Abbreviated Sampling and Analysis Plan for Planning Decontamination and Decommissioning at Test Reactor Area (TRA) Facilities

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SCIENTECH, Inc.
Idaho Falls, ID 83402

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Under Subcontract
and for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
Under DOE Idaho Field Office
Contract DE-AC07-94ID13223

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Prepared for
ENVIRONMENTAL SUPPORT GROUP

ABBREVIATED SAMPLING AND ANALYSIS PLAN FOR PLANNING DECONTAMINATION AND DECOMMISSIONING AT TEST REACTOR AREA (TRA) FACILITIES

October 1994

APPROVED BY

D. Baxter
D&D Project Manager

Date

REVIEWED BY

I. P. Shea
Chairman, ERD Independent Review Committee

Date
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ABSTRACT

This Abbreviated Sampling and Analysis Plan (ASAP) supports the EG&G Idaho, Inc., Decontamination and Decommissioning (D&D) Program at the U.S. Department of Energy's Idaho National Engineering Laboratory (INEL) in Southeastern Idaho. The objective is to sample and analyze for the presence of gamma emitting isotopes and hazardous constituents within certain areas of the Test Reactor Area (TRA), prior to D&D activities.

The TRA, located approximately 4.5 miles northwest of the Central Facilities Area (CFA), is composed of three major reactor facilities and three smaller reactors built in support of programs studying the performance of reactor materials and components under high neutron flux conditions. The Materials Testing Reactor (MTR) and Engineering Test Reactor (ETR) facilities are currently pending Decontamination and Decommissioning. ATR continues to operate.

Work encompassed in this ASAP consists of pre-D&D sampling of designated TRA (primarily ETR) process areas. This ASAP addresses only a limited subset of the samples which will eventually be required to characterize MTR and ETR and plan their D&D. Sampling which is addressed in this document is intended to support planned D&D work which is funded at the present time. Biased samples, based on process knowledge and plant configuration, are to be performed. The multiple process areas which may be potentially sampled will be initially characterized by obtaining data for upstream source areas which, based on facility configuration, would affect downstream and as yet unsampled, process areas. Sampling and analysis will be conducted to determine the level of gamma emitting isotopes and hazardous constituents present in designated areas within buildings TRA-612, 642, 643, 644, 645, 647, 648, 663; and in the soils surrounding Facility TRA-611. These data will be used to plan the D&D and help determine disposition of material by D&D personnel. Both MTR and ETR facilities will eventually be decommissioned by total dismantlement so that the area can be restored to its original condition.

This document also functions as a Quality Plan during site sampling and analysis to ensure that all data collected are valid, reliable, and defensible. The ASAP outlines organization, objectives, and quality assurance/quality control activities to achieve the desired data quality goals.
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<td>Auxiliary Reactor Area</td>
</tr>
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<td>ASAP</td>
<td>Abbreviated Sampling and Analysis Plan</td>
</tr>
<tr>
<td>CFA</td>
<td>Central Facilities Area</td>
</tr>
<tr>
<td>COC</td>
<td>Chain of Custody</td>
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<tr>
<td>C/P or CPM</td>
<td>counts per minute</td>
</tr>
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<td>D&amp;D</td>
<td>decontamination and decommissioning</td>
</tr>
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<td>DMS</td>
<td>data management system</td>
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<td>DOE</td>
<td>U.S. Department of Energy</td>
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<td>DQOs</td>
<td>data quality objectives</td>
</tr>
<tr>
<td>EG&amp;G</td>
<td>EG&amp;G Idaho</td>
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<tr>
<td>EM</td>
<td>environmental monitoring</td>
</tr>
<tr>
<td>EMSP</td>
<td>environmental monitoring standard practices</td>
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<tr>
<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
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<tr>
<td>ESG</td>
<td>Environmental Support Group</td>
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<tr>
<td>ETR</td>
<td>Engineering Test Reactor</td>
</tr>
<tr>
<td>FTL</td>
<td>Field Team Leader</td>
</tr>
<tr>
<td>HAZMAT</td>
<td>hazardous material</td>
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<tr>
<td>HEPA</td>
<td>high-efficiency particulate air</td>
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<tr>
<td>HMTM</td>
<td>EG&amp;G Hazardous Materials Transportation Manual</td>
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<tr>
<td>HPLC</td>
<td>high-performance liquid chromatography</td>
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<tr>
<td>HSP</td>
<td>Health and Safety Plan</td>
</tr>
<tr>
<td>ICP</td>
<td>inductively coupled plasma</td>
</tr>
<tr>
<td>IH</td>
<td>Industrial Hygienist</td>
</tr>
<tr>
<td>INEL</td>
<td>Idaho National Engineering Laboratory</td>
</tr>
<tr>
<td>LDPE</td>
<td>Low Density Polyethylene</td>
</tr>
<tr>
<td>LLW</td>
<td>Low Level Radioactive Waste</td>
</tr>
<tr>
<td>mg</td>
<td>milligram</td>
</tr>
<tr>
<td>ml</td>
<td>milliliter</td>
</tr>
<tr>
<td>MS/MSD</td>
<td>matrix spike and matrix spike duplicate</td>
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<tr>
<td>MTR</td>
<td>Materials Testing Reactor</td>
</tr>
<tr>
<td>MW(t)</td>
<td>Megawatts, thermal</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety and</td>
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<tr>
<td></td>
<td>Health</td>
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<table>
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<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>OMP</td>
<td>Occupational Medical Program</td>
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<td>Occupational Safety and Health Administration</td>
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<td>PPE</td>
<td>Personal Protective Equipment</td>
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<td>QA/QC</td>
<td>Quality Assurance and Quality Control</td>
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<td>Quality Assurance Project Plan</td>
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<td>Radiation Area Monitor</td>
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<td>RCRA</td>
<td>Resource Conservation and Recovery Act</td>
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<td>RCT</td>
<td>Radiological Control Technician</td>
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<tr>
<td>RML</td>
<td>Radiation Measurements Laboratory</td>
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<td>RRWAC</td>
<td>Reusable Property, Recyclable Material Waste Acceptance Criteria</td>
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<td>Relative Standard Deviation</td>
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<td>Reactor Temperature Vulcanizing</td>
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<td>RWMC</td>
<td>Radioactive Waste Management Complex</td>
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<td>Radiological Work Permit</td>
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<td>Sample Management Office</td>
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<td>SOP</td>
<td>Standard Operating Procedure</td>
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<td>SW-846</td>
<td>EPA publication SW-846: Test Methods for Evaluating Solid Waste</td>
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<td>TCLP</td>
<td>Toxicity Characteristic Leaching Procedure</td>
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<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
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<td>TRA</td>
<td>Test Reactor Area</td>
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<tr>
<td>TRU</td>
<td>Transuranic Radioactive Waste</td>
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<td>μg</td>
<td>Microgram</td>
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<td>Volatile Organic Analysis</td>
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<tr>
<td>VOCs</td>
<td>Volatile Organic Compounds</td>
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ABBREVIATED SAMPLING AND ANALYSIS PLAN FOR PLANNING DECONTAMINATION AND DECOMMISSIONING AT TEST REACTOR AREA (TRA) FACILITIES

1.0 INTRODUCTION

This abbreviated sampling and analysis plan (ASAP) was prepared for the Decontamination and Decommissioning (D&D) Program, which is responsible for the total dismantlement of the Materials Testing Reactor (MTR) and the Engineering Test Reactor (ETR).

Scope

This ASAP addresses only a portion of the samples which will eventually be required to characterize the entire MTR and ETR and plan their D&D. Sampling, addressed in this document is intended to support planned D&D work. For the areas addressed, the document outlines the approach for gathering sufficient and appropriate data to plan the D&D of designated TRA facilities, and ensure proper characterization of materials from the planned work areas for proper disposal. Waste materials will be disposed of in accordance with the RRWAC, DOE/ID-10381. Resource Conservation and Recovery Act (RCRA) hazardous waste and Class I nonhazardous waste will be transported to a RCRA-approved landfill. Unregulated waste does not require special handling for removal.

Correlated Data

The document is organized to allow cross-referencing (See Table 1.1) the planned samples, sampling methodology, media, planned analytes, and sampling locations. Location drawings and photographs of the sites to be sampled are provided as exhibits at the back of the document.

Quality Plan

This ASAP also functions as a Quality Assurance Project Plan (QAPjP). A QAPjP serves as a controlling mechanism during sampling and analysis to ensure that all data collected are valid, reliable, defensible, and meet the identified data quality objectives. This document outlines the organization, objectives, and quality assurance/quality control (QA/QC) activities needed to achieve the desired data quality objectives.

Key Personnel

The Abbreviated Sampling and Analysis Plan and the Health and Safety Plan for the preliminary sampling assessment of the MTR and ETR work areas was requested by
Don Baxter in June, 1994. The following are key project personnel and responsibilities:

Prepared By:  N. R. Ricks, SCIENTECH
Field Team Leader:  TBD
Sampling Operations:  TBD
IH/Safety:  TBD
Quality Assurance:  TBD
Laboratory:  To be contracted by the EG&G Idaho Sample Management Office (SMO)
Validation:  SMO
Radiological Engineer:  TBD
2.0 PROJECT DESCRIPTION

2.1 Background

The TRA, located approximately 4.5 miles northwest of the Central Facilities Area (CFA) of the INEL (see Figure 1), is composed of three major reactor facilities and three smaller reactors built in support of programs studying the performance of reactor materials and components under high neutron flux conditions. The MTR and ETR facilities are currently pending Decontamination and Decommissioning. ATR continues to operate.

This ASAP is intended to address D&D work which can be accommodated by currently approved budgets, and is restricted primarily to areas at ETR.

Materials Testing Reactor
The Materials Testing Reactor (MTR) was the second reactor operating at INEL, and was first operated on March 31, 1952, at a power level of 30 MW(t), (see Figure 2). MTR was used until April 23, 1970, when it was placed in standby status. MTR consists of a building containing the reactor structure, extensive experimental facilities, and a storage canal. Waste systems at MTR are still operable.

Engineering Test Reactor
The Engineering Test Reactor (ETR) became operational in 1957, at an operating power level of 175 MW(t). It provided more high-flux testing space, more stable flux, and a greater variety of flux levels than the MTR could provide, (see Figure 2). ETR was used until 1981.

ETR is housed in a three-story building with two complete floors below grade. The first basement houses experimental control panels, (identified in drawings as the “Console”); the second basement contains experimental equipment, housed in heavily-shielded concrete cubicles (identified in drawings as the “Basement”).

The reactor main floor is relatively clear of plant and experimental equipment, and provides access to the T-shaped storage canal.

Much of the proposed sampling activity is adjacent to the experimental facilities areas at ETR, which consist of high pressure water loops. The loops pumped as much as 100 gallons per minute of high temperature, high pressure water past experimental fuel assemblies located in special facilities passing through the reactor core.
Figure 1. Location of the TRA facilities
Figure 2. Perspective View of the TRA
Advanced Test Reactor
The Advanced Test Reactor (ATR), the world's largest test reactor, became operational in July, 1967, and has operated since that time at near its operating power level of 250 MW(t), (see Figure 2). Because ATR continues in use today, it is not considered for D&D at the present time, and is not addressed in this ASAP.

