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Long-Term Monitoring Plan for Operable Unit 3-13, Group 5, Snake River Plain Aquifer

IDAHO NATIONAL ENGINEERING & ENVIRONMENTAL LABORATORY

DOE/ID-10783
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ABSTRACT

This plan, along with the *Quality Assurance Project Plan for Waste Area Group 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites*, DOE/ID-10587, comprises the groundwater monitoring plan for the Operable Unit 3-13, Group 5, Snake River Plain Aquifer. The sampling and monitoring activities discussed include groundwater sampling (both above and below the HI interbed) and monitoring of groundwater elevations. The data are being collected to determine the effectiveness of the Operable Unit 3-13, Group 5, Snake River Plain Aquifer remedial action.

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ACRONYMS

BBWI	Bechtel BWXT Idaho, LLC
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
COC	contaminant of concern
DEQ	Department of Environmental Quality
DMP	data management plan
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
DOT	U.S. Department of Transportation
DQO	data quality objective
DS	decision statement
EPA	U.S. Environmental Protection Agency
ER	environmental restoration
ERIS	Environmental Restoration Information System
ES&H	environment, safety, and health
ES&H/QA	environment, safety, and health/quality assurance
FFA/CO	Federal Facility Agreement and Consent Order
FSP	field sampling plan
FTL	field team leader
FUM	facilities, utilities, and maintenance
HASP	health and safety plan
HDR	Hydrogeologic Data Repository

HSO	health and safety officer
ICPP	Idaho Chemical Processing Plant
ID	identification
IDHW	Idaho Department of Health and Welfare
IEDMS	Integrated Environmental Data Management System
IH	industrial hygienist
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
JRC	job requirements checklist
JSS	job-site supervisor
LAV	Limitations and Validation
LTMP	long-term monitoring plan
M&O	management and operation
MCL	maximum contaminant level
MCP	management control procedure
MSIP	monitoring system and installation plan
MW	monitoring well
NEPA	National Environmental Policy Act
OMP	Occupational Medical Program
OSHA	Occupational Safety and Health Administration
OU	operable unit
PEW	process equipment waste
PM	project manager
PPE	personal protective equipment
PRD	program requirements directives
PSQ	principal study question

PW	perched water
QA	quality assurance
QAPjP	quality assurance project plan
QA/QC	quality assurance/quality control
QC	quality control
RAO	remedial action objective
RCT	radiological control technician
RD/RA	remedial design/remedial action
RG	remedial goals
RI/BRA	remedial investigation/baseline risk assessment
RI/FS	remedial investigation/feasibility study
RML	Radiation Measurements Laboratory
ROD	Record of Decision
SAP	sample and analysis plan
SC	safety coordinator
SH&QA	safety, health, and quality assurance
SMO	Sample Management Office
SNF	spent nuclear fuel
SOP	standard operating procedure
SRPA	Snake River Plain Aquifer
STL	sample team lead
TL	technical leader
TRA	Test Reactor Area
TPR	technical procedure
USGS	United States Geological Survey
WAG	waste area group

WGS	Waste Generator Services
WMP	waste management plan

Long-Term Monitoring Plan for Operable Unit 3-13, Group 5, Snake River Plain Aquifer

1. INTRODUCTION

The Idaho National Engineering and Environmental Laboratory (INEEL) is divided into 10 waste area groups (WAGs) to manage environmental operations mandated under the Federal Facilities Agreement and Consent Order (FFA/CO) (DOE-ID 1991). The Idaho Nuclear Technology and Engineering Center (INTEC), formerly the Idaho Chemical Processing Plant (ICPP), is designated as WAG 3. Operable Unit (OU) 3-13 encompasses the entire INTEC facility.

The OU 3-13 was investigated to identify potential contaminant releases and exposure pathways to the environment from individual sites as well as the cumulative effects of related sites. Ninety-nine release sites were identified in the OU 3-13 Remedial Investigation/Feasibility Study (RI/FS), of which 46 were shown to have a potential risk to human health or the environment (DOE-ID 1997a). A new operable unit, OU 3-14, was created to specifically address activities at the tank farm area where special actions will be required. The 46 sites were divided into seven groups based on similar media, contaminants of concern (COC), accessibility, or geographic proximity. The OU 3-13 Record of Decision (ROD) (DOE-ID 1999) identifies remedial design/remedial action (RD/RA) objectives for each of the seven groups. The seven groups are

Group 1	Tank Farm Soils
Group 2	Soils Under Buildings and Structures
Group 3	Other Surface Soils
Group 4	Perched Water
Group 5	Snake River Plain Aquifer
Group 6	Buried Gas Cylinders
Group 7	SFE-20 Hot Waste Tank System.

