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Groundwater Monitoring Plan for the PER-722 Underground Storage Tank Diesel Fuel Release

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Revision 0
Project No. 23366

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Prepared for the
U.S. Department of Energy
Idaho Operations Office

ABSTRACT

This plan outlines the collection and analysis of samples that will be taken from the Snake River Plain Aquifer in order to monitor any potential impacts of diesel fuel released from the PER-722 underground storage tank. The PER-722 tank is a 37,854-L (10,000-gal), single-walled, carbon-steel tank that was used to supply heating fuel to the Power Burst Facility Reactor Building (PBF-620) at the Idaho National Engineering and Environmental Laboratory. Flow meter measurements from November 1999 through June 2002 indicate that as much as 64,350 L (17,000 gal) of No. 2 diesel fuel is unaccounted for and might have leaked to the Power Burst Facility subsurface.

Two core holes have been drilled at the release site. The first core hole (PBF-1840) was drilled to 42.7 m (140 ft) below land surface and showed the presence of diesel fuel constituents. A second core hole (PBF-1930) was drilled to the aquifer, with the last noted presence of diesel (visually and odor) occurring at 99.8 m (327.5 ft) below land surface. No evidence of diesel fuel, either visual or analytical, was found beneath that depth. A piezometer was installed in PBF-1930, allowing the collection of groundwater samples from the aquifer. Other than toluene at a concentration below the maximum contaminant levels defined by the U.S. Environmental Protection Agency, no potential contaminants of concern were encountered in the aquifer samples. Toluene is frequently encountered following the drilling process and is not attributed to the diesel fuel release.

On February 12, 2004, the Idaho Department of Environmental Quality issued a Schedule and Criteria for the petroleum release from the PER-722 tank outlining requirements for 3 years of groundwater monitoring to ensure that the diesel fuel release has not adversely impacted the Snake River Plain Aquifer. In accordance with the Schedule and Criteria, monitoring of the Snake River Plain Aquifer will continue via the piezometer installed in PBF-1930. Samples will be analyzed for benzene, toluene, ethyl benzene, and xylene along with the polynuclear aromatic hydrocarbons acenapthene, anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)anthracene, benzo(g,h,i)perylene, chrysene, fluorene, fluoranthene, naphthalene, phenantrene, and pyrene in accordance with the *Risk Based Corrective Action Guidance Document for Petroleum Releases*. These data will be used to ascertain whether the aquifer has been adversely impacted by the diesel fuel release from the PER-722 tank. If evidence indicates that the aquifer has been adversely impacted, then additional action may be warranted.

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FIGURES

TABLES

ACRONYMS

bls	below land surface
BTEX	benzene, toluene, ethyl benzene, and xylene
CFA	Central Facilities Area
CFR	Code of Federal Regulations
DMCS	Document Management Control System
DOE-ID	U.S. Department of Energy Idaho Operations Office
DQO	data quality objective
DS	decision statement
EPA	U.S. Environmental Protection Agency
FTL	field team leader
GDE	guide
HASP	health and safety plan
IAG	interface agreement
ID	identification
IDEQ	Idaho Department of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
MCP	management control procedure
NA	not applicable
PAH	polynuclear aromatic hydrocarbon
PBF	Power Burst Facility
PQL	practical quantitation limit
PSQ	principal study question
QA	quality assurance
QAPjP	quality assurance project plan
QC	quality control

RCRA	Resource Conservation and Recovery Act
SAP	sampling and analysis plan
SPERT	Special Power Excursion Reactor Test
SRPA	Snake River Plain Aquifer
USC	United States Code
WGS	Waste Generator Services

Groundwater Monitoring Plan for the PER-722 Underground Storage Tank Diesel Fuel Release (Draft)

1. OVERVIEW

The PER-722 tank is a 37,854-L (10,000-gal), single-walled, carbon-steel tank that was used to supply heating fuel to the Power Burst Facility (PBF) -620 Reactor Building at the Idaho National Engineering and Environmental Laboratory (INEEL). On February 12, 2004, the Idaho Department of Environmental Quality (IDEQ) issued a Schedule and Criteria for the petroleum release from the PER-722 tank outlining requirements for 3 years of groundwater monitoring to ensure that the diesel fuel release has not adversely impacted the Snake River Plain Aquifer (SRPA). This plan describes sampling activities designed to monitor the SRPA for diesel fuel released from the PER-722 underground storage tank.

Together, this plan and the quality assurance project plan (QAPjP) compose the sampling and analysis plan (SAP). These plans have been prepared pursuant to 40 *Code of Federal Regulations* (CFR) 300, "National Oil and Hazardous Substances Pollution Contingency Plan," in accordance with guidance from the U.S. Environmental Protection Agency (EPA) on the preparation of SAPs and in accordance with Management Control Procedure (MCP) -9439, "Preparation for Environmental Sampling Activities at the INEEL." This Groundwater Monitoring Plan describes the field sampling activities, while the QAPjP details the processes and programs that will be used to ensure that the data obtained from the monitoring activities are suitable. This Groundwater Monitoring Plan also describes the data quality objectives (DQOs) on which sample collection will be based. The governing QAPjP for this sampling effort will be the *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning* (DOE-ID 2004). Work control processes will follow formal practices identified in the following interface agreement (IAG): *Interface Agreement between the Balance of INEEL Cleanup Project and Idaho Nuclear Technology and Engineering Center for the Performance of Balance of INEEL Cleanup Activities at the Power Burst Facility* (IAG-226).

1.1 Groundwater Monitoring Plan and Other Documentation

The primary purpose of this plan is to delineate the sampling activities that will be needed to assess whether contaminants from as much as 64,350 L (17,000 gal) of No. 2 diesel fuel released from PER-722 have adversely impacted the SRPA.

The *Health and Safety Plan for the Long-Term Stewardship Sitewide Groundwater Monitoring* (INEEL 2003) describes measures that will be used to protect workers from hazards during groundwater sample collection. Balance of INEEL Cleanup program activities conducted within PBF under the purview of the Idaho Nuclear Technology and Engineering Center Nuclear Facility manager are addressed in IAG-226.

1.2 Project Organization and Responsibility

The organizational structure for this work reflects the resources and expertise needed to plan and do the work while minimizing risks to worker health and safety. The Health and Safety Plan (HASP) (INEEL 2003) provides the organizational lines of responsibility and communication and the job titles of individuals who will fill key managerial roles.

2. SITE BACKGROUND

This section describes the site to be monitored, the nature and extent of contamination, and the project.

2.1 Site Description

The INEEL is a government-owned/contractor-operated facility managed by the U.S. Department of Energy Idaho Operations Office (DOE-ID) and is located 51 km (32 mi) west of Idaho Falls, Idaho (Figure 2-1). The INEEL occupies 2,305 km^2 (890 mi^2) of the northeastern portion of the Eastern Snake River Plain.

Once known as the Special Power Excursion Reactor Test (SPERT) facilities, PBF consists of five separate operational areas: (1) the PBF control area, (2) the PBF reactor area, (3) the Waste Engineering Development Facility, (4) the Waste Experimental Reduction Facility, and (5) the Mixed Waste Storage Facility. Collectively, the last three are known as the Waste Reduction Operations Complex. The locations of the five areas are shown in Figure 2-2.

The PBF reactor was constructed in 1972 just north of the remains of the SPERT-I facility. Since 1985, the PBF reactor has been on standby and has been shut down. Other PBF structures include a maintenance and storage building, cooling towers, two electrical substations, and numerous smaller buildings and structures. The PER-722 underground storage tank is located north of, and adjacent to, the PBF Reactor Building (PER-620), as shown in Figure 2-3. The tank was installed about 3 m (10 ft) below land surface (bls) on a 15-cm (6-in.) bed of sand that overlies basalt bedrock.

2.2 Nature and Extent of Contamination

The PER-722 tank is a 37,854-L (10,000-gal), single-walled, carbon-steel tank that was used to supply No. 2 diesel heating fuel to PBF-620. The tank was installed in 1971 and had been in continual use until a leak was suspected in June 2002. During routine gauging of the tank, a decrease in the diesel level was observed. Although the heating equipment supplied by the tank had not operated since late May 2002, subsequent weekly measurements over a 3-week period confirmed a constant decrease in the diesel level. In late June 2002, the remaining diesel in the tank (2,271 L [600 gal]) was transferred to another tank. A state-certified vendor then tested the tank for leaks on June 28, 2002. The results of that test confirmed the presence of a leak in PER-722. In July 2002, engineering calculations were done to more accurately determine how much diesel leaked from the tank. The results indicated that as much as 64,350 L (17,000 gal) of diesel might have leaked into the subsurface between November 1999 and June 2002 (Gundersen 2002).

