WP 02-EM1014

Revision 4

Groundwater Level Measurement

Technical Procedure

EFFECTIVE DATE: 02/26/08

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APPROVED FOR USE

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INTRODUCTION [1, 2]

This document describes the method used by environmental monitoring (EM) personnel for groundwater level measurements in support of groundwater monitoring at the Waste Isolation Pilot Plant (WIPP).

The specific requirements for water level measurements in the WIPP Groundwater Monitoring Program Plan (WP 02-1) are contained in the sections outlined below:

- Monitoring Frequency Section
- Groundwater Surface Elevation Monitoring Methodology Section
- Groundwater Surface Elevation Records and Document Control Section

Performance of this procedure generates the following record: Attachment 2, Water Level Measurement Field Data Sheet.

REFERENCES

BASELINE DOCUMENTS

- DOE/WIPP-99-2194, *WIPP Environmental Monitoring Plan*
- WP 02-1, WIPP Groundwater Monitoring Program Plan
- WP 02-EM3001, Administrative Processes for Environmental Monitoring and Hydrology Programs
- WP 10-AD3029, Calibration and Control of Monitoring and Data Collection Equipment
- WP 13-1, Washington TRU Solutions LLC Quality Assurance Program Description
- DA:03:02636, Hydrogen Sulfide Safety Requirements

EQUIPMENT

- H_2S Monitor
- Water-Level Probe (Calibrated)
- Radio/Telephone-Communications (always available)

PREREQUISITE ACTIONS

1.0 Attend SAF-112, Hydrogen Sulfide Training.

2.0 Verify EM personnel are qualified in accordance with qualification card EM-02, **OR** are under direct supervision of qualified personnel before performing this procedure.

3.0 Assure that the Water-Level Probe has an up-to-date calibration label and that a Certificate of Compliance (C of C) is on file.

PERFORMANCE

1.0 OPERATIONAL CHECKS OF THE WATER-LEVEL PROBE

1.1 Verify that probe is not out of calibration date.

1.2 Perform the following to check Water-Level Probe:

1.2.1 Set toggle switch to ON position, **OR** turn rotary dial fully clockwise (depending on the probe).

1.2.2 Depress TEST button to test the battery and circuitry (excluding the probe).

1.3 Perform the following to check Sensitivity Adjustment once per day and before use:

NOTE

A clockwise rotation of rotary dial of some Water-Level Probes turns meter ON and increases sensitivity. Regardless of probe type, the highest sensitivity position is **ALWAYS** selected, then the sensitivity decreased as necessary.

1.3.1 Set Water-Level Probe sensitivity switch to highest sensitivity position.

1.3.2 Submerge the electrode (probe) in tap water to activate the alarm.

1.3.3 If alarm continues after removing probe from water, clean and dry probe to deactivate the alarm.

2.0 WATER LEVEL MEASUREMENT USING WATER-LEVEL PROBE

2.1 Verify well location before lowering probe into well.

2.2 Turn probe power ON.

2.3 Lower probe into well.

NOTE

When probe reaches water level, an electrical circuit is completed, causing an alarm to sound.

2.4 When alarm sounds, read footage on embossed electrical cable.

NOTE

Conductor cable is marked in increments of 0.01 of a foot. Reference point on casing is stamped "X" by the survey crew.

2.5 If well head is beveled or measurement cannot be taken accurately, lay a straight edge across well head using lowest edge to take measurement.

NOTE

The adjustment in the field, and on the form, is only for indication that the PIP has not been re-set. When a PIP is re-set, the adjustment will be measured to 0.01 feet and carried over, month-to-month, in processing the water level data until there is indication of a change (either by the field measurement, or notification by others that the well has been worked). A new standard adjustment to 0.01 feet will then be implemented for processing the data.

2.6 Record the following on Attachment 2:

- Date measurement was taken
- Time measurement was taken (military time)
- Water level measurement recorded to within 0.01 of a foot
- Adjustment, if needed
- Initials of performer
- Instrument identification (I.D.) number
- Calibration due date
- Comments of unusual events, if any, in the comment column
- Any security observation.

2.7 After completing water level measurement, raise probe to surface and perform the following:

2.7.1 Clean and rinse equipment with fresh water in preparation for next well.

2.7.2 Team Leader (TL) or designee, verify that all field data sheets are filled out properly.

2.7.3 TL or designee, verify that all applicable records are stored in accordance with site standards.

Attachment 1 - Reference Point Determination and Adjustment for Variably Installed Tubing

The top of casing is always the innermost, permanent casing for the well. See Reference Point Determination and Adjustment for Variably Installed Tubing Figure.

