

Based on PD Tracking Number 0005135

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INTRODUCTION

This position is part of the National Association of Geoscience Teachers (NAGT)/USGS Cooperative Summer Field Training Program. As a NAGT participant, the employee works in a field, laboratory, or office environment and assists higher-grade scientists. The work is designed to complement the incumbents existing scientific background in preparation for more advanced work experiences. Based on the major duties checked below, this interdisciplinary position may be filled within one of the following occupations:

- Geologist, GS-1350
- Hydrologist, GS-1315
- Biologist, GS-0401
- Cartographer, GS-1370
- Physical Scientist, GS-1301
- Ecologist, GS-408
- Geophysicist, GS-1313
- Geographer, GS-150
- Chemist, GS-1320

MAJOR DUTIES

As part of the NAGT Program, the incumbent may perform one or more of the following types of duties:

A. Geology Type Duties:

{ }Field Study: Perform limited geologic mapping; and make field identification of rocks and minerals. Collect and describe representative samples of fossils, rocks, mineral deposits, stream sediments, and panned concentrates. Prepare samples for further analysis.

{ }Laboratory Study: Select and prepare varied samples by sawing, sieving, grinding, mounting, polishing, etching, etc., for use in chemical, physical, and mineralogical analysis. Perform separations of minerals. Maintain sample inventories and document observations of experimental effects. Perform laboratory study of rocks and minerals and other geologic materials, utilizing appropriate procedures specialized equipment. Maintain cleanliness of laboratories and keep them stocked with necessary supplies.

{ }Analysis and Reporting of Scientific Information: Assemble and evaluate varied field data and plot information on maps, sections, graphs, tables, and other diagrams using GIS when appropriate. Prepare preliminary interpretive compilations of geologic data. Assist in the preparations of reports pertaining to geologic research.

B. Hydrology Type Duties:

{ }Surface Water: Use resourcefulness to make stream discharge measurements, using the various techniques, equipment and protocols depending upon field conditions or other unforeseen circumstances. Observe and make detailed notes of various hydraulic or environmental conditions that may have a bearing on discharge. Compute and check surface-water records from field data where hydrologic conditions are fairly stable. Review the plotting of discharge measurements. Develop stage-discharge and/or velocity index curves and ratings. Estimate periods of missing record and non-routine flow such as tidal, backwater, or ice periods. Perform office review for selected surface-water records. Review gage-height data and discharge measurements to check methods and accuracy of computation. Plot and analyze differences in hydrographs by comparing records and makes changes to correct inconsistencies in data. Perform routine phases of statistical and technical analyses of the hydrologic data collected in the field. Prepare material for publication, including maps, tables, and other illustrative material. Prepare plots, drafts, or sketches from surveying field notes. Review surface-water records to assure accuracy, uniformity, and compliance with Division standards. Verify the accuracy of data summaries. Document the procedure used to compute records.

{ }Ground Water: Perform water level and discharge measurements from wells and springs adjusting approach for unforeseen circumstances. Observe and note various hydraulic and environmental conditions. Compute and check ground-water records from field data where hydrologic conditions are fairly stable. Review plots of water-level measurements. Perform routine statistical and technical analyses of the hydrologic data collected in the field. Review ground-water records to assure accuracy, uniformity, and compliance with technical standards. Verify the accuracy of data summaries. Document the procedure used to compute records. Perform ground-level measurements in support of aquifer tests. Perform routine analyses and computation of data assembled during pumping tests.

{ }Water Quality: Perform routine field measurements such as water temperature, specific conductance, pH, dissolved oxygen and alkalinity selecting the appropriate technique, protocol, and equipment. Observe and note various hydraulic or environmental conditions. Collect and process a wide variety of samples modifying approaches as necessary in order to ensure the integrity of the data. Perform various field or lab analyses of sample constituents. Prepares representative samples for lab analyses. Compute and check water-quality monitoring records using basic techniques. Perform routine phases of statistical and technical analysis of the hydrologic data collected. Prepare summaries and basic data reports of results of field activities, including the preparation of materials for publications such as tables of data, maps, and other illustrative material. Document the procedure used to compute records. Conduct quality assurance review of water-quality records to ensure accuracy, uniformity, and compliance with technical standards.

