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U.S. Department of Energy
Idaho Operations Office

Idaho National Laboratory Site Environmental Monitoring Plan

August 2012

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DOE Idaho Operations Office

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EXECUTIVE SUMMARY

The Idaho National Laboratory (INL) consists of nine major facilities located in southeastern Idaho within a U.S. Department of Energy (DOE) specified boundary, typically referred to as the "INL Site," and several laboratories and administrative buildings located in Idaho Falls, Idaho, approximately 48 km (30 mi) east of the INL Site boundary. This plan describes routine environmental compliance and surveillance monitoring of airborne and liquid effluents, and ecological and meteorological conditions in and around the vicinity of the INL Site.

Environmental monitoring discussed in this plan is conducted in accordance with DOE Order 458.1, *Radiation Protection of the Public and the Environment*[1]. The purpose of DOE Order 458.1 is to establish requirements to protect the public and the environment against undue risk from radiation associated with radiological activities conducted under the control of DOE pursuant to the Atomic Energy Act of 1954, as amended. It provides guidance for implementing sound practices for protecting the air, water, land, and other natural and cultural resources that may be impacted by DOE operations. This plan provides an overview of the organizations and federal agencies responsible for meeting the Sustainable Environmental Stewardship goals and Environmental Management System implementation objectives found in DOE order 436.1[2] at the INL Site. It also includes the rationale for monitoring, the types of media monitored, where the monitoring is conducted, and information regarding access to analytical results. Environmental monitoring activities are conducted by a variety of organizations consisting of:

- Idaho National Laboratory
- Idaho Cleanup Project
- Environmental Surveillance, Education, and Research Program
- United States Geological Survey
- National Oceanic and Atmospheric Administration
- Advanced Mixed Waste Treatment Project.

Monitoring of airborne and liquid effluents is performed to verify compliance with permitting requirements, state and federal regulations, and environmental protection policies and commitments. Surveillance monitoring addressed in this document is driven by DOE order and is performed to characterize pre-operational conditions, detect, characterize, and respond to releases from site operations and activities, assess impacts, estimate dispersal patterns in the environment, characterize the exposures and doses to individuals and the population, and evaluate the potential impacts to biota in the vicinity of the release.

Nonroutine activities, such as special research studies and the characterization of individual sites for environmental restoration, are outside the scope of this plan. Environmental monitoring activities at Naval Reactors Facility conducted by Bechtel Marine Propulsion Corporation are not included in this plan.

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FIGURES

TABLES

ACRONYMS

AMWTP	Advanced Mixed Waste Treatment Project
ARLFRD	Air Resources Laboratory Field Research Division
ARP	Accelerated Retrieval Project
ASER	Annual Site Environmental Report
ASME	American Society of Mechanical Engineers
ATR Complex	Advanced Test Reactor Complex
BEA	Battelle Energy Alliance
BBS	Breeding Bird Survey
BLR	Big Lost River
CFA	Central Facilities Area
CITRC	Critical Infrastructure Test Range Complex
CFR	*Code of Federal Regulations*
CRMO	Cultural Resources Management Office
CRWG	Cultural Resources Working Group
CWI	CH2M-WG Idaho, LLC
DEQ	Idaho Department of Environmental Quality
DOE	Department of Energy
DOE-ID	Department of Energy Idaho Operations Office
ESRPA	Eastern Snake River Plain Aquifer
EBR	Experimental Breeder Reactor
EDE	effective dose equivalent
EMS	Environmental Management System
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESER	Environmental Surveillance, Education and Research (Program)
ES&S	Environmental Support and Services
GPRS	global positioning radiometric scanner
GSS	Gonzales Stoller Surveillance
HSL	Health Services Laboratory
ICDF	Idaho CERCLA Disposal Facility
ICP	Idaho Cleanup Project
IDAPA	Idaho Administrative Procedures Act
IEMP	Idaho Environmental Monitoring Program
INEEL	Idaho National Engineering and Environmental Laboratory

INEL	Idaho National Engineering Laboratory
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
IRC	INL Research Center
ITG	Integrated Treatment Group, LLC
IWTU	Integrated Waste Treatment Unit
M&O	management and operating
MDIFF	mesoscale diffusion
MEI	maximally exposed individual
MFC	Materials and Fuels Complex
MSC	Monitoring and Surveillance Committee
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOAA	National Oceanic and Atmospheric Administration
NRF	Naval Reactors Facility
OSLD	optically stimulated luminescent dosimeter
QA	quality assurance
R&D	research and development
RCRA	Resource Conservation and Recovery Act
REC	Research and Education Campus
RESL	Radiological and Environmental Sciences Laboratory
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RWMC	Radioactive Waste Management Complex
SDA	Subsurface Disposal Area
SMC	Specific Manufacturing Capability
STP	Sewage Treatment Plant
TAN	Test Area North
TLD	thermoluminescent dosimeter
USGS	United States Geological Survey
USGS-BRD	United States Geological Survey-Biological Resources Discipline
WAG	Waste Area Group
WIPP	Waste Isolation Pilot Plant
WNS	White-nose syndrome
WRP	Wastewater Reuse Permit
WRRTF	Water Reactor Research Test Facility

Idaho National Laboratory
Environmental Monitoring Plan

1. GENERAL INFORMATION

1.1 Purpose

This plan provides a high-level summary of environmental monitoring performed by various organizations within and around the Idaho National Laboratory (INL) Site as required by U.S. Department of Energy (DOE) Order 435.1, *Radioactive Waste Management*[3], DOE Order 450.1A, *Environmental Protection Program*[4], and DOE Order 458.1, *Radiation Protection of the Public and the Environment*[1], Guide DOE/EH-0173T, *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance*[5] , and in accordance with 40 *Code of Federal Regulations* (CFR 61) *National Emission Standards for Hazardous Air Pollutants*[6]. The purpose of these orders is to 1) implement sound stewardship practices that protect the air, water, land, and other natural and cultural resources that may be impacted by DOE operations, and 2) to establish standards and requirements for the operations of DOE and DOE contractors with respect to protection of the environment and members of the public against undue risk from radiation. This plan describes the organizations responsible for conducting environmental monitoring across the INL Site, the rationale for monitoring, the types of media being monitored, where the monitoring is conducted, and where monitoring results can be obtained.

Detailed monitoring procedures, program plans, or other governing documents used by contractors or agencies to implement requirements are referenced in this plan. This plan covers all planned monitoring and environmental surveillance. Nonroutine activities such as special research studies and characterization of individual sites for environmental restoration are outside the scope of this plan.

1.2 INL Site Description

The INL Site is approximately 230,500 hectares (890 mi^2) and is located on the Eastern Snake River Plain in southeastern Idaho (see Figure 1-1). It was established as a nuclear energy research and development (R&D) testing station in the late 1940s and was designated a National Environmental Research Park in 1975. All land within the Site is protected as an outdoor laboratory where the effects of energy development, industrial activities on the environment, and the complex ecological relationships of this cool desert ecosystem can be studied. The INL Site is owned by DOE and administered through its Idaho Operations Office (DOE-ID). The DOE-ID oversees operations at the INL Site.

Subsurface geology consists of successive layers of basalt and sedimentary strata, overlain by wind- and water-deposited sediments. Most of the Site is in the closed Mud Lake-Lost River drainage basin, which has been informally named the Pioneer Basin. Surface waters within the Pioneer Basin include the Big Lost River, the Little Lost River, and Birch Creek drainages which drain mountain watersheds located to the north and northwest of the Site. All three drainages may flow onto the Site during high flow years but are otherwise ephemeral. In addition, local rainfall and snowmelt contribute to surface water, mainly during the spring. The portion of surface water that is not lost to evapotranspiration infiltrates into the subsurface. Both aquifer and surface waters are used for irrigating crops and other applications outside the Site.

The primary groundwater source of the region is the Eastern Snake River Plain Aquifer (ESRPA) (Figure 1-2). The ESRPA is approximately 320 km (199 mi) long, 30 to 100 km (20 to 60 mi) wide, and encompasses an area of about 2,500,000 hectares (9,650 mi^2). This sole-source aquifer is one of the most

productive in the U.S, is a source of process and drinking water to more than 200,000 people, and supplies irrigation water to a large, regional agricultural and aquaculture economy.

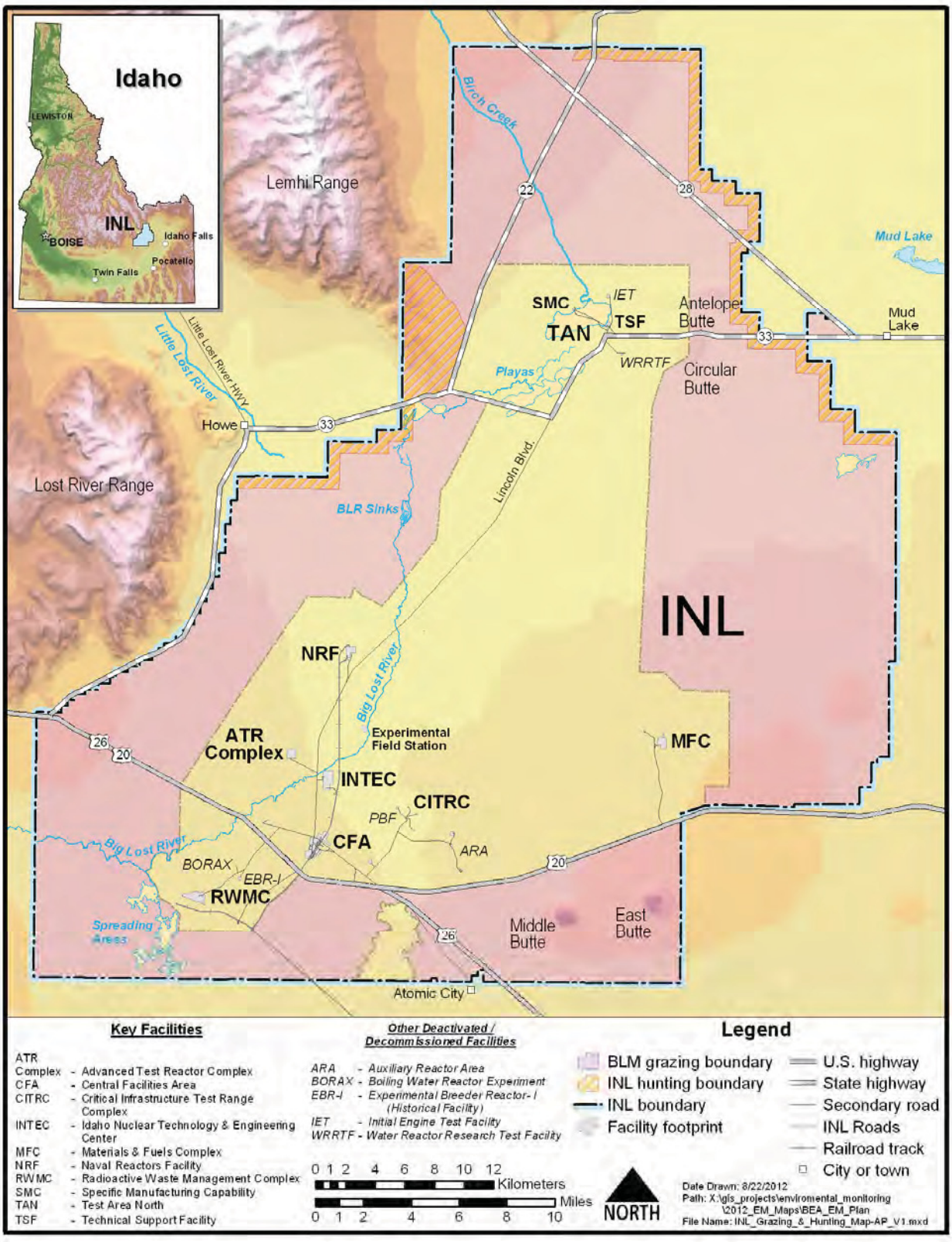

Figure 1-1. Idaho National Laboratory Site.

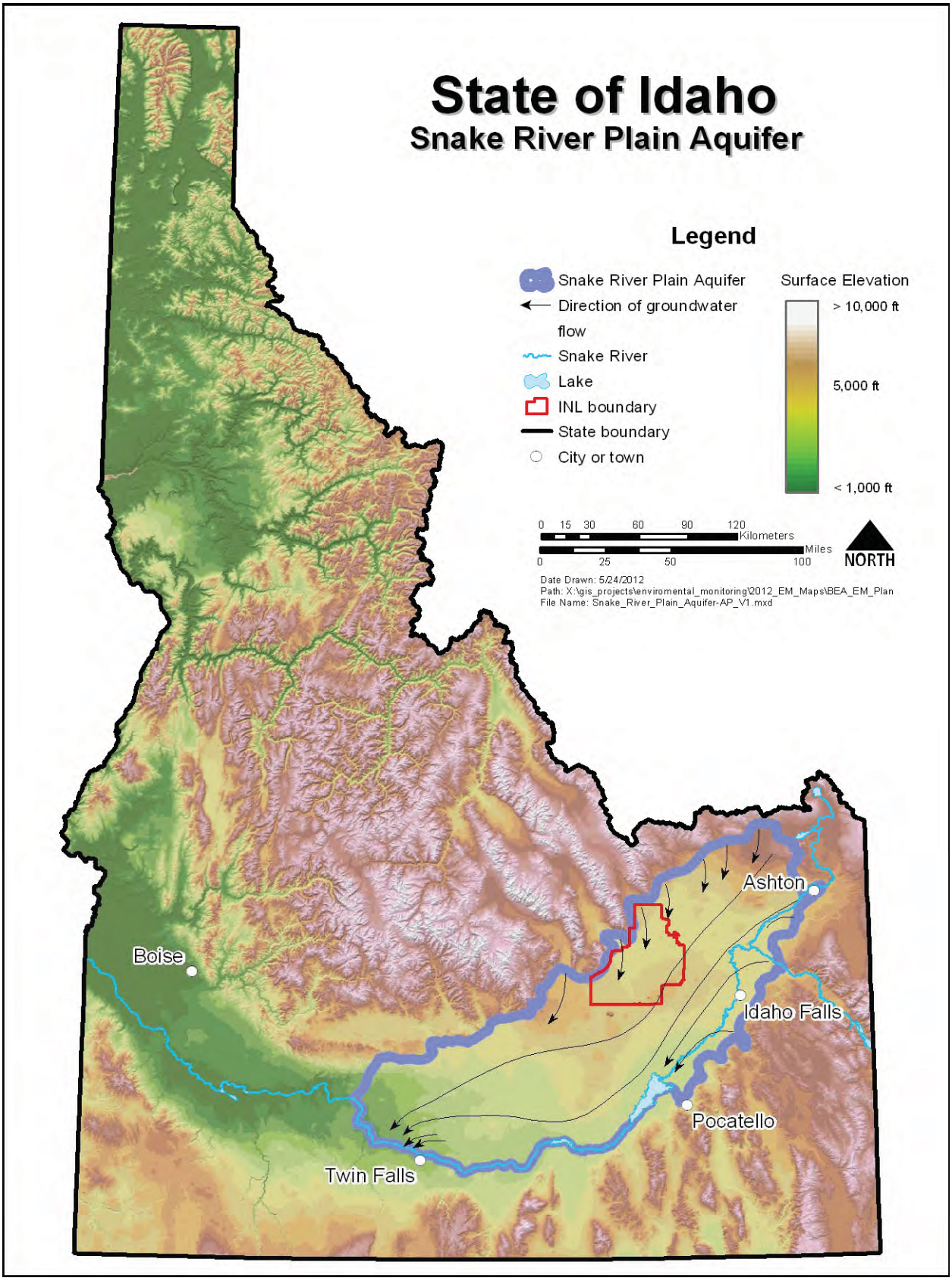

Figure 1-2. Idaho National Laboratory Site in relation to the Snake River Plain Aquifer.

The depth to the ESRPA varies from approximately 60 m (200 ft) in the northern part of the INL Site to more than 270 m (900 ft) in the southern part. The aquifer is recharged from infiltrating precipitation and irrigation seepage, runoff from the surrounding highlands, and groundwater underflows from the surrounding watersheds. Groundwater in the ESRPA flows generally to the southwest, although locally the direction of flow is influenced by recharge from rivers, surface water, spreading areas, and heterogeneities in the aquifer. Groundwater flow rates in the vicinity of the INL Site range from approximately 1.5 to 6 m (5 to 20 ft) per day.

Annual rainfall at the Site is light, and the region is classified as arid to semiarid.[7] The long-term average (from March 1950 through 2005) annual precipitation at the Site is 21.6 cm (8.5 in. at the Central Facilities Area ([CFA) station). Monthly precipitation is usually highest in April, May, and June and lowest in July and October. The average daily temperature is 17.1°C (62.7°F) in the summer, and the average daily minimum temperature is - 5.5°C (22.1°F) in the winter. The Site is in the belt of prevailing westerly winds, which are channeled within the plain to produce a west-southeasterly or southwesterly wind at most locations on the Site.

1.3 Summary of INL Site Facilities

The INL Site consists of eight major facilities and several laboratories and administrative buildings located approximately 48 km (30 mi) east of the Site boundary in Idaho Falls, Idaho. Battelle Energy Alliance, LLC (BEA) is the management and operating (M&O) contractor for the INL. In this document, BEA is referred to as the INL contractor. CH2M-WG Idaho, LLC (CWI) is the Idaho Cleanup Project (ICP) contractor and is referred to as the ICP contractor. The Advanced Mixed Waste Treatment Project (AMWTP) contractor is Integrated Treatment Group, LLC (ITG).

1.3.1 INL Facilities

The CFA houses many technical and support services for the INL contractor including administrative offices, monitoring and calibration laboratories, fire protection, medical services, warehouses, vehicle and equipment pools, and bus operations.

The Research and Education Campus (REC) in Idaho Falls consists of office and classroom complexes and multiple laboratory facilities, including many one-of-a-kind advanced labs dedicated to the full spectrum of physical and life science research. The laboratories are “modular,” with respect to their provisions, for ease of utility tailoring and flexibility. There are other advanced R&D laboratories located in Idaho Falls, including engineering demonstration facilities, robotics laboratories, material research laboratories, and advanced information technology and computer simulation and modeling facilities.

The Materials and Fuels Complex (MFC) is the prime testing center in the U.S. for demonstration and proof-of-concept of nuclear energy technologies. Research and development activities at this facility are focused on areas of national concern, including energy, nuclear safety, spent nuclear fuel treatment, nonproliferation, decommissioning and decontamination technologies, nuclear material disposal, and homeland security.

The Advanced Test Reactor Complex (ATR Complex) is the world’s most sophisticated nuclear reactor testing complex and has extensive facilities for studying the effects of radiation on materials, testing nuclear fuels, and producing medical and industrial isotopes.

The Critical Infrastructure Test Range Complex (CITRC) is an isolated and secure microcosm of many of the critical infrastructure systems important to the operation of our country, including power, transportation, cyber, and communications. This INL facility was chosen to be a "Test Range" due to its remote location and dedication to various research, development, and testing activities.

The CITRC has a number of specific test beds (12 buildings, approx 6,652 m^2 [71,600 ft^2], including the following:

- Range Support Area, which consists of office structures, training facility, area power substation, and area water supply system
- National Contraband Detection and Testing Center
- Incident Response Training and Testing Center, Range Control Center facility, and an office building housing the range director's office with other test bed facilities
- Special Programs test facility.

The Specific Manufacturing Capability (SMC) facility, located at Test Area North (TAN) houses a unique project that began with a Memorandum of Understanding between DOE and the U.S. Army in February 1985. Operated by the INL contractor, the SMC Project manufactures armor for the army's M1A2 Abrams battle tank.

1.3.2 Idaho Cleanup Project Facilities

The Idaho Nuclear Technology and Engineering Center (INTEC) was established in the 1950s to recover usable uranium in spent nuclear fuel from government reactors and to store spent nuclear fuel. The current work scope at INTEC includes removing excess nuclear material, closing radioactive and hazardous waste tanks, constructing the Integrated Waste Treatment Unit (IWTU) to prepare the liquid radioactive waste for shipment off-Site, transferring spent nuclear fuel from wet to dry storage, remediating the spent nuclear fuel basin, treating and disposing of waste, closing liquid waste tanks, remediating contaminated environmental sites, and demolishing facilities.

The Radioactive Waste Management Complex (RWMC) historically managed, stored, and disposed of radioactive waste. Currently, RWMC manages solid transuranic and low-level radioactive waste. RWMC is removing and disposing of targeted waste from the Subsurface Disposal Area (SDA), remediating the SDA, disposing of transuranic waste at an off-Site facility, and demolishing facilities.

TAN, which is located at the north end of the Site, was built in the 1950s to house the nuclear-powered airplane project. CWI has completed cleanup operations at TAN, including demolishing 44 excess facilities. Groundwater is currently monitored at TAN to satisfy specific Comprehensive Environmental Response Compensation, and Liability Act (CERCLA)-related remedial action objectives.

1.3.3 Advanced Mixed Waste Treatment Project Facility

The Advanced Mixed Waste Treatment Project (AMWTP) retrieves mixed transuranic waste from temporary storage, characterizes the waste, treats the waste to meet disposal criteria, and packages the waste for shipment to the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico. The AMWTP also receives other transuranic waste from the INL and off-Site DOE facilities for characterization, treatment, and shipment to WIPP. The AMWTP is operated by ITG.

1.3.4 Naval Reactors Facility

The Naval Reactors Facility (NRF), operated by Bechtel Marine Propulsion Corporation, is specifically excluded from detailed discussion in this monitoring plan. As established in Executive Order 12344,[8] the Naval Nuclear Propulsion Program is exempt from the requirements of DOE Orders 450.1A[4], 458.1, *Radiation Protection of the Public and the Environment*,[1] and 414D, *Quality Assurance* [9]. The director, Naval Nuclear Propulsion Program, establishes reporting requirements and methods implemented within the program, including those necessary to comply with appropriate environmental laws. NRF's program is documented in the *Naval Reactors Facility Environmental Monitoring Program*[10].

2. INL SITE ENVIRONMENTAL MONITORING OVERVIEW

The INL's mission is to ensure the nation's energy security with safe, competitive, and sustainable energy systems and unique national and homeland security capabilities. The vision for the site is to be the preeminent nuclear energy laboratory with synergistic, world-class, multi-program capabilities and partnerships. Two of the INL's site-strategic objectives are to develop public trust and confidence in site operations and nuclear programs, and to demonstrate sound environmental stewardship. The environmental policy ensures sound environmental stewardship by requiring that energy and national security R&D efforts be conducted in a manner that protects and preserves human health and the environment. This policy is in full compliance with applicable environmental laws, regulations, and other requirements. Environmental Management Systems (EMS) have been established to implement this policy. The EMS integrates the environmental functional area into the Integrated Safety Management Systems, is based on the international standard ANSI/ISO 14001, *Environmental Management System*[11] and meets the objectives of DOE Order 436.1[2].

Comprehensive environmental monitoring is conducted in support of the EMS. Environmental monitoring consists of two major activities: effluent monitoring and environmental surveillance. Environmental surveillance is conducted to generate measurement-based estimates of the amounts or concentrations of contaminants in the environment. Measurements are performed by sampling and laboratory analysis or by 'in-place' measurement of contaminants in environmental media.

Effluent monitoring of airborne emissions and liquid effluents is driven by DOE and Environmental Protection Agency (EPA) requirements, state and federal regulations, and facility operating permits. Effluent monitoring refers to the collection and analysis of samples, or measurements of liquid and gaseous effluents for characterizing and quantifying contaminants, assessing radiation exposures of members of the public, controlling effluents at or near the point of discharge, and demonstrating compliance with applicable standards and permit requirements. Liquid and airborne effluents from facilities are monitored for radiological and nonradiological parameters.

Environmental surveillance is the collection and analysis of samples or direct measurements of air, water, soil, biota, and agricultural products from DOE sites and their environs. Environmental surveillance activities are discussed in more detail in Section 4 and are conducted to:

- Comply with DOE Order 458.1[1]
- Determine potential effects of contaminants on the public and the environment
- Evaluate pathways through which contaminants move in the environment.

In addition to effluent monitoring and environmental surveillance, meteorological conditions are monitored in and around the Site. Meteorological monitoring provides information needed to support and interpret the results of other monitoring and surveillance activities, particularly for air dispersion modeling. Meteorological monitoring activities are discussed in Section 5.

Ecological resource monitoring documents sensitive and threatened species on the Site, evaluates habitat needs, and monitors biota population trends and weed invasions in disturbed areas. These data better enable the evaluation of environmental impacts of operations and help determine restoration and mitigation needs. These activities are discussed in Section 4.9.

Cultural resource monitoring enables the Site Cultural Resources Management Office (CRMO) staff to gather baseline data and assess the condition of known cultural resources that have the potential to be impacted by natural processes, unauthorized activities, or inadvertently by project activities. If impacts are noted during monitoring visits, appropriate notifications are made as outlined in DOE/ID-10997, *INL*

Cultural Resource Management Plan[12] and as legitimized through Programmatic Agreement between the Idaho State Historic Preservation Office, the Advisory Council on Historic Preservation and DOE-ID. By identifying impacts to cultural resources in this manner and implementing mitigation or treatment plans, federal stewardship responsibilities are fulfilled by completing actions to avert further deterioration. Certain properties that are of special significance to the Shoshone-Bannock Tribes and other groups are monitored at least once per year while others are chosen based on known threats (i.e., close to public roads, ongoing projects in the vicinity). Because of tribal sensitivities, all projects that will disturb the ground in and around the CITRC area are monitored. Details of the annual monitoring activities are reported to DOE-ID annually in the *INL Monitoring Report* and are summarized for the public in the *INL Cultural Resource Management Program Activities Report*. A description of the INL CRMO monitoring program is located in Appendix L of DOE/ID 10997[12].

A separate system of environmental monitoring and surveillance is activated during environmental events, which may be planned, as in startup of new equipment/process, or unplanned, such as operational events or wild fires. This environmental event monitoring is discussed in Section 6. Environmental reporting on compliance and regulatory sampling is discussed in Section 7.

The locations of monitoring stations within and surrounding the Site are shown in Figure 2-1.

2.1 History of Environmental Monitoring at the INL

Some of the earliest environmental monitoring on the INL Site was completed by the U.S. Weather Bureau, which created a Research Station in 1948 to support the National Reactor Testing Station, as the INL was then called. The Research Station still exists as the Air Resources Laboratory Field Research Division (ARLFRD) of the National Oceanic and Atmospheric Administration (NOAA). The Station's task was to develop a basic understanding of the regional meteorology and climatology, with a focus on protecting the health and safety of workers and nearby residents using meteorological measurements and transport and dispersion models.

In 1949, the Health and Safety Division of the Idaho Operations Office of the Atomic Energy Commission collected numerous samples to determine the pre-reactor radionuclide background in soil, plants, animals, etc., at the Site[13]. The United States Geological Survey (USGS) also began monitoring hydrologic conditions of the Eastern Snake River Plain Aquifer (ESRPA) in 1949 by sampling nine on-Site wells.

In 1959, the first of several aerial radiological surveys of the Site was performed under the direction of the Idaho Operations Office in an attempt to determine the extent of natural and man-made radioactivity. Subsequent aerial surveys performed in 1965, 1974, 1982, and 1990 focused mainly on characterizing facilities and associated regions of the Site[14].

Between 1956 and 1963, ecological research was conducted on-Site by Health Services Laboratory (HSL), which focused on movement of radioactive contaminants through the food chain. Rabbits were sampled as indicators of the extent of contamination around Site facilities. In 1970, HSL established a routine soil sampling and monitoring program for radionuclides in the surface soils near INL facilities and the surrounding area.

In 1973, the Radiological and Environmental Sciences Laboratory (RESL) incorporated a biological component into its program that included extensive studies of radionuclide-contaminated areas and transport by biota from these areas. In 1977, HSL merged with RESL and the RESL Program continued on-Site and off-Site monitoring through 1993.

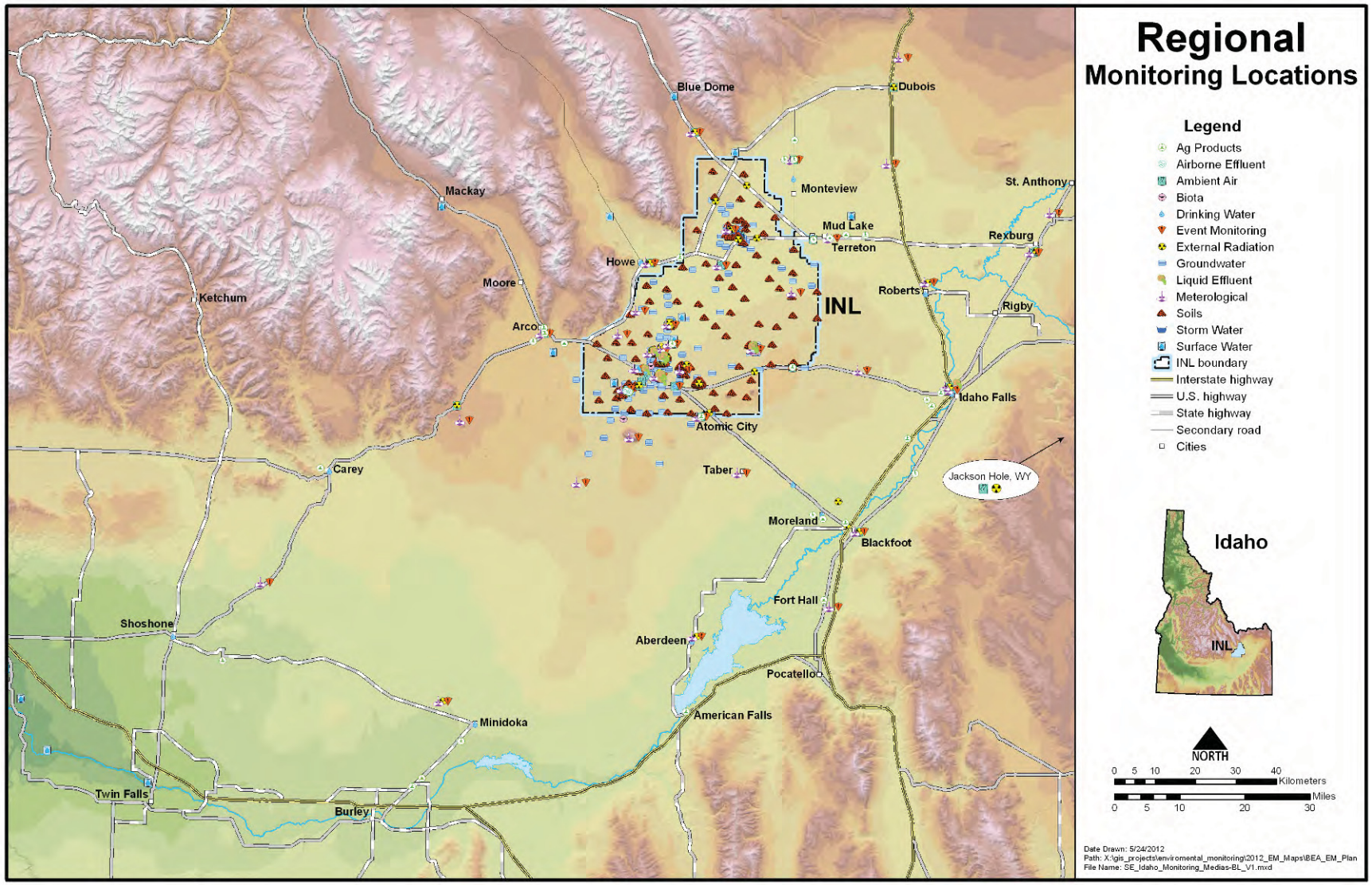

Figure 2-1. Regional monitoring locations.

In 1989, the INL Site was placed on the National Priorities List found at http://www.epa.gov/superfund/sites/npl/. In 1991, DOE, EPA, and the state of Idaho signed the *Federal Facility Agreement and Consent Order*[15] under 42 USC § 9601, *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA)[16] to ensure that environmental hazards associated with contaminant releases were identified and remediation was completed. Since 1991, comprehensive remedial investigations/feasibility studies and Records of Decision (RODs) have been completed for most of the ten Waste Area Groups (WAGs) identified, and remediation in some areas has been completed. As part of CERCLA regulatory commitments, long-term monitoring is ongoing.

Also, in 1989, the Idaho Legislature established a comprehensive state oversight program for the INL Site. In 1990, Idaho became the first state in the nation to negotiate an agreement (Environmental Oversight and Monitoring Agreement[17]) with DOE to provide funding for independent environmental oversight and monitoring of a DOE facility. Over the years, the INL Oversight Program has developed an effective monitoring network to verify and supplement INL Site monitoring programs and to assure that DOE activities protect Idaho's environment. The INL Oversight Program also provides independent information concerning DOE impacts on the public and environment.

In 1994, DOE transferred the responsibility for on-Site environmental surveillance from RESL to the prime INL M&O contractor, and all off-Site environmental surveillance was transferred to a private contractor under the Environmental Surveillance, Education and Research (ESER) Program. Currently, the ESER Program continues to conduct off-Site surveillance. The on-Site program was split in 2005 with award of contracts to BEA and CWI, whose facilities and activities are discussed in other parts of this plan.

Environmental monitoring performed by the various contractors in charge of facility operations initially involved limited sampling of liquid and airborne effluents from the facilities to develop waste inventory information and to meet operational monitoring objectives. Over the years, these contractor-run monitoring programs have evolved to ensure compliance with applicable federal, state, and local regulations and protect human health and the environment.

2.2 Environmental Monitoring Organizations

A number of organizations conduct environmental monitoring activities on or in the vicinity of the Site. Three organizations conduct monitoring at facilities they operate—BEA, CWI, and ITG. Other organizations perform INL Site-related environmental monitoring but do not operate facilities—NOAA, Gonzales Stoller Surveillance (GSS), and USGS. Currently, BEA has Site-wide environmental monitoring responsibilities and conducts environmental monitoring at the facilities under its control.

Table 2-1 lists the environmental monitoring organizations at the INL Site and summarizes the environmental media monitored by each.

2.2.1 ICP and INL Contractors

The INL and ICP contractors conduct environmental monitoring activities at facilities under their respective areas of purview, as discussed in section 1.3 of this Plan. Both the INL and ICP contractors perform liquid and airborne effluent monitoring, along with environmental surveillance of ambient air, groundwater, drinking water, surface water runoff, soils, and external radiation. The ICP contractor also monitors biota. Compliance monitoring programs have been instituted to meet the monitoring requirements of federal, state, and local regulations, permits, and DOE orders. Requirements exist to sample drinking water, liquid effluents, injection well basins for storm water runoff, and groundwater. Facilities with airborne emissions are responsible for monitoring airborne effluents in compliance with the standards set forth in Public Law 91-604, *Clean Air Act Amendments of 1990*[18] and Idaho

Administrative Procedures Act (IDAPA) 58.01.01, *Rules for the control of Air Pollution in Idaho*[19] . Those facilities with Wastewater Reuse Permits (WRPs) are monitored as required by their associated permits in accordance with the Wastewater Rules (IDAPA 58.01.16)[20], the Recycled Water Rules (IDAPA 58.01.17)[21], and the Ground Water Quality Rule (IDAPA 58.01.11)[22].

Both INL and ICP contractors perform CERCLA monitoring of groundwater and soil, and the ICP contractor conducts ecological monitoring. A majority of the CERCLA monitoring is performed by the ICP contractor, because the INL contractor is only responsible for the CERCLA work at MFC. Sites with residual contamination will need to be monitored, controlled, operated, and maintained by institutional controls to protect human health and the environment.

Post closure monitoring is conducted to evaluate the effectiveness of the final remedies and ensure that no additional contamination is occurring. However, even though CERCLA regulates most INL stewardship activities, INL expects some stewardship activities to be regulated under the Resource Conservation and Recovery Act (RCRA), including post closure groundwater monitoring. The monitoring of facilities operated by both INL and ICP contractors will continue at the remediation areas for the period negotiated in the RODs 5-year review reports, in RCRA closure plans, or in other laws or agreements that govern the remedies.

Table 2-1. Summary of INL environmental monitoring organization activities.

	Organization					
	INL	ICP	AMWTP	ESER	USGS	NOAA
Effluent						
Airborne	X	X	X			
Liquid	X	X				
Storm Water	X					
Surveillance						
Ambient Air	X[a]	X		X[a]		
Drinking Water	X	X		X		
Precipitation				X		
Groundwater	X	X			X	
Surface water		X		X	X	
Soil	X	X		X		
Biota		X		X		
Agricultural Products & Game Animals				X		
External Radiation	X	X		X		
Ecological		X		X		
Cultural	X					
Meteorological						X

a. Includes collection of atmospheric moisture samples.

The staff of CRMO monitors cultural resources for both INL and ICP contractors. The CRMO, which is organized within BEA's Energy and Environment Division, provides cultural resource management services to the ICP contractor through an agreement between the two contractors. The CRMO services facilitate a coordinated and seamless management of Site cultural resources for DOE-ID and inform and educate stakeholders about the INL Site's more than 13,000-year history of rich and varied human land use. The CRMO staff of professional archaeologists, historians, and anthropologists conducts monitoring to determine if natural events or human activities are impacting Site cultural resources and to provide current information regarding the resources' preservation and protection. As required through an agreement between DOE-ID and the Shoshone-Bannock Tribes, the CRMO staff invites tribal participation during monitoring activities of properties that are of importance to them (Agreement-in-Principle 2007)[23].

2.2.2 AMWTP

The Integrated Treatment Group, LLC (ITG) performs limited environmental monitoring in compliance with the Clean Air Act.

2.2.3 ESER Program

The ESER Program, currently managed by GSS, primarily conducts off-Site environmental surveillance for DOE-ID. The ESER Program's primary responsibility is to monitor a number of different pathways by which radiological pollutants from the INL Site could reach the public. Current services provided by the ESER Program include off-Site sample collection and analyses of air (including analysis of moisture in air for tritium), precipitation, surface water, drinking water, soil, milk, wheat, lettuce, potatoes, alfalfa and animal tissue samples; measurement of external ambient radiation; wildlife habitat and vegetation surveys, and ecological research on and near the Site; research concerning endangered species, pollutants in the environment, and revegetation; environmental education concerning ecological issues around the INL Site; and preparing the Annual Site Environmental Report (ASER) summarizing environmental monitoring activities across the INL Site.

2.2.4 USGS

The USGS collects water samples and measurements in and around the Site boundary to describe hydrologic and geochemical conditions and to evaluate effects of waste disposal and other activities at the Site on the hydrogeologic system. The data are used to prepare interpretive reports.

The USGS monitors more than 160 wells within a regional network in the ESRPA, both on-Site and off-Site, to study contaminant migration and determine groundwater quality and quantity as they relate to Site operations. Well placement within the regional network and constituent selection supplements existing INL and ICP contractors' groundwater monitoring programs. The USGS also monitors seven surface water sites on the Big Lost River, Little Lost River, Birch Creek, and Mud Lake.

2.2.5 NOAA

NOAA provides meteorological services and supporting research to the INL through the Air Resources Laboratory Field Research Division (ARLFRD). The ARLFRD operates a large meteorological monitoring network to characterize the meteorology and climatology of the eastern Snake River Plain, which includes the INL Site.

Meteorological monitoring data are required to characterize atmospheric transport and diffusion conditions in the vicinity of the Site and to represent other meteorological conditions (e.g., precipitation,

temperature, and atmospheric moisture) that are important to environmental surveillance activities, such as air quality and radiological monitoring.

2.2.6 Idaho Environmental Monitoring Program

The Idaho Environmental Monitoring Program (IEMP) is jointly supported by the INL Oversight Program, the ESER Program, DOE-ID, NOAA, and the Shoshone-Bannock Tribes. Four weather stations were constructed in 1997 at publicly accessible locations in southeastern Idaho. These stations are located in Idaho Falls, Fort Hall, Terreton, and the Big Lost River Rest Area on U.S. Highway 20/26. In 2001, two community monitoring stations in Blackfoot and Rexburg managed by the ESER Program were incorporated into the IEMP network. Kiosks at each station contain real-time displays of meteorological conditions, such as wind speed, wind direction, air temperature, relative humidity, barometric pressure, solar radiation, and background gamma radiation. Posters in these kiosks provide the public with easy-to-understand information about the function of the various sensors and the variables they measure.

