

Hydrographer (7263)
Task List 2016

DATA GATHERING

1. Reads (visually) dial meters (e.g., totalizer read, instantaneous flow) located on pumping wells and flow meters, and records flow and volume data on a Read Sheet form and verifies calibration of meter using a stopwatch in order to ensure that water flow and volume are at normal levels, and that meters are providing accurate readings.
2. Measures the water levels of wells, test holes, weirs, and flumes using slope indicators (e.g., m-scope) and whistlebobs, reading (visually) staff gauges, hook gauges, and pressure gauges, and by pumping nitrogen into an airline using a pressurized tank and observing the pressure gauge in order to complete routine field measurements, and records the water level using paper and pencil and data loggers.
3. Computes flow rate in a dam or reservoir vault by placing a volumetric container under a water flow by hand and determining the length of time for the container to reach full capacity using a stopwatch, and performs mathematical calculations to compute flow rate into specific measurements such as gallons per minute, cubic feet per second, acre feet, and acres in order to determine if flow rate in dams or reservoirs are atypical.
4. Performs current metering of channels and streams of water using propeller meters, ultrasonic velocity meters, and area velocity flow meters based on site selection criteria such as laminar flow, cross section geometry, and upstream/downstream channel conditions in order to determine water flow of the channel or stream.
5. Conducts water quality testing including pH tests, electroconductivity tests, and total dissolve solids tests of groundwater and surface water using an Oakton and Handheld Tester to obtain a baseline of groundwater and surface water quality.
6. Attaches pressure recording equipment such as an analog recorder or digital data logger to various infrastructures including fire hydrants, residential water lines or meters by hand or using basic hand tools such as wrenches in order to conduct pressure surveys and evaluate system integrity.
7. Determines meteorological conditions such as wind direction and intensity, atmospheric pressure, precipitation, and temperature using weather instruments such as thermometers, anemometers, barometers, and precipitation gauges and records data using paper and pencil or data loggers in order to track historical trend information for rain and weather to be used in water runoff forecasts and irrigation modeling.

8. Performs surveying activities such as using a transit and rod to determine and/or verify reference points of measuring stations such as weirs and flumes for calibration purposes.
9. Conducts special investigations including water loss studies and water diversion studies requested by management, engineering staff (e.g., Waterworks Engineer), or outside agencies through means such as tracing and measuring flow of water in channels, pipes, and streams by performing field visits and using geographic information systems to perform current metering using handheld current meters, and concluding with a determination of where water is travelling between two known locations which is then reported back to the requesting entity in written and/or verbal form.
10. Evaluates atmosphere conditions present in areas such as confined spaces and compounds by examining gas concentration readings or by listening for audible alerts from the gas detector signaling hazardous gas levels in order to determine if confined spaces and compounds are safe to enter.
11. Researches water rights and historical water uses (e.g., irrigation, diversion for municipal consumption) of water sources such as creeks, streams, and rivers by reviewing electronic and hardcopy real estate deeds, preemption claims, and other historical documents in order to create an electronic report of the data using Microsoft Word for the California State Water Resources Control Board.

INSPECTION AND MAINTENANCE

12. Inspects flow meters, current meters, recorders, and solar panels visually with the aid of tools such as voltmeters and performs minor repairs (e.g., replacing propellers) and maintenance such as lubricating parts, or reports more complex issues to supervisor through direct contact, email, or telephone.
13. Inspects (visually) data (e.g., daily and weekly water reports) on computer screens or printed reports and determines whether incorrect or unusual data is present such as excessive water usage or excessive amounts of unaccounted water in order to determine whether noteworthy water flows or readings have occurred which require further investigation.
14. Inspects (visually) spreading grounds facilities for weeds, fine dirt, and conditions of existing embankments that may inhibit water absorption into the ground in order to determine if corrective action such as turning dirt or building embankments is necessary to improve efficient water absorption.
15. Pulls (manually) recording paper off of precipitation recorders, flow recorders, pressure recorders, and water stage recorders and attaches (manually) new recording paper to each recorder by doing the following:

