

7.11

## **STANDARD OPERATING PROCEDURES FOR MEASURING STREAM STAGE USING AUTOMATED STAGE RECORDER**

### **Summary**

Daily and annual stage records are essential for estimating daily and annual nutrient, sediment and hydraulic loadings. Loading estimates are crucial elements for assessing the effectiveness of Best Management Practice implementation.

The least expensive and most reliable method for collecting stage is to place an electronic data recording device into the stream. The recorder is normally set to collect a stage record either at 1 to 4 hour increments.

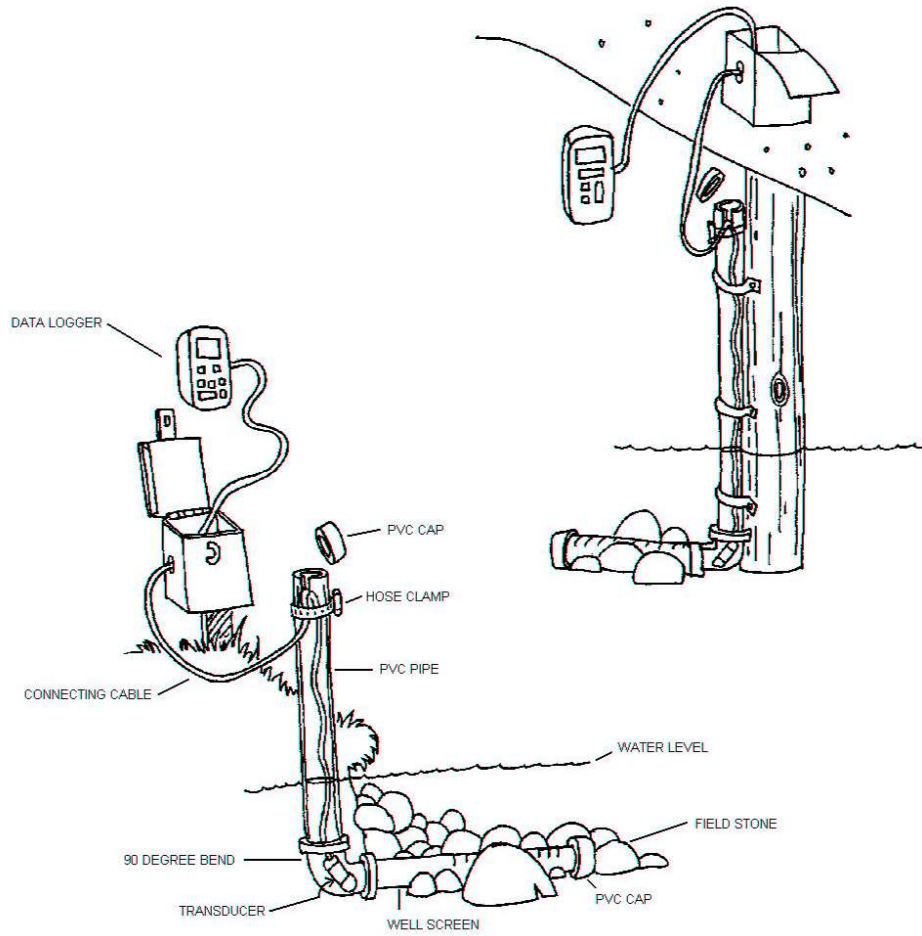
To protect the data recorder and ensure accurate readings a stilling well is constructed. A fairly common construction method for the well is to set a 1.5 inch diameter PVC pipe into the stream and allow water to enter by cutting slits or drilling holes in the portion of the pipe below the water surface. The pressure transducer is then suspended in the vertical portion of the pipe below the surface level of the stream to collect stage heights at predetermined time interval. Figure 1 shows this type of stilling well utilizing a digital data logger protected in a metal box.

### **Equipment List**

- Date recorder/Data Logger
- Pressure transducer and connecting cable
- Stilling well

### **Field Maintenance and Calibration**

1. To prevent data loss, stored data in the data logger should be downloaded a minimum of every two weeks. Transfer may be accomplished in the field by uploading data to a laptop computer or handheld device. Depending on model type, the whole unit may be transported to an office to transfer data to a desktop computer. If removing a data logging unit from the field for downloading, the unit must be returned to the field and re-calibrated within 48-hours.
2. Transducers should be checked and calibrated monthly to ensure data accuracy. Calibration checks should be preformed following the manufacturer's instructions.
3. During data transfer and/or calibration, a logging unit's batteries life and system settings should be checked following the manufacturer's instructions.



**Figure 7.11.1.** Examples of Automated Stream Stage Recorder Set Up.