

# ***SUMMARY of CHANGE***

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Information Management: Publishing and Printing GUIDANCE FOR PREPARATION  
AND PROCESSING OF PUBLICATIONS AND FORMS

- Added “U. S. Army” to the address for the document, page i
- Added supersession statement, page i
- Used abbreviation (CW instead of Civil Works) on Page 1, Section 1, para b, subparagraph (2). Term previously spelled out.
- Spelled out FEMA - Federal Emergency Management Agency, Page 10, para b. Term used only once in the document.

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Engineering and Design  
GUIDELINES FOR THE CAREER DEVELOPMENT OF GEOTECHNICAL ENGINEERS,  
GEOLOGISTS, AND MATERIAL ENGINEERS

1. Purpose. The U.S. Army Corps of Engineers (USACE) must continue to develop and maintain a highly trained and experienced geotechnical staff to support all engineering activities. The guidelines in this pamphlet describe the experience, education, training, and skill development opportunities that USACE geotechnical, geology, and materials professionals (referred to collectively as geotechnics professionals) are suggested to acquire. This ensures USACE maintains the essential geotechnical and materials science capabilities required to support USACE missions. This information should be used by geotechnics professionals within USACE in the preparation of Individual Development Plans (IDPs) for their career development, especially in the technical field for Career Program (CP) 18 Engineers and Scientists (Resources and Construction) Professionals.
2. Applicability. This pamphlet applies to all USACE elements having Civil Works (CW), Environmental, Interagency & International Support (IIS), and Military Construction (MILCON) responsibilities.
3. Distribution Statement. Approved for Public Release, distribution is unlimited.

FOR THE COMMANDER:

2 Appendices  
Appendix A: Geotechnics Professional  
Career Map  
Appendix B: Geotechnics Professionals  
Training Opportunities

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1. Purpose.

a. USACE must continue to develop and maintain a highly trained and experienced geotechnical staff to support all engineering activities. The guidelines in this pamphlet describe the experience, education, training, and skill development opportunities that USACE geotechnical, geology, and materials professionals (referred to collectively as geotechnics professionals) are suggested to acquire. This ensures USACE maintains the essential geotechnical and materials science capabilities required to support USACE missions. This information should be used by geotechnics professionals within USACE in the preparation of IDPs for their career development especially in the technical field of the CP 18 Engineers and Scientists (Resources and Construction) program. NOTE: This document contains recommendations set forth by USACE-HQ. Processes, position requirements, etc. may vary from division and/or district.

b. Army Regulation (AR) 690-950.

(1) AR 690-950 Career Program Management (2016) defines and establishes the role of the Army Career Program Proponency Office in support of the Army mission and its relationship to Strategic Human Capital Planning. Army civilians stand in support of our Soldiers' mission accomplishment and deploy with them across the globe.

(2) Career Programs are civilian position functional groupings, aligned by position Occupational Series that provide a "lifecycle" career management structure incorporating civilian development, training, and mentorship. These engineers and scientists are to perform duties and responsibilities in eight functional categories: CW Planning, Construction, Engineering, Project Management, Public Works, Real Estate, Operations, and Research and Development.

(3) Geotechnics professionals are primarily involved with planning, design, construction, operation and maintenance of Civil Works and MILCON projects; hazardous toxic waste remediation and installation restoration programs; and management of land, water, and related natural resources for public purposes and research in such fields.

c. Army Civilian Training, Education and Development (ACTEDS).

(1) ACTEDS provides guidance on the types of experience, training, education, and career planning that are recommended for progression to the key leadership positions in the career program. However, the principal emphasis of ACTEDS is on developing leadership and management skills. The guidelines described in this Pamphlet, No. 690-2-3, are directed toward the development of technical and professional skills which are not detailed in the ACTEDS.

(2) The two documents should be used together to help USACE managers and personnel develop organizational and individual development plans for technical and supervisory positions. The experience, education, training, and skill development opportunities suggested are important for geotechnics professionals to perform their assigned tasks; however, the suggested information is not to be considered absolute requirements.

2. Applicability. This pamphlet applies to all USACE elements having CW, Environmental, IIS, and MILCON responsibilities.

3. Distribution. Approved for Public Release, distribution is unlimited.

4. References.

a. AR 350-1, Army Training and Leader Development, Chapter 4 .

[https://armypubs.army.mil/epubs/DR\\_pubs/DR\\_a/pdf/web/ARN18487\\_R350\\_1\\_Admin\\_FINAL.pdf](https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/ARN18487_R350_1_Admin_FINAL.pdf)

b. AR 690-950, Career Program Management .

[https://armypubs.army.mil/epubs/DR\\_pubs/DR\\_a/pdf/web/AR690-950\\_Web\\_FINAL.pdf](https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/AR690-950_Web_FINAL.pdf)

c. Engineer Regulation (ER) 690-1-1212, Professional Registration as a Selective Placement Factor.

[https://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER\\_690-1-1212.pdf?ver=2014-12-23-092455-060](https://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_690-1-1212.pdf?ver=2014-12-23-092455-060)

d. ER 1110-1-8152 Professional Registration and Signature on Design Documents.

[https://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER\\_1110-1-8152.pdf?ver=2013-09-08-233410-043](https://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_1110-1-8152.pdf?ver=2013-09-08-233410-043)

e. ER 1110-2-1156 Safety of Dams: Policy and Procedures.

