is determined by the project manager, in consultation with the program or regional manager, consistent with the “graded approach” used by DEQ in implementing the quality management system (QMS).

Those assigned to perform project data review, verification, and validation *shall use the associated checklist provided in the appendices to perform and document* the effort in the associated project EDMS file. The checklists are also available as stand-alone documents in the DEQ EDMS as follows: data review (record 2012AEB2), data verification (record 2012AEB3), and data validation (record 2012AEB4).

## 23 Review, Verification, and Validation Methods

Data review, verification, and validation efforts are based on the analytical support determined to be necessary in the planning stages of the project. DEQ personnel performing data verification and validation are encouraged to review the following guidance documents:

- EPA QA/G-8 (EPA 2002b) for guidance on methods for this task.
- Appendix A of EPA’s *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 2009)

- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA 2004).
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (EPA 2008).

**Review** of data and information collected under this QAPP shall be performed by the project manager using the data review checklist found in **Appendix A**. This review will also include evaluation of supplied laboratory data reports. Data review will include the following activities, at a minimum:

- An examination of project data, identifying errors or undocumented changes in data entry, storage, calculation, reduction, transformation, or transcription.
- An examination to ensure all required sample information is documented and available, in preparation for the verification, validation, and assessment processes. This includes pertinent project information concerning blanks, matrixes, temperature requirements, duplicates, preservatives, shipping dates, holding times, chain-of-custody records, etc.
- An examination to identify if all required external data (non-direct measurement data) information *and supporting documentation*, as required by the project QAPP, have been received and are available for the verification and validation processes.
- A determination if any data deficiencies exist, such as missing data or compromised data integrity, due to issues such as loss in acquisition, storage, or processing.
- An examination to ensure all necessary analytical laboratory support documentation, as set forth and stipulated in the project QAPP (and FSP, if used), have been received from the applicable laboratories.
- An examination to identify programming, data entry, or software related errors, if applicable to the project.

**Verification** of data and information collected under this QAPP shall be performed by the project manager using the data verification checklist found in **Appendix A**. The general focus of the process is to identify if all requirements specified in the project QAPP, associated procedures, and project contractual requirements (if applicable), have been met, and if not, to determine the extent to which requirements failed to be achieved. Data verification will include the following activities, at a minimum:

- Verification that all data completeness criteria, as stated in the project QAPP, have been satisfied. This shall include items such as the number of samples, number of QC samples such as spikes and duplicates, and chain-of-custody record continuity.
- Verification that the values of individual data points, and/or comparison calculations such as RPD, meet the criteria specified in the QAPP.
- Verification that the required analytical methods, as listed in the project QAPP, correspond to the analytical methods employed by the laboratory, as recorded in laboratory reports.
- Verification that QAPP requirements relative to laboratory analytical support documentation have been satisfied by the reporting laboratory, including the correct application of data qualifiers.
- Verification that all supporting information and documentation for external data (non-direct measurement data) meet the requirements of the QAPP. If not, identify any limitations or restriction on the use of such data.

- Verification that data and sample collection practices adhered to procedural requirements, to include a review of project logs and field notes, as applicable.
- Verification that sample handling activities conform to QAPP (and FSP, if used) requirements. Examples include sample shipment timelines, sample holding times, preservatives, number of samples obtained, duplicate or split sample frequency, and chain-of-custody documentation.
- Verification that data calculation and handling activities conform to QAPP (and FSP, if used) requirements. Examples include correct use of mathematical formulas, numerical methods, programs and programing, and correct application and documentation of database editing and information transfers.
- Verification that any remaining or unique project QAPP (and FSP, if used) or procedural requirements have been met, and if not, determine and document the extent to which these requirements failed to be achieved.
- Determine and document any limitations on the use of the project data.

**Validation** of data and information collected under this QAPP shall be performed by the project QAO using the data validation checklist found in [Appendix A](#). The general focus of the process is to identify if the quality of the project data meets the needs of the end user and the associated decision makers.

