

Monitored Natural Attenuation Final Inspection Report

*Kevin A. Hall
Brennan R. Orr*

June 2009

ICP/EXT-03-00089
Revision 1
Project No. 23339

Monitored Natural Attenuation Final Inspection Report

**Kevin A. Hall
Brennan R. Orr**

June 2009

**Idaho Completion Project
Idaho Falls, Idaho 83415**

**Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
Under DOE/NE Idaho Operations Office
Contract DE-AC07-99ID13727**

ABSTRACT

This report presents the results of the Test Area North Operable Unit 1-07B monitored natural attenuation prefinal inspection held on October 16, 2003. Items addressed in this report include prefinal inspection checklist items, discussion of prefinal inspection findings, and action for correction of inspection findings. This report documents the Agencies' concurrence that monitored natural attenuation meets the project's functional and operational requirements and that performance operations are ready to begin.

CONTENTS

ABSTRACT.....	iii
ACRONYMS.....	vii
1. INTRODUCTION.....	1
1.1 Background.....	1
1.2 Objectives and Scope.....	2
2. PREFINAL INSPECTION CHRONOLOGY.....	2
3. PREFINAL INSPECTION CHECKLIST.....	3
3.1 Project Documents.....	3
3.2 Procedures and Work Control Documents.....	3
3.3 Equipment and System Readiness.....	4
3.4 Management Programs.....	4
4. CORRECTIVE ACTIONS.....	4
5. REFERENCES.....	7
Appendix A—Monitored Natural Attenuation Prefinal Inspection Checklist.....	9

TABLES

1. Operable Unit 1-07B distal zone monitoring well interior casing and cap status.....	4
--	---

ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
D&D&D	deactivation, decontamination, and decommissioning
DOE	Department of Energy
EPA	Environmental Protection Agency
ER	Environmental Restoration
FLUTE™	Flexible Liner Underground Technology
IDEQ	Idaho Department of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
MCP	management control procedure
MNA	monitored natural attenuation
NE-ID	Department of Energy Idaho Operations Office (see footnote a)
OU	operable unit
PDD	program description document
TAN	Test Area North
TPR	technical procedure
TSF	Technical Support Facility
WAG	waste area group

Monitored Natural Attenuation Final Inspection Report

1. INTRODUCTION

This final inspection report addresses the results of the monitored natural attenuation (MNA) prefinal inspection activities that took place on October 16, 2003, at Test Area North (TAN) at the Idaho National Engineering and Environmental Laboratory (INEEL). Topics to be addressed in this report include:

- A report of the prefinal inspection events (Section 2)
- Prefinal inspection checklist items (Section 3)
- Discussion of resolutions and corrective actions as a result of Agency inspection findings (Section 4).

This final inspection report documents the Agencies' concurrence that MNA meet the project's functional and operational requirements, and that performance operations may commence starting October 17, 2003.

1.1 Background

Monitored natural attenuation has been identified as the remedy for the distal portion of the contaminated groundwater plume associated with the Technical Support Facility (TSF) injection well (TSF-05). Principal contaminants of concern (COCs) in this plume include selected volatile organic compounds (VOCs) and radionuclides. The contaminant plume in groundwater that originates from well TSF-05 has been designated as Operable Unit (OU) 1-07B. This Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601) remedial action will proceed in accordance with the signed *Record of Decision Amendment—Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-05) and Miscellaneous No Action Sites, Final Remedial Action* (DOE-ID 2001).

Natural attenuation in the distal zone of the TSF-05 contaminated groundwater plume is the sum of the physical, chemical, and biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. Monitored natural attenuation at TAN OU 1-07B will be implemented in two phases: performance operations and long-term operations. The performance operations phase includes annual groundwater monitoring and remedy performance reviews to compare actual natural degradation rates to predicted degradation rates. The duration of this phase is undetermined and will be dependent on sample results. The long-term operations phase will begin once the determination has been made that MNA is operational and functional. This phase will consist of periodic monitoring to track the remedy's progress toward achieving remedial action objectives (RAOs). Engineering and administrative controls have also been put in place to protect current and future users from health risks associated with groundwater contamination.