The contaminants of potential concern consist of those associated with No. 2 diesel fuel: benzene, toluene, ethyl benzene, and xylenes (BTEXs) and polynuclear aromatic hydrocarbons (PAHs), including acenapthene, anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)anthracene, benzo(g,h,i)perylene, chrysene, fluorene, fluoranthene, naphthalene, phenanthrene, and pyrene.

In April 2003, one core hole (PBF-1840) was installed near the PER-722 tank to a depth of 42.7 m (140 ft) bls. Evidence of diesel contamination was present throughout the coring. After reviewing the data collected from PBF-1840, the IDEQ requested additional characterization to ascertain the extent of contamination in the underlying basalt and sedimentary interbeds and to determine if the SRPA has been impacted.

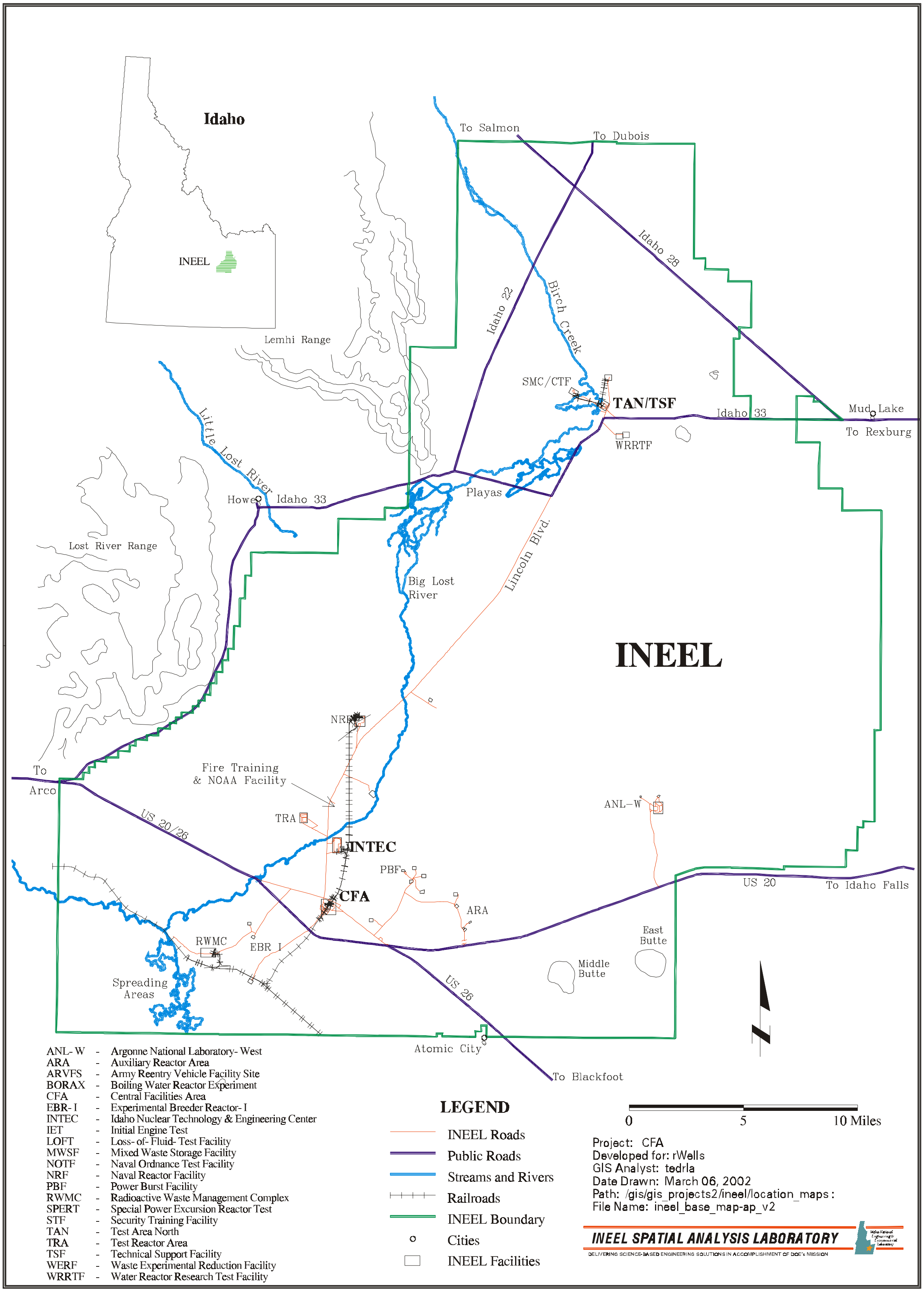

Figure 2-1. Idaho National Engineering and Environmental Laboratory.

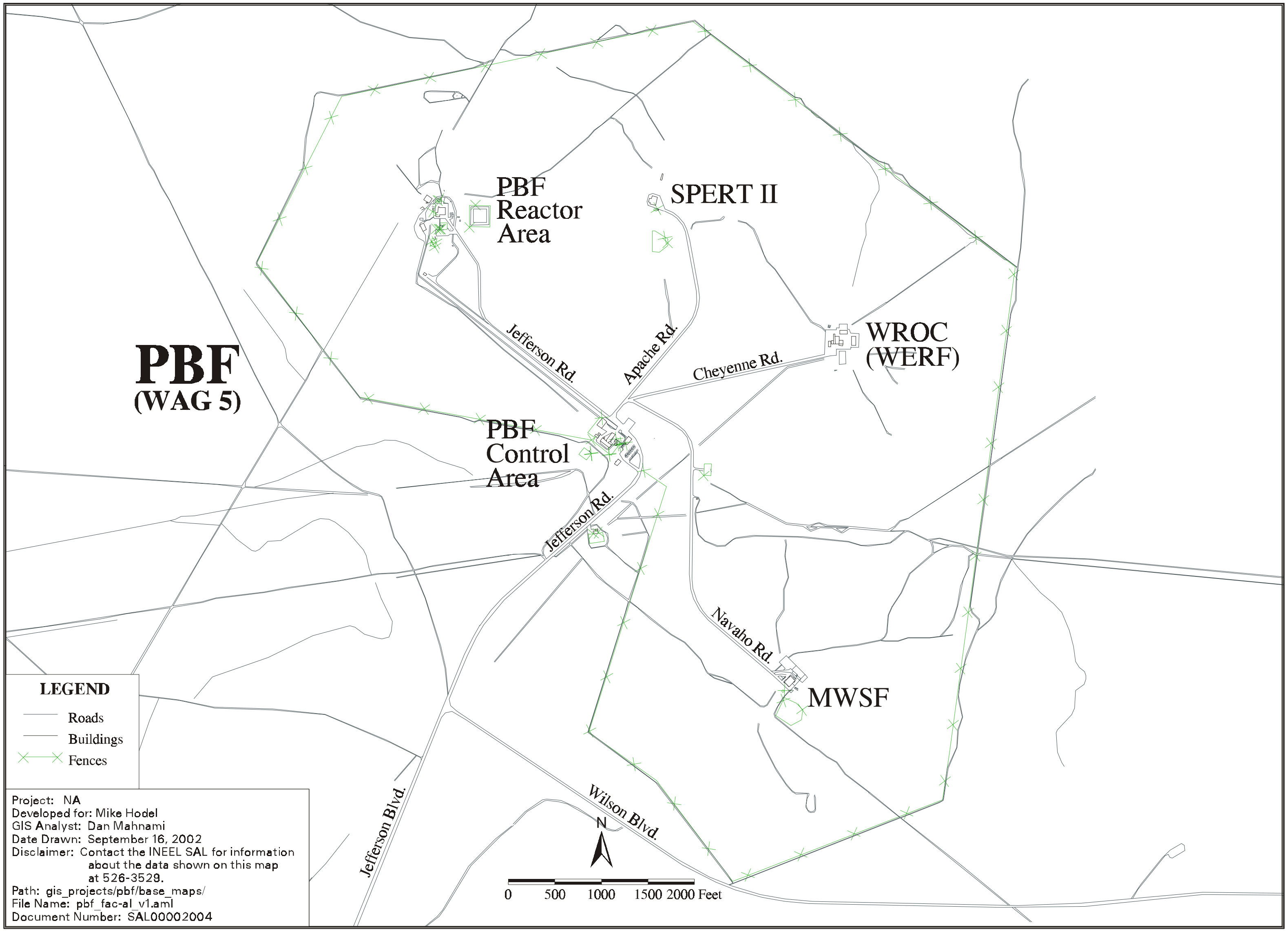

Figure 2-2. Power Burst Facility.

