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Plan

Wastewater Reuse Permit Groundwater Monitoring Program Plan

Idaho Cleanup Project

CH2M ◆ WG Idaho, LLC is the Idaho Cleanup Project contractor for the U.S. Department of Energy

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1. INTRODUCTION

The Idaho Cleanup Project (ICP) owns and operates numerous facilities that manage hazardous and radioactive wastes. Small quantities of radioactive and diluted chemical wastes have previously been released to the Snake River Plain Aquifer as a result of some of these historical operational activities. These contaminants must be monitored, and applicable regulatory and permitting requirements must be implemented. As a result, the ICP Wastewater Reuse Permit (WRP) Groundwater Monitoring Program was developed.

This program plan is used by the Groundwater Monitoring Program to guide groundwater sampling activities in support of the Idaho Nuclear Technology and Engineering Center (INTEC) New Percolation Ponds WRP No. LA-000130-05 (PER-143).

This program plan covers:

- WRP groundwater sampling schedule
- Environmental Protection Agency (EPA) methods used for analysis
- Data quality objectives (DQOs) of the Groundwater Monitoring Program
- Sampling requirements of the WRP
- Sample collection
- Sample analysis
- Quality assurance/quality control (QA/QC) requirements
- Documentation.

1.1 Purpose

The purpose of this program plan is to act as a sampling and analysis plan and to set forth program requirements to ensure that data of sufficient quantity and quality are collected to meet regulatory requirements. This plan is a Category B record as defined in Management Control Procedure (MCP)-135, "Document Management" as an "assisting" document and is not intended to direct work. This program plan addresses permit requirements in the State of Idaho WRP in accordance with:

- "Recycled Water Rules" (IDAPA 58.01.17)
- "Ground Water Quality Rule" (IDAPA 58.01.11).

1.2 Scope

This program plan applies to the groundwater sampling activities in and around Department of Energy (DOE) facilities and operations at the Idaho National Laboratory (INL) Site. This program plan

covers both radioactive and nonradioactive parameters in groundwater and addresses the permit requirements in the State of Idaho WRP and DOE environmental protection objectives.

1.3 Organization

This program plan follows the guidelines of:

- ANSI/ASQC-E4, *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs*
- EPA-QA/R-5, *EPA Requirements for Quality Assurance Project Plans*
- Program Requirements Document (PRD)-5093, "Management of Environmental Data"
- MCP-561, "Quality Program Plan/Quality Assurance Project Plan Development."

Table A-1 in Appendix A provides a cross-cutting comparison to these criteria.

2. PROGRAM DESCRIPTION

The Groundwater Monitoring Program was developed by Environmental Project Support to conduct regular sampling of the Snake River Plain Aquifer and associated perched water bodies. For several years, the wells identified in this program plan and other numerous wells across the INL Site have been sampled, and baselines (based on historical data) for groundwater quality at INL Site facilities have been established.

Under this program plan, data are collected by the Groundwater Monitoring Program to ensure that the ICP complies with the established state guidelines per the WRP.

Results of monitoring are documented in reports submitted to the State of Idaho and in annual monitoring reports. For permit sampling, a decision is made and documented in the report as to whether permit limits or groundwater quality standards applicable to each parameter in each well have been exceeded and whether there is evidence of a change in the concentration of the parameter.

3. REQUIREMENTS AND OBJECTIVES

The objective of the Groundwater Monitoring Program is to fulfill the WRP requirements through representative sampling and analysis of selected wells at the INTEC New Percolation Ponds. This section addresses criteria for obtaining representative samples and maintaining sample quality and integrity, as well as addressing safety considerations for field personnel.

All WRP groundwater sampling is conducted under this plan. A comprehensive list of parameters to be monitored during permit sampling is presented in Section 4, Table 1.

3.1 Data Usage and Types

Data generated from this sampling are used to meet regulatory requirements for WRP groundwater monitoring at the INTEC New Percolation Ponds.

In addition to regular samples, field QC samples are prepared or collected. Section 12, Table 5 shows the types of QC samples collected.

3.2 Personnel Safety and Health Precautions

Hazards associated with the Groundwater Monitoring Program have been identified and mitigated in Job Safety Analysis (JSA)-6634, "Environmental and Regulatory Services Groundwater Monitoring Activities," and JSA-597, "Working in Environmental Project Support Sample Preparation Areas-Various Locations." JSA-6634 was developed for the operations-related task of groundwater sampling performed by Environmental Project Support personnel at the INL Site.

Prior to sampling activities, all personnel are listed on a pre-job briefing, Form 434.14, "Prejob Briefing Checklist." Persons conducting the pre-job briefing are required to have been granted the qualification QLPREJOB, "Performing Pre-Job Briefs," specified in MCP-3003, "Performing Pre-Job Briefings and Documenting Feedback," before performing a pre-job briefing. Persons attending the pre-job briefing must complete required training 00ICP732, "Performing Pre-Job Briefings and Documenting Feedback," specified in MCP-3003, before attending a pre-job briefing. If any person considers conditions to be unsafe during a sampling event, sample collection operations will be stopped in accordance with MCP-553, "Step Back and Stop Work Authority." If a situation arises that is outside the scope of this sampling plan, the sampling procedure or JSA-6634 (for example, petroleum product, high organic, or high radiation), then the work control will be updated or different work control assigned to comply with the Integrated Safety Management System and company work control policy.

4. PROGRAM BASIS AND DESIGN

This section discusses the basis behind the design of the Groundwater Monitoring Program. Most of the design requirements are derived from the INTEC New Percolation Ponds WRP No. LA-000130-05 (PER-143). Other factors integral to the design basis of the program are discussed under project DQO development in Section 6.

4.1 Monitoring Locations

Permit monitoring well locations are set by WRP Permit LA-000130-05 requirements. Table 1 lists the permit groundwater monitoring wells sampled under the existing WRP. Table 2 contains well information for all sampling locations mentioned in the plan. Figure 1 shows the WRP facility location, and Figure 2 shows the permit well locations for the WRP.

4.2 Sampling Frequency and Analytes

Required sampling frequencies and sample parameters are negotiated with the State of Idaho Department of Environmental Quality (DEQ) and documented in the WRP and other negotiated agreements.

All WRP sample collection activities, which include water level measurement, well purging, parameter collection, and actual sample collection, are conducted in accordance with this program plan and applicable Groundwater Monitoring Program technical procedures (TPRs) and sampling procedures (SPRs).

Table 1. Groundwater monitoring frequency, locations, and parameters.

WRP Permit Number	Monitoring Frequency	Monitoring Location	Well Name or Number	Parameters
LA-000130-05	Semiannually— April/May September/October	INTEC New Percolation Ponds	ICPP-MON-A-164B ICPP-MON-A-165 ICPP-MON-A-166 ICPP-MON-V-191 ICPP-MON-V-200 ICPP-MON-V-212	Biochemical oxygen demand[a] Chloride[a] Fecal coliform[a] Fluoride[a] Metals (filtered) Dissolved aluminum[a] Dissolved arsenic Dissolved cadmium Dissolved chromium Dissolved copper Dissolved iron[a] Dissolved manganese[a] Dissolved mercury Dissolved selenium Dissolved silver[a] Dissolved sodium Metals (unfiltered) Aluminum Arsenic[a] Cadmium[a] Chromium[a] Copper[a] Iron Manganese Mercury[a] Selenium[a] Silver Sodium[a] Nitrate-nitrogen (NO_3-N)[a] Nitrite-nitrogen (NO_2-N)[a] pH[a] Total coliform[a]

Table 1. (continued).