2.1.1 Sampling Areas

The facility locations targeted for this characterization are listed in Table 2.1-1, together with references to their associated location drawings and photographs, which are presented as Exhibits in the rear of this document. The spatial relationship of the facilities to one another is shown in Figure 3. A general description of the processes and waste streams associated with these areas is identified below:

**TRA-611 Plug Storage Facility**
The Plug Storage Facility is an ancillary structure supporting MTR experiment handling. It consists of a series of 14 horizontal east-west parallel channels accessible from their east end (inside the building), the west portions of which extend outside the building through a wall, and are covered with a soil covering to a depth of approximately eight feet. The soil covering the channels is posted as a radiation area. The soil is to be sampled at locations near--and below--the channels to confirm the presence of gamma emitting isotopes, as a prerequisite to its proper handling and disposal. No process knowledge has been identified to indicate a credible potential of chemical contamination to the soils; therefore no chemical sampling is to be performed.

**TRA-612 Retention Basin Pumphouse Sump**
The MTR primary coolant circuit includes a set of large concrete underground retention basins which are designed to be able to receive all of the primary coolant in the event of an accident, and retain it until such time as the short-lived isotopes have decayed sufficiently to allow the water to be released to a surface pond. The TRA-612 building is the pumphouse associated with these retention basins. It is located well southeast of MTR, and consists of a walled structure approximately 15 feet square by 40 feet deep within which the pump risers and inlet/outlet piping to the retention basins are located. The liquid which has accumulated in the bottom of the pumphouse sump, will be sampled. During the active life of the facility, the retention basins did receive primary coolant liquids which were transferred to the warm waste pond. No process knowledge has been identified to indicate a credible potential of chemical contamination to the sump liquid; therefore no chemical sampling is to be performed. If sludge is present, a sample will be obtained and analyzed for gamma emitting isotopes and TCLP metals.
Table 2.1-1. Summary of Samples (Page 1 of 2)
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Samples, Location</th>
<th>Contents</th>
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<td>Trench Contents (each end of trench)</td>
<td>Exhibit 1.20</td>
<td>Section 2.7.20</td>
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Figure 3. TRA Facility Plot Plan
The TRA-612 structure is a confined space as defined by OSHA, and special access and egress precautions will apply to the sampling crew. Access is gained through a manhole in the surface cover.

**TRA-644 ETR Heat Exchanger Building**

The ETR Heat Exchanger building is located east of the ETR, and houses the pumps, and heat exchangers which transfer the heat from the primary coolant circuit flowing through the reactor (demineralized water) to the secondary coolant circuit which releases the heat through the cooling towers to the atmosphere. It also contains water treatment facilities and their associated piping and tankage. This sampling plan addresses only sampling associated with the concrete on the building east-side exterior (where ion-exchange resins were transferred), and with a 20-foot diameter, 10-foot high steel degassing tank located on the roof. Resins were designed to remove metals from the water, so any spillage would present a potential for heavy metal contamination of the concrete. Analyses for TCLP metals and radionuclides are to be performed in this area.

The degassing tank located on the roof is a confined space as defined by OSHA, and special access and egress precautions will apply to the sampling crew. Access is gained through a manhole in the tank top.

**TRA-645 ETR Secondary Coolant Pump House**

The ETR Secondary Coolant Pump House is located immediately north of the ETR Cooling Tower, and houses the pumps, piping, tankage and water treatment appliances for the secondary cooling system. Samples are required of any residues or sludges present in the sump below the pipe trench which enclosed the coolant supply pipe and provides the area needed to manifold the output from the four secondary coolant pumps, the two utility pumps, and the emergency pump. Samples of the acid-resistant brick and of the drain serving the acid-handling area are also required. At least three soil samples are required from the south exterior of the building, through the wall from the area formerly occupied by the chemical mixing tanks.

It should be noted that the return water from the cooling tower entered a cold well from which the pumps drew water reentering the heat exchangers. This cold well also has a sump which might be sampled. Both the pipe trench and the cold well are confined spaces as defined by OSHA, and special access and egress precautions will apply to the sampling crew. Access is gained through a removable metal grate above each area, respectively.

**TRA-647 ETR Office Building**

The ETR office building is a three-story service building immediately north of the ETR. It is constructed of concrete, consisting of offices with adjacent restrooms on the first and second floors, and shops and mechanical rooms in the basement.
Samples are required in the sink drains of the Health Physicist’s Office and the Shop (for gamma emitting isotopes and for metals), and of pits, tanks and mechanical equipment in the basement.

The sump in the basement contains a tank, both of which will be sampled for gamma emitting isotopes and for metals in any liquid sludge, or residue which may be present. If no liquid is present, the walls of the pit and tank will be sampled for those same analytes using a smear.

Oil in the dash pots serving the ventilation louvres will be sampled for PCBs.

Filter media in the basement will be sampled for gamma emitting isotopes and for lead.

ETR-642  ETR Reactor Building Basement
ETR Reactor Building areas addressed in this ASAP are primarily in the basement and console floors of the building; main floor areas to be sampled consist only of high density concrete used for reactor shielding. The basement, as defined on ETR drawings, is the subbasement which provided access to the experimental test loops, as distinguished from the first underground “console” level which was used for associated instrumentation.

ETR-642  Basement
A sump is located in the flooring of the basement rad-access room (directly below the sub-pile room) which will be sampled for gamma emitting isotopes and for metals in any liquid which may be present. If no liquid is present, the walls of the sump will be sampled for those same analytes using a smear.

Paint in the vicinity of both the inside and the outside of the sub-pile room will be sampled to characterize its radiochemistry.

The sub-pile room is surrounded by experimental cells which surround the circumference of the reactor. One of these cells, M-3, will be entered to obtain samples of the ion-exchange resin which remains at that location. Resins were designed to remove metals from the water, so remaining resin material would present a potential for heavy metal contamination. Analyses for TCLP metals and radionuclides are therefore to be performed.

A warm-waste tank area is located in a pit on the north side of this subbasement floor, and is covered with a set of high-density concrete covers. The tank contents will be sampled for radionuclides and for TCLP metals. The warm-waste tank pit is a confined space as defined by OSHA, and special access and egress precautions will apply to the sampling crew. Access is gained through an adjacent manhole, or by removing the concrete covers.
In addition to the warm-waste tank, a cold-waste tank is located in a pit west of the warm-waste tank, which is also covered with a high-density concrete cover. The cold-waste tank is believed to be clean, but any contents will be sampled as a confirmatory action for radionuclides and for TCLP metals. The cold-waste tank pit is also a confined space as defined by OSHA, and special access and egress precautions will likewise apply to the sampling crew at that location. Access is gained by removing the concrete covers.

A decontamination station is located on the extreme south side of the reactor building basement floor, near the southeast stairwell. Oil residue on the floor at this location will be sampled for PCBs, to provide guidance for its cleanup.

**ETR-642 Console Floor**

On the south-center console floor of the ETR Building, a pipe trench extends from the east wall eastward toward the reactor. Samples are desired from this trench at both ends, one near the east wall of the console floor, the other at a point where the trench meets the southeast reactor shielding wall. Radionuclides and metal contamination are possible in this area, given the processes involved, so radiochemistry and TCLP metals analyses are to be performed.

The console floor also contains a number of access points to the hot experiment drain system. Samples for radionuclides, metals, and volatile organic compounds will be obtained from at least one drain in this system. Based on system configuration, the drain access immediately south of the reactor, near the center of the floor has been chosen as the sampling point.

Access points to the warm drain system likewise exist on the console floor, for which samples are required. Samples for radionuclides and metals are desired from at least one access point in this system. Based on system configuration, the drain access adjacent to the exterior wall of the reactor canal has been chosen as the sampling point.

**ETR-642 Main Floor**

Shielding blocks composed of high-density concrete have the potential to be classified as hazardous material, based on their composition. For this reason, small diameter core samples obtained with a diamond hollow-core drill will be taken from shielding blocks surrounding the reactor core and analyzed for TCLP metals. The selection of shielding blocks for sampling has not been finalized at the time of this writing.

**ETR-643 ETR Compressor Building**

The ETR Compressor Building is located east of the ETR, and shares a wall with the Heat Exchanger Building which lies immediately to its south as well as the reactive building on its west side. The compressor equipment provides service air for the ETR complex, including power for the pneumatically-operated valves and controls serving both the reactor and its primary cooling system. The building houses two
large compressors with their associated motor drives, and all associated piping and appliances.

The first area to be sampled in the Compressor Building is a set of motors which operate the gate valves of the primary coolant system. Oil in each of these operators is to be sampled to determine whether PCBs are present. The motors are aligned in an east-west line paralleling a grating-covered trench in the south-center portion of the building, which will also be sampled. If liquid exists in the trench, it will be sampled for radionuclides, metals, and for PCBs.

Four primary coolant pump motors are located in the Compressor Building which must also be sampled for PCBs. The oil reservoir in each motor will be sampled.

The Clark air compressors and their associated compressor actuators will be sampled for PCBs, by mean of access to the oil reservoirs in each separate unit, if necessary. The compressors are believed to still contain their initial complement of oil. A metal grate-covered trench is located below and surrounding each of the compressors. Samples for radiochemistry, metals, and PCB contamination will be obtained from each of these trench areas. If liquid exists in the trench, it will be sampled for radionuclides, metals, and for PCBs.

Two large Clark air compressor drive motors located in the Compressor Building will be sampled for PCBs. The oil reservoir in each motor will be sampled.

A restroom used by the decontamination staff, and a chemistry laboratory which are both part of the Compressor Building will be sampled to characterize the shower drain and sink traps, and the lab sink and trench, respectively. Radionuclides and metals are the target analytes, given the process history of those rooms. Additional sampling of the chemistry laboratory may be required, based on the results of the screening samples.

**TRA-648 ETR Electrical Building**

The ETR Electrical Building is located immediately south of the ETR. It contains a large diesel engine-powered generator, together with its fuel system, and a large array of high-capacity switchgear and power conditioning equipment, including space for two lead-acid batteries which were part of the uninterruptable power supply for the plant. The diesel-generator remains in place, however one of the batteries and some of the switchgear have been previously removed.

In the generator room, samples will be obtained from the metal-grate-covered trench which surrounds the generator unit. Analysis will be made for radioisotopes, metals, and PCBs.
Although the batteries have been removed from one of the battery rooms, evidence of residual contamination is visible in both the drain and in staining on the concrete floor of the in-service battery room. Both areas will be sampled for radioisotopes and metals.

**TRA-663  ETR Superior Diesel Building**

The ETR Superior Diesel Building adjoins the ETR Electrical Building on its southwest side, and performs a similar function to the Electrical Building, having housed a large diesel-powered plant generator. Samples are required in the maintenance area of the building, at a point where fuel injectors were cleaned and serviced, and where spillage is known to have occurred. The concrete and surface areas in this part of the building will be sampled to identify metals or PCBs which may be present.

### 2.1.2 Summary of Sampling Safety Issues

Thirty-five separate sampling areas are identified in this ASAP. With few exceptions, they are located within existing buildings in areas without unusual physical hazards associated with access. A detailed analysis of the health and safety considerations associated with this project is present in a separate document.

Several sampling locations are in pits, tanks, sumps, and trenches which are confined spaces. Personnel entering these spaces will adhere to applicable requirements for entry (such as permits, training and atmospheric testing of the spaces). Specific direction and requirements will be provided by the on-site health and safety professionals.

Radiological contamination is likely to be present in many of the sampling areas, especially those associated with the primary reactor cooling circuit and the reactor experiment loops. The main areas of radiological and chemical contamination concern for the scope addressed in this ASAP are the reactor experiment cubicles located on the basement floor of TRA-642. A detailed radiological characterization of these areas will be made prior to sampling as part of the Radiological Work Permit process. The existing radiological characterization identifies Cubicle M-3 as having the highest levels of radionuclides present in areas proposed for sampling (general body field in TRA-642, Cubicle M-3, is in excess of 500 mrem/hr). Job specific work control documents will be prepared in support of sampling activities. All radiological work will be in accordance with Rad Con requirements.

