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**WORK PLAN FOR GROUND WATER
ELEVATION DATA RECORDER
INSTALLATION AT
RIVERTON, WYOMING**

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ELEVATION DATA RECORDER INSTALLATION
AT RIVERTON, WYOMING**

August 1994

**Prepared for
U.S. Department of Energy
UMTRA Project Office
Albuquerque, New Mexico**

**Prepared by
Jacobs Engineering Group Inc.
Albuquerque, New Mexico**

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
1.1 Purpose	1
1.2 Data collection objectives	1
2.0 DATA LOGGER INSTALLATION TASKS	2
2.1 Data logger locations	2
2.2 Permits, clearances, and access agreements	2
2.3 Site conditions	2
2.4 Data logger installation methods	4
2.5 Field documentation	5
2.6 Anti-contamination measures	5
3.0 HEALTH AND SAFETY	6
3.1 Local contingencies and contacts	6
4.0 WELL AND DATA LOGGER INSTALLATION TASK SCHEDULE	8
5.0 REFERENCE	9

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	Data logger location map, Riverton, Wyoming	3
2	Route to hospital, Riverton, Wyoming	7

LIST OF ACRONYMS AND ABBREVIATIONS

<u>Acronym</u>	<u>Definition</u>
BIA	Bureau of Indian Affairs
DCO	data collection objective
DOE	U.S. Department of Energy
FTR	field technical representative
SOP	standard operating procedure
TAC	Technical Assistance Contractor
UMTRA	Uranium Mill Tailing Remedial Action

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this document is to describe the work that will be performed and the procedures that will be followed during installation of ground water elevation data recorders (data loggers) at the Riverton, Wyoming, Uranium Mill Tailings Remedial Action (UMTRA) Project site.

Previous investigations conducted at the Riverton site to date supports a preliminary determination regarding the selection of ground water remediation alternatives appropriate to this site. Although ground water modeling employing existing data indicates that a natural flushing strategy may be appropriate, additional site-specific data are needed to confirm the applicability and feasibility of this remedial option. The data loggers will be used to gather required time-dependent data to investigate the interaction between ground water and surface water in the area.

1.2 DATA COLLECTION OBJECTIVES

Data collection objectives (DCO) identify reasons for collecting data. The following are DCOs for the Riverton ground water elevation data recorder installation project:

- Long-term continuous ground water level data will be collected to determine the effect of seepage from irrigation canals on the hydraulic gradient and the rate of ground water movement. These measurements will be made in both the surficial and semiconfined aquifers.
- Water level data will be collected to assess the relationship between the ground water and the surface water in the wetland to the east and in the Little Wind River to the south.
- Water level data will be used in ground water modeling to more firmly demonstrate the potential of natural flushing as a remedial alternative.

2.0 DATA LOGGER INSTALLATION TASKS

2.1 DATA LOGGER LOCATIONS

The placement of data loggers in existing monitor wells will allow the necessary ground water level data to be collected. No new monitor wells will be installed at this time. Data loggers will remain in the monitor wells for a complete hydrologic cycle, approximately 1 year. The data loggers will record ground water elevation measurements before and after the irrigation canal system is fully active and as it is reactivated next spring. They will record the growth, variations, and decay of the ground water mound that is thought to be related to canal seepage. They will also be installed in surficial aquifer wells near the wetland east of the site and near the Little Wind River.

Data loggers will be installed in nine existing monitor wells (Figure 1). Data loggers will be installed in monitor wells 724 and 728 in the surficial aquifer and in 725 and 727 in the semiconfined aquifer along the northern boundary of the site near the irrigation canal. Data loggers will also be installed in surficial monitor wells 716, 718, and 101 to record changes more distant from the canal. Water level information from the nested wells completed in the semiconfined aquifer will be used to quantify the relationship between the aquifers. Rather than incur the expense of installing additional data loggers in all of these wells, manual measurements will be made four times per year when the data loggers are serviced. Installation of data loggers in wells 729 and 705 will provide information on the relationship between ground water and surface water in the wetland to the east of the site and the Little Wind River to the south, respectively.

The data loggers will collect six water level measurements per day (at 4-hour intervals). Field technicians will download the recorded data to a personal computer and check the data logger for proper operation at approximately 3-month intervals (four times per year).

2.2 PERMITS, CLEARANCES, AND ACCESS AGREEMENTS

No monitor well permits or access agreements are needed for the installation of data loggers in existing wells. Technical Assistance Contractor (TAC) Property Management has verified that existing access agreements are sufficient to allow the installation of data loggers in monitor wells. Property owners will be notified before fieldwork begins.