2.3 Laboratory-wide Monitoring Committees

2.3.1 Monitoring and Surveillance Committee and Groups

The INL Site has a Monitoring and Surveillance Committee (MSC) with participating organizations from DOE-ID, INL, ICP contractors, AMWTP, NRF, ESER Program, INL Oversight Program, NOAA, USGS, and the Shoshone-Bannock Tribes. Chartered in 1997, the MSC provides a means for exchanging and sharing technical information, expertise and data. The MSC is to provide a collaborative atmosphere in which the participating organizations can communicate and discuss what they are doing in the areas of environmental monitoring and surveillance and make recommendations where appropriate.

2.3.2 INL Water Committee

The INL Water Committee was established in 1994 to coordinate drinking-water-related activities across the Site and to provide a forum for exchanging information related to drinking water systems. In 2007 the committee was expanded to include wastewater, storm water, and groundwater interests. In 2011, the Water Committee incorporated membership from the former Water Resource Committee to serve as a resource for the coordination and exchange of technical information on water-related activities.

The committee meets quarterly and includes participants from DOE-ID, USGS, INL, ICP, AMWTP, and NRF. Water and wastewater-related issues addressed during these meetings include regulatory issues, the Cross-Connection Program, construction activities, facility-specific activities, sampling, analytical results, and training.

2.3.3 Cultural Resources Working Group

The Cultural Resources Working Group (CRWG) was established in l993. Representatives from DOE-ID, The Shoshone-Bannock Heritage Tribal Office, and the INL Cultural Resources Management Office meet monthly to discuss, among many other items, properties to be monitored and projects and events that have the potential to impact sensitive cultural resources on the INL Site. The CRWG has served as a model for other sites.

3. EFFLUENT MONITORING

Operations of Site facilities have the potential to release pollutants such as radioactive and nonradioactive contaminants into the environment. These pollutants can enter the atmosphere as airborne effluents and can enter surface and groundwater as liquid effluents or storm water runoff via injection wells. The following subsections summarize the effluent monitoring currently conducted by various organizations at the INL.

3.1 Airborne Effluent

Regulated facilities at the INL are required, under Public Law 91-604[18] and IDAPA 58.01.01[19], to measure and estimate airborne effluents. These facilities include:

- AMWTP
- CFA
- INTEC
- CITRC
- MFC
- RWMC
- TAN
- ATR Complex
- SMC
- INL Research and Education Complex (REC)

One Tier I Operating Permit and several Permits to Construct have been granted by the Idaho Department of Environmental Quality (DEQ). These permits include specific air emission sources at the various Site facilities.

Numerous stack emissions are monitored for radioactive pollutants, but specific stack emission monitoring depends on the facility source term. Some monitoring is required by regulation or DOE order, and some monitoring is conducted as a best management practice or for facility information. Where monitoring is performed, emissions are normally sampled after abatement; otherwise, emissions are estimated on the basis of engineering calculations or process knowledge.

Continuous monitoring is required for emission points that have a potential to emit radionuclides[a] in quantities that could result in an effective dose equivalent (EDE) to a member of the public in excess of 0.1 millirem (mrem) per year, which is 1% of the of 10 mrem per year specified by the National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 61, Subpart H[6].

Monitoring for compliance and screening purposes is conducted in accordance with the guidance of 40 CFR 61, Appendix B, *Method 114*,[24] ANSI N13.1, *Sampling and Monitoring Releases of Airborne Radioactive Substances from Stacks and Ducts of Nuclear Facilities*[25], and the air monitoring recommendations of DOE/EH-0173T, *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance*[5],

[a] The "potential to emit radionuclides" is evaluated by assuming normal facility operations; however no credit is taken for reduction of emissions by abatement equipment.

The contractor associated with each permitted facility at the Site is responsible for airborne effluent monitoring at their facility. Figure 3-1 shows the locations of those emission sources that currently require continuous monitoring by Subpart H of 40 CFR 61[6]. Sources shown in Figure 3-1 at RWMC include both RWMC and AMWTP as listed in Section 3.1. The following information on airborne effluent emissions and sources associated with contractor-operated facilities is summarized in DOE/ID-10890, *National Emission Standards for Hazardous Air Pollutants INL Report for Radionuclides*[26].

Other sources with the potential to emit low quantities of radioactive emissions also exist at other contractor-operated facilities. Emissions from sources that could cause annual doses to the maximally exposed individual greater than 10^{-5} mrem are periodically monitored and included in calculating the INL's annual EDE to members of the public. .

3.1.1 INL Contractor

The INL contractor-operated facilities are monitored for air emissions associated with R&D and operational activities as described in the following paragraphs. Release points at INL Site facilities that do not require continuous monitoring are sampled periodically to provide emissions data for INL reports and permit requirements as well as a best management practice.

CFA. Minor releases occur from CFA facilities where work is routinely conducted with small quantities of radioactive materials. This includes operations at the CFA Laboratory Complex CFA-625. Only trace quantities of radioactive materials are used at the facility. Additional radioactive emissions are associated with decontamination activities, sample analyses, and site remediation.

ATR Complex. Radiological air emissions from the ATR Complex are primarily associated with operation of the Advanced Test Reactor. These emissions include noble gases, iodines, and other mixed fission and activation products. Other radiological air emissions are associated with hot cell operations, sample analysis, site remediation, and R&D activities.

REC. Radiological releases from the REC could arise from uncontrolled laboratory fume hoods within the INL Research Center (IRC) facility. Exhaust from most of the fume hoods is released directly to the outside atmosphere via the heat recovery fan system in the IRC heating, ventilating, and air conditioning system. Other potential release points include IF-603, the System Analysis Facility, RESL, and the INL Engineering Demonstration Facility.

MFC. MFC has three release points that require continuous emission monitoring as specified under 40 CFR 61, Subpart H[6]: the Experimental Breeder Reactor (EBR)-II/Fuel Conditioning Facility Main Stack (MFC-764); the Hot Fuel Examination Facility Stack (MFC-785); the Fuel Manufacturing Facility (MFC-704); and the Irradiated Materials Characterization Laboratory (IMCL) (MFC-1729).

SMC. Operations at SMC include material development, fabrication, and assembly work to produce armor packages for the U.S. Department of the Army. Other activities include developing tools and fixtures and preparing and testing metallurgical specimens. Radiological air emissions from SMC are associated with processing of depleted uranium. Potential emissions are uranium isotopes and associated radioactive progeny.

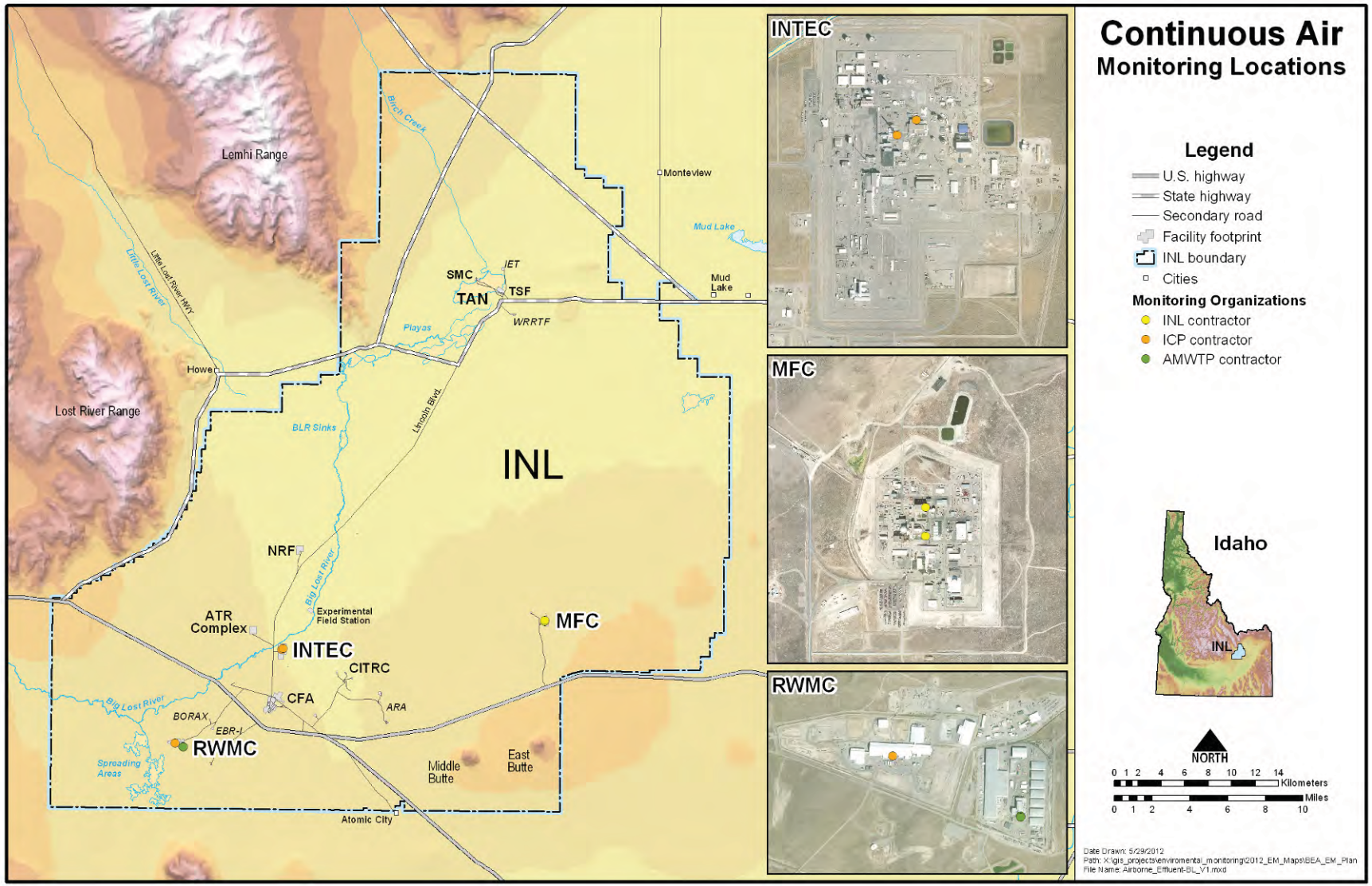

Figure 3-1. Continuous air monitoring locations.

3.1.2 ICP Contractor

The ICP remediation and waste management activities are conducted in compliance with federal and state rules and Federal Facility Agreements and Consent Orders. The ICP radiological emissions originate from process equipment, deactivation/demolition activities, and waste management. The ICP monitors radioactive emissions at INTEC and RWMC as described in the following paragraphs:

INTEC. Emissions from INTEC are primarily associated with spent nuclear fuel management (e.g., fuel receipt and wet and dry storage areas). Radioactive emissions include noble gases, iodines, and other mixed fission and activation products. Additional radioactive emissions are associated with decontamination and debris treatment activities, site remediation, R&D, radiological and hazardous waste accumulation areas, remote-handled transuranic waste characterization and repackaging, and other miscellaneous emissions from radioactively contaminated buildings and liquids in tanks. Emission monitors at the INTEC Main Exhaust Stack (CPP-708-001), Fluorinel Dissolution Process and Fuel Storage Stack (CPP-767-001), the New Waste Calcining Facility Stack (CPP-659-033), and the Integrated Waste Treatment Unit (IWTU) continuously monitor radiological emissions from these stacks.

RWMC. Radiological air emission point sources at the RWMC include three vapor vacuum extraction units in the Subsurface Disposal Area (SDA) and the Accelerated Retrieval Project (ARP) excavation enclosures. The ARP shows compliance with the NESHAP standard using ambient air measurements. The ARP compliance measurement project is approved by EPA and meets the requirements specified by the NESHAP (40 CFR 61.93 (g))[27]. Three high-volume air samplers are located near the EBR-I facility, and a fourth sampler is operated at Howe, Idaho to serve as a control. The ARP ambient air measurement project is documented in ICP PLN-720, *Environmental Surveillance Program Plan*[28]. For emissions from the ARP, the EBR-I facility is a conservative surrogate location for the INL Site's maximally exposed individual. Periodic/confirmatory measurements of Carbon-14 (C-14) and tritium (H-3) emissions from the three vapor vacuum extraction units are made twice a year. As disposal areas are filled, they are covered with soil. Gaseous forms of radionuclides – particularly, H-3 and C-14 from activated beryllium – are released from the SDA surface soil. The amounts of these radionuclides released to air are estimated based on site-specific corrosion data for buried beryllium, assuming that all of the C-14 and H-3 released to the soil by corrosion of the beryllium is immediately emitted to the atmosphere. Measurements of C-14 and H-3 in soil gas collected near a known beryllium disposal location are used to determine whether the release rate to soil has unexpectedly increased. A small amount of H-3 is pumped from the aquifer beneath the RWMC for use at the facility, and then is released from the surface of the RWMC sewage lagoon. Emissions of H-3 from the lagoon are conservatively estimated by assuming all of the H-3 pumped from the aquifer is immediately released to the atmosphere.

3.1.3 AMWTP

Operational features associated with the AMWTP consist of processes to vent waste containers, perform nondestructive examination of container contents, and certify, treat, store, and assemble and load waste containers for transport and disposal.

Operational activities at the AMWTP, operated within the Transuranic Storage Area at RWMC, could potentially result in the release of radiological and other pollutants to the atmosphere. Currently, AMWTP continuously monitors for radioactive particulates at three stack locations—two stacks on WMF-676 and one stack on WMF-636. Periodic confirmatory stack sampling is conducted for the characterization facilities WMF-634 and WMF-636. These emissions do not require continuous monitoring for NESHAP, but periodic confirmatory measurement is required to verify that emissions are less than 0.1 millirem per year. These emissions are monitored and calculated and are included in calculating the Site's annual EDE to members of the public. Monitoring requirements for emissions are specified in AMWTP-MP-EC&P-

7.5, “Advanced Mixed Waste Treatment Project National Emissions Standards for Hazardous Air Pollutants Emissions of Radionuclides”[29].

3.2 Liquid Effluent

Operations at the INL may result in the release of liquid effluent discharges containing radioactive or nonradioactive pollutants. Effluent monitoring includes the collection and analysis of samples and other measurements to establish the type and concentrations of pollutants in liquid discharges from facilities. Monitoring also provides data to evaluate the effectiveness of liquid effluent treatment and control systems, identifies potential contaminant source areas and environmental problems, and provides a mechanism for detecting, characterizing, and reporting unplanned releases.

Direct discharge of wastewater to the land surface is regulated under IDAPA 58.01.17, *Recycled Water Rules*[21], formerly the Wastewater Land Application Rules, and IDAPA 58.01.16, *Wastewater Rules*[20]. Four facilities operated by the INL and ICP contractors have Wastewater Reuse Permits (WRPs) issued by the DEQ; all four require monitoring of liquid effluents for facility-specific parameters.

Additional liquid effluent monitoring is performed in support of DOE environmental protection objectives. Radiological liquid effluents are monitored in accordance with DOE Order 458.1[1] and the recommendations of DOE/EH-0173T[5]. A risk-based approach, identified in PLN-8540, *Idaho National Laboratory Liquid Effluent Monitoring Plan*[30], is used by the INL contractor to determine which nonpermitted effluent streams or additional nonpermitted parameters require monitoring. The ICP contractor has a similar approach documented in PLN-932, *Management Plan and Implementation of Best Available Technology per DOE Order 5400.5 for Disposal of Wastewater*[31]. The risk-based approach considers the likelihood that an effluent measurement equals or exceeds a regulatory limit or environmental release level. It will also determine the severity of the exceeded levels, were such an event to occur.

Figure 3-2 shows liquid effluent monitoring locations currently sampled across the Site. Some facilities have in-line alarm monitors located upstream from the routine effluent monitoring locations. These monitors are used to detect radiation or pH levels that fall outside predetermined levels.

3.2.1 INL Contractor

The INL contractor conducts sampling on the wastewater treatment systems at MFC, CFA, and the ATR Complex and monitors for nonradioactive and radioactive parameters in liquid waste effluents as required by the applicable WRP and DOE environmental protection objectives. Specific liquid effluent monitoring locations, frequencies, and analytes are documented in PLN-8540[30] and associated procedures.

Wastewater reuse permits (WRPs) are in effect for the ATR Complex Cold Waste Pond, the CFA Sewage Treatment Plant (STP), and the MFC Industrial Waste Pond and Industrial Waste Ditch. Discharge of wastewater to the land surface is regulated by wastewater rules (IDAPA 58.01.16[20] and 58.01.17[21]). The CFA WRP requires monitoring but does not specify release limits. The WRPs for the ATR Complex Cold Waste Pond and the MFC Industrial Waste Ditch and Industrial Waste Pond specify maximum effluent concentrations for total suspended solids and total nitrogen. These facilities also have specific radiological and other parameters monitored for surveillance purposes in order to comply with DOE orders 450.1A[4] and 458.1[1]. Furthermore, the permits generally require that data from groundwater monitoring wells at the INL Site comply with the Idaho groundwater quality primary constituent standards and secondary constituent standards (IDAPA 58.01.11)[22]. The permits specify annual discharge volumes, application rates and effluent quality limits. All permitted and nonpermitted facilities are

monitored in accordance with state of Idaho requirements. As a best management practice and to comply with DOE orders, the INL contractor also monitors the MFC sanitary sewage lagoon.

The INL facilities located in Idaho Falls are required to comply with the applicable regulations in Chapter 1, Section 8 of the *Municipal Code of the City of Idaho Falls*[32]. Industrial wastewater acceptance forms are obtained for facilities that dispose liquid effluent through the City of Idaho Falls sewer system. Industrial wastewater acceptance forms include general requirements that apply to all REC facilities and specific monitoring requirements for the IRC owing to the nature of activities conducted therein. The city of Idaho Falls currently monitors effluents at the IRC for compliance with the City's wastewater acceptance criteria.

3.2.2 ICP Contractor

A WRP is in effect for the INTEC New Percolation Ponds. Discharge of wastewater to the land surface is regulated by IDAPA 58.01.16[20] and IDAPA 58.01.17[21]. The INTEC WRP requires liquid effluent monitoring but does not specify any release limits. The facility also has specific radiological and other field parameters monitored for surveillance purposes in order to comply with DOE Orders 450.1A[4] and 458.1[1]. Furthermore, the permit generally requires that data from groundwater monitoring wells at the New Percolation Ponds comply with the IDAPA 58.01.11[22] groundwater quality primary constituent standards and secondary constituent standards. The permit also specifies daily and annual discharge volumes. Liquid effluent monitoring is performed in accordance with PLN-729, *Idaho Cleanup Project Liquid Effluent Monitoring Program Plan*[33].

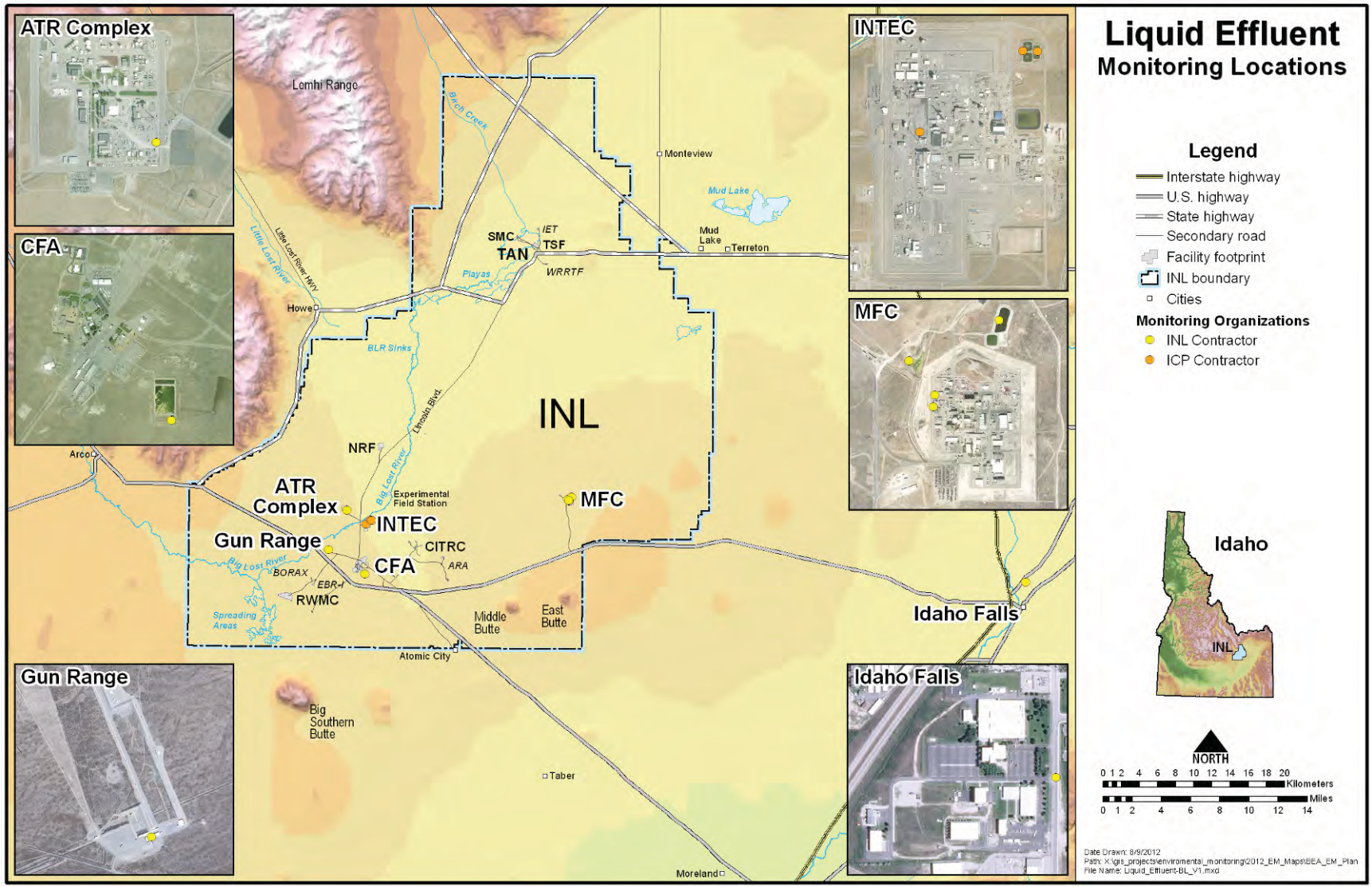

Figure 3-2. Liquid effluent monitoring locations.

3.3 Injection Wells

Storm water discharges to injection wells are monitored to ensure compliance with state of Idaho permits and to protect the Snake River Plain aquifer (Figure 3-3) as regulated by IDAPA 37.03.03, *Rules for the Construction and Use of Injection Wells*[34]. Injection wells have been constructed to control flooding resulting from storm water or snowmelt runoff. The INL contractor monitors discharges of storm water at injection well locations during large precipitation events or snowmelt conditions to evaluate potential pollutants in the storm water.

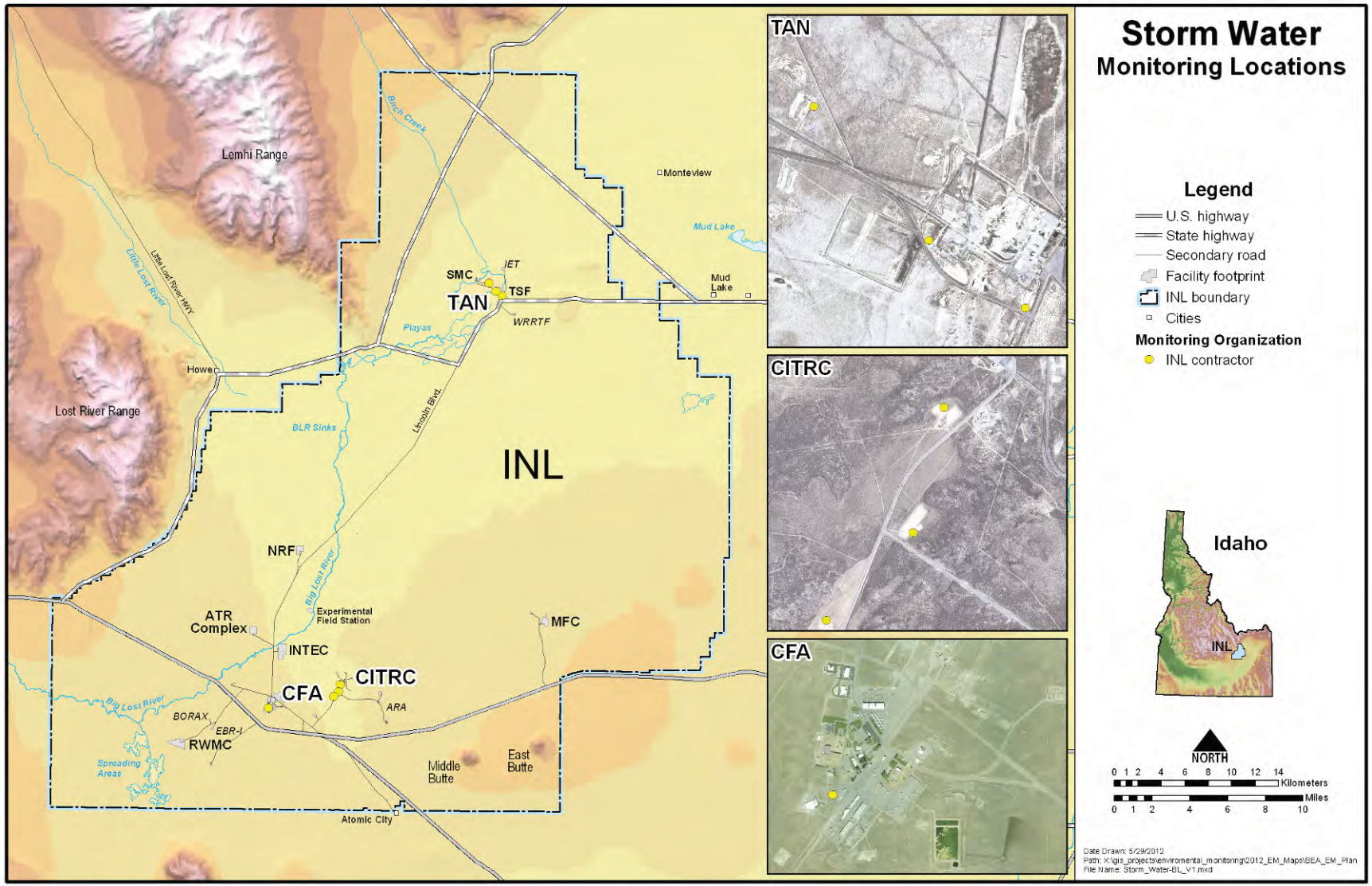

Figure 3-3. Storm water injection well basin monitoring locations.

4. ENVIRONMENTAL SURVEILLANCE

Environmental surveillance at the INL Site includes the collection and analysis of samples or direct measurements of air, water, soil, biota, and agricultural products. Environmental surveillance is conducted by several organizations to support laboratory-wide compliance with DOE Order 450.1A[4], DOE Order 458.1[1], environmental laws and regulations and DOE agreements, and follows the criteria in DOE/EH-0173T[5] for establishing environmental surveillance programs.

Separate on-Site environmental surveillance is required for waste management facility operations to meet DOE Order 435.1, *Radioactive Waste Management*[3] requirements. The SDA at RWMC is the only low-level waste disposal facility at the Site and is required to be monitored for DOE Order 435.1[3] compliance. Waste management surveillance monitoring is designed to be more facility- or source-specific than other site-wide surveillance.

4.1 Ambient Air

The air pathway is the most likely transport pathway for which INL contaminants could reach off-Site populations according to DOE/ID-12119, *Idaho National Engineering Laboratory Historical Dose Evaluation*[35]. Using a network of low-volume air samplers, several organizations monitor ambient air to compare concentrations at on-Site release locations with off-Site control locations. The network of regional ambient air monitoring locations is shown in Figure 4-1, and a more detailed look at the on-Site ambient air monitoring locations is shown in Figure 4-2. Ambient air particulate matter and airborne radionuclides are also sampled during wildfires or other emergency events. (Refer to Section 6.1 for a discussion of air monitoring performed for operational emergencies.)

The various organizations conducting air monitoring are discussed below.

4.1.1 INL Contractor

The INL contactor measures airborne radionuclides and monitors for potential trends in radioactivity in the environment per PLN-8510, *Planning and Management of Environmental Support and Services Monitoring Activities*[36], PLN-8550, *Environmental Support and Services Monitoring Services Surveillance Plan*[37], and supporting Laboratory Instructions (LIs). The ambient air monitoring activities support INL compliance with DOE Order 458.1[1] and the Idaho Air Quality Operating Permit. Atmospheric particulates released from INL facilities, natural radioactivity, and global fallout from historical nuclear detonations or nuclear accidents are collected on- and off-Site using low-volume samplers and 2-in. filters. Potential gaseous iodine releases are monitored using activated charcoal cartridges. Tritiated water vapor (hydrogen, tritium, oxygen) is collected using digital flow meters and molecular sieves per LI-351, *Sampling Atmospheric Tritium*[38].

4.1.2 ICP Contractor

The ICP contractor measures airborne radionuclides and monitors for potential trends in radioactivity in the environment per ICP PLN-720, *Environmental Surveillance Program Plan*[28]. The ICP ambient air monitoring activities support the waste management facility requirements of DOE Order 435.1[3]. A series of samplers that monitor for particulates are used around the RWMC SDA and at the Idaho CERCLA Disposal Facility (ICDF). Airborne materials from the SDA and ICDF are predominantly fugitive dusts potentially contaminated with small amounts of sorbed radionuclides. The samplers are located along the periphery of the SDA in predominant wind paths from disposal activities and at a control location north of Howe, Idaho.

4.1.3 ESER Program

The ESER Program conducts ambient air monitoring both on-Site and off-Site using a variety of monitors to determine if there is a gradient in radionuclide concentrations between the off-Site locations and the INL Site. These monitors include:

- A network of low-volume air samplers on and around the INL Site to collect particulate matter on filters, and gaseous radioiodine on cartridges. Placement of these samplers is based on wind dispersal patterns and DOE regulatory guidance to monitor population centers within 50 miles and on public interest.
- A high-volume air sampler in Idaho Falls is operated as part of the EPA's RadNet Program, which monitors environmental radioactivity in the U.S. to provide high-quality data for assessing public exposure and environmental impacts resulting from nuclear emergencies and baseline data during routine operations. The sampler collects real-time data on gross beta and gamma activity, which EPA monitors from their RadNet headquarters. Filters are also collected biweekly from the Idaho Falls sampler by the ESER Program and are shipped to an EPA laboratory where they are analyzed for gross radioactive activity and concentrations of specific radionuclides. Results can be found at http://www.epa.gov/enviro/html/erams.
- Four atmospheric moisture monitors located in Idaho Falls, Atomic City, and at community monitoring stations in Blackfoot and Rexburg, which monitor for tritium in water vapor.

The ESER Program also collects precipitation samples to measure tritium in air. One sampler is located in Idaho Falls as a control or background sampler, and two others are located at the Site, one at CFA and the other at the Experimental Field Station near INTEC. The Idaho Falls station is operated as part of the EPA's RadNet Program. Ambient air monitoring locations, frequencies, methodologies, and analytes are specified in the ESER Program Procedures Manual[39].

4.2 Drinking Water

Groundwater supplies the drinking water systems at the INL Site, and drinking water is monitored according to regulations to ensure that the drinking water at the facilities is safe for consumption in accordance with IDAPA 58.01.08, *Idaho Rules for Public Drinking Water Systems*[40] and Public Law 104-182, *Safe Drinking Water Act*[41]. All on-Site contractors participate in the INL Drinking Water Program as a means of sharing information, but each contractor administers its own drinking water monitoring program. Because of known contaminants, certain parameters are monitored more frequently than required.

Monitoring is based on the classification and size of the water systems (i.e. transient or nontransient noncommunity). Off-Site drinking water systems are also monitored by the ESER program due to the potential for contaminant migration beyond the Site boundary and are collected from taps. Samples collected off-Site are included as drinking water samples, but are not used for compliance with drinking water regulations. Instead, they are used to assess groundwater quality. Section 4.3 discusses the groundwater monitoring samples taken directly from wellheads.

Transient, noncommunity water systems on the Site are the CITRC, EBR-I, Gun Range, Test Area North/Technical Support Facility and the main gate. Nontransient, noncommunity water systems have more stringent compliance requirements than transient, noncommunity water systems. The nontransient, noncommunity water systems at the Site are INTEC, RWMC, CFA, ATR Complex, Test Area North/Contained Test Facility, and MFC. .

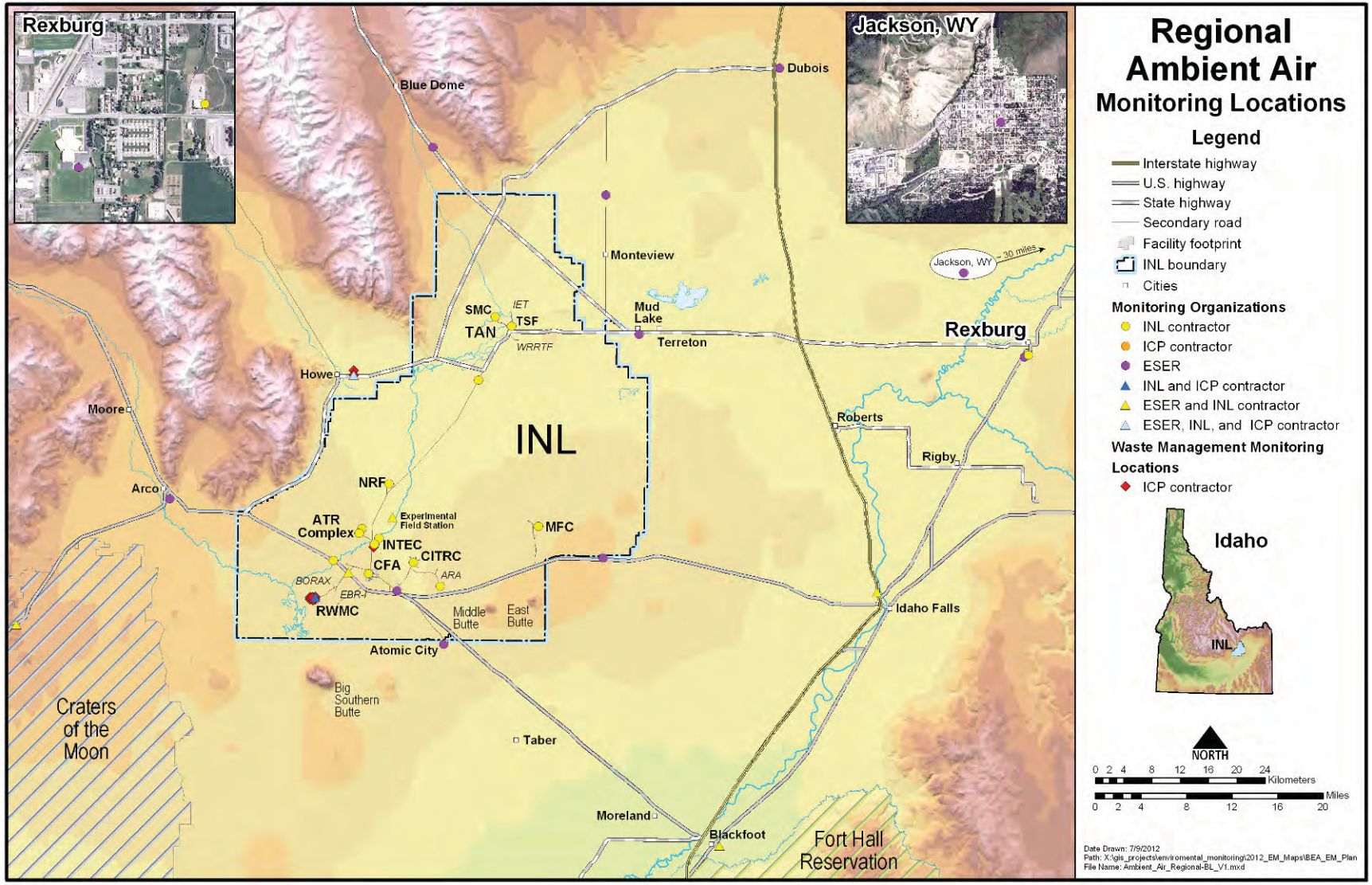

Figure 4-1. Regional ambient air monitoring locations.

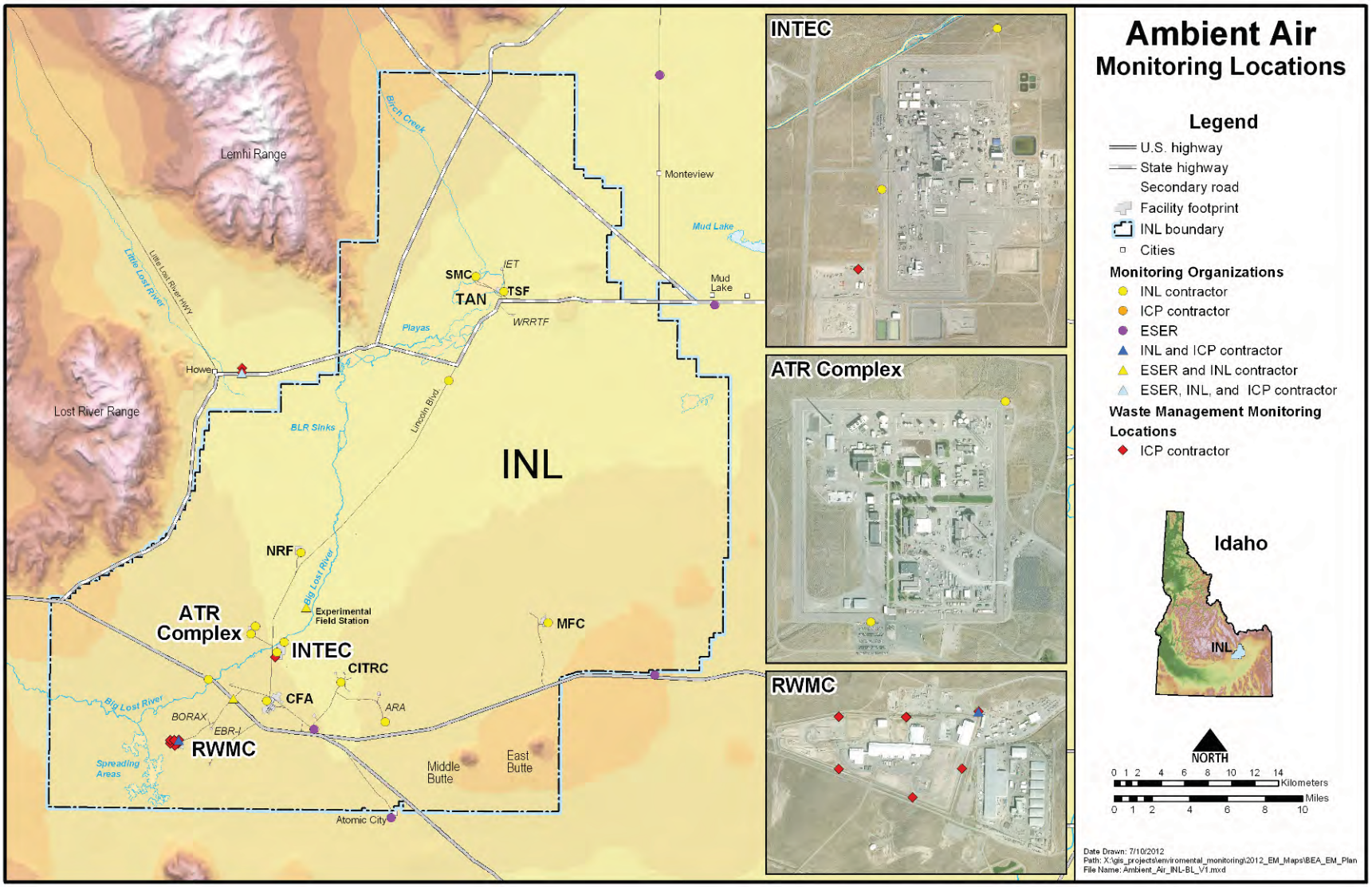

Figure 4-2. Detailed on-Site ambient air monitoring locations.

Figure 4-3 shows regional drinking water monitoring locations. On-Site drinking water samples are collected from the point of entry to each distribution system or manifold, directly from the wellheads, and from buildings associated with each drinking water distribution system. Figure 4-4 shows the detailed locations of those manifolds and wellheads that are currently monitored across the INL Site. Individual sampling points from each drinking water distribution system are not shown on Figure 4-4 because these sample points include most buildings connected to the distribution system.