**The data validation effort for this project shall** include the following activities, at a minimum:

- An evaluation and examination of all (100%) of obtained field QC sample results, such as duplicates and trip blanks, etc., followed by assignment (if necessary) of appropriate data qualifiers to these data based on project criteria.
- A review of project analytical laboratory reports and data, including the assigned data qualifiers, to evaluate the data quality with respect to the project DQOs. Assign data qualifiers to individual data values as necessary and appropriate.
- A review of the outcome of the data verification effort to evaluate the impact on data quality with respect to the DQOs.
- A determination, when necessary and where possible, of the reasons for any failure to meet methodological, procedural, or contractual requirements and an evaluation of the impact of such failure on the overall data.
- A comparison of the project DQOs, as defined in the project QAPP (and FSP, if used), to the data obtained by the project to assess the adequacy of the data (new or external) in relation to their intended use.
- A determination of the extent to which any external data (non-direct measurement data), and the accompanying supporting information and documentation, meet the requirements of the data user. Specifically, does the quality of the existing data adequately support the needs of the project and support the intended use of the data for the project.
- Determine and document any limitations on the use of the project data.
- Determine the adequacy of the data to proceed on to the data assessment and reconciliation with user requirements phase.

Any potentially unacceptable departures from the requirements of the project QAPP will be noted during the data review, verification, and validation process. If the project manager or the project QAO determines the data do not meet the needs of the project or the DQOs of the QAPP

and/or if the conclusions drawn from the data do not appear to be reasonable, the project manager and the QAO shall immediately report such findings to the appropriate regional manager and/or State Office program manager to determine the necessary corrective actions. Documentation of such findings and activities shall be maintained in accordance with the DEQ QMP.

## **24 Reconciliation with User Requirements**

Data quality assessment (DQA) will be performed in accordance with this QAPP and the DEQ QMP (DEQ 2017). Additional guidance for conducting data assessment can be found in EPA QA/G-9R or EPA QA/G-9S (EPA 2006a, b).

The DQA will be performed (at a minimum) by the project manager and the project QAO to determine if the project data set is of the right type, quality, and quantity to achieve the objectives of the project and can confidently be used to make an informed decision.

Information and findings associated with the project data review, verification, and validation efforts shall be considered during the data assessment process.

When DQOs are not met, the project manager will discuss appropriate corrective actions with project staff, project management, and with the analytical laboratory. Corrective actions may be initiated to suggest improvements to data collection activities, data and sample handling techniques, internal laboratory quality procedures, etc., to solve quality issues.

If the project manager or the QAO decide the project data do not meet the project needs or the QAPP quality objectives or if the conclusions drawn from the data do not appear to be reasonable, the project manager and the QAO shall immediately report such findings to the appropriate regional manager and/or State Office program manager to determine and document the necessary corrective actions.

If sampling activities require revision, the project QAPP will be revised as necessary. Following revision, and prior to implementation, the revised project QAPP must be re-approved in accordance with the DEQ QMP (DEQ 2017).

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## 25 References

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## Appendix A. Project Checklists

All checklists in this appendix are available for download and use by project staff as standalone electronic documents, from either the DEQ EDMS or the DEQ Quality System website: <http://deq.intranet/quality-management/administrative-resources.aspx>. Prior to using an activity checklist, project staff should review the applicable requirements listed in the project QAPP and the QMP.

The following checklists are included in this appendix:

- Data Review—EDMS # **2012AEB2**
- Data Verification—EDMS # **2012AEB3**
- Data Validation—EDMS # **2012AEB4**

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## DEQ QAPP/FSP Checklist—Data Review

The individual(s) assigned in the project QAPP/FSP to perform **data review** shall complete and file this checklist in the appropriate project electronic document management system (EDMS) file. Project personnel are encouraged to expand this standard list, as project conditions warrant.