Previously, activities that supported the evaluation of MNA at TAN OU 1-07B were governed by the *Phase C Groundwater Monitoring Plan, Test Area North Operable Unit 1-07B* (INEEL 2002a). Monitored natural attenuation operations are now governed by the *Monitored Natural Attenuation Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B*

(DOE-ID 2003a). These operations have commenced with the implementation of the performance operations phase, as defined in the *Monitored Natural Attenuation Operations, Monitoring, and Maintenance Plan for Test Area North, Operable Unit 1-07B* (DOE-ID 2003b).

1.2 Objectives and Scope

This final inspection report provides documentation of the prefinal inspection performed by the Department of Energy Idaho Operations Office (NE-ID^a), Environmental Protection Agency (EPA), and Idaho Department of Environmental Quality (IDEQ) project managers (or their designees) and resolution of any deficiencies that were identified during the inspection. The primary objective is to provide a check to ensure that all regulatory requirements are satisfied and that the identified operating requirements can be met.

2. PREFINAL INSPECTION CHRONOLOGY

A walk-through of the monitoring well network was conducted on October 16, 2003. During the walk-through, the NE-ID, EPA, and IDEQ project managers first observed the GIN-4 and GIN-2 wellheads, which are located in Zone 2 of the distal portion of the contaminant plume. The inspection party then observed the TAN-56 wellhead. This well, which is located outside of the contaminant plume in Zone 3, has been equipped with a Flexible Liner Underground Technology (FLUTETM) liner sampling system. Finally, the inspection party observed the TAN-58 wellhead, which is also located in Zone 3. In all cases, the primary well casing was capped and locked in accordance with site and project policies and procedures; however, the IDEQ requested that wells equipped with an interior (secondary) casing be capped as well. All three non-FLUTETM wells were observed to be missing an interior cap. A brief meeting was held on October 17, 2003, to discuss the observations from the walk-through.

The MNA prefinal inspection binder was made available to the NE-ID, EPA, and IDEQ project managers, or their designees, for review of the documents and procedures that pertain to implementation of the MNA remedy. One purpose of the binder was to present the governing documents such that these project managers could confirm, upon inspection, that all documents required to govern MNA operations at TAN are complete. The documents in the binder included:

- *Monitored Natural Attenuation Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07* (DOE-ID 2003a)
- *Monitored Natural Attenuation Operations, Monitoring, and Maintenance Plan for Test Area North, Operable Unit 1-07B* (DOE-ID 2003b)
- *Test Area North Operable Unit 1-07B Final Groundwater Remedial Action Health and Safety Plan* (INEEL 2002b)
- *Interim Decontamination Plan for Operable Unit 1-07B* (INEEL 2002c)
- *Waste Management Plan for Test Area North Final Groundwater Remediation Operable Unit 1-07B* (INEEL 2002d)
- MCP-1192, “Chain-of-Custody and Sample Labeling for ER and D&D&D Projects”

a. NE-ID signifies that the U.S. Department of Energy Idaho Operations Office (abbreviated as DOE-ID before October 1, 2003) reports to the DOE Office of Nuclear Energy, Science, and Technology.

- MCP-1193, “Handling and Shipping Samples for ER and D&D&D Projects”
- MCP-1194, “Logbook Practices for ER and D&D&D Projects”
- PDD-150, “ICP D&D/ER Training Plan for LTHC3 Facilities”
- TPR-165, “Low Flow Groundwater Sampling”
- TPR-1841, “Barcad Sampling”
- TPR-4907, “Installation and Removal of Equipment in TAN Wells”
- TPR-6247, “Troll 9000 Operations Water Quality Probe Operation and Maintenance”
- TPR-6371, “FLUTE Liner Water Sampling”
- TPR-6580, “Port-A-Reel for Field Use”
- TPR-6641, “New Pump and Treat Facility Purge Water Injection”
- A list of available equipment for performing MNA operations.