4.2.1 INL Contractor

The INL contractor performs all drinking water monitoring and is responsible for all site drinking water systems with the exception of INTEC and RWMC, which are ICP contractor facilities. Currently, the INL contractor monitors 17 wells and nine distribution systems across the Site for both radiological and nonradiological parameters. Sampling locations, parameters, and frequencies are documented in the PLN-8530, *Idaho National Laboratory Drinking Water Program Plan*[42], and associated procedures.

4.2.2 ICP Contractor

The ICP contractor monitors drinking water systems at INTEC and RWMC. The ICP contractor is responsible for regulatory compliance at these facilities. Sampling locations, parameters, and frequencies are documented in PLN-730, *Idaho Cleanup Project Drinking Water Program Plan*[43], and associated procedures.

4.2.3 ESER Contractor

The ESER contractor collects drinking water at Atomic City, Craters of the Moon, Howe, Idaho Falls, Minidoka, Mud Lake, and the public rest stop on Highway 20/26. The last location is the only public drinking water site located close to the mapped tritium plume from the INL Site. Howe is monitored because it is close to the INL Site boundary and the Big Lost River Sinks.

The water at Atomic City, Minidoka, Mud Lake and Shoshone are collocated with the state of Idaho Department of Environmental Quality INL Oversight Program. A subsample of the Idaho Falls sample is sent to EPA for analysis as part of the EPA RadNet program. These samples are all distant from the INL Site groundwater plume but are of interest to the public.

The Craters of the Moon and Idaho Falls locations are outside the influence of the groundwater plume and are used for comparison with the other sites.

All samples are analyzed for gross alpha/beta activity and tritium.

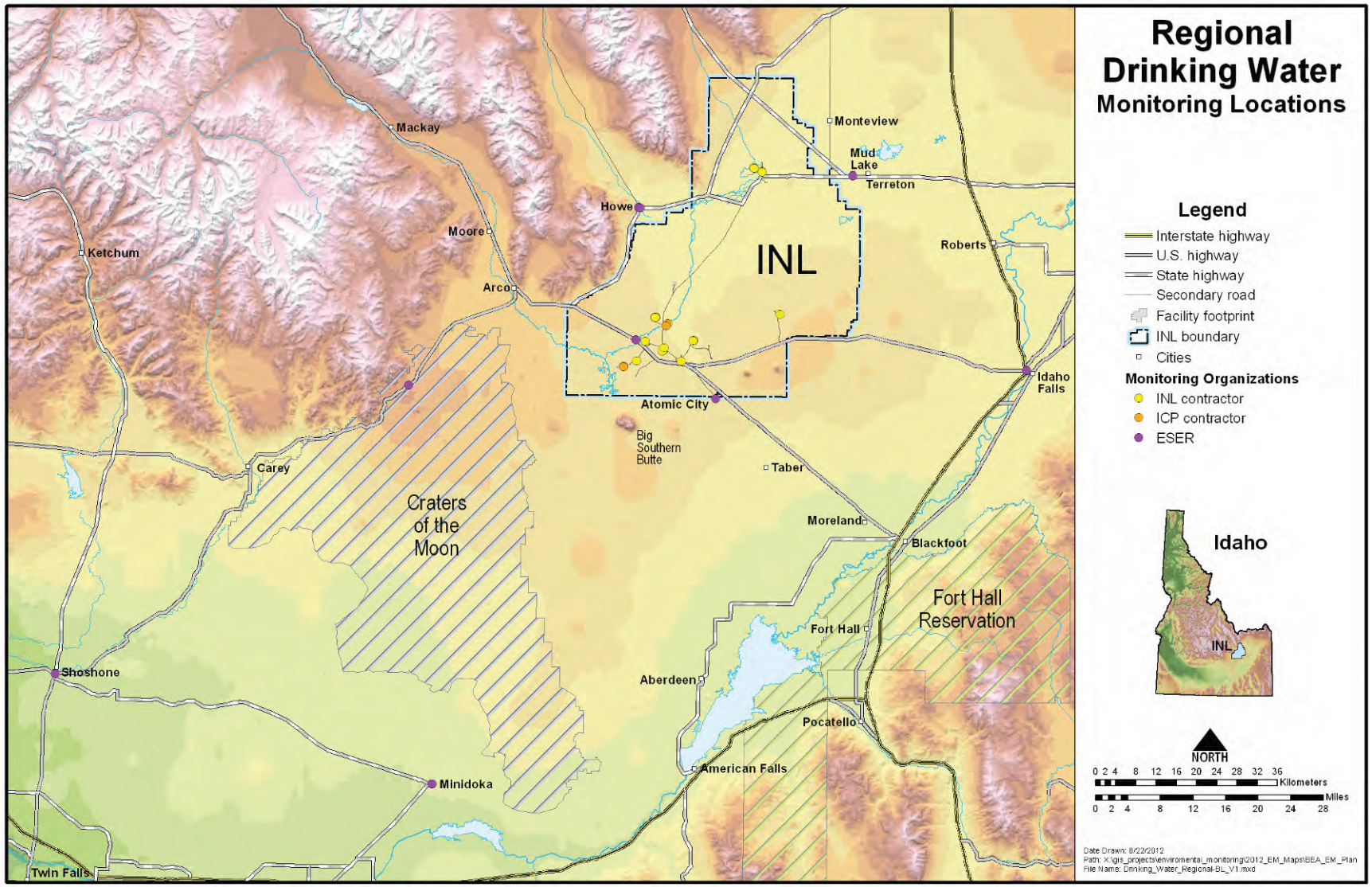

Figure 4-3. Regional drinking water monitoring locations.

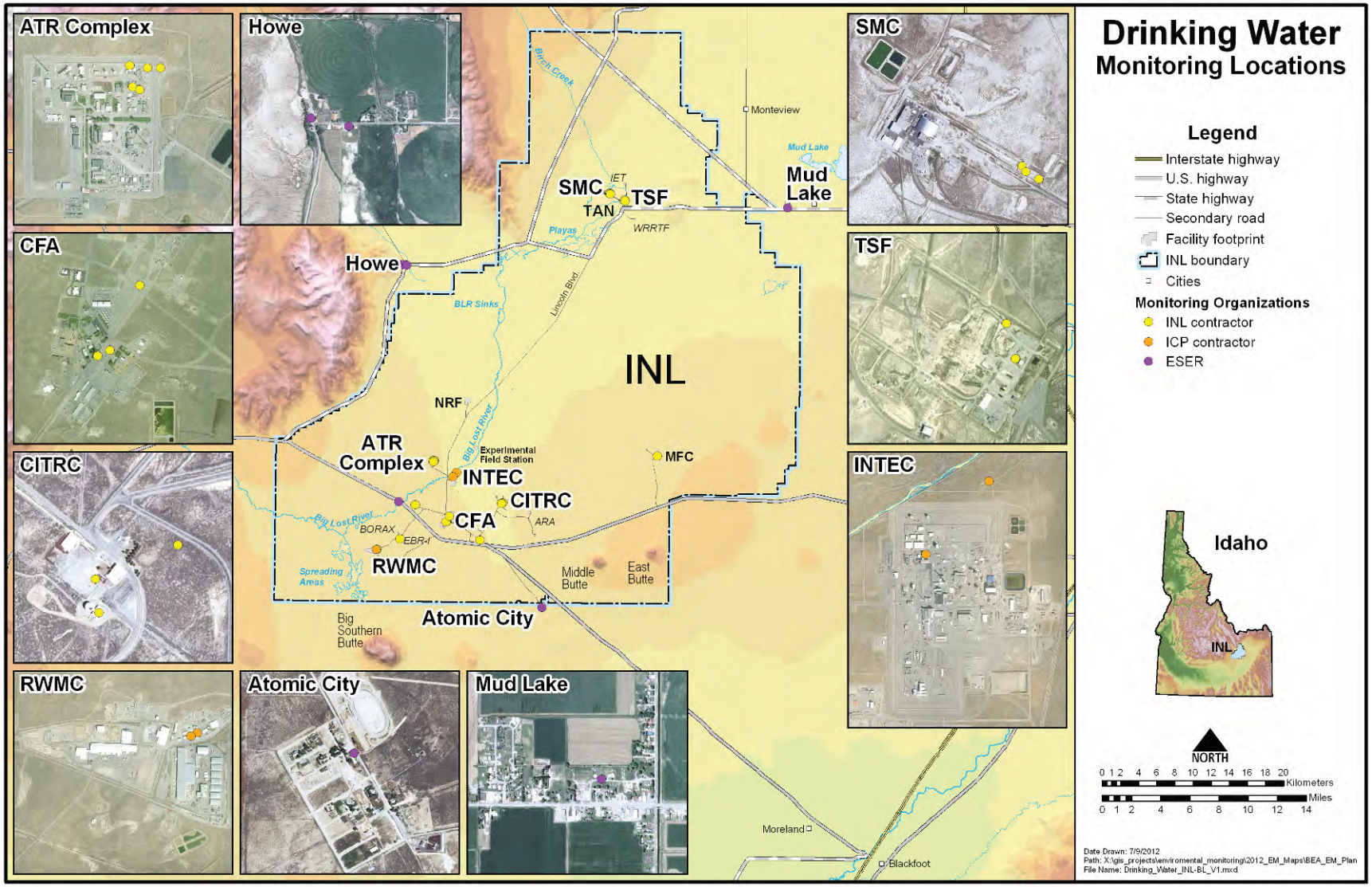

Figure 4-4. Detailed on-Site drinking water monitoring locations.

4.3 Groundwater

Historic waste disposal practices have produced localized areas of contamination in the ESRPA beneath the INL Site. The ESRPA is the source of regional drinking water and supplies irrigation water to a large, regional agricultural and aquaculture economy. On-Site groundwater samples are taken from wells near each facility, in areas of known contamination, and regionally across the Site (including upgradient of Site operations). Contaminants resulting from past INL operations have been detected in the ESRPA beyond the Site's southern boundary at concentrations far below regulatory limits. Off-Site groundwater samples are taken downgradient of the INL Site near the INL boundary and near the terminus of the ESRPA.

Groundwater is currently monitored at the INL Site by multiple organizations to:

- Satisfy specific CERCLA-related remedial action objectives and/or regulatory requirements contained in RODs, RCRA regulations, /WRPs, and DOE orders
- Determine the nature and extent of groundwater contamination during CERCLA remedial investigation/feasibility study activities
- Evaluate general groundwater conditions and contaminant fate and transport on a regional and subregional scale (as performed by the USGS and WAG 10).

The groundwater monitoring programs established by the contractors responsible for managing and operating INL Site facilities, at a minimum, address regulatory compliance and remediation goals at each of the facilities for which they have management responsibility. DOE/ID-11034, *Idaho National Laboratory Groundwater Monitoring and Contingency Plan*[44], provides an overview of the routine groundwater monitoring conducted on-Site and specifies how the recommended elements of a groundwater monitoring program under DOE Order 458.1[1] are met. Figure 4-5 shows regional groundwater monitoring locations, and Figure 4-6 shows detailed on-Site groundwater monitoring locations.

4.3.1 INL Contractor

The INL contractor is responsible for groundwater monitoring at MFC per the CERCLA ROD and the WRP for the Industrial Waste Ditch and Pond, and at the ATR Complex in compliance with the WRP for the Cold Waste Pond.

4.3.2 ICP Contractor

The ICP contractor is responsible for groundwater monitoring conducted at all other CERCLA site monitoring locations, WRP compliance at INTEC, and RCRA post-closure monitoring at INTEC's Waste Calcining Facility and CPP-301/627/640 Landfill. The ICP contractor currently performs all data interpretations to determine the cumulative impact of all CERCLA sites at the INL Site.

4.3.3 USGS

USGS monitors ESRPA wells within its defined regional network (both on-Site and at boundary locations) to study contaminant migration and determine groundwater quality and quantity as they relate to Site operations. The Site boundaries are monitored to detect groundwater contaminants entering and leaving the INL Site. Wells within the Site boundary are monitored to evaluate contaminant movement in the ESRPA between facilities.

Each monitoring well in the USGS regional network is monitored for the contaminants of concern specific to its locale and known or suspected contaminant sources. In general, on-Site ESRPA wells outside of facility fences are sampled by the USGS annually, depending on location. Samples are routinely collected and analyzed for radionuclides, volatile organic compounds, trace elements, and anions. Sampling locations, methodologies, and parameters are specified in DOE/ID-22206, *Field Methods and Quality Assurance Plan for Quality-of-Water Activities, US Geological Survey, Idaho National Laboratory, Idaho*[45].

4.4 Surface Water

The Big Lost River system includes the Little Lost River, Big Lost River, Birch Creek, and associated tributary channels, playas, and sinks. No streams or rivers flow from within the Site to locations outside the boundaries, and most years, the channels of the Big Lost River system on the INL Site are dry. However, surface water samples are taken when water is present both on and around the Site to monitor the surface water pathway. Currently, there are no discharges of storm water or liquid effluent from INL Site facilities that require monitoring under 33 USC § 1251, *Federal Clean Water Act*[46]. Figure 4-7 shows all of the current on-Site and off-Site surface water monitoring locations.

4.4.1 ICP Contractor

Surface and near-surface soils at RWMC have become contaminated from waste handling and biotic intrusion during past flooding of open pits. Surface water runoff is sampled at the SDA because of the potential for surface water runoff to become contaminated. Sampling locations, parameters, and frequencies are documented in the ICP PLN-720[28] and associated procedures. These samples are collected to comply with the following objectives:

- Meet the requirements for waste management facility monitoring per DOE Order 435.1[3].
- Determine concentrations of radionuclides in surface water leaving the facility.
- Report comparisons of measured concentrations against derived concentration guides for the public. Derived concentration technical standards are calculated from DOE dose equivalent tables and based on DOE radiation protection standards given in DOE Order 458.1[1].
- Detect and report significant trends in measured concentrations of radionuclides in surface waters leaving the facility.

4.4.2 ESER Contractor

Surface water is sampled on the Big Lost River (BLR) through the INL Site, as it has the potential to carry contaminated soil to the BLR Sinks. The samples are analyzed for gross alpha/beta activity and tritium. In addition, gamma spectroscopy is performed on these samples, as cesium (Cs)-137 is a major soil contaminant at the INL Site.

Samples are collected semiannually at five locations along the BLR, from the Highway 20/26 to the BLR Sinks, when water is available.

Surface water is also collected semiannually at locations downgradient of the BLR Sinks at Buhl, Hagerman, and Twin Falls. These samples are cosampled with the state of Idaho Department of Environmental Quality INL Oversight Program and are analyzed for gross alpha/beta activity and tritium.

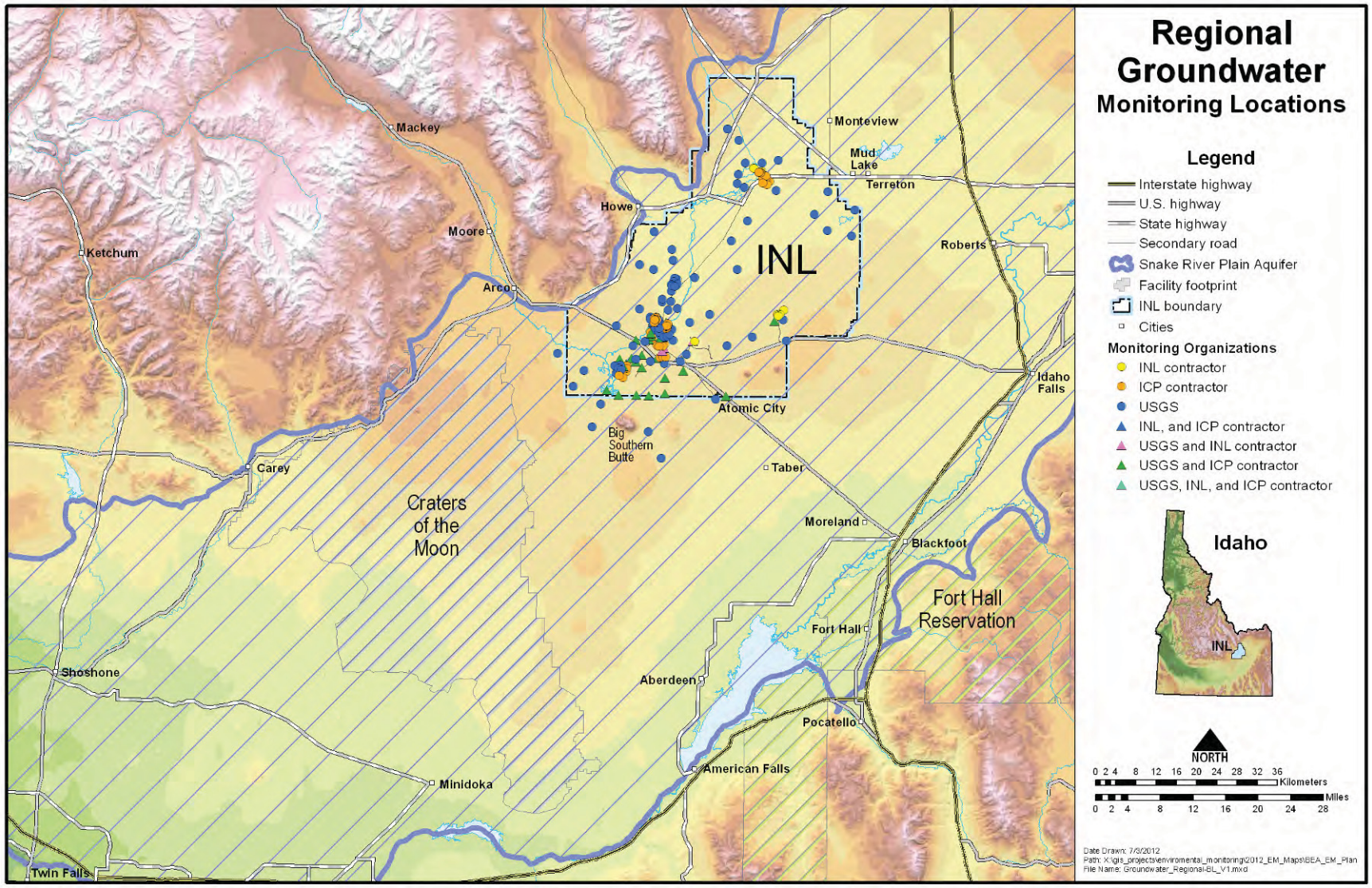

Figure 4-5. Regional groundwater monitoring locations.

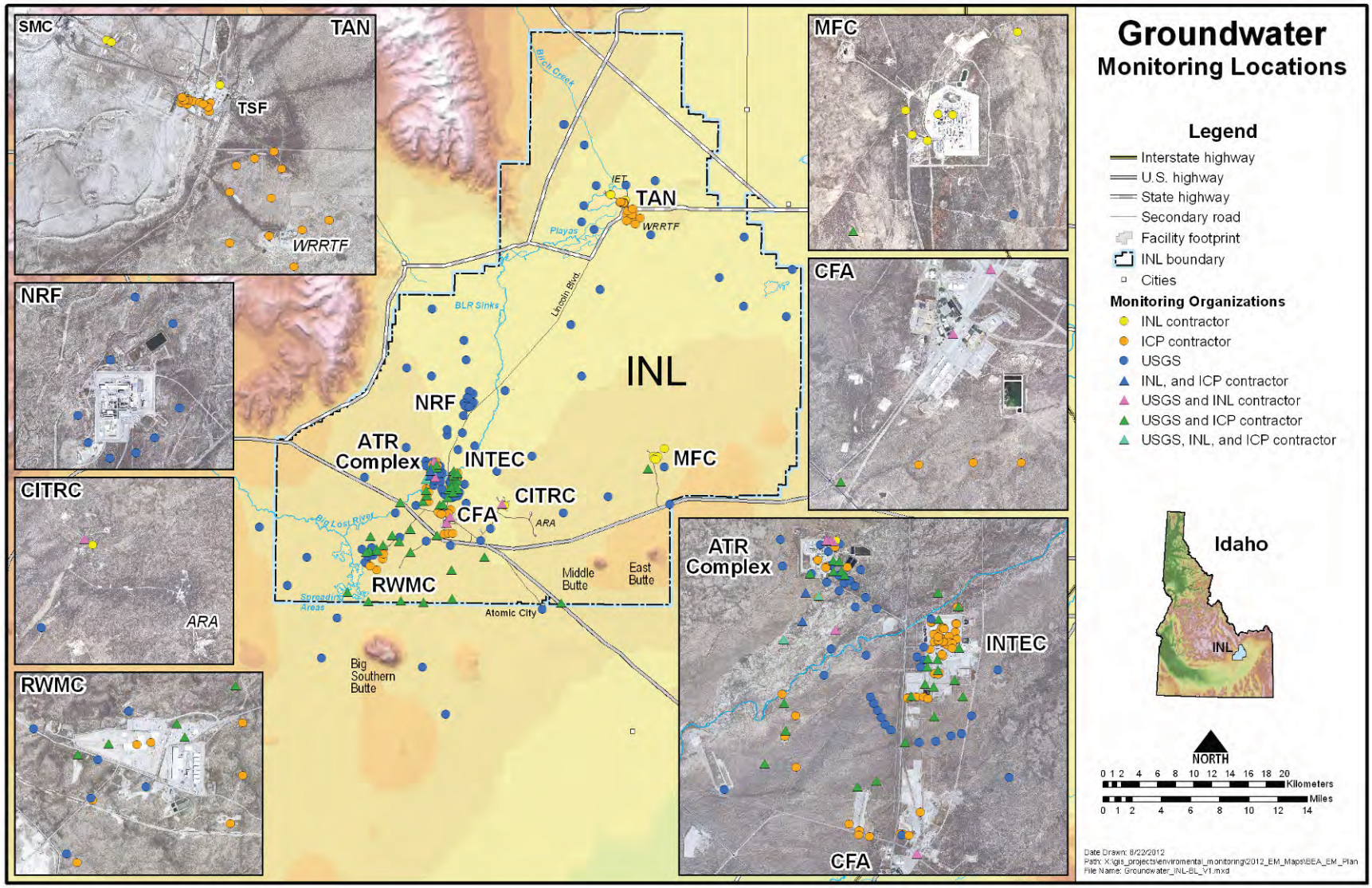

Figure 4-6. Detailed on-Site groundwater monitoring locations.

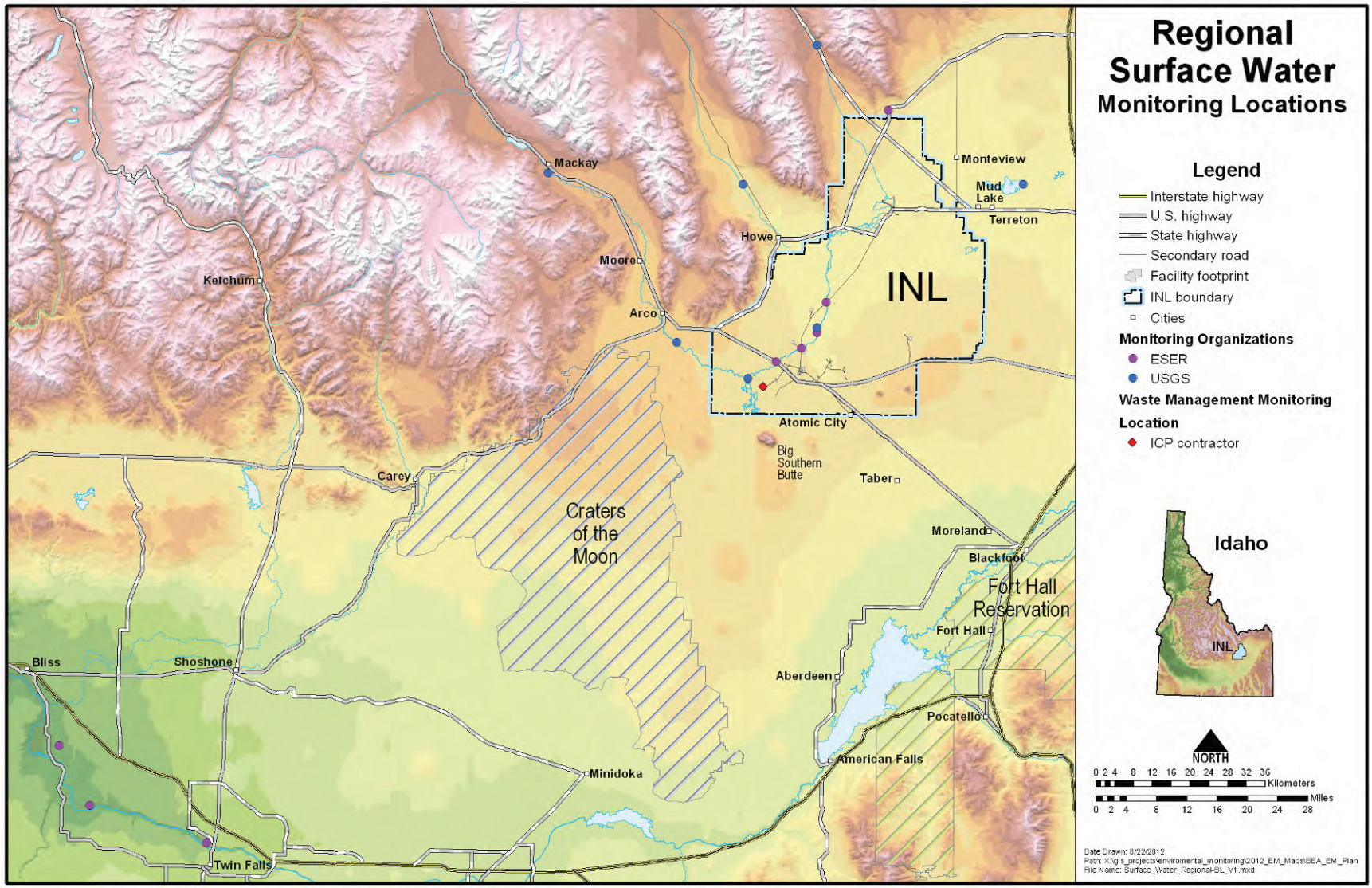

Figure 4-7. Surface water monitoring locations.

4.4.3 USGS

When flow occurs in the Big Lost River or other selected streams, surface water samples are collected annually and submitted for radionuclide and chemical analyses to determine the effect that surface water flow has on the chemistry of groundwater beneath the Site.

The USGS takes surface water samples from Birch Creek, the Little Lost River, and Mud Lake, and from four locations on the Big Lost River. The Big Lost River on-Site sampling locations include the INL Diversion Dam near RWMC and the Experimental Field Station near INTEC. The off-Site sampling locations are located near Mackay and Arco. Details on the surface water sampling performed by the USGS are specified in DOE-ID-22206[45].

4.5 Soil

Some INL Site soils have been contaminated by radioactive and nonradioactive effluents from INL Site operations and from nuclear weapons testing fallout. Soil sampling is conducted at the Site to:

- Determine present concentrations of nonradioactive contaminants and radioactivity (natural and anthropogenic) in soil
- Identify and quantify changes in contaminant concentrations in the soil caused by INL Site operations
- Comply with regulatory requirements
- Provide data used to calculate fugitive air emissions.

Figure 4-8 shows regional soil monitoring locations, and Figure 4-9 shows detailed on-Site soil monitoring locations.

4.5.1 INL Contractor

The INL contractor conducts soil sampling in compliance with DOE Order 458.1[1] requirements for monitoring to determine the impacts of operations on the environment and public health, and for compliance with the WRP for the CFA STP irrigation area.

Soil monitoring activities are conducted primarily to determine if long-term deposition of airborne materials released from INL Site facilities have resulted in a build-up of radionuclides in the environment. Soils are analyzed on a yearly rotation schedule around all INL Site facilities and regionally using portable in situ gamma spectrometers capable of detecting gamma-emitting radionuclides. A subset of these locations shown in Figures 4-8 and 4-9 are monitored on an annual basis to provide a radiological baseline for gamma-emitting radionuclides in soils. Roadways and Site facility perimeters are monitored on an annual basis using vehicle-mounted radiation detectors. These systems provide background-corrected count rate and isotopic concentration data, which is mapped for each measured roadway or facility perimeter. Geostatistical and trend analyses are performed on the radiological data to evaluate the soil radionuclide concentrations over time at the INL Site.

Soil samples taken in support of the CFA STP WRP are analyzed for nonradiological contaminants to determine the effect of wastewater irrigation on soil chemistry. These soil samples are collected in accordance with the permit and company-controlled procedures.

4.5.2 ICP Contractor

The ICP contractor conducts soil sampling in compliance with DOE Order 435.1[3]. Locations of soil samples taken at the RWMC are selected from specific areas at the SDA. Surface and near-surface soils at

RWMC have become contaminated from past flooding of open pits, waste handling, and biotic intrusion. Soil sampling is performed because wind, water, and biota can transport contaminated soil particulates on-Site and off-Site. The areas at the SDA delineated for sampling include active areas, Pad A, inactive areas, and previously flooded areas. Soil samples are collected at the SDA every three years. Details of this sampling can be found in ICP PLN-720[28].

Soil sampling is performed as required by the remedial investigation/feasibility study (RI/FS) activities, RODs, and as part of the CERCLA Long-Term Ecological Monitoring Program to verify that the remedial objectives of each CERCLA ROD are maintained and that the long-term INL-wide ecological impact of the contamination left in place remains within acceptable limits.

Under the CERCLA Long-Term Ecological Monitoring Program, soil samples will be taken at locations identified as sites of concern and will be monitored for both radiological and nonradiological contaminants. Soil samples will be collected from the surface to no more than 0.61 m (2 ft) below ground surface and will consist of composites from locations within the sampling plots that correspond to plants from which vegetation samples are collected. This depth is anticipated to concentrate sampling and analytical efforts on the depth most likely to pose a source of contamination to plant roots and ingestion/physical exposures to surface dwellings and burrowing animals. These soil samples are collected in accordance with INEEL/EXT-02-01191, *Long-term Ecological Monitoring Plan for the Idaho National Engineering and Environmental Laboratory*[47]. Because the locations of this monitoring can be extensive and vary within each site of concern, the actual sampling locations are not depicted on the soil figures.

The ICP contractor performs additional monitoring to comply with EXT-95-00496, *Record of Decision Declaration for Central Facilities Area Landfills I, II, and III (Operable Unit 4-12), and No Action Site, (Operable Unit 4-03)*[48], and to support ongoing work for a WAG 7 RI/FS of RWMC areas. At CFA, moisture content in the soil is monitored by neutron access tubes adjacent to the landfills; moisture infiltration through the soil cover of the landfills is monitored using time-domain reflectometry arrays; and soil gas is monitored through a series of soil-gas sampling ports at varying depths adjacent to the landfills in accordance with Idaho National Engineering Laboratory (INEL)-95/0585, *Field Sampling Plan (FSP) for Post-Record of Decision (ROD) Monitoring for the Central Facilities Area (CFA) Landfills I, II, and III Under Operable Unit (OU) 4-12*[49].

At RWMC, soil moisture and soil gas are monitored to support the WAG 7 CERCLA activities. The data collected for WAG 7 are also used to satisfy the requirements of DOE Order 435.1[3]. Soil moisture monitoring in the vadose zone using lysimeters at RWMC is addressed in Section 4.3.2. Soil gas is sampled in the waste zone using vapor probes placed directly in the waste at selected locations. Soil gas is sampled in the vadose zone using an extensive system of soil gas sampling ports inside and outside the SDA boundary. Figure 4-10 shows the soil gas and soil moisture monitoring locations.

4.5.3 ESER Program

Soil samples are used to establish background levels of radionuclides (both natural and those resulting from fallout from nuclear weapons testing) and to detect any long-term buildup of radionuclides from the INL Site in off-Site soils. Soil is taken from 12 off-Site locations during even-numbered years for transuranic and gamma-emitting radionuclide analyses. Details on the soil sampling performed by the ESER Program are specified in the *Environmental Science, Education and Research Program Manual*[39].

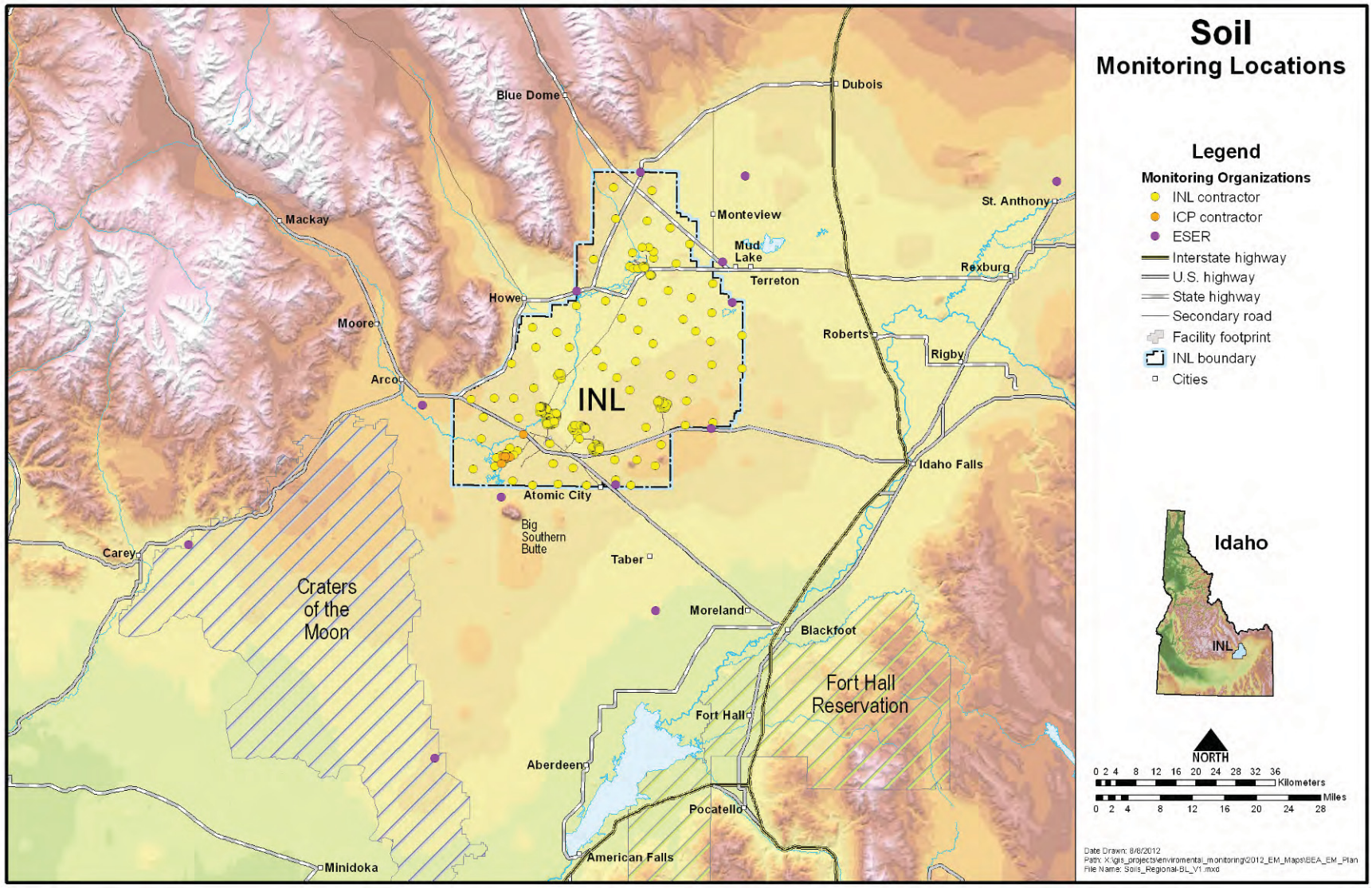

Figure 4-8. Regional soil monitoring locations.

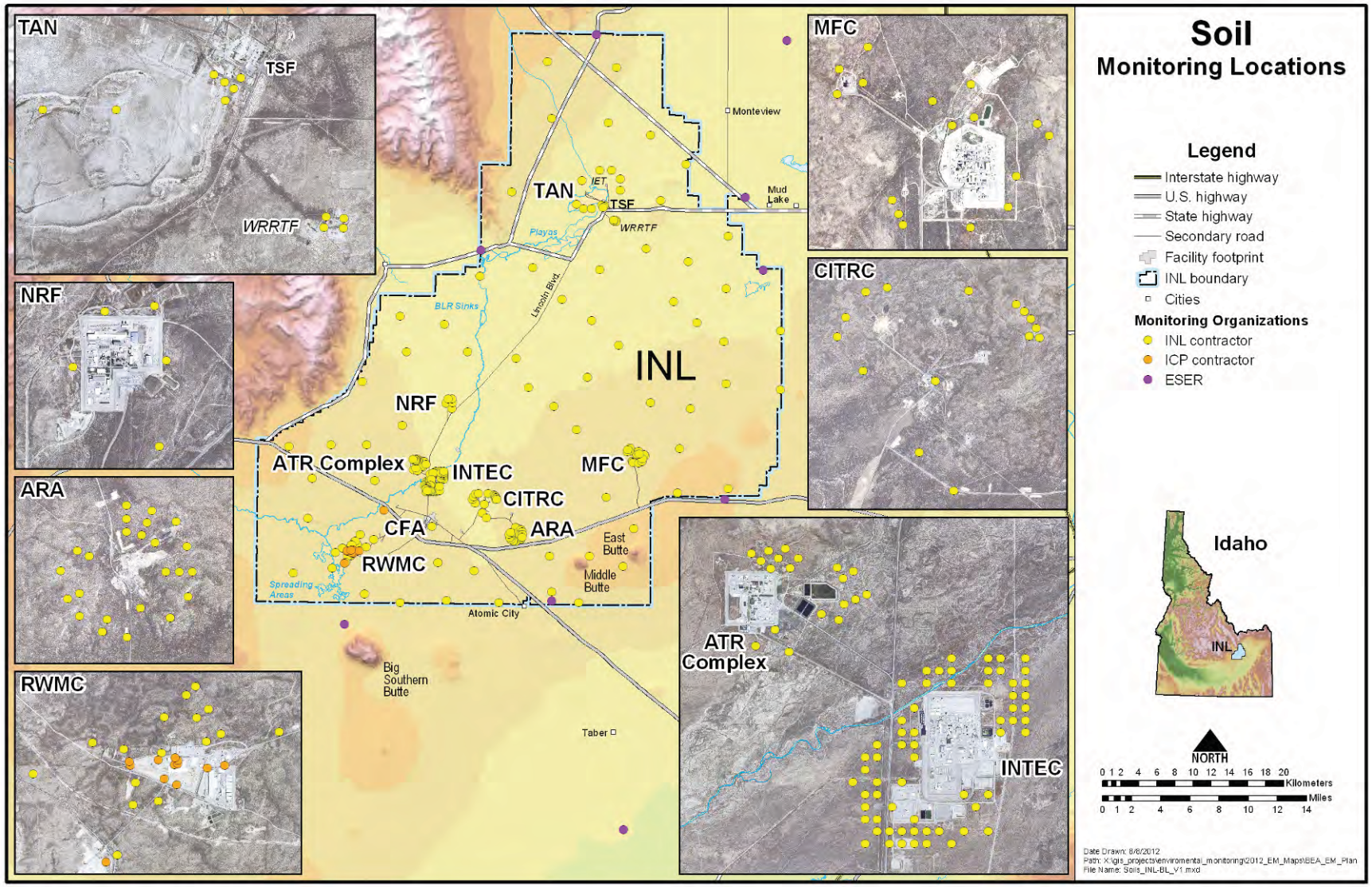

Figure 4-9. Detailed on-Site soil monitoring locations.