\_\_\_\_\_  
 Printed Name of Staff Performing Data Review \_\_\_\_\_  
 Date Completed

\_\_\_\_\_  
 Project QAPP/FSP Title \_\_\_\_\_  
 QAPP/FSP EDMS Record #

**Check the following review boxes after completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Verify that the approved current project quality assurance project plan (QAPP), including a copy of the signed approval signature page, is currently filed in the EDMS. Also, verify the project information has been entered into the quality assurance officer (QAO) project tracker found at EDMS # **2012AEB8**. If the QAPP is not filed in the EDMS, or the QAO tracker is not current, immediately inform the DEQ quality manager.

\_\_\_\_\_  
 \_\_\_\_\_

- If the project utilizes a field sampling plan (FSP), verify that the approved project FSP, including a copy of the signed approval signature page, is currently filed in the EDMS. Also, verify the project information has been entered into the QAO project tracker found at EDMS # **2012AEB8**. If the FSP is not filed in the EDMS, or the QAO tracker is not current, immediately inform the DEQ quality manager.

\_\_\_\_\_  
 \_\_\_\_\_

- Examine and review the project QAPP (and FSP, if used) to determine if additional project-specific data *review* requirements apply. Update this checklist to include all such items.

\_\_\_\_\_  
 \_\_\_\_\_

- Examine project data, identifying errors or undocumented changes in data entry, storage, calculation, reduction, transformation, or transcription.

\_\_\_\_\_  
 \_\_\_\_\_

Yes No

Ensure all required sample information is documented and available, in preparation for the verification, validation, and assessment processes. This includes pertinent project information concerning blanks, matrixes, temperature requirements, duplicates, preservatives, shipping dates, holding times, chain-of-custody records, etc.

\_\_\_\_\_  
 \_\_\_\_\_

Identify if all required external (non-direct measurement) data, information, *and supporting documentation*, as required by the QAPP (and FSP, if used), have been received and are available for the verification and validation processes.

\_\_\_\_\_  
 \_\_\_\_\_

Determine if any data deficiencies exist, such as missing data or compromised data integrity, due to issues such as loss during acquisition, storage, editing, or processing.

\_\_\_\_\_  
 \_\_\_\_\_

Ensure all necessary analytical laboratory support documentation, as set forth and stipulated in the project QAPP (and FSP, if used), have been received from the applicable laboratories.

\_\_\_\_\_  
 \_\_\_\_\_

Identify programming, data entry, or software related errors, if applicable to the project.

\_\_\_\_\_  
 \_\_\_\_\_

Ensure that all deficiencies or conditions adverse to quality determined during the data *review* process have been communicated to project management and are listed on this checklist or attached for inclusion in the EDMS.

\_\_\_\_\_  
 \_\_\_\_\_

Verify that a copy of this data review checklist has been provided to the project manager for deficiency resolution and placed in the project EDMS file. Note that additional administrative actions may be required based on the review findings, such as development of a corrective action plan, report, etc. The project manager shall consult the DEQ Quality Management Plan and proceed accordingly.

\_\_\_\_\_  
 \_\_\_\_\_

Please list any additional comments below. Attach additional sheets as necessary.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## DEQ QAPP/FSP Checklist—Data Verification

The individual(s) assigned in the project QAPP/FSP to perform **data verification** shall complete and file this checklist in the appropriate project electronic document management system (EDMS) file.

Project personnel are encouraged to expand this standard list, as project conditions warrant.

