Rocky Flats Environmental Technology Site

Integrated Monitoring Plan
Background Document

Introduction

June 30, 1997
Rev. 1

1.0 INTRODUCTION

Soon after Kaiser-Hill Company, L.L.C. (Kaiser-Hill) became the Integrating Management Contractor at the Rocky Flats Environmental Technology Site (RFETS or the Site), Kaiser-Hill undertook a structured, comprehensive, reevaluation of all environmental monitoring programs. The objective of this effort was to develop specifications for monitoring utilizing the U.S. Environmental Protection Agency's (EPA's) established data quality objectives (DQO) process. The process involved the Department of Energy (DOE), EPA and Colorado Department of Public Health and Environment (CDPHE) (state) regulators, the cities of Broomfield and Westminster, and the Kaiser-Hill team. The effort was intended to identify any unnecessary monitoring and existing weaknesses in the monitoring programs, and to ensure protective and compliant programs. Using the consensus specifications (DQOs), an optimal data collection design was determined. This approach demonstrates compliance with the myriad of federal and state regulations and DOE Orders, and supports the decisions that must be made to protect human health and the environment with an acceptable degree of certainty. The monitoring programs of the regulators and cities were included and also modified to develop an integrated, multi-party Site monitoring program. The development and maintenance of this integrated program became a requirement of the *Rocky Flats Cleanup Agreement* (RFCA) issued on July 19, 1996[1]. This *Integrated Monitoring Plan* (IMP) is a result of the process described above.

The DQO process is a structured decision-making process that requires the identification of and agreement on decisions for which data are required, and results in the full set of specifications needed to develop a protective and compliant monitoring program (i.e., qualitative and quantitative statements that specify the type, quality, and quantity of the data required to support decision making). The formal DQO process is documented in EPA QA/G-4 (1993)(1) and EPA/540/G-93/071 (1993)(2). In September 1994, the DOE institutionalized the DQO process for environmental data collection activities. This was implemented to balance the DOE's environmental sampling and analysis costs with the need for sound environmental data that address regulatory requirements and stakeholder concerns. Specific steps in the DQO process include:

[1] RFCA Part 21 Sections 267 and 268 state; "In consultation with CDPHE and EPA, DOE shall establish an IMP that effectively collects and reports the data required to ensure the protection of human health and the environment consistent with the Preamble, compliance with this Agreement, laws and regulation, and the effective management of RFETS's resources. The IMP will be jointly evaluated for adequacy on an annual basis, based on previous monitoring results, changed conditions, planned activities and public input. Changes to the IMP will be made with the approval of EPA and CEPHE. Disagreements regarding any modifications to the IMP will be subject to the dispute resolution process described in Subpart 15B or E, as appropriate.

"All Parties shall make available to each other and the public results of sampling, tests, or other data with respect to the implementation of this Agreement as specified in the IMP or appropriate sampling and analysis plan. If quality assurance is not completed within the time frames specified in the IMP or appropriate sampling and analysis plan, raw data or results shall be submitted upon the request of EPA or CDPHE. In addition, quality assured data or results shall be submitted as soon as they become available."

- Identify and define problem(s) to be solved;
- Identify decision(s) to be made relative to the problem;
- Identify inputs to the decision (data needed to make decision);
- Define study boundaries/scope of problem and decision;
- Develop decision rule(s) [IF/THEN action statement(s)];
- Specify limits on decision errors (acceptable types and degrees of uncertainty); and
- Develop and optimize design for obtaining data.

The goal of using this approach was to reevaluate the basis and focus of existing programs, increase the defensibility of Site monitoring, and incorporate regulatory changes (e.g., water quality standards and cleanup levels) associated with RFCA. The RFCA requirements have been incorporated into the DQOs.

Implementation of the DQO process forces data suppliers and data users to consider the following questions:

- What decision has to be made?
- What type and quality of data are required to support the decision?
- Why are new data needed for the decision?
- How will new data be used to make the decision?

