

STANDARD REQUIREMENTS FOR MONITORING WELL INSTALLATION WORK PLANS AND MONITORING WELL INSTALLATION REPORTS

Prior to installation of groundwater monitoring wells, the Discharger shall submit a work plan containing, at a minimum, the information listed in Section 1, below. Wells may be installed after staff approves the work plan. Upon installation, the Discharger shall submit a well installation report that includes the information contained in Section 2, below. All work plans and reports must be prepared under the direction of, and certified by, a California registered geologist or civil engineer.

SECTION 1 Monitoring Well Installation Work Plan and Groundwater Sampling and Analysis Plan

The monitoring well installation work plan shall contain, at a minimum, the following information:

- A. General Information:
 - a. Purpose of the well installation project
 - b. Brief description of local geologic and hydrogeologic conditions
 - c. Proposed monitoring well locations and rationale for well locations
 - d. Topographic map showing facility location, roads, and surface water bodies
 - e. Large-scaled site map showing all existing on-site wells, proposed wells, surface water bodies and drainage courses, buildings, waste handling facilities, utilities, and major physical and man-made features

- B. Drilling Details:
 - a. On-site supervision of drilling and well installation activities
 - b. Description of drilling equipment and techniques
 - c. Equipment decontamination procedures
 - d. Cuttings disposal methods
 - e. Soil sampling intervals (if appropriate); logging methods; number and location of soil samples and rationale; and sample collection, preservation, and analytical methods

- C. Monitoring Well Construction Details (in graphic form with rationale provided in narrative form):
 - a. Borehole diameter
 - b. Casing and screen material, diameter, and centralizer spacing (if needed)
 - c. Type of well caps (bottom cap either screw on or secured with stainless steel screws)
 - d. Anticipated depth of well, length of well casing, and length and position of perforated interval
 - e. Thickness, position and composition of surface seal, sanitary seal, and sand pack
 - f. Anticipated screen slot size and filter pack

- D. Well Development (performed at least 48 hours after sanitary seal placement):
 - a. Method of development to be used (i.e., surge, bail, pump, etc.)
 - b. Parameters to be monitored during development and record keeping technique
 - c. Method of determining when development is complete
 - d. Disposal of development water

- E. Well Survey (precision of vertical survey data shall be at least 0.01 foot):

- a. Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey
 - b. Datum for survey measurements
 - c. List well features to be surveyed (i.e., top of casing, horizontal and vertical coordinates, etc.)
- F. Schedule for Completion of Work
- G. Appendix: Groundwater Sampling and Analysis Plan (SAP)
The Groundwater SAP, a guidance document that is referred to by individuals responsible for conducting groundwater monitoring and sampling activities, shall contain, at a minimum, a detailed written description of standard operating procedures for:
- a. Equipment to be used during sampling
 - b. Equipment decontamination procedures
 - c. Water level measurement procedures
 - d. Well purging (include a discussion of procedures to follow if three casing volumes cannot be purged)
 - e. Monitoring and record keeping during water level measurement and well purging (include copies of record keeping logs to be used)
 - f. Purge water disposal
 - g. Analytical methods and required reporting limits
 - h. Sample containers and preservatives
 - i. General sampling techniques
 - j. Record keeping during sampling (include examples of record-keeping logs)
 - k. QA/QC samples
 - l. Chain of Custody
 - m. Sample handling and transport

SECTION 2

Monitoring Well Installation Report

The monitoring well installation report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved work plan.

- A. General Information:
- a. Purpose of the well installation project
 - b. Number of monitoring wells installed and identifying label(s) for each
 - c. Brief description of geologic and hydrogeologic conditions encountered during well installation
 - d. Topographic map showing facility location, roads, surface water bodies
 - e. Large-scaled site map showing all previously existing wells, newly installed wells, surface water bodies and drainage courses, buildings, waste handling facilities, utilities, and other major physical and man-made features.
- B. Drilling Details (in narrative and/or graphic form):
- a. On-site supervision of drilling and well installation activities
 - b. Drilling contractor and driller's name
 - c. Description of drilling equipment and techniques
 - d. Equipment decontamination procedures

- e. Well boring log (provide for each well)
 - i. Well boring number and date drilled
 - ii. Borehole diameter and total depth
 - iii. Total depth of open hole (i.e., total depth drilled if no caving or back-grouting occurs)
 - iv. Depth to first encountered groundwater and stabilized groundwater depth
 - v. Detailed description of soils encountered, using the Unified Soil Classification System

- C. Well Construction Details (provide a diagram for each well):
 - a. Monitoring well number and date constructed
 - b. Casing and screen material, diameter, and centralizer spacing (if needed)
 - c. Length of well casing
 - d. Length and position of slotted casing and size of perforations
 - e. Thickness, position and composition of surface seal, sanitary seal, and sand pack
 - f. Type of well caps (bottom cap either screw on or secured with stainless steel screws)

- D. Well Development (provide for each well):
 - a. Date(s) and method of development
 - b. How well development completion was determined
 - c. Volume of water purged from well and method of development water disposal

- E. Well Survey (provide for each well):
 - a. Reference elevation at the top rim of the well casing with the cap removed (feet above mean sea level to within 0.01 foot)
 - b. Ground surface elevation (feet above mean sea level to within 0.01 foot)
 - c. Horizontal geodetic location, where the point of beginning shall be described by the California State Plane Coordinate System, 1983 datum, or acceptable alternative (provide rationale)
 - d. Present the well survey report data in a table

- F. Water Sampling:
 - a. Date(s) of sampling
 - b. How well was purged
 - c. How many well volumes purged
 - d. Levels of temperature, EC, and pH at stabilization
 - e. Sample collection, handling, and preservation methods
 - f. Sample identification
 - g. Analytical methods used
 - h. Laboratory analytical data sheets
 - i. Water level elevation(s)
 - j. Groundwater contour map

- G. Soil Sampling (if applicable):
 - a. Date(s) of sampling
 - b. Sample collection, handling, and preservation methods

- c. Sample identification
 - d. Analytical methods used
 - e. Laboratory analytical data sheets
 - f. Present soil sampling data in a table
- H. Well Completion Report(s) (as defined in California Water Code § 13751). Blank forms are available from California Department of Water Resources' website **www.water.ca.gov**. Submit this section under separate cover.
- I. Appendix (include, at a minimum, copies of the following):
- a. County-issued well construction permits
 - b. Registered engineer or licensed surveyor's report and field notes
 - c. Field notes from well development