\_\_\_\_\_  
Printed Name of Staff Performing Data Verification

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Project QAPP/FSP Title

\_\_\_\_\_  
QAPP/FSP EDMS Record #

**Check the following review boxes after completion of each listed task.**

**Check *yes* if the task was completed without any noted discrepancies. Otherwise, check *no* and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Examine and review the quality assurance project plan (QAPP), and field sampling plan (FSP) if used, to determine if additional project-specific data *verification* requirements apply. Update this checklist to include all such items.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Verify that all data completeness criteria, as stated in the QAPP (and FSP, if used), have been satisfied. This shall include items such as the number of samples, number of quality control samples such as spikes and duplicates, and chain-of-custody record continuity.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Verify that the values of individual data points and any comparison calculations such as relative percent difference, meet the QAPP (and FSP, if used) specifications.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Verify that the required analytical methods, as listed in the QAPP (and FSP, if used) correspond to the analytical methods employed by the laboratory, as recorded in laboratory reports.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Verify that QAPP (and FSP, if used) requirements relative to laboratory analytical support documentation have been satisfied by the reporting laboratory, including the correct application of data qualifiers.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- Verify that all supporting information and documentation for external (non-direct measurement) data meet the requirements of the QAPP (and FSP, if used). If not, identify any limitations or restriction on the use of these data.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Yes No

- Verify that data and sample collection practices adhered to procedural requirements, to include a review of project logs and field notes, as applicable.

- Verify that sample handling activities conform to QAPP (and FSP, if used) requirements. Examples include sample shipment timelines, sample holding times, preservatives, number of samples obtained, duplicate or split sample frequency, and chain-of-custody documentation.

- Verify that data calculation and handling activities conform to QAPP (and FSP, if used) requirements. Examples include correct use of mathematical formulas and numerical methods, correct use of programs and programing, and correct application of database information transfers.

- Verify that any remaining or unique QAPP (and FSP, if used) or procedural requirements have been met, and if not, determine the extent to which these requirements failed to be achieved.

- Determine and document any limitations on the use of the project data.

- Ensure that all deficiencies or conditions adverse to quality determined during the project data *verification* process have been communicated to project management and are listed on this checklist or attached for inclusion in the EDMS.

- Verify that a copy of this data verification checklist has been provided to the project manager for deficiency resolution and placed in the project EDMS file. Note that additional administrative actions may be required based on the verification findings, such as development of a corrective action plan, report, etc. The project quality assurance officer shall consult the DEQ Quality Management Plan and proceed accordingly.

Please list any additional comments below. Attach additional sheets as necessary.

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## DEQ QAPP/FSP Checklist—Data Validation

The individual(s) assigned in the QAPP/FSP to perform **data validation** shall complete and file this checklist in the appropriate project electronic document management system (EDMS) file. Project personnel are encouraged to expand this standard list as project conditions warrant.

---

Printed Name of Staff Performing Data Validation

---

Date Completed

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Project QAPP/FSP Title

---

QAPP/FSP EDMS Record #

**Check the following review boxes after completion of each listed task.**

**Check yes if the task was completed without any noted discrepancies. Otherwise, check no and include a description of the discrepancy in the space provided. Use additional sheets as necessary.**

Yes No

- Verify that the approved and current quality assurance project plan (QAPP), including a copy of the signed approval signature page, is currently filed in the EDMS. Also, verify the project information has been entered into the quality assurance officer (QAO) project tracker found at EDMS # **2012AEB8**. If the QAPP is not filed in the EDMS, or the QAO tracker is not current, immediately inform the DEQ quality manager.

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- If the project utilizes a field sampling plan (FSP), verify that the approved project FSP, including a copy of the signed approval signature page, is currently filed in the EDMS. Also, verify the project information has been entered into the QAO project tracker found at EDMS # **2012AEB8**. If the FSP is not filed in the EDMS, or the QAO tracker is not current, immediately inform the DEQ quality manager.

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- Examine and evaluate the project QAPP (and FSP, if used) to determine if additional project-specific data *validation* requirements apply. Update this checklist to include all such items.

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- Examine and evaluate all (100%) of obtained field quality control sample results (i.e. duplicates, trip blanks, etc.) followed by assignment (if necessary) of appropriate data qualifiers to these data based on project criteria.

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- Assess project analytical laboratory reports and data, including the assigned data qualifiers, to evaluate the data quality with respect to the project data quality objectives (DQOs). Assign and document data qualifiers to individual data values as necessary and appropriate.