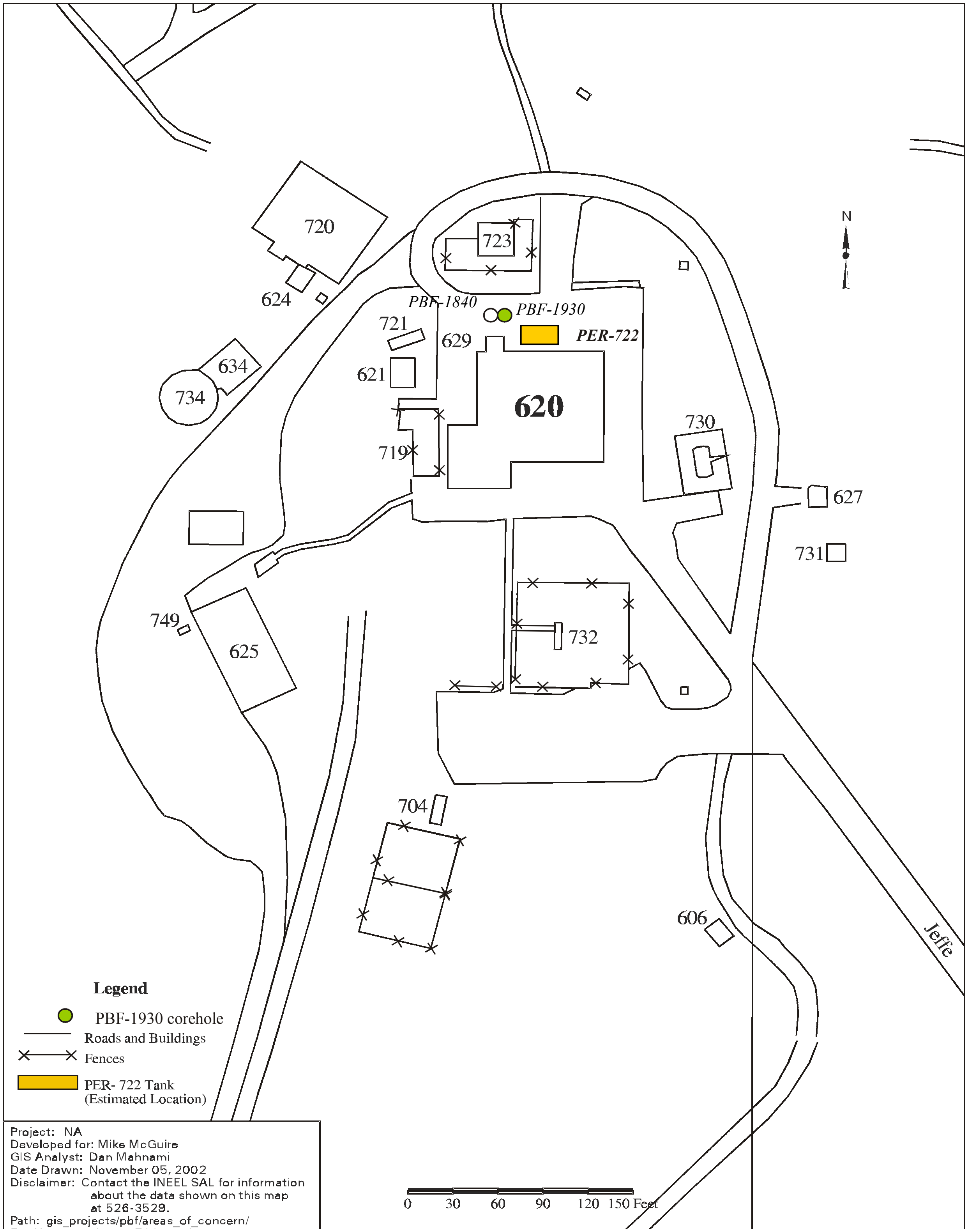

Figure 2-3. Location of PER-722 relative to the Power Burst Facility Reactor Building (PER-620).

The second core hole (PBF-1930) was drilled to the aquifer, with core samples showing the presence of diesel in permeable zones with the last noted presence of diesel (visually and odor) occurring at 99.8 m (327.5 ft) bls. No evidence of diesel fuel, either visual or analytical, was detected beneath that depth. A piezometer was installed in PBF-1930, allowing the collection of groundwater samples from the aquifer. Groundwater was encountered at 139.1 m (456.3 ft) bls. Other than toluene at a concentration below the maximum contaminant levels defined by the EPA, no potential contaminants of concern were encountered in the aquifer samples. Upon review of this information, the IDEQ issued a Schedule and Criteria for the petroleum release from PER-722, requiring 3 years of groundwater monitoring to ensure that the release does not adversely impact the SRPA.

2.3 Project Description

Groundwater samples collected from the SRPA through the piezometer installed in PBF-1930 will be collected for a period not to exceed 3 years following IDEQ approval of this SAP. This sampling will occur on a quarterly basis, and samples will be submitted for laboratory analysis. The analytical data will be used to determine whether the contaminant concentrations pose an unacceptable risk to human health or the environment (i.e., primarily to the SRPA underlying the INEEL).

As shown in Figure 2-4, the PBF-1930 core hole was completed with a 3.81-cm (1.5-in.) polyvinyl chloride pipe (piezometer) installed down to the aquifer with a screened interval from 132 to 144 m (434 to 474 ft) bls. The total depth of the core hole was 151.1 m (495.8 ft) bls.

Following the collection and analysis of samples, analytical data will be reported to the IDEQ within 75 days of sample collection, not to exceed 120 days. The data will be transmitted via a letter report format, which will include a summary of the contaminants of potential concern and will identify any contaminants that exceed any regulatory thresholds. If thresholds are exceeded, recommendations will be made as to what additional actions are necessitated, if any. Any subsequent actions will require a separate funding request and approval and negotiation with the IDEQ as to the extent of the actions. The letter report will also include any organic analytical results obtained from Wells PBF-MON-A-001 and PBF-MON-A-003, as well as the PBF distribution system (e.g., SPERT-I production well) during the reporting system. This will not require any additional sampling of these wells beyond the annual monitoring currently being performed under the purview of Waste Area Group 5 and the INEEL Drinking Water Program.

Figure 2-4. PBF-1930 core hole completion diagram.

Figure 2-4. (continued).

3. SAMPLING OBJECTIVES

Data needs and DQOs for the proposed SRPA sampling are defined in the following subsections. Data needs have been determined by evaluating existing information and projecting data requirements for analysis of samples collected during the PER-722 groundwater monitoring effort.

3.1 Data Quality Objectives

The DQOs were developed following the seven-step process outlined in *Guidance for the Data Quality Objectives Process* (EPA 1994). The DQOs in these subsections provide the basis for the sampling to be done.

3.1.1 Problem Statement

The objective of DQO Step 1 is to use relevant information to clearly and concisely state the problem to be resolved. The problem statement associated with this DQO process step is as follows:

Problem Statement 1—Impact to Snake River Plain Aquifer: Determine over time if the regional aquifer has been impacted by the release of diesel fuel from PER-722.

3.1.2 Decision Identification

The goal of DQO Step 2 is to develop the questions that the monitoring will attempt to answer and to identify the alternative actions that could be taken based on the monitoring results. Alternative actions are those that result from resolution of the stated principal study questions (PSQs). The types of alternative actions considered depend on the answers to the PSQs. The PSQs and their corresponding alternative actions will then be joined to form decision statements (DSs). The PSQs, alternative actions, and resulting DSs for the PER-722 sampling effort are provided in Table 3-1.

3.1.3 Identify Inputs to the Decision

The purpose of DQO Step 3 is to identify the type of data needed to resolve each DS developed in DQO Step 2. These data could already exist or be derived from computational or surveying/sampling and analysis methods. In addition, analytical performance requirements (e.g., practical quantitation limits [PQLs], precision, and accuracy) are provided in this step for any new data that will be collected.

3.1.3.1 Information Required to Resolve Decision Statements. Table 3-2 specifies the data needed to resolve the DS described in Subsection 3.1.2 and shows whether these data already exist. For data that exist, the source references have been provided with a qualitative assessment as to whether the data are of sufficient quality to resolve the corresponding DS. The qualitative assessment of the existing data was based on the evaluation of the corresponding quality control (QC) data (e.g., spikes, duplicates, and blanks), detection limits, and data collection methods.

Table 3-1. Summary of Data Quality Objective Step 2 information.

PSQ #1—Are contaminants present in the aquifer that would indicate that the diesel fuel spill from PER-722 has adversely affected the SRPA?