WRP Permit Number	Monitoring Frequency	Monitoring Location	Well Name or Number	Parameters
				Total dissolved solids[a] Total Kjeldahl nitrogen[a] Total phosphorus[a] Water table depth (below ground surface)[a] Water table elevation (above mean sea level)[a]
LA-000130-05 (Radiological monitoring parameters)[b]	Semiannually—April/May September/October	INTEC New Percolation Ponds	ICPP-MON-A-165 ICPP-MON-A-166 ICPP-MON-V-200 ICPP-MON-V-212	Gross alpha[c] Gross beta[c]

a. Wastewater Reuse Permit No. LA-000130-05 parameter.

b. Radiological parameters to be monitored are specified in the Radiological Monitoring Agreement (Perkins 2003).

c. Samples of appropriate volumes for the gross alpha and gross beta analyses and for analysis by gamma spectrometric and radiochemical methods will be taken. If gross beta concentrations exceed 40 pCi/L, the remaining sample volume will be analyzed for Sr-90 and specific gamma-emitting radionuclides: Cs-134 and Cs-137, even if not detected, along with any true positive results for gamma spectrometry. If the results of the gross alpha analysis exceed 15 pCi/L and the results exceed the estimated total uncertainty for the measurement by an amount that ensures rejection of false positives with 95% confidence, then radiochemistry will be performed for the following alpha-emitting radionuclides: Am-241, Pu-238, Pu-239, Pu-240, U-234, U-235 and U-238.

Table 2. Specific well information.

Well Name (ID)	Completion Depth (ft)	Approximate Depth to Water at Measuring Point[a] (ft)	Stick Up from Brass Cap to Official Measuring Point (ft)	Casing Diameter (in.)
ICPP-MON-A-164B (1349)	533	506.94	2.97	4
ICPP-MON-A-165 (1351)	525	506.68	3.36	6
ICPP-MON-A-166 (1352)	527	512.82	2.30	6
ICPP-MON-V-191 (1357)	118.75	Dry	2.00	4
ICPP-MON-V-200 (1363)	127	116.67	3.48	4
ICPP-MON-V-212 (1425)	248.33	239.97	3.90	6

a. Measurements taken during the October 2011 sampling event.

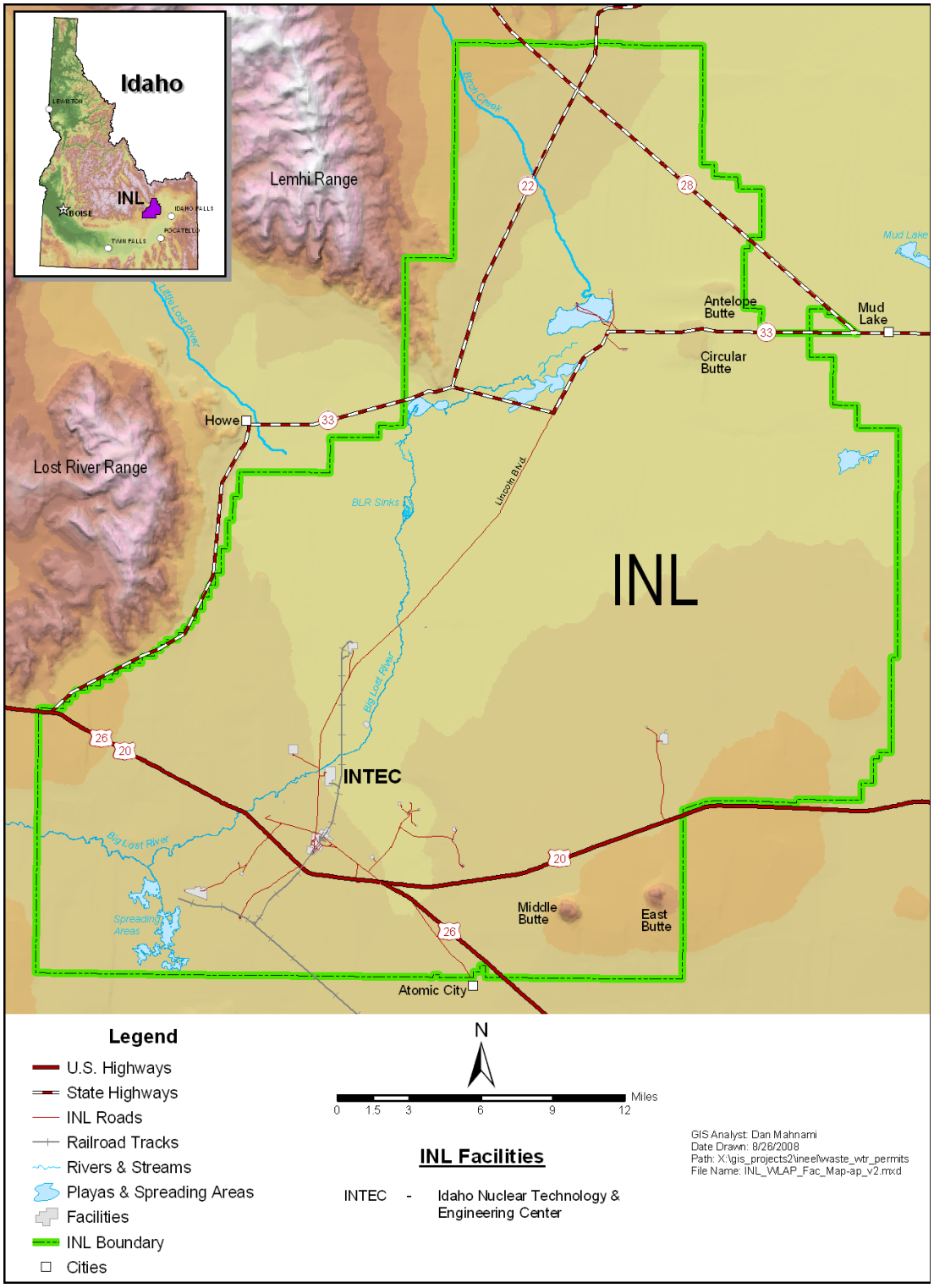

Figure 1. Idaho National Laboratory Site Wastewater Reuse Permit facility location.