{ }Sediment: Collect, process, compute and check varied suspended sediment and bed-load samples modifying approaches due to unforeseen conditions. Compute and check measurements

for analyses and computation. Perform routine phases of statistical and technical analysis of hydrologic data collected. Enter sediment data into the water-quality and/or daily-values file using automated systems. Assemble and prepare data for tabulation and subsequent publication. Document the procedure used to compute records. Use sediment computation programs to process routine sediment load data. Input data for the programs are: (1) sediment grain-size data and (2) discharge data. Apply initial quality-control techniques and makes corrections to sediment data based on review of the sediment data.

{ }Instrumentation: Install, maintain and service a variety of sensing, recording and communications equipment and instrumentation. Troubleshoot selected hydrologic instrumentation in the office. Maintain repair logs on hydrologic instrumentation. Calibrate meters and analytical equipment. Determine appropriate equipment for field or laboratory activities depending upon data collection needs and field conditions.

{ }Infrastructure: With general instructions, perform simple construction of gages and supporting structures. Identify and procure materials for construction and repair jobs. Schedule and/or obtain appropriate vehicles, equipment, and supplies. Perform routine safety inspections of equipment and work areas.

C. Biology Type Duties:

{ }Plan the approach and collect the data to carry out less complex studies or portions of larger investigations to assist higher grade biologists in planning, analyzing, and reporting on complex fish, wildlife, or ecological investigations. Perform data analysis and write objective reports to evaluate findings.

{ }Assist in planning, organizing, and implementing biological investigations that affect wildlife and/or habitat conditions. Prepare reports on progress and completion of studies.

{ }Assist in developing, directing, and ensuring completion of program objectives and associated documentation on a continuing basis in accordance with established program directives. Conduct on-going analysis of program and analyzes results of special studies or investigations. Draft or prepare reports with recommendation for changes, elimination, or improvement of operations and program plans.

{ }Collect a variety of data from field investigations and make observations. Report observations in field notes for use of higher grade-level employees. Search technical sources for information on designated topics and prepare summaries for reference.

{ }Assist with studies by senior biologists and prepare reports on fish and /or wildlife resources.

{ }Prepare varied samples and perform data analysis. Draft assigned portions of reports. Prepare graphs and charts.

{ }Prepare correspondence pertaining to technical aspects of the work.

{ }Assist with planning, organizing, and implementing biological investigations that affect wildlife

and/or habitat conditions. Prepare reports on progress and result of studies.

{ } Assist with gathering, organizing, and interpreting biological, ecological, pathological, public use, or other information.

D. Cartography Type Duties:

{ } Prepare base maps on scale-stable material from USGS and other map products, for use in field work and in published reports.

{ } Participate in the preparation of final illustrations for use in reports on scientific studies.

{ } Prepare digital image processing products, using the latest GIS technology and techniques.

{ } Gather, modify, and encode digital spatial data; and operate automated GIS equipment and peripherals.

{ } Perform darkroom procedures, using a wide variety of films, processing speeds, and developing chemicals.

{ } Analyze and evaluate cartographic program data.

{ } Participate in cartographic studies and projects.

E. Geography Type Duties:

{ } Analyze mapped or remotely sensed data in support of efforts to map and quantify spatial characteristics.

{ } Assist with the design and preparation of publications-ready maps and graphics, using GIS technology.

{ } Compile data sets for ARC/INFO databases.

F. Geophysics Type Duties:

{ } Accumulate and compile a wide variety of data on geophysical phenomena through the operation of scientific instruments.

{ } Analyze varied geophysical data to help ensure that instrumentation is functioning properly.

{ } Process geophysical data through application of established mathematical formulas.

{ } Adapt computer programs for the analysis of geophysical data.