Alternative Action	Error Associated with Incorrect Action	Consequences of Error	Severity of Consequences
No contaminants are detected, indicating that the diesel fuel spill has not adversely affected the SRPA.	Contaminants are erroneously determined to be absent.	The SRPA is adversely affected by the diesel fuel release from PER-722, and no corrective action is taken.	High
Contaminants are detected, indicating that the diesel fuel spill has adversely affected the SRPA.	Contaminants are erroneously determined to be present.	The SRPA is not adversely affected by the diesel fuel release from PER-722, but corrective action is taken.	Moderate

DS #1—Determine if the regional aquifer has been impacted by the release of diesel fuel from PER-722.

DS = decision statement
PSQ = principal study question
SRPA = Snake River Plain Aquifer

Table 3-2. Required information and reference sources.

DS #	Measurement Variable	Required Data	Do Data Exist?	Source Reference	Sufficient Quality?	Additional Information Required?
1	BTEX and PAH concentrations	Laboratory measurements of contaminants	Yes	Analytical results	Yes	Yes

BTEX = benzene, toluene, ethyl benzene, and xylene
DS = decision statement
PAH = polynuclear aromatic hydrocarbon

3.1.3.2 Basis for Setting the Action Level. The action level is the threshold value that provides the criterion for choosing between alternative actions. For DS 1, the potential contaminants of concern are BTEX and PAHs. The bases for setting the action level are the EPA-defined maximum contaminant levels for drinking water (40 CFR 141, "National Primary Drinking Water Regulations"). The numerical values for the action levels are provided in DQO Step 5.

3.1.3.3 Computational and Survey/Analytical Methods. Table 3-3 shows whether data either do not exist or are of insufficient quality to resolve the DS. For this DS, Table 3-3 presents computational and surveying/sampling methods that could be used to obtain the required data.

Table 3-3. Information required to resolve the decision statements.

DS #	Measurement Variable	Required Data	Computational Methods	Survey/Analytical Methods
1	BTEX and PAHs	Total contaminant concentrations in SRPA water samples	Compare contaminant concentrations to EPA-defined maximum contaminant levels for drinking water.	Analytical laboratory determination of contaminant concentrations in SRPA water samples

BTEX = benzene, toluene, ethyl benzene, and xylene
DS = decision statement
EPA = U.S. Environmental Protection Agency
PAH = polynuclear aromatic hydrocarbon
SRPA = Snake River Plain Aquifer

3.1.3.4 Analytical Performance Requirements. Table 3-4 shows the analytical performance requirements for the data that need to be collected to resolve the DS. These include PQL, precision, and accuracy requirements for each potential contaminant.

Table 3-4. Analytical performance requirements.

DS #	Analyte List	Analytical Method	Action Limit (mg/kg or mg/L)	PQL (mg/kg or mg/L)	Precision Requirement	Accuracy Requirement
2	BTEX	SW-846			± 20%	80–120%
	Benzene		0.005	0.005		
	Toluene		1	0.005		
	Ethyl benzene		0.7	0.005		
	Xylenes (mixed)		10	0.005		
	PAHs	SW-846				
	Acenaphthene		NA	0.023		
	Anthracene		NA	0.0066		
	Benzo(a)pyrene		0.0002[a]	0.00023		
	Benzo(b)fluoranthene		NA	0.00018		
	Benzo(k)fluoranthene		NA	0.00017		
	Benzo(a)anthracene		NA	0.00013		
	Benzo(g,h,i)perylene		NA	0.00076		
	Chrysene		NA	0.0015		
	Fluorene		NA	0.0021		
	Fluoranthene		NA	0.0021		
	Naphthalene		NA	0.018		
	Phenanthrene		NA	0.0064		
	Pyrene		NA	0.0027		

a. Actual detection limit will be less than the required detection limit.
BTEX = benzene, toluene, ethyl benzene, and xylene
DS = decision statement
NA = not applicable
PAH = polynuclear aromatic hydrocarbon
PQL = practical quantitation limit

3.1.4 Study Boundaries

The primary objective of DQO Step 4 is to identify the population of interest, define the spatial and temporal boundaries that apply to the DS, define the scale of decision-making, and identify any practical constraints (hindrances or obstacles) that must be considered for the sampling design. Implementing this step ensures that the sampling design will result in the collection of data that accurately reflect the condition of the site under investigation.

3.1.4.1 Geographic Boundaries. Limiting the geographic boundaries of the study area ensures that the investigation does not expand beyond the original scope of the task. This study will focus on the SRPA underlying the PER-722 tank at PBF. Collection of water samples from the SRPA will satisfy the DQOs defined for DS 1.

3.1.4.2 Temporal Boundaries. The temporal boundary refers to the timeframe that the DS applies to (e.g., number of years) and when (e.g., season, time of day, and weather conditions) the data optimally should be collected. Temporal boundaries are important when contaminant concentration changes over time are significant. For this monitoring effort, samples will be collected on a quarterly basis for a maximum period of 3 years. In addition to ensuring that the diesel release from the PER-722 tank has not adversely affected the SRPA, the initial collection of samples on a quarterly basis will allow for identification of seasonal effects on groundwater quality.

3.1.4.3 Scale of Decision-Making. The scale of decision-making is defined by joining the population of interest and the geographic and temporal boundaries of the area under investigation. For the PER-722 groundwater monitoring, the scale of decision-making is the same as the geographic and temporal boundaries defined in Subsections 3.1.4.1 and 3.1.4.2, respectively.

3.1.4.4 Practical Constraints. Practical constraints include, but are not limited to, physical barriers, difficult sample matrices, and high-radiation areas that will need to be considered in the design and scheduling of the sampling program.

The PBF-1930 core hole for PER-722 groundwater sample collection is adjacent to the PBF-620 building. In addition, a berm is located approximately 12 m (40 ft) north of the building. As shown in Figure 2-3, access to the sampling location is either by the paved area surrounding the PBF-620 building or by a road that circles around the east side of the building. While these are not insurmountable barriers to collecting groundwater samples through the piezometer installed in PBF-1930, the field team does need to consider these access constraints.

3.1.5 Develop a Decision Rule

The purpose of DQO Step 5 initially is to define the statistical parameter of interest (e.g., mean and 95% upper confidence level) that will be used for comparison against the action level. The decision rule summarizes the attributes the decision-maker needs to know about the sample population and how this knowledge will guide the selection of a course of action to solve the problem. For this monitoring effort, the decision rule is as follows:

> **If** the contaminant concentrations exceed the maximum contaminant levels, **then** the risk associated with contamination in the aquifer will need to be evaluated to determine whether any additional action is warranted. **Else**, the contaminants will be assumed to pose no unacceptable risks, and no further action will be required.

3.1.6 Decision Error Limits

Because analytical data can only estimate the condition of the site under investigation, decisions that are made based on measurement data could be erroneous (i.e., decision error). Therefore, the primary objective of DQO Step 6 is to determine which DSs (if any) require a statistically based sample design. The purpose of determining the decision error limits is to specify the decision-maker's tolerable limits for decision errors, which are used to establish performance goals for the data collection design.

Tolerable error limits assist in the development of sampling designs to ensure that the spatial variability and sampling frequency are within specified limits. For the defined DS, selection of the coring location for the sampling is based on professional judgment rather than statistics, so error limits are not used to determine the sampling location or frequency.

3.1.7 Optimize the Design

The objective of DQO Step 7 is to present alternative data collection designs that meet the minimum data quality requirements, as specified in DQO Steps 1 through 6. Then, a selection process will be used to identify the most resource-effective data collection design that satisfies all of the data quality requirements.

For DS 1, sampling will occur in the SRPA through PBF-1930, which was drilled previously to (1) ascertain the vertical extent of the diesel contamination and (2) initially assess whether the diesel fuel release adversely impacted the SRPA. The water samples will be analyzed using standard laboratory methods to learn the concentrations of the contaminants of potential concern.

3.2 Quality Assurance Objectives for Measurement

The quality assurance (QA) objectives for measurement will meet or surpass the minimum requirements for data quality indicators established in the QAPjP (DOE-ID 2004). The QAPjP provides minimum requirements for the following measurement quality indicators: precision, accuracy, representativeness, completeness, and comparability. Precision, accuracy, and completeness will be calculated in accordance with the QAPjP.

3.2.1 Precision

Precision is a gauge of the reproducibility of measurements under a given set of conditions. In the field, precision is affected by sample collection procedures and the natural heterogeneity encountered in the environment. Overall precision (field and laboratory) can be evaluated by using duplicate samples collected in the field. Typically, greater precision is required for analytes with very low action levels that are close to background concentrations.

Laboratory precision will be based on the use of laboratory-generated duplicate samples or matrix spike/matrix spike duplicate samples. The project will evaluate laboratory precision during the data review process.