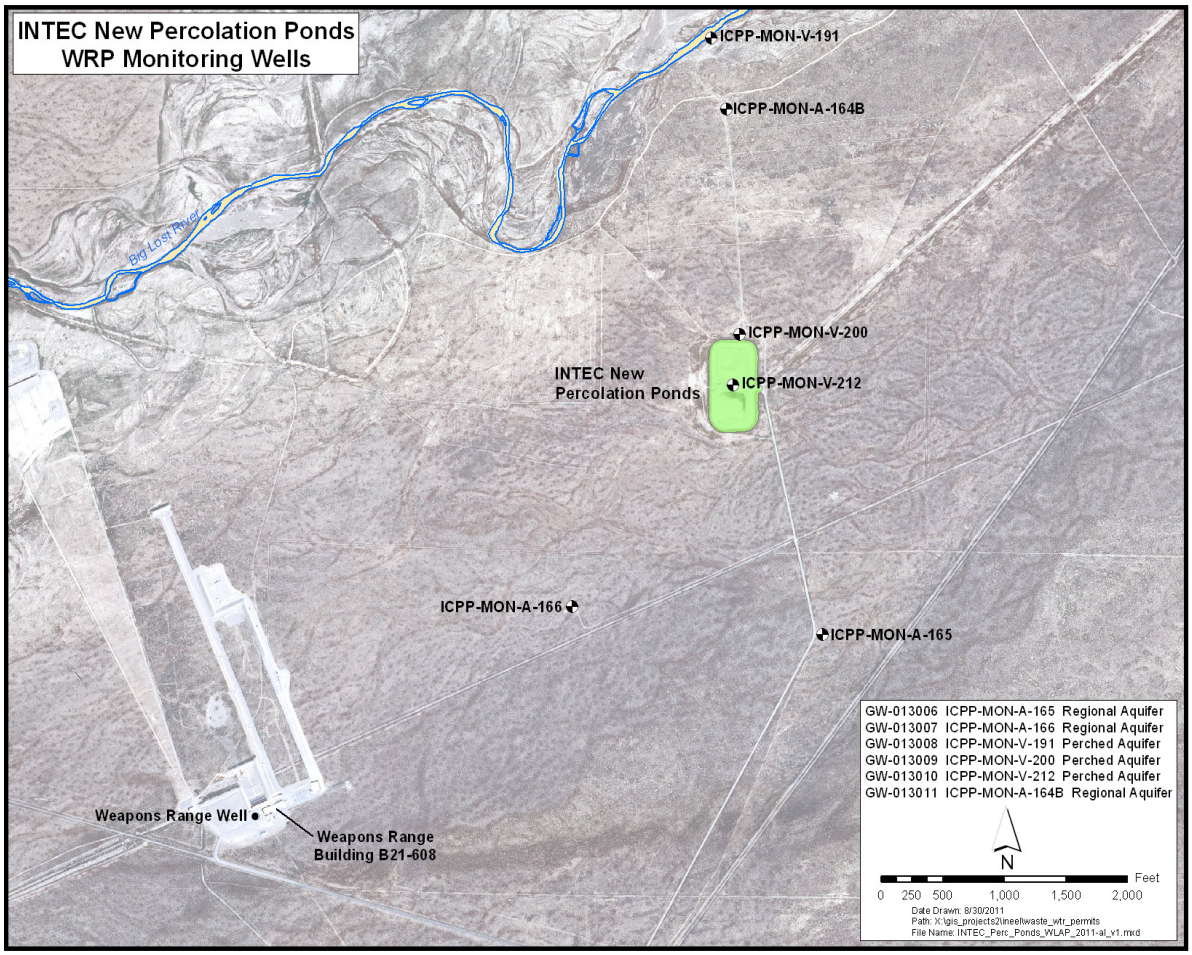

Figure 2. Idaho Nuclear Technology and Engineering Center New Percolation Ponds Wastewater Reuse Permit well locations.

5. PROGRAM ORGANIZATION AND RESPONSIBILITIES

This section describes the Groundwater Monitoring Program organization and the responsibilities of key program positions.

5.1 Program Responsibilities

5.1.1 Environmental and Regulatory Services Director

The Environmental and Regulatory Services director is responsible for implementing the Wastewater Reuse Permit Groundwater Monitoring Program, including seeking necessary funding to implement the program as defined in this program plan, and obtaining trained staff and facilities to carry out the monitoring activities. The Environmental and Regulatory Services director is also responsible for maintaining a records management system for quality records generated by this program plan.

5.1.2 Groundwater Monitoring Program Technical Resource

The Groundwater Monitoring Program technical resource has the following responsibilities:

- Ensures that the program plan and implementing procedures meet regulatory and company requirements
- Provides direction to program personnel in conformance with plan requirements
- Ensures that monitoring is conducted in compliance with the permit requirements, DOE orders and agreements, company procedures, and the program plan
- Monitors work schedules to ensure compliance with plan commitments
- Assigns personnel to verify, validate, interpret, and maintain monitoring data
- Reviews monitoring data and identifies issues arising from the data
- Reports monitoring data, as required
- Reviews reports to ensure compliance with this program plan
- Communicates monitoring results and issues to facility management and support personnel.

5.1.3 Groundwater Monitoring Program Field Team Leader

The Groundwater Monitoring Program field team leader has the following responsibilities:

- Ensures that all field activities are conducted according to the requirements of the program plan and follows all applicable TPRs, SPRs, and MCPs
- Establishes a system of recordkeeping
- Recommends standards for purchasing
- Coordinates sampling, analysis, and validation
- Ensures that assigned personnel are adequately trained to perform required sampling
- Identifies and resolves issues (with the Groundwater Monitoring Program technical resource).

5.1.4 Groundwater Monitoring Program Field Team Member

Groundwater Monitoring Program field team members are responsible for conducting field activities following the Groundwater Monitoring Program plan, and all associated procedures and job safety analyses.

5.1.5 Quality Engineer

A quality engineer provides QA support to Environmental Project Support.

5.1.6 Safety Engineer

A safety engineer provides support from a safety viewpoint to Environmental Project Support.

5.2 PERSONNEL TRAINING

Personnel and new employees must be trained in sampling TPRs, SPRs, and paperwork (logbook, chain of custody [COC], etc.) for the Groundwater Monitoring Program.

5.2.1 Program Training Techniques

The Environmental and Regulatory Services director prepares individual training plans for Groundwater Monitoring Program personnel in accordance with MCP-27, "Preparation and Administration of Individual Training Plans." In addition, the new employee is familiarized with the Environmental Project Support per MCP-27.

5.2.2 Project-Specific Training

The new employee or personnel new to the Groundwater Monitoring Program must be familiar with this program plan and the *Compliance Monitoring Handbook*, which contains the program's TPRs and SPRs. The new employee is under an observation period until the Groundwater Monitoring field team leader determines that the employee is capable of performing the task alone. JSA-6634 lists required training courses, qualifications, job codes, and required reading.

5.2.3 Continued Training

Continued training for Groundwater Monitoring Program personnel occurs through sampling meetings, training sessions (as needed), on-Site and off-Site seminars, and education programs. Safety training occurs during the initial staff orientation meeting and on a continual basis throughout the year. The Environmental and Regulatory Services training coordinator keeps records of staff meeting attendance and safety seminars.

6. DATA QUALITY OBJECTIVES

The DQO process was developed by the EPA to facilitate setting QA objectives for environmental data collection activities (EPA-QA/G-4). The DQO process provides qualitative and quantitative statements, which specify the types and amounts of data to collect and the levels of uncertainty in data that will be acceptable to support decisions.

This section follows the steps of the DQO process to define the project-specific QA objectives for the Groundwater Monitoring Program. Many aspects of the program, such as the decisions to be made, along with the types of samples to collect and collection frequency, are defined in the WRP.

6.1 Decisions To Be Made

Section 3 identifies the objectives the Groundwater Monitoring Program supports. Those objectives can be rephrased as decisions. The decisions to be made by the Groundwater Monitoring Program are:

- Is groundwater in compliance with limits and monitoring requirements set in the WRP?
- Are applicable radiological parameters in the INTEC New Percolation Ponds wells below the required activity levels identified in the Radiological Monitoring Agreement?

If the answers to both questions are "Yes," then no action is necessary. If the answer to either of the two questions is "No," then the Groundwater Monitoring Program technical resource or designee identifies the concerns to the Environmental and Regulatory Services director and facility manager (if necessary). The Groundwater Monitoring Program technical resource supports the Environmental and Regulatory Services director or facility manager in evaluating the situation and developing alternative actions, if required.