2.3 SITE CONDITIONS

There is an extensive, active, irrigation system throughout the Wind River/Little Wind River valley. An unlined irrigation canal borders the western half of the northern edge of the site, then turns south to approximately bisect the northern half of the site (in a north-south direction). This canal again turns to the east

MAC: NON-SITE/WORK/PLAN/BASE-LOGWELLS

and then to the south and exits onto the adjoining property to the east near the middle of the eastern property line (Figure 1). The canal eventually empties into the natural wetland east of the site.

Water in the canal is controlled by the U.S. Bureau of Indian Affairs (BIA) in Lander, Wyoming. The irrigation season typically runs from May 1 until October 1 each year. Measurements taken June 20, 1994, at flow control gates along the canal just north of the site and within the property indicated a flow of approximately 1 cubic foot per second. Leakage from this irrigation canal is thought to have a significant impact on ground water conditions at the site.

Ground water flows beneath the Riverton site to the southeast and discharges to the Little Wind River and possibly to the wetlands east of the site.

2.4 DATA LOGGER INSTALLATION METHODS

Data loggers and pressure transducers will be installed and calibrated in each monitor well following the manufacturer's instructions. Data loggers will be suspended in the monitor well for approximately 30 minutes to allow for cable stretch, water level equalization, and proper temperature equilibration between the ground water and data logger. Proper data logger operation will be verified by comparing the water level reading given by the data logger to the actual water level reading determined with a water level probe. Length of transducer cable will vary depending on depth to water and anticipated water level fluctuations in the monitor well. Existing ground water data, such as depth to water and historical water level fluctuations, will be reviewed to ensure that data loggers and pressure transducers are installed so that the instruments operate properly throughout the year.

To verify proper data logger operation, data loggers will be checked after installation by field personnel. Approximately 2 weeks after installation, data logger operation will again be verified by field personnel. Once proper data logger operation is ensured, data will be downloaded at approximately 3-month intervals.

The following applicable standard operating procedures (SOP) (JEG, n.d) will be followed during data logger installation:

- 14.1.2 Instructions for Field Technical Representative
- 14.1.5 FTR Daily Diary
- 14.1.7 Field/Off-Site Procurement of Supplies & Services

Internal communications will be maintained between the field representatives, site hydrogeologists, the TAC Contracts Department, the TAC site manager, and the U.S. Department of Energy (DOE) Project Office. Any problems or

complications encountered during fieldwork will be immediately reported to the TAC site manager, who will forward the information to the DOE Project Office.

2.5 FIELD DOCUMENTATION

In addition to the daily diary kept by the field technical representative (FTR), the following documentation will be compiled and data collected:

- Water level measurements from each existing monitor well will be recorded at least once just before the data loggers are set to begin logging in the wells.
- Proper functioning of the data loggers will be verified by recording the depth to water as reported by the data logger and a water level probe.
- Water level measurements in nested, semiconfined aquifer wells will be measured at the same time.

Copies of all pertinent field documentation will be maintained in the UMTRA Project Document Control Center. Work copies will be provided to the site hydrologist and the manager of the water samplers.

2.6 ANTI-CONTAMINATION MEASURES

The data loggers will be rinsed in distilled water before being installed in the monitor well. To prevent the cross-contamination of monitor wells, the water level probe will be rinsed with distilled water before being used in any other well.

3.0 HEALTH AND SAFETY

3.1 LOCAL CONTINGENCIES AND CONTACTS

No heavy equipment will be used during the installation of data loggers. Therefore, the health and safety risks associated with this work are minimal. Standard field clothing, consisting of long pants, work boots, and a long-sleeved shirt, will provide sufficient protection for data logger installation personnel.

The following items will be on the site:

- First-aid kit.
- Sunblock lotion.
- Fresh drinking water.
- Cellular telephone.

The location of the nearest hospital in case of emergency is Riverton Memorial Hospital (307-856-4161) located at 2100 West Sunset Drive, Riverton, Wyoming (Figure 2). The phone number for all emergencies is 911.

4.0 WELL AND DATA LOGGER INSTALLATION TASK SCHEDULE

The tasks and accompanying tentative completion dates for this work plan are as follows:

<u>Task</u>	<u>Completion</u>
Draft work plan	August 5
Final work plan	August 19
Purchase equipment	September 16
Conduct field operation readiness evaluation	October 17
Install data loggers	October 21
Check data logger operation	November 4

5.0 REFERENCE

JEG (Jacobs Engineering Group Inc.), n.d. *Albuquerque Operations Manual*, standard operating procedures, prepared by Jacobs Engineering Group Inc., Albuquerque, New Mexico, for the U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico.

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