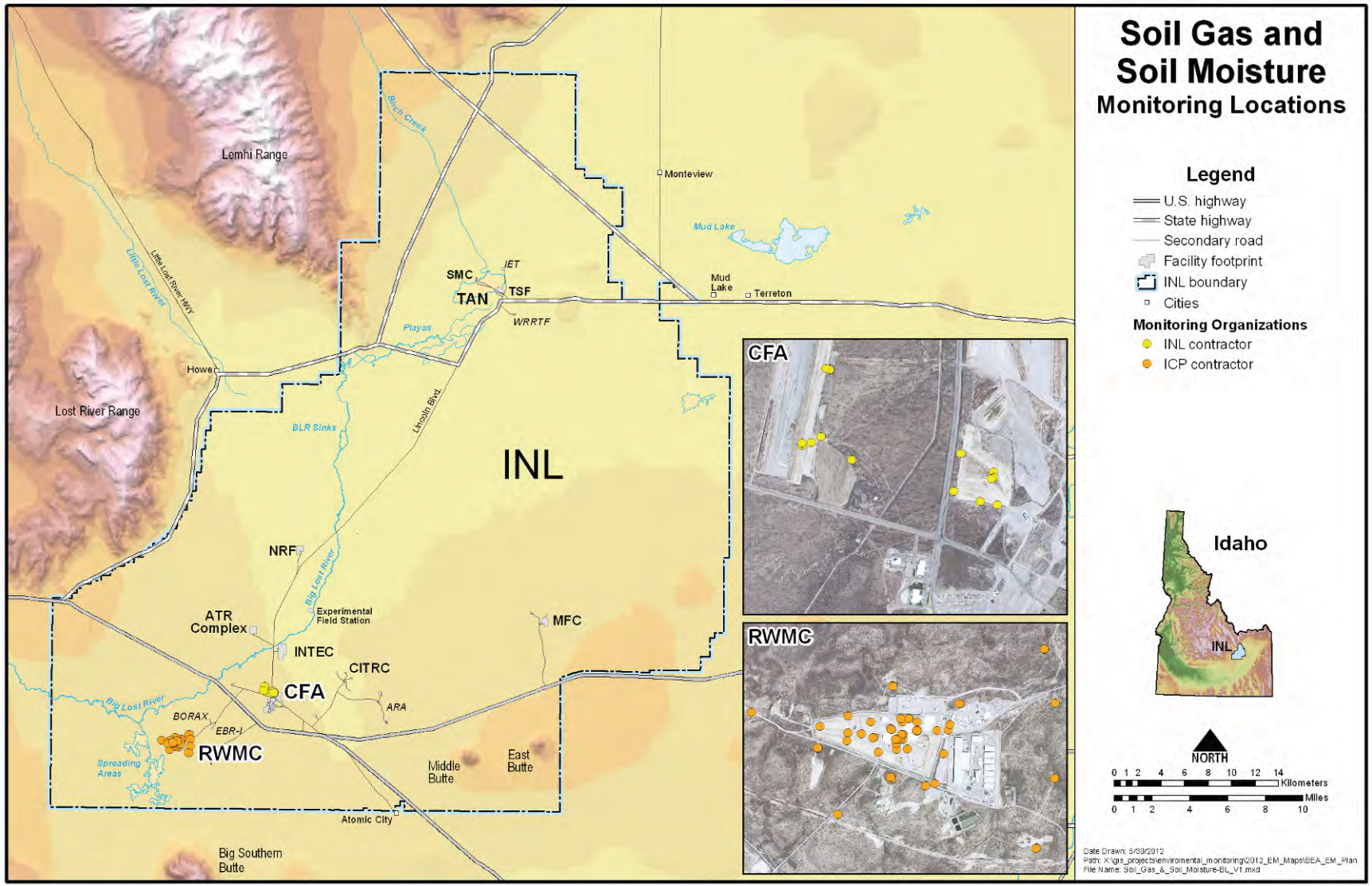

Figure 4-10. Soil gas and soil moisture monitoring locations.

4.6 Biota

Plants represent the major linkage in transfer of soil-borne contaminants to primary consumers and higher trophic levels. The leaves, florets, and shoots of plants can accumulate constituent concentrations caused by wind-blown contamination and uptake from the soil. Belowground plant components can also accumulate certain contaminants, although most birds and mammals are expected to consume primarily aboveground components. Plants are sampled to determine potential migration of facility contaminants and to ensure waste confinement integrity.

Wildlife has access to some areas on the Site containing radioactive contamination. Because wildlife has the potential to move off-Site and be harvested by the public for consumption, wildlife is sampled to document levels of radioactivity in the edible tissues. Small mammal species are sampled to determine long-term ecological impacts of contamination and assess waste confinement integrity. Figure 4-11 shows the biota monitoring locations.

4.6.1 ICP Contractor

The ICP contractor performs both CERCLA and non-CERCLA biota sampling activities. Routine non-CERCLA monitoring is performed to:

- Determine if biota are transporting radionuclides from buried waste or contaminated soil
- Identify biotic conditions that may compromise waste confinement at waste storage and disposal facilities
- Detect and report significant trends in the radionuclides and concentrations in biotic samples.

Plants at the RWMC SDA are sampled to comply with DOE Order 435.1[3] and to monitor waste confinement integrity because radionuclides may migrate away from the facility. Vegetation is collected from a control location approximately 11 km (7 mi) south of RWMC and from four representative areas at the RWMC SDA. These include active areas, Pad A, inactive areas, and previously flooded areas. Non-CERCLA plant monitoring is conducted as described in ICP PLN-720[28] and associated procedures. Three composite samples are collected from each of the four representative areas as follows: crested wheatgrass in odd-numbered years, Russian thistle in even-numbered years, and either rabbitbrush or sagebrush (perennials) in odd-numbered years. All biotic samples are analyzed by gamma spectrometry. Radiochemistry is performed on at least one sample from each of the major areas.

Biota sampling is performed as part of the CERCLA Long-Term Ecological Monitoring Program to verify that the remedial objectives of each CERCLA ROD are maintained and that any contamination left in place remains within acceptable limits. Vegetation harvested at each selected location includes leaves, small stems, and inflorescences for sagebrush, and leaves, culms, and inflorescences for grass. The intent of this sampling is to gather the plant material most likely to be browsed by herbivores.

Selected mammal species are obtained and analyzed for metals, explosive compounds, and radionuclide activity. Population surveys on birds and mammals, community structure surveys on soil fauna and plants, and physiological effects studies are performed.

Biota samples are collected on an annual basis at locations identified as sites of concern; actual sample locations are not depicted on Figure 4-11 because they can be extensive and vary within each area. These samples are monitored for both radiological and nonradiological contaminants. Sampling activities are conducted in accordance with INEEL/EXT-02-01191[47].

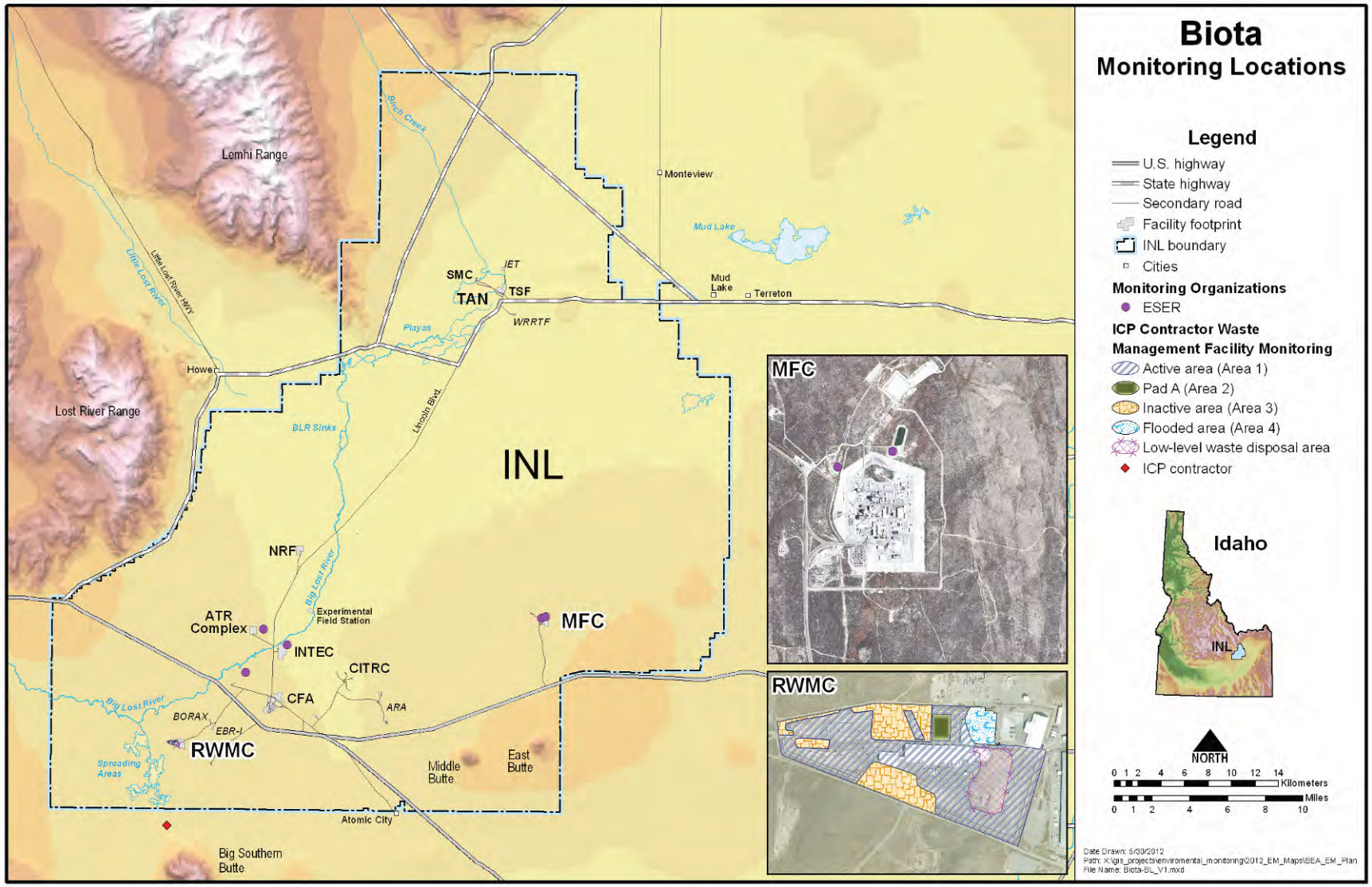

Figure 4-11. Biota monitoring locations.

4.6.2 ESER Program

Because large game animals (pronghorn, mule deer, and elk) are wide ranging and are a popular food source for many area residents, the ESER Program collects samples of game animals that are killed on roadways on or near the Site. The collection of large game animal samples is described in the ESER Program Procedure Manual[38]. The thyroid and samples of muscle and liver tissue are collected from each animal and analyzed for radioactivity. Some basic biological information such as weight, age, muscle condition, and the fat depth on various tissues may also be obtained from the animals when possible. Figure 4-12 shows locations where ESER big-game samples have been collected in the past. These locations vary from year to year depending on the numbers and locations of big-game/motor vehicle accidents.

The ESER Program also collects waterfowl on an annual basis from liquid waste disposal ponds on the Site and from off-Site control areas. Ponds sampled may include the MFC Industrial and Sanitary Sewage Lagoons, ATR Complex sewage lagoon, and an off-Site location. Past results indicate waterfowl may use the hypalon-lined pond at ATR Complex, but no sampling is conducted there. Edible tissues, viscera and remaining tissues (feathers, skin and bones) from waterfowl (primarily ducks) are each analyzed for radioactivity.

Ecological studies, such as population surveys (on birds and mammals) and community structure surveys (on soil fauna and plants) are performed by the ESER Program at varying times during the year as described in Section 4.9.

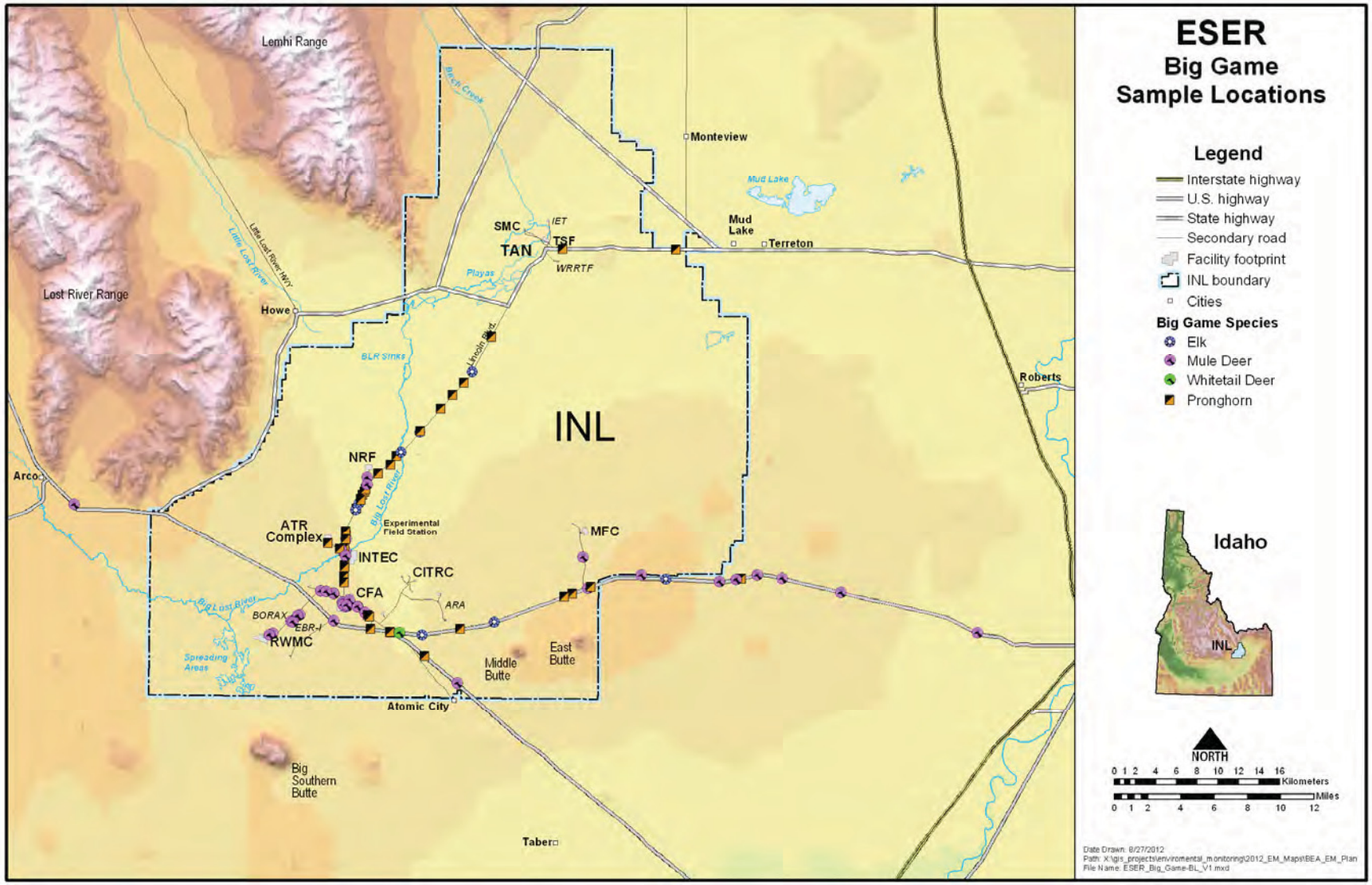

Figure 4-12. ESER big game sample locations.

4.7 Agricultural Products

The INL Site is located in a large agricultural area that produces products that are economically important to the state. These food products are monitored because they are a direct route of human exposure through ingestion. Milk, meat, and produce may become contaminated via atmospheric deposition, irrigation using contaminated water, and ingesting contaminated water or feed. Figure 4-13 shows the locations where agricultural products are monitored. The ESER Program performs most of the agricultural monitoring in the vicinity of the INL Site. The agricultural products monitored are chosen for their abundance in the upper Snake River Valley and their availability for testing. The ESER Program Description details the collection and processing of agricultural products[39].

4.7.1 Milk

Milk is monitored at off-Site locations because it is a potential pathway to the public for radioactive materials from the INL Site activities, particularly radioiodine and strontium-90. Some samples are taken from single-family dairies; others are taken from commercial dairies. A dairy in Idaho Falls is sampled weekly; the rest are sampled monthly.

4.7.2 Lettuce

Lettuce from portable lettuce growers at selected locations and wheat from local grain elevators are collected annually to measure the uptake of radionuclides from soil and deposition from air and because they are a part of the typical diet.

4.7.3 Potatoes

Although potatoes were not generally considered to be as good an indicator of radionuclide uptake as leafy vegetables, routine potato sampling was resumed in 1994 due to public interest in Idaho's most famous product. Potato samples are obtained annually from warehouses in the vicinity of the Site during harvest. Potatoes are also obtained from friends and relatives living out of state from areas as distant as Maine and Alaska to serve as control samples.

4.7.4 Wheat

Wheat is sampled because it potentially represents a major part of the typical diet. Wheat samples are collected and processed from a number of areas in southeastern Idaho. These samples are collected annually during harvest time at local grain elevators.

4.7.5 Alfalfa

Because milk cows could eat hay potentially contaminated by releases from the INL Site, alfalfa is collected downwind of the INL Site from a rancher in Mud Lake. It is analyzed for gamma-emitting radionuclides.

4.8 External Radiation

External (or penetrating) radiation is measured using radiation dosimeters, pressurized ion chambers, and gamma radiation detectors at facilities, roadways, and surrounding communities. Sources of external radiation include natural radioactivity, cosmic radiation, fallout from nuclear weapons testing, radioactivity from fossil fuel burning, and radioactive effluents from INL Site operations. The

contribution of INL Site operations to background radiation exposure is determined by comparing exposures measured at the Site boundary locations to those at distant locations. Figure 4-14 shows the regional external radiation monitoring locations, and Figure 4-15 shows detailed on-Site monitoring locations.

Radiation monitoring is performed at the INL Site to:

- Characterize penetrating radiation levels at specific points of interest at waste management facilities and at the perimeter of Site facilities
- Detect and report significant trends in measured levels of penetrating radiation.

To meet these objectives, INL contractors measure gamma radiation exposure rates and cumulative exposures and perform gamma-radiation surveys both on-Site and off-Site.

Environmental Dosimeters are used to measure cumulative exposures to ambient penetrating radiation for monitoring locations. The dosimeters measure changes in ambient exposures possibly attributed to handling, processing, transporting, or disposing radioactive waste. The dosimeters are located along major highways, in surrounding communities, and around the perimeter fences of each major facility. The dosimeters are placed 0.9 m (3 ft) above ground, and are collected and analyzed in May and November of each year to determine background exposures resulting from natural terrestrial sources, cosmic radiation, and fallout from testing nuclear weapons.

In addition to environmental dosimeters, a global positioning radiometric scanner (GPRS) system is used to conduct gamma-radiation surveys. These surveys measure gross gamma radiation and are used to identify general areas of radioactivity. They differ from the in situ soils analysis discussed in Section 4.5.1, which are used to identify specific radionuclides and activity levels. Gamma-radiation surveys are used to screen soils that have become contaminated with gamma-emitting nuclides and to detect penetrating radiation exposures outside the fenced areas from a variety of possible sources inside the facility.

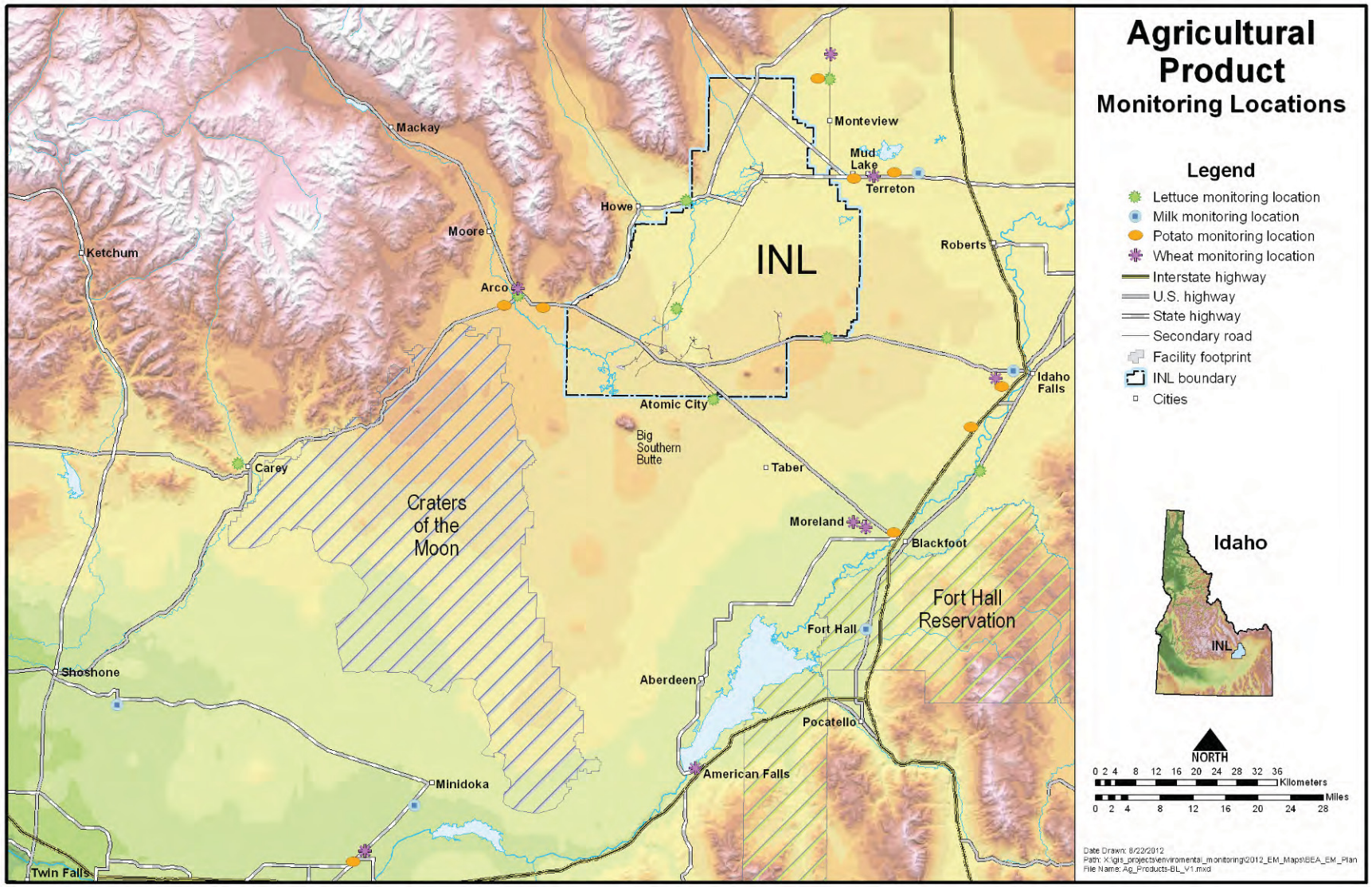

Figure 4-13. Agricultural products monitoring locations.

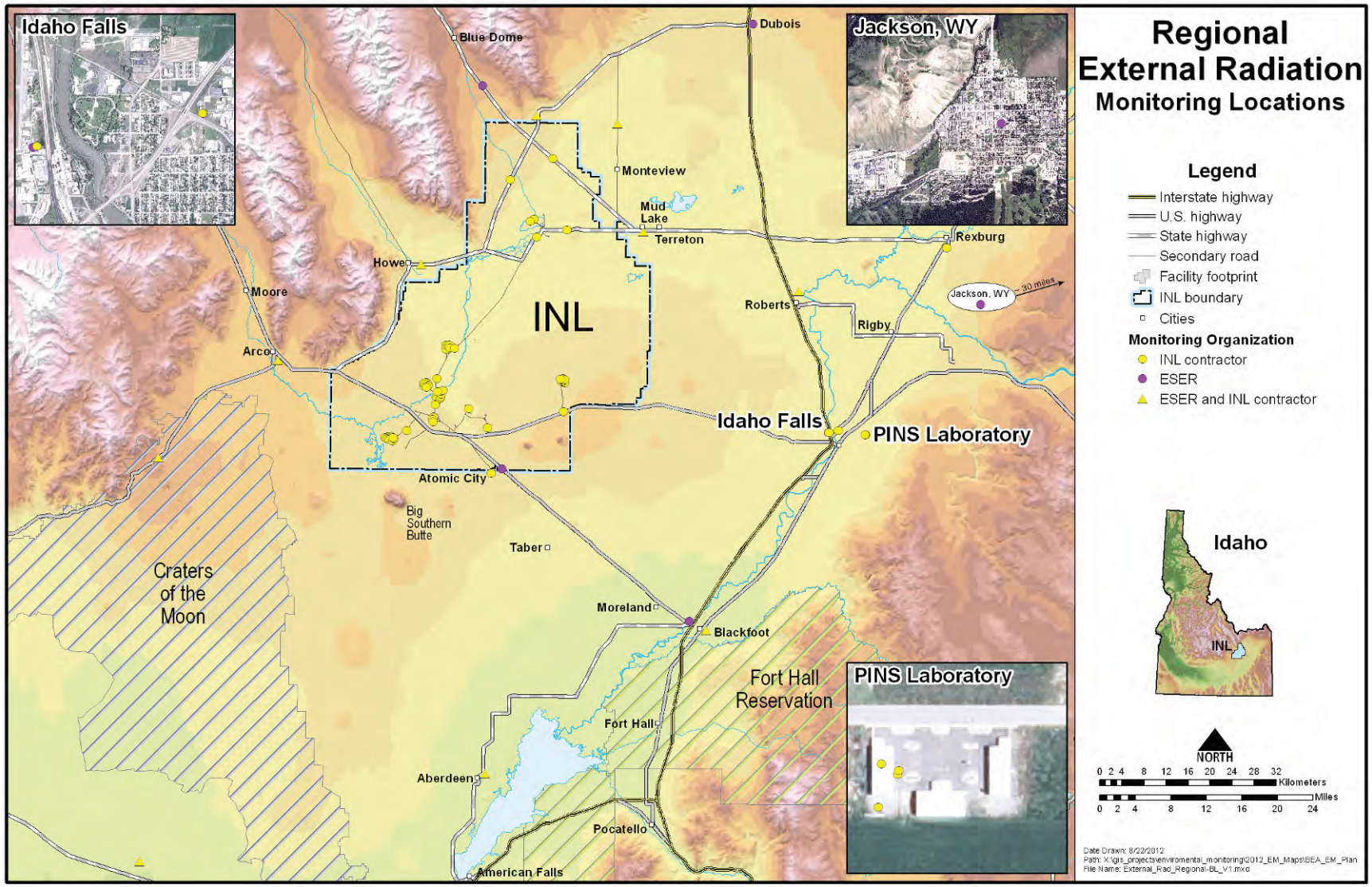

Figure 4-14. Regional external radiation monitoring locations.

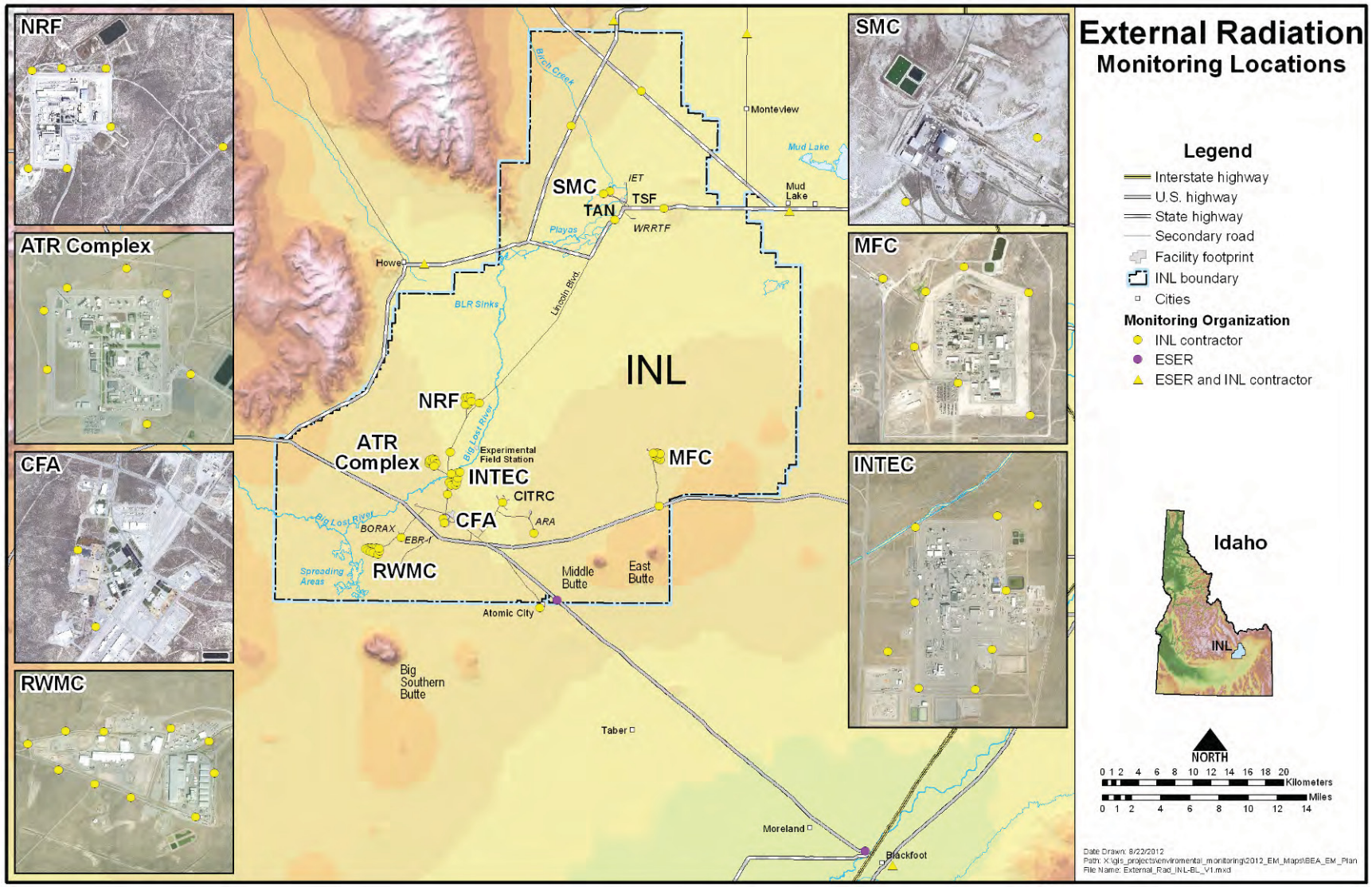

Figure 4-15. Detailed on-Site external radiation monitoring locations.

The GPRS is mounted on a four-wheel drive vehicle. Annual gamma-radiation surveys are conducted around the perimeter of selected facilities on an annual schedule to document penetrating radiation fields. Two plastic scintillation detectors identify contaminated areas, and both the global positioning system and radiometric data are recorded. Because these surveys involve facility perimeters, these monitoring locations are not displayed on either of the external radiation figures.

4.8.1 INL Contractor

External radiation monitoring is performed by the INL contractor as described in the PLN-8510[36] and associated procedures. Environmental dosimeters are maintained at locations on the Site along major highways, around the perimeter fences of each major facility, and at off-Site locations.

A GPRS is used for Sitewide radiological monitoring and Sitewide emergency response. The GPRS units used are primarily for collecting long-term stewardship data and yearly monitoring of gross radiation levels at Site perimeters and roadways. These data are used to identify and analyze year-to-year trends.

4.8.2 ICP Contractor

External radiation monitoring is performed by the ICP contractor as described in ICP PLN-720[28] and associated procedures. Annual surveys are conducted per DOE Order 435.1[3] compliance requirements for detecting gross gamma radiation at the RWMC SDA and around the Idaho CERCLA Disposal Facility. The survey is conducted using a vehicle mounted GPRS. The system utilizes a Trimble Global Positioning System and two plastic scintillation detectors connected to a personal computer on-board the vehicle. The GPRS information data are differentially corrected and transmitted via satellites, and geographic coordinates (latitude and longitude) are recorded at least every two seconds. The vehicle is driven less than or equal to 5 miles per hour, with the detector height at 36-in above the ground.

4.8.3 ESER Program

The ESER Program monitors external radiation at seven Site boundary and ten off-Site locations (Figure 4-15) using environmental dosimeters. An OSLD is placed at each location one meter above the ground surface. The dosimeters are changed semiannually, normally in early May and again in early November. Conversion to OSLDs began in November 2010 when they were placed side-by-side with existing thermoluminiscent dosimeters (TLDs). The TLDs were permanently replaced in November 2011.

The Operational Dosimetry Section of the ICP contractor analyzes the TLDs. The four chips are read separately and a mean response is determined for each set. This value is converted to the exposure in milliroentgen based on a detailed calibration procedure. Dosimeter data are interpreted by comparing exposures measured at the boundary locations to those at distant locations.

The OSLDs are analyzed by the Idaho State University Environmental Measurements Laboratory.

4.8.4 NOAA

The NOAA ARLFRD is primarily responsible for meteorological monitoring at the Site (see Section 5). In the past, ARLFRD maintained its own external radiation sensors at the towers in the meteorological monitoring network, but these have been deactivated. All external radiation sensors on the NOAA towers are owned and maintained by other organizations as described in other parts of this section. ARLFRD collects these data together with the meteorological data so that the information can be simultaneously displayed using ARLFRD's meteorological display tool that is described in a following

section. The ARLFRD's primary role with these sensors is to collect and display the data in near-real time.

4.9 Ecological Monitoring

The ESER Program conducts an array of ecological activities on the Site to provide ecological and natural resources support to DOE-ID for land management issues and to supply ecological information and expertise to support activities that affect natural resources. These activities include wildlife and vegetation surveys, revegetation, weed management, assessing potential impacts to ecological resources, and facilitating ecological research on the Idaho National Environmental Research Park.

Specific ecological monitoring work at the Site involves collecting data related to the abundance and distribution of certain species or groups of species. Results provide information on ecological conditions and trends at the Site that are used to:

- Provide assessments of the condition and trend of INL Site ecological resources
- Assess compliance with federal and state regulations
- Provide assessments of the likely impacts to ecological resources from human-caused or natural disturbances
- Propose mitigation for minimizing adverse impacts to ecological resources from Site activities
- Support the long-term stewardship goal of conserving ecological resources
- Provide baseline data to support ecological research opportunities at the Idaho National Environmental Research Park.

Ecological monitoring data are provided in various technical reports and presented on the ESER web site athttp://www.gsseser.com/. The data are reported to DOE-ID and various state and federal natural resource and agricultural agencies with whom the ESER Program collaborates.

4.9.1 Native Vegetation and Noxious Weeds

Long-term vegetation plots were established in 1950 to monitor the potential effects of activities at the INL Site on ecological resources. Although they were established for that specific purpose, vegetation plots now provide one of the most significant data sets for understanding vegetation dynamics in sagebrush steppe. These plots are among the most intensive and scientifically rigorous efforts by any agency to document long-term changes in sagebrush steppe. This monitoring provides information on plant community-level changes at a landscape level. Initially, 100 permanent plots were established on two intersecting transects (Figure 4-16). These plots are surveyed at 5-year intervals. Data collected at each plot include cover by line intercept and point interception frame and density and frequency.

Noxious weeds are also monitored through the ESER Program. At least 10 noxious weed species located on the Site are regulated by federal and state law. Inventories for noxious weeds are conducted using funds received from the state of Idaho through the Lost River Cooperative Weed Management Area when funds are available. This inventory is coordinated as an ESER Program environmental education program for high school students who use global positioning system technology to map weed locations on the Site. Survey areas are determined each year based on several criteria, including:

- Areas likely at risk for invasion
- Areas where noxious weeds have been observed, but not properly recorded
- Areas that have not yet been surveyed.

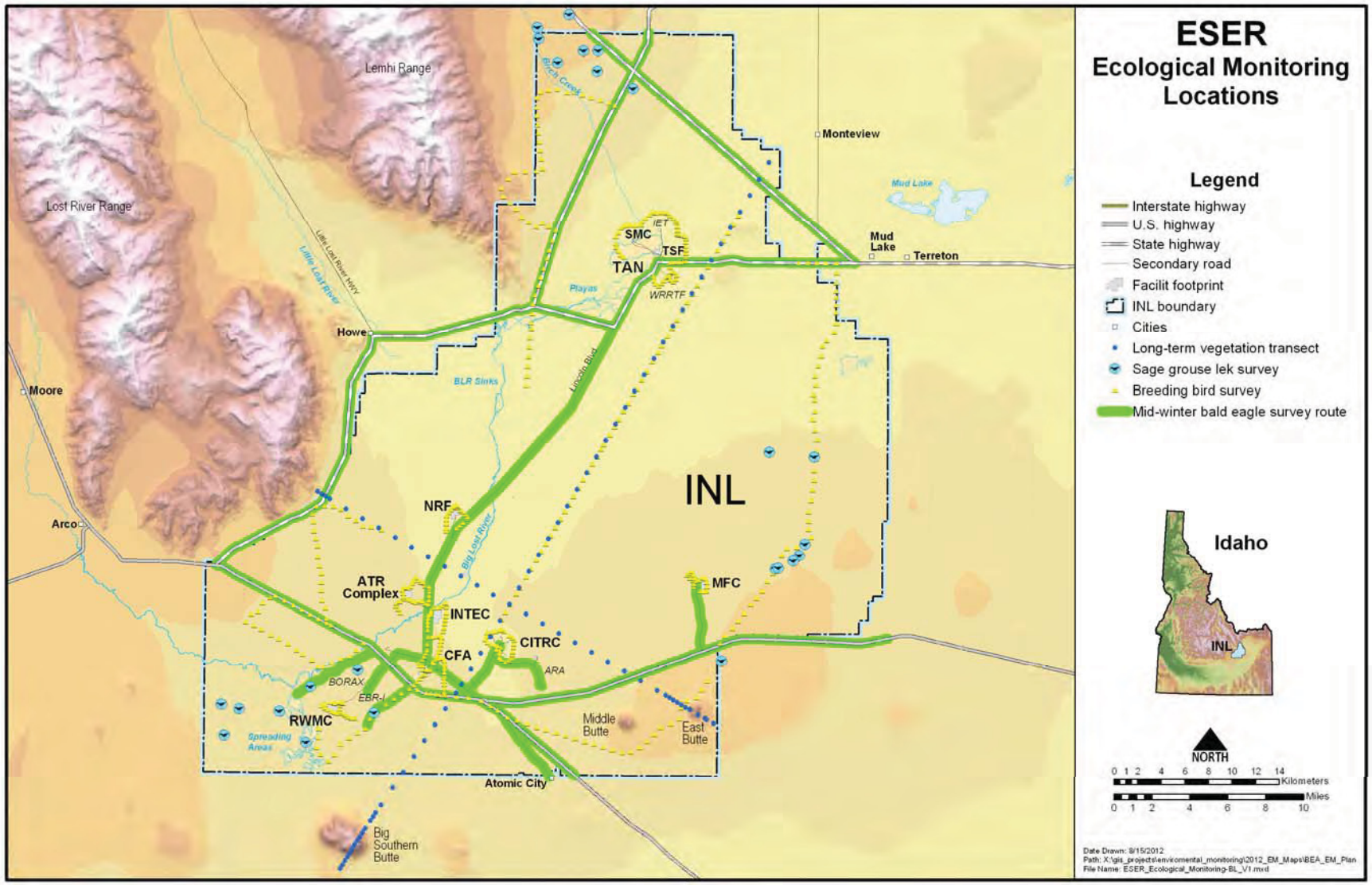

Figure 4-16. ESER Program ecological monitoring locations.

All data collected conform to state guidelines and are reported annually to the state of Idaho, Cooperative Weed Management Area, and the INL contractor. The INL contractor uses the data to control weeds. Locations vary by year and are not displayed in Figure 4-16.

4.9.2 Mammals

Large mammal surveys through 2009 were conducted in January and July each year to estimate abundance and distribution of elk, deer, and pronghorn antelope. The surveys were done from the air on a representative sample of transects. Data were collected in a manner that is comparable with those collected by neighboring agencies (Idaho Department of Fish and Game, Bureau of Land Management, and U.S. Forest Service for example). In 2010, the scope of the big game surveys was changed from conducting flights across the INL Site to placing global positioning system collars on elk. These data will allow DOE to quantify how elk may incorporate (through foraging on potentially contaminated vegetation) and transport environmental contaminants offsite. These data will provide defensible and reliable data for NEPA documents and enable a more complete and reliable assessment of impacts from infrastructure development, roadway accidents, and wild fires. This study will also provide information on migratory corridors, agricultural area use, contaminant area use, and evaluation of potential radionuclide contamination of human receptors off the INL Site.