There are suspected chemical contaminants in almost all of the proposed sampling areas. Metals are the primary target analytes; solvents are a much smaller concern. Pesticides are not expected, based on TRA process history. Samples collected for this project will be analyzed for TCLP metals, notably chromium (from the cooling tower) and lead. PCB contamination is possible in the oils used as motor and compressor lubricants.
Floor drains and sink traps identified for sampling are located in laboratory and Health Physics Decontamination areas, and have had some radiological contamination identified.

Waste types identified are as follows:

- **Radioisotopes**: Reactor-produced uranium fission products (e.g., Cesium, Strontium, Cobalt) expected in TRA-611, TRA-612, TRA-643, TRA-644, TRA-647, and TRA-642.

- **RCRA**: Heavy metal contamination from chrome-based water conditioners used in the secondary cooling circuit, and lead-containing fuel handling areas associated with engine-driven generators, and in former lead-acid battery areas, are expected in TRA-644, TRA-645, TRA-647, TRA-642, TRA-643, TRA-648, and TRA-663. Water conditioning chemicals may be present in the laboratory area of TRA-643.

- **TSCA**: PCBs are likely in many of the oils used as motor and compressor lubricants, in TRA-647, TRA-642, TRA-643, TRA-648, and TRA-663.

- **NESHAPS**: Asbestos from acid brick mastic in TRA-645.

**NOTE**: There are asbestos floor tiles and asbestos insulation on piping and associated equipment in the Compressor Building, the Heat Exchanger Building, and the Electrical Building, as well as in the window and door seals of the office building. EG&G Idaho's Asbestos Team will address asbestos removal and sampling which may be associated with the D&D of areas addressed in this document.

### 2.2 Objectives and Scope

The TRA D&D project area has not been completely characterized to evaluate the presence, type, and extent of chemical and/or radioactive contamination. The purpose of the proposed sampling is to determine the presence, extent, and concentrations of chemical and radioactive constituents inside the structures for which D&D funding has been approved. In addition, soil surrounding an experimental plug storage area (TRA-611), and the ETR Cooling Tower Pumphouse (TRA-645) will be sampled to determine its contents. This data will be used to characterize the structures that will be removed.

Analytical Level III will be used for all chemical analyses and analytical Level V will be used for radiological analyses (SMO-SOP-12.1.1). The information gained from this sampling effort will be used as a preliminary assessment. This data will be used as an aid in planning the D&D activities. Compounds detected in sludges, sump liquids, and tank residues will be compared to regulatory levels to determine disposition of these materials.
For the sampling areas identified, this ASAP addresses criteria for documenting the hazardous nature of the potential waste sources and obtaining representative samples and maintaining sample quality, as well as outlining safety considerations for field personnel. The QA/QC requirements for this project follow the guidelines as detailed in Quality Program Plan for D&D, QPP-149.

2.3 Area Description

The areas addressed in this plan for sampling are primarily indoors, in unheated industrial support buildings in which most operational activity has been suspended. Except for D&D activities, no occupancy by office workers or crafts personnel occurs.

Physical conditions at the sampling areas may be inferred by reference to the photographs of each sampling area which are included as Exhibits 2.1 through 2.35 at the rear of this document. These photographs may be compared to the locations of the sampling by reference to the corresponding facility plot plans, presented in Exhibits 1.1 through 1.11, also at the rear of this document.

2.4 Data Usage

The samples collected as part of this preliminary assessment will be analyzed to characterize the potential hazardous nature of the waste. This characterization will be based on the concentration of hazardous constituents found in the samples. The data will also be evaluated to determine hazardous waste exposure to personnel during planned D&D activities at the sites identified and to determine the final disposition of materials generated by planned D&D activities at TRA. This will be accomplished by comparing the data to the limits for TCLP metals, volatile organic compounds (VOCs), semi-VOCs, and to the D&D release limits for radionuclides. In addition, radiation measurements and analyses results will also be used to plan the D&D of the listed structures.

2.5 Data Types

Samples collected in support of this project are intended to be submitted to a SMO sub-contracted laboratory for Toxicity Characteristic Leaching Procedure (TCLP) metals analysis, limited volatile organic analysis (VOA), and PCB analysis. Samples for gamma analysis will be sent to the Radiation Measurement Laboratory (RML), located on-site at TRA.

All samples collected for this project will be surveyed by a Radiological Control Technician (RCT) before being transported. Any samples that cannot be released based on sample container surface contact readings will be shipped to the laboratories by a qualified INEL shipper.

Packaging and shipping will be done in accordance with ER PD 5.7, Chain of Custody Sample Handling and Packaging. Samples will be transported as soon as possible to
the designated laboratory accompanied by chain-of-custody (COC) documentation. Upon receipt of the samples, the laboratory will check for damage to the sample containers and check for discrepancies between the COC and the sample label information. The laboratory sample receiving person will sign the COC indicating receipt and transfer of custody of the samples.

This characterization is intended to only characterize materials as typical of those found in the candidate sampling areas, therefore defining boundaries of any contamination is not applicable.

Logbooks will be maintained per ER PD 4.2, "Logbooks." During execution of the work, any deviations from this plan will be in accordance with ER PD 4.1, "Document Control." The ASAP may also be revised at the completion of the sampling activity to reflect any changes or deviations that were made in the field.

2.6 Personnel Safety and Health Precautions

Health and Safety requirements for this sampling effort are specified in the Health and Safety Plan for TRA Facility Sampling.

In order to provide for the health and safety of the samplers, field activities will be performed in close consultation with site operations management, radiological control, and safety representatives. A pre-sampling briefing will be held to ensure all safety and radiological matters are addressed and communicated to the samplers prior to sampling in any individual sampling area.

Process knowledge and results of previous sampling and surveys by IH and RADCON personnel have been used to make a preliminary indication of PPE requirements. TCLP metals encountered are expected to be chromium and lead at some multiples of ambient soil background levels. PCBs may be present in oils which are to be sampled. VOAs in the form of carbon tetrachloride, trichloroethylene, and chloroform may be present in trace amounts in some of the laboratory drains and reactor experimental drains. Radioactive contamination is anticipated in the majority of the sampling areas, and will be precisely specified in the Radiation Work Permits prepared to support the sampling campaign.

Samplers shall be trained as per 29 CFR Part 1910.120 and wear appropriate protective clothing and equipment (see section 2.7). Skin contact, aspiration or ingestion of particulate matter from dry tanks and drains, or concrete, is anticipated to be the primary health and safety risk. Additional protective equipment will be determined by the on-site RADCON and health and safety representatives, based on actual sampling conditions.

Eating, drinking, smoking or chewing will not be permitted in the sampling area.

Any contact with potentially contaminated surfaces will be avoided. Team
members will avoid sitting, leaning, or placing equipment on areas that are potentially contaminated. Sample collection operations will be stopped in the event of an accident or if any personnel determine conditions are unsafe.

A Radiological Work Permit and Safe Work Permit may be initiated by the requester and the field team leader prior to sampling, as appropriate.

2.7 Sampled Materials

The samples included in this ASAP consists of the following types of materials:

- Soil samples obtained at depths extending from the surface to a depth of approximately eight feet.
- Aqueous Liquid Samples obtained from inflow to sumps which are up to 40 feet below plant grade. Sludge, if present, will be sampled.
- Aqueous Liquid Samples obtained from residuals in tanks which range from approximately 2 feet to 20 feet in diameter. Sludges, if present, will be sampled.
- Concrete, brick, and steel tank-wall smears of areas exposed to aqueous liquids, oils, acids, and to ion exchange resins, pits and trenches, and exterior concrete pads.
- Drain traps in floor drains, showers and sinks, and lab hoods
- Piping and drains serving reactor experimental loops
- Oil reservoirs in dash pots, valve operators, motors, compressors, and compressor actuators
- Building ventilation system filter media
- Paint from walls and floors in radioactively contaminated areas
- Ion Exchange Resins and oils in bulk and as a concrete contaminant
Necessary materials to support this sampling include the following:

**Sample Containers:** 500-ml LDPE plastic quart jars (alpha, beta, and gamma analysis)
250-ml glass jars (TCLP metals)
125-ml glass jars (PCBs)
125-ml glass vials (VOCs)

**Equipment List:**
- Field logbooks
- Paraffilm™
- Type II water
- Latex gloves
- Sample Splitter Box
- Hand tools
- Trip blanks
- TLD Badges,
- Hand Augers
- Level-C protection
- Teriwipe™
- Coolers with blue ice
- Stainless Steel pans
- Stainless steel spoons
- Garbage bags
- Safety Glasses
- Air Hammer with Chisels

At TRA, it is anticipated that PPE will be provided by the RCTs.

Type II and/or deionized water will be used for trip blanks, rinsates, and field blanks.

**Sampling Equipment Decontamination:**
- Wash pan, nonphosphate detergent
- Tap water
- Deionized water
- Air dry rack
- Aluminum foil for cleaned equipment

**Sampling Documentation and Shipping Supplies:**
- Field logbooks and waterproof pens
- RML Radiochemistry analysis request forms
- U.S. DOE Hazardous Material Shipping Record (IDF 5480.3A) (if required)
- Abbreviated Sampling and Analysis Plan
- Sample labels
- Chain of Custody Forms
- Shipping labels
- Custody seals
- Clear tape
- Strapping Tape
- Packing material (i.e., bubble wrap)
- EGG Form 176, "Request for Shipment of Materials"
EGG Form 253, "Requisition for Purchase of Materials and Services"

Blue ice Coolers

2.8 Sampling Design and Procedures

Data validation and laboratories to be utilized will be determined by the Sample Management Office (SMO). Sample preservation will be according to the specific method and analysis being conducted.

Quality assurance/quality control (QA/QC) samples will be collected during TRA D&D sampling and analysis. Rinsates (equipment blanks), field blanks and trip blanks will be collected. The number of field blanks, trip blanks, replicates, and rinsates were selected to meet 5% of the total number of samples to be collected. The 5% criterion is commonly accepted for a minimum number of QA samples (DOE, 1989a). The types and frequency of collection for field quality control samples are provided below:

- **Field Blanks** — defined as samples of ASTM Type II (or other high purity) water from the same source as water used for decontamination. One field blank will be prepared for each method type and will be analyzed for the same analytes as the samples collected that day. Field blanks are prepared and preserved using sample containers from the same lot as the other samples collected that day. Results of the field blank analysis will help determine the level of contamination introduced into the sample due to sampling technique and as a check of the water used for decontamination.

- **Rinsates** (equipment blanks) — defined as the final analyte-free water rinse from equipment cleaning, collected during a sampling event. The sample is analyzed for the same analytes as the samples collected that day. The results of the rinsate analysis will be used to flag or assess the level of analytes in the samples, which enables contaminant evaluation of the decontamination process, the final rinse water, and the sample containers.

Biased sampling locations were chosen to determine the presence and concentration of chemical and radiological contaminants at locations that have the highest probability of containing contaminants. The specific locations were determined as a result of process knowledge and, to a limited extent, of previous sampling activities. Biased samples will be collected to investigate the presence and the extent of contamination in the structures scheduled for D&D removal. The Field Team Leader will document in the appropriate logbook the sample collection procedure used.

Radiological samples collected for gamma analysis from all sampling locations will be placed in 500-ml plastic bottles. Material will also be collected for analysis by
scraping (e.g., floor drains, pit interiors, and painted walls) with precleaned stainless steel spoons, chisels, or other appropriate sampling tools. Collected material will be surveyed with radiation survey instruments and placed in the 500-ml plastic bottles and sealed. Samples collected for TCLP metals (250-ml glass jars), and PCB (125 ml glass jars) analyses will be placed in their appropriate containers.