DOE and Kaiser-Hill recognized that the Site could no longer have separate, non-integrated sampling and analysis activities performed by various entities at the Site (e.g., Environmental Restoration and Environmental Protection), or between the Site, the cities, the state, and EPA Region VIII. DOE and Kaiser-Hill also realized that they should not work alone; therefore, an integrated monitoring working group was formed with representatives from EPA, the state, and the cities of Broomfield, Northglenn, and Westminster (see Table 1-1) to develop consensus on what data were needed, and how data would be used, and to develop sampling and analysis plans based on these specifications. The responsibility for data generation was then spread across these entities in a logical way. In developing the requirements for an integrated monitoring plan, the decisions and multimedia data requirements associated with Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Clean Air Act (CAA), Clean Water Act (CWA), Colorado Water Quality Control Commission (CWQCC) standards, natural resource management regulations, Site-specific cleanup agreements (e.g., the *Industrial Area Interim Measures/Interim Remedial Action Decision Document*), and several DOE Orders were considered. After data requirements to support each of the desired decisions were identified, data collection was streamlined by looking for opportunities to use measurements for more than one decision.

Table 1-1
Participants in the RFETS *Integrated Monitoring Plan* Development Process

Organization	Person	Surface Water	Ground-water	Air	Ecology
DOE, RFFO	K. Brakken				X
	J. Dion			X	
	P. Halder	X	X		
	R. McCallister			X	X
	S. Slaten	X	X	X	X
	J. Stover	X			X
DOE Contractor	J. Marks	X	X	X	X
Kaiser-Hill	E. Brovsky	X	X	X	X
	G. Kelly	X	X	X	X
	S. Nesta		X		X
	R. Nininger			X	
	G. Setlock	X	X		
	L. Woods				X
RMRS	M. Buddy	X			
	L. Dunston	X			
	S. Evans	X	X		X
	R. Fiehweg	X			
	C. Hoffman	X			
	J. Krause				X
	S. Singer		X		
	J. Starr	X			
	G. Wetherbee	X			
Radian Corporation	R. Crocker			X	
	G. Euler			X	
USGS	K. Lull	X			
	M. Smith	X			
EPA	W. Fraser	X			
	G. Kleeman		X		X
	M. Reed	X			
	C. Reynolds			X	
	S. Whitmore			X	
CDPHE	J. Bruch	X			
	R. Fox			X	
	T. Harrison	X		X	
	J. Love	X	X	X	X
	S. Marek	X			

Table 1-1 (continued)

Organization	Person	Surface Water	Ground-water	Air	Ecology
CDPHE	E Pottorff		X		
Colorado Dept. of Wildlife	D. Weber				X
Broomfield	H. Mahan	X			
	K. Schnoor	X			
Northglenn	K. Scott	X			
Westminster	S. Bernia	X			
	T. Settle	X			
RFCAB/CSM	S. Jovic	X	X		
Neptune & Co. Associates	D. Michael	X	X	X	X
	D. Neptune	X	X	X	X
PNNL	D. Gilbert	X	X	X	X

Notes:

CDPHE = Colorado Department of Public Health and Environment
DOE = Department of Energy
EPA = U.S. Environmental Protection Agency
Kaiser-Hill = Kaiser-Hill Company, L.L.C.
PNNL = Pacific Northwest National Laboratories
RFCAB/CSM = Rocky Flats Citizens Advisory Board/Colorado School of Mines
RMRS = Rocky Mountain Remediation Services, L.L.C.
USGS = United States Geological Survey

To accomplish the work associated with developing an integrated monitoring plan, four medium-specific DQO working groups (i.e., surface water, groundwater, air, and ecological resources) were established. Each group met regularly to work through the DQO process for each decision that required monitoring data. In addition, all four groups met together to discuss data needs across media, share progress, ensure consistency, and identify problems. DQO facilitators and statisticians, sponsored in part by DOE Headquarters, assisted the integrated monitoring working group in developing the DQOs, evaluating the adequacy of existing designs, and developing new sampling and analysis plans. The results of these efforts represent a multi-party consensus agreement and are documented below by environmental media. Integration was achieved between monitoring entities, regulatory programs, and environmental media. Interactions between media are discussed in Section 6.0 of this IMP.

This document covers all the environmental monitoring conducted by DOE and the Kaiser-Hill team, as well as monitoring conducted by CDPHE and the cities where interface and integration opportunities exist. There is other monitoring conducted by CDPHE and the cities that is related to the Site, but this monitoring did not present integration opportunities (e.g., monitoring of area reservoirs conducted by the cities and spot checks conducted by CDPHE).

Soil monitoring is not discussed in this document. Soil monitoring is conducted as it relates to specific environmental restoration (ER) and decontamination and decommissioning (D&D).