The ESER program has been instrumental in facilitating a substantial body of research on pygmy rabbit behavior and ecology, including some of the earliest comprehensive studies of the species. In most of the studies, the INL Site was the central research location. These studies investigated such diverse topics as population structure, burrow ecology, reproduction, habitat selection and foraging preferences, habitat suitability models, survivorship and predation, activity patterns, and effects of prescribed fire on rabbit persistence. While previous studies provided substantially better understanding of pygmy rabbit ecology, until recently DOE-ID had virtually no information on the distribution of this mammal on the INL Site. From 2006 to 2009, biologists made a significant effort to document pygmy rabbit presence by conducting surveys for active burrows across the INL Site. Researchers surveyed 577 unique 16 ha (40 acre) plots (i.e. not including plots that were resurveyed within or among seasons), most of which were selected based on a stratified random design (i.e. more random points were selected in good habitat than in poor habitat or in areas that had burned recently; Unpublished data). During the winters of 2006 and 2007, surveys were limited to the southeast corner of the Site, but during fall of 2007 and winter and fall of 2009, plots were selected throughout the remainder of the INL Site, including the Sagebrush Steppe Reserve. In 2008, the U. S. Fish and Wildlife Service (FWS) published a finding that the pygmy rabbit may warrant protection under the Endangered Species Act. This resulted in an effort to prepare a Candidate Conservation Agreement for this species and a comprehensive monitoring plan was designed. However, in 2010 the FWS determined it did not warrant listing. At this time pygmy rabbit monitoring on the INL Site was suspended and efforts focused other critical mammals, bats.

Recently, white-nose syndrome (WNS) has been identified as a major threat to many bats that hibernate in caves. WNS is a disease caused by a cold-adapted fungus (*Geomyces destructans*). Since its discovery in 2006, transmission of WNS has expanded 1,200 km (746 miles) from New York to Oklahoma, and researchers estimate that the spread of WNS syndrome will continue. WNS has killed at least 5.5 to 6.7 million bats in seven species. This disease has been labeled by some as the greatest wildlife crisis of the past century, and many species of bats could be at risk of significant declines or extinction due to this disease. Several species of bats on the INL Site could be affected by WNS. One of these species (little brown myotis [*Myotis lucifugus*]) has been petitioned for emergency listing under the Endangered Species Act (ESA). Two species that occur on the INL Site (western small-footed myotis [*Myotis ciliolabrum*] and western long-eared myotis [*Myotis evotis*]) are the western counterparts of the eastern small-footed myotis (*M. leibii*) and northern long-eared myotis (*M. septentrionalis*). The status of the latter two species is currently being reviewed for potential listing under the ESA. Therefore, the ESER

Program developed and initiated a bat monitoring program on the INL Site in collaboration with the U. S. Fish and Wildlife Service and Idaho Department of Fish and Game.

4.9.3 Birds

Sage grouse populations are monitored annually by surveying their use of leks. Breeding and nesting generally occurs within two miles of leks. A representative sample of Site sage grouse leks (Figure 4-16) are monitored weekly for a minimum of 4 weeks beginning in March. The surveys are conducted by visiting those leks at dawn and counting the number of individual birds. As with large mammal surveys, the methods used provide comparable data to those collected by neighboring agencies.

Raptors are surveyed annually on the Site through mid-winter raptor counts in collaboration with the United States Geological Survey Biological Resources Discipline (USGS-BRD). Raptor populations tend to fluctuate with slight changes in the environment, such as prey availability and weather conditions. Therefore, they are often used as environmental indicators to determine effects of human development on the environment and the general health of the ecosystem. Site raptor surveys are conducted in conjunction with the nationwide USGS-BRD Mid-winter Bald Eagle Survey. The ESER Program surveys two official USGS-BRD Mid-winter Bald Eagle Survey routes (Figure 4-16). In addition to surveying for bald eagles, ESER surveys include all eagles, hawks, falcons, shrikes, owls, ravens, crows, and magpies.

The Breeding Bird Survey (BBS) is a large-scale survey of North American birds. It is a roadside route survey of avifauna designed to monitor abundance and distribution of birds primarily covering the continental U.S. and southern Canada. It is administered by the USGS-BRD. These surveys yield useful information about population dynamics, effects of weather and fire on avian abundance, effects of INL Site operations on avifauna, and the breeding status of a number of bird species of concern, including sagebrush obligate species and other species exhibiting declines throughout their range. Thirteen BBS routes are surveyed on the Site (Figure 4-16). Five remote routes are standard 40-km (25 mi) BBS routes, data from which are reported to the USGS-BRD annually. These routes traverse the remote areas of the INL Site and include major habitat types throughout the Site. Eight facility routes are located in and around major Site facility complexes. Each remote route consists of 50 stop locations at approximately 0.5-mi (0.8 km) intervals. Facility routes consist of 18–60 stop locations at approximately 0.2-mi (0.32 km) intervals. The data collected are comparable to those collected by other neighboring agencies.

5. METEOROLOGICAL MONITORING

The meteorological monitoring program supports laboratory-wide environmental monitoring activities as well as emergency response. Short- and long-term weather conditions have a substantial effect on the INL Site environment, particularly with respect to the movement of contaminants in air and the groundwater system. Meteorological monitoring is performed to record weather conditions such as wind speed and direction, temperature, and precipitation so that this information may be used with predictive models to estimate the concentration of contaminants after they have been released to the environment. Meteorological monitoring results are also used to plan environmental measurement programs or for modeling required for compliance with air quality regulations. For example, the Site contractors perform modeling to show compliance with ambient air quality regulations and to comply with requirements to estimate off-Site dose (see Section 9 for a discussion of dose assessment modeling). Figure 5-1 shows the meteorological monitoring locations.

Results of past work related to the tower network are summarized in DOE-ID-12118[7], and DOE-ID-12119[35].

5.1 NOAA

Meteorological services and supporting research are provided to the INL by the NOAA ARLFRD. The ARLFRD provides real-time meteorological data, climatological data, weather predictions, and dispersion calculations for routine operations and emergency response.

The ARLFRD operates a meteorological monitoring network that covers an area of approximately 3,885,000 hectare (15,000 mi^2) to characterize the meteorology and climatology of the INL Site. The network consists of 35 meteorological towers both on and around the Site. Most of the towers are 15 m (50 ft) tall and take wind speeds and direction measurements at 15 m (50 ft), temperatures at 2 m and 15 m (6 and 50 ft), and relative humidity at 2 m (6 ft) above ground level. Three taller towers range from 46 m to 76 m (150 ft to 250 ft) high and are instrumented at multiple levels. Many towers have additional sensors for precipitation, solar radiation, and barometric pressure. All the tower measurements are averaged over 5-minute periods and transmitted to ARLFRD in near real-time via radio-frequency communication.

In addition to the meteorological towers, ARLFRD operates a 915-MHz radar wind profiler with a Radio Acoustic Sounding System at a site just north of INTEC. These systems provide wind speed and direction profiles up to about 4 km (2.5 mi) above ground level and temperature profiles up to about 1 km (0.6 mi) above ground level, thereby providing crucial information about winds and temperatures aloft. More recently, ARLFRD added a minisodar system capable of providing high-resolution wind and turbulence measurements up to 200 m (650 ft) above the ground.

The ARLFRD has also developed a program called INLViz to display data in near real-time from the tower network and the vertical profilers. INLViz has been installed at many office locations both within and outside the INL Site. At this time INLViz is being phased out in favor of web-based displays of the network data. A real-time display of the meteorological data is publicly available on the Internet at http://www.noaa.inel.gov/windV/windV.asp. In addition, ARLFRD now maintains an INL Weather Center at http://niwc.noaa.inel.gov that provides a range of meteorological information relevant to INL.

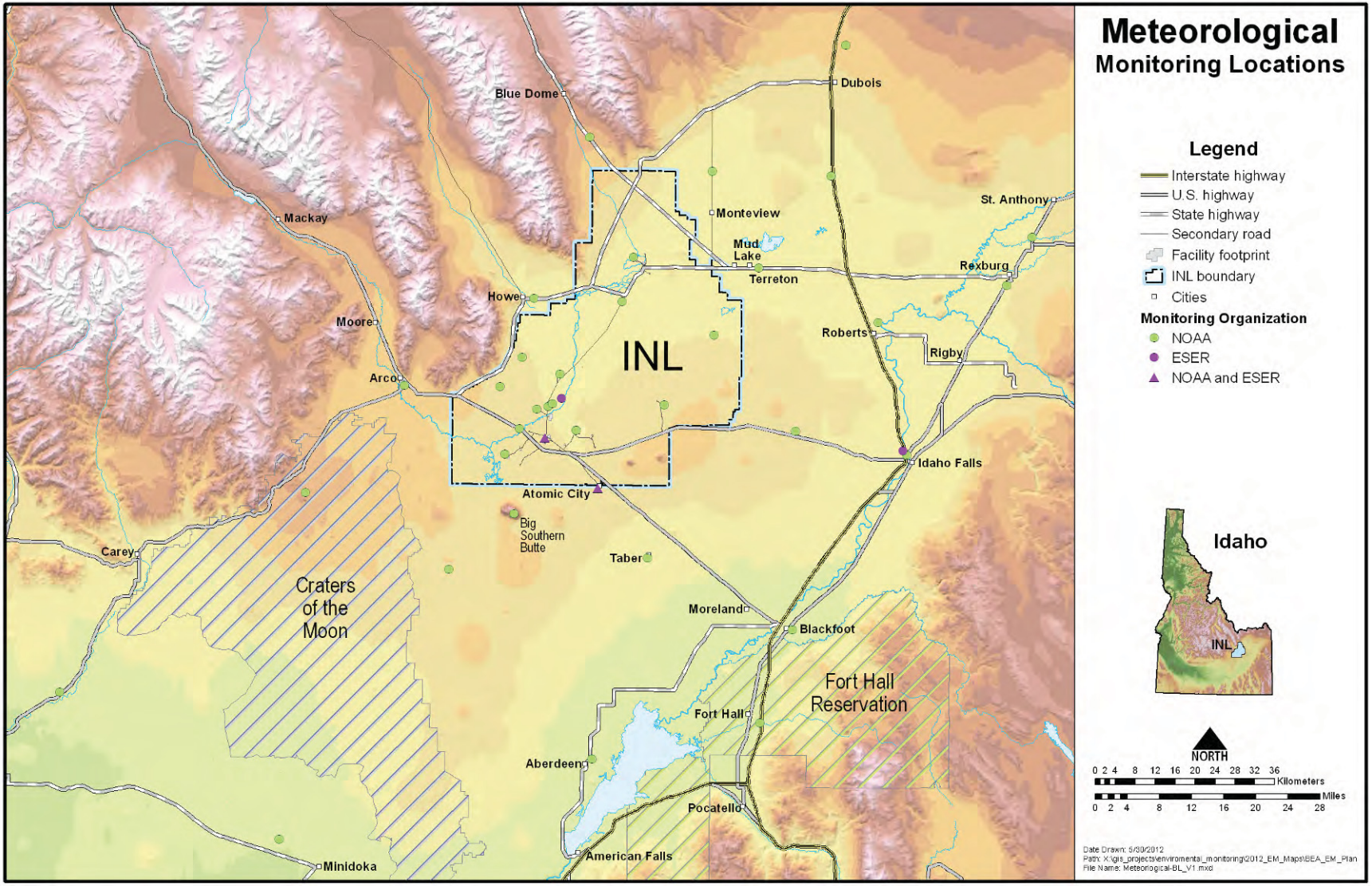

Figure 5-1. Meteorological monitoring locations.

6. ENVIRONMENTAL EVENT MONITORING

Environmental event monitoring is an essential part of safe operations because of the potential impacts a release of radioactive or regulated materials from Site facilities, either from unplanned/accidental operational events or natural events, could have on the environment and the public. Environmental events at the Site can be widespread (e.g., a wildland fire spread by high winds) or facility-specific (e.g., a chemical spill limited to a small area immediately around the spill). Data from event-specific monitoring are used to evaluate the potential impact of an event to personnel, the environment, and the public.

Responses to environmental events vary depending on the severity of the event and are conducted by the responsible contractor. The INL contractor responds to all events. Figure 6-1 shows the locations of samplers specifically intended for use during an environmental event. Locations of portable or routine samplers are not shown.

6.1 Response to an Emergency or Unplanned Release

The INL has an extensive program to identify chemical/radioactive hazards, evaluate associated risks, prevent accidental releases, and respond appropriately in the event of a release. This comprehensive INL Site Emergency Preparedness Program is addressed in PLN-114, *INL Emergency Plan/RCRA Contingency Plan*[50]. The Plan is used by the Emergency Response Organization and other trained personnel in the event of an emergency and provides the overall process for responding to and mitigating consequences of emergencies that might arise at the Site. Emergency plans for the INL Site consolidate all emergency-planning requirements for federal, state, and local agencies. Mutual aid agreements are in place between the INL and state and local agencies to respond to emergencies. One such agreement allows local fire departments to respond to fires on the Site and allows the INL fire department to respond to fires off-Site.

The Plan also includes spill prevention and response requirements for each facility. Spills and releases are reported to the INL Spill Notification Teams. The Spill Notification Teams determine if the spill or release is reportable and provides assistance to operations for making appropriate release notifications.

If an unplanned radioactive release or an event such as a wildland fire occurs at the Site, the INL contractor Environmental Support and Services (ES&S) Monitoring Services organization collects field data. Data collected include readings of penetrating radiation levels, airborne and surface contamination levels, and radiation surveys outside of facility fences. The ES&S Monitoring Services organization reports the field data results to the Emergency Response Organization.

In the event of an emergency or unplanned release, anthropogenic or natural radioactivity can be released into the air. These releases could result from direct atmospheric release from a facility, or by redistribution by fire or winds of anthropogenic or natural radioactivity contained in soil and vegetation. Three types of air samples can be taken during environmental events that are declared operational emergencies or which involve soil contamination areas:

- Immediate short-term “grab” samples
- Stationary 24-hour samples at strategic locations specific to the event
- Routine environmental samples taken at standard locations (continuous monitoring).

6.1.1 AMWTP

Spills or releases greater than a preset reportable quantity are reported to the INL Site Spill Notification Teams. The AMWTP also has a *Spill Response Procedure* (AMWTP-MP-EC&P-7.10)[51] and an *Advanced Mixed Waste Treatment Project Emergency Plan/RCRA Contingency Plan* (AMWTP-MP-EP&C-12.1)[52].

AMWTP has installed ANSI N13.1[25] compliant monitors with alarms on two stacks at the AMWTP. If the stack monitors initiate an alarm, AMWTP will respond using a graded approach to minimize the release by switching filter banks and/or shutting down the processes.

6.1.2 INL

High-volume air samplers owned and maintained by ES&S are located at some of the ARLFRD towers operated by NOAA. These samplers are intended for use in the event of a radiological accident at the Site and are not used for routine environmental monitoring. Samplers can be turned on and off remotely upon request from DOE-ID by an operator stationed at ARLFRD or in the Emergency Operations Center (EOC).

Short-term grab samples are taken in the field by the ES&S Monitoring Services organization to provide gross radiation levels for early indication of event conditions. The grab samples are taken using portable high-volume air monitors to assess exposure potentials, verify the effectiveness of on-Site protective actions, and determine the need for off-Site protective actions. The high-volume air monitor locations are selected by the EOC based on wind direction and conditions specific to the event. High-volume air monitors are capable of drawing large quantities of air through a particulate filter over a short period of time (approximately 15 minutes) and are used to detect gross alpha and gross beta emitting radionuclides. Results of short-term samples are generally available within 1 to 2 hours after samples are collected.

Event-specific monitoring provides data to evaluate potential radiological doses associated with events resulting in accidental or unplanned radiological releases from Site operations or wild fires. During the fire season, the INL contractor temporarily installs high-volume air samplers that can be activated during wildfires in situations where the fire may burn through areas with radiological contamination. Because most events are short term, ambient air is sampled for 24 hours to obtain the required airflow through the samplers and desired detection levels for specific radionuclide measurements. These samplers are not weather-hardened and are used only during the fire season (May through September).

The INL contractor maintains a routine monitoring network of low-volume air samplers at fixed locations that take continuous air samples. Results from these routine environmental samples are used to supplement other event-specific measurements to determine and document the nature and quantity of any radioactive material detected in ambient air on and around the INL Site.

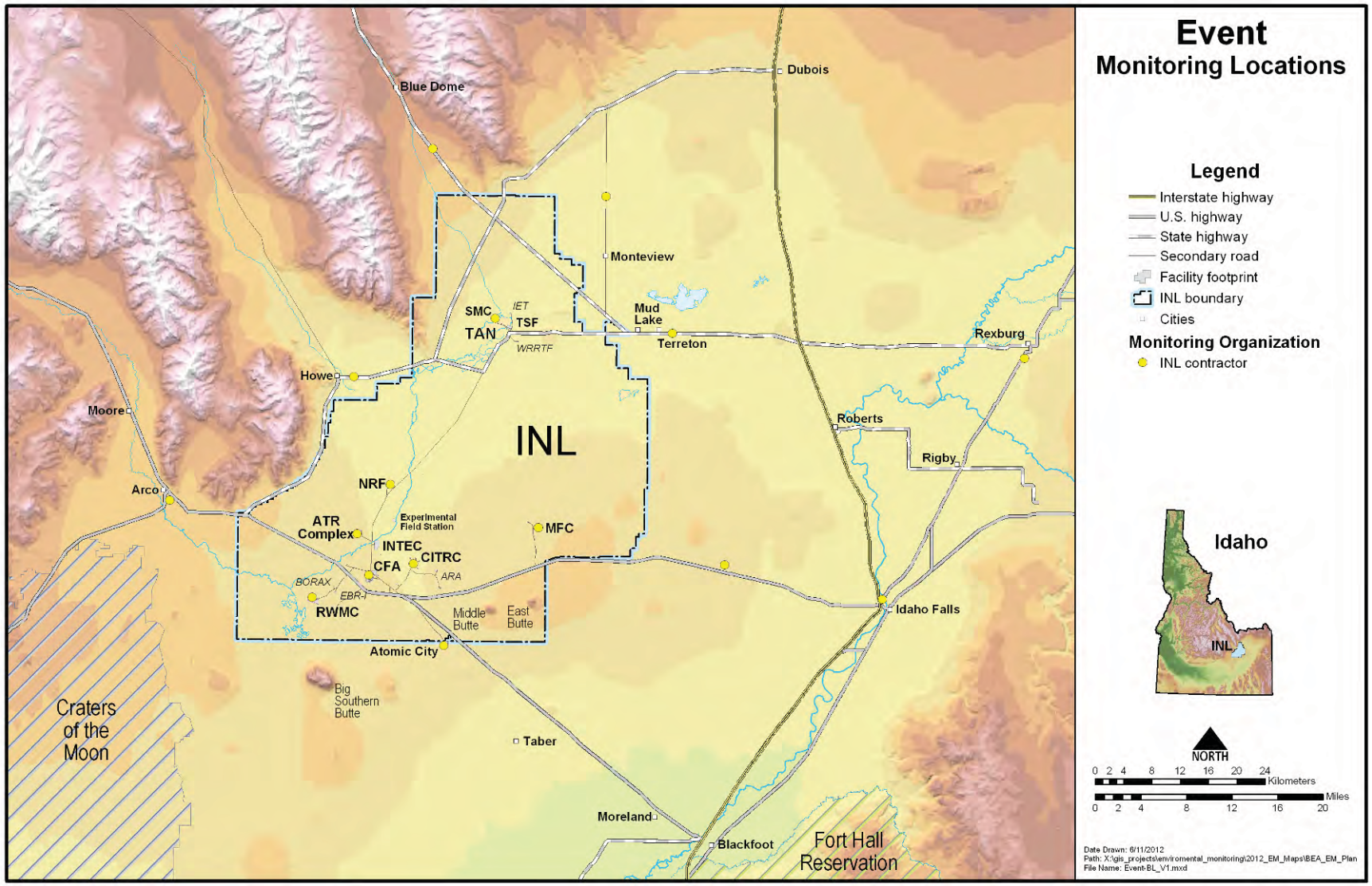

Figure 6-1. Event monitoring locations.

6.2 Response to an Exceedance

Each INL contractor maintains their own plans or procedures to ensure that appropriate, timely notifications to appropriate authorities occur and that corrective actions are taken in the event that monitoring results exceed a regulatory limit or, in some cases, a preset trigger level. Specific actions to be taken when validated monitoring results are above certain trigger levels are identified in the applicable permits and regulations (e.g., RCRA, WRP, and Safe Drinking Water Act[41]). These actions include reporting any exceedances to the appropriate federal, state, or local agencies, along with initiating appropriate corrective actions in a timely manner. The types of corrective actions could vary depending on the specific regulation and could include follow-up analysis or confirmation sampling, removing potable water well from service, or remedial action.

For reportable occurrences, specific actions to be taken are identified in the DOE Order 231.1B, *Environment, Safety and Health Reporting*[52], which establishes reporting requirements and categorizes releases of radionuclide and hazardous substances or regulated pollutants. Taking the following general steps when responding to an environmental data exceedance will ensure that coordinated actions are taken and INL stakeholders are notified in a timely manner:

1. Discover, confirm, and make initial notification
2. Categorize environmental data exceedance
3. Determine and initiate appropriate response
4. Complete necessary reporting and notification.

7. REPORTS

General reporting requirements for effluent monitoring and environmental monitoring activities at the INL Site are outlined in DOE Order 231.1B[52] and DOE Order 458.1[1]. These orders specify the reporting responsibilities, timing, and distribution of several routine environmental reports. The requirements for preparing and distributing accident-related or unusual occurrence reports are included in DOE Order 231.1B[52].

Following are the principal objectives of DOE's reporting system, as stated in DOE/EH-0173T[5]:

- Alert DOE management to occurrences for the purpose of investigating and evaluating causes, and identify appropriate measures to prevent recurrences
- Obtain early, complete, and factual information on occurrences as a basis for reports to the Secretary of Energy, Congress, other federal agencies, and the public, as appropriate
- Identify trends in areas of concern for DOE and contractor operations
- Provide a basis for improving codes, guides, and standards used in the DOE and contractor operations
- Monitor, evaluate, and report on-Site discharges, liquid and airborne effluents, and environmental conditions in the vicinity of DOE sites to assess the levels of radioactive pollutants and their impact on the public and the environment
- Comply with regulations and DOE orders.

Compliance monitoring data driven by specific permits or regulatory requirements are reported to federal, state, and local agencies in formats and frequencies specified by the respective regulatory document. Table 7-1 lists effluent and environmental monitoring reports at the INL Site.

Table 7-1. Effluent monitoring and environmental monitoring reports at the INL.

Report Title	Frequency	Summary Description
Annual Site Environmental Report	Annual	Summarizes DOE, USGS, and contractor data from environmental monitoring activities and data from monitoring programs. Includes a yearly environmental compliance summary for the INL Site.
INL Offsite Environmental Surveillance Program Reports	Quarterly	Reports results of offsite monitoring under the ESER Program including air, agricultural, external radiation, soil, water, and wildlife sampling.
INL Oversight Program Environmental Surveillance Program Reports	Quarterly	Presents quarterly environmental data results and associated quality assurance data.
	Annual	Summarizes trends in environmental data and compares data collected by the INL Oversight Program, contractors, and the USGS for selected sample locations.
Injection Well Monitoring Reports	As required	Provides the analytical results from monitoring of storm water runoff discharged to injection wells.
Semi-Annual Report for the HWMA/RCRA Post Closure Permit for the Waste Calcining Facility at INTEC	Semiannual	Summarizes the analytical results from HWMA/RCRA groundwater monitoring conducted for the Waste Calcining Facility Post Closure Permit.
Fiscal Year Environmental Monitoring Report for the RWMC	Annual	Summarizes monitoring data from the air, waste zone, vadose zone, and aquifer in and around the RWMC.
USGS Scientific Investigations Reports	Every 3 years	Summarizes USGS data, describes hydrologic conditions and distribution of selected constituents in groundwater and surface water in and around the INL.
Wastewater Reuse Site Performance Reports for the INL	Annual	Reports required information for each permitted Wastewater Land Application Permit facility to include (a) all permit monitoring data (b) status of any permit special compliance conditions, (c) interpretive discussion of monitoring data with particular respect to environmental impacts by the facility.
Monthly and Semiannual Liquid Effluent Reports to city of Idaho Falls	Monthly and Semiannual	Monthly pH logs and semiannual monitoring reports from the IRC effluent to the city of Idaho Falls sewer system.
Storm Water Discharge Monitoring Reports	As required	Reports storm characteristic information and all analytical results from National Pollutant Discharge Elimination System permit monitoring.
CERCLA 5-Year Review Reports	Every 5 years	Reports overall effectiveness of remedial actions covered by a CERCLA ROD.
CERCLA Post-Record of Decision Monitoring Reports	As specified in ROD	Summarizes data collected in support of remedial actions and long-term monitoring.

7.1 ICP and INL Reporting Requirements

The INL and ICP contractors are responsible for reporting requirements for their respective facilities with regard to:

- Source-specific and Sitewide air permits required for compliance with Public Law 91-604, *Clean Air Act Amendments of 1990*[18] and with IDAPA 58.01.01, *Rules for the Control of Air Pollution in Idaho*[19]
- Permits required for compliance with IDAPA 58.01.17, *Recycled Water Rules*[21]
- Permits required for compliance with IDAPA 37.03.03, *Rules for the Construction and Use of Injection Wells in the State of Idaho*[34]
- Laboratory-wide permits and records required under the RCRA; Public Law 94-469, *Toxic Substances Control Act*[54]; 42 USC 11001, *Emergency Planning and Community Right-to-Know Act*[54], and 7 USC 136, *Federal Insecticide, Fungicide, and Rodenticide Act*[56]
- 42 USC 9601, *Comprehensive Environmental Response, Compensation, and Liability Act*[16]
- Public Law 104-182, *Safe Drinking Water Act*[41].

The INL contractor is also responsible for reporting requirements associated with the following:

- City Order Chapter 1, Section 8, *Permits required for compliance with City of Idaho Falls Sewer Ordinance and Municipal Stormwater Discharge Permit*[32].

7.2 ESER Program Reporting

The ESER Program prepares the ASER each calendar year, with input from the various organizations performing environmental monitoring on and around the INL Site. The ASER is available electronically, summarizes data from effluent monitoring programs, environmental monitoring activities, and includes a yearly environmental compliance summary for the INL Site. The ASER is prepared as required by DOE Order 231.1B[53].

The ESER Program prepares quarterly reports summarizing off-Site monitoring results and distributes these electronically. A number of other topical reports summarizing trends in data for a particular medium or dealing with other environmental monitoring subjects are produced periodically.

The ESER Program also maintains an environmental public communications and education program. Articles covering environmental monitoring and other ESER Program activities are published in the ESER Program newsletter and in press releases. The ESER Program has established a web site at http://www.gsseser.com/ containing information on the various aspects of the program, all ESER Program data, and recently published reports.

7.3 USGS Reporting

All data collected by the USGS INL Project Office are publicly available after review. Most data are published in periodic data reports and used in interpretive reports. The ASER contains an appendix listing the abstracts of USGS publications for the calendar year. The USGS National Water Information System web site is open to the public. This system permits public electronic access and retrieval of USGS water data, including groundwater and water quality data. The web site address is http://waterdata.usgs.gov/id/nwis/.

7.4 NOAA Reporting

The NOAA-ARLFRD, *Quality Program Plan, NOAA Air Resources Laboratory Field Research Division*[57], addresses the requirements of DOE Order 414D, *Quality Assurance*[9], and is consistent with ANSI/ANS-3.11-2005*, Determining Meteorological Information at Nuclear Facilities*[58]. Implementing procedures include regular independent system and performance audits, written procedures and checklists, follow-up actions, and continuous automated and visual data checks to ensure representation and accuracy. The plan and implementing procedures provide the framework to ensure that the INL Meteorological Monitoring Network meets the elements of DOE/EH-0173T[5] and DOE Order 458.1[1].

Network meteorological data are transmitted every five minutes from each station in NOAA's meteorological network via radio to the central ARLFRD facility in Idaho Falls. The data receive nearly continuous monitoring and quality control screening. Data are recorded on electronic media and stored in a dedicated, computerized archive, with backup media maintained as recommended by DOE/EH-0173T[5].

Specific climatological data from the IEMP are available in real time to the public electronically at http://www.noaa.inel.gov/. The ARLFRD's data specific to the INL Site are available in near real time electronically at http://niwc.noaa.inel.gov/. Results of past work are summarized in DOE/ID-12118[7] and DOE/ID-12119[35].

8. QUALITY ASSURANCE

An effective quality assurance (QA) program is essential to collect quality data. This section presents QA procedures and practices used as part of the effluent monitoring and environmental monitoring programs. This section does not provide a QA plan for monitoring at the INL Site but rather defines QA requirements applicable to environmental programs. Each monitoring organization incorporates the required components into its QA documentation for environmental monitoring.

The primary policy, requirements, and responsibilities for establishing and maintaining plans and actions that ensure QA in DOE activities are provided in DOE Order 414D[9], *Quality Assurance*, 10 CFR 830, Subpart A, *Quality Assurance Requirements*[59], and American Society of Mechanical Engineers (ASME) NQA-1-2004, *Quality Assurance Requirement for Nuclear Facility Applications*[60]. The ASME NQA-1-2004 is the preferred standard for activities at nuclear facilities. Additional QA program requirements found in 40 CFR 61, Appendix B[24] must be met for all radiological air emission sources continuously monitored for compliance with 40 CFR 61, Subpart H[6].

The EPA policy on QA plans is based on the national consensus standard ANSI/ASQC E4-1994, *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs*[61]. The EPA approach to data quality centers on the data quality objective process. Data quality objectives are project dependent and are determined on the basis of the data users' needs and the purpose for which data are generated. Quality elements applicable to environmental monitoring and decision-making are specifically addressed in EPA/240/B-01/003, *EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5)*[62]. These elements are included in the following general categories:

- Project management
- Data generation and acquisition
- Assessment and oversight
- Data validation and usability.

8.1 QA Requirements

The QA procedures are designed to ensure sample integrity, precision, and accuracy in the analytical results and to ensure that the environmental data is representative and complete. The following subsections describe how each monitoring organization implements the above QA requirements.

8.1.1 INL Contractor

The INL contractor integrates applicable requirements from *Manual 13A—Quality and Requirements Management Program Documents*[63], into the implementing monitoring program plans and procedures for non-CERCLA monitoring activities. The program plans address the QA elements as stated in EPA/240/B-01/003[62] to ensure that the required standards of data quality are met.

In addition, the INL contractor uses a documented approach for collecting, assessing, and reporting environmental data. Environmental and effluent monitoring are conducted in accordance with PLN-8510 *Planning and Management of Environmental Support and Services Monitoring Services Activities*[36], PLN-8515 *Data Management Plan for the INL Environmental Support and Services Monitoring Services Program*[64], and PLN-8550 *Environmental Support and Services Monitoring Services Surveillance Plan*[37] in order to assure that analytical work for environmental and effluent monitoring supports data quality objectives.

8.1.2 ICP Contractor

All CERCLA monitoring activities at the INL Site are conducted in accordance with DOE/ID-10587, *Quality Assurance Project Plan (QAPjP) for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10 and Removal Actions*.[65] The Quality Assurance Project Plan was written in accordance with EPA/540/G-89/004, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Office of Emergency and Remedial Response*[66]. In addition, the ICP contractor uses:

- PLN-720, *Environmental Surveillance Program Plan*[28]
- PLN-729, *Idaho Cleanup Project Liquid Effluent Monitoring Program Plan*[33]
- PLN-730, *Idaho Cleanup Project Drinking Water Program Plan*[43]
- PLN-1305, *Groundwater Monitoring Program Plan*[67]
- PLN-1373, *Groundwater Monitoring Plan for the Waste Calcining Facility and for the CPP-601/627/640 Facility*[68].

8.1.3 AMWTP

AMWTP maintains a QA program in accordance with 40 CFR 61, Appendix B[24], as required of all radiological air emission sources continuously monitored for compliance with 40 CFR 61, Subpart H[6]. The QA requirements are documented in AMWTP-PD-EC&P-02, *Quality Assurance Project Plan for the WMF 676 NESHAPs Stack Monitoring System*[69].

8.1.4 ESER Program

The ESER Program maintains a QA program consistent with the requirements of 10 CFR 830[59] and DOE Order 414D[9] that is implemented through the ESER *Quality Assurance Implementation Plan (OIP)*[70]. Additional QA requirements for monitoring activities are provided in the ESER *Offsite Environmental Surveillance Program Quality Assurance Project Plan*[71]. Analytical laboratories used by the ESER Program maintain their own QA programs consistent with DOE requirements.

8.1.5 USGS

DOE/ID-22206[45] defines procedures and tasks performed by project-office personnel that ensure the reliability of water quality data. The plan addresses all elements needed to ensure reliability:

- Reliability of the water-quality data
- Compatibility of the data with data collected by other organizations at the INL Site
- That data meet the programmatic needs of the DOE and its contractors and the scientific and regulatory communities.

The USGS conducts performance audits on field personnel collecting the sample and of the analytical laboratories that analyze their environmental monitoring samples.

8.1.6 NOAA

A QA plan[57] addresses the requirements of DOE Order 414D[9], and is consistent with ASME. Implementing procedures include regular independent system and performance audits, written procedures and checklists, follow-up actions, and continuous automated and visual data checks to ensure representativeness and accuracy. The plan and implementing procedures provide the framework to ensure

that the INL Meteorological Monitoring Network meets the elements of DOE/EH-0173T[5] and DOE Order 458.1[1].

All the meteorological sensors in the ARLFRD tower network are inspected, serviced, and calibrated semiannually as recommended by American Nuclear Society guidelines found in ANSI/ANS-3.11-2005[58]. Unscheduled service is also promptly performed whenever a sensor malfunctions.

8.2 Sample and Analysis Management Activities

Sample and analysis management activities are performed separately by the various monitoring organizations. Functions performed by each of these monitoring organizations include:

- Developing a Sample and Analysis Plan or equivalent
- Coordinating sampling
- Obtaining analytical laboratory services
- Processing analytical laboratory data packages
- Managing sample and analytical data
- Validating analytical data (where applicable)
- Coordinating sample disposition.

Subcontract laboratories used by the INL and ICP contractors are audited by the DOE Consolidated Audit Program. This program uses trained and certified personnel to perform in-depth audits of subcontract laboratories to review:

- Personnel training and qualification
- Detailed analytical procedures
- Calibration of instrumentation
- Participation in an inter-comparison program
- Use of blind controls
- Analysis of calibration standards.

Audit results are maintained by the DOE Consolidated Audit Program. Laboratories are required to provide corrective action plans for audit findings.

9. RADIOLOGICAL DOSE EVALUATION

Potential radiological doses to the public from INL operations are evaluated to determine compliance with pertinent regulations and limits. Two different computer codes are used to estimate doses. The EDE for a maximally exposed individual (MEI) to INL airborne releases of radionuclides is calculated annually using the methods prescribed by Subpart H of 40 CFR 61[21] and documented in an annual NESHAP report for radionuclides[25]. The annual dose to the public for the MEI and the collective 80-km (50-mi) population and the biota dose are estimated annually and documented in DOE/ID-12082, *Idaho National Laboratory Site Environmental Report.*[73]

9.1 Maximum Individual Dose—Airborne Emissions Pathway

The EDE to an individual member of the public is calculated from airborne emission sources across the INL to demonstrate compliance with Subpart H of 40 CFR 61[6] and DOE Order 458.1[1]. Subpart H requires that emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive an EDE of 10 millirem per year. The purpose of DOE Order 458.1[1] is to implement sound stewardship practices that protect the air, water, land, and other natural and cultural resources impacted by DOE operations, and by which DOE cost effectively meets or exceeds compliance with applicable environmental, public health, and resource protection laws, regulations, and DOE requirements. DOE Order 458.1[1] states it is also a DOE objective that potential exposures to members of the public be as far below the limits as is reasonable achievable.

Because individual radiological impacts to the public surrounding the INL remain too small to be measured by available monitoring techniques, the dose to the public from INL operations is calculated using the reported amounts of radionuclides released from INL facilities and EPA-approved air dispersion codes. Compliance to Subpart H of 40 CFR 61[6] is demonstrated primarily through the use of the CAP-88 computer code. The mesoscale diffusion (MDIFF) air dispersion model (NOAA-TM-OAR-ARL-238, PB-2001-014789)[72] was developed by NOAA to evaluate dispersion of pollutants in arid environments, such as those at the Site, and is used to comply with DOE Order 458.1[1].

9.1.1 Dose Evaluation Using CAP-88 Computer Code

Use of the CAP-88 computer code is required by the EPA to demonstrate compliance with the *Clean Air Act Amendments of 1990*[18]. Using the CAP-88 code and information on the reported amounts of radionuclides released from INL facilities, the EDE to the MEI is estimated. CAP-88 uses dose and risk tables developed by the EPA. It does not include shielding by housing materials, but does include a factor to allow for shielding by surface soil contours from radioactivity on the ground surface. The ARLFRD performs annual meteorological and dispersion assessments as part of the environmental compliance at the Site. Yearly wind statistics are generated for many of the towers in the meteorological network; these are used to run the CAP-88 plume dispersion code required for NESHAP[6] compliance. CAP-88 makes its calculations based on the joint frequency of wind conditions from a single wind station located near a facility (or emission source) in a straight line from that source and ignores recirculation.

9.1.2 Dose Evaluation Using MDIFF Dispersion Model

The ARLFRD developed and maintains a puff transportation and dispersion model called MDIFF to estimate radiological pollutant emissions from the INL. The MDIFF calculations of total integrated concentrations are used to evaluate the dose to members of the public to show compliance with DOE Order 458.1[1]. This method offers a more realistic dose estimate for the Site than that from the CAP-88 code. The dispersion algorithms within the code, which are derived in part from field data collected at the Site and the puff transport, are driven by the wind data from the ARLFRD tower network. The MDIFF is

used only for calculating population dose. Unlike CAP-88, MDIFF can account for spatial and temporal wind variations associated with the complex topography near the Site.

The ARLFRD has also developed a program called INLViz to display data in near real time from the tower network and the vertical profilers. The program contains a user interface to the MDIFF puff dispersion code. INLViz has been installed at about 50 locations in and around the Site. It is widely used to support Site operations, and is a major part of ARLFRD's support to the INL EOC.

9.2 80-Kilometer (50-Mile) Population Dose

An estimate of the collective EDE, or population dose, from inhalation, submersion, ingestion, and deposition resulting from airborne releases of radionuclides from the INL is determined from the MDIFF evaluations and information on the population within 80 km (50 mi) of an INL facility. Results of the MDIFF population dose evaluations are used to show compliance with DOE Order 458.1[1]. The population dose is calculated from the average dispersion coefficient for the county census division, the population in each census division within that county, and the normalized dose received at the location of the MEI from the MDIFF evaluation. This gives an approximation of the dose received by the entire population in a given county division. Total population dose is the sum of the population dose for the various county divisions. The calculation overestimates dose because radioactive decay and deposition of the isotopes is not calculated during transport over distances greater than that to the MEI. Population estimates are reviewed and updated annually, as necessary.

9.3 Biotic Dose

Maximum radionuclide concentrations in collected waterfowl and game animals are used to estimate a potential dose from ingestion. Estimates of the potential dose an individual may receive from occasionally ingesting meat from game animals take into account that waterfowl may reside briefly at the various waste disposal ponds on the Site and those game birds and other game animals may reside on or migrate across the Site. The potential dose estimate is based on the highest concentrations of radionuclides in waterfowl or game animals sampled from the Site.

A graded approach is used to evaluate the potential dose to aquatic and terrestrial biota from contaminated soil and water according to DOE-STD-1153-2002, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota*.[73] The graded approach evaluates the impacts of a given set of radionuclides on aquatic and terrestrial ecosystems by comparing available concentration data in soils and water with biota concentration guides. Details and justifications for applying the graded approach at the INL Site can be found in NW-ID-2003-062, *Biota Dose Assessment Guidance for the INEEL*[74].