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Yes No

- Evaluate the outcome of the data verification effort and assess the impact on data quality with respect to the DQOs.  
\_\_\_\_\_  
\_\_\_\_\_
- Determine, when necessary and where possible, the reasons for any failure to meet methodological, procedural, or contractual requirements and evaluate the impact of such failure on overall data quality.  
\_\_\_\_\_  
\_\_\_\_\_
- Compare the project DQOs, as defined in the QAPP (and FSP, if used), to the data obtained to assess the adequacy of the data (new or external) in relation to their intended use.  
\_\_\_\_\_  
\_\_\_\_\_
- Determine the extent to which any external (non-direct measurement) data, and the accompanying supporting information and documentation, meet the requirements of the end user. Specifically, does the quality of the data adequately support the needs of the project and support its intended use?  
\_\_\_\_\_  
\_\_\_\_\_
- Determine and document any limitations on the use of the data.  
\_\_\_\_\_  
\_\_\_\_\_
- Determine the adequacy of the data to proceed on to the data-assessment and reconciliation-with-user-requirements phases.  
\_\_\_\_\_  
\_\_\_\_\_
- Ensure that all deficiencies or conditions adverse to quality determined during the project data *validation* process have been communicated to project management and are listed on this checklist or attached for inclusion in the EDMS.  
\_\_\_\_\_  
\_\_\_\_\_
- Verify that a copy of this data validation checklist has been provided to the project manager for deficiency resolution and placed in the project EDMS file. Note that additional administrative actions may be required based on the validation findings, such as development of a corrective action plan, report, etc. The project QAO shall consult the DEQ Quality Management Plan and proceed accordingly.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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## Appendix B. Appendix B: Audit Form

This is the 2016 audit form. 2020 will be very similar, and is in progress.

Site	Admin	Roads	Yarding	Streams	Stocking	Chemicals	General	Summary	
Sale Name	<input type="text"/>		Audit Date	<input type="text"/>					
County	<input type="text"/>	▼	Ownership	<input type="text"/>					▼
FPA Region	<input type="text"/>	▼	Forest Type	<input type="text"/>					▼
Yarding	<input type="text"/>	▼	Silvicultural	<input type="text"/>					▼
Felling	<input type="text"/>	▼	Activities	<input type="text"/>					▼
Notification Number	<input type="text"/>		<input type="checkbox"/> Harvest In-Progress?						
Notification Date	<input type="text"/>		<i>Site Notes</i>						
Volume (mmbf)	<input type="text"/>		<div style="background-color: #cccccc; width: 100%; height: 100%;"></div>						
Owner	<input type="text"/>								
Operator	<input type="text"/>								
Forester	<input type="text"/>								
Inspector	<input type="text"/>								
Auditors	<input type="text"/>								▼
Others Present	<input type="text"/>								

N/A  Yes  No

**Variances**

- Variance request made in writing? (020 01ai)
- Variance request evaluated by IDL? (020 01aii)
- Variance provides equal protection? (020 01aiii)
- Lake site-specific plan for SPZ activities? (030 07a)
- Site-specific BMPs followed, if required? (031 04)

Details of variance, if granted

**Roads**

- Plan minimizes road width? (040 02b)
- Plan aligns road with natural terrain features? (040 02b)
- Plan drains roads naturally where possible? (040 02c)
- Plan includes culverts and ditches to protect roads? (040 02d)
- Plan avoids road reconstruction in SPZ? (040 02h)
- Plan avoids road construction in SPZ? (040 02a)
- Plan leaves vegetation between roads and streams? (040 02a)
- Plan disposes of road material in stable location? (040 02b)
- Were earthwork and hauling suspended during rain? (040 03h)
- Was hauling minimized during wet periods? (040 04civ)