Samples collected from drains, pipes, and tank interiors will be collected using precleaned stainless steel spoons. If the sample material cannot be collected with a spoon, the Field Team Leader will determine a different collection procedure. Any asbestos present will not be disturbed. Any tools used to collect samples will be decontaminated after use. Any deviation from the ASAP will be documented in the logbook by the FTL.

In addition to radiological characterization described above, general radiological surveys including direct beta-gamma radiation measurements and smears for removable contamination will be performed by RCTs in rooms for which current, reliable radiological characterization is not available.

In some areas, the absence of liquid material may necessitate using smears to obtain radiochemistry data. Smears shall be taken by firmly wiping a piece of dry smear material (Whatman 50 filter paper or equivalent) over approximately 100 cm² (an area about 4 x 4 in.) of the surface being monitored. Smears shall be counted with an alpha, beta-gamma proportional counting system or a system with equivalent sensitivity. Calibration, performance checks, and operation of the counting system shall be performed in accordance with RCT procedures. The counting system shall have sufficient sensitivity to detect contamination below 20 dpm/100 cm² alpha and 200 dpm/100 cm² beta-gamma above background. Smear samples, where used to define chemical contamination, will be analyzed by the RML.

Fixed radiological contamination shall be measured with a portable survey meter for beta-gamma contamination. When searching for contamination, or when trying to find the most highly-contaminated portion of contaminated materials or areas, audible instrument response shall be used, when provided, rather than visual meter response.

Crafts personnel will assist in gaining access to the desired sampling locations (e.g., tank access below high density concrete lids in the basement of TRA-642 which must be removed by crane), where required.

Representative samples will be collected from floor drains, shower drains, sink traps, and drain pipes. If sufficient sample material is present, sample bottle sizes noted above will be used. All samples will be collected using stainless steel spoons or similar devices. It is not known whether adequate amounts of material will be present in all the locations described, but every attempt will be made to collect samples from locations of possible high radionuclide concentration or source of RCRA waste. If there is not enough material, radiological analyses will be the first
priority followed by TCLP metals, VOCs, and PCBs (in that order). Environmental Standard Operating Procedures (ESOPs) will be followed for obtaining samples, when possible.

Analytical methods used shall consist of the following SW-846 protocols, as appropriate:

- TCLP metals: EPA 1311/6010/7470
- TCLP VOAs: EPA 1311/8240 or 8260
- Isotopic Gamma: EPA 901.1 or equivalent
- PCBs: EPA 8080

Site Specific Sampling Design and Procedures

2.8.1 Soil Sampling

Sample Areas 1 and 8 consist of soil samples obtained at depths extending from the surface to a depth of approximately eight feet, in the vicinity of TRA-611, and TRA-645, respectively.

The TRA-611 and TRA-645 cover soils are disturbed fill materials; a wide variation in analyte concentrations as a function of sampling location is possible. Published INEL TRA soil sample background concentrations will be compared to levels of analytes detected in the soil samples.

Because this characterization is intended to provide indications of typical TRA soil cover conditions and to provide characterization for disposal, composites of soil samples will be taken.

Within each of the areas where soils are sampled, subsamples will be collected from different areas throughout the sample location using a stainless steel scoop and hand auger. The subsamples at TRA-611 and at TRA-645 will be separately composited into a stainless steel pan during the collection process. After compositing, the material will be transferred to the proper sample containers. The RCT will perform contamination surveys while the samples are being collected.

Immediately after compositing, the RCT will survey samples prior to material being placed in the containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information. The samples will be surveyed by a RCT before the samples are shipped to the analytical laboratory.

After the samples have been surveyed by the RCT, proper shipping papers and documentation will be produced as per ER PD 5.7, Chain of Custody, Sample
Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two composite samples each will be obtained for TCLP metals and Gamma Spectrometry at each sampled area.

Except for cooling to 4°C, no sample preservatives will be required.

2.5.2 Aqueous Liquid Samples in Sumps

Sample Areas 2 (TRA-612 Retention Basin Pumphouse Sump), 5 (TRA-645 ETR Secondary Coolant Pumphouse Sump), 6 (TRA-645 ETR Secondary Coolant Pumphouse Sump West Side), 11 (TRA-647 Heating and Ventilating Room Sump Pit), 14 (TRA-642 Reactor Building Rad-Access Room Sump), 20 (TRA-642 South Console Floor Pipe Trench), 25 (TRA-643 Compressor Building Pipe Trench), 28 (TRA-643 Trench Below Compressors), 31 (TRA-643 Chemistry Lab Trench), and 32 (ETR Electrical Building Diesel Generator Room Pit) have the potential for aqueous materials in their floors which will be sampled. All are easily accessed except the TRA-612 sampling area, which is up to 40 feet below plant grade.

Areas 11, 14, and 20 are associated with the reactor primary cooling circuit, in which radioactive contamination is expected. Areas 5, 6, 11, 25, 28, 31, and 32 are in areas in which metal contamination is expected. Additionally, Areas 25, 28, and 32 have the potential for PCB contamination. A wide variation in analyte concentrations as a function of sampling location is possible. Published regulatory action levels and risk-based action levels will compared to levels of analytes detected in the samples.

Because this characterization is intended to provide indications of site-specific conditions and to provide characterization for disposal, composites of aqueous samples will be taken at each individual sampling area. Sludges/sediments layers will also be sampled, if present.

Within each of the areas where aqueous liquids are sampled, subsamples will be collected from different areas throughout the sample location using a coliwasa sampler, where possible. After compositing, the aqueous liquid will be transferred to the proper sample containers. The RCT will perform contamination surveys while the samples are being collected.

Immediately after compositing, the RCT will survey samples prior to aqueous liquid being placed in the containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information. The samples will be surveyed by a RCT before the samples are shipped to the analytical laboratory.
After the samples have been surveyed by the RCT, proper shipping papers and documentation will be produced as per ER PD 5.7, Chain of Custody, Sample Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two composite samples each will be obtained for TCLP metals, Gamma Spectrometry, and PCBs at each sampled area, as listed in Table 2.1-1.

Except for cooling to 40°C, no sample preservatives will be required.

2.8.3 Aqueous Liquid Samples from Tanks

Sample Areas 11 (TRA-647 H&V Room Tank in Floor Pit), 17 (TRA-642 Basement Warm Waste Tanks Below Floor), and 18 (TRA-642 Basement Cold Waste Tank Below Floor) have the potential for containing aqueous materials, which will be sampled if present. All are accessed with difficulty except the TRA-647 sampling area, which is accessible by removing a metal floor grate.

Area 17 is associated with the reactor experimental channels, in which significant radioactive contamination is expected. All areas are areas in which metal contamination is expected. Area 11 may have PCB contamination. A wide variation in analyte concentrations as a function of sampling location is expected. Published regulatory action levels and risk-based actions levels will be compared to levels of analytes detected in the samples.

Because this characterization is intended to provide indications of site-specific conditions and to provide characterization for disposal, composites of aqueous samples will be taken at each individual sampling area.

Within each of the areas containing a large tank or multiple tanks where aqueous liquids are sampled, subsamples will be collected from different areas throughout the sample location using a Coliwasa sampler, where possible. After compositing, the aqueous liquid will be transferred to the proper sample containers. The RCT will perform contamination surveys while the samples are being collected.

Immediately after compositing, the RCT will survey samples prior to aqueous liquid being placed in the containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information. The samples will be surveyed by a RCT before the samples are shipped to the analytical laboratory.

After the samples have been surveyed by the RCT, proper shipping papers and documentation will be produced as per ER PD 5.7, Chain of Custody, Sample
Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two composite samples each will be obtained for TCLP metals, TCLP VOAs, Gamma Spectrometry, and PCBs at each sampled area, as listed in Table 2.1-1.

Except for cooling to 40°C, no sample preservatives will be required.

2.8.4 Concrete and Brick Samples

Sample Areas 2 (TRA-612 Retention Basin Pumphouse Sump), 3 (TRA-644 Concrete Pad where resin was transferred), 5 (TRA-645 ETR Secondary Coolant Pumphouse Sump), 6 (TRA-645 ETR Secondary Coolant Pumphouse Sump West Side), 7 (TRA-645 Acid Pit Area Drain), 11 (TRA-647 Heating and Ventilating Room Sump Pit), 14 (TRA-642 Reactor Building Sub Pile Room Sump), 19 (TRA-642 Decontamination Station), 20 (TRA-642 South Console Floor Pipe Trench), 22 (TRA-642 Warm Drain around Storage Canal), 25 (TRA-643 Compressor Building Pipe Trench), 28 (TRA-643 Trench Below Compressors), 31 (TRA-643 Chemistry Lab Trench), 32 (ETR Electrical Building Diesel Generator Room Pit), 33 (ETR Electrical Building Battery Room Floor), and 34 (TRA-633 Superior Diesel Building injector Maintenance Station Floor) have the potential for residues or absorbed hazardous materials in their floors and walls. When present, solids that remain will be sampled. Porous surfaces, such as brick or concrete, will also be sampled. All are easily accessed except the TRA-612 sampling area, which is up to 40 feet below plant grade, and the TRA-644 Degasifier Tank, another confined space with a potential for a hazardous atmosphere.

Areas 2, 4, 14, 19, 20, 22, and 31 are associated with the reactor primary cooling system, in which radioactive contamination is expected. All areas are areas in which metal contamination is possible. Areas 19, 25, 28, 32, 33, and 34 may have PCB contamination. Area 31 may have a wide variety of chemicals present. Published regulatory action levels and risk-based actions levels will be compared to levels of analytes detected in the samples.

Because this characterization is intended to provide indications of site-specific conditions and to provide characterization for disposal, composites of concrete and pit wall samples may be taken at each individual sampling area. Steel/metal tank walls will not be sampled; residues or aqueous contents are the objective for solid samples in those locations. Smears may be obtained for gamma analysis.

Within each of the areas where multiple pits, tanks or trenches are sampled, subsamples will be collected from different areas throughout the sample location using a scoop, power chisel or other appropriate tool. After compositing, the
material obtained will be transferred to the proper sample containers. The RCT will perform contamination surveys while the samples are being collected. Smears may be obtained inside "empty" locations for gamma analysis.

Immediately after compositing, the RCT will survey samples prior to material being placed in the containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information. The samples will be surveyed by a RCT before the samples are shipped to the analytical laboratory.

After the samples have been surveyed by the RCT, proper shipping papers and documentation will be produced as per ER PD 5.7, Chain of Custody, Sample Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two composite samples each will be obtained for TCLP metals, Gamma Spectrometry, and PCBs at each sampled area, as listed in Table 2.1-1.

Except for cooling to 40 C, no sample preservatives will be required.

2.8.5 Drain Traps

Sample Areas 7 (TRA-645 Acid Pit Area Drain), 9 (TRA-647 Health Physicists’ Office Drain), 10 (TRA-647 Shop Drain), 30 (ETR-643 Compressor Building Decon Restroom), 31(TRA-643 Chemistry Lab Hood Drain), and 33 (ETR Electrical Building Battery Room Floor Drain) have the potential for hazardous materials in their drain traps which will be sampled. All are easily accessed.

Areas 7 and 33 are associated with the sulfuric acid handling, in which acid or metal salt contamination is expected. Areas 9, 30, and 31 are areas in which radioactive contamination is possible. Area 31 may have a variety of chemicals present. Published regulatory action levels and risk-based actions levels will be used to indicate levels of significance for analytes detected in the specified aqueous liquid samples.