3.2.2 Accuracy

Accuracy is a gauge of bias in a measurement system. Laboratory accuracy is demonstrated using laboratory control samples, blind QC samples, and matrix spikes. The project will evaluate laboratory accuracy during the data review process. Sample handling, field contamination, and the sample matrix in the field affect overall accuracy.

3.2.3 Representativeness

Representativeness is a qualitative parameter that expresses the degree to which the sampling and analysis data accurately and precisely represent the characteristic of a population parameter being measured at a given sampling point or for a process or environmental condition. Representativeness will be evaluated by determining whether measurements are made and physical samples are collected in such a manner that the resulting data appropriately measure the media and phenomenon studied. The comparison of all field and laboratory analytical data sets obtained throughout this remedial action will be used to ensure representativeness.

3.2.4 Detection Limits

Detection limits will meet or exceed the risk- or decision-based concentrations for the contaminants of concern. Detection limits will be as specified in the Sample and Analysis Management laboratory master task agreement statements of work and task order statements of work and as described in the QAPjP (DOE-ID 2004).

3.2.5 Completeness

Completeness is a measure of the quantity of usable data collected during the field sampling activities. The QAPjP (DOE-ID 2004) requires that an overall completeness goal of 90% be achieved for noncritical samples. If critical parameters or samples are identified, then a 100% completeness goal is specified. Critical data points are those sample locations or parameters for which valid data must be obtained in order for the sampling event to be considered complete.

The end use of the data generated as a result of this sampling activity serves one primary purpose, as discussed in Subsection 3.1.1. For this project, all data will be considered noncritical with a completeness goal of 90%.

3.2.6 Comparability

Comparability is a qualitative characteristic that refers to the confidence with which one data set can be compared to another. At a minimum, comparable data must be obtained using unbiased sampling designs. If sampling designs are biased, the reasons for selecting another design should be well documented. Data comparability will be assessed through the comparison of all data sets collected during this study using the following parameters:

- Data sets will contain the same variables of interest
- Units will be expressed in common metrics
- Similar analytical procedures and QA will be used to collect data
- Time measurements of variables will be similar
- Measuring devices will have similar detection limits
- Samples within data sets will be selected in a similar manner
- The number of observations will be of the same order of magnitude.

4. SAMPLING LOCATION AND FREQUENCY

The material presented in this section is intended to support the DQOs summarized in Section 3.

4.1 Quality Assurance/Quality Control Samples

The QA samples will be included to satisfy the QA requirements for the field operations in accordance with requirements in the QAPjP (DOE-ID 2004). The duplicate QA/QC samples will be analyzed as outlined in Section 3.

4.2 Sampling Location and Frequency

The PBF-1930 location is shown in Figure 2-3. Groundwater sample(s) will be collected from the SRPA through PBF-1930. Samples will be collected on a quarterly basis for a period not to exceed 3 years following IDEQ approval of this SAP.

5. SAMPLING DESIGNATION

5.1 Sample Identification Code

A systematic character identification (ID) code will be used to uniquely identify all laboratory samples. Uniqueness is required to maintain consistency and prevent the same ID code from being assigned to more than one sample.

The first three designators of the code will always be **PER,** representing the origin of the sample from the PER-722 tank groundwater monitoring effort. The next three numbers designate the sequential sample number for the project. Then, a two-character set (i.e., 01, 02) will be used to designate field duplicate samples. The last two characters refer to a particular analysis and bottle type. For BTEX analytical samples, this two-character designator will be **BX,** with **KH** being used for the PAH samples.

For example, a sample collected in support of determining BTEX concentrations might be designated as PER00101BX, where (from left to right):

- **PER** designates the sample as originating in support of the PER-722 tank groundwater monitoring effort
- **001** designates the sequential sample number
- **01** designates the type of sample (01 = original, 02 = field duplicate)
- **BX** designates BTEX analysis.

A SAP table/database will be used to record all pertinent information associated with each sample ID code.

5.2 Sampling and Analysis Plan Table/Database

A SAP table format was developed to simplify the presentation of the sampling scheme for project personnel. The following subsections describe the information recorded in the SAP table/database. The SAP tables will be generated before each individual sampling event.

5.2.1 Sample Description

The sample description fields contain information about individual sample characteristics.

5.2.1.1 Sampling Activity. The sampling activity field contains the first six characters of the assigned sample number. The sample number in its entirety will be used to link information from other sources (e.g., field data and analytical data) to the information in the SAP table for data reporting, sample tracking, and completeness reporting. The analytical laboratory also will use the sample number to track and report analytical results.

5.2.1.2 Sample Type. Data in this field will be selected from the following:

REG	for a regular sample
QC	for a QC sample.

5.2.1.3 Media. Data in this field will be selected from the following:

GW	for groundwater samples
WATER	for QA/QC water samples.

5.2.1.4 Collection Type. Data in this field will be selected from the following:

GRAB	for grab sample collection
RNST	for rinsate QA/QC samples
DUP	for field duplicate samples
FBLK	for field blank QA/QC samples
TBLK	for trip blank QA/QC samples.

5.2.1.5 Planned Date. This date is related to the planned sample collection start date.

5.2.2 Sample Location Fields

This group of fields pinpoints the exact location for the sample in three-dimensional space, starting with the general AREA, narrowing the focus to an exact location geographically, and then specifying the DEPTH in the depth field.

5.2.2.1 Area. The AREA field identifies the general sample collection area. This field should contain the standard identifier for the INEEL area being sampled. For this investigation, samples are being collected from PBF, and the AREA field identifier will correspond to that site.

5.2.2.2 Location. The LOCATION field can contain geographical coordinates, x-y coordinates, building numbers, or other location-identifying details as well as program-specific information such as core hole or well number (in this case, PBF-1930). Data in this field will normally be subordinated to the AREA. This information is included on the labels generated by the Sample and Analysis Management Program to aid sampling personnel.

5.2.2.3 Type of Location. The TYPE OF LOCATION field supplies descriptive information about the exact sample location. Information in this field may overlap that in the location field; however, it is intended to add detail to the location.

5.2.2.4 Depth. The DEPTH of a sample location is the distance in feet from surface level or a range in feet from the surface.

5.2.3 Analysis Types (AT1–AT20)

These fields indicate analysis types (e.g., radiological, chemical, and hydrological). Space is provided at the bottom of the form to clearly identify each type. A standard abbreviation also will be provided, if possible.

6. SAMPLING PROCEDURES AND EQUIPMENT

This section describes the sampling procedures and equipment to be used for the planned sampling and analyses described in this plan. Before beginning any sampling activities, a prejob briefing will be held to review the requirements of this plan and the project HASP (INEEL 2003) and to ensure that all supporting documentation has been completed.

6.1 Sampling Requirements

Requirements for the PER-722 monitoring activity are outlined in the following subsections.

6.1.1 Site Preparation

All required documentation and safety equipment will be assembled at the sampling site, including radios, fire extinguishers, personal protective equipment, sample bottles, sampling tools and equipment, and accessories. All sampling personnel are responsible for having read both this plan and the project HASP (INEEL 2003) before sampling. Before work begins each day, the field team leader (FTL) will brief personnel about potential hazards and ensure that they have the required training. The FTL will assign a team member to maintain document control and note this assignment in the FTL's logbook in accordance with MCP-9227, "Environmental Services Project Logkeeping Practices."

6.1.2 Sample Collection

Before sampling, all nondedicated sampling equipment that contacts the sample water will be cleaned following the procedures outlined in Guide (GDE)-162, "Decontaminating Sampling Equipment." Water samples will be collected in accordance with the procedures outlined in GDE-127, "Sampling Groundwater." After sampling, all sampling equipment that has contacted the sample water will be decontaminated in accordance with the procedures in GDE-162.

For BTEX samples, a separate aliquot of the same volume as the samples will be collected to determine the correct amount of preservative and will be tested for pH. Refer to Appendix C in GDE-127 for appropriate sample preservation for a 40-mL vial. The 40-mL glass volatile organic analysis vials will be filled, leaving no headspace or air bubbles. Sulfuric acid (H_2SO_4) preservative will be introduced into the vials before sample collection. Table 6-1 summarizes the specific sample requirements.

Table 6-1. Specific water sample requirements.

Analytical Parameter	Container Size	Container Type	Preservative	Analytical Method	Holding Time
BTEX	3 mL to 40 mL	Glass vials	H_sSO_4 to pH<2, cool to 4°C	SW-846 Method 8021B	14 days
PAHs	1 L	Amber glass	Cool to 4°C	SW-846 Method 8310	7 days

BTEX = benzene, toluene, ethyl benzene, and xylene
PAH = polynuclear aromatic hydrocarbon

6.1.3 Sample Shipping

Samples will be transported in accordance with the regulations promulgated in 49 CFR 171, 172, 173, 175, 176, and 178 and EPA sample handling, packaging, and shipping methods delineated in 40 CFR 262, Subpart C, "Pre-Transport Requirements." Additional information pertaining to sample shipping is found in MCP-9228, "Environmental Sample Management." All samples will be packaged and transported in a manner that protects the integrity of the samples and prevents sample leakage.