3. PREFINAL INSPECTION CHECKLIST

A prefinal inspection checklist was generated to identify operational and regulatory requirements necessary prior to the start of MNA performance operations. The items shown on the checklist represent the status of MNA at the completion of the prefinal inspection meeting. This checklist, as presented during the inspection, is included as Appendix A. The checklist was divided into the following four areas:

1. Project documents
2. Procedures and work control documents
3. Equipment and system readiness
4. Management programs.

3.1 Project Documents

Monitored natural attenuation is governed by the MNA Remedial Action Work Plan (DOE-ID 2003a), the MNA Operations, Monitoring, and Maintenance Plan (DOE-ID 2003b), and the OU 1-07B Health and Safety Plan (INEEL 2002b). The checklist documents the Agencies’ concurrence that these documents are approved and issued.

3.2 Procedures and Work Control Documents

The Waste Area Group (WAG) 1 institutional controls are in place and sampling procedures have been approved and issued. Waste Area Group 1 institutional controls and sampling procedures were reviewed in the various documents contained in the MNA prefinal inspection binder and during the inspection.

3.3 Equipment and System Readiness

The necessary sampling equipment is available for use during MNA operations. A list of this equipment was included in the binder that was available for review.

3.4 Management Programs

Personnel responsibilities and line of authority are clearly defined for MNA in the OU 1-07B Health and Safety Plan (INEEL 2002b).

4. CORRECTIVE ACTIONS

It was observed during the prefinal inspection that all four wells inspected had a locked cap on the exterior casing. However, interior casings in several wells were not capped. The IDEQ requested that all interior well casings be capped. Table 1 summarizes corrective actions for all wells used for monitoring at TAN. All exterior casings were capped and locked; this table refers to interior casings only. Wells used for monitoring MNA under the MNA Operations, Monitoring, and Maintenance Plan (DOE-ID 2003b) are highlighted. These corrective actions will be completed prior to May 31, 2004, which is before the next scheduled MNA sampling round.

Table 1. Operable Unit 1-07B distal zone monitoring well interior casing and cap status.

Well	Corrective Action
ANP-5 ^a	No action needed.
ANP-6 ^a	No action needed.
ANP-7 ^a	No action needed.
ANP-8	Install 1-in. and 3-in. flat caps.
ANP-91	No action needed.
ANP-101	No action needed.
FET Disposal	No action needed.
GIN-1	Install a cap over inside pipe.
GIN-2	Install a cap over inside pipe.
GIN-3	Install a cap over inside pipe.
GIN-4	Install a cap over inside pipe.
GIN-5	Install a cap over inside pipe.
MW-2	Install existing cap.
NONAME	No action needed.
OWSLEY-21	No action needed.
P&W 11	No action needed.
P&W 21	No action needed.
P&W 31	No action needed.
PSTF	No action needed.
TANT-MON-A-01	Small hole in landing plate for pump power supply will be sealed.
TAN-04	Small hole in landing plate for pump power supply will be sealed.
TAN-05	Small hole in landing plate for pump power supply will be sealed.

Table 1. (continued).