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Appendix A Monitoring Locations

Table A-1 Agricultural Products Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
American Falls	No	ESER	American Falls	Wheat	No	N42* 47' 16.256"	W112* 51' 18.298"
Arco	No	ESER	Arco	Lettuce	No	N43* 37' 28.547"	W113* 17' 49.078"
Arco	No	ESER	Arco	Wheat	No	N43* 38' 11.389"	W113* 17' 58.295"
Astle Dairy	No	ESER	Astle Dairy	Milk	No	N42* 53' 0.897"	W114* 15' 24.340"
Atomic City	No	ESER	Atomic City	Lettuce	No	N43* 26' 37.361"	W112* 48' 56.222"
Blackfoot	No	ESER	Blackfoot	Lettuce	No	N43* 19' 6.710"	W112* 9' 50.864"
Butte City	No	ESER	Butte City	Potatoes	No	N43* 36' 9.981"	W113* 14' 12.159"
Carey	No	ESER	Carey	Lettuce	No	N43* 19' 1.572"	W113* 58' 25.909"
Experimental Field Station	No	ESER	EFS	Lettuce	Yes	N43* 36' 17.442"	W112* 54' 24.364"
FAA Tower	No	ESER	FAA Tower	Lettuce	No	N43* 33' 15.618"	W112* 32' 16.721"
Fort Hall	No	ESER	Fort Hall	Milk	No	N43* 2' 14.706"	W112* 26' 28.700"
Groveland	No	ESER	Groveland	Potato	No	N43* 12' 30.977"	W112* 22' 32.358"
Idaho Falls	No	ESER	Idaho Falls	Wheat	No	N43* 28' 58.128"	W112* 7' 40.071"
Idaho Falls	No	ESER	Idaho Falls	Potatoes	No	N43* 28' 5.249"	W112* 6' 45.934"
Idaho Falls - Reed's Dairy	No	ESER	Idaho Falls (Reed's Dairy)	Milk	No	N43* 29' 48.913"	W112* 5' 3.263"
Minidoka	No	ESER	Minidoka	Milk	No	N42* 42' 56.293"	W113* 31' 54.725"
Monteview	No	ESER	Monteview	Wheat	No	N44* 3' 30.250"	W112* 32' 6.136"
Monteview	No	ESER	Monteview	Potato	No	N44* 0' 54.498"	W112* 33' 59.294"
Monteview	No	ESER	Monteview	Lettuce	No	N44* 0' 55.355"	W112* 32' 9.552"
Moreland	No	ESER	Moreland	Wheat	No	N43* 13' 1.249"	W112* 26' 39.961"
Mud Lake	No	ESER	Mud Lake	Potatoes	No	N43* 50' 15.308"	W112* 28' 34.367"
Rupert	No	ESER	Rupert	Wheat	No	N42* 37' 54.958"	W113* 38' 55.151"
Rupert	No	ESER	Rupert	Potato	No	N42* 36' 48.357"	W113* 40' 37.573"
Rupert	No	ESER	Rupert	Wheat	No	N42* 37' 57.062"	W113* 38' 55.285"
Shelley	No	ESER	Shelley	Potato	No	N43* 23' 45.233"	W112* 11' 15.453"
South of Arco on U.S. 93	No	ESER	Arco	Potatoes	No	N43* 36' 21.846"	W113* 19' 55.490"
State HWY 33 mile marker 22	No	ESER	Howe	Lettuce	No	N43* 47' 48.106"	W112* 53' 8.301"
Taber	No	ESER	Taber	Wheat	No	N43* 13' 35.352"	W112* 28' 29.107"
Terreton	No	ESER	Terreton	Potato	No	N43* 50' 55.320"	W112* 22' 34.631"
Terreton	No	ESER	Terreton	Milk	No	N43* 50' 52.973"	W112* 19' 1.254"
Terreton	No	ESER	Terreton	Wheat	No	N43* 50' 28.588"	W112* 25' 35.266"

Table A-2 Airborne Effluent Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
MFC - Inside facility fence	No	INL	EBR-II/FCF Main Stack (ANL-764)	Effluent	Yes	N43* 35' 41.492"	W112* 39' 21.818"
MFC - Inside facility fence	No	INL	HFEF Stack (ANL-785)	Effluent	Yes	N43* 35' 45.211"	W112* 39' 21.854"
RWMC - TSA/AMWTP area	No	AMWTP	Glovebox Extract (WMF-676-003)	Effluent	Yes	N43* 29' 47.866"	W113* 2' 14.837"
RWMC - TSA/AMWTP area	No	AMWTP	Zone 3 Extract (WMF-676-002)	Effluent	Yes	N43* 29' 47.696"	W113* 2' 14.835"
INTEC - Inside facility fence	No	ICP	INTEC Main Stack (CPP-708)	Effluent	Yes	N43* 34' 19.270"	W112* 56' 1.050"
INTEC - Inside facility fence	No	ICP	INTEC New Waste Calciner (CPP-659)	Effluent	Yes	N43* 34' 21.409"	W112* 55' 57.405"
RWMC/SDA - Inside facility fence	No	ICP	Advanced Retrieval Project (ARP 1 - AL2)	Effluent	Yes	N43* 29' 58.080"	W113* 2' 45.591"

Table A-3 Ambient Air Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
ARA I & II	No	INL	ARA	Low-Volume Air	Yes	N43* 31' 1.701"	W112* 49' 22.169"
Arco	No	ESER	Arco	Low-Volume Air	No	N43* 37' 28.547"	W113* 17' 49.078"
Atomic City	Yes	ESER	Atomic City	Low-Volume Air	No	N43* 26' 37.361"	W112* 48' 56.222"
ATR Complex - NE corner	No	INL	RTC	Low-Volume Air	Yes	N43* 35' 22.834"	W112* 57' 38.277"
ATR Complex - Parking lot	No	INL	TRA	Low-Volume Air	Yes	N43* 35' 1.376"	W112* 57' 55.935"
Big Lost River Rest Area	Yes	INL	Rest Area	Low-Volume Air	Yes	N43* 32' 55.260"	W113* 0' 35.640"
Blackfoot	Yes	ESER/INL	Blackfoot	Low-volume Air & Atmospheric Moisture Sampler	No	N43* 11' 23.204"	W112* 19' 59.484"
Blue Dome	No	ESER	Blue Dome	Low-Volume Air	No	N44* 4' 29.603"	W112* 50' 31.601"
CFA	No	INL	CFA	Low-Volume Air	Yes	N43* 31' 56.807"	W112* 56' 52.622"
CITRC	No	INL	PBF	Low-Volume Air	Yes	N43* 32' 50.940"	W112* 52' 10.860"
Craters of the Moon	Yes	ESER/INL	Craters of the Moon	Low-volume Air Sampler & Precipitation Monitor for H-3	No	N43* 27' 44.080"	W113* 33' 42.882"
Dubois	No	ESER	Dubois	Low-Volume Air	No	N44* 10' 38.115"	W112* 13' 49.772"
Experimental Field Station	Yes	ESER/INL	EFS	Low-volume Air Sampler & Precipitation Monitor for H-3	Yes	N43* 36' 17.442"	W112* 54' 24.364"
FAA Tower	No	ESER	FAA Tower	Low-Volume Air	No	N43* 33' 16.562"	W112* 32' 17.172"
Howe	Yes	ESER/ICP	Howe	Low-Volume Air/Waste Management Monitoring/ NESHAP Compliance Sampling	No	N43* 47' 2.705"	W112* 58' 38.284"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
Idaho Falls	Yes	ESER/ INL	Idaho Falls	Low-Volume Air & Atmospheric Moisture Sampler	No	N43* 30' 42.315"	W112* 3' 33.556"
INTEC - North of facility	No	INL	INTEC	Low-Volume Air	Yes	N43* 34' 40.548"	W112* 55' 48.522"
INTEC - south of Cleveland Blvd.	No	INL	CPP	Low-Volume Air	Yes	N43* 34' 11.595"	W112* 56' 16.560"
INTEC/ICDF	No	ICP	INT 100.3	Waste Management Monitoring	Yes	N43* 33' 57.238"	W112* 56' 22.150"
Jackson Hole	No	ESER	Jackson Hole	Low-Volume Air	No	N43* 28' 41.228"	W110* 45' 40.258"
Main Guard Gate	No	ESER	Main Gate	Low-Volume Air	Yes	N43* 30' 40.535"	W112* 53' 51.463"
MFC	No	INL	ANL-W	Low-Volume Air	Yes	N43* 35' 38.880"	W112* 39' 6.240"
Monteview	No	ESER	Monteview	Low-Volume Air	No	N44* 0' 55.355"	W112* 32' 9.552"
Mud Lake	No	ESER	Mud Lake	Low-Volume Air	No	N43* 50' 19.795"	W112* 28' 35.190"
NRF	No	INL	NRF	Low-Volume Air	Yes	N43* 38' 48.395"	W112* 54' 49.028"
Rexburg	No	ESER	Rexburg	Low-Volume Air	No	N43* 48' 34.204"	W111* 48' 1.599"
Rexburg	No	INL	Rexburg	Lo-volume Air & Atmospheric Moisture Sampler	No	N43* 48' 43.775"	W111* 47' 35.009"
RWMC - East side of the SDA	No	ICP	SDA 1.3	Waste Management Monitoring	Yes	N43* 29' 55.941"	W113* 2' 28.822"
RWMC - Northeast of Pit 9	Yes	ICP/INL	SDA 2.3	Waste Management Monitoring/ Low-Volume Air	Yes	N43* 30' 5.946"	W113* 2' 24.975"
RWMC - Northeast side of the SDA	No	ICP	SDA 4.2	Waste Management Monitoring	Yes	N43* 30' 4.770"	W113* 2' 42.175"
RWMC - Northeast side of the SDA	No	ICP	SDA 4.3	Waste Management Monitoring	Yes	N43* 30' 4.769"	W113* 2' 42.280"
RWMC - Northwest side	No	ICP	SDA 6.3	Waste Management	Yes	N43* 30' 4.778"	W113* 2' 58.413"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
of the SDA				Monitoring			
RWMC - Southeast side of the SDA	No	ICP	SDA 11.3	Waste Management Monitoring	Yes	N43* 29' 50.842"	W113* 2' 40.511"
RWMC - Southwest side of the SDA	No	ICP	SDA 9.3	Waste Management Monitoring	Yes	N43* 29' 55.658"	W113* 2' 58.294"
Sand Dunes NOAA tower	Yes	INL	Gate4	Low-Volume Air	Yes	N43* 46' 46.524"	W112* 45' 29.340"
TAN/SMC	No	INL	SMC	Low-Volume Air	Yes	N43* 51' 35.160"	W112* 43' 48.960"
TAN/TSF	No	INL	TAN	Low-Volume Air	Yes	N43* 50' 54.016"	W112* 42' 2.549"
Van Buren Blvd	Yes	ESER/ INL	Van Buren	Low-volume Air Sampler & Precipitation Monitor for H-3	Yes	N43* 32' 3.521"	W112* 58' 59.300"

Table A-4 Biota Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
MFC - Industrial Waste Pond	No	ESER	Industrial Waste Pond (IWP)	Waterfowl	Yes	N43* 35' 51.536"	W112* 39' 33.730"
MFC -SW Sanitary Sewage Lagoon Pond (MFC-779)	No	ESER	Sanitary Sewage Lagoons	Waterfowl	Yes	N43* 35' 54.867"	W112* 39' 17.800"
ATR Complex - Main Sewage Lagoon TRA-736	No	ESER	Sewage Lagoons	Waterfowl	Yes	N43* 35' 15.098"	W112* 57' 12.904"
INTEC - Cell 2 at Sewage Treatment Lagoons	No	ESER	Sewage Treatment Lagoons	Waterfowl	Yes	N43* 34' 31.967"	W112* 55' 41.857"
VZRP - South of new INTEC Percolation Ponds	No	ESER	New Percolation Ponds	Waterfowl	Yes	N43* 33' 15.397"	W112* 58' 18.705"
Big Southern Butte - North end of the runway at Frenchman's Cabin	No	ICP	Frenchman`s Cabin	Biotic Monitoring	No	N43* 26' 10.728"	W113* 3' 11.115"

Table A-5 Drinking Water Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
Atomic City	No	ESER	Atomic City	Drinking Water	No	N43* 26' 41.494"	W112* 48' 43.649"
ATR Complex	No	INL	TRA-650	Drinking Water	Yes	N43* 35' 21.212"	W112* 57' 37.939"
ATR Complex	No	INL	TRA-608	Drinking Water	Yes	N43* 35' 18.259"	W112* 57' 43.773"
ATR Complex	No	INL	TRA-672	Drinking Water	Yes	N43* 35' 21.506"	W112* 57' 44.419"
ATR Complex	No	INL	TRA-601	Drinking Water	Yes	N43* 35' 21.197"	W112* 57' 40.660"
ATR Complex	No	INL	TRA-696	Drinking Water	Yes	N43* 35' 18.259"	W112* 57' 43.773"
Big Lost River Rest Area	No	ESER	Rest Area	Drinking Water	Yes	N43* 32' 53.962"	W113* 0' 30.949"
CFA	No	INL	CFA-1603	Drinking Water	Yes	N43* 31' 45.313"	W112* 56' 33.665"
CFA	No	INL	CFA-642	Drinking Water	Yes	N43* 31' 43.663"	W112* 56' 38.237"
CFA	No	INL	CFA-651	Drinking Water	Yes	N43* 32' 3.445"	W112* 56' 22.412"
CFA Rifle Range	No	INL	B21-608	Drinking Water	Yes	N43* 32' 43.918"	W112* 59' 9.231"
CITRC	No	INL	PBF-614	Drinking Water	Yes	N43* 32' 53.944"	W112* 51' 59.781"
CITRC	No	INL	PBF-602	Drinking Water	Yes	N43* 32' 51.888"	W112* 52' 6.528"
CITRC	No	INL	PBF-638	Drinking Water	Yes	N43* 32' 49.901"	W112* 52' 6.185"
Craters of the Moon	No	ESER	Craters of the Moon	Drinking Water	No	N43* 27' 44.080"	W113* 33' 42.882"
EBR-I	No	INL	EBR-601	Drinking Water	Yes	N43* 30' 40.988"	W113* 0' 23.414"
Howe	No	ESER	Howe	Drinking Water	No	N43* 46' 59.053"	W113* 0' 4.420"
Howe	Yes	ESER	Howe	Drinking Water	No	N43* 47' 0.971"	W113* 0' 17.775"
Idaho Falls	No	ESER	Idaho Falls	Drinking Water	No	N43* 29' 47.861"	W112* 3' 7.276"
INTEC	Yes	ICP	CPP-614	Drinking Water	Yes	N43* 34' 25.071"	W112* 56' 6.645"
Main Guard Gate	No	INL	B27-603	Drinking Water	Yes	N43* 30' 39.130"	W112* 53' 49.168"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
MFC	No	INL	MFC-754 Manifold	Drinking Water	Yes	N43* 35' 44.371"	W112* 39' 20.839"
Minidoka	No	ESER	Minidoka	Drinking Water	No	N42* 45' 12.728"	W113* 29' 24.430"
Minidoka	Yes	ESER	Minidoka	Drinking Water	No	N42* 45' 12.728"	W113* 29' 24.430"
Mud Lake	No	ESER	Mud Lake Well #2 (Control)	Drinking Water	No	N43* 50' 32.448"	W112* 28' 44.121"
North of INTEC	No	ICP	CPP-1767 Sump	Drinking Water	Yes	N43* 34' 39.992"	W112* 55' 49.187"
RWMC	No	ICP	WMF-603	Drinking Water	Yes	N43* 30' 2.986"	W113* 2' 17.018"
RWMC	No	ICP	WMF-604	Drinking Water	Yes	N43* 30' 2.223"	W113* 2' 19.127"
Shoshone	Yes	ESER	Shoshone	Drinking Water	No	N42* 56' 7.081"	W114* 24' 25.778"
TAN/SMC	No	INL	TAN-614	Drinking Water	Yes	N43* 51' 21.014"	W112* 43' 24.921"
TAN/SMC	No	INL	TAN-632	Drinking Water	Yes	N43* 51' 20.019"	W112* 43' 23.980"
TAN/SMC	No	INL	TAN-639	Drinking Water	Yes	N43* 51' 18.775"	W112* 43' 20.922"
TAN/TSF	No	INL	TAN-613	Drinking Water	Yes	N43* 50' 59.228"	W112* 42' 10.139"
TAN/TSF	No	INL	TAN-610	Drinking Water	Yes	N43* 50' 54.810"	W112* 42' 8.547"

Table A-6 Event Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
CFA	No	INL	CFA	High volume air monitor	Yes	N43* 31' 57.420"	W112* 56' 51.840"
MFC	No	INL	EBR	High volume air monitor	Yes	N43* 35' 38.880"	W112* 39' 6.240"
TAN/SMC	No	INL	LOF	High volume air monitor	Yes	N43* 51' 35.160"	W112* 43' 48.960"
NRF	No	INL	NRF	High volume air monitor	Yes	N43* 38' 52.320"	W112* 54' 40.440"
CITRC	No	INL	PBF	High volume air monitor	Yes	N43* 32' 50.940"	W112* 52' 10.860"
RWMC	No	INL	RWM	High volume air monitor	Yes	N43* 30' 12.360"	W113* 2' 45.720"
ATR Complex	No	INL	GRI	High volume air monitor	Yes	N43* 35' 4.680"	W112* 58' 7.200"
Arco	No	INL	ARC	High volume air monitor	No	N43* 37' 28.380"	W113* 17' 49.560"
Atomic City	No	INL	ATO	High volume air monitor	No	N43* 26' 37.440"	W112* 48' 56.340"
Blue Dome	No	INL	BLU	High volume air monitor	No	N44* 4' 30.000"	W112* 50' 31.320"
Howe	No	INL	HOW	High volume air monitor	No	N43* 47' 2.820"	W112* 58' 38.340"
Kettle Butte	No	INL	KET	High volume air monitor	No	N43* 32' 51.240"	W112* 19' 34.500"
Monteview	No	INL	MON	High volume air monitor	No	N44* 0' 55.320"	W112* 32' 9.300"
Terreton	No	INL	TER	High volume air monitor	No	N43* 50' 30.060"	W112* 25' 5.700"
Idaho Falls	No	INL	IDA	High volume air monitor	No	N43* 30' 14.880"	W112* 3' 0.480"
Rexburg	No	INL	RXB	High volume air monitor	No	N43* 48' 34.200"	W111* 48' 1.740"

Table A-7 External Radiation Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
Aberdeen	Yes	ESER/INL	ABERDEEN O-8	Dosimeter	No	N42* 57' 17.524"	W112* 49' 28.437"
ARA	No	INL	ARA I&II O-1	Dosimeter	Yes	N43* 31' 3.147"	W112* 49' 27.438"
Arco	Yes	ESER/INL	ARCO O-1	Dosimeter	No	N43* 37' 28.547"	W113* 17' 49.078"
Atomic City	No	INL	ATOMIC CITY O-2	Dosimeter	No	N43* 26' 37.262"	W112* 48' 56.129"
ATR	No	INL	TRA O-13	Dosimeter	Yes	N43* 35' 9.083"	W112* 58' 6.557"
ATR	No	INL	TRA O-11	Dosimeter	Yes	N43* 35' 19.245"	W112* 58' 7.468"
ATR	No	INL	TRA O-10	Dosimeter	Yes	N43* 35' 23.100"	W112* 58' 1.974"
ATR	No	INL	TRA O-8	Dosimeter	Yes	N43* 35' 26.581"	W112* 57' 48.040"
ATR	No	INL	TRA O-6	Dosimeter	Yes	N43* 35' 22.273"	W112* 57' 38.446"
ATR	No	INL	TRA O-4	Dosimeter	Yes	N43* 35' 8.532"	W112* 57' 32.604"
ATR	No	INL	TRA O-2	Dosimeter	Yes	N43* 34' 59.929"	W112* 57' 42.848"
Blackfoot	No	ESER	Blackfoot	Dosimeter	No	N43* 12' 13.911"	W112* 22' 15.588"
Blackfoot	Yes	ESER/INL	BLACKFOOT O-9	Dosimeter	No	N43* 11' 23.204"	W112* 19' 59.484"
Blue Dome	Yes	ESER/INL OP	Blue Dome	Dosimeter	No	N44* 4' 29.603"	W112* 50' 31.601"
CFA	No	INL	CFA O-1	Dosimeter	Yes	N43* 31' 52.765"	W112* 56' 53.828"
CFA	No	INL	LINCOLNBLVD O-1	Dosimeter	Yes	N43* 31' 36.297"	W112* 56' 48.220"
CITRC	No	INL	PBF SPERT O-1	Dosimeter	Yes	N43* 32' 52.743"	W112* 52' 3.822"
Craters of the Moon	Yes	ESER/INL	CRATERS OF THE MOON O-7	Dosimeter	No	N43* 27' 44.890"	W113* 33' 41.599"
Dubois	No	ESER	Dubois	Dosimeter	No	N44* 10' 38.115"	W112* 13' 49.772"
EBR-I	No	INL	EBR I O-1	Dosimeter	Yes	N43* 30' 42.916"	W113* 0' 21.618"
Howe	Yes	ESER/INL	HOWE O-3 & 001	Dosimeter	No	N43* 47' 2.789"	W112* 58' 38.544"
Idaho Falls	No	INL	IDAHO FALLS O-10	Dosimeter	No	N43* 30' 42.662"	W112* 3' 31.836"
Idaho Falls	No	INL	Idaho Falls-627 O-30	Dosimeter	No	N43* 30' 53.461"	W112* 2' 17.152"
Idaho Falls	No	INL	Idaho Falls IF-675S O-34	Dosimeter	No	N43* 30' 28.858"	W111* 58' 40.110"
Idaho Falls	No	INL	Idaho Falls IF-675W O-35	Dosimeter	No	N43* 30' 29.929"	W111* 58' 39.993"
Idaho Falls	No	ESER	Idaho Falls	Dosimeter	No	N43* 30' 42.315"	W112* 3' 33.556"
Idaho Falls	No	INL	Idaho Falls-675E O-31	Dosimeter	No	N43* 30' 29.674"	W111* 58' 39.455"
Idaho Falls	No	INL	Idaho Falls	Dosimeter	No	N43* 30' 29.772"	W111* 58' 39.412"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
			IF-675D O-33				
INTEC	No	INL	ICPP O-19	Dosimeter	Yes	N43* 34' 14.466"	W112* 56' 16.490"
INTEC	No	INL	ICPP TREEFARM O-3	Dosimeter	Yes	N43* 34' 2.057"	W112* 56' 25.721"
INTEC	No	INL	ICPP O-21	Dosimeter	Yes	N43* 33' 52.903"	W112* 56' 15.041"
INTEC	No	INL	ICPP O-23	Dosimeter	Yes	N43* 33' 52.718"	W112* 55' 55.332"
INTEC	No	INL	ICPP O-25	Dosimeter	Yes	N43* 34' 2.766"	W112* 55' 49.635"
INTEC	No	INL	ICPP O-26	Dosimeter	Yes	N43* 34' 17.625"	W112* 55' 44.983"
INTEC	No	INL	ICPP O-15	Dosimeter	Yes	N43* 34' 36.370"	W112* 55' 48.257"
INTEC	No	INL	ICPP O-9	Dosimeter	Yes	N43* 34' 39.266"	W112* 55' 34.127"
INTEC	No	INL	ICPP O-17	Dosimeter	Yes	N43* 34' 33.426"	W112* 56' 16.653"
Jackson Hole	No	ESER	Jackson Hole	Dosimeter	No	N43* 28' 41.228"	W110* 45' 40.258"
Lincoln Blvd.	No	INL	LINCOLN BVLD O-9	Dosimeter	Yes	N43* 38' 47.472"	W112* 54' 2.426"
Lincoln Blvd.	No	INL	LINCOLN BVLD O-5	Dosimeter	Yes	N43* 35' 51.264"	W112* 56' 23.567"
Lincoln Blvd.	No	INL	LINCOLN BVLD O-3	Dosimeter	Yes	N43* 33' 19.046"	W112* 56' 35.126"
MFC	No	INL	ANL W EBR II O-13	Dosimeter	Yes	N43* 35' 29.581"	W112* 39' 8.056"
MFC	No	INL	ANL W EBR II O-12	Dosimeter	Yes	N43* 35' 35.103"	W112* 39' 25.154"
MFC	No	INL	ANL W EBR II O-7	Dosimeter	Yes	N43* 35' 41.209"	W112* 39' 35.490"
MFC	No	INL	ANL W EBR II O-18	Dosimeter	Yes	N43* 35' 50.616"	W112* 39' 32.805"
MFC	No	INL	ANL W EBR II O-17	Dosimeter	Yes	N43* 35' 54.895"	W112* 39' 23.824"
MFC	No	INL	ANL W EBR II O-15	Dosimeter	Yes	N43* 35' 50.578"	W112* 39' 8.586"
MFC	No	INL	ANL W TREAT O-9	Dosimeter	Yes	N43* 35' 52.835"	W112* 39' 42.946"
Minidoka	Yes	ESER/INL	MINIDOKA O-11	Dosimeter	No	N42* 48' 15.850"	W113* 35' 22.386"
Monteview	Yes	ESER/INL	MONTEVIEW O-4	Dosimeter	No	N44* 0' 55.355"	W112* 32' 9.552"
Mud Lake	Yes	ESER/INL	MUD LAKE O-5	Dosimeter	No	N43* 50' 19.795"	W112* 28' 35.190"
NRF	No	INL	NRF O-20	Dosimeter	Yes	N43* 38' 41.426"	W112* 54' 57.807"
NRF	No	INL	NRF O-19	Dosimeter	Yes	N43* 38' 41.388"	W112* 55' 11.643"
NRF	No	INL	NRF O-16	Dosimeter	Yes	N43* 39' 6.592"	W112* 55' 10.526"
NRF	No	INL	NRF O-5	Dosimeter	Yes	N43* 39' 7.416"	W112* 55' 0.062"
NRF	No	INL	NRF O-4	Dosimeter	Yes	N43* 39' 7.357"	W112* 54' 44.212"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
NRF	No	INL	NRF O-12	Dosimeter	Yes	N43* 38' 52.349"	W112* 54' 42.308"
Reno Ranch	Yes	ESER/INL	RENO RANCH O-6	Dosimeter	No	N44* 1' 38.278"	W112* 43' 11.708"
Rexburg	No	INL	REXBURG O-12	Dosimeter	No	N43* 48' 43.685"	W111* 47' 34.960"
Roberts	Yes	ESER/INL	ROBERTS O-13	Dosimeter	No	N43* 44' 31.853"	W112* 7' 33.049"
RWMC	No	INL	RWMC O-46	Dosimeter	Yes	N43* 30' 6.601"	W113* 2' 23.095"
RWMC	No	INL	RWMC O-9A	Dosimeter	Yes	N43* 30' 5.652"	W113* 2' 47.154"
RWMC	No	INL	RWMC O-13A	Dosimeter	Yes	N43* 30' 5.662"	W113* 3' 1.047"
RWMC	No	INL	RWMC O-17A	Dosimeter	Yes	N43* 30' 2.178"	W113* 3' 14.600"
RWMC	No	INL	RWMC O-21A	Dosimeter	Yes	N43* 29' 55.410"	W113* 3' 3.372"
RWMC	No	INL	RWMC O-25A	Dosimeter	Yes	N43* 29' 51.787"	W113* 2' 50.292"
RWMC	No	INL	RWMC O-29A	Dosimeter	Yes	N43* 29' 48.455"	W113* 2' 37.267"
RWMC	No	INL	RWMC O-43	Dosimeter	Yes	N43* 29' 43.430"	W113* 2' 13.722"
RWMC	No	INL	RWMC O-41	Dosimeter	Yes	N43* 29' 54.988"	W113* 2' 7.209"
RWMC	No	INL	RWMC O-39	Dosimeter	Yes	N43* 30' 3.378"	W113* 2' 9.316"
State Highway 22	No	INL	Hwy22 T28 O-1	Dosimeter	Yes	N43* 55' 19.867"	W112* 46' 39.291"
State Highway 28	No	INL	Hwy28 N2300 O-2	Dosimeter	Yes	N43* 57' 26.054"	W112* 40' 54.284"
State HWY 33	No	INL	Hwy33 T17 O-3	Dosimeter	Yes	N43* 50' 27.297"	W112* 38' 57.626"
TAN	No	INL	TAN LOFT O-7	Dosimeter	Yes	N43* 51' 28.583"	W112* 43' 25.979"
TAN	No	INL	TAN LOFT O-6	Dosimeter	Yes	N43* 51' 17.285"	W112* 43' 57.187"
TAN	No	INL	LINCOLN BVLD O-25	Dosimeter	Yes	N43* 49' 46.107"	W112* 43' 1.357"
US HWY 20	No	INL	Hwy20 Mile O-276	Dosimeter	Yes	N43* 32' 42.631"	W112* 39' 13.609"
US HWY 26	No	ESER	Atomic City	Dosimeter	Yes	N43* 27' 3.952"	W112* 47' 30.286"