6.2 Data Needed to Support the Decisions

The first decision, presented in Section 6.1, is based on monitoring requirements as stated in the WRP. The permit specifies which parameters are to be monitored, the type of sample to collect, the required frequency for monitoring, and the analytical methods to be used. Data needed to make the first decision include:

- Collection dates and number of samples for each location
- List of analyzed parameters
- Laboratory method QC criteria
- Concentrations of compounds in groundwater
- Applicable limits.

The second decision, presented in Section 6.1, is based on monitoring requirements as stated in the Radiological Monitoring Agreement (Perkins 2003). The Agreement specifies the wells to be sampled and the radiological monitoring requirements. Data needed to make the second decision include:

- Collection dates and number of samples for each location
- List of radiological parameters analyzed
- Laboratory methods and QC criteria
- Radiological activity in the groundwater samples
- Applicable action levels.

6.3 Specific Tolerance Limits on the Decision Error

The uncertainty in the analytical data from laboratory measurement is determined during the data validation process. Acceptable limits for laboratory uncertainty are published in EPA analytical methods.

Uncertainty from field activities, such as sample collection, packaging, and shipping, are determined using field QC samples.

6.3.1 Acceptable Quality of Laboratory Data

Analytical methods specify certain QC checks be performed during sample analysis and specify the limits within which the QC checks must fall. Environmental Project Support passes these requirements to laboratories through the laboratory statement of work (SOW). The laboratory is required to include the results of laboratory QC measurements with the analytical results. The data validation process involves checking the QC data against the method-specified limits to ensure that QA goals were met. Data flags are used to mark analytical data that either do not conform to QC limits or may be questionable because of laboratory findings. In this way, the quality of laboratory data is marked so the level of uncertainty in the analytical result is known during data interpretation.

6.3.2 Acceptable Quality of Field Practices

To quantify measurement uncertainty from field activities, the Groundwater Monitoring Program collects field QC samples at a rate equivalent to 5% of the total samples collected. Field QC samples consist of duplicates, field blanks, and equipment rinsates. Trip blanks do not count toward the 5% field QC rate. The field QC sample results are used to determine uncertainty contributed by field sample collection and are compared to programmatic QA objectives as discussed in field sampling plans. If the QA goals for the program are not met, corrective action is triggered as discussed in Section 14.

7. SAMPLING PROCEDURES

The Groundwater Monitoring Program consistently follows documented field procedures that closely follow accepted EPA protocols to ensure that samples are representative of the media being monitored.

Generating quality data, upon which sound regulatory compliance decisions can be based, begins with preparing plans (documentation), training personnel on the plans, and collecting representative samples. Samples must be collected in a manner that is representative of the groundwater and avoids alteration of the sample composition during sampling, handling, or shipping. Sampling plans and procedures must follow requirements in the WRP.

7.1 Sample Collection Procedures and Methods

The *Compliance Monitoring Handbook* contains written and approved TPRs and SPRs that are strictly followed by the Groundwater Monitoring Program. Sampling TPRs and SPRs that apply to the Groundwater Monitoring Program sampling events are as follows:

- SPR-162, “Measuring Groundwater Levels and Sampling Groundwater”
- TPR-6539, “Calibrating and Using the Hydrolab Quanta Water Quality Multiprobe”

Groundwater monitoring wells shall be purged a minimum of three casing volumes, and/or until field measurements for pH, specific conductance, and temperature meet the following conditions:

- Two successive temperature values measured at least 5 minutes apart are within 1°C of each other

- pH values for two successive measurements measured at least 5 minutes apart are within 0.2 units of each other
- Two successive specific conductance values measured at least 5 minutes apart are within 10% of each other.

Wells with inadequate sampling volume during sampling shall be reported as dry in the annual WRP report.

For samples, the static water level shall be measured prior to pumping or sampling the groundwater. The water table elevation is obtained using Equation (1):

Water table elevation = elevation at the brass cap – (water level measurement – stick-up) (1)

Where

elevation at the brass cap is obtained from Table 3 of this document

water level measurement and stick-up are obtained using SPR-162.

Table 3. Land surface elevations.

Well Name and Identification Number	L_S_BC_88 (Land Surface Brass Cap) (ft)
ICPP-MON-A-164B (ID # 1349)	4,952.17
ICPP-MON-A-165(ID # 1351)	4,952.91
ICPP-MON-A-166 (ID# 1352)	4,959.50
ICPP-MON-V-191(ID# 1357)	4,947.96
ICPP-MON-V-200(ID# 1363)	4,952.97
ICPP-MON-V-212(ID# 1425)	4,958.34

7.2 Sample Containers and Sample Preservation

The Groundwater Monitoring Program follows EPA-established sample container cleaning protocols, sample container type requirements, and sample preservation requirements appropriate for the analytical method associated with the parameter. Sample containers and preservation follow requirements in 40 Code of Federal Regulations (CFR), Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants." The appropriate methods can be found in Table 4. The sample container volume will vary for each parameter and with each laboratory. Also, the laboratory will communicate the appropriate hold time (the period from the time a sample is collected to the time it must be analyzed) for each parameter based on the appropriate method.

Table 4. Detection limits and analytical methods for groundwater monitoring parameters.

Parameter	Detection Limit	EPA Analytical Method or Equivalent
Metals	**(mg/L)**	
Aluminum	0.025	200.7, 200.8, 200.9
Arsenic	0.010	200.8, 200.9
Cadmium	0.001	200.7, 200.8, 200.9
Chromium	0.010	200.7, 200.8, 200.9
Copper	0.001	200.7, 200.8, 200.9
Iron	0.060	200.7, 200.9
Manganese	0.010	200.7, 200.8, 200.9
Mercury	0.0002	245.1, 245.2, 200.8
Selenium	0.005	200.8, 200.9
Silver	0.010	200.7, 200.8, 200.9
Sodium	5.0	200.7
Inorganic Compounds	**mg/L**	
Chloride	0.5	300.0
Fluoride	0.5	300.0
Solids, total dissolved	10	SM2540C
Nutrient Parameters	**mg/L**	
Total Kjeldahl nitrogen	0.2	351.1, 351.2, 351.3, 351.4
Nitrate as nitrogen	0.5	300.0
Nitrite as nitrogen	0.5	300.0
Total phosphorus	0.01	365.1, 365.2, 365.3, 365.4
Oxygen Demand	**mg/L**	
Biochemical oxygen demand	2.0	SM5210B
Field Parameters		
Hydrogen ion (pH)	0.1	150.1, 150.2
Specific conductance	10	SM2510B
Temperature	nd[a]	170.1
Biological Parameters	**colonies/100 mL**	
Coliform bacteria, fecal	NA[b]	SM9221E, SM9222D
Coliform bacteria, total	NA	SM9221A, B, C; SM9222A, B, C; SM9221D, SM9223
Radionuclides	**pCi/L**	
Americium-241	0.2	Alpha spectroscopy
Neptunium-237	0.2	Alpha spectroscopy
Plutonium-238	0.2	Alpha spectroscopy
Plutonium-239/240	0.2	Alpha spectroscopy
Radium-226	1	Alpha spectroscopy
Uranium-234	0.5	Alpha spectroscopy
Uranium-235	0.5	Alpha spectroscopy
Uranium-238	0.5	Alpha spectroscopy
Antimony-125	—[c]	Gamma spectroscopy
Cerium-144	—[c]	Gamma spectroscopy
Cesium-134	—[c]	Gamma spectroscopy
Cesium-137	30[c]	Gamma spectroscopy

Table 4. (continued).