Well	Corrective Action
TAN-06	Small hole in landing plate for pump power supply will be sealed.
TAN-07	Small hole in landing plate for pump power supply will be sealed.
TAN-08	Small hole in landing plate for pump power supply will be sealed.
TAN-09	Small hole in landing plate for pump power supply will be sealed.
TAN-10	Install a cap over inside pipe.
TAN-10A	Small hole in landing plate for pump power supply will be sealed.
Well	Corrective Action
TAN-11	Small hole in landing plate for pump power supply will be sealed.
TAN-12	Small hole in landing plate for pump power supply will be sealed.
TAN-13A	Small hole in landing plate for pump power supply will be sealed.
TAN-14	Small hole in landing plate for pump power supply will be sealed.
TAN-15	Small hole in landing plate for pump power supply will be sealed.
TAN-16	Small hole in landing plate for pump power supply will be sealed.
TAN-17	Install a 1-3/4-in. cap.
TAN-18	Small hole in landing plate for pump power supply will be sealed.
TAN-19	Small hole in landing plate for pump power supply will be sealed.
TAN-20	Small hole in landing plate for pump power supply will be sealed.
TAN-21 ²	Small hole in landing plate for pump power supply will be sealed.
TAN-22A	Small hole in landing plate for pump power supply will be sealed.
TAN-23A	Small hole in landing plate for pump power supply will be sealed.
TAN-24A	Install existing cap.
TAN-25	No action needed.
TAN-26	No action needed.
TAN-27	Small hole in landing plate for pump power supply will be sealed.
TAN-28	Install a 2-in. cap.
TAN-29	Small hole in landing plate for pump power supply will be sealed.
TAN-30A	Install a 2-in. cap.
TAN-31	Install a notch cut in lid for EZ-Reel.
TAN-32	Install a 4-in. cap.
TAN-33	Inner 10-in. casing has a half landing plate for hose and power supply. The casing will be capped.
TAN-34	Install an 8-in. cap.
TAN-35	Install an 8-in. cap.
TAN-36	Inner 10-in. casing has a half landing plate for hose and power supply. The casing will be capped.
TAN-37	No action needed.
TAN-38	No action needed.
TAN-39	No action needed.
TAN-40	No action needed.
TAN-41	Install a 6-in. cap on inner casing.

Table 1. (continued).

Well	Corrective Action
TAN-42	Install a 4-in. cap on inner casing.
TAN-43	Inner 6-in. casing has a half landing plate for hose and power supply. The casing will be capped.
Well	Corrective Action
TAN-44	Inner 6-in. casing has a half landing plate for hose and power supply. The casing will be capped.
TAN-45	6-in. inner casing with Mini-troll down-hole. The casing will be capped.
TAN-46	Install a 6-in. cap on inner casing.
TAN-47	Install a 10-in. cap on inner casing.
TAN-48	Install a 1/2-in. cap on pipe. The fittings will be replaced on FLUTE™ lines.
TAN-49	Install a 10-in. cap on inner casing.
TAN-50	Install a 10-in. cap on inner casing.
TAN-51 ^b	Install a 1/2-in. cap on water level pipe.
TAN-52 ^b	Install a 1/2-in. cap on water level pipe.
TAN-54 ^b	Install a 1/2-in. cap on water level pipe.
TAN-55 ^b	Install a 1/2-in. cap on water level pipe.
TAN-56 ^b	Install a 1/2-in. cap on water level pipe.
TAN-57	Install a 10-in. cap on inner casing.
TAN-58	Install a 10-in. cap on inner casing.
TAN-CH2 mon. 1	Install 2, 1-in. caps.
TAN-CH2 mon. 2	No action needed.
TAN-D1 ^c	No action needed.
TAN-D2 ^c	No action needed.
TAN-D3 ^c	No action needed.
TSF-05	Install a 4-in. flat cap.
USGS-07	No action needed.
USGS-24	No action needed.
USGS-25	No action needed.
USGS-26	No action needed.
TAN-1859	No action needed.
TAN-1860	Install a 10-in. cap on inner casing.
TAN-1861	Install a 10-in. cap on inner casing.

a. These wells were completed with exterior casing only.

b. These are FLUTE™ wells.

c. These wells are stormwater injection wells. They are equipped with a wire mesh cap.