Table A-8 Groundwater Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
Atomic City	No	USGS	ATOMIC CITY	Drinking Water	No	N43* 26' 37.674"	W112* 48' 43.972"
ATR Complex	No	ICP	PW-14	Observation	Yes	N43* 35' 17.663"	W112* 57' 36.679"
ATR Complex	No	ICP	PW-11	Observation	Yes	N43* 35' 4.879"	W112* 57' 25.475"
ATR Complex	No	ICP	PW-12	Observation	Yes	N43* 35' 9.227"	W112* 57' 51.694"
ATR Complex	No	ICP	PW-13	Observation	Yes	N43* 35' 5.128"	W112* 57' 43.881"
ATR Complex	No	ICP	TRA-1933	Monitoring	Yes	N43* 35' 5.049"	W112* 57' 44.539"
ATR Complex	No	ICP	TRA-1934	Monitoring	Yes	N43* 35' 4.402"	W112* 57' 44.653"
ATR Complex	No	ICP	TRA-06A	Observation	Yes	N43* 34' 45.558"	W112* 57' 50.111"
ATR Complex	Yes	ICP/INL/ USGS	USGS-065	Observation	Yes	N43* 34' 46.516"	W112* 57' 50.122"
ATR Complex	Yes	ICP/USGS	USGS-053	Observation	Yes	N43* 35' 1.976"	W112* 57' 37.735"
ATR Complex	Yes	ICP/USGS	USGS-054	Observation	Yes	N43* 35' 1.966"	W112* 57' 30.934"
ATR Complex	Yes	ICP/USGS	USGS-056	Observation	Yes	N43* 35' 8.898"	W112* 57' 37.945"
ATR Complex	Yes	ICP/USGS	USGS-058	Observation	Yes	N43* 34' 59.855"	W112* 57' 28.065"
ATR Complex	Yes	ICP/USGS	USGS-055	Observation	Yes	N43* 35' 8.460"	W112* 57' 32.464"
ATR Complex	Yes	ICP/USGS	PW-9	Observation	Yes	N43* 35' 0.427"	W112* 57' 57.988"
ATR Complex	No	INL	TRA-1863	Potable Water	Yes	N43* 35' 21.725"	W112* 57' 35.659"
ATR Complex	No	USGS	TRA-03	Potable Water	Yes	N43* 35' 21.135"	W112* 57' 37.913"
ATR Complex	Yes	INL/ICP	TRA-08	Observation	Yes	N43* 34' 30.485"	W112* 58' 4.203"
ATR Complex	Yes	INL/ICP	TRA-07	Observation	Yes	N43* 34' 48.502"	W112* 58' 1.742"
ATR Complex	Yes	INL/ICP	MIDDLE-1823	Monitoring	Yes	N43* 34' 18.631"	W112* 58' 20.581"
ATR Complex	Yes	INL/USGS	TRA-01	Potable Water	Yes	N43* 35' 21.129"	W112* 57' 40.669"
ATR Complex	Yes	INL/USGS	TRA-04	Potable Water	Yes	N43* 35' 21.519"	W112* 57' 44.330"
ATR Complex	Yes	INL/USGS	USGS-076	Observation	Yes	N43* 34' 24.970"	W112* 57' 35.299"
ATR Complex	No	USGS	MTR TEST	Observation	Yes	N43* 35' 19.746"	W112* 57' 32.190"
ATR Complex	No	USGS	USGS-070	Observation	Yes	N43* 35' 3.114"	W112* 57' 13.888"
ATR Complex	No	USGS	TRA DISPOSAL	Observation	Yes	N43* 35' 5.820"	W112* 57' 39.968"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
ATR Complex	No	USGS	USGS-068	Observation	Yes	N43* 35' 14.674"	W112* 57' 42.376"
ATR Complex	No	USGS	USGS-072	Observation	Yes	N43* 35' 18.836"	W112* 57' 49.147"
ATR Complex	No	USGS	USGS-098	Monitoring	Yes	N43* 36' 56.706"	W112* 56' 39.303"
ATR Complex	No	USGS	WATER SUPPLY FOR INEL 1	Monitoring	Yes	N43* 37' 15.664"	W112* 56' 38.992"
ATR Complex	No	USGS	USGS-134	Monitoring	Yes	N43* 36' 10.815"	W113* 0' 1.272"
ATR Complex	No	USGS	USGS-133	Monitoring	Yes	N43* 36' 5.100"	W112* 55' 46.306"
ATR Complex	No	USGS	CWP-01	Observation	Yes	N43* 34' 58.582"	W112* 57' 28.960"
ATR Complex	No	USGS	CWP-03	Observation	Yes	N43* 34' 54.726"	W112* 57' 28.369"
ATR Complex	No	USGS	CWP-08	Observation	Yes	N43* 34' 59.624"	W112* 57' 33.093"
ATR Complex	No	USGS	PW-8	Observation	Yes	N43* 34' 56.213"	W112* 57' 23.725"
ATR Complex	No	USGS	USGS-060	Observation	Yes	N43* 34' 56.321"	W112* 57' 23.333"
ATR Complex	No	USGS	USGS-061	Observation	Yes	N43* 34' 52.812"	W112* 57' 18.617"
ATR Complex	No	USGS	USGS-063	Observation	Yes	N43* 34' 55.149"	W112* 57' 43.191"
ATR Complex	No	USGS	USGS-069	Observation	Yes	N43* 34' 49.882"	W112* 57' 32.348"
ATR Complex	No	USGS	USGS-071	Observation	Yes	N43* 34' 39.436"	W112* 57' 18.376"
ATR Complex	No	USGS	USGS-073	Observation	Yes	N43* 35' 0.517"	W112* 57' 56.698"
ATR Complex	No	USGS	USGS-084	Observation	Yes	N43* 33' 56.170"	W112* 57' 44.830"
ATR Complex	No	USGS	USGS-078	Observation	Yes	N43* 34' 12.983"	W112* 57' 38.901"
ATR Complex	No	USGS	MIDDLE-2050A	Corehole	Yes	N43* 34' 9.140"	W112* 57' 8.370"
ATR Complex	No	USGS	USGS-062	Observation	Yes	N43* 34' 45.799"	W112* 57' 9.082"
ATR Complex	No	USGS	USGS-066	Observation	Yes	N43* 34' 38.730"	W112* 56' 59.575"
ATR Complex	No	USGS	SITE-19	Observation	Yes	N43* 35' 21.980"	W112* 58' 24.484"
ATR Complex	No	USGS	USGS-079	Observation	Yes	N43* 35' 5.151"	W112* 58' 22.102"
Big Lost River Rest Area	Yes	ICP/USGS	HIGHWAY 3	Potable Water	Yes	N43* 32' 55.709"	W113* 0' 28.861"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
Big Southern Butte	No	USGS	USGS-OBS-A-124	Monitoring	No	N43* 23' 6.540"	W112* 58' 31.208"
Big Southern Butte	No	USGS	USGS-OBS-A-125	Monitoring	No	N43* 25' 59.083"	W113* 5' 33.352"
Big Southern Butte	No	USGS	USGS-014	Observation/ Distant Groundwater Monitoring Location	No	N43* 20' 18.947"	W112* 56' 34.906"
Big Southern Butte	No	USGS	USGS-011	Observation/ Distant Groundwater Monitoring Location	No	N43* 23' 35.841"	W113* 6' 45.517"
CFA	No	ICP	LF2-08	Observation	Yes	N43* 32' 16.015"	W112* 56' 34.773"
CFA	No	ICP	LF2-09	Observation	Yes	N43* 32' 16.203"	W112* 56' 36.977"
CFA	No	ICP	LF2-11	Observation	Yes	N43* 32' 30.065"	W112* 56' 19.998"
CFA	No	ICP	LF3-08	Observation	Yes	N43* 32' 18.054"	W112* 57' 13.059"
CFA	Yes	ICP/USGS	USGS-085	Observation	Yes	N43* 32' 45.895"	W112* 57' 14.880"
CFA	Yes	ICP/USGS	USGS-104	Observation	Yes	N43* 28' 55.738"	W112* 56' 11.126"
CFA	No	USGS	LF2-10	Observation	Yes	N43* 32' 15.537"	W112* 56' 35.958"
CFA	No	ICP	CFA-1932	Monitoring	Yes	N43* 32' 14.292"	W112* 57' 4.145"
CFA	No	ICP	CFA-1931	Monitoring	Yes	N43* 32' 15.249"	W112* 56' 29.561"
CFA	No	ICP	LF3-09	Observation	Yes	N43* 32' 15.215"	W112* 57' 13.381"
CFA	No	ICP	LF3-10	Observation	Yes	N43* 32' 22.115"	W112* 57' 22.104"
CFA	No	ICP	CFA-MON-A-001	Monitoring	Yes	N43* 31' 3.297"	W112* 56' 52.289"
CFA	No	ICP	CFA-MON-A-002	Monitoring	Yes	N43* 31' 4.188"	W112* 56' 29.236"
CFA	No	ICP	CFA-MON-A-003	Monitoring	Yes	N43* 31' 4.241"	W112* 56' 8.822"
CFA	Yes	ICP/USGS	USGS-103	Observation	Yes	N43* 27' 13.243"	W112* 56' 9.514"
CFA	Yes	ICP/USGS	USGS-128	Monitoring	Yes	N43* 32' 49.514"	W112* 56' 58.509"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
CFA	Yes	INL/USGS	CFA-2	Groundwater/ Potable Water	Yes	N43* 31' 43.610"	W112* 56' 38.095"
CFA	Yes	INL/USGS	CFA-1	Groundwater/ Potable Water	Yes	N43* 32' 3.496"	W112* 56' 22.512"
CFA	No	USGS	RIFLE RANGE WELL	Potable Water	Yes	N43* 32' 43.305"	W112* 59' 10.971"
CFA	No	USGS	USGS-083	Observation	Yes	N43* 30' 22.698"	W112* 56' 18.268"
CITRC	No	INL	SPERT-2	Potable Water	Yes	N43* 32' 46.516"	W112* 51' 53.808"
CITRC	Yes	INL/USGS	SPERT-1	Potable Water	Yes	N43* 32' 52.499"	W112* 52' 5.467"
East of ARA	No	USGS	USGS-002	Observation	Yes	N43* 33' 19.541"	W112* 43' 24.247"
East of ARA	No	USGS	NTP-AREA 2	Observation	Yes	N43* 32' 22.294"	W112* 47' 5.375"
EBR-I	Yes	ICP/USGS	SOUTH-MON-A-003	Monitoring	Yes	N43* 30' 36.320"	W113* 0' 29.836"
EBR-I	Yes	ICP/USGS	SOUTH-MON-A-001	Monitoring	Yes	N43* 30' 57.568"	W113* 1' 6.739"
EBR-I	No	USGS	EBR-I	Potable Water	Yes	N43* 30' 49.312"	W113* 0' 29.362"
Experimental Field Station	No	USGS	SITE-04	Production	Yes	N43* 36' 17.760"	W112* 54' 24.129"
Farragut Blvd.	Yes	ICP/USGS	USGS-OBS-A-127	Monitoring	Yes	N43* 30' 57.948"	W112* 57' 25.029"
ICDF	No	ICP	ICPP-1782	Monitoring	Yes	N43* 33' 42.978"	W112* 56' 28.621"
ICDF	No	ICP	ICPP-1783	Monitoring	Yes	N43* 33' 43.006"	W112* 56' 24.277"
ICDF	No	ICP	ICPP-1800	Monitoring	Yes	N43* 33' 43.032"	W112* 56' 17.800"
ICDF	No	ICP	ICPP-1829	Monitoring	Yes	N43* 33' 42.165"	W112* 56' 14.355"
ICDF	No	ICP	ICPP-1831	Monitoring	Yes	N43* 33' 42.112"	W112* 56' 32.125"
ICDF	Yes	ICP/USGS	USGS-123	Observation	Yes	N43* 33' 51.367"	W112* 56' 16.716"
ICDF	Yes	ICP/USGS	USGS-057	Observation	Yes	N43* 33' 43.704"	W112* 56' 28.985"
INTEC	No	ICP	CPP-55-06	Observation	Yes	N43* 34'	W112* 55' 52.823"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
						16.579"	
INTEC	No	ICP	ICPP-SCI-P-218	Scientific Instrumentation	Yes	N43* 34' 30.440"	W112* 56' 11.681"
INTEC	No	ICP	ICPP-SCI-P-221	Scientific Instrumentation	Yes	N43* 34' 29.978"	W112* 55' 50.447"
INTEC	No	ICP	ICPP-SCI-P-248	Scientific Instrumentation	Yes	N43* 34' 30.428"	W112* 56' 12.195"
INTEC	No	ICP	ICPP-MON-A-230	Monitoring	Yes	N43* 34' 27.047"	W112* 56' 0.928"
INTEC	No	ICP	CPP-33-1	Observation	Yes	N43* 34' 19.828"	W112* 56' 1.346"
INTEC	No	ICP	CPP-33-2	Observation	Yes	N43* 34' 19.735"	W112* 56' 5.423"
INTEC	No	ICP	CPP-33-3	Observation	Yes	N43* 34' 23.912"	W112* 56' 5.169"
INTEC	No	ICP	CPP-37-4	Observation	Yes	N43* 34' 24.541"	W112* 55' 50.483"
INTEC	No	ICP	ICPP-MON-P-001	Monitoring	Yes	N43* 34' 13.224"	W112* 56' 12.634"
INTEC	No	ICP	ICPP-MON-P-002	Monitoring	Yes	N43* 34' 18.811"	W112* 55' 56.907"
INTEC	No	ICP	ICPP-MON-P-003	Monitoring	Yes	N43* 34' 18.040"	W112* 56' 9.018"
INTEC	No	ICP	ICPP-MON-P-004	Monitoring	Yes	N43* 34' 19.775"	W112* 55' 49.234"
INTEC	No	ICP	ICPP-MON-P-005	Monitoring	Yes	N43* 34' 17.062"	W112* 55' 59.568"
INTEC	No	ICP	ICPP-MON-P-006	Monitoring	Yes	N43* 34' 22.729"	W112* 56' 9.743"
INTEC	No	ICP	ICPP-MON-P-007	Monitoring	Yes	N43* 33' 58.276"	W112* 56' 3.911"
INTEC	No	ICP	ICPP-MON-P-009	Monitoring	Yes	N43* 33' 57.842"	W112* 56' 8.918"
INTEC	No	ICP	ICPP-MON-P-010	Monitoring	Yes	N43* 34' 19.492"	W112* 55' 59.414"
INTEC	No	ICP	ICPP-MON-P-013	Monitoring	Yes	N43* 34' 17.070"	W112* 55' 55.878"
INTEC	No	ICP	ICPP-MON-P-018	Monitoring	Yes	N43* 33' 57.476"	W112* 56' 5.313"
INTEC	No	ICP	ICPP-MON-P-020	Monitoring	Yes	N43* 34' 21.619"	W112* 55' 56.298"
INTEC	No	ICP	ICPP-MON-P-019	Monitoring	Yes	N43* 34' 16.206"	W112* 55' 57.794"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
INTEC	No	ICP	CS-CH	Scientific Instrumentation	Yes	N43* 34' 9.292"	W112* 56' 1.217"
INTEC	No	ICP	ICPP-2018	Monitoring	Yes	N43* 34' 18.059"	W112* 56' 0.508"
INTEC	No	ICP	ICPP-2019	Monitoring	Yes	N43* 34' 17.710"	W112* 55' 55.107"
INTEC	No	ICP	ICPP-2020	Monitoring	Yes	N43* 34' 18.009"	W112* 56' 1.408"
INTEC	No	ICP	ICPP-2021	Monitoring	Yes	N43* 34' 17.054"	W112* 55' 53.456"
INTEC	No	ICP	MW-8	Monitoring	Yes	N43* 34' 14.104"	W112* 55' 53.419"
INTEC	No	ICP	MW-11-2	Monitoring	Yes	N43* 34' 10.378"	W112* 56' 2.336"
INTEC	No	ICP	ICPP-2196	Monitoring	Yes	N43* 34' 18.391"	W112* 56' 5.828"
INTEC	No	ICP	ICPP-2205	Monitoring	Yes	N43* 34' 18.799"	W112* 56' 5.466"
INTEC	No	ICP	ICPP-2195	Monitoring	Yes	N43* 34' 21.173"	W112* 56' 5.526"
INTEC	No	ICP	TF-DP	Scientific Instrumentation	Yes	N43* 34' 27.023"	W112* 56' 2.368"
INTEC	No	ICP	STL-CH-2	Scientific Instrumentation	Yes	N43* 34' 29.661"	W112* 55' 50.050"
INTEC	No	ICP	TF-CH	Scientific Instrumentation	Yes	N43* 34' 27.046"	W112* 56' 1.631"
INTEC	No	ICP	33-4	Observation	Yes	N43* 34' 26.323"	W112* 56' 0.445"
INTEC	No	ICP	CPP-05	Potable Water	Yes	N43* 34' 40.270"	W112* 55' 48.833"
INTEC	Yes	ICP/USGS	USGS-047	Observation	Yes	N43* 34' 7.177"	W112* 56' 6.114"
INTEC	Yes	ICP/USGS	USGS-052	Observation	Yes	N43* 34' 14.401"	W112* 55' 47.252"
INTEC	Yes	ICP/USGS	USGS-067	Observation	Yes	N43* 33' 43.758"	W112* 55' 43.710"
INTEC	Yes	ICP/USGS	USGS-112	Monitoring	Yes	N43* 33' 14.164"	W112* 56' 33.727"
INTEC	Yes	ICP/USGS	USGS-041	Observation	Yes	N43* 34' 7.367"	W112* 56' 14.768"
INTEC	Yes	ICP/USGS	USGS-042	Observation	Yes	N43* 34' 2.422"	W112* 56' 14.714"
INTEC	Yes	ICP/USGS	USGS-048	Observation	Yes	N43* 34' 0.286"	W112* 56' 5.504"
INTEC	Yes	ICP/USGS	USGS-051	Observation	Yes	N43* 33' 49.672"	W112* 56' 9.045"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
INTEC	Yes	ICP/USGS	USGS-059	Observation	Yes	N43* 33' 53.985"	W112* 55' 51.012"
INTEC	Yes	ICP/USGS	CPP-01	Potable Water	Yes	N43* 34' 32.381"	W112* 56' 5.208"
INTEC	Yes	ICP/USGS	USGS-121	Monitoring	Yes	N43* 34' 49.146"	W112* 56' 6.308"
INTEC	Yes	ICP/USGS	CPP-04	Potable Water	Yes	N43* 34' 40.610"	W112* 55' 47.882"
INTEC	Yes	ICP/USGS	USGS-111	Observation	Yes	N43* 33' 30.825"	W112* 56' 8.179"
INTEC	No	USGS	USGS-115	Observation	Yes	N43* 33' 19.881"	W112* 55' 44.375"
INTEC	No	USGS	USGS-082	Monitoring	Yes	N43* 34' 0.597"	W112* 55' 13.336"
INTEC	No	USGS	CPP-02	Potable Water	Yes	N43* 34' 32.330"	W112* 56' 11.976"
INTEC	No	USGS	USGS-037	Observation	Yes	N43* 33' 25.463"	W112* 56' 51.123"
INTEC	No	USGS	USGS-038	Observation	Yes	N43* 33' 22.009"	W112* 56' 46.253"
INTEC	No	USGS	USGS-077	Observation	Yes	N43* 33' 14.913"	W112* 56' 6.556"
INTEC	No	USGS	USGS-113	Observation	Yes	N43* 33' 14.200"	W112* 56' 21.278"
INTEC	No	USGS	USGS-114	Monitoring	Yes	N43* 33' 18.534"	W112* 55' 53.737"
INTEC	No	USGS	USGS-116	Monitoring	Yes	N43* 33' 31.217"	W112* 55' 35.652"
INTEC	No	USGS	USGS-020	Observation	Yes	N43* 32' 52.466"	W112* 55' 2.392"
INTEC	No	USGS	USGS-034	Observation	Yes	N43* 33' 34.101"	W112* 56' 57.750"
INTEC	No	USGS	USGS-035	Observation	Yes	N43* 33' 38.536"	W112* 57' 1.125"
INTEC	No	USGS	USGS-036	Monitoring	Yes	N43* 33' 29.771"	W112* 56' 54.460"
INTEC	No	USGS	USGS-039	Monitoring	Yes	N43* 33' 42.855"	W112* 57' 4.409"
INTEC	No	USGS	USGS-043	Observation	Yes	N43* 34' 14.456"	W112* 56' 17.807"
INTEC	No	USGS	USGS-044	Observation	Yes	N43* 34' 8.270"	W112* 56' 24.134"
INTEC	No	USGS	USGS-045	Observation	Yes	N43* 34' 2.011"	W112* 56' 20.744"
INTEC	No	USGS	USGS-046	Observation	Yes	N43* 34' 6.214"	W112* 56' 17.668"
Lincoln Blvd.	No	USGS	USGS-099	Monitoring	Yes	N43* 37' 3.404"	W112* 55' 24.168"
Lincoln Blvd.	No	USGS	SITE-14	Observation	Yes	N43* 43' 34.329"	W112* 46' 34.476"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
Lincoln Blvd.	No	USGS	USGS-017	Monitoring	Yes	N43* 39' 36.086"	W112* 51' 57.255"
Lincoln Blvd.	No	USGS	USGS-018	Observation	Yes	N43* 45' 40.363"	W112* 44' 12.261"
Main Guard Gate	No	USGS	BADGING FACILITY WELL	Potable Water	Yes	N43* 30' 39.905"	W112* 53' 51.502"
MFC	Yes	ICP/USGS	USGS-100	Observation	Yes	N43* 35' 2.395"	W112* 40' 9.629"
MFC	No	INL	EBR-II #2	Potable Water	Yes	N43* 35' 44.166"	W112* 39' 28.428"
MFC	No	INL	EBR-II #1	Monitoring	Yes	N43* 35' 44.066"	W112* 39' 21.328"
MFC	No	INL	ANL-MON-A-012	Monitoring	Yes	N43* 36' 13.527"	W112* 38' 49.565"
MFC	No	INL	ANL-MON-A-013	Monitoring	Yes	N43* 35' 45.381"	W112* 39' 44.261"
MFC	No	INL	ANL-MON-A-014	Monitoring	Yes	N43* 35' 36.794"	W112* 39' 41.155"
MFC	No	INL	ANL-MON-A-011	Monitoring	Yes	N43* 35' 34.696"	W112* 39' 33.594"
MFC	No	USGS	ARBOR TEST	Observation	Yes	N43* 35' 8.590"	W112* 38' 50.968"
Northeast corner of site near farm land	No	USGS	USGS-027	Observation	Yes	N43* 48' 50.890"	W112* 32' 21.849"
Northeast corner of site near farm land	No	USGS	USGS-004	Observation	Yes	N43* 46' 55.606"	W112* 28' 24.558"
NPR	No	USGS	NPR TEST	Observation	Yes	N43* 34' 49.102"	W112* 52' 34.244"
NRF	No	USGS	NRF-11	Monitoring	Yes	N43* 38' 43.077"	W112* 54' 42.236"
NRF	No	USGS	NRF-12	Monitoring	Yes	N43* 38' 53.546"	W112* 54' 30.191"
NRF	No	USGS	NRF-6	Monitoring	Yes	N43* 39' 10.117"	W112* 55' 3.999"
NRF	No	USGS	NRF-9	Monitoring	Yes	N43* 38' 35.772"	W112* 55' 3.802"
NRF	No	USGS	USGS-015	Monitoring	Yes	N43* 42' 34.507"	W112* 55' 20.366"
NRF	No	USGS	NRF-7	Monitoring	Yes	N43* 39' 23.185"	W112* 54' 33.776"
NRF	No	USGS	NRF-MON-A-013	Monitoring	Yes	N43* 39' 32.286"	W112* 54' 52.276"
NRF	No	USGS	SITE-17	Observation	Yes	N43* 40' 26.403"	W112* 57' 59.496"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
NRF	No	USGS	USGS-023	Observation	Yes	N43* 40' 54.806"	W113* 0' 3.022"
NRF	No	USGS	USGS-097	Monitoring	Yes	N43* 38' 6.433"	W112* 55' 19.746"
NRF	No	USGS	NRF-MON-A-008	Monitoring	Yes	N43* 38' 41.196"	W112* 55' 14.256"
NRF	No	USGS	NRF-MON-A-010	Monitoring	Yes	N43* 38' 37.638"	W112* 54' 51.284"
NRF	No	USGS	USGS-102	Monitoring	Yes	N43* 38' 50.533"	W112* 55' 19.418"
RWMC	Yes	ICP/USGS	USGS-092	Observation	Yes	N43* 30' 0.205"	W113* 2' 56.187"
RWMC	Yes	ICP/USGS	USGS-109	Observation	Yes	N43* 27' 0.891"	W113* 2' 58.808"
RWMC	No	USGS	USGS-086	Observation	Yes	N43* 29' 34.450"	W113* 8' 4.446"
RWMC	No	ICP	88-02D	Observation	Yes	N43* 30' 0.694"	W113* 2' 34.540"
RWMC	No	ICP	SOUTH-MON-A-010	Monitoring	Yes	N43* 30' 8.404"	W113* 1' 47.377"
RWMC	No	ICP	SOUTH-MON-A-009	Monitoring	Yes	N43* 29' 48.864"	W113* 1' 47.216"
RWMC	No	ICP	RWMC-MON-A-162	Monitoring	Yes	N43* 29' 59.879"	W113* 2' 41.782"
RWMC	No	ICP	M4D	Observation	Yes	N43* 29' 38.880"	W113* 3' 4.176"
RWMC	No	ICP	RWMC-MON-A-066	Monitoring	Yes	N43* 29' 15.660"	W113* 3' 11.676"
RWMC	No	ICP	USGS-132	Corehole	Yes	N43* 29' 6.344"	W113* 2' 53.925"
RWMC	No	ICP	M6S	Observation	Yes	N43* 29' 30.770"	W113* 1' 53.339"
RWMC	No	ICP	RWMC-MON-A-013	Monitoring	Yes	N43* 28' 52.418"	W113* 2' 19.848"
RWMC	Yes	ICP/USGS	USGS-105	Observation	Yes	N43* 27' 3.071"	W113* 0' 20.771"
RWMC	Yes	ICP/USGS	USGS-108	Observation	Yes	N43* 26' 58.458"	W112* 58' 29.324"
RWMC	Yes	ICP/USGS	M3S	Observation	Yes	N43* 30' 7.949"	W113* 2' 21.309"
RWMC	Yes	ICP/USGS	M1SA	Observation	Yes	N43* 29' 55.969"	W113* 3' 11.853"
RWMC	Yes	ICP/USGS	USGS-009	Observation	Yes	N43* 27' 32.044"	W113* 4' 42.778"
RWMC	Yes	ICP/USGS	M7S	Observation	Yes	N43* 30' 22.228"	W113* 1' 51.384"
RWMC	Yes	ICP/USGS	SOUTH-MON-A-004	Monitoring	Yes	N43* 30' 51.611"	W113* 2' 52.982"
RWMC	Yes	ICP/USGS	RWMC PRODUCTION	Potable Water	Yes	N43* 30' 2.986"	W113* 2' 17.018"
RWMC	No	USGS	USGS-087	Observation	Yes	N43* 30'	W113* 2' 46.051"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
						12.402"	
RWMC	No	USGS	USGS-120	Observation	Yes	N43* 29' 18.850"	W113* 3' 17.004"
RWMC	No	USGS	USGS-088	Observation	Yes	N43* 29' 39.863"	W113* 3' 4.954"
RWMC	No	USGS	USGS-117	Observation	Yes	N43* 29' 54.159"	W113* 3' 1.664"
RWMC	No	USGS	USGS-119	Observation	Yes	N43* 29' 44.270"	W113* 2' 36.689"
RWMC	No	USGS	USGS-089	Observation	Yes	N43* 30' 5.329"	W113* 3' 34.726"
RWMC	No	USGS	USGS-135	Monitoring	Yes	N43* 27' 53.118"	W113* 9' 38.612"
Rye Grass Flats	No	USGS	SITE-09	Observation	Yes	N43* 31' 22.524"	W112* 53' 3.776"
Southwest of INL	No	USGS	USGS-008	Observation	No	N43* 31' 20.658"	W113* 12' 0.011"
State HWY 22	No	USGS	USGS-OBS-A-126A	Monitoring	Yes	N43* 55' 28.420"	W112* 47' 15.885"
State HWY 22	No	USGS	USGS-OBS-A-126B	Monitoring	Yes	N43* 55' 28.160"	W112* 47' 16.650"
T-12	No	USGS	MIDDLE-2051	Corehole	Yes	N43* 32' 16.591"	W113* 0' 52.371"
TAN	No	USGS	P&W-2	Observation	Yes	N43* 54' 15.688"	W112* 45' 33.758"
TAN/IET	No	USGS	USGS-026	Monitoring	Yes	N43* 52' 10.213"	W112* 39' 43.708"
TAN/IET	No	USGS	ANP-04	Monitoring	Yes	N43* 51' 53.039"	W112* 42' 8.189"
TAN/SMC	No	INL	FET-1	Potable Water	Yes	N43* 51' 19.981"	W112* 43' 23.943"
TAN/SMC	No	INL	FET-2	Potable Water	Yes	N43* 51' 18.762"	W112* 43' 20.953"
TAN/SMC	No	USGS	ANP-06	Monitoring	Yes	N43* 51' 51.239"	W112* 44' 34.366"
TAN/SMC	No	USGS	NO NAME 01	Observation	Yes	N43* 50' 38.450"	W112* 45' 35.740"
TAN/SMC	No	USGS	PSTF TEST	Observation	Yes	N43* 49' 40.392"	W112* 45' 44.459"
TAN/SMC	No	USGS	USGS-007	Observation	Yes	N43* 49' 14.474"	W112* 44' 42.849"
TAN/TSF	No	ICP	ANP-03	Observation	Yes	N43* 50' 52.200"	W112* 42' 34.394"
TAN/TSF	No	ICP	TAN-1860	Extraction	Yes	N43* 50' 52.818"	W112* 42' 30.833"
TAN/TSF	No	ICP	TAN-1861	Extraction	Yes	N43* 50' 50.902"	W112* 42' 31.508"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
TAN/TSF	No	ICP	TANT-MON-A-030A	Monitoring	Yes	N43* 50' 51.834"	W112* 42' 30.736"
TAN/TSF	No	ICP	TANT-MON-A-024	Monitoring	Yes	N43* 50' 52.044"	W112* 42' 34.134"
TAN/TSF	No	ICP	TANT-MON-A-025	Monitoring	Yes	N43* 50' 51.911"	W112* 42' 33.824"
TAN/TSF	No	ICP	TANT-MON-A-007	Monitoring	Yes	N43* 50' 50.681"	W112* 42' 16.303"
TAN/TSF	No	ICP	TANT-MON-A-017	Monitoring	Yes	N43* 50' 49.677"	W112* 42' 20.029"
TAN/TSF	No	ICP	TANT-MON-A-018	Monitoring	Yes	N43* 50' 48.707"	W112* 42' 17.795"
TAN/TSF	No	ICP	TANT-INJ-A-003	Reinjection	Yes	N43* 50' 52.691"	W112* 42' 34.470"
TAN/TSF	No	ICP	TAN DRAINAGE DISP. 02	Deep Injection	Yes	N43* 50' 53.256"	W112* 42' 35.011"
TAN/TSF	No	ICP	TAN-41	Monitoring	Yes	N43* 50' 51.069"	W112* 42' 22.919"
TAN/TSF	No	ICP	TAN-42	Monitoring	Yes	N43* 50' 50.276"	W112* 42' 20.906"
TAN/TSF	No	ICP	TAN-1859	Injection	Yes	N43* 50' 51.958"	W112* 42' 33.190"
TAN/TSF	No	ICP	TAN-09	Monitoring	Yes	N43* 50' 53.083"	W112* 42' 34.576"
TAN/TSF	No	ICP	TANT-MON-A-027	Monitoring	Yes	N43* 50' 49.809"	W112* 42' 31.570"
TAN/TSF	No	ICP	TANT-MON-A-010	Monitoring	Yes	N43* 50' 46.766"	W112* 42' 17.178"
TAN/TSF	No	ICP	TANT-MON-A-028	Monitoring	Yes	N43* 50' 52.003"	W112* 42' 30.857"
TAN/TSF	No	ICP	TANT-MON-A-029	Monitoring	Yes	N43* 50' 51.528"	W112* 42' 27.452"
TAN/TSF	No	ICP	TANT-MON-A-011	Monitoring	Yes	N43* 50' 51.865"	W112* 42' 32.431"
TAN/TSF	No	ICP	TAN-10A	Monitoring	Yes	N43* 50' 50.597"	W112* 42' 35.444"
TAN/TSF	No	INL	ANP-02	Potable Water	Yes	N43* 50' 59.282"	W112* 42' 10.165"
TAN/WRRTF	No	ICP	TANT-MON-A-058	Monitoring	Yes	N43* 49' 55.985"	W112* 40' 58.701"
TAN/WRRTF	No	ICP	TAN-21	Monitoring	Yes	N43* 50' 8.967"	W112* 42' 3.237"
TAN/WRRTF	No	ICP	TANT-MON-A-052	Monitoring	Yes	N43* 50' 6.372"	W112* 41' 36.529"
TAN/WRRTF	No	ICP	TANT-MON-A-054	Monitoring	Yes	N43* 50' 21.430"	W112* 41' 59.337"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
TAN/WRRTF	No	ICP	TANT-MON-A-056	Monitoring	Yes	N43* 49' 34.019"	W112* 41' 21.308"
TAN/WRRTF	No	ICP	GIN-04	Monitoring	Yes	N43* 49' 48.471"	W112* 41' 37.623"
TAN/WRRTF	No	ICP	TANT-MON-A-057	Monitoring	Yes	N43* 49' 45.058"	W112* 42' 3.017"
TAN/WRRTF	No	ICP	ANP-08	Production	Yes	N43* 49' 51.347"	W112* 41' 16.096"
TAN/WRRTF	No	ICP	TAN-16	Monitoring	Yes	N43* 50' 20.094"	W112* 41' 29.795"
TAN/WRRTF	No	ICP	TANT-MON-A-051	Monitoring	Yes	N43* 50' 24.711"	W112* 41' 47.345"
TAN/WRRTF	No	ICP	TANT-MON-A-055	Monitoring	Yes	N43* 50' 28.003"	W112* 41' 34.826"
TAN/WRRTF	No	USGS	ANP-09	Monitoring	Yes	N43* 48' 55.371"	W112* 40' 3.327"
T-Road 14	No	USGS	USGS-019	Observation	Yes	N43* 44' 26.340"	W112* 57' 59.580"
T-Road 16	Yes	ICP/USGS	USGS-107	Observation	Yes	N43* 29' 41.690"	W112* 53' 30.506"
T-Road 20	No	USGS	USGS-006	Observation	Yes	N43* 40' 30.792"	W112* 45' 39.636"
T-Road 3	No	USGS	USGS-005	Observation	Yes	N43* 35' 42.415"	W112* 49' 40.632"
T-Road 4	No	USGS	USGS-032	Observation	Yes	N43* 44' 43.739"	W112* 32' 24.184"
T-Road 5	No	USGS	USGS-012	Monitoring	Yes	N43* 41' 25.855"	W112* 55' 10.097"
T-Road 9	No	USGS	USGS-029	Observation	Yes	N43* 44' 6.535"	W112* 28' 53.193"
T-Road 9	No	USGS	USGS-031	Observation	Yes	N43* 46' 25.571"	W112* 34' 23.418"
US 20/26	Yes	ICP/USGS	USGS-106	Observation	Yes	N43* 29' 58.268"	W112* 59' 34.368"
US 20/26	No	USGS	USGS-131	Monitoring	Yes	N43* 30' 35.950"	W112* 58' 19.034"
US HWY 20	No	USGS	USGS-101	Observation	Yes	N43* 32' 55.425"	W112* 38' 22.871"
US HWY 20/26	No	USGS	USGS-022	Observation	Yes	N43* 34' 21.942"	W113* 3' 24.086"
US HWY 26	Yes	ICP/USGS	USGS-001	Observation	Yes	N43* 26' 59.749"	W112* 47' 11.509"
Van Buren Blvd	Yes	ICP/USGS	SOUTH-MON-A-002	Monitoring	Yes	N43* 31' 18.107"	W112* 59' 37.040"
VZRP	No	ICP	ICPP-MON-V-212	Monitoring	Yes	N43* 33' 17.024"	W112* 58' 18.723"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
VZRP	No	ICP	ICPP-MON-A-165	Monitoring	Yes	N43* 32' 57.827"	W112* 58' 8.601"
VZRP	No	ICP	ICPP-MON-V-191	Monitoring	Yes	N43* 33' 43.798"	W112* 58' 21.500"
VZRP	No	ICP	ICPP-MON-A-167	Monitoring	Yes	N43* 33' 30.305"	W112* 58' 9.680"
VZRP	Yes	ICP/USGS	ICPP-MON-A-166	Monitoring	Yes	N43* 32' 59.791"	W112* 58' 36.178"
VZRP	Yes	ICP/USGS	ICPP-MON-V-200	Monitoring	Yes	N43* 33' 20.943"	W112* 58' 18.021"
VZRP	Yes	ICP/USGS	ICPP-MON-A-164B	Monitoring	Yes	N43* 33' 38.327"	W112* 58' 19.730"

Table A-9 Liquid Effluent Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
ATR Complex	Yes	INL	TRA-764	Liquid Effluent	Yes	N43* 35' 5.807"	W112* 57' 39.987"
CFA	Yes	INL	CFA-LS1	Liquid Effluent	Yes	N43* 32' 2.440"	W112* 56' 7.247"
CFA	Yes	INL	CFA-STF	Liquid Effluent	Yes	N43* 31' 19.429"	W112* 56' 9.967"
CFA	No	INL	B21-608	Liquid Effluent	Yes	N43* 32' 43.980"	W112* 59' 9.118"
REC	No	INL	IFF-603B	Liquid Effluent	No	N43* 31' 4.552"	W112* 2' 1.243"
INTEC	Yes	ICP/INL	CPP-797	Liquid Effluent	Yes	N43* 34' 17.228"	W112* 56' 6.596"
INTEC	Yes	ICP/INL	CPP-769	Liquid Effluent	Yes	N43* 34' 31.034"	W112* 55' 42.883"
INTEC	Yes	ICP/INL	CPP-773	Liquid Effluent	Yes	N43* 34' 30.994"	W112* 55' 39.501"
MFC	No	INL	Industrial Waste Pond	Liquid Effluent	Yes	N43* 35' 49.832"	W112* 39' 34.760"
MFC	No	INL	Sanitary Lift Station (MFC-778)	Liquid Effluent	Yes	N43* 35' 41.938"	W112* 39' 17.792"
MFC	No	INL	Sanitary Sewage Lagoon (secondary lagoon)	Liquid Effluent	Yes	N43* 35' 57.872"	W112* 39' 16.039"

Table A-10 NOAA Tower Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
Aberdeen	No	NOAA	ABE	weather	No	N42* 57' 17.760"	W112* 49' 28.320"
Arco	No	NOAA	ARC	weather	No	N43* 37' 28.380"	W113* 17' 49.560"
Atomic City	Yes	ESER/ NOAA	Atomic City	Atmospheric Moisture Column/ weather	No	N43* 26' 37.361"	W112* 48' 56.222"
ATR Complex	No	NOAA	TRA	weather	Yes	N43* 35' 4.680"	W112* 58' 7.200"
Base of Howe Peak	No	NOAA	BAS	weather	Yes	N43* 40' 39.120"	W113* 0' 21.720"
Big Lost River Rest Area	No	NOAA	LOS	weather	Yes	N43* 32' 55.260"	W113* 0' 35.640"
Big Southern Summit	No	NOAA	SUM	weather	No	N43* 23' 46.800"	W113* 1' 18.660"
Blackfoot	No	NOAA	BLK	weather	No	N43* 11' 23.460"	W112* 19' 59.520"
Blue Dome	No	NOAA	BLU	weather	No	N44* 4' 30.000"	W112* 50' 31.320"
CFA	Yes	ESER/ NOAA	CFA	Precipitation / weather	Yes	N43* 31' 57.420"	W112* 56' 51.840"
CITRC	No	NOAA	PBF	weather	Yes	N43* 32' 50.940"	W112* 52' 10.860"
Cox's Well	No	NOAA	BIG	weather	No	N43* 17' 39.000"	W113* 10' 52.620"
Craters of the Moon	No	NOAA	CRA	weather	No	N43* 25' 45.060"	W113* 32' 17.880"
Dead Man Canyon	No	NOAA	DEA	weather	Yes	N43* 37' 30.240"	W113* 3' 35.220"
Dubois	No	NOAA	DUB	weather	No	N44* 14' 32.580"	W112* 12' 6.600"
Experimental Field Station	No	ESER	EFS	Precipitation	Yes	N43* 36' 17.442"	W112* 54' 24.364"
Fort Hall	No	NOAA	FOR	weather	No	N43* 1' 19.200"	W112* 24' 43.140"
Hamer	No	NOAA	HAM	weather	No	N44* 0' 26.700"	W112* 14' 19.800"
Howe	No	NOAA	HOW	weather	No	N43* 47' 2.820"	W112* 58' 38.340"
Idaho Falls	No	NOAA	IDA	weather	No	N43* 30' 14.880"	W112* 3' 0.480"
Idaho Falls	No	ESER	Idaho Falls	Atmospheric Moisture Column, Precipitation	No	N43* 30' 42.315"	W112* 3' 33.556"
INTEC	No	NOAA	PRO	upper air profiles; flux	Yes	N43* 35' 41.640"	W112* 55' 45.120"
INTEC	No	NOAA	GRI	weather	Yes	N43* 35' 22.920"	W112* 56' 23.760"
Kettle	No	NOAA	KET	weather	No	N43* 32' 51.240"	W112* 19' 34.500"
MFC	No	NOAA	EBR	weather	Yes	N43* 35' 38.880"	W112* 39' 6.240"
Minidoka	No	NOAA	MIN	weather	No	N42* 48' 15.900"	W113* 35' 22.740"
Monteview	No	NOAA	MON	weather	No	N44* 0' 55.320"	W112* 32' 9.300"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
NRF	No	NOAA	NRF	weather	Yes	N43* 38' 52.320"	W112* 54' 40.440"
Rexburg	No	NOAA	RXB	weather	No	N43* 48' 34.200"	W111* 48' 1.740"
Richfield	No	NOAA	RIC	weather	No	N43* 3' 38.160"	W114* 8' 4.500"
Roberts	No	NOAA	ROB	weather	No	N43* 44' 36.660"	W112* 7' 16.020"
Rover	No	NOAA	ROV	weather	Yes	N43* 43' 14.160"	W112* 31' 46.440"
RWMC	No	NOAA	RWM	weather	Yes	N43* 30' 12.360"	W113* 2' 45.720"
Sand Dunes	No	NOAA	SAN	weather	Yes	N43* 46' 46.800"	W112* 45' 29.460"
Sugar City	No	NOAA	SUG	weather	No	N43* 53' 47.700"	W111* 44' 15.420"
Taber	No	NOAA	TAB	weather	No	N43* 19' 7.260"	W112* 41' 30.480"
TAN/SMC	No	NOAA	LOF	weather	Yes	N43* 51' 35.160"	W112* 43' 48.960"
Terreton	No	NOAA	TER	weather	No	N43* 50' 30.060"	W112* 25' 5.700"