All samples require cooling for preservation. Upon receipt, laboratory personnel will verify the condition of the samples, including temperature. The laboratory will communicate any discrepancies to the field personnel and the project through the Sample and Analysis Management Program. Project personnel will determine the appropriate corrective action on a case-by-case basis.

6.2 Handling and Disposition of Monitoring Waste

Waste will be generated during the sampling activities, as described herein. The disposition and handling of waste for this project will be consistent with standard Waste Generator Services (WGS) procedures. Samples will be handled in accordance with MCP-9228, "Environmental Sample Management." Waste streams generated from the sampling activity will be characterized in accordance with MCP-62, "Waste Generator Services—Low-Level Waste Management," and handled, stored, and disposed of accordingly. A Waste Determination and Disposition Form has been prepared previously by WGS for the waste generated during the historical sampling events.

Types of waste expected to be generated because of sampling activities conducted during this project include the following:

- Personal protective equipment
- Liquid decontamination residue
- Plastic sheeting
- Unused/unaltered sample material
- Sample containers
- Hydraulic spills
- Miscellaneous waste.

Based upon historical data, it is not anticipated that any waste generated will be hazardous. In the event that hazardous waste is generated and as sampling continues, additional waste streams could be identified. All new waste streams, as well as those identified above, will require identification and characterization of the waste. A hazardous waste determination must be completed and presented to the appropriate waste management organization (e.g., WGS) for approval by that organization at the time of generation. The waste associated with the sampling activities will be managed in a manner that complies with the established procedures, protects human health and the environment, and minimizes waste to the extent possible.

6.2.1 Waste Minimization

Waste minimization techniques will be incorporated into planning and daily work practices to improve worker safety and efficiency. In addition, such techniques will help reduce the project's environmental and financial liability. Specific waste-minimization practices to be implemented will include, but not be limited, to the following:

- Excluding materials that could become hazardous waste in the decontamination process (if any)
- Controlling transfer between clean and contaminated zones
- Designing containment such that the spread of contamination is minimized
- Collecting all necessary samples at one time, such that no additional waste is generated from re-sampling.

The *U.S. Department of Energy - Idaho Operations Office Idaho National Engineering and Environmental Laboratory Interim Pollution Prevention Plan* (DOE-ID 2000) addresses the efforts to be expended and the reports required to track waste generated by projects. That plan directs that the volume of waste generated by INEEL operations be reduced as much as possible.

Industrial waste does not require segregation by type; therefore, containers will be identified as industrial waste and maintained outside the controlled area for separate collection. Industrial waste is defined as solid waste generated by industrial processes and manufacturing. Industrial waste is not radioactive, hazardous, or mixed waste in accordance with 40 CFR 243, "Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste," and 40 CFR 243.101, "Definitions." Contaminated waste has the potential to be hazardous. This waste will require segregation as either incinerable (e.g., wipes and personal protective equipment) or nonincinerable (e.g., polyvinyl tubing) in anticipation of subsequent waste management. Containers for collection of contaminated waste will be clearly labeled to identify the waste type and will be maintained inside the controlled area, as defined in the project HASP (INEEL 2003), until removal for subsequent management.

6.2.2 Laboratory Samples

All laboratory and sample waste will be managed in accordance with Sample and Analysis Management master task agreements as part of the contract for the subcontracted laboratory. The laboratories will dispose of any unused sample material. They are also responsible for any waste generated as a result of sample analyses. If unused sample material must be returned from the laboratory, then only the unused, unaltered samples in the original sample containers will be accepted. These samples will be returned to the waste stream from which they originated. If a laboratory must return altered sample material (e.g., analytical residue), then the laboratory will specifically define the types of chemical additives used in the analytical process and help make a hazardous waste determination. This information will be provided to the project FTL and environmental compliance coordinator. In addition, management of this waste will require separation from the other unaltered samples being returned.

6.2.3 Packaging and Labeling

Containers used to store and transport hazardous waste must meet the requirements of 40 CFR 264, Subpart I, "Use and Management of Containers." The *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* document (DOE-ID 2003) contains additional details about packaging and container conditions. Appropriate waste containers include 208-L (55-gal) drums and other suitable containers that meet the U.S. Department of Transportation's packaging regulations (49 CFR 171, 173, 178, and 179) or the requirements outlined in the *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* document (DOE-ID 2003). The WGS will be consulted to ensure that the packaging is acceptable to the receiving facility.

Waste containers will be labeled with standard waste labels that include the following information:

- Unique bar code serial number
- Name of generating facility
- Phone number of generator contact
- Listed or characteristic waste code(s)
- Waste package gross weight
- Waste accumulation start date
- Maximum radiation level on contact and at 1 m (3 ft) in air
- Waste stream or material identification number assigned by the receiving facility
- Other labels and markings required by 49 CFR 172, Subpart D, "Marking," and 49 CFR 172, Subpart E, "Labeling."

Any of the above information that is unknown when the waste is labeled may be added when the information is known.

The unique bar code serial number is used for tracking and consists of a five-digit number followed by a single alpha designator. The alpha designator indicates which facility generated the bar code. A new bar code will be affixed to each container when waste is first placed in the container.

Any waste shipped off the INEEL site must be labeled in accordance with applicable U.S. Department of Transportation labels and markings (49 CFR 172, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements"). Additionally, waste labels must be visible, legibly printed or stenciled, and placed so that a full set of labels and markings are visible. See the *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* document (DOE-ID 2003) for additional labeling information.

6.2.4 Storage and Inspection

Waste can be stored in an established 90-day storage area. Solid waste segregated as potentially hazardous and placed in 208-L (55-gal) drums will be stored in the 90-day storage area. Based upon historical sampling data, it is not anticipated that any hazardous waste will be generated during these sampling activities. However, in the event that a hazardous waste is generated, the waste will be stored in a 90-day storage area previously established at the INEEL. To meet the substantive requirements of 40 CFR 264, Subpart I, "Use and Management of Containers," the Resource Conservation and Recovery Act (RCRA) inspection of the 90-day storage area will be conducted as part of the weekly waste container inspection. The purposes of the weekly container inspection are to look for containers that are leaking or deteriorating due to corrosion or other factors, ensure that the containment system has not deteriorated due to corrosion, and verify that labels are in place and legible. Inspections of the containers and the 90-day storage area are conducted to meet the guidance in MCP-3470, "RCRA 90-Day Storage Areas." The inspections will be documented on a weekly inspection form when completed. The WGS will maintain the checklists used to guide the inspection.

6.2.5 Personal Protective Equipment

Personal protective equipment requiring disposal will include, but not be limited to, gloves. Personal protective equipment will be disposed of in accordance with the requirements in the *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* document (DOE-ID 2003) and standard WGS procedures.

6.2.6 Hazardous Waste Determinations

All waste generated will be characterized in accordance with the requirements of 40 CFR 262.11, "Hazardous Waste Determination." Hazardous waste determinations will be prepared for all waste streams in accordance with the requirements set forth in MCP-62, "Waste Generator Services—Low-Level Waste Management." Completed hazardous waste determinations will be maintained for all waste streams as part of the project file held by WGS. Two approaches can be used to determine whether a waste is characteristic:

1. Process knowledge can be used if enough information exists to characterize the waste. Process knowledge can include direct knowledge of the source of contamination and/or existing validated analytical data.

2. Representative samples of the waste stream can be analyzed by using specialized RCRA protocols, standard protocols for sampling and laboratory analysis that are not specialized RCRA methods, or other equivalent regulatory-approved methods. In addition, process knowledge can influence the amount of sampling and analysis required for characterization.

Land disposal restrictions for hazardous waste are addressed in 40 CFR 268, "Land Disposal Restrictions." The INEEL-specific requirements for treatment, storage, and disposal are addressed in the *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* document (DOE-ID 2003). After the hazardous waste determinations are completed, the INEEL Interim Waste Tracking System profile number is assigned, and the appropriate information is entered into the tracking system.

6.2.7 Waste Disposition

At the conclusion of the investigations, or when deemed necessary, industrial waste will be disposed of in the Central Facilities Area (CFA) landfill following the protocols and completing the forms identified in the *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* document (DOE-ID 2003). To achieve this waste management activity, industrial waste will be turned over to CFA Operations personnel for management under existing facility waste streams and in accordance with standing facility procedures. When enough waste has accumulated to ship it to one of the INEEL waste management units or off the INEEL to a commercial waste management facility, WGS will be contacted, and the appropriate forms will be completed and submitted for approval (as required). The waste-generator interface will provide help in packaging and transporting the waste.