{ } Participate in activities such as: well monitoring and analyzing strain measurements; borehole drilling; magnetic surveying on volcanoes; self potential surveying on volcanoes; borehole seismometer installation; measuring physical properties of core samples, installing permanent,

telemetered broadband digital seismic instruments; installing satellite telemetry systems; operating high-precision GPS instruments and performing differential corrections on GPS data; and working on active-seismology data collection projects using portable seismic instruments and operation of active-seismology source devices.

G. Ecology Type Duties:

{ }Collect varied data concerning fish and invertebrate food webs and their changes.

{ }Investigate patterns of interactions between organisms and physical environment factors.

{ }Participate in studies of the distribution and density of organisms that live in ecosystems.

H. Chemistry Type Duties:

{ }Perform varied but relatively routine and limited chemical analyses and tests on samples submitted by bureau personnel to the laboratory. The analyses and tests are to determine the chemical composition of substances, presence, and identification of compounds in samples submitted to the laboratory.

{ }Based upon previous assignments or instructions as to the specific analyses and tests to be performed, select the appropriate methods and procedures.

{ }Perform the analyses and tests, which include physical tests, wet laboratory analyses and instrumental analyses.

{ }Perform routine calculations. May perform computer programming used for the analysis and reduction of data.

{ }Detect unusual reactions and instances when the established methods and procedures are not applicable. Recommends to the supervisor a minor modification to the method, extending examination, or alternate methods to use.

{ }Write a laboratory report identifying the sample, stating the methods and procedures used, and showing the results.

FACTOR 1-KNOWLEDGE REQUIRED BY THE POSITION

Professional knowledge of physical, biological, and/or biological principles, theories, and practices (e.g., biology, cartography, chemistry, ecology, geography, geology, geophysics, hydrology, or physical science); knowledge of common methods and procedures; and a skill in calibrating and operating analytical instruments sufficient to perform relatively routine and limited analyses and tests.

FACTOR 2-SUPERVISORY CONTROLS

The supervisor assigns individual samples with clear instructions as to the data to be obtained. For new or more difficult assignments, the supervisor also provides instructions as the methods and

procedures to apply and the location of source material available for reference. The incumbent is responsible for independently completing recurring assignments, but refers all deviations and problems not covered by the instructions to the supervisor or a higher-level chemist for assistance. The work is reviewed for adherence to instructions and standard procedures and for technical soundness of the results. New or more difficult assignments are reviewed more closely including in-progress review.

FACTOR 3-GUIDELINES

The methods and procedures for performing the work are established. Specific guidelines such as established methodology manuals, precedents, and standard operating procedures are available for reference. For each sample, the incumbent must exercise judgment to select the appropriate methods and procedures to carry out the analyses and tests. Situations in which the guides do not apply are referred, typically with a recommended action, to the supervisor or a higher-level scientist.

FACTOR 4-COMPLEXITY

The assignments involve the performance of a series of sequential and specific phases of a broad scientific study or project. The incumbent identifies relatively straightforward phenomena and scientific conditions, and selects the appropriate established methods and procedures to utilize. Problems encountered can usually be solved by minor method modification or adaptation.

FACTOR 5-SCOPE AND EFFECT

The work involves carrying out well-established scientific analyses and tests in accordance with relatively specific guidelines. The work efforts affect the accuracy and reliability of the chemical analytical services provided by the laboratory.

FACTOR 6-PERSONAL CONTACTS

The personal contacts are with scientists and technical support personnel within the organization.

FACTOR 7-PURPOSE OF CONTACTS

The personal contacts are to receive advice and assistance and to report the progress and results of the work.

FACTOR 8-PHYSIAL DEMANDS

The work is primarily sedentary but may involve prolonged standing in the laboratory environment. Field assignments involve outdoor work where there is considerable walking and climbing over rough or mountainous terrain.

FACTOR 9-WORK ENVIRONMENT

Work is performed primarily in a field, laboratory or office setting. Work performed in the laboratory may involve use of equipment that can result in exposure to dust, toxic chemicals, mechanical and

electrical hazards, and noise. Special safety precautions are required including use of laboratory coats, safety glasses, dust masks, gloves, etc. Work in the field involves exposure to a range of weather and temperature conditions with exposure to poisonous growth and insects.