Because this characterization is intended to provide indications of site-specific conditions and to provide characterization for disposal and the individual nature of the drains, individual samples will be taken at each separate sampling area.

Within each of the areas to be sampled, samples will be collected using a scoop, power chisel, power brush, or other appropriate tool. After sampling, the material obtained will be transferred to the proper sample containers. The RCT will perform contamination surveys while the samples are being collected.

Immediately after sampling, the RCT will survey samples prior to their being placed
in the containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information. The samples will be surveyed by a RCT before the samples are shipped to the analytical laboratory.

After the samples have been surveyed by the RCT, proper shipping papers and documentation will be produced as per ER PD 5.7, Chain of Custody, Sample Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two samples each will be obtained for TCLP metals and Gamma Spectrometry at each sampled area, as listed in Table 2.1-1.

Except for cooling to 40°C, no sample preservatives will be required.

2.8.6 Piping and Drains Serving Reactor Experimental Loops

Sample Areas 21 (TRA-642 South Console Floor Hot Experiment Drain) and 22 (TRA-642 South Console Floor Warm Drain Around Storage Canal) have the potential for both radioactive and hazardous materials in their piping and drains which will be sampled. Both are easily accessed.

Both areas may have a variety of chemicals present; therefore a variation in analyte concentrations as a function of sampling location is expected. Published regulatory action levels and risk-based actions levels will be used to indicate levels of significance for analytes detected in the specified aqueous liquid samples.

Because this characterization is intended to provide indications of site-specific conditions and to provide characterization for disposal and the individual nature of the piping and drain system, individual samples will be taken at each separate sampling area.

Within each of the areas to be sampled, samples will be collected using a scoop, power chisel, power brush, or other appropriate tool. After sampling, the material obtained will be transferred to the proper sample containers. The RCT will perform contamination surveys while the samples are being collected.

Immediately after sampling, the RCT will survey samples prior to their being placed in the containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information. The samples will be surveyed by a RCT before the samples are shipped to the analytical laboratory.

After the samples have been surveyed by the RCT, proper shipping papers and
documentation will be produced as per ER PD 5.7, Chain of Custody, Sample Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two samples each will be obtained for TCLP metals and Gamma Spectrometry at each sampled area, as listed in Table 2.1-1.

Except for cooling to 40 $^\circ$C, no sample preservatives will be required.

2.8.7 Oil Reservoirs in Equipment

Sample Areas 12 (TRA-647 ETR Office Building Heating and Ventilating Room Louver Dash Pots), 23 (TRA-643 ETR Compressor Building Gate Valve Motor Operators), 24 (TRA-643 ETR Compressor Building Primary Coolant Pump Motor), 26 (TRA-643 ETR Compressor Building Compressors), 27 (TRA-643 ETR Compressor Building Compressor Actuators), and 29 (TRA-643 ETR Compressor Building Compressor Motor Drives) have the potential for oil containing PCBs in their oil reservoirs which will be sampled. All will require mechanical disassembly of some portions of the equipment to obtain a sample.

None of these areas are expected to be associated with hazardous levels of heavy metals or of radioactive contamination. Published regulatory action levels and risk-based action levels will be compared to levels of PCBs which are detected in the oil samples.

Because this characterization is intended to provide indications of site-specific conditions and to provide characterization for disposal, individual samples will be taken at each separate sampling area.

Within each of the areas to be sampled, samples will be collected by pouring the material directly into the sampling container, where possible. The RCT will perform contamination surveys while the samples are being collected.

Immediately after sampling, the RCT will survey samples prior to their being placed in the shipping containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information. The samples will be surveyed by a RCT before the samples are shipped to the analytical laboratory.

After the samples have been surveyed by the RCT, proper shipping papers and documentation will be produced as per ER PD 5.7, Chain of Custody, Sample Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two samples each will be obtained for PCBs at each sampled area, as listed in
Table 2.1-1.

Except for cooling to 4° C, no sample preservatives will be required.

2.8.8 Ventilation System Filter Media

Sample Area 13 (TRA-643 Heating and Ventilating Filters) has the potential for radiological and lead contamination in the filter media which will be sampled. No complex mechanical disassembly is anticipated.

The sample media may have dust containing hazardous levels of heavy metals or of other hazardous materials. Published regulatory action levels and risk-based actions levels will be compared to levels of lead detected in the filter media samples.

Because this characterization is intended to provide indications of site-specific conditions and to provide characterization for disposal, composites of material taken from several filters will be made.

Samples will be collected by cutting the filter material directly into the sampling container, where possible. The RCT will perform contamination surveys prior to and during sample collection.

Immediately after sampling, the RCT will survey samples prior to their being placed in the shipping containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information.

After the samples have been surveyed by the RCT, proper shipping papers and documentation will be produced as per ER PD 5.7, Chain of Custody, Sample Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two composite samples will be obtained for lead in the filter media, as listed in Table 2.1-1. The samples will be analyzed according to SW-846.

Except for cooling to 4° C, no sample preservatives will be required.

2.8.9 Paint from Walls in Radioactively Contaminated Areas

Sample Area 15 (TRA-642 Sub Pile Room Entrance) has the potential for significant radioactive contamination bonded in the paint on both the interior and exterior areas of the Sub Pile Room Entrance which will be sampled. No complex
mechanical disassembly is anticipated to obtain access to the paint, however the strength of the epoxy based paint may make it necessary to chisel the samples from the walls.

The paint may cover areas of contamination, since it was commonly used as a fixative. Published regulatory action levels and risk-based actions levels will be compared to levels of radioactive contamination which are detected in the paint samples.

Because this characterization is intended to provide indications of site-specific conditions and to limited characterization for disposal, composites will be taken from several areas of paint.

Samples will be collected using a power chisel by chiseling the paint material directly on to the plastic sheet from which it can be collected. The RCT will perform contamination surveys while the samples are being collected.

Immediately after sampling, the RCT will survey samples prior to their being placed in the shipping containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information. The samples will be surveyed by a RCT before the samples are shipped to the analytical laboratory.

After the samples have been surveyed by the RCT, proper shipping papers and documentation will be produced as per ER PD 5.7, Chain of Custody, Sample Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two composite samples will be obtained for the paint material, as listed in Table 2.1-1. The samples will be analyzed according to SW-846.

Except for cooling to 40° C, no sample preservatives will be required.

2.8.10 Ion Exchange Resins

Sample Area 16 (TRA-642 Experimental Cubicle M-3) has remaining ion-exchange resin which will be bulk-sampled. The mechanical disassembly required to obtain access to the resin is unknown at this time, however the high radiation field within the cubicle may make it necessary to do a mock-up of this sampling to minimize exposure to radiation in conformance with ALARA.

Published regulatory action levels and risk-based actions levels will be compared to levels of radioactive and chemical (primarily metals) contamination detected in the resin.
Because this characterization is intended to provide indications of site-specific conditions and to provide characterization for disposal, direct samples of resin material will be taken.

Samples will be collected using a scoop to transfer the material from the housing from which it is collected directly to the sample bottle. The RCT will perform contamination surveys while the samples are being collected.

Immediately after sampling, the RCT will survey samples prior to their being placed in the shipping containers, the sampling times will be recorded for the samples and the sample containers labeled, parafilmed, and placed into a cooler with blue ice. The chain of custody will then be filled out, recording all pertinent information. The samples will be surveyed by a RCT before the samples are shipped to the analytical laboratory.

After the samples have been surveyed by the RCT, proper shipping papers and documentation will be produced as per ER PD 5.7, Chain of Custody, Sample Handling, and Packaging, and the EG&G Idaho HMTM in order for the samples to be shipped to the analytical laboratory for analysis.

Two separate samples will be obtained for the resin material, as listed in Table 2.1-1.

Except for cooling to $40^\circ$ C, no sample preservatives will be required.

2.9 Sample Identification and Locations

A systematic character code will be used to number the samples. The Sample ID codes will be generated by the INEL Sample Management Office (SMO).

Table 2.9-2 presents the relationship between the sampling locations and the numbers of samples projected at each location. The final sample numbers used on sample labels which are prepared by SMO for the project, will be presented in Table 2.9-3 [Pending].

The building location and location of sampling will be recorded in the field logbook. Candidate sampling locations, based on a walk-through with the Facility D&D Manager, are identified in Exhibits 1.1 through 1.11, at the rear of this document.

Figures A-1, A-2, and A-3 in Appendix A present examples of sample labels, chain-of-custody forms, and sample log sheets that will be used for the sampling excursion.

Sample labels will identify the analysis desired, for each radiochemistry and hazardous waste sample. Analytes identified in the radiochemistry analyses will be consistent with those listed on the Environmental Monitoring Target Radionuclide List, presented in Table 2.9-4.
The sample label will also indicate the time of sample acquisition and the type of sample, so that holding times may be readily identified. The sample bottles and preservatives used, together with associated holding times and minimum sample volumes are presented in Table 2.9-5, *Typical Requirements — Soils/Sediments/Sludges/Biota*, from (DOE, 1989a).
<table>
<thead>
<tr>
<th>Area</th>
<th>Building</th>
<th>Room</th>
<th>Description</th>
<th>Samples</th>
<th>Lab Analyses</th>
<th>Bottle Type</th>
<th>Number Req'd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TRA-641</td>
<td></td>
<td>Sox Governing-Plug Storage Facility</td>
<td>Sol.</td>
<td>Ra Radiochemistry</td>
<td>16oz Plastic</td>
<td>2 each a Composite of 5 cu ft</td>
</tr>
<tr>
<td>2</td>
<td>TRA-642</td>
<td></td>
<td>Research Basin Pump House Sump</td>
<td>Sump Liquid</td>
<td>Ra Radiochemistry</td>
<td>16oz Plastic</td>
<td>2 each a Composite of Available</td>
</tr>
<tr>
<td>3</td>
<td>TRA-644</td>
<td></td>
<td>ETA-MI Reactor Building Contactor Outside Building</td>
<td>Ra Radiochemistry</td>
<td>TR TOLP Metals (Cu)</td>
<td>250 ml Glass</td>
<td>2 each a Composite of Available</td>
</tr>
<tr>
<td>4</td>
<td>TRA-644</td>
<td></td>
<td>ETA-MI Reactor Building Bypass Tank</td>
<td>Ra Radiochemistry</td>
<td>TR TOLP Metals (Cu)</td>
<td>250 ml Glass</td>
<td>2 each a Composite of Available</td>
</tr>
<tr>
<td>5</td>
<td>TRA-645</td>
<td></td>
<td>ETA-Secondary Coolant Pump House Coolant Pt Liquid</td>
<td>Ra Radiochemistry</td>
<td>TR TOLP Metals (Cu)</td>
<td>250 ml Glass</td>
<td>2 each a Composite of Available</td>
</tr>
<tr>
<td>6</td>
<td>TRA-645</td>
<td></td>
<td>ETA-Secondary Coolant Pump House Coolant Pt Liquid</td>
<td>Ra Radiochemistry</td>
<td>TR TOLP Metals (Cu)</td>
<td>250 ml Glass</td>
<td>2 each a Composite of Available</td>
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<td>7</td>
<td>TRA-645</td>
<td></td>
<td>ETA-Secondary Coolant Pump House Drain Samples</td>
<td>Ra TR</td>
<td>16oz Plastic / 250 ml Glass</td>
<td>2-3 each a Composite of Available</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>TRA-645</td>
<td></td>
<td>ETA-Secondary Coolant Pump House Sump Sump Samples</td>
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<td>16oz Plastic / 250 ml Glass / Plastic Val</td>
<td>12-24 each a Composite of Available</td>
<td></td>
</tr>
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<td>9</td>
<td>TRA-645</td>
<td></td>
<td>ETA-Secondary Coolant Pump House South Side of Building</td>
<td>Ra TR</td>
<td>16oz Plastic / 250 ml Glass</td>
<td>2 each a Composite of Available</td>
<td></td>
</tr>
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<td>ETA Office Sump Old HP Office Sump Drain</td>
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<td>250 ml Glass</td>
<td>2 each a Composite of Available</td>
</tr>
<tr>
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<td>TRA-647</td>
<td></td>
<td>Snaps</td>
<td>Ra Radiochemistry</td>
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<td>250 ml Glass</td>
<td>2 each a Composite of Available</td>
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<tr>
<td>12</td>
<td>TSB-647</td>
<td></td>
<td>Basement H&amp;WTaken Sump PE P1 Connentot Inc. basement</td>
<td>Ra TR</td>
<td>16oz Plastic / 250 ml Glass</td>
<td>2-3 each a Composite of Available</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>TSB-647</td>
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<td>Tank in Pt</td>
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<td>Basement H&amp;W Room Sump PE Tank Contents</td>
<td>Ra TR</td>
<td>16oz Plastic / 250 ml Glass</td>
<td>2 each a Composite of Available</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>TSB-647</td>
<td></td>
<td>Darq. Pumps</td>
<td>Filter Media</td>
<td>Ra Radiochemistry</td>
<td>TR TOLP Metals (Cu)</td>
<td>250 ml Glass</td>
</tr>
<tr>
<td>16</td>
<td>TSB-647</td>
<td></td>
<td>Basement H&amp;W Room Sump PE Filter Media</td>
<td>Ra Radiochemistry</td>
<td>TR TOLP Metals (Cu)</td>
<td>250 ml Glass</td>
<td>2 each a Composite of Available</td>
</tr>
<tr>
<td>17</td>
<td>TSB-647</td>
<td></td>
<td>TR Reactor Building Basement Sump Sump Liquid</td>
<td>Ra Radiochemistry</td>
<td>TR TOLP Metals (Cu)</td>
<td>250 ml Glass</td>
<td>2 each a Composite of Available</td>
</tr>
<tr>
<td>18</td>
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<td></td>
<td>TR Reactor Building Basement Paul Inside of Room</td>
<td>Ra Radiochemistry</td>
<td>TR TOLP Metals (Cu)</td>
<td>250 ml Glass</td>
<td>2 each a Composite of Available</td>
</tr>
<tr>
<td>19</td>
<td>TSB-647</td>
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<td>2 each a Composite of Available</td>
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<td>20</td>
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<td>Pa Cr</td>
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<td>21</td>
<td>TSB-647</td>
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<td>TR Reactor Building Basement Warm Waste Tank Room Floor</td>
<td>Ra TR</td>
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<td></td>
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<td>Ra Radiochemistry</td>
<td>TR TOLP Metals (Cu)</td>
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<td>2 each a Composite of Available</td>
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Table 2.9-3. Listing of Sample Numbers Assigned by the INEL SMO.