**Crossings**

- Plan minimizes number of stream crossings? (040 02g)
- If bridges >75' long, IDWR permit obtained? (020 01b)
- If bridges encroach on stream, IDWR permit obtained? (020 01b)
- If culverts >60' in class II, IDWR permit obtained? (020 01b)
- If culverts >85" dia, IDWR permit obtained? (020 01b)
- If fords >75' long or >25' wide, IDWR permit obtained? (020 01b)
- Are all planned culverts >12" in diameter? (040 02eiii)
- Are planned culverts appropriately sized? (040 02eii)
- Do planned culverts provide fish passage? (040 02ei)
- Do planned culverts minimize discharge of sediment? (040 02d)
- Plan has fords crossing stream at right angles? (040 02g)
- Plan avoids fords in areas with gradient >4%? (040 02g)
- Plan has fords cross-drained and rocked for 75'? (040 02g)
- Plan avoids fords harming salmonid spawning? (040 02g)

**Administrative Notes**

Site	Admin	Roads	Yarding	Streams	Stocking	Chemicals	General	Summary
------	-------	-------	---------	---------	----------	-----------	---------	---------

N/A     Yes     No

### Construction

<input type="checkbox"/> Were roads constructed according to plans? (040 03a)	<input type="checkbox"/> Has road fill material been properly compacted? (040 03d)
<input type="checkbox"/> Was embankment erosion minimized? (040 03g)	<input type="checkbox"/> Has outslope drainage been retained and berms removed? (040 03e)
<input type="checkbox"/> Have erosion sources been repaired? (040 04b)	<input type="checkbox"/> Are roads on slopes >60% full benched (or variance)? (040 03j)
<input type="checkbox"/> Have exposed erodible materials been stabilized? (040 03c)	<input type="checkbox"/> Were cut-slopes reconstructed to minimize sloughing? (040 03i)
<input type="checkbox"/> Has bare earth been stabilized? (040 04gvi)	<input type="checkbox"/> Were embankments built without wood or excessive ice? (040 03d)
<input type="checkbox"/> Is debris placed to avoid stream entry? (040 04a)	

### Drainage

<input type="checkbox"/> Are quarries properly drained? (040 03f)	<input type="checkbox"/> Is road drainage adequate with no unnecessary berms? (040 04cii)
<input type="checkbox"/> Has adequate drainage been installed for winter use? (040 05a)	<input type="checkbox"/> Were relief culverts with gradient <1% installed? (040 03g)
<input type="checkbox"/> Are culverts and ditches functional? (040 04ci)	<input type="checkbox"/> Is road surface adequately maintained? (040 04ciii)
<input type="checkbox"/> Are all surfaces and drainage structures maintained? (040 04ei)	<input type="checkbox"/> Has ditch-line erosion been controlled? (040 04gv)
<input type="checkbox"/> Was surface drainage maintained during thaws? (040 05b)	<input type="checkbox"/> Were surface-stabilizing materials kept out of streams? (040 04cv)

### Inactive and Abandoned Roads

<input type="checkbox"/> Are inactive roads controlling erosion? (040 04fi)	<input type="checkbox"/> Have inactive roads been blocked to vehicular traffic? (040 04fii)
<input type="checkbox"/> Are inactive bridges and culverts maintained? (040 04fiii)	<input type="checkbox"/> Are abandoned drainage structures removed? (040 04gi)
<input type="checkbox"/> Are abandoned crossings restored to original gradient? (040 04gi)	<input type="checkbox"/> Are abandoned road prisms uncompacted? (040 04gii)
<input type="checkbox"/> Are abandoned fill slopes have long-term stability? (040 04giii)	<input type="checkbox"/> Are abandoned sidehill fills stable? (040 04giv)

### Road Notes

N/A  Yes  No

*Trails*

Skid trails kept to minimum width and number (030 03c)

Were skidding tractor sizes appropriate? (030 03c)

Skid trail gradients <30% on unstable soils? (030 03b)

Did log skidding avoid causing rutting or erosion? (030 03a)

Was erosion minimized during downhill yarding? (030 03d)

Landings and skid trails located in stable areas outside of SPZ? (030 04a)

Are trail drainage and stabilization adequate and current? (030 05a)

*Landings*

Size of landings minimized? (030 04b)

Sidecasted landings properly stabilized? (030 04c)

Landings and trails located to minimize sidecasting? (030 04a)