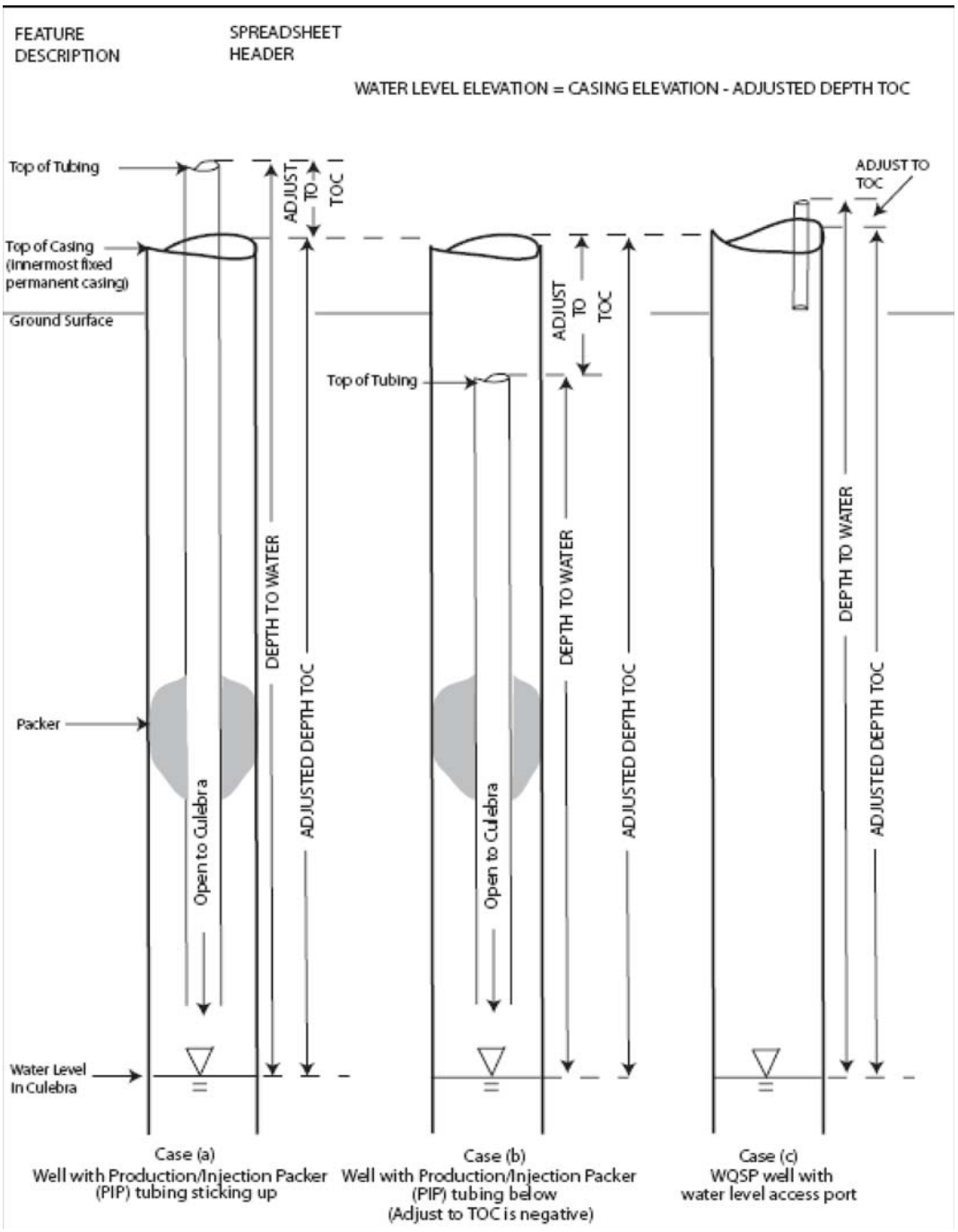
If a well is completed with PVC or fiberglass reinforced plastic casing protected by outer surface casing, the reference point is the inner casing.

If there is only one surface casing, that casing is the reference point. Record the adjustment ("Adj") as 0 (zero) on the water level measurement field data sheet.

For wells with tubing installed on which a Production Inflation Packer (PIP) is installed to isolate the Culebra, the tubing elevation may change each time the packer is reset. The measuring point for the water level is the top of tubing.

Measure and record the adjustment to the nearest inch for the tubing relative to the innermost, permanent casing, because this elevation will never change. If the tubing is a "stickup", or higher than the permanent reference point, the entry is positive. If the tubing is below the permanent reference point, the entry is negative.

Attachment 1 - Reference Point Determination and Adjustment for Variably Installed Tubing



Reference Point Determination and Adjustment for Variably Installed Tubing Figure

Attachment 2 - Water Level Measurement Field Data Sheet

WATER LEVEL MEASUREMENT FIELD DATA SHEET									Page ___ of ___
Well Number	**Zone**	**Date**	**Time**	**Measurement in Feet**	**Adjt.**	**Initials**	**Instrument I.D. Number**	**Calibration Due Date**	**Comments**