

## STATE OF SOUTH DAKOTA CLASS SPECIFICATION

**Class Title: Senior Hydrologist**

**Class Code: 40526**

---

### **A. Purpose:**

Oversees and conducts ground water and hydrologic investigations and studies to ensure regulatory compliance, be protective of public health and safety, and protect our ground water resources and hydrologic systems; and to detect, prevent, and remediate pollution of the state's ground waters, hydrologic systems, and other natural resources.

### **B. Distinguishing Feature:**

Senior Hydrologists are assigned complete research projects and investigations, apply appropriate conditions to permits and clean-up plans, and work under general supervision. Hydrology Specialists provide direct departmental oversight to hydrologic goals and objectives; and routinely provide comprehensive hydrologic information and evaluations to the department secretary, division directors, program administrators, and department boards for critical decisions regarding environmental permitting and natural resources management. Hydrologists are entry-level positions and work under direct supervision of other staff for a minimum of one year.

### **C. Functions:**

*(These are examples only; any one position may not include all of the listed examples nor do the listed examples include all functions which may be found in positions of this class.)*

1. Evaluates remedial action plans to determine if they are effective in mitigating impacts to ground waters and hydrologic systems, human health, and environment; and recommends corrections and enhancements.
  - a. Reviews site assessments, hydrogeologic reports, geochemical reports, remedial investigative reports, and remedial action work plans.
  - b. Reviews remedial recommendations and recommends alternatives.
  - c. Verifies accuracy of data gathered from site investigations.
  - d. Writes comment letters on findings, conclusions, and corrective actions to project managers and consultants.
  - e. Conducts on-site investigations to monitor project implementation and determine effectiveness.
    - i. Evaluates effectiveness of remedial activities.
    - ii. Recommends corrective actions and extensions.
    - iii. Recommends site closures.
    - iv. Writes progress reports.
2. Develops and directs hydrologic studies and research to identify, assess, monitor, and protect the ground waters and hydrologic systems of the state.
  - a. Conducts interdisciplinary investigations of surface and ground waters to determine movement and availability of water, probable areas of recharge and discharge, and surface and ground water relationships.
  - b. Evaluates factors related to fluctuation in ground water levels.
  - c. Evaluates the impact of development on aquifers.
    - i. Plans and supervises test drilling, borehole geophysical logging, and observation well construction.
    - ii. Determines hydrogeologic parameters.
    - iii. Analyzes hydrologic and geologic data.
    - iv. Constructs hydrologic maps.

- v. Executes ground water flow models.
  - d. Analyzes study results and reports prepared by consultants and industry representatives to determine hydrologic and geologic conditions.
  - e. Designs ground water monitoring systems to determine ground water flow rates and vertical and horizontal hydraulic gradients, and to obtain water quality data.
3. Conducts hydrologic inspections and investigations of industry and facility activities and operations to evaluate impact to ground water and hydrologic systems; and prevent, monitor, and control the causes of pollution.
    - a. Monitors adequacy of hydrologic regulatory controls.
    - b. Applies new and updated regulatory controls to permits.
    - c. Develops and applies site-specific sampling and testing requirements.
    - d. Chooses and approves locations of ground water monitoring wells.
    - e. Interprets and evaluates water quality data.
    - f. Processes permits, permit amendments, and technical revisions to permits.
    - g. Reports on investigative findings and testifies at hearings.
    - h. Evaluates hazardous material spills to determine impacts on ground water and hydrologic systems.
      - i. Institutes clean-up procedures.
      - ii. Develops monitoring networks.
      - iii. Writes reports of investigative results.
      - iv. Reviews others' reports.
    - i. Prepares preliminary assessments under Superfund for use by Environmental Protection Agency (EPA) in the listing of national priorities list sites by gathering information on ground water and hydrologic systems at the site; waste characteristics to include short and long term fate; geology; meteorology; geochemistry; soils; and pathways to human, animal, and environmental receptors.
  4. Represents the department at meetings, on conference calls, and on site visits to provide assistance and information, site briefings, and updates.
  5. Performs other work as assigned.

**D. Reporting Relationships:**

Reports to a Natural Resources Administrator or the State Geologist. Does not supervise.

**E. Challenges and Problems:**

Challenged to deal with multi-faceted projects where varying issues require specialized knowledge in several areas of expertise. Further challenged to evaluate remedial alternatives through research of various technologies to determine if proposed remedies will meet desired goals. This is challenging because remedial investigations typically include evaluation of impacts to surface water, ground water, soils and sediments, aquatic and terrestrial biota, and human health.

Problems encountered include evaluating interactions of waste and hydrology, permit application deficiencies, convincing the regulated community of the need for regulatory requirements, making hydrogeological recommendations based on limited data, and integrating comments and information from other programs in the department and other state agencies into one document representing the concerns of the state.

**F. Decision-making Authority:**

Decisions include scope of hydrologic studies and recommended budgets, if ground or surface water contamination is occurring and further investigation is warranted, whether remedial activities are in regulatory compliance, hydrologic conditions of permits, the most technically feasible and scientifically sound plan for hydrologic investigations, the design of monitoring networks, how to present department activities and policies to the public, when to seek expertise from other sources, the content of letters and reports, recommendations for site closures, recommendations for enforcement actions, recommendations on policy and procedure changes, and recommendations for record keeping and data management.

Decisions referred include final policy decisions on regulation and enforcement, the order of remedial action measures, the application of legal enforcement actions, deadlines for research to be completed, changes in policies and procedures, final approval of permits, project assignments, final approval of budget requests, final decisions regarding department direction, final approval of site closures, and data management parameters.

#### **G. Contact with Others:**

Daily contact with industries to convey information on permit procedures and discuss current permits and proposed applications; with the general public to answer questions about hazardous spills and other environmental concerns; with the EPA to address problems associated with remedial efforts; and with staff for exchange of information and consultations; weekly contact with other government agencies to coordinate project information and clean-up activities, and gather technical information; with private consultants regarding ground water investigations; and with city officials and rural water system managers regarding ground water investigations; and monthly contact with attorneys regarding legal issues; and with the Corps of Engineers to discuss additions to work plans.

#### **H. Working Conditions:**

Works in a typical office environment, on construction sites, and around environmental management facilities; is exposed to varied weather conditions, construction equipment, hazardous materials, and infectious bacteria; must be able to wear self-contained breathing apparatus and personal protection equipment; and is subject to physical exertion during on-site inspections and field investigations.

#### **I. Knowledge, Skills, and Abilities:**

Knowledge of:

- hydrology, hydraulics, and fluid mechanics;
- systems for collecting waste water, waste water disposal and treatment processes, solid waste disposal;
- physical, chemical, and biological technologies as they relate to analyses of water quality;
- well construction and placement;
- the principles and practices applied when conducting hydrologic field studies and investigations;
- sources of technical hydrologic information;
- the state's water resources;
- environmental statutes and regulations governing the use and protection of ground water and hydrologic systems;
- department policies and procedures;
- technical report writing;
- basic statistical and water modeling methods;
- the basic principles and terminology of data processing;

- human relations sufficient to establish working relationships with coworkers, consultants, and the general public.

Ability to:

- analyze data and reach conclusions;
- design ground water monitoring systems;
- calculate the impact of hazardous materials on water quality;
- assign priorities to work activities based on organizational goals and situational pressures;
- communicate complex technical and natural resource issues to the general public in a clear and understandable manner both verbally and in writing;
- favorably present and promote department priorities, services, and actions internally and externally;
- establish and maintain effective working relationships with associates, consultants, and the public;
- analyze problems and develop solutions.