The RCRA hazardous waste is not intended for storage in a permitted treatment, storage, and disposal facility. If further characterization of the contaminated waste becomes necessary, services will be requested from WGS and the Sample and Analysis Management Program. Requesting these services requires completion of Form 435.26, "SMO/WGS Services Request Form." For final disposition of RCRA hazardous waste, WGS will be contacted to determine whether the waste qualifies for disposal under terms of existing master task agreements.

The subcontract laboratory will be responsible for managing contaminated waste generated at the laboratory during analytical testing. However, overall management of the samples must be done in accordance with the requirements of MCP-9228, "Environmental Sample Management." Specifically, MCP-9228 requires the facility environmental, safety, and health manager to provide written approval before the return of any media and that written documentation of sample disposition be developed and maintained. To initiate return of the waste to the INEEL, the subcontract laboratory must notify the Sample and Analysis Management Program via a written report that provides the known volume and characteristics of each waste type and the shipping and packaging details. Written final authorization for the return of waste will be provided to the subcontract laboratory from the Sample and Analysis Management Program with concurrence from the technical task manager. If laboratory waste is returned, then WGS will be contacted and responsible for the disposition of the waste.

6.2.8 Recordkeeping and Reporting

Records and reports related to waste management must be maintained in accordance with MCP-3470, "RCRA 90-Day Storage Areas." Based upon historical data, it is not anticipated that any hazardous waste will be generated during these sampling activities. As required, some of the records and reports can be completed by subcontractors but must be available either at CFA or within the project files. All information related to the tracking and disposition of waste generated as a result of the sampling effort will be entered into the Integrated Waste Tracking System, which WGS operates and maintains. These records must include, but not be limited to, the following:

- Hazardous waste determinations, characterization information, and statements of process knowledge (by subcontractors)
- 90-day storage area inspection reports and log-in/log-out history
- Training records
- Documentation with respect to all spills.

6.3 Project-Specific Waste Streams

Several distinct waste stream types are likely to be generated during this project. Some of these waste types will be clean, but many could be contaminated. After generation, any or all of the waste might be reclassified; therefore, the intended waste management strategies for each are outlined in the following subsections. They describe the expected waste that will require compliant storage and/or disposal, including the intended management strategy from the time of generation until final disposition. Field and laboratory personnel will be responsible for segregating waste. The anticipated quantities also have been approximated. However, they are considered a rough order of magnitude, because, in some cases, the type of contamination presented cannot be determined before sampling and analysis. Estimated waste volumes are based on historical sampling activities conducted in support of other sampling activities at the INEEL in addition to calculated volumes based on drawings and discussions with Idaho Completion Project personnel.

6.3.1 Personal Protective Equipment

Personal protective equipment in the form of coveralls, leather and rubber gloves, and anticontamination clothing could be used during sampling activities. The anticipated quantity of personal protective equipment to be used and requiring disposal because of sampling activities is 0.76 m^3 (1 yd^3), classified as clean.

6.3.2 Liquid Decontamination Residue

Decontamination methods for field and sampling equipment will ensure containment of all decontamination fluids and minimize waste and equipment contamination. Decontamination fluids will be generated as a result of wet decontamination of sampling equipment (e.g., spoons and shovels). The anticipated quantity of decontamination fluids to be generated and requiring disposal because of sampling activities is 57 L (15 gal), classified based on the site of origin. A sample of the rinsate water will be submitted for laboratory analysis to verify the end classification of decontamination fluids.

6.3.3 Solid Decontamination Residue

As with the liquid decontamination residues, solid decontamination methods will ensure the minimization of waste and equipment contamination. Solid decontamination residues will be generated as a result of dry decontamination of sampling equipment. Dry decontamination methods will be used to the extent practicable to minimize the generation of liquid decontamination residues. The anticipated quantity of solid decontamination residues to be generated and requiring disposal as a result of the sampling activities is 57 L (15 gal), classified based on the site of origin. The end classification of the solid decontamination residues will be based on the results of the analytical samples collected from the contaminated source.

6.3.4 Plastic Sheeting

Plastic sheeting can be used as an environmental barrier to contamination and to provide a lay down site for staging equipment and tooling. Based on historical use of plastic sheeting at environmental remediation sites, the anticipated volume to be generated and requiring disposal because of sampling activities is 0.76 m^3 (1 yd^3), classified as clean.

6.3.5 Unused/Unaltered Sample Material

Unused/unaltered sample material will be generated from the sampling activities in the form of water not needed for sampling and analysis. In most cases, the analytical laboratory will be responsible for disposing of the unused/unaltered sample material and any waste generated from sample analyses. If the unused sample material must be returned from the laboratory, then only the unused, unaltered samples in the original sample containers will be accepted. The unused, unaltered sample material will be returned to the point of origin whenever possible. If sample material cannot be returned to the point of origin, then the material will be consolidated for disposal at an approved facility.

6.3.6 Analytical Residues

Analytical residues will be generated from the sample analytical activities conducted by subcontracted laboratories. The laboratories are required to dispose of analytical residues under terms of the subcontract, but the residues might be returned, particularly in the case of materials regulated under the Toxic Substances Control Act (15 USC § 2601 et seq.). No known sources of materials regulated under that act are in the immediate vicinity of the PER-722 tank. Generation of analytical residues that require disposal because of sampling activities is not anticipated. If analytical residues that require disposal by the INEEL are generated, then the residues will be classified based on the site of origin. Residues returned to the INEEL will be consolidated for eventual disposal at an approved facility.

6.3.7 Sample Containers

Sample containers will become a waste stream after analysis. As with unused/unaltered sample material, the analytical laboratory will be responsible for disposal of the sample containers. If the laboratory has to return unused sample material, then the samples will be consolidated for disposal. The sample containers, by virtue of the empty container rule, will be disposed of as clean waste.

6.3.8 Hydraulic Spills

A small quantity of hydraulic oil (less than 18.9 L [5 gal]) might be generated during the sampling activities. The waste oil will be collected in drip pans. The collected hydraulic oil will be removed to the CFA Land Farm. The WGS will make the final determination, which will depend partially on quantities generated.

6.3.9 Miscellaneous Waste

Miscellaneous waste (such as trash, labels, rags, and other miscellaneous debris) might be generated during the project. The anticipated quantity of miscellaneous waste to be generated and requiring disposal because of sampling activities is 1.53 m^3 (2 yd^3), classified as clean. Clean miscellaneous waste will be removed to the CFA landfill.

7. DOCUMENTATION MANAGEMENT AND SAMPLE CONTROL

Subsection 7.1 summarizes document management and sample control activities associated with PER-722. Documentation includes field logbooks used to record field data and sampling procedures. Subsection 7.2 outlines sample handling and discusses chain of custody and radioactivity screening for shipment to the analytical laboratory (if required). After validation of the analytical results from each sampling event, a letter report summarizing the results will be submitted to the IDEQ.

7.1 Documentation

The FTL will be responsible for controlling and maintaining all field documents and records and for ensuring that all required documents are submitted to the Administrative Record and Document Control. All entries will be made in permanent ink. A single line will be drawn through any error with the correct information entered next to it. All corrections will be initialed and dated.

7.1.1 Sample Container Labels

Waterproof, gummed labels generated from the SAP database will display information such as the sample ID number, name of the project, sample location, and analysis type. In the field, labels will be completed and placed on the containers before collecting the sample. Labels will be filled out with the sample date, sample time, preservative used, field measurements of hazards, and the sampler's initials during field sampling.

7.1.2 Field Guidance Forms

Field guidance forms, provided for each sample location, will be generated from the SAP database to ensure unique sample numbers. These forms are used to facilitate sample container documentation and organization of field activities. The forms contain information regarding the following:

- Media
- Sample ID numbers
- Sample location
- Aliquot ID
- Analysis type
- Container size and type
- Sample preservation.

7.1.3 Field Logbooks

In accordance with Administrative Record and Document Control format, field logbooks will be used to record information necessary to interpret the analytical data. All field logbooks will be controlled and managed according to MCP-9227, "Environmental Services Project Logkeeping Practices."

7.1.3.1 Sample Logbooks. Field teams will use sample logbooks. Each sample logbook will contain information such as the following:

- Physical measurements (if applicable)
- All QC samples
- Sample date, time, and location
- Shipping information (e.g., shipping dates, cooler ID number, destination, chain-of-custody number, and name of shipper).

7.1.3.2 Field Team Leader's Daily Logbook. An operational logbook maintained by the FTL will contain a daily summary of the following:

- All the project field activities
- Problems encountered
- Visitor log
- List of site contacts.