Parameter	Detection Limit	EPA Analytical Method or Equivalent
Cobalt-58	—[c]	Gamma spectroscopy
Cobalt-60	—[c]	Gamma spectroscopy
Europium-152	—[c]	Gamma spectroscopy
Europium-154	—[c]	Gamma spectroscopy
Europium-155	—[c]	Gamma spectroscopy
Manganese-54	—[c]	Gamma spectroscopy
Niobium-94	—[c]	Gamma spectroscopy
Niobium-95	—[c]	Gamma spectroscopy
Radium-226	—[c]	Gamma spectroscopy
Ruthenium-103	—[c]	Gamma spectroscopy
Ruthenium-106	—[c]	Gamma spectroscopy
Silver-108m	—[c]	Gamma spectroscopy
Silver-110m	—[c]	Gamma spectroscopy
Tritium (H-3)	400	Liquid scintillation
Zinc-65	—[c]	Gamma spectroscopy
Zirconium-95	—[c]	Gamma spectroscopy
Gross Alpha	3	Gas proportional
Gross Beta	4	Gas proportional

a. nd—Not determined.
b. NA—Not applicable.
c. These detection limits are subject to change by laboratory or analytical method.

7.3 Sample Security and Storage

Samples are collected and transported under COC as discussed in Section 8.

Sample storage by the subcontract laboratory follows the laboratory QA plan to ensure sample integrity. The laboratory QA plan is reviewed and approved during the laboratory procurement process.

7.4 Sample Packaging and Shipping

Samples are packaged according to MCP-9228, “Managing Nonhazardous Samples.” Samples are packed in a cooler with sufficient cooling material to maintain sample temperatures, if needed, following preservation recommendations. Glass bottles are wrapped with bubble wrap or other protective material.

Samples are either delivered to on-Site laboratories or shipped off-Site by overnight carrier to ensure sample integrity and to meet EPA-required holding times.

7.5 Recordkeeping

Auditable records of environmental surveillance activities carried out under DOE Order 458.1, “Radiation Protection of the Public and the Environment,” Chg. 2 must be maintained in accordance with the requirements of DOE Order 414.1D, “Quality Assurance.” The Environmental Project Support processes for quality records are contained in MCP-557, “Records Management.” In addition, the Groundwater Monitoring Program uses MCP-9227, “Environmental and Regulatory Services Logkeeping Practices.”

7.5.1 Sample Identifier

A systematic 10-character sample designation code is used to uniquely identify all samples. The uniqueness of the number maintains consistency and ensures that no two samples are assigned the same identification code. Sample identification numbers are assigned by the Sample and Analysis Management (SAM). The integrated environmental data management system is used to ensure the uniqueness of sample identification.

The first three characters identify the WRP project. The next three characters designate the sequential sample location for that event. The following two characters designate the sample type (i.e., original or duplicate). The last two characters designate the analysis code, including the analysis and container type. For example, the number WLP470019A from the October 2011 sampling event contains the following information:

- "WLP" designates the sample in support of the WRP groundwater sampling
- "470" designates the sequential sample number
- "01" designates the sample type (i.e., 01 = original sample, 02 = duplicate, etc.)
- "9A" designates the sample analysis as chloride/fluoride.

7.5.2 Sample Label

Sample labels are obtained from SAM. All sample containers are identified with waterproof, gummed labels. Labels may be affixed to sample containers before they are brought to the field and completed on the actual sample date. Each sample is clearly labeled using waterproof ink, which states the sample collection time, collection date, and the initials of the sampler. Additionally, the sampling location, sample ID number, analysis type and preservation used, should be preprinted on the label.

7.5.3 Chain of Custody Form

A COC form accompanies the sample and provides documentation of the handling and transfer of the sample. Use of COC forms is further explained in MCP-9228. The COC form is maintained as a quality record. Further discussion of the COC process is described in detail in Section 8 of this plan.

7.5.4 Sample Logbook

Sample logbooks are used to record field sampling activities, to document the results of field measurements, and to record all samples collected, including all QA/QC samples. Sample logbooks are completed in accordance with MCP-9227.

The nature of sampling activities is such that variations from the procedures will occasionally be required to complete the task. When these deviations are one-time events, instructions in MCP-135 will be followed, and the field change will be noted in the sample logbook. If the field change results in a permanent change, then a Document Revision Form must be completed and a new revision of the procedure released.

7.5.5 Laboratory Analytical Data Package

Results of laboratory analyses are recorded in an analytical data package, which is transmitted from the laboratory to the Groundwater Monitoring Program technical resource or designee. Contents of laboratory data packages are specified in the laboratory SOW and generally include the analytical results and a summary of laboratory method QC data. Once the data package is received from the laboratory, it is scanned into the Electronic Document Management System, and the electronic copy becomes the record copy.

Data validation reports document the review of the analytical data to ensure that the data conform to method QA/QC requirements. Data validation reports are considered to be quality records for the project and are retained in project files.

Information concerning the laboratory QA program and procedures is reviewed during the laboratory procurement process. Documentation of the review and approval of the laboratory quality documents is maintained in ICP Subcontracts and Procurement Management files.

7.5.6 Record Retention

Quality records generated by the Groundwater Monitoring Program are retained according to MCP-557.

7.6 Equipment Decontamination

Equipment is decontaminated using instructions detailed in SPR-162, “Measuring Groundwater Levels and Sampling Groundwater.”

7.7 Disposition of Excess Sample Material

External and internal laboratory SOWs are written to assign responsibility to the laboratory for disposal of excess sample material and residuals from sample analysis. Excess sample materials are not returned from the laboratory to the Groundwater Monitoring Program.

7.8 Disposition of Purge Water

All purge water and wastes from WRP wells ICPP-MON-A-164B, ICPP-MON-A-165, ICPP-MON-A-166, ICPP-MON-V-191, ICPP-MON-V-200, and ICPP-MON-V-212 can be purged directly to the ground per documented “Waste Determination & Disposition Form (WDDF)” (Form 435.39).

8. SAMPLE CUSTODY

Sample COC provides traceability of analytical results to the time and location at which the sample was collected. COCs also document the handling and transfer of samples from the time and location of sampling through the analysis procedure in the laboratory.

COC forms are prepared for all samples, custody is maintained to the extent practicable, and transfers are documented with signatures, dates, and times on the COC form. Sample identity is verifiable from the field logbook and laboratory analytical sheets, as well as the COC form.

The COC procedure for the Groundwater Monitoring Program is MCP-9228.

8.1 Definition of Custody

A sample is considered to be in an individual's custody if the sample is one of the following:

- In the physical possession or view of the responsible party
- Secured by the responsible party to prevent tampering
- Placed in a restricted area by the responsible party.

The Sample Preparation Area is used by the Groundwater Monitoring Program to store samples in a secured area with restricted access. It is locked to restrict access whenever Environmental Project Support personnel are not present.