Landing drainage and stabilization adequate? (030 05b)

No loose stumps nor excessive slash in landing filler? (030 04c)

*Yarding Notes*

[Empty text area for Yarding Notes]

N/A  Yes  No

**Crossings**

- Stream crossings at right angles? (030 07b)
- Temporary stream crossings adequate? (030 07b)
- Ends of stream-crossing skid trails water barred? (030 07b)
- Temporary stream crossings removed immediately? (030 07b)
- Water diversions screened appropriately? (020 01ciii)
- Was stream crossing fill on slopes >60% minimized? (040 03j)

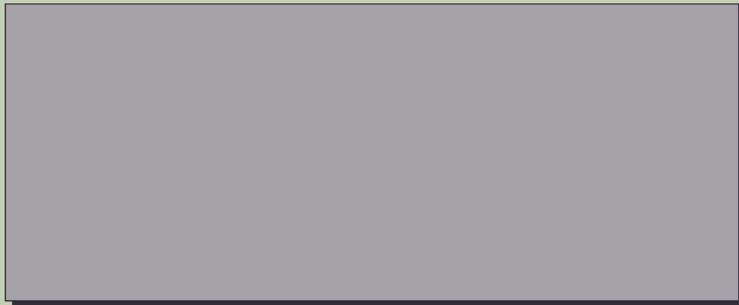
Number of Class I stream-crossing structures

**Riparian Disturbance**

- Was riparian management variance followed? (030 07evii)
- No disturbance on riparian slopes >45% (030 03a)
- Streamside shrubs, grasses and rocks remaining? (030 07ei)
- Stream disturbance minimized during cable yarding? (030 07d)
- Trees felled away from Class I streams? (030 06a)
- Avoid skidding logs through streams? (030 07b)
- If banks were armored, IDWR permit obtained? (020 01b)
- Avoid ground-based equipment use in SPZ? (030 07c)

**Slash and Debris**

- Was non-LOD slash moved 5' above OHWM in Class I? (030 07evi)
- Was non-LOD slash below OHWM removed in Class II? (030 07evi)
- Non-LOD harvest debris moved 5' above OHWM in Class I? (030 06a)
- Non-LOD harvest debris moved above OHWM in Class II? (030 06b)
- Naturally down LOD remaining over Class I stream? (030 07v)
- Felled trees left as LOD in Class I? (030 07iv)
- Trail waste deposited only outside of SPZ? (030 06c)
- Road debris deposited only outside SPZ? (040 03b)
- Mechanical piling of slash in SPZ avoided? (030 07fii)
- Were hand piles >5' from OHWM? (030 07fi)



*LOD = Live or dead trees and parts or pieces of trees that are large enough or long enough or sufficiently buried in the stream bank or bed to be stable during high flows. Pieces longer than the channel width or longer than twenty feet are considered stable.*

LOD, shade and filtering maintained in SPZ? (030 07iv)  N/A  Yes  No

**Class I Streams**

Plot Length (ft)  Plot Width (ft)   
 Forest Type  either 75' or 150' (one or both sides above OHWM)

Distance Above OHWM	Tree Diameter Class (DBH in inches)						
	4-8"	8-12"	12-16"	16-20"	20-24"	24-28"	28-32"
0-25'	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
25-50'	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
50-75'	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Shade Option Selected

Distance	Actual RS	Required RS	Required stocking met or exceeded? (030 07eii)	Only one shade option implemented? (030 07eii)
0-25'	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
25-50'	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
50-75'	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Class II Streams or Reforestation**

Tree Count (DBH in inches)  Plot Length (ft)   
 < 3" 3 - 11" > 11" Plot Width (ft)   
 Required stocking >170 North of Salmon River or >125 South of Salmon River

Was stocking adequate within 30' of Class II OHWM? (030 07eiii)

Was stocking adequate across the entire harvested area? (50 04)