This logbook will be signed and dated at the end of each day's sampling activities.

7.1.3.3 Field Instrument Calibration/Standardization Logbook. A logbook containing records of calibration data will be maintained for each piece of equipment requiring periodic calibration or standardization. This logbook will contain sheets to record the date, time, method of calibration, and instrument ID number.

7.2 Sample Handling

Analytical samples for laboratory analyses will be collected in precleaned containers and packaged according to procedures recommended by the American Society for Testing and Materials or the EPA. The duplicate QA samples will be included to satisfy the QA requirements for the field operation, as outlined in the QAPjP (DOE-ID 2004). Only qualified (Sample and Analysis Management-approved) analytical and testing laboratories will analyze these samples.

7.2.1 Sample Preservation

For samples requiring temperatures of 4°C (39°F) for preservation, the temperature will be checked periodically to certify adequate preservation before sample shipment. Ice chests (coolers) containing frozen, reusable ice will be used to chill the samples in the field after sample collection, if required.

7.2.2 Chain-of-Custody Procedures

The chain-of-custody procedures outlined in MCP-9228, "Environmental Sample Management," and the QAPjP (DOE-ID 2004) will be followed. Sample bottles will be stored in a secured area accessible only to the field team members.

7.2.3 Transportation of Samples

Samples will be shipped in accordance with the regulations issued by the U.S. Department of Transportation (49 CFR 171, 172, 173, 175, 176, and 178) and EPA sample handling, packaging, and shipping methods (40 CFR 262 Subpart C and 40 CFR 263). All samples will be packaged in accordance with the requirements set forth in MCP-9228, "Environmental Sample Management."

7.2.3.1 Custody Seals. Custody seals will be placed on all shipping containers to indicate when tampering or unauthorized opening occurs. Clear plastic tape will be placed over the seals to protect them during shipment.

7.2.3.2 On-Site and Off-Site Shipping. An on-Site shipment is any transfer of material within the perimeter of the INEEL. Site-specific requirements for transporting samples within INEEL site boundaries and those required by the shipping/receiving department will be followed. Shipment within INEEL boundaries will conform to U.S. Department of Transportation requirements, as stated in 49 CFR, "Transportation." All shipments will be coordinated with WGS and conform to the applicable packaging and transportation MCPs. Radiological Control personnel must screen all samples to be removed from the task site for radiological contaminants before the samples are shipped.

7.3 Document Revision Requests

Revisions to this document will follow the requirements set forth in MCP-135, "Creating, Modifying, and Canceling Procedures and Other DMCS-Controlled Documents."

8. REFERENCES

40 CFR 141, 2004, "National Primary Drinking Water Regulations," *Code of Federal Regulations*, Office of the Federal Register, March 2004.

40 CFR 243, 2002, "Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste," *Code of Federal Regulations*, Office of the Federal Register, February 2002.

40 CFR 243.101, 2002, "Definitions," *Code of Federal Regulations*, Office of the Federal Register, February 2002.

40 CFR 262, Subpart C, 2004, "Pre-Transport Requirements," *Code of Federal Regulations*, Office of the Federal Register, March 2004.

40 CFR 262.11, 2004, "Hazardous Waste Determination," *Code of Federal Regulations*, Office of the Federal Register, March 2004.

40 CFR 263, 2002, "Standards Applicable to Transporters of Hazardous Waste," *Code of Federal Regulations*, Office of the Federal Register, February 2002.

40 CFR 264, Subpart I, 2002, "Use and Management of Containers," *Code of Federal Regulations*, Office of the Federal Register, April 2002.

40 CFR 268, 2004, "Land Disposal Restrictions," *Code of Federal Regulations*, Office of the Federal Register, February 2004.

40 CFR 300, 2004, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, Office of the Federal Register, February 2004.

49 CFR, 2004, "Transportation," *Code of Federal Regulations*, Office of the Federal Register, March 2004.

49 CFR 171, 2004, "General Information, Regulations, and Definitions," *Code of Federal Regulations*, Office of the Federal Register, January 2004.

49 CFR 172, 2004, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements," *Code of Federal Regulations*, Office of the Federal Register, January 2004.

49 CFR 172, Subpart D, 2004, "Marking," *Code of Federal Regulations*, Office of the Federal Register, January 2004.

49 CFR 172, Subpart E, 2004, "Labeling," *Code of Federal Regulations*, Office of the Federal Register, January 2004.

49 CFR 173, 2004, "Shippers—General Requirements for Shipments and Packagings," *Code of Federal Regulations*, Office of the Federal Register, January 2004.

49 CFR 175, 2004, "Carriage by Aircraft," *Code of Federal Regulations*, Office of the Federal Register, January 2004.

49 CFR 176, 2004, "Carriage by Vessel," *Code of Federal Regulations*, Office of the Federal Register, January 2004.

49 CFR 178, 2004, "Specifications for Packagings," *Code of Federal Regulations*, Office of the Federal Register, January 2004.

49 CFR 179, 2004, "Specifications for Tank Cars," *Code of Federal Regulations*, Office of the Federal Register, January 2004.

15 USC § 2601 et seq., 1976, "The Toxic Substances Control Act (TSCA) of 1976," *United States Code.*

DOE-ID, 2000, *U.S. Department of Energy - Idaho Operations Office Idaho National Engineering and Environmental Laboratory Interim Pollution Prevention Plan*, DOE/ID-10333(00), Rev. 0, U.S. Department of Energy Idaho Operations Office, June 2000.

DOE-ID, 2003, *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria*, DOE/ID-01-10381, Rev. 18, U.S. Department of Energy Idaho Operations Office, May 2003.

DOE-ID, 2004, *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning*, DOE/ID-10587, Rev. 8, U.S. Department of Energy Idaho Operations Office, March 2004.

EPA, 1994, *Guidance for the Data Quality Objectives Process*, EPA QA/G, EPA/600/R-96/055, U.S. Environmental Protection Agency, September 1994.

EPA, 2002, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Revision 5, U.S. Environmental Protection Agency, Office of Solid Waste, August 2002.

Form 435.26, 2001, "SMO/WGS Services Request Form," Rev. 13, Idaho National Engineering and Environmental Laboratory, March 2001.

GDE-127, 2003, "Sampling Groundwater," Rev. 0, *Environmental Monitoring/Compliance Monitoring Handbook*, Idaho National Engineering and Environmental Laboratory, February 2003.

GDE-162, 2003, "Decontaminating Sampling Equipment," Rev. 0, *Environmental Services Project Characterization Sampling Handbook*, Idaho National Engineering and Environmental Laboratory, April 2003.

Gundersen, J. M., 2002, *Calculation of Loss of Diesel Fuel from PBF Fuel Tank PER-722,* EDF-2400, Rev. 0, Idaho National Engineering and Environmental Laboratory, July 2002.

IAG-226, 2003, "Interface Agreement between the Balance of INEEL Cleanup Project and Idaho Nuclear Technology and Engineering Center for the Performance of Balance of INEEL Cleanup Activities at the Power Burst Facility," Rev. 0, Idaho National Engineering and Environmental Laboratory, December 2003.

IDEQ, 1996, *Risk-Based Corrective Action Guidance Document for Petroleum Releases,* State of Idaho Division of Environmental Quality Remediation Bureau, August 1996.

INEEL, 2003, *Health and Safety Plan for the Long-Term Stewardship Sitewide Groundwater Monitoring*, INEEL/EXT-01-01644, Rev. 2, Idaho National Engineering and Environmental Laboratory, November 2003.

MCP-62, 2004, “Waste Generator Services—Low-Level Waste Management,” Rev. 9, *Manual 17—Waste Management,* Idaho National Engineering and Environmental Laboratory, January 2004.

MCP-135, 2003, “Creating, Modifying, and Canceling Procedures and Other DMCS-Controlled Documents,” Rev. 14, *Manual 1—General Administration and Information*, Idaho National Engineering and Environmental Laboratory, September 2003.

MCP-3470, 2001, “RCRA 90-Day Storage Areas,” Rev. 1, *Manual 17—Waste Management*, Idaho National Engineering and Environmental Laboratory, May 2001.

MCP-9227, 2003, “Environmental Services Project Logkeeping Practices,” Rev. 5, *Environmental Services Administration Handbook*, Idaho National Engineering and Environmental Laboratory, December 2003.

MCP-9228, 2004, “Environmental Sample Management,” Rev. 5, *Environmental Services Administration Handbook*, Idaho National Engineering and Environmental Laboratory, January 2004.

MCP-9439, 202, “Preparation for Environmental Sampling Activities at the INEEL,” Rev. 1, *Manual 8—Environmental Protection and Compliance*, Idaho National Engineering and Environmental Laboratory, October 2002.