<table>
<thead>
<tr>
<th>Sampling Activity</th>
<th>Sample Type</th>
<th>Media</th>
<th>Collection Type</th>
<th>Sampling Method</th>
<th>Planned Date</th>
<th>Area</th>
<th>Location</th>
<th>Type of Location</th>
<th>Depth (ft)</th>
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<tbody>
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<td>TRS001</td>
<td>REG</td>
<td>SOIL</td>
<td>CCHP</td>
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<td>TRA-611</td>
<td>PLUG STORAGE</td>
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<td>TRS002</td>
<td>REG</td>
<td>LIQUID</td>
<td>CCHP</td>
<td></td>
<td>09/15/94</td>
<td>TRA-612</td>
<td>PUMPHOUSE SUMP</td>
<td>RETENTION BASIN</td>
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<td>TRS003</td>
<td>REG</td>
<td>CONCRETE</td>
<td>CCHP</td>
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<td>TRA-644</td>
<td>OUTSIDE BLDG</td>
<td>HEAT EXC-BLDG</td>
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<tr>
<td>TRS004</td>
<td>REG</td>
<td>WASTE</td>
<td>CCHP</td>
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<td>09/15/94</td>
<td>TRA-645</td>
<td>DEGASSER TANK</td>
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<td>CCHP</td>
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<td>TRA-645</td>
<td>COOLANT PIT</td>
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Enter the appropriate analysis type code in the boxes between the double lines under "ENTER ANALYSIS TYPES". Enter the number of bottles in the single line boxes below the analysis type for each sampling activity. Any descriptions for non-standard analysis types (not given in SAP Table 2) should be entered under "COMMENTS" on the

AT1: Asbestos
AT2: PCBs (8080)
AT3: Hydrogen Ion (pH)
AT4: Gamma Spectroscopy
AT5: TCLP Metals
AT6: TCLP Volatiles
AT7: 
AT8: 
AT9: 
AT10: 
AT11: 
AT12: 
AT13: 
AT14: 
AT15: 
AT16: 
AT17: 
AT18: 
AT19: 
AT20: 
### Table 2, Sampling And Analysis Plan Table - Codes & Descriptions.

| T | AT2 | AT3 | AT4 | AT5 | AT6 | AT7 | AT8 | AT9 | AT10 | AT11 | AT12 | AT13 | AT14 | AT15 | AT16 | AT17 | AT18 | AT19 | AT20 |
|---|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
|   | PC  | PH  | R4  | TI  | TV  |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 1 | 2   |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2 | 2   |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2 2 |      |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2 2 |      |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2 2 |      |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2 2 |      |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2 | 2   |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2 | 2   |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2 2 |      |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
Table 2.9-3. Listing of Sample Numbers Assigned by the INEL SMO. (Cont.)

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<th>COLL TYPE</th>
<th>SAMPLING METHOD</th>
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<th>LOCATION</th>
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<td>COMP</td>
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Enter the appropriate analysis type code in the boxes between the double lines under "ENTER ANALYSIS TYPES". Refer to the descriptions for non-standard analysis types (not given in SAP Table 2) should be entered under "COMMENTS" on the SAP form.

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<th>AT1: Asbestos</th>
<th>AT2: PCBs (8080)</th>
<th>AT3: Hydrogen Ion (pH)</th>
<th>AT4: Gamma Spectroscopy</th>
<th>AT5: TCLP Metals</th>
<th>AT6: TCLP Volatiles</th>
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</thead>
<tbody>
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<td>AT9:</td>
<td>AT10:</td>
<td>AT11:</td>
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<td>AT19:</td>
<td>AT20:</td>
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</tr>
</tbody>
</table>
### Enter Analysis Types (AT) and Quantity Requested

| AT1 | AT2 | AT3 | AT4 | AT5 | AT6 | AT7 | AT8 | AT9 | AT10 | AT11 | AT12 | AT13 | AT14 | AT15 | AT16 | AT17 | AT18 | AT19 | AT20 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
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| 2   | 2   |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2   |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2   |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
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| 2   |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2   |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |
| 2   |     |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |

*SAP Table 2, Sampling And Analysis Plan Table - Codes & Descriptions.*

**Comments**

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Table 2.9-3. Listing of Sample Numbers Assigned by the INEL SMO. (Cont.)

<table>
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<th>SAMPLING ACTIVITY</th>
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Enter the appropriate analysis type code in the boxes between the double lines under "ENTER ANALYSIS TYPES". Refer to the number of bottles in the single line boxes below the analysis type for each sampling activity.

Any descriptions for non-standard analysis types (not given in SAP Table 2) should be entered under "COMMENTS" on the bottom of the sheet.

AT1: Asbestos
AT2: PCBs (8080)
AT3: Hydrogen Ion (pH)
AT4: Gamma Spectroscopy
AT5: TCLP Metals
AT6: TCLP Volatiles
AT7: 
AT8: 
AT9: 
AT10: 
AT11: 
AT12: 
AT13: 
AT14: 
AT15: 
AT16: 
AT17: 
AT18: 
AT19: 
AT20: 
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SAP Table 2, Sampling And Analysis Plan Table - Codes & Descriptions.

**COMMENTS**

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Table 2.9-4. Environmental Monitoring Target Radionuclide List.

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<td>Actinium-228</td>
<td>6.13 hours</td>
</tr>
<tr>
<td>Americium-241</td>
<td>458 years</td>
</tr>
<tr>
<td>Antimony-125</td>
<td>2.7 years</td>
</tr>
<tr>
<td>Bismuth-212&lt;sup&gt;a&lt;/sup&gt;</td>
<td>60.6 minutes</td>
</tr>
<tr>
<td>Bismuth-214&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19.8 minutes</td>
</tr>
<tr>
<td>Cerium-144</td>
<td>284 days</td>
</tr>
<tr>
<td>Cesium-134</td>
<td>2.05 years</td>
</tr>
<tr>
<td>Cesium-137</td>
<td>30.2 years</td>
</tr>
<tr>
<td>Cobalt-60</td>
<td>5.27 years</td>
</tr>
<tr>
<td>Europium-152</td>
<td>12 years</td>
</tr>
<tr>
<td>Europium-154</td>
<td>16 years</td>
</tr>
<tr>
<td>Europium-155</td>
<td>1.81 years</td>
</tr>
<tr>
<td>Lead-212&lt;sup&gt;a&lt;/sup&gt;</td>
<td>10.6 hours</td>
</tr>
<tr>
<td>Lead-214&lt;sup&gt;a&lt;/sup&gt;</td>
<td>26.8 minutes</td>
</tr>
<tr>
<td>Manganese-54</td>
<td>303 days</td>
</tr>
<tr>
<td>Plutonium-238&lt;sup&gt;b&lt;/sup&gt;</td>
<td>87.7 years</td>
</tr>
<tr>
<td>Plutonium-239&lt;sup&gt;b&lt;/sup&gt;</td>
<td>24,000 years</td>
</tr>
<tr>
<td>Plutonium-240&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6,580 years</td>
</tr>
<tr>
<td>Protactinium-234&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.7 hours</td>
</tr>
<tr>
<td>Radium-226&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1600 years</td>
</tr>
<tr>
<td>Silver-110 m&lt;sup&gt;a&lt;/sup&gt;</td>
<td>253 days</td>
</tr>
<tr>
<td>Strontium-90&lt;sup&gt;b&lt;/sup&gt;</td>
<td>28.8 years</td>
</tr>
<tr>
<td>Thallium-208&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3 minutes</td>
</tr>
<tr>
<td>Thorium-234&lt;sup&gt;a&lt;/sup&gt;</td>
<td>24.1 days</td>
</tr>
<tr>
<td>Uranium-234</td>
<td>2.5 x 10&lt;sup&gt;5&lt;/sup&gt; years</td>
</tr>
<tr>
<td>Uranium-238&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.5 x 10&lt;sup&gt;9&lt;/sup&gt; years</td>
</tr>
<tr>
<td>Zinc-65&lt;sup&gt;a&lt;/sup&gt;</td>
<td>245 days</td>
</tr>
</tbody>
</table>

<sup>a</sup> Radionuclides with no radiological release criteria guidelines.

<sup>b</sup> To be determined by radiochemical techniques and methods. All others listed are determined by gamma spectrometric techniques.