Table A-11 Soil Sampling Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
ARA	No	INL	ARA-1	Insitu Gamma	Yes	N43* 31' 19.587"	N43* 31' 19.587"
ARA	No	INL	ARA-14	Insitu Gamma	Yes	N43* 30' 47.739"	N43* 30' 47.739"
ARA	No	INL	ARA-14	Insitu Gamma	Yes	N43* 30' 47.739"	N43* 30' 47.739"
ARA	No	INL	ARA-16	Insitu Gamma	Yes	N43* 30' 51.197"	N43* 30' 51.197"
ARA	No	INL	ARA-2	Insitu Gamma	Yes	N43* 31' 24.588"	N43* 31' 24.588"
ARA	No	INL	ARA-24	Insitu Gamma	Yes	N43* 30' 40.260"	N43* 30' 40.260"
ARA	No	INL	ARA-28	Insitu Gamma	Yes	N43* 30' 46.847"	N43* 30' 46.847"
ARA	No	INL	ARA-29	Insitu Gamma	Yes	N43* 30' 42.249"	N43* 30' 42.249"
ARA	No	INL	ARA-29	Insitu Gamma	Yes	N43* 30' 42.249"	N43* 30' 42.249"
ARA	No	INL	ARA-31	Insitu Gamma	Yes	N43* 31' 18.503"	N43* 31' 18.503"
ARA	No	INL	ARA-32	Insitu Gamma	Yes	N43* 31' 23.059"	N43* 31' 23.059"
ARA	No	INL	ARA-34	Insitu Gamma	Yes	N43* 31' 27.615"	N43* 31' 27.615"
ARA	No	INL	ARA-38	Insitu Gamma	Yes	N43* 30' 47.914"	N43* 30' 47.914"
ARA	No	INL	ARA-4	Insitu Gamma	Yes	N43* 31' 29.519"	N43* 31' 29.519"
ARA	No	INL	ARA-4	Insitu Gamma	Yes	N43* 31' 29.519"	N43* 31' 29.519"
ARA	No	INL	ARA-42	Insitu Gamma	Yes	N43* 30' 56.577"	N43* 30' 56.577"
ARA	No	INL	ARA-43	Insitu Gamma	Yes	N43* 30' 54.361"	N43* 30' 54.361"
ARA	No	INL	ARA-47	Insitu Gamma	Yes	N43* 31' 4.889"	N43* 31' 4.889"
ARA	No	INL	ARA-50	Insitu Gamma	Yes	N43* 31' 10.515"	N43* 31' 10.515"
ARA	No	INL	ARA-51	Insitu Gamma	Yes	N43* 31' 12.460"	N43* 31' 12.460"
ARA	No	INL	ARA-62	Insitu Gamma	Yes	N43* 31' 15.642"	N43* 31' 15.642"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
ARA	No	INL	ARA-65	Insitu Gamma	Yes	N43* 31' 23.565"	N43* 31' 23.565"
ARA	No	INL	ARA-71	Insitu Gamma	Yes	N43* 31' 14.309"	N43* 31' 14.309"
ARA	No	INL	ARA-74	Insitu Gamma	Yes	N43* 31' 4.881"	N43* 31' 4.881"
ARA	No	INL	ARA-75	Insitu Gamma	Yes	N43* 31' 4.926"	N43* 31' 4.926"
ARA	No	INL	ARA-77	Insitu Gamma	Yes	N43* 31' 4.961"	N43* 31' 4.961"
ARA	No	INL	ARA-9	Insitu Gamma	Yes	N43* 30' 55.689"	N43* 30' 55.689"
ARA	No	INL	LG-56	Insitu Gamma	Yes	N43* 33' 21.057"	N43* 33' 21.057"
Atomic City	No	INL	LG-20	Insitu Gamma	Yes	N43* 27' 4.201"	N43* 27' 4.201"
Atomic City	No	INL	LG-58	Insitu Gamma	No	N43* 27' 2.058"	N43* 27' 2.058"
Atomic City	No	INL	LG-22	Insitu Gamma	Yes	N43* 28' 54.163"	N43* 28' 54.163"
Atomic City	No	INL	LG-60	Insitu Gamma	Yes	N43* 27' 41.131"	N43* 27' 41.131"
Atomic City	No	ESER	Atomic City	Soil Sample	Yes	N43* 27' 8.275"	N43* 27' 8.275"
ATR Complex	No	INL	TRA.0.3	Insitu Gamma	Yes	N43* 35' 10.066"	N43* 35' 10.066"
ATR Complex	No	INL	TRA.-1.1	Insitu Gamma	Yes	N43* 35' 24.712"	N43* 35' 24.712"
ATR Complex	No	INL	TRA.-1.2	Insitu Gamma	Yes	N43* 35' 20.293"	N43* 35' 20.293"
ATR Complex	No	INL	TRA.1.3	Insitu Gamma	Yes	N43* 35' 12.031"	N43* 35' 12.031"
ATR Complex	No	INL	TRA.-1.3	Insitu Gamma	Yes	N43* 35' 12.031"	N43* 35' 12.031"
ATR Complex	No	INL	TRA.1.4	Insitu Gamma	Yes	N43* 35' 3.830"	N43* 35' 3.830"
ATR Complex	No	INL	TRA.-2.2	Insitu Gamma	Yes	N43* 35' 23.265"	N43* 35' 23.265"
ATR Complex	No	INL	TRA.2.3	Insitu Gamma	Yes	N43* 35' 6.116"	N43* 35' 6.116"
ATR Complex	No	INL	TRA.-2.3	Insitu Gamma	Yes	N43* 35' 13.996"	N43* 35' 13.996"
ATR Complex	No	INL	TRA-A1.2	Insitu Gamma	Yes	N43* 35' 28.274"	N43* 35' 28.274"
ATR Complex	No	INL	TRA-A2.2	Insitu Gamma	Yes	N43* 35' 24.344"	N43* 35' 24.344"
ATR Complex	No	INL	TRA-A1.3	Insitu	Yes	N43* 35' 32.113"	N43* 35' 32.113"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
				Gamma			
ATR Complex	No	INL	TRA-A2.3	Insitu Gamma	Yes	N43* 35' 28.091"	N43* 35' 28.091"
ATR Complex	No	INL	TRA-A2.3	Insitu Gamma	Yes	N43* 35' 28.091"	N43* 35' 28.091"
ATR Complex	No	INL	TRA-A2.4	Insitu Gamma	Yes	N43* 35' 28.091"	N43* 35' 28.091"
ATR Complex	No	INL	TRA-A3.2	Insitu Gamma	Yes	N43* 35' 31.069"	N43* 35' 31.069"
ATR Complex	No	INL	TRA-A3.4	Insitu Gamma	Yes	N43* 35' 24.034"	N43* 35' 24.034"
ATR Complex	No	INL	TRA-A3.5	Insitu Gamma	Yes	N43* 35' 27.022"	N43* 35' 27.022"
ATR Complex	No	INL	TRA-A4.5	Insitu Gamma	Yes	N43* 35' 30.000"	N43* 35' 30.000"
ATR Complex	No	INL	LG-30	Insitu Gamma	Yes	N43* 37' 30.954"	N43* 37' 30.954"
ATR Complex	No	INL	RTC8-2	Insitu Gamma	Yes	N43* 34' 53.147"	N43* 34' 53.147"
ATR Complex	No	INL	TRA-6.4	Insitu Gamma	Yes	N43* 34' 50.725"	N43* 34' 50.725"
ATR Complex	No	INL	TRA6-2	Insitu Gamma	Yes	N43* 34' 59.596"	N43* 34' 59.596"
ATR Complex	No	INL	LG-26	Insitu Gamma	Yes	N43* 36' 20.588"	N43* 36' 20.588"
ATR Complex	No	INL	LG-29	Insitu Gamma	Yes	N43* 36' 21.953"	N43* 36' 21.953"
Blackfoot	No	ESER	Blackfoot	Soil Sample	No	N43* 13' 33.971"	N43* 13' 33.971"
Butte City	No	ESER	Butte City	Soil Sample	No	N43* 35' 31.837"	N43* 35' 31.837"
Carey	No	ESER	Carey	Soil Sample	No	N43* 20' 2.127"	N43* 20' 2.127"
CFA	No	INL	LG-53	Insitu Gamma	Yes	N43* 31' 30.822"	N43* 31' 30.822"
CFA	No	INL	LG-5	Insitu Gamma	Yes	N43* 27' 7.968"	N43* 27' 7.968"
CFA	No	INL	LG-23	Insitu Gamma	Yes	N43* 29' 23.125"	N43* 29' 23.125"
CFA	No	INL	LG-23	Insitu Gamma	Yes	N43* 29' 23.125"	N43* 29' 23.125"
CITRC	No	INL	PBF-1	Insitu Gamma	Yes	N43* 32' 51.683"	N43* 32' 51.683"
CITRC	No	INL	PBF-8	Insitu Gamma	Yes	N43* 33' 11.258"	N43* 33' 11.258"
CITRC	No	INL	WERF800A	Insitu Gamma	Yes	N43* 33' 25.058"	N43* 33' 25.058"
CITRC	No	INL	WERF800B	Insitu Gamma	Yes	N43* 33' 22.181"	N43* 33' 22.181"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
CITRC	No	INL	WERF800C	Insitu Gamma	Yes	N43* 33' 18.762"	N43* 33' 18.762"
CITRC	No	INL	WERF800D	Insitu Gamma	Yes	N43* 33' 14.870"	N43* 33' 14.870"
CITRC	No	INL	WERF800E	Insitu Gamma	Yes	N43* 33' 10.641"	N43* 33' 10.641"
CITRC	No	INL	PBF-5	Insitu Gamma	Yes	N43* 33' 29.896"	N43* 33' 29.896"
CITRC	No	INL	PBF-6	Insitu Gamma	Yes	N43* 33' 31.962"	N43* 33' 31.962"
CITRC	No	INL	PBF-7	Insitu Gamma	Yes	N43* 33' 30.641"	N43* 33' 30.641"
CITRC	No	INL	PBF-9	Insitu Gamma	Yes	N43* 32' 4.413"	N43* 32' 4.413"
CITRC	No	INL	PBF-10	Insitu Gamma	Yes	N43* 32' 20.715"	N43* 32' 20.715"
CITRC	No	INL	PBF-2	Insitu Gamma	Yes	N43* 33' 10.354"	N43* 33' 10.354"
CITRC	No	INL	PBF-3	Insitu Gamma	Yes	N43* 33' 18.889"	N43* 33' 18.889"
CITRC	No	INL	PBF-11	Insitu Gamma	Yes	N43* 32' 55.860"	N43* 32' 55.860"
Crystal Ice Caves	No	ESER	Crystal Ice Caves	Soil Sample	No	N42* 57' 21.050"	N42* 57' 21.050"
East Butte	No	INL	LG-17	Insitu Gamma	Yes	N43* 31' 28.800"	N43* 31' 28.800"
East Butte	No	INL	LG-18	Insitu Gamma	Yes	N43* 29' 13.137"	N43* 29' 13.137"
EBR	No	INL	RW10-1	Insitu Gamma	Yes	N43* 30' 44.248"	N43* 30' 44.248"
FAA Tower	No	ESER	FAA Tower	Soil Sample	No	N43* 33' 15.724"	N43* 33' 15.724"
Frenchman's Cabin	No	ESER	Frenchman's Cabin	Soil Sample	No	N43* 25' 39.847"	N43* 25' 39.847"
Howe	No	INL	LG-41	Insitu Gamma	Yes	N43* 46' 27.682"	N43* 46' 27.682"
Howe	No	ESER	Howe	Soil Sample	Yes	N43* 47' 59.977"	N43* 47' 59.977"
Howe	No	INL	LG-40	Insitu Gamma	Yes	N43* 44' 2.103"	N43* 44' 2.103"
ICDF	No	INL	INB71	Insitu Gamma	Yes	N43* 33' 49.306"	N43* 33' 49.306"
ICDF	No	INL	INB-80	Insitu Gamma	Yes	N43* 33' 44.451"	N43* 33' 44.451"
INTEC	No	INL	INA-16	Insitu Gamma	Yes	N43* 34' 24.318"	N43* 34' 24.318"
INTEC	No	INL	INA-17	Insitu Gamma	Yes	N43* 34' 24.363"	N43* 34' 24.363"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
INTEC	No	INL	INA-27	Insitu Gamma	Yes	N43* 34' 29.256"	N43* 34' 29.256"
INTEC	No	INL	INA-28	Insitu Gamma	Yes	N43* 34' 29.301"	N43* 34' 29.301"
INTEC	No	INL	INA-4	Insitu Gamma	Yes	N43* 34' 19.335"	N43* 34' 19.335"
INTEC	No	INL	INA-44	Insitu Gamma	Yes	N43* 34' 38.905"	N43* 34' 38.905"
INTEC	No	INL	INA-47	Insitu Gamma	Yes	N43* 34' 39.042"	N43* 34' 39.042"
INTEC	No	INL	INA55	Insitu Gamma	Yes	N43* 34' 43.843"	N43* 34' 43.843"
INTEC	No	INL	INA58	Insitu Gamma	Yes	N43* 34' 43.980"	N43* 34' 43.980"
INTEC	No	INL	INA-6	Insitu Gamma	Yes	N43* 34' 19.425"	N43* 34' 19.425"
INTEC	No	INL	INA-66	Insitu Gamma	Yes	N43* 34' 48.781"	N43* 34' 48.781"
INTEC	No	INL	INA69	Insitu Gamma	Yes	N43* 34' 48.917"	N43* 34' 48.917"
INTEC	No	INL	INA-70	Insitu Gamma	Yes	N43* 34' 48.963"	N43* 34' 48.963"
INTEC	No	INL	INB-101	Insitu Gamma	Yes	N43* 33' 34.621"	N43* 33' 34.621"
INTEC	No	INL	INB-17	Insitu Gamma	Yes	N43* 34' 13.940"	N43* 34' 13.940"
INTEC	No	INL	INB-28	Insitu Gamma	Yes	N43* 34' 9.003"	N43* 34' 9.003"
INTEC	No	INL	INB-29	Insitu Gamma	Yes	N43* 34' 8.956"	N43* 34' 8.956"
INTEC	No	INL	INB-4	Insitu Gamma	Yes	N43* 34' 18.971"	N43* 34' 18.971"
INTEC	No	INL	INB-40	Insitu Gamma	Yes	N43* 34' 4.135"	N43* 34' 4.135"
INTEC	No	INL	INB-50	Insitu Gamma	Yes	N43* 33' 59.127"	N43* 33' 59.127"
INTEC	No	INL	INB-52	Insitu Gamma	Yes	N43* 33' 59.034"	N43* 33' 59.034"
INTEC	No	INL	INB89	Insitu Gamma	Yes	N43* 33' 39.605"	N43* 33' 39.605"
INTEC	No	INL	INB-90	Insitu Gamma	Yes	N43* 33' 39.559"	N43* 33' 39.559"
INTEC	No	INL	INB-91	Insitu Gamma	Yes	N43* 33' 39.513"	N43* 33' 39.513"
INTEC	No	INL	INB-99	Insitu Gamma	Yes	N43* 33' 34.713"	N43* 33' 34.713"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
INTEC	No	INL	INC-15	Insitu Gamma	Yes	N43* 34' 23.909"	N43* 34' 23.909"
INTEC	No	INL	INC-25	Insitu Gamma	Yes	N43* 34' 28.892"	N43* 34' 28.892"
INTEC	No	INL	INC-46	Insitu Gamma	Yes	N43* 34' 38.814"	N43* 34' 38.814"
INTEC	No	INL	INC-48	Insitu Gamma	Yes	N43* 34' 38.722"	N43* 34' 38.722"
INTEC	No	INL	INC-56	Insitu Gamma	Yes	N43* 34' 43.798"	N43* 34' 43.798"
INTEC	No	INL	INC-57	Insitu Gamma	Yes	N43* 34' 43.752"	N43* 34' 43.752"
INTEC	No	INL	IND-56	Insitu Gamma	Yes	N43* 33' 54.510"	N43* 33' 54.510"
INTEC	No	INL	IND-68	Insitu Gamma	Yes	N43* 33' 49.617"	N43* 33' 49.617"
INTEC	No	INL	IND-89	Insitu Gamma	Yes	N43* 33' 39.696"	N43* 33' 39.696"
INTEC	No	INL	IND-91	Insitu Gamma	Yes	N43* 33' 39.787"	N43* 33' 39.787"
INTEC	No	INL	INT-A15	Insitu Gamma	Yes	N43* 34' 24.273"	N43* 34' 24.273"
INTEC	No	INL	INT-A38	Insitu Gamma	Yes	N43* 34' 34.194"	N43* 34' 34.194"
INTEC	No	INL	INT-A39	Insitu Gamma	Yes	N43* 34' 34.239"	N43* 34' 34.239"
INTEC	No	INL	INT-A49	Insitu Gamma	Yes	N43* 34' 39.132"	N43* 34' 39.132"
INTEC	No	INL	INT-A50	Insitu Gamma	Yes	N43* 34' 39.177"	N43* 34' 39.177"
INTEC	No	INL	INT-A59	Insitu Gamma	Yes	N43* 34' 44.025"	N43* 34' 44.025"
INTEC	No	INL	INT-A61	Insitu Gamma	Yes	N43* 34' 44.115"	N43* 34' 44.115"
INTEC	No	INL	INT-A72	Insitu Gamma	Yes	N43* 34' 49.053"	N43* 34' 49.053"
INTEC	No	INL	INT-B102	Insitu Gamma	Yes	N43* 33' 34.575"	N43* 33' 34.575"
INTEC	No	INL	INT-B103	Insitu Gamma	Yes	N43* 33' 34.529"	N43* 33' 34.529"
INTEC	No	INL	INT-B104	Insitu Gamma	Yes	N43* 33' 34.483"	N43* 33' 34.483"
INTEC	No	INL	INT-B106	Insitu Gamma	Yes	N43* 33' 34.391"	N43* 33' 34.391"
INTEC	No	INL	INT-B14	Insitu Gamma	Yes	N43* 34' 14.079"	N43* 34' 14.079"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
INTEC	No	INL	INT-B15	Insitu Gamma	Yes	N43* 34' 14.033"	N43* 34' 14.033"
INTEC	No	INL	INT-B15	Insitu Gamma	Yes	N43* 34' 14.033"	N43* 34' 14.033"
INTEC	No	INL	INT-B25	Insitu Gamma	Yes	N43* 34' 9.141"	N43* 34' 9.141"
INTEC	No	INL	INT-B3	Insitu Gamma	Yes	N43* 34' 19.017"	N43* 34' 19.017"
INTEC	No	INL	INT-B48	Insitu Gamma	Yes	N43* 33' 59.219"	N43* 33' 59.219"
INTEC	No	INL	INT-B48	Insitu Gamma	Yes	N43* 33' 59.219"	N43* 33' 59.219"
INTEC	No	INL	INT-B61	Insitu Gamma	Yes	N43* 33' 54.189"	N43* 33' 54.189"
INTEC	No	INL	INT-B62	Insitu Gamma	Yes	N43* 33' 54.143"	N43* 33' 54.143"
INTEC	No	INL	INT-B73	Insitu Gamma	Yes	N43* 33' 49.205"	N43* 33' 49.205"
INTEC	No	INL	INT-B83	Insitu Gamma	Yes	N43* 33' 44.313"	N43* 33' 44.313"
INTEC	No	INL	INT-B84	Insitu Gamma	Yes	N43* 33' 44.267"	N43* 33' 44.267"
INTEC	No	INL	INT-B92	Insitu Gamma	Yes	N43* 33' 39.467"	N43* 33' 39.467"
INTEC	No	INL	INT-B93	Insitu Gamma	Yes	N43* 33' 39.421"	N43* 33' 39.421"
INTEC	No	INL	INT-B94	Insitu Gamma	Yes	N43* 33' 39.375"	N43* 33' 39.375"
INTEC	No	INL	INT-D58	Insitu Gamma	Yes	N43* 33' 54.600"	N43* 33' 54.600"
INTEC	No	INL	RW9-1	Insitu Gamma	Yes	N43* 28' 59.328"	N43* 28' 59.328"
Lincoln Blvd.	No	INL	LG-35	Insitu Gamma	Yes	N43* 41' 35.315"	N43* 41' 35.315"
Lincoln Blvd.	No	INL	LG-43	Insitu Gamma	Yes	N43* 45' 7.232"	N43* 45' 7.232"
MFC	No	INL	EBR2-1	Insitu Gamma	Yes	N43* 36' 1.237"	N43* 36' 1.237"
MFC	No	INL	EBR2-10	Insitu Gamma	Yes	N43* 36' 6.376"	N43* 36' 6.376"
MFC	No	INL	EBR2-11	Insitu Gamma	Yes	N43* 35' 53.966"	N43* 35' 53.966"
MFC	No	INL	EBR2-12	Insitu Gamma	Yes	N43* 35' 51.180"	N43* 35' 51.180"
MFC	No	INL	EBR2-13	Insitu Gamma	Yes	N43* 35' 54.581"	N43* 35' 54.581"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
MFC	No	INL	EBR2-15	Insitu Gamma	Yes	N43* 35' 31.656"	N43* 35' 31.656"
MFC	No	INL	EBR2-16	Insitu Gamma	Yes	N43* 35' 27.411"	N43* 35' 27.411"
MFC	No	INL	EBR2-17	Insitu Gamma	Yes	N43* 35' 24.281"	N43* 35' 24.281"
MFC	No	INL	EBR2-2	Insitu Gamma	Yes	N43* 35' 23.559"	N43* 35' 23.559"
MFC	No	INL	EBR2-3	Insitu Gamma	Yes	N43* 35' 29.732"	N43* 35' 29.732"
MFC	No	INL	EBR2-4	Insitu Gamma	Yes	N43* 35' 38.989"	N43* 35' 38.989"
MFC	No	INL	EBR2-6	Insitu Gamma	Yes	N43* 35' 56.561"	N43* 35' 56.561"
MFC	No	INL	TRT-1	Insitu Gamma	Yes	N43* 36' 17.246"	N43* 36' 17.246"
MFC	No	INL	TRT-2	Insitu Gamma	Yes	N43* 36' 6.548"	N43* 36' 6.548"
MFC	No	INL	TRT-3	Insitu Gamma	Yes	N43* 36' 3.239"	N43* 36' 3.239"
MFC	No	INL	TRT-4	Insitu Gamma	Yes	N43* 36' 10.601"	N43* 36' 10.601"
Middle Butte	No	INL	LG-19	Insitu Gamma	Yes	N43* 29' 49.987"	N43* 29' 49.987"
Middle Butte	No	INL	LG-21	Insitu Gamma	Yes	N43* 29' 48.986"	N43* 29' 48.986"
Monteview	No	ESER	Monteview	Soil Sample	No	N44* 0' 35.992"	N44* 0' 35.992"
Mud Lake	No	ESER	Mudlake #1	Soil Sample	No	N43* 51' 15.142"	N43* 51' 15.142"
Mud Lake	No	ESER	Mudlake #2	Soil Sample	Yes	N43* 46' 54.302"	N43* 46' 54.302"
Northeast corner of site near farm land	No	INL	LG-6	Insitu Gamma	Yes	N43* 48' 56.409"	N43* 48' 56.409"
NRF	No	INL	NRF-6	Insitu Gamma	Yes	N43* 38' 54.712"	N43* 38' 54.712"
NRF	No	INL	NRF-7	Insitu Gamma	Yes	N43* 39' 8.844"	N43* 39' 8.844"
NRF	No	INL	NRF-8	Insitu Gamma	Yes	N43* 39' 7.292"	N43* 39' 7.292"
NRF	No	INL	LG-34	Insitu Gamma	Yes	N43* 41' 56.442"	N43* 41' 56.442"
NRF	No	INL	LG-59	Insitu Gamma	Yes	N43* 43' 33.509"	N43* 43' 33.509"
NRF	No	INL	LG-50	Insitu Gamma	Yes	N43* 41' 54.425"	N43* 41' 54.425"
NRF	No	INL	NRF-14	Insitu Gamma	Yes	N43* 38' 32.548"	N43* 38' 32.548"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
NRF	No	INL	NRF-12	Insitu Gamma	Yes	N43* 38' 52.847"	N43* 38' 52.847"
Reno Ranch	No	ESER	Reno Ranch	Soil Sample	Yes	N44* 0' 54.127"	N44* 0' 54.127"
RWMC	No	INL	RW8-5	Insitu Gamma	Yes	N43* 29' 56.465"	N43* 29' 56.465"
RWMC	No	INL	RW2-1	Insitu Gamma	Yes	N43* 30' 11.794"	N43* 30' 11.794"
RWMC	No	INL	RW2-4	Insitu Gamma	Yes	N43* 30' 11.794"	N43* 30' 11.794"
RWMC	No	INL	RW2-6	Insitu Gamma	Yes	N43* 30' 22.557"	N43* 30' 22.557"
RWMC	No	INL	RW2-8	Insitu Gamma	Yes	N43* 30' 32.605"	N43* 30' 32.605"
RWMC	No	INL	RW3-4	Insitu Gamma	Yes	N43* 30' 15.227"	N43* 30' 15.227"
RWMC	No	INL	RW3-6	Insitu Gamma	Yes	N43* 30' 26.319"	N43* 30' 26.319"
RWMC	No	INL	RW3-8	Insitu Gamma	Yes	N43* 30' 36.559"	N43* 30' 36.559"
RWMC	No	INL	RW4-1	Insitu Gamma	Yes	N43* 30' 16.612"	N43* 30' 16.612"
RWMC	No	INL	RW4-5	Insitu Gamma	Yes	N43* 30' 59.292"	N43* 30' 59.292"
RWMC	No	INL	RW5-12	Insitu Gamma	Yes	N43* 30' 8.161"	N43* 30' 8.161"
RWMC	No	INL	RW5-4	Insitu Gamma	Yes	N43* 30' 6.547"	N43* 30' 6.547"
RWMC	No	INL	RW5-7	Insitu Gamma	Yes	N43* 30' 22.504"	N43* 30' 22.504"
RWMC	No	INL	LG-3	Insitu Gamma	Yes	N43* 31' 56.346"	N43* 31' 56.346"
RWMC	No	INL	RW6-1	Insitu Gamma	Yes	N43* 29' 44.825"	N43* 29' 44.825"
RWMC	No	INL	RW6-3	Insitu Gamma	Yes	N43* 29' 53.093"	N43* 29' 53.093"
RWMC	No	INL	RW7-2	Insitu Gamma	Yes	N43* 29' 43.169"	N43* 29' 43.169"
RWMC	No	INL	RW8-1	Insitu Gamma	Yes	N43* 29' 20.414"	N43* 29' 20.414"
RWMC	No	INL	LG-25	Insitu Gamma	Yes	N43* 27' 27.698"	N43* 27' 27.698"
RWMC	No	INL	LG-24	Insitu Gamma	Yes	N43* 26' 58.890"	N43* 26' 58.890"
RWMC	No	INL	LG-54	Insitu Gamma	Yes	N43* 28' 40.134"	N43* 28' 40.134"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
RWMC	No	INL	RW6-7	Insitu Gamma	Yes	N43* 30' 10.739"	N43* 30' 10.739"
RWMC/SDA	No	ICP	1-2	Waste Management Soil	Yes	N43* 29' 52.301"	N43* 29' 52.301"
RWMC/SDA	No	ICP	2-1	Waste Management Soil	Yes	N43* 30' 1.181"	N43* 30' 1.181"
RWMC/SDA	No	ICP	2-3	Waste Management Soil	Yes	N43* 30' 1.735"	N43* 30' 1.735"
RWMC/SDA	No	ICP	2-4	Waste Management Soil	Yes	N43* 30' 3.149"	N43* 30' 3.149"
RWMC/SDA	No	ICP	2-5	Waste Management Soil	Yes	N43* 30' 4.323"	N43* 30' 4.323"
RWMC/SDA	No	ICP	3-1	Waste Management Soil	Yes	N43* 29' 54.962"	N43* 29' 54.962"
RWMC/SDA	No	ICP	3-2	Waste Management Soil	Yes	N43* 30' 0.690"	N43* 30' 0.690"
RWMC/SDA	No	ICP	3-3	Waste Management Soil	Yes	N43* 30' 2.508"	N43* 30' 2.508"
RWMC/SDA	No	ICP	3-5	Waste Management Soil	Yes	N43* 30' 3.280"	N43* 30' 3.280"
RWMCTSA - AMWTP facility area	No	ICP	1-1	Waste Management Soil	Yes	N43* 29' 59.911"	N43* 29' 59.911"
RWMCTSA - AMWTP facility area	No	ICP	5-4	Waste Management Soil	Yes	N43* 30' 1.354"	N43* 30' 1.354"
Spreading Area B (north end)	No	ICP	T-13	Control Soil Sample Site	Yes	N43* 29' 17.220"	N43* 29' 17.220"
St. Anthony	No	ESER	St. Anthony	Soil Sample	No	N43* 59' 57.317"	N43* 59' 57.317"
State HWY 22	No	INL	LG-57	Insitu Gamma	Yes	N43* 51' 29.562"	N43* 51' 29.562"
State HWY 22	No	INL	LG-51	Insitu Gamma	Yes	N43* 55' 53.990"	N43* 55' 53.990"
State HWY 28	No	INL	LG-52	Insitu Gamma	Yes	N43* 58' 56.158"	N43* 58' 56.158"
State HWY 28	No	INL	LG-48	Insitu Gamma	Yes	N43* 59' 17.012"	N43* 59' 17.012"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
State HWY 28	No	INL	LG-7	Insitu Gamma	Yes	N43* 53' 11.497"	N43* 53' 11.497"
State HWY 28	No	INL	LG-8	Insitu Gamma	Yes	N43* 54' 56.131"	N43* 54' 56.131"
State HWY 33	No	INL	LG-9	Insitu Gamma	Yes	N43* 51' 3.108"	N43* 51' 3.108"
State HWY 33	No	INL	LG-42	Insitu Gamma	Yes	N43* 46' 59.305"	N43* 46' 59.305"
State HWY 33	No	INL	LG-33	Insitu Gamma	Yes	N43* 40' 7.500"	N43* 40' 7.500"
State HWY 33	No	INL	LG-44	Insitu Gamma	Yes	N43* 46' 53.497"	N43* 46' 53.497"
TAN/IET	No	INL	IET-6	Insitu Gamma	Yes	N43* 51' 37.826"	N43* 51' 37.826"
TAN/IET	No	INL	IET-7	Insitu Gamma	Yes	N43* 52' 19.116"	N43* 52' 19.116"
TAN/IET	No	INL	LG-49	Insitu Gamma	Yes	N43* 55' 40.353"	N43* 55' 40.353"
TAN/IET	No	INL	IET-8	Insitu Gamma	Yes	N43* 52' 49.631"	N43* 52' 49.631"
TAN/IET	No	INL	IET-9	Insitu Gamma	Yes	N43* 52' 48.666"	N43* 52' 48.666"
TAN/SMC	No	INL	L2-76	Insitu Gamma	Yes	N43* 52' 11.896"	N43* 52' 11.896"
TAN/SMC	No	INL	L3-76	Insitu Gamma	Yes	N43* 50' 46.088"	N43* 50' 46.088"
TAN/SMC	No	INL	L4-76	Insitu Gamma	Yes	N43* 50' 31.805"	N43* 50' 31.805"
TAN/SMC	No	INL	L5-76	Insitu Gamma	Yes	N43* 50' 31.952"	N43* 50' 31.952"
TAN/TSF	No	INL	TSF7	Insitu Gamma	Yes	N43* 50' 42.973"	N43* 50' 42.973"
TAN/TSF	No	INL	TAN-1	Insitu Gamma	Yes	N43* 50' 44.547"	N43* 50' 44.547"
TAN/TSF	No	INL	TAN-6	Insitu Gamma	Yes	N43* 50' 45.751"	N43* 50' 45.751"
TAN/TSF	No	INL	TAN-8	Insitu Gamma	Yes	N43* 50' 40.486"	N43* 50' 40.486"
TAN/TSF	No	INL	TAN-9	Insitu Gamma	Yes	N43* 50' 35.757"	N43* 50' 35.757"
TAN/WRRTF	No	INL	WRTF-5	Insitu Gamma	Yes	N43* 49' 50.822"	N43* 49' 50.822"
TAN/WRRTF	No	INL	WRTF-8	Insitu Gamma	Yes	N43* 49' 51.472"	N43* 49' 51.472"
TAN/WRRTF	No	INL	WRTF-6	Insitu Gamma	Yes	N43* 49' 47.048"	N43* 49' 47.048"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
TAN/WRRTF	No	INL	WRTF-7	Insitu Gamma	Yes	N43* 49' 47.167"	N43* 49' 47.167"
T-Road 17	No	INL	LG-31	Insitu Gamma	Yes	N43* 38' 43.299"	N43* 38' 43.299"
T-Road 17	No	INL	LG-39	Insitu Gamma	Yes	N43* 43' 52.726"	N43* 43' 52.726"
T-Road 17	No	INL	LG-36	Insitu Gamma	Yes	N43* 39' 50.335"	N43* 39' 50.335"
T-Road 20	No	INL	LG-14	Insitu Gamma	Yes	N43* 36' 15.644"	N43* 36' 15.644"
T-Road 20	No	INL	LG-37	Insitu Gamma	Yes	N43* 40' 29.480"	N43* 40' 29.480"
T-Road 22	No	INL	LG-11	Insitu Gamma	Yes	N43* 45' 2.208"	N43* 45' 2.208"
T-Road 22	No	INL	LG-12	Insitu Gamma	Yes	N43* 43' 47.395"	N43* 43' 47.395"
T-Road 22	No	INL	LG-55	Insitu Gamma	Yes	N43* 39' 0.599"	N43* 39' 0.599"
T-Road 25	No	INL	LG-38	Insitu Gamma	Yes	N43* 42' 23.072"	N43* 42' 23.072"
T-Road 3	No	INL	LG-32	Insitu Gamma	Yes	N43* 37' 21.124"	N43* 37' 21.124"
T-Road 4	No	INL	LG-13	Insitu Gamma	Yes	N43* 38' 38.796"	N43* 38' 38.796"
T-Road 4	No	INL	LG-61	Insitu Gamma	Yes	N43* 45' 48.276"	N43* 45' 48.276"
T-Road 4	No	INL	LG-46	Insitu Gamma	Yes	N43* 40' 9.693"	N43* 40' 9.693"
T-Road 4	No	INL	LG-4	Insitu Gamma	Yes	N43* 42' 40.142"	N43* 42' 40.142"
T-road 8	No	INL	LG-1	Insitu Gamma	Yes	N43* 39' 47.906"	N43* 39' 47.906"
T-Road 9	No	INL	LG-10	Insitu Gamma	Yes	N43* 47' 25.438"	N43* 47' 25.438"
T-road 9	No	INL	LG-2	Insitu Gamma	Yes	N43* 43' 18.582"	N43* 43' 18.582"
T-road 9	No	INL	LG-45	Insitu Gamma	Yes	N43* 48' 9.760"	N43* 48' 9.760"
U.S. HWY 20	No	INL	LG-16	Insitu Gamma	Yes	N43* 33' 37.597"	N43* 33' 37.597"
U.S. HWY 20	No	INL	LG-15	Insitu Gamma	Yes	N43* 33' 53.517"	N43* 33' 53.517"
U.S. HWY 20/26	No	INL	LG-28	Insitu Gamma	Yes	N43* 36' 11.363"	N43* 36' 11.363"
U.S. HWY 20/26	No	INL	LG-47	Insitu Gamma	Yes	N43* 34' 14.362"	N43* 34' 14.362"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
U.S. HWY 20/26	No	INL	LG-27	Insitu Gamma	Yes	N43* 34' 19.461"	N43* 34' 19.461"
U.S. HWY 20/26	No	ICP	T-12	Control Soil Sample Site	Yes	N43* 32' 27.664"	N43* 32' 27.664"

Table A-12 Soil Gas and Soil Moisture Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
CFA Landfill	No	INL	LF3-East	WAG 4 Landfill	Yes	N43* 32' 24.940"	W112* 57' 9.490"
CFA Landfill	No	INL	LF3-West	WAG 4 Landfill	Yes	N43* 32' 24.478"	W112* 57' 11.369"
CFA Landfill	No	INL	LF2-North	WAG 4 Landfill	Yes	N43* 32' 20.717"	W112* 56' 31.187"
CFA Landfill	No	INL	LF2-South	WAG 4 Landfill	Yes	N43* 32' 19.942"	W112* 56' 31.093"
CFA Landfill	No	INL	CFA-GAS-V-004	Vapor Port	Yes	N43* 32' 22.333"	W112* 57' 0.961"
CFA Landfill	No	INL	CFA-GAS-V-005	Vapor Port	Yes	N43* 32' 15.759"	W112* 56' 30.318"
CFA Landfill	No	INL	CFA-GAS-V-006	Vapor Port	Yes	N43* 32' 23.505"	W112* 56' 38.031"
CFA Landfill	No	INL	CFA-GAS-V-007	Vapor Port	Yes	N43* 32' 25.820"	W112* 57' 7.386"
CFA Landfill	No	INL	CFA-GAS-V-008	Vapor Port	Yes	N43* 32' 36.037"	W112* 57' 5.772"
CFA Landfill	No	INL	LF2-03	Neutron Access	Yes	N43* 32' 16.188"	W112* 56' 33.918"
CFA Landfill	No	INL	LF2-04	Neutron Access	Yes	N43* 32' 17.703"	W112* 56' 39.497"
CFA Landfill	No	INL	LF2-07	Neutron Access	Yes	N43* 32' 19.641"	W112* 56' 31.607"
CFA Landfill	No	INL	LF3-03	Neutron Access	Yes	N43* 32' 36.219"	W112* 57' 6.520"
CFA Landfill	No	INL	LF3-05	Neutron Access	Yes	N43* 32' 24.879"	W112* 57' 11.307"
RWMC	No	ICP	TEM2-A	Unknown	Yes	N43* 29' 55.896"	W113* 2' 43.841"
RWMC	No	ICP	TEM3-A	Unknown	Yes	N43* 30' 0.963"	W113* 2' 29.476"
RWMC	No	ICP	9302	Vapor Port	Yes	N43* 29' 58.595"	W113* 2' 41.565"
RWMC	No	ICP	D-02	Vapor Port	Yes	N43* 30' 3.031"	W113* 2' 41.868"
RWMC	No	ICP	89-02D	Vapor Port	Yes	N43* 29' 57.395"	W113* 2' 43.944"
RWMC	No	ICP	9301	Vapor Port	Yes	N43* 29' 58.525"	W113* 2' 42.714"
RWMC	No	ICP	WWW1	Vapor Port	Yes	N43* 30' 5.161"	W113* 3' 35.762"
RWMC	No	ICP	USGS-118	Monitoring	Yes	N43* 29' 46.547"	W113* 2' 33.185"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
RWMC	No	ICP	78-4	Vapor Port	Yes	N43* 30' 12.557"	W113* 2' 45.329"
RWMC	No	ICP	77-1	Vapor Port	Yes	N43* 30' 12.284"	W113* 2' 45.353"
RWMC	No	ICP	M10S	Observation	Yes	N43* 29' 48.617"	W113* 2' 45.704"
RWMC	No	ICP	M1SA	Observation	Yes	N43* 29' 55.969"	W113* 3' 11.853"
RWMC	No	ICP	88-01D	Vapor Port	Yes	N43* 29' 58.641"	W113* 2' 43.445"
RWMC	No	ICP	M3S	Observation	Yes	N43* 30' 7.949"	W113* 2' 21.309"
RWMC	No	ICP	M6S	Observation	Yes	N43* 29' 30.770"	W113* 1' 53.339"
RWMC	No	ICP	M7S	Observation	Yes	N43* 30' 22.228"	W113* 1' 51.384"
RWMC	No	ICP	VVE-7	Vapor Vacuum Extraction	Yes	N43* 30' 22.429"	W113* 1' 51.400"
RWMC	No	ICP	SOUTH-MON-A-010	Monitoring	Yes	N43* 30' 8.404"	W113* 1' 47.377"
RWMC	No	ICP	SOUTH-MON-A-009	Monitoring	Yes	N43* 29' 48.864"	W113* 1' 47.216"
RWMC	No	ICP	VVE-6	Vapor Vacuum Extraction	Yes	N43* 29' 30.658"	W113* 1' 53.858"
RWMC	No	ICP	SOUTH-1898	Scientific Instrumentation	Yes	N43* 29' 47.217"	W113* 2' 29.927"
RWMC	No	ICP	VVE-4	Vapor Vacuum Extraction	Yes	N43* 29' 38.860"	W113* 3' 4.488"
RWMC	No	ICP	SOUTH-1835	Monitoring	Yes	N43* 29' 48.264"	W113* 2' 45.325"
RWMC	No	ICP	VVE-10	Vapor Vacuum Extraction	Yes	N43* 29' 48.766"	W113* 2' 45.869"
RWMC	No	ICP	RWMC-GAS-V-081	Vapor Monitoring Well	Yes	N43* 30' 1.708"	W113* 3' 11.126"
RWMC	No	ICP	RWMC-VVE-V-204	Vapor Vacuum Extraction	Yes	N43* 30' 1.132"	W113* 2' 45.629"
RWMC	No	ICP	RWMC-VVE-V-205	Vapor Vacuum Extraction	Yes	N43* 29' 59.867"	W113* 2' 41.462"
RWMC	No	ICP	RWMC-1816	Vapor Vacuum Extraction	Yes	N43* 29' 58.937"	W113* 2' 52.080"
RWMC	No	ICP	RWMC-GAS-V-074	Vapor Monitoring Well	Yes	N43* 30' 3.139"	W113* 2' 36.657"
RWMC	No	ICP	RWMC-1819	Vapor Vacuum Extraction	Yes	N43* 29' 58.576"	W113* 2' 43.946"
RWMC	No	ICP	RWMC-GAS-V-075	Vapor Monitoring Well	Yes	N43* 29' 56.101"	W113* 2' 39.864"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
RWMC	No	ICP	RWMC-VVE-V-071	Vapor Vacuum Extraction	Yes	N43* 30' 0.115"	W113* 3' 1.225"
RWMC	No	ICP	RWMC-GAS-V-076	Vapor Monitoring Well	Yes	N43* 29' 55.078"	W113* 2' 50.234"
RWMC	No	ICP	RWMC-GAS-V-077	Vapor Monitoring Well	Yes	N43* 30' 2.994"	W113* 2' 53.096"
RWMC	No	ICP	RWMC-GAS-V-078	Vapor Monitoring Well	Yes	N43* 29' 59.828"	W113* 2' 56.292"
RWMC	No	ICP	RWMC-VVE-V-067	Vapor Vacuum Extraction	Yes	N43* 30' 1.099"	W113* 2' 25.338"
RWMC	No	ICP	RWMC-GAS-V-079	Vapor Monitoring Well	Yes	N43* 29' 58.006"	W113* 3' 1.559"
RWMC	No	ICP	RWMC-1810	Vapor Vacuum Extraction	Yes	N43* 30' 3.983"	W113* 2' 39.457"
RWMC	No	ICP	RWMC-GAS-V-080	Vapor Monitoring Well	Yes	N43* 30' 4.478"	W113* 3' 1.228"
RWMC	No	ICP	RWMC-MON-A-162	Monitoring	Yes	N43* 29' 59.879"	W113* 2' 41.782"
RWMC	No	ICP	VVE-1	Vapor Vacuum Extraction	Yes	N43* 29' 56.149"	W113* 3' 11.817"
RWMC	No	ICP	RWMC-VVE-V-163	Vapor Vacuum Extraction	Yes	N43* 29' 59.884"	W113* 2' 42.130"
RWMC	No	ICP	VVE-3	Vapor Vacuum Extraction	Yes	N43* 30' 7.925"	W113* 2' 21.624"
RWMC	No	ICP	RWMC-1809	Vapor Vacuum Extraction	Yes	N43* 30' 4.093"	W113* 2' 39.534"
RWMC	No	ICP	RWMC-1812	Vapor Vacuum Extraction	Yes	N43* 30' 1.332"	W113* 2' 46.043"
RWMC	No	ICP	RWMC-1815	Vapor Vacuum Extraction	Yes	N43* 29' 58.940"	W113* 2' 51.840"
RWMC	No	ICP	RWMC-1818	Vapor Vacuum Extraction	Yes	N43* 29' 58.567"	W113* 2' 43.683"
RWMC	No	ICP	RWMC-1821	Vapor Vacuum Extraction	Yes	N43* 30' 0.988"	W113* 2' 36.607"
RWMC	No	ICP	RWMC-GAS-V-072	Vapor Monitoring Well	Yes	N43* 30' 2.529"	W113* 2' 24.912"
RWMC	No	ICP	RWMC-1822	Vapor Vacuum Extraction	Yes	N43* 30' 0.782"	W113* 2' 36.533"

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
RWMC	No	ICP	RWMC-VVE-V-068	Vapor Vacuum Extraction	Yes	N43* 30' 0.652"	W113* 2' 36.765"
RWMC	No	ICP	RWMC-GAS-V-073	Vapor Monitoring Well	Yes	N43* 29' 54.869"	W113* 2' 27.099"
RWMC	No	ICP	RWMC-1813	Vapor Vacuum Extraction	Yes	N43* 30' 1.100"	W113* 2' 45.880"
RWMC	No	ICP	RWMC-VVE-V-069	Vapor Vacuum Extraction	Yes	N43* 30' 3.933"	W113* 2' 42.329"
RWMC	No	ICP	RWMC-1817	Vapor Vacuum Extraction	Yes	N43* 29' 58.583"	W113* 2' 44.184"
RWMC	No	ICP	RWMC-1820	Vapor Vacuum Extraction	Yes	N43* 30' 0.863"	W113* 2' 36.621"
RWMC	No	ICP	RWMC-1808	Vapor Vacuum Extraction	Yes	N43* 30' 3.884"	W113* 2' 39.389"
RWMC	No	ICP	RWMC-1814	Vapor Vacuum Extraction	Yes	N43* 29' 58.944"	W113* 2' 52.329"

Table A-13 Storm Water Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
CFA	No	INL	CFA-MP-3	Storm Water Injection Monitoring Well	Yes	N43* 31' 36.775"	W112* 56' 50.272"
TAN/TSF	No	INL	TAN DISP 01	Storm Water Injection Monitoring Well	Yes	N43* 50' 41.867"	W112* 42' 12.099"
TAN/TSF	No	INL	TAN DISP 02	Storm Water Injection Monitoring Well	Yes	N43* 50' 53.256"	W112* 42' 35.011"
TAN/SMC	No	INL	TAN DISP 03	Storm Water Injection Monitoring Well	Yes	N43* 51' 15.996"	W112* 43' 2.359"
CITRC	No	INL	SPERT DISP 1	Storm Water Injection Monitoring Well	Yes	N43* 32' 43.442"	W112* 52' 18.079"
CITRC	No	INL	SPERT DISP 2	Storm Water Injection Monitoring Well	Yes	N43* 32' 23.604"	W112* 52' 24.459"
CITRC	No	INL	SPERT DISP 3	Storm Water Injection Monitoring Well	Yes	N43* 32' 9.621"	W112* 52' 43.270"

Table A-14 Surface Water Monitoring Locations

Location	Collocated	Contractor	Name	Type	On-Site	Latitude	Longitude
State HWY 22	No	ESER	BLR Control	Surface Water	No	N44* 1' 49.862"	W112* 43' 0.606"
Experimental Field Station	No	ESER	BLR at EFS	Surface Water	Yes	N43* 36' 17.646"	W112* 54' 1.695"
Lincoln Blvd. bridge	No	ESER	BLR at NRF	Surface Water	Yes	N43* 39' 47.481"	W112* 52' 40.133"
BLR at INTEC	No	ESER	BLR at INTEC	Surface Water	Yes	N43* 34' 27.278"	W112* 56' 31.123"
Big Lost River Rest Area	No	ESER	BLR AT Rest Area	Surface Water	Yes	N43* 32' 53.634"	W113* 0' 29.653"
Alpheus Springs	No	ESER	Alpheus Springs	Surface Water	No	N42* 36' 31.979"	W114* 28' 16.871"
Bill Jones Fish Farm	No	ESER	Bill Jones Fish Farm	Surface Water	No	N42* 47' 12.904"	W114* 51' 42.453"
Clear Spring	No	ESER	Clear Spring	Surface Water	No	N42* 40' 27.295"	W114* 46' 38.039"
Mackey	No	USGS	Big Lost River near Mackey	Surface Water	No	N43* 54' 9.668"	W113* 37' 2.080"
Howe	No	USGS	Little Lost River	Surface Water	No	N43* 53' 9.651"	W113* 6' 3.016"
Terreton	No	USGS	Mud Lake	Surface Water	No	N43* 53' 24.669"	W112* 21' 30.935"
Arco	No	USGS	Big Lost River near Arco	Surface Water	No	N43* 34' 59.653"	W113* 16' 13.019"
Blue Dome	No	USGS	Birch Creek	Surface Water	No	N44* 9' 13.665"	W112* 54' 27.010"
RWMC	No	ICP	SDA Lift Station	Surface Water	Yes	N43* 29' 59.977"	W113* 2' 27.566"
Experimental Field Station	No	USGS	Big Lost River @ Experimental Field Station	Surface Water	Yes	N43* 36' 49.665"	W112* 54' 2.987"
Big Lost River Diversion	No	USGS	BLR @ INL Diversion	Surface Water	Yes	N43* 30' 56.662"	W113* 4' 54.999"