The final ROD for OU 3-13 was signed in October 1999 (DOE-ID 1999). This comprehensive ROD presents the selected remedial actions for the above groups and specifically provides for Group 5 groundwater monitoring to assess contaminant flux into the Snake River Plain Aquifer (SRPA) from within the INTEC facility.

1.1 Purpose

The purpose of this long-term monitoring plan (LTMP) is to guide the collection and analysis of groundwater samples and data to support the Group 5 OU 3-13 SRPA monitoring at the INTEC and downgradient of the INTEC. Development of the LTMP was based on the data requirements identified in the OU 3-13 ROD.

This LTMP, combined with the quality assurance project plan (QAPjP) (DOE-ID 2000a), form the sampling and analysis plan. They are two of the documents that comprise the Monitoring System Implementation Plan (MSIP) (DOE-ID 2000b). The MSIP contains additional Group 5 project documentation, including the Plume Field Sample Plan (FSP) (DOE-ID 2000c), the Waste Management Plan (WMP) (DOE-ID 2000d), the Health and Safety Plan (HASP) (INEEL 2000), the Data Management Plan (DMP) (DOE-ID 2000e) as well as other documentation including the Quality Level Designation (DOE-ID 2000b, Appendix I), the Spill Prevention/Response Plan (DOE-ID 2000b, Appendix K), and the Storm Water Pollution Prevention Plan (DOE-ID 2000b, Appendix M).

1.2 Scope

The WAG 3 ROD establishes two remediation goals for the aquifer: (1) "preventing current onsite workers and nonworkers during the institutional control period from ingesting contaminated drinking water above the applicable State of Idaho groundwater standards or risk-based groundwater concentrations," and (2) "in 2095 and beyond, ensure that SRPA groundwater does not exceed a cumulative carcinogenic risk of 1×10^{-4} a total hazard index of 1; or applicable State of Idaho groundwater quality standards" (ROD, Sect 8, p 8-3) (DOE-ID 1999). The first remediation goal will be met by maintaining institutional control over the area of the identified SRPA contaminant plume south of the current INTEC security fence for as long as contaminant levels remain above groundwater standards or risk-based groundwater concentrations. The second remediation goal will be met by long-term monitoring unless remedial action is found to be necessary.

The purpose of this LTMP and the related project is to collect data for use in determining if the WAG 3 ROD goal for aquifer water quality in the year 2095 will be met. The investigation will (1) conduct long-term monitoring of the INTEC groundwater plume outside the INTEC fence line, (2) monitor the COC flux migrating from INTEC to outside the INTEC fence, (3) determine if the sediment and/or sludge that may exist in the vicinity of the former INTEC injection well is acting as a source of COC flux to the aquifer, and (4) provide the above data to update the OU 3-13 aquifer numerical model, which will provide more accurate COC concentration predictions for the year 2095. The data will be used in a three-step decision process to determine actions under the OU 3-13 ROD (DOE-ID 1999).

A logic diagram showing the scope of activities associated with Group 5 is presented in Figure 1-1.

Additional scope, supporting the Group 5 long-term monitoring program, but not directly called out in the ROD or Group 5 DQOs, is an evaluation of the micropurge sampling method to support long-term waste minimization and cost savings. The micropurge evaluation will consist of the collection of micropurge samples during the semiannual sampling event for statistical evaluation of results as well as comparison to historical data.

1.3 Regulatory Background

In October 1999, the ROD was issued for OU 3-13, which includes the INTEC perched and groundwater systems (DOE-ID 1999). The remedial actions chosen in the ROD are in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. In addition, remedies comply with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (EPA 1990) and are intended to satisfy the requirements of the Federal Facility Agreement and Consent Order (FFA/CO – Executive Order 12580).