Actual Stocking

Are leave-trees of acceptable species and quality? (050 02)  Are leave-trees reasonably distributed? (030 07eiii)  Was replanting-exempt land protected with vegetation? (050 05b)

*Stocking and Reforestation Notes*

N/A  Yes  No

**Storage**

- Were pesticides stored securely? (060 04b)
- Were pesticides stored safely? (060 04b)
- Were warning notices posted for dangerous pesticides? (060 04b)
- Are large petroleum containers stored >100' from water? (060 02)
- Does impervious catchment > 110% storage volume? (060 02)

**Records**

- Did pesticide applicator have current Idaho license? (060 03)
- Were the pesticide(s) registered for use in Idaho? (020 01b)

Were the proper records kept for:

- |  |  |                                       |
|--|--|---------------------------------------|
| Pesticides?<br>(060 10a)                         | <input type="checkbox"/> Date and time?            | Amendments?<br>Soil<br>Fertilizers or |
|  | <input type="checkbox"/> Owner name and address?   |                                       |
|  | <input type="checkbox"/> Purpose?                  |                                       |
|  | <input type="checkbox"/> Contractor or pilot name? |                                       |
|  | <input type="checkbox"/> Project location?         |                                       |
|  | <input type="checkbox"/> Hourly air temperature?   |                                       |
|  | <input type="checkbox"/> Hourly wind information?  |                                       |
| <input type="checkbox"/> Details and quantities? |  |                                       |

Which chemical(s) were used?

- 
- Were chemicals applied in accordance with the label? (060 09a)
  - Were chemicals applied at allowable rates? (060 09b)

**Equipment**

- Was rinsate properly disposed of? (060 05biii)
- Did fuel transfers avoid risk of spills to water? (060 02a)
- Did chemical mixing avoid risk of spills to water? (060 05bi)
- Was all petroleum equipment leak-proof? (060 02b)
- Was aerial equipment capable of immediate shut-off? (060 06b)
- Was an air gap provided during chemical mixing? (060 05ai)
- Were fuel transfers attended at all times? (060 02a)
- Did equipment washout avoid risk of spills to water? (060 05bi)
- Was all chemical equipment leak-proof? (060 04a)

**Spills and Misapplications**

- Were chemical spills immediately reported to IDL? (060 12a)
- Were spills immediately controlled and contained? (060 12b)
- Were landings located to avoid spills to water? (060 05bii)
- Did aerial applications of pesticide stay > 100' from open water? (060 06a)
- Did ground applications of pesticide stay > 25' from open water? (060 07a)
- Were hand-applied chemicals used only on specific targets? (060 08a)
- Were petroleum spills immediately reported to IDL? (060 02)
- Were spills appropriately removed? (060 12c)
- Were misapplications immediately reported to IDL? (060 13)
- Did aerial applications of fertilizer stay > 50' from open water? (060 06a)
- Did ground applications of fertilizer stay > 10' from open water? (060 07b)
- Were hand-applied chemicals kept out of all water sources? (060 08b)

**Chemical Notes**

*General Rules*

N/A  Yes  No

020 01b Idaho Water Quality Standards complied with?

030 08c Did operations avoid wet areas?

030 08a Was cleanup and reseeding prompt in scenic areas?

020 01b Hazardous materials disposed of properly?

030 08b Was critical wildlife habitat preserved?

030 08d Wildlife cover available within 1/4 mile of clearcuts?

020 01b Wastewater disposed of properly?

060 02c Was all non-biodegradable waste properly disposed of?

060 11 Were all chemical containers removed?

Were all chemical containers properly disposed of? (060 11)

Method of wastewater disposal

Method of hazardous material disposal

*General Notes*

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Site	Admin	Roads	Yarding	Streams	Stocking	Chemicals	General	Summary
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To what extent were BMPs applied?

Were the BMPs effective?

Did, or could, pollutants enter the water?

What other nonpoint sources are affecting water quality?

Suggested FPA rule changes

Suggested FPA administrative changes

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## **Appendix C: Chain of Custody Form**

(awaiting from lab)