Integration of Site-wide and project-specific monitoring will occur during the planning of all major new activities, such as ER and D&D projects. Kaiser-Hill will review all major project plans and evaluate the need for specific environmental monitoring, based on potential release characteristics (e.g., constituents and concentrations), potential impacts [e.g., adherence to regulatory standards, RFCA, and as low as reasonably achievable (ALARA) principles], and existing Site-wide, multi-media monitoring. Consideration will be given to data needs before, during, and after a proposed activity. Monitoring before a project would assist in defining baseline conditions, characterizing relationships between media, assessing potential impacts to multiple media, and developing designs and controls to eliminate or mitigate impacts. Monitoring during and after a project would assist in determining the effectiveness and performance of designs and controls to eliminate or mitigate impacts. If additional monitoring was deemed necessary, Kaiser-Hill would work with project personnel to develop appropriate, media-specific DQOs and monitoring specifications. Project-specific DQOs will address protection of project personnel, collocated workers, off-Site populations, and the environment, and will complement Site-wide monitoring DQOs. Project-specific monitoring plans will be included in separate field sampling plans and/or health and safety plans, and therefore, will be available for review by the regulatory agencies and other stakeholders. Integration of Site-wide and project-specific monitoring could also be the subject of future meetings of the integrated monitoring working group.

A key component of the DQO process and the RFETS IMP is data evaluation. To be successful, both Site-wide and project-specific monitoring data will need to be continuously evaluated to support the DQO decision rules. Decision rules could address baseline definition, relationships between various media, performance and compliance demonstration, and identification of unplanned conditions and trends. Actions based on data evaluation are specified by the decision rules. Actions also may involve modification of DQOs and monitoring specifications. For example, additional data may be required to adequately characterize observed conditions and potential impacts (e.g., exceedance of RFCA Tier I and Tier II groundwater action levels), and in some cases, to properly scope a proposed activity (e.g., ER and D&D projects, or changes to existing water management schemes). Data evaluation is discussed in the media-specific sections that follow and in RFETS environmental program plans.

Data reporting and data exchange were considered during the development of the IMP. The data exchange mechanism, which was formalized as a RFCA requirement (Section 207), will provide Site-wide and project-specific monitoring data to all appropriate monitoring entities and regulatory agencies and will allow these groups to evaluate data needs associated with proposed activities (e.g., baseline characterization, design, and performance monitoring). Work is progressing on defining the data management tools needed for data exchange and interpretation. All entities are involved to ensure that the proper information is conveyed in a timely manner.

The plan presented herein should be considered dynamic. The monitoring programs will evolve as further progress is made on Site remediation and closure, as new remediation and closure efforts are planned and initiated that require performance monitoring, as the regulatory setting changes, and as new data become available to improve the statistical design. Such changes will be made by the multi-party working group and documented in updates to this plan. Routine meetings of the working group will be held, and resulting changes will be presented to other stakeholders, including the RFETS Citizens Advisory Board. Additional work that should be performed is presented below.

- Evaluate detection limits, quality control (QC) specifications, and other aspects not fully specified at this time;
- Finalize process to develop and evaluate monitoring DQOs and plans for new activities, such as ER and D&D projects, including integration of Site-wide and project-specific monitoring;
- Continue to identify integration opportunities between media (see Table 6-1);
- Finalize DQOs for Buffer Zone flow monitoring;
- Develop monitoring DQOs for controlled detention mode of pond operations;
- Continue to evaluate groundwater data regarding Tier I and II exceedances, and modify sampling and analysis accordingly (data review, additional sampling and analysis, and modeling as appropriate). For example:
  - Nitrate plume at solar ponds,
  - Walnut Creek wells,
  - Wells north of B771/B779 Complex, and
  - Volatile organic compound plume at Property Utilization and Disposal (PU&D) yard;
- Negotiate changes in National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities (Rad NESHAP) monitoring in light of facility D&D (i.e., use of ambient monitoring to demonstrate compliance with NESHAP standards);
- Solicit broader stakeholder input (e.g., present plan and modifications to interested stakeholder groups);
- Convene integrated monitoring working group routinely (e.g., semiannually); and Complete development of mechanism to exchange data among monitoring entities and with other stakeholders.

1.1 References

1. EPA QA/G4, *Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objective Process.* U.S. Environmental Protection Agency, October 1993.

2. EPA/540/G-93/071, *Data Quality Objectives Process for Superfund*. U.S. Environmental Protection Agency, September 1993.