8.2 Transfer of Custody

Samples are accompanied by a COC form. When the possession of the sample is transferred, the individual relinquishing the sample signs and records the date and time on the COC form. The individual receiving the sample also signs and records the date and time on the COC form. When samples are sent to the laboratory, the COC form is sealed in the shipping container and is not available for documenting transfers. Security of the samples during shipping is monitored by sealing the shipping container prior to shipment with a custody seal. The laboratory records the condition of the containers upon receipt to document that the seals were intact upon arrival. Information on the condition of the containers and samples upon arrival at the laboratory and a copy of the original COC form are included with the analytical data package. The shipping forms from the freight carrier are maintained by the Packaging and Transportation Department if information on the shipment is needed.

8.3 Laboratory Custody Procedures

Upon receipt of the samples, the laboratory signs the COC form and writes on the form the condition of the samples. Any conditions, such as temperatures in excess of preservation requirements, are noted in this way. The laboratory notifies the Groundwater Monitoring Program field team leader, SAM, technical resource or designee of any evidence of tampering, broken sample containers, COC discrepancies, etc. The laboratory follows internal COC procedures documented in laboratory standard operating procedures. These internal laboratory procedures are reviewed for adequacy during the laboratory procurement process.

9. STANDARDIZATION PROCEDURES AND FREQUENCY

Analytical and sampling equipment is standardized or calibrated, whichever is applicable for the equipment being used, to ensure that it is operating correctly and that information provided by the instrumentation is accurate.

9.1 Field Instrumentation

Field-generated data (e.g., water levels and water meter data) are validated using properly calibrated instrumentation (to manufacturer's guidelines) and comparing and cross-checking current data with historical and independently gathered data. Field water quality data (temperature, pH, specific conductance) are collected using a Hydrolab Water Quality Multiprobe or other comparable field instrument. Methods and frequency of standardization are discussed in TPR-6539, "Calibrating and Using the Hydrolab Quanta Water Quality Multiprobe." Records of standardization are maintained in instrument or field logbooks, which are retained as quality records.

9.2 Laboratory Instrumentation

Standardization and calibration frequencies for laboratory analytical equipment are defined in EPA analytical methods specified in 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants." Compliance with method–specific calibration procedures is required in the SOW in the procurement contract between ICP and the laboratory. Laboratory compliance with method requirements is checked during the procurement process. Continued compliance with method–specific standardization and calibration requirements is confirmed by validation of laboratory analytical data packages.

10. ANALYTICAL PROCEDURES

Analytical procedures, detection limits, and analytical methods must be clearly and concisely communicated to the laboratory. Each laboratory must be assessed and approved by SAM and QA personnel before use to evaluate its analytical procedures, calibration, and QA/QC program. An analytical services SOW, awarded under a blanket master contract, describes requirements for laboratory operations (e.g., sample custody, handling, storage, data reporting, and delivery schedules). Task order statements of work may be prepared that describe any additional analysis requirements or deviations from the analytical services SOW. The analytical services SOW requires that the laboratories have chemical hygiene plans, sample control and analysis procedures, and waste management procedures. Those documents are evaluated as part of the onsite audit, and the implementation of those practices is observed. Guidelines for SOWs and evaluating laboratories are discussed in MCP-591, "Supplier Evaluation and Qualification." Requirements for procurement of laboratory services are outlined in MCP-1186, "Service Acquisitions." The SOW-362 statement of work for analytical services describes the requirements for laboratories supplying analytical services to ICP SAM under the Integrated Contractor Purchasing Team Basic Ordering Agreement.

10.1 Required Analytical Procedures

Analytical methods for nonradiological parameters, except ammonia as nitrogen, total Kjeldahl nitrogen, total phosphorus, and biochemical oxygen demand, in 40 CFR 141, "National Primary Drinking Water Regulations," 40 CFR 143, "National Secondary Drinking Water Regulations" or methods approved by DEQ, are used for analysis in compliance with the WRP. Ammonia as nitrogen, total Kjeldahl nitrogen, total phosphorus, and biochemical oxygen demand parameters use analytical methods in 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants." Radiological techniques are based on accepted methods derived from EPA methods.

11. DATA VALIDATION, ASSESSMENT, INTERPRETATION, AND REPORTING

This section discusses activities conducted with analytical data provided by the laboratory. Data are validated to determine the quality of the data based on conformance with sampling and laboratory analysis procedures and conditions. Once the quality of the data is assessed, data are used for reporting and comparing to permit limits or agreement activity levels. The WRP requires periodic reporting of analytical results. In addition, results of sampling are reported in the Annual Site Environmental Report.

11.1 Data Validation

Analytical data packages received from the laboratory are reviewed to assess the quality of the analytical data. Laboratory analytical data from samples collected by the Groundwater Monitoring Program are validated following Guide (GDE)-201, "Inorganic Analyses Data Validation for INL Sample and Analysis Management" and GDE-205, "Radioanalytical Data Validation." Quality of data is based on adherence to sample collection requirements and laboratory method requirements. Data that fully meet all requirements are of acceptable quality.

Where data may have a somewhat greater uncertainty than normal due to small deviations from the requirements, the data results may be labeled with a "J" qualifier flag to indicate the value is an estimated value. Estimated data are still a reasonable estimate of actual concentrations in groundwater.

If conditions significantly deviate from requirements during collection or laboratory analysis, the data must be rejected for use. Rejected data results are qualified with an "R" qualifier flag. Rejected data results are not considered to provide any information about groundwater and are not considered in completeness goals. In addition, radiological data results that are so questionable that they should not be used are flagged "UJ" and should not be considered in completeness goals. Field-generated data (e.g., water levels and water meter data) are validated by using properly calibrated instrumentation (to manufacturer's guidelines), comparing and cross-checking current data with historical and independently gathered data, and recording data collection activities in a logbook.

11.2 Data Assessment

Once the quality of the data has been determined, the Groundwater Monitoring Program technical resource or designee assesses the data for usability in the program. That assessment focuses on whether sufficient information meeting the minimum quality requirements has been collected to meet the regulatory requirements. The assessment also evaluates the programmatic QC samples (equipment rinsates, performance evaluation standards, field duplicates, field blanks, and/or trip blanks; see Section 12) to determine whether programmatic QA objectives have been met.

11.3 Data Interpretation

Qualified data from sampling are compared to permit limits to determine whether operations have adversely impacted human health or the environment. Qualified radiological data are compared to agreement activity levels to determine if additional radiological parameters should be requested.

11.4 Data Reporting

Reporting is conducted for three purposes. The first purpose is to meet the requirements of the WRP and the Radiological Monitoring Agreement for reporting monitoring results. The second purpose is to document decisions made based on the monitoring data concerning impact on human health or the environment. The third purpose is to document any issues related to programmatic QA/QC requirements or any impacts on the DQOs of the program.

11.4.1 External Reporting

Monitoring results from WRP monitoring sites must be submitted to the State of Idaho in accordance with MCP-9109, "Preparation, Certification, and Transmittal of Environmental Deliverables," on or before March 1 of each year. The Groundwater Monitoring Program technical resource or designee is responsible for preparing the monitoring results for submission to the State of Idaho DEQ. Monitoring results also are published in the Idaho National Laboratory Annual Site Environmental Report.

12. INTERNAL QUALITY CONTROL CHECKS

The Groundwater Monitoring Program monitors data quality with internal QC checks as stated in program-specific TPRs, SPRs, MCPs, and this program plan.

12.1 Field Activities

Assessments are periodically conducted by Environmental Project Support personnel not specifically associated with the Groundwater Monitoring Program. These assessments are conducted to ensure that program plans and procedures are being followed.