NOTE: Thorium-234, protactinium-234, uranium-234, radium-226, lead-214, and bismuth-214 are decay products (daughters) of the natural uranium series decay chain. Actinium-228, lead-212, bismuth-212, and thallium-208 are decay products (daughters) of the natural thorium series decay chain.
<table>
<thead>
<tr>
<th>Analytical parameter</th>
<th>Container</th>
<th>Preservative</th>
<th>Holding time&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Sample volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatile organic Hydrocarbons</td>
<td>125 ml (WM) glass jar</td>
<td>4°C</td>
<td>14 d</td>
<td>50 g (minimum)</td>
</tr>
<tr>
<td>Semivolatile organic Anions TCLP semivols PCB Pesticide</td>
<td>250 ml (WM) glass jar</td>
<td>4°C</td>
<td>Ext. org. — 14 d TCLP — 28 d Sulfides — 7 d Pest. — 7 d</td>
<td>150 g</td>
</tr>
<tr>
<td>High explosives</td>
<td>(WM) glass jar</td>
<td>4°C</td>
<td>N/A</td>
<td>200 g</td>
</tr>
<tr>
<td>CLP metals ICP metals Cations Cyanide TCLP metals Pb Hg Cr Cr&lt;sup&gt;6+&lt;/sup&gt; As Ti Sn</td>
<td>250 ml (WM) glass jar</td>
<td>4°C</td>
<td>6 mo Cyanide — 28 d Mercury—28d</td>
<td>75 g</td>
</tr>
<tr>
<td>Gamma analysis Gross a &amp; b analysis Total Pu H Total U Th Sr-90 Am Ra-226 Cs-137</td>
<td>16 oz Plastic squat jar</td>
<td>None</td>
<td>1 y</td>
<td>Fill to top</td>
</tr>
<tr>
<td>Environmental asbestos Bulk asbestos</td>
<td>500 ml Plastic squat jar</td>
<td>4°C</td>
<td>None</td>
<td>400 ml</td>
</tr>
<tr>
<td>Soil gas</td>
<td>— Canister</td>
<td>4°C</td>
<td>6wk</td>
<td>Variable</td>
</tr>
</tbody>
</table>

<sup>a</sup> Holding times are from the date of collection as referred to in Federal Register, Vol. 49, No. 209, October 26, 1984.
2.10 Radiological Considerations

Based on the nature of the work to be performed at TRA and the results of previous RADCON surveys, radiological contamination will be encountered during sampling. A certified Radiological Control Technician (RCT) will support sampling activities at all times. RCT general surveys will be conducted in all rooms, Contamination areas, and High Contamination areas. PPE will be evaluated on a case-by-case basis and any additions to minimal clothing requirements stated will be identified on the radiological work permit. Detailed work control documentation will be prepared in accordance with the DOE Radiological Control Manual.

2.11 Decontamination Procedures

Establishing decontamination procedures for personnel and equipment is necessary to control both chemical and radiological contamination and to protect field personnel. If equipment or personnel are radiologically contaminated, decontamination will be supervised by the RCT.

To prevent cross-contamination of samples, all onsite sampling equipment will be decontaminated. Decontamination will be performed throughout the workday as equipment is used and clean equipment supplies are depleted. Sampling equipment decontamination will follow the Environmental Monitoring Decontamination Standard Operating Procedure (SOP-EM-SR-1.12).

2.11.1 Disposal of Contaminated Materials

Materials and equipment known or suspected to be contaminated and for which decontamination or treatment is not feasible shall be properly disposed. D&D Programs will provide the necessary containers for disposal of contaminated materials. These materials may include disposable clothing, tools, or other equipment resulting from sampling activities. All project personnel will be responsible for using the appropriate waste container for the type of contamination encountered (radiological, hazardous, and/or mixed waste). D&D Programs will be responsible for final disposition of all wastes. It is the responsibility of all site personnel to minimize waste generation where possible.
3.0 DATA QUALITY OBJECTIVES AND REQUIREMENTS

The overall objective of the project is to produce data of known quality that can be used to characterize wastes and assist in planning future D&D actions at the site.

Sampled materials will be analyzed to determine the presence of gamma-emitting isotopes and/or TCLP metals, volatiles and semi-volatiles. Validation of laboratory data will be performed by the INEL SMO according to SMO SOPs 12.1.2-12.1.15. Data reporting, tracking, sample handling, etc. shall be according to ER PDs cited elsewhere in this document.

3.1 Completeness and Critical Samples

Many of the planned sample locations are in areas that have been unused for years. If no material is present, it will not be possible to obtain samples. If material is present, composites will be taken where possible. As a minimum, radiological smears should be obtainable from 90% of the planned locations. Soils to be sampled are known to be present and it is expected that 90% of these critical samples will be obtainable.
Environmental Monitoring (EM) will send a closure package containing copies of the following items listed below to the project manager:

- **Chain-of-Custody.** Samples must be labeled and handled according to standard custody procedures as necessary to ensure the project objectives are fulfilled. These procedures will be in accordance with ER PD 5.7, Chain of Custody, "Sample Handling and Packaging."

- **Field Logbooks.** Field activities must be recorded with waterproof ink in the appropriate field logbook. The use of logbooks will be in accordance with ER PD 4.2, "Logbooks."

- **Laboratory Data.** Analytical results must be reported within 30 working days after sample receipt by the laboratory. Analytical data produced for the requested analyses will be reported to Donna Kirchner of EG&G Idaho, Environmental Restoration Program, Sample Management Office, P.O. Box 1625, Idaho Falls, ID 83415-1403, telephone (208) 526-9873.

Data must be reported for all samples submitted for analysis and shall include all QA/QC data (except for RML data).

**Waste Disposal**

Samples submitted to the laboratories must be disposed after the data results have been interpreted. Samples will be disposed of by the laboratories.

A report will be issued upon completion of the data evaluation by the Environmental Monitoring Unit to the requester, Don Baxter. The report will evaluate the results of the sampling (e.g., maximums and standard deviations) with respect to regulatory standards.
5.0 DATA VALIDATION AND REPORTING

The EG&G Sample Management Office (SMO) will validate the data according to (a) requirements associated with the MTR-ETR D&D project, (b) analytical methods selected by the laboratory, and (c) SMO validation procedures.

When appropriate as determined by the analytical level, data will be reported with statistically supported limits of uncertainty to indicate limitations on the use of the data. All data, when reported, will be rounded to the number of significant figures consistent with the confidence limits. ER PD 3.7, "Characterization Process in Environmental Restoration," details the flow of characterization data collected in the field.
6.0 CORRECTIVE ACTION

Corrective action will be initiated when the project objectives are not met, or when assessment of the data reveals questionable or unknown data quality. Corrective action may be initiated by any individual on the project subject to approval by the project manager. These corrective actions will include, but are not limited to, modifications of the sampling procedure, sampling design, analytical techniques within EPA-approved guidelines, and data reporting procedures.

6.1 Field Corrective Action

The initial responsibility for monitoring the quality of field measurements lies with the field personnel. The project manager is responsible that all quality assurance (QA) procedures are followed. This requires that the D&I Project Manager assess the field methods and their ability to meet the QA objectives, and to make a subjective assessment of the impact a procedure has on field objectives and subsequent data quality. If a problem occurs that might jeopardize the integrity of the project, cause failure to meet QA objectives, or impact data quality, the EM Project Manager will immediately contact the project requester.

The EM Project Manager will document the situation, the field objectives affected, the corrective actions taken, and the results of that action. Copies of documentation will be provided to the project requester.

Corrective action will be implemented when the project objectives are not met or when conditions adverse to quality standards have been identified. Conditions adverse to quality shall be promptly identified and corrected as soon as possible. The identification, cause, and corrective action to prevent reoccurrence shall be determined and documented for significant conditions adverse to quality.

6.2 Laboratory Corrective Action

The laboratory corrective action plan will be detailed in the laboratory quality program plan. The need for corrective action may come from several sources: equipment malfunctions, failure of internal QC checks, blank contamination, failure of performance or system assessments, and noncompliance with QA requirements.

Laboratory measurement equipment or analytical methods that fail to meet project QC requirements will be immediately brought to the attention of the laboratory QC manager. If failure is due to the equipment malfunctioning, the equipment will be repaired, re-calibrated and the analysis repeated. All attempts will be made to repeat all affected parts of the analysis so that the end product will not be affected by failure to meet QC requirements. Nonconforming data will be qualified with a note specifying any reasons for the qualification. All incidents of failure to meet QC requirements and all corrective actions will be documented. Corrective action
reports will be immediately implemented for deficiencies noted during checks of raw data. This action will vary depending upon problems noted, and can range from correcting miscalculated data to requiring reanalysis of samples. As soon as sufficient time has elapsed for corrective action to be implemented, evidence of corrective action will be presented. Documentation of corrective action measures will be forwarded to the EM Project Manager. Corrective action documentation will include the following: a discussion of the nature of the problem; date and time of discovery; parameters affected; sample lot affected; date, time, and description of the resulting corrective action; and signature of the complying manager.

The laboratory QA officer will prepare a written report on corrective action for the EM Project Manager. The report will review the validity, quality, and completeness of the data in question and, if necessary, make recommendations for corrective action.
7.0 REFERENCES

1. Data Quality Objectives for Remedial Response Activities: Developmental Process U.S. Environmental Protection Agency (USEPA), 1987


ER PD 4.1, Document Control, Handling, Storing, and Shipping Samples.

ER PD 4.2, Logbooks.

ER PD 5.7, Chain of Custody, Sample Handling and Packaging.


12. OSHA, 29 CFR 1910.120.
Exhibit 1.1: Location Drawing for Sample Group 1

TRA -611 Plug Storage Facility: Soil Sampling Required Below Plug Storage Channels (#1)
Exhibit 1.2: Location Drawing for Sample Group 2

TRA-612 MTR Retention Basin Sump Pumphouse: Liquid and Sludge Sampling Required in Sump (#2)
Exhibit 1.3: Location Drawing for Sample Groups 3 and 4 (1 of 2)

TRA -644 ETR Heat Exchanger Building: Concrete Sampling Required in Resin Transfer Area (#3) and in Degasifier Tank Room, Roof of Building (#4)
Exhibit 1.4: Location Drawing for Sample Groups 3 and 4

TRA -644 ETR Heat Exchanger Building: Concrete Sampling Required in Resin Transfer Area (#3), and in Degasifier Tank Room, Roof of Building (#4)
Exhibit 1.5: Location Drawing for Sample Groups 5 through 8

TRA -645 ETR Secondary Coolant Pump House:
Samples Required in Pit Area (#5 and #6)
Samples of Drain and Brick Required (#7)
Three Soil Samples Required (#8)
Sample Locations
Exhibit 1.6: Location Drawing for Sample Groups 9 through 13

TRA-647 ETR Office Building
Room 104, Sink Drain Samples Required (#9)
Shop, Sink Drain Samples Required (#10)
Basement HVAC Room
Sump Pit with Tank in Pit, Samples Required for Tank and Pit (#11)
Samples Required of Hydraulic Oil in Dash Pots (#12)
Air Intake Filters, Filter Media Samples Required for Lead (#13)
FIRST FLOOR PLAN

GENERAL NOTES
1. TOTAL FLOOR AREA EACH LEVEL 19,647 SQ FT FOOTAGE CALCULATED FROM INSIDE OF THE EXTERIOR PERIPHERAL WALLS.
2. ROOM NUMBERS SHOWN WERE ASSIGNED ON CONSTRUCTION DWGS.