- 15a. Inspects recorders and their component parts such as the pen or clock for malfunctions and defects by visual inspecting and using tools such as a voltmeter and/or deadweight tester;
- 15b. Repairs and/or maintains parts such as the pen or clock by means such as manually disassembling recorders, using a voltmeter to further investigate and troubleshoot issues, lubricating parts using grease, reassembling recorders, and calibrating recorders and adjusting the tension in a clock if necessary using tools such as screwdrivers, wires, wrenches, and pliers in order to ensure recorders are in proper operating condition and to complete field servicing of recorders.

CONSTRUCTION OF HYDROGRAPHIC STRUCTURES

- 16. Assembles or repairs stainless steel snow pillows using tools such as crescent wrenches, pipe wrenches, and flaring tools; connects snow pillow assemblies to electronic packages such as data loggers and telemetry equipment (e.g., programmable logic controllers) needed to record and transmit data such as snow water content, and calibrates snow pillows using snow sampling tubes and a scale in order to ensure proper functioning of snow pillow assemblies.
- 17. Inspects and coordinates the installation of flumes and weirs performed by construction crews consisting of crafts such as Building Repairmen by walking through job sites to determine if installations are being performed according to engineered drawings (e.g., that structures are at the appropriate level and possess correct flow characteristics such as not being submerged) using visual judgment, and informing supervisor if alterations are necessary.
- 18. Performs basic plumbing activities such as attaching precut hosing, piping, and fittings from instrumentation (e.g., pressure recorder) to infrastructures (e.g., fire hydrant) using tools such as wrenches in order to monitor the pressure of a system.
- 19. Uses tools such as hammers, drills, saws, and levels to assist in the basic construction of wooden and metal installations at metering sites such as weirs, flumes, wing walls, and meteorological cabinets for the purpose of hydrographic measurement.
- 20. Installs electronic components of hydrographic instruments such as data loggers, transducers, shaft encoders, solar panels, and remote transmitting units using wire strippers, splicers, and soldering irons in order to make electrical terminal connections.
- 21. Lifts objects manually such as recorders, sandbags, tool boxes, snow survey equipment (e.g., snow tubes), weir plates, nitrogen bottles, batteries, and large metal bullet shields in order to transport equipment and materials to the jobsite.

OTHER JOB TASKS

22. Establishes safe work zones within public streets and sidewalks by placing cones, barricades, and arrow boards around work sites in order to facilitate effective vehicular and pedestrian traffic flow that conforms to the Department of Water and Power and the State Work Area Traffic Control Handbook (WATCH) guidelines.
23. Monitors water system facilities (e.g., flows, pressures, valve control, pump control, irrigation schedules) using the Supervisory Control and Data Acquisition (SCADA) system to set alarm set points that trigger when preset thresholds are breached in order to control water system facility operations.
24. Inputs and analyzes hydrographic data using software such as Microsoft Excel in order to determine if there are trends (i.e. Gauging station flow trends) and/or patterns and to create a record of hydrographic data.
25. Writes various documents/reports such as maintenance and accident reports at hydrographic stations, and requests for equipment repair using paper and pencil and/or Microsoft Word in order to document incidents occurring at hydrographic stations and to obtain proper materials and personnel needed for equipment repair.
26. Interacts with members of the public who would be affected by hydrographic work through telephone and/or direct contact in order to explain the department's need for and request to use their property for various purposes including the installation of pressure recorders.
27. Travels to destinations (e.g., mountains) in extreme weather and elevation conditions using vehicles such as pick-up trucks, snow cats, snowmobiles, all-terrain vehicles, and boats and camps overnight over a span of multiple days using specialized equipment such as snow shoes, cross country skis, and tents in order to conduct snow surveys to measure snow depth and water content, and to inspect and construct work stations such as snow pillows and hydrographic stations using tools such as hammers, drills, and saws.