5. REFERENCES

- 42 USC § 9601 et seq., 1980, “Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund),” *United States Code*, December 11, 1980.
- DOE-ID, 1995, *Record of Decision for the Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites, Final Remedial Action*, DOE/ID-10139, Revision 0, U.S. Department of Energy Idaho Operations Office, August 1995.
- DOE-ID, 2001, *Record of Decision Amendment for the Technical Support Facility Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) and Miscellaneous No Action Sites, Final Remedial Action*, DOE/ID-10139, Revision 0, U.S. Department of Energy Idaho Operations Office, September 2001.
- DOE-ID, 2003a, *Monitored Natural Attenuation Remedial Action Work Plan for Test Area North Final Groundwater Remediation, Operable Unit 1-07B*, DOE/ID-11055, Revision 0, U. S. Department of Energy Idaho Operations Office, June 2003.
- DOE-ID, 2003b, *Monitored Natural Attenuation Operations, Monitoring, and Maintenance Plan for Test Area North, Operable Unit 1-07B*, DOE/ID-2002-11066, Revision 0, Idaho National Engineering and Environmental Laboratory, June 2003.
- INEEL, 2002a, *Phase C Groundwater Monitoring Plan, Test Area North Operable Unit 1-07B*, INEEL/EXT-99-00021, Revision 1, Idaho National Engineering and Environmental Laboratory, April 2002.
- ICP 2009, PLN-2128, “Environmental Restoration Project Health and Safety Plan,” Revision 6, Idaho Cleanup Project, May 2009.
- INEEL, 2002c, *Interim Decontamination Plan for Operable Unit 1-07B*, INEEL/EXT-97-01287, Revision 4, Idaho National Engineering and Environmental Laboratory, June 2002.
- INEEL, 2002d, *Waste Management Plan for TAN Final Groundwater Remediation OU 1-07B*, INEEL/EXT-98-00267, Revision 4, Idaho National Engineering and Environmental Laboratory, May 2002.
- MCP-1192, 2003, “Chain-of-Custody and Sample Labeling for ER and D&D&D Projects,” Revision 0, *Environmental Restoration Work Processes Manual*, February 2003.
- MCP-1193, 2003, “Handling and Shipping Samples for ER and D&D&D Projects,” Revision 0, *Environmental Restoration Work Processes Manual*, February 2003.
- MCP-1194, 2003, “Logbook Practices for ER and D&D&D Projects,” Revision 1, *Environmental Restoration Work Processes Manual*, May 2003.
- PDD-150, “ICP D&D/ER Training Plan for LTHC3 Facilities” March, 2009.
- TPR-165, 2004, “Low-Flow Groundwater Sampling,” Revision 8, January 2004.
- TPR-1841, 2003, “Barcad Sampling,” Revision 0, April 2003.

TPR-4907, 2002, "Installation and Removal of Equipment in TAN Wells," Revision 0, April 2002.

TPR-6247, 2003, "Troll 9000 Operations Water Quality Probe Operation and Maintenance," Revision 0, October 2003.

TPR-6371, 2003, "FLUTE™ Liner Water Sampling," Revision 3, October 2003.

TPR-6580, 2003, "Port-A-Reel for Field Use," Revision 2, November 2003.

TPR-6641, 2003, "New Pump and Treat Facility Purge Water Injection," Revision 2, February 2003.

Appendix A

Monitored Natural Attenuation Prefinal Inspection Checklist

MNA PREFINAL INSPECTION CHECKLIST

ITEM NO.	PROJECT TITLE	ITEM DESCRIPTION	STATUS	DATE	PERSON RESPONSIBLE	COMMENTS
1.	PROJECT DOCUMENTS					
a		Site Health and Safety Plan with MNA included is approved and issued				
b		MNA Remedial Action Work Plan is approved and issued				
c		MNA Operations and Maintenance Plan is approved and issued				
2.	PROCEDURES AND WORK CONTROL DOCUMENTS					
a		WAG 1 Institutional Controls are in place				
b		Sampling Procedures are approved and issued				
3.	EQUIPMENT AND SYSTEM READINESS					
a		Necessary Wells are in place and functional				
4.	MANAGEMENT PROGRAMS					
a		Personnel responsibilities and line of authority are clearly defined				