REFERENCE DWGS
1. KAISER ENGINEERS DWG NO. 7T7587
2. SECOND FLOOR ACCESS DOORWAY 425799
3. SECOND FLOOR ACCESS DOOR STAIRWAY 425800
4. SECOND FLOOR ACCESS DOOR STAIRWAY 425135

SPACE-OCUPANCY
FLOOR PLAN

MTR-647
IDaho Nuclear Corporation
Idaho Falls, Idaho

APPROVED

REVISION

IDaho Nuclear Corporation
Idaho Falls, Idaho
Exhibit 1.7: Location Drawing for Sample Groups 14 through 18

TRA -642 ETR Reactor Building Basement,
Basement Sump Samples Required (#14)
Sub Pile Room, Paint Samples Required Inside and Outside of Room (#15)
Cubicle No. M-3,
Resin Samples Required from Inside M-3 (#16)
Warm Waste Tanks Below Floor, Tank Samples Required (#17)
Cold Waste Pit Below Floor, Pit Interior Samples Required
to Verify Cleanliness (#18)
Exhibit 1.8: Location Drawing for Sample Group 19

TRA -642 ETR Reactor Building Basement  Decontamination Station,  Oil Residue  
Samples Required for PCB Analysis (#19)
GENERAL NOTES:
1. BASEMENT FLOOR IS 15,146 SQ. FT. (INCLUDES SUMP PIT & ACCESS CONTROL ROOM)
   CONSOLE FLOOR IS 1,976 SQ. FT.
   POSI FLOOR IS 7,224 SQ. FT.
   TOTAL BLD AREA IS 24,346 SQ. FT.
   FOOTAGE CALCULATED FROM INSIDE THE EXTERIOR PERIMETER WALLS.

REFERENCE DRAWING
ROAER ENGINEERS DWG NO. 678-5330-15F-665-446
(IN-Nr. BLD. BASEMENT FLOOR PLAN)
Exhibit 1.9: Location Drawing for Sample Groups 20 through 23

TRA -642 ETR Reactor Building Basement, South Console Floor
Pipe Trench Adjacent to Reactor Containment, Samples Required from Trench (#20, #21)
Hot Experiment Drain, Representative Drain Sample Required from One Drain (#22)
Warm Drain Around Storage Canal, Sample Required from Drain and Trench Drain (#23)
Exhibit 1.10: Location Drawing for Sample Groups 24 through 32

TRA -643 ETR Compressor Building
Gate Valve Motor Operators, Representative Oil Sample Required (#24)
Primary Coolant Pump Motor, 460V, Representative Oil Reservoir Sample Required (#25)
Pipe Trench, Pit and Trench Samples Required (#26)
Compressors, Representative Oil Sample Required (#27)
Compressor Actuators, Representative Oil Sample Required (#28)
Trench Below Compressors, Trench Sample Required (#29)
Compressor Motor Drive, Oil Reservoir Sample Required (#30)
Decon Restroom, Samples from Shower Drain and Sinks Required (#31)
Chemistry Laboratory, Samples from Sink and Trench Required (#32)
Exhibit 1.11: Location Drawing for Sample Groups 33 through 35

- TRA-648 ETR Electrical Building
  - Diesel Generator Room Pit, Pit Samples Required (#33)
  - Battery Room, Samples of Drain and Floor Spill Areas Required (#34)
- TRA-663 ETR Superior Diesel Building (Adjacent to TRA-648, to SW, not shown)
  - Fuel Injector Cleaning Station, Residue Samples Required (#35)
Exhibit 2.1: Photograph of TRA -611 Plug Storage Facility.
Soil Covering Potentially Contaminated Soil Sampling Required Below Channels (View to East)
Exhibit 2.2: Photograph of TRA -612 MTR Retention Basin Sump Pumphouse
Liquid and Sludge Sampling Required from Floor, 40 feet down
(View to Northwest)
Exhibit 2.3: Photograph of TRA -644 ETR Heat Exchanger Building
Concrete Samples Required Outside of Building, in Resin Handling Area
(View to Northwest)
Exhibit 2.4: Photograph of TRA -644 ETR Heat Exchanger Building
Sampling Required in Degasifier Tank, Roof of Building
(View to Northwest)
Exhibit 25: Photograph of TRA-645 EER Secondary Coolant Pump House Sample(s) Recovered in Pit Area

(View to West)
Exhibit 2.6: Photograph of TRA -645 ETR Secondary Coolant Pump House
Top-- Closeup of Coolant Pit
Bottom-- West Side of Coolant Pump House
Samples Required in Pit Area
Exhibit 2.7: Photograph of TRA -645 ETR Secondary Coolant Pump House
Top -- Acid Pit Area Drain
Bottom -- Acid Pit Area
Samples of Drain and Brick Required
(View to South)
Exhibit 2.8: Photograph of TRA -645 ETR Secondary Coolant Pump House
South Side of Building
Three Soil Samples Required
(View to West)
Exhibit 2.9: Photograph of TRA-647 ETR Office Building, Room 104
Sink Drain Samples Required
(View to East)
Exhibit 2.10: Photograph of TRA -647 ETR Office Building, Shop Sink Drain Samples Required (View to North)
Exhibit 2.11: Photograph of TRA -647 ETR Office Building Basement HVAC Room
Sump Pit with Tank in Pit
Samples Required for Tank and Pit
(View to North)
Exhibit 2.12: Photograph of TRA-647 ETR Office Building Basement HVAC Room
Closeup of Sump Pit Area
Samples Required of Hydraulic Oil in Dash Pots
(View to East)
Exhibit 2.13: Photograph of TRA-647 ETR Office Building Basement HVAC Room
Air Intake Filters
Filter Media Samples Required for Lead
(View to East)
Exhibit 2.14: Photograph of TRA -642 ETR Reactor Building Basement
Stairs to Rod Access Room
Sump Samples Required
(View to West)
Exhibit 2.15: Photograph of TRA -642 ETR Reactor Building Basement
Sub Pile Room
Paint Samples Required Inside and Outside of Room
(View to West )
Exhibit 2.16: Photograph of TRA -642 ETR Reactor Building Basement
Cubicle No. M-3,
Resin Samples Required from Inside M-3
(View to South)
Exhibit 2.17: Photograph of TRA -642 ETR Reactor Building Basement Cubicle No. M-3, Warm Waste Tanks Below Floor Tank Samples Required (View to West)
Exhibit 2.18: Photograph of TRA-642 ETR Reactor Building Basement Cubicle No. M-3, Cold Waste Pit Below Floor Pit Interior Samples Required to Verify Cleanliness (View to Northeast)
Exhibit 2.19: Photograph of TRA -642 ETR Reactor Building Basement Decontamination Station
Oil Residue Samples Required for PCB Analysis
(View to South)
Exhibit 2.20: Photograph of TRA-642 ETR Reactor Building Basement South Console Floor, Pipe Trench Adjacent to Reactor Containment Samples Required from Trench (View to Northwest)
Exhibit 2.21: Photograph of TRA -642 ETR Reactor Building Basement South Console Floor, Pipe Trench Adjacent to Reactor Containment Samples Required from this End of Trench (View to Northeast)
Exhibit 2.22: Photograph of TRA-642 ETR Reactor Building Basement
South Console Floor, Hot Experiment Drain
Representative Drain Sample Required from One Drain
(View to South)
Exhibit 2.23: Photograph of TRA -642 ETR Reactor Building Basement South Console Floor, Warm Drain Around Storage Canal Sample Required from Drain and Trench Drain (View to West)
Exhibit 2.24: Photograph of TRA -643 ETR Compressor Building
Gate Valve Motor Operators
Representative Oil Sample Required
(View to East)
Exhibit 2.25: Photograph of TRA -643 ETR Compressor Building
Primary Coolant Pump Motor, 460V
Representative Oil Reservoir Sample Required
(View to North)
Exhibit 2.26: Photograph of TRA-643 ETR Compressor Building
Pipe Trench
Pit and Trench Samples Required
(View to East)
Exhibit 2.27: Photograph of TRA -643 ETR Compressor Building
Compressors
Representative Oil Sample Required
(View to South)
Exhibit 2.28: Photograph of TRA-643 ETR Compressor Building
Compressor Actuators
Representative Oil Sample Required
(View to North)
Exhibit 2.29: Photograph of TRA-643 ETR Compressor Building
Trench Below Compressors
Trench Sample Required
Exhibit 2.30: Photograph of TRA-643 ETR Compressor Building
Compressor Motor Drive
Oil Reservoir Sample Required
(View to North)
Exhibit 2.31: Photographs of TRA-643 ETR Compressor Building Decon Restroom
Samples from Shower Drain and Sinks Required
(View to West)
Exhibit 2.32: Photographs of TRA-643 ETR Compressor Building Chemistry Laboratory
Samples from Sink and Trench Required
(View to South)
Exhibit 2.33: Photographs of TRA -648 ETR Electrical Building
Diesel Generator Room Pit
Pit Samples Required
(View to West)
Exhibit 2.34: Photographs of TRA-648 ETR Electrical Building Battery Room
Samples of Drain and Floor Spill Areas Required
(View to Northeast)
Exhibit 2.35: Photograph of TRA -663 ETR Superior Diesel Building
Fuel Injector Cleaning Station
Residue Samples Required
Figures A-1, A-2, and A-3 in Appendix A present examples of sample labels, chain-of-custody forms, and sample log sheets that will be used for the sampling excursion.
<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Time</th>
<th>Date (ddmmyy)</th>
<th>Sampler</th>
<th>Location</th>
<th>Depth</th>
<th>Analysis</th>
<th>Field Measurement/Hazards/Preservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPS0010I1XH</td>
<td></td>
<td></td>
<td></td>
<td>GRID #183</td>
<td>0-0.33</td>
<td>Total Spectrometric Alpha/Sr Screen</td>
<td></td>
</tr>
<tr>
<td>SPS0010IR4</td>
<td></td>
<td></td>
<td></td>
<td>GRID #183</td>
<td>0-0.33</td>
<td>Gamma Spectroscopy</td>
<td></td>
</tr>
<tr>
<td>SPS0010IC1</td>
<td></td>
<td></td>
<td></td>
<td>GRID #183</td>
<td>0-0.33</td>
<td>CLP Metals</td>
<td></td>
</tr>
</tbody>
</table>

Figure A-1: Sample Label
Figure A-2: Chain-of-Custody (COC) Form
### Sample Logsheets

**Date (DD/MM/YYYY):** __/__/__  
**Location:** ________________

**Sample Type:**
- (0) Normal  
- (1) Control, Blank (Prior)  
- (2) Trip Blank (Prior)  
- (3) Control, Blank (Post)  
- (4) Spike  
- (5) Other

<table>
<thead>
<tr>
<th>ID No.</th>
<th>CODE</th>
<th>ID No.</th>
<th>CODE</th>
<th>ID No.</th>
<th>CODE</th>
</tr>
</thead>
</table>

**Specific Sampling Points/locations and Definitions:**

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
<th>UNITS BELOW SURFACE</th>
</tr>
</thead>
</table>

**Sample Method:**
- (0) Grab  
- (1) Spike  
- (2) Time  
- (3) Other

**Sample Description:**

<table>
<thead>
<tr>
<th>Soil/Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0) Surf. Soil</td>
<td></td>
</tr>
<tr>
<td>(01) Sub. Surf. Soil</td>
<td></td>
</tr>
<tr>
<td>(02) Nbrvl</td>
<td></td>
</tr>
<tr>
<td>(03) Alkali</td>
<td></td>
</tr>
<tr>
<td>(04) Sediment Interbed</td>
<td></td>
</tr>
<tr>
<td>(05) Other</td>
<td></td>
</tr>
<tr>
<td>(11) Other</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>

**Field Measurements:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Units</th>
<th>Instrument/Model</th>
<th>Instrument No.</th>
</tr>
</thead>
</table>

**Sampling and Analysis Plan Followed:**

- (0) No  
- (1) Yes  

**If No, Explain Deviations:**

**Recorded By:** ________________

---

**Figure A-3: Sample Logsheets**

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Figure A-3: Sample Logsheet (Page 2 of 2)