QA/QC samples are included with samples to assess field activities and laboratory performance. The types and frequencies of submissions are presented in Table 5.

Table 5. Quality control samples.

QC Sample Type	Purpose	Process	Frequency
Duplicate	To establish data comparability	Collected from the same location using the same technique, and placed in bottles that have been prepared the same as regular samples	One duplicate collected for every 20 samples or at a minimum 5% of the total number of samples collected
Field blanks	To check chemical preservation and environmental (ambient) contamination at the site	Water used for field blanks obtained from the deionized water supply at the Research and Education Campus Idaho Research Center or from an off-Site vendor and poured into the prepared bottles at the sample site	Collected at the same frequency as the field duplicates

Table 5. (continued).

QC Sample Type	Purpose	Process	Frequency
Equipment blanks (rinsates)	To verify decontamination procedures	Analyte-free water poured over or through the sampling equipment	Collected after decontamination and before use
Laboratory QC	To satisfy QC requirements of SOW-362	Double volume collected	One aqueous sample for each radiological analysis type for each sample delivery group

12.2 Laboratory Activities

The laboratory follows approved EPA groundwater analytical methods to prepare and analyze laboratory samples. Data validation verifies that QC checks were performed and that results conform to method requirements.

13. PERFORMANCE AND SYSTEM ASSESSMENTS

13.1 System Audits

Environmental Project Support, in coordination with SAM, may conduct an annual audit of an analytical laboratory's operations and performance. The audit may be an onsite evaluation or a desk evaluation of the laboratory's past performance at the discretion of SAM. Department of Energy Consolidated Audit Program (DOECAP) audits of the laboratory will be considered as part of the evaluation information. They are conducted in according to:

- PRD-5093, "Management of Environmental Data"
- PRD-5030, "Environmental Requirements for Facilities, Processes, Materials and Equipment"
- MCP-591, "Supplier Evaluation and Qualification"
- MCP-3480, "Environmental Instructions for Facilities, Processes, Materials and Equipment"

The SAM performance evaluations of analytical laboratories are addressed in Plan (PLN)-491, "Laboratory Performance Evaluation Program Plan," which is owned by SAM.

13.2 Self-Assessments

A self-assessment is a systematic check to determine whether personnel are complying with the requirements outlined and referenced in this program plan and the Groundwater Monitoring Program TPRs and SPRs. The scheduling frequency of field activity assessments is the responsibility of the Environmental and Regulatory Services director. This is accomplished by implementing MCP-8, "Performing Management Assessments and Management Reviews," and MCP-9172, "Developing, Integrating, and Implementing Assessment Schedules." The self-assessment schedule is tracked in the companywide Integrated Assessment Schedule Database. Any issues from a self-assessment are identified, and response actions are scheduled and tracked in ICARE (Issue Communication and

Resolution Environment) in accordance with MCP-598, "Corrective Action System," and MCP-538, "Control of Non-Conforming Items."

14. CORRECTIVE ACTION

The identification, cause, and corrective actions for conditions adverse to quality are documented and reported to appropriate levels of management as discussed in implementing procedures. Subsequently, the cause of any adverse condition that affects compliance with the applicable technical or QA/QC requirements is determined, and action is taken to preclude its recurrence. Nonconforming items are handled according to MCP-538. Corrective actions are taken according to MCP-598.

When errors, deficiencies, or out-of-control situations exist, the QA Program provides systematic procedures and corrective actions to resolve problems and restore proper function to the analytical system. Corrective action procedures are described in Section 14.1.

14.1 Laboratory and Programmatic Quality Control

QC samples are used to measure the performance of the laboratory and for the overall sampling program. Method requirements for analytical QC are published in EPA methods, and conformance to the method requirements is documented by data validation. Field QC samples (duplicates, field blanks, equipment blanks, and trip blanks) are used to assess the introduction of bias and uncertainty from the entire sampling and analysis process. Programmatic goals for field QC samples are presented in Section 6. Corrective action procedures are implemented when samples do not meet QA/QC established standards. The two types of reconciliation corrective actions available are: laboratory corrective action(s) and field corrective action(s), which are identified in the following subsections.

Performance evaluation standards are prepared by an independent laboratory and sent "blind" to the analytical laboratory biannually. Performance evaluation standards consist of specified parameter type and concentration prepared in the independent laboratory and sent to the INL Site. On a biannual basis, the standard is submitted as a "blind" sample to the analytical laboratory for analysis. The performance evaluation standard is used to assess laboratory accuracy; results should be within the performance acceptance limits specified on the performance standard's certification.

14.1.1 Laboratory Corrective Actions

The laboratory manager is responsible for ensuring that laboratory QA/QC procedures are followed. Laboratory situations requiring corrective actions, the appropriate corrective action, and the documentation requirements are specified in the laboratory SOW prepared by the SAM in accordance with MCP-3480. If notified by the laboratory of a situation that may impact the DQOs of the Groundwater Monitoring Program, then the SAM will notify the Groundwater Monitoring Program field team leader or technical resource or designee of the situation and the corrective actions being implemented.

14.1.2 Field Corrective Actions

The Groundwater Monitoring Program field team leader and technical resource are responsible for ensuring that field QA/QC procedures are followed. If a situation develops that may jeopardize the integrity of the samples, the Groundwater Monitoring Program field team leader and technical resource

will document the situation, the possible impacts to the DQOs of the program, and the corrective actions taken. The Groundwater Monitoring technical resource will notify or consult with appropriate individuals. For permit sampling, the situation and impacts on the DQOs of the program will be described in the Idaho National Laboratory Annual Site Environmental Report. Any situations that impact compliance with permit requirements will be described in the annual WRP report or in the specific compliance activity report, as applicable.

15. QUALITY ASSURANCE REPORTS TO MANAGEMENT

Data quality is addressed in two annual reports:

- *Wastewater Reuse Site Performance Report for the Idaho Nuclear Technology and Engineering Center New Percolation Ponds (LA-000130-05)*
- *Idaho National Laboratory Annual Site Environmental Report*.

WRP reports are required by the State of Idaho, DEQ permit number LA-000130-05. The *Idaho National Laboratory Annual Site Environmental Report* is prepared annually in compliance with DOE Order 231.1B and DOE Order 458.1, Chg. 2.

16. REFERENCES

40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants"

40 CFR 141, "National Primary Drinking Water Regulations"

40 CFR 143, "National Secondary Drinking Water Regulations"

ANSI/ASQC-E4, *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs*

Compliance Monitoring Handbook, Environmental and Regulatory Services

DOE Order 231.1B, "Environment, Safety and Health Reporting," Chg. 2

DOE Order 414.1D, "Quality Assurance"

DOE Order 458.1, "Radiation Protection of the Public and the Environment," Chg. 2

EPA-QA/G-4, *Guidance for the Data Quality Objectives Process*

EPA-QA/R-5, *EPA Requirements for Quality Assurance Project Plans*

SOW-362, "Statement of Work for Analytical Services"

Form 434.14, "Pre-Job Briefing Checklist"

Form 435.39, "Waste Determination and Disposition Form (WDDF)"

GDE-201, "Inorganic Analyses Data Validation for INL Sample and Analysis Management"

GDE-205, "Radioanalytical Data Validation"

IDAPA 58.01.11, "Ground Water Quality Rule"

IDAPA 58.01.17, "Recycled Water Rules"