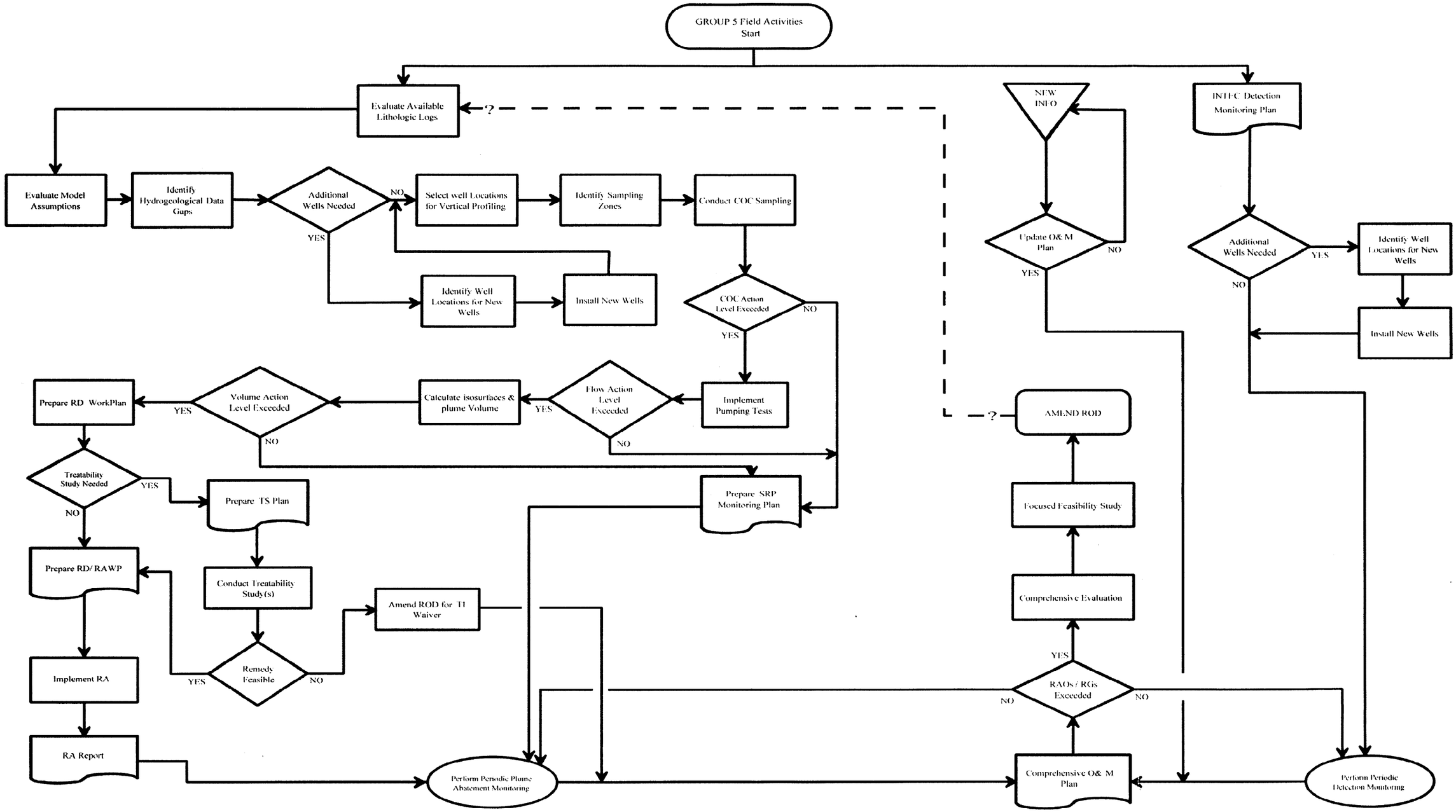

Figure 1-1. Logic diagram for Group 5 field activities.

The U.S. Department of Energy Idaho Operations Office (DOE-ID) is the lead agency for remedy decisions. The U.S. Environmental Protection Agency (EPA) Region 10 and the Idaho Department of Health and Welfare (IDHW) approve these decisions.

1.4 Document Organization

The LTMP is organized to facilitate understanding and maximize its usefulness to the field sampling team. The organization is as follows:

- Site description and background
- Group 5 Data Quality Objectives (DQOs)
- Discussion of types of sampling to be conducted, including groundwater monitoring, groundwater level measurements, and the types of analyses to be performed and determination of sample locations and frequency on the basis of available data (such as, well construction/completion, historical water level data, historical water quality data, and other relevant considerations)
- Description of all sampling and monitoring procedures and equipment to be used
- Sample control considerations
- Quality assurance (QA) requirements
- Data management, analysis, and unusual occurrences
- Project organization and responsibilities
- Waste management considerations
- Health and safety requirements
- Document management.