JSA-597, "Working in Environmental Project Support Sample Preparation Areas - Various Locations"

JSA-6634, "Environmental and Regulatory Services Groundwater Monitoring Activities"

MCP-8, "Performing Management Assessments and Management Reviews"

MCP-27, "Preparation and Administration of Individual Training Plans"

MCP-135, "Document Management"

MCP-538, "Control of Non-Conforming Items"

MCP-553, "Step Back and Stop Work Authority"

MCP-557, "Records Management"

MCP-561, "Quality Program Plan/Quality Assurance Project Plan Development"

MCP-591, "Supplier Evaluation and Qualification"

MCP-598, "Corrective Action System"

MCP-1186, "Service Acquisitions"

MCP-3003, "Performing Pre-Job Briefings and Documenting Feedback"

MCP-3480, "Environmental Instructions for Facilities, Processes, Materials, and Equipment"

MCP-9109, "Preparation, Certification, and Transmittal of Environmental Deliverables"

MCP-9172, "Developing, Integrating and Implementing Assessment Schedules"

MCP-9227, "Environmental and Regulatory Services Logkeeping Practices"

MCP-9228, "Managing Nonhazardous Samples"

PER-143, "Municipal and Industrial Wastewater Reuse Permit, LA-000130-05, Idaho Nuclear Technology and Engineering Center New Percolation Ponds"

Perkins, Teresa, U.S. Department of Energy Idaho Operations Office, to Gregory Eager, Idaho Department of Environmental Quality, March 19, 2003, "Radiological Monitoring Associated with the INTEC New Service Wastewater Percolation Ponds WLAP No. LA-000130-03," TS-ETSD-03-047, CCN 40999.

PLN-491, "Laboratory Performance Evaluation Program Plan"

PRD-5030, "Environmental Requirements for Facilities, Processes, Materials, and Equipment"

PRD-5093, "Management of Environmental Data"

SPR-162, "Measuring Groundwater Levels and Sampling Groundwater"

TPR-6539, "Calibrating and Using the Hydrolab Quanta Water Quality Multiprobe"

Appendix A

Comparison of Program Plan to PRD-5093, MCP-561, ANSI/ASQC-E4, and EPA-QA/R-5

Table A-1. Comparison of Idaho Cleanup Project Groundwater Monitoring Program Plan to PRD-5093, MCP-561, ANSI/ASQC-E4, and EPA-QA/R-5.

PLN-1305 Elements		PRD-5093 Elements	MCP-561 Appendix B Elements		ANSI/ASQC-E4 Elements		EPA-QA/R-5 Elements	
	ICP Controlled Document Cover, Form 412.14		1.1	ICP Controlled Document Cover, Form 412.14, with provision for approval signatures for the project manager, and quality engineer			A1	Title and Approval Sheet
	Electronic Document Revision Form or ICP Controlled Document Approval Sheet, Form 412.15 with record of concurrence signatures		1.2	Electronic Document Revision Form or ICP Controlled Document Approval Sheet, Form 412.15 for recording concurrence signatures (not required if concurrence signatures are recorded on a DRF form)			A1	Title and Approval Sheet
	Table of Contents		1.3	Table of contents			A2	Table of Contents
2	Program Description	Program Description	1.4 (5.3)	Project description	2.7	Planning	A5	Problem Definition/ Background
3	Requirements and Objectives				2.8	Implementation of Work Processes	A6	Project/Task Description
4	Program Basis and Design				3.1	Planning and Scoping		

Table A-1. (continued).

PLN-1305 Elements		PRD-5093 Elements	MCP-561 Appendix B Elements		ANSI/ASQC-E4 Elements		EPA-QA/R-5 Elements	
5.1	Program Organization and Responsibilities	Organization	1.5 (5.4)	Project organization and responsibility	2.1	Management and Organization	A3	Distribution List
							A4	Project/Task Organization
					2.2	Quality System and Description	A8	Special Training/Certification
							A9	Documents and Records
5.2	Personnel Training		1.6.1	Personnel qualifications	2.3	Personnel Qualification and Training	A8	Special Training/Certification
6	Data Quality Objectives	QA Objectives for Data	1.6 (5.5)	QA objectives for measurement data in terms of precision, accuracy, completeness, representativeness and comparability	3.2	Design of Data Collection Operations	A7	Quality Objectives and Criteria
7	Sampling Procedures	Sampling Procedures	1.7 (5.6)	Sampling procedures	3.3	Implementation of Planned Operations	B1	Sampling Process Design
							B2	Sampling Methods
			1.18	Change control or revision process while QAPjP is effective				
7.5	Recordkeeping	Records	1.20	Records	2.5	Documents and Records	A9 & B10	Documents and Records
					2.6	Computer Hardware and Software		Data Management
8	Sample Custody	Transportation Chain-of-Custody	1.8 (5.7)	Sample custody	3.3	Implementation of Planned Operations	A7	Quality Objectives and Criteria
							B3	Sample Handling and Custody
9	Standardization Procedures and Frequency	Laboratory Quality Control	1.9 (5.8)	Calibration procedures and frequency			A7	Quality Objectives and Criteria for Measurement Data
							B7	Instrument/Equipment Calibration and Frequency

Table A-1. (continued).

PLN-1305 Elements		PRD-5093 Elements	MCP-561 Appendix B Elements		ANSI/ASQC-E4 Elements		EPA-QA/R-5 Elements	
10	Analytical Procedures	Laboratory Quality Control	1.10 (5.9)	Analytical procedures	2.4	Procurement of Items and Services	B4	Analytical Methods
11	Data Validation, Assessment, Interpretation, and Reporting	Data Validation Evaluation	1.11 (5.10) (5.14)	Data reduction, validation and reporting	3.5	Assessment and Verification of Data Usability	A7	Quality Objectives and Criteria for Measurement Data
							B9	Nondirect Measurements
							B10	Data Management
							D1	Data Review, Verification and Validation
							D2	Verification and Validation Methods
							D3	Reconciliation with User Requirements
			1.19	Reporting				
12	Internal Quality Control Checks	Field QC	1.12 (5.11)	Internal quality control checks and frequency	2.9	Assessment and Response	B2	Sampling Methods
							B5	Quality Council
		Laboratory Quality Control					B6	Instrument/Equipment Testing, Inspection, and Maintenance
							B7	
							B9	Instrument/Equipment Calibration and Frequency
								Nondirect Measurements
13	Performance and System Assessments	Performance and System Audits/ Assessments	1.13 (5.12)	Performance and system audits and frequency			C1	Assessments and Response Actions
			1.14	Preventive maintenance procedures and schedules	3.3	Implementation of Planned Operations	B6	Instrument/Equipment Testing, Inspection, and Maintenance

Table A-1. (continued).

PLN-1305 Elements		PRD-5093 Elements	MCP-561 Appendix B Elements		ANSI/ASQC-E4 Elements		EPA-QA/R-5 Elements	
			1.15	Specific routine procedures to be used to assess data precision, accuracy and completeness of specific measurement parameters involved			D3	Reconciliation with User Requirements
14	Corrective Action	Corrective Action	1.16 (5.15) 1.16.1	Corrective action Deviations	3.4	Assessment and Response	C1	Assessments and Response Actions
15	Quality Assurance Reports to Management	Reports to Management	1.17 (5.16)	Quality assurance reports to management	2.10	Quality Improvement	A7 C2	Quality Objectives and Criteria for Measurement Data Reports to Management