[https://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER\\_1110-2-1156.pdf](https://www.publications.usace.army.mil/Portals/76/Publications/EngineerRegulations/ER_1110-2-1156.pdf)

f. Engineering Construction Bulletin 2018-15 Technical Lead for E&C Deliverables (2018). [https://www.wbdg.org/FFC/ARMYCOE/COEECB/ecb\\_2018\\_15.pdf](https://www.wbdg.org/FFC/ARMYCOE/COEECB/ecb_2018_15.pdf)

g. ACTEDS Training Catalog. Located at <https://actnow.army.mil> in the Communities Section. In the drop-down menu scroll to “Select a Category,” and choose “Civilian.” Under “select a page,” choose Army Civilian Training and Leader Development. On the left side of the menu, select “Files.”

h. Kiersch, G.A., 1955, Engineering Geology; Historical Development, Scope, and Utilization: Quarterly, Colorado School of Mines, vol. 50, no. 3, 122 p.

5. Records Management (Recordkeeping) Requirements. Records management requirements for all record numbers, associated forms, and reports required by this regulation are included in the Army's Records Retention Schedule—Army. Detailed information for all record numbers, forms, and reports associated with this regulation are located in the Army's Records Retention Schedule—Army at <https://www.arims.army.mil/arims/default.aspx>.

6. Responsibilities for Professional Development.

a. Professional development of the geotechnics workforce is both the ongoing responsibility of USACE and the individual member. Individual professional development is fostered through field work, training, education, and/or developmental opportunities that are directly linked to the job responsibilities.

b. Supervisors, managers, and Career Program Managers are responsible for informing personnel of career development programs and providing opportunities to meet corporate needs. The individual employee is responsible for establishing his or her career goals and developing the plan to achieve them. In order to be qualified to assume or apply for positions when the opportunity arises, particularly for those positions with advancement potential, the employee should develop an IDP (Individual Development Plan) which states career goals, identifies specific positions associated with those goals, and includes any training, education, or skill development required for desired positions.

c. The IDP should provide for attainment of plan objectives in a deliberate, progressive manner. While many opportunities for professional and career development are available to members at the expense of USACE during work hours, personnel should also consider opportunities that are available at individual expense during non-work hours.

d. General tasks performed by and knowledge, skills, and abilities of geotechnics professionals from entry level General Schedule (GS)-5/7/9 through GS-15 managers are defined in Appendix A. Discussion of particular tasks associated with geotechnical engineers, engineering geologists, and material engineers are discussed further herein.

7. Nature and Scope of Geotechnical Engineering. Geotechnical engineering is the portion of civil engineering that deals with all aspects of the theory and practice of soil mechanics. It includes, but is not limited to:

- a. Subsurface investigations and exploration;
- b. Site selection and site characterization;
- c. In-situ and materials laboratory testing;
- d. Determination of soil material properties;
- e. Foundation design;

- f. Slope stability evaluation and modeling;
- g. Design of retaining structures and slope stabilization;
- h. Seepage evaluations and groundwater modeling;
- i. Design of dewatering, seepage, and uplift control systems;
- j. Emergency response for flood fighting and evidences of project distress;
- k. Design of instrumentation and monitoring systems;
- l. Risk assessments and periodic inspections;
- m. Project monitoring and performance evaluation;
- n. Forensics engineering;
- o. Evaluation of natural materials for use in construction;
- p. Development of contract documents and instructions to construction personnel; and
- q. Coordination and visits to construction sites.

8. Nature and Scope of Geology.

a. General. Geologists generally focus on two main fields of geology in USACE: engineering geology and environmental geology. Specialized areas such as geophysics, geochemistry, coastal geology, and many other areas of study are also applicable fields of geology to USACE works. All apply knowledge of the principles and theory of geology and related sciences and use engineering principles in the process of sample collection, measurement, analysis, evaluation, and interpretation of geologic information concerning the structure, soil and rock composition, and history of the Earth. However, the focus of each field varies, and each field may overlap throughout projects within each USACE CW, Environmental, IIS, and MILCON Missions.

b. Engineering Geology. Engineering geology focuses on the material properties of soil and rock to assess their risk factors and advise on the best procedures for further developing, modifying, or deconstructing a site. Engineering geology has been defined as the “art or technique of using geologic data and methods to solve problems inherent to engineering practice,” (Kiersch 1955). It includes, but is not limited to:

- (1) Site characterization, evaluation, selection;
- (2) Subsurface investigations and exploration;

- (3) Effective communication of difficulties encountered in exploration during real-world construction to later assist in developing plans and specifications;
- (4) Development of performance parameters;
- (5) In-situ and laboratory engineering property and strength testing;
- (6) Determination of rock and soil material properties;
- (7) Rock and soil reinforcement and support systems;
- (8) Installation of ground monitoring instrumentation;
- (9) Well construction and screen design;
- (10) Earth movement and landslides;
- (11) Drainage and erosion;
- (12) Sinkhole mapping, evaluation, and monitoring;
- (13) Subsidence;
- (14) Foundation mapping and treatment;
- (15) Stability of rock cuts, excavations, and slopes;
- (16) Tunnel evaluation and construction;
- (17) Blasting plans and execution;
- (18) Grouting design;
- (19) Dewatering, seepage, and uplift control systems;
- (20) Coastal and marine engineering;
- (21) Forensics evaluation;
- (22) Evaluation of geologic materials for construction;
- (23) Active monitoring, inspection, and evaluation of project performance for completed work;

(24) Development and preparation of contract documents; and

(25) Conduct formal technical reviews for large and/or complex projects.

c. Environmental Geology. Environmental Geologists bridge the gap between environmental science and geology to link the study of physical, biological, and social processes of the environment. Environmental Geologists apply the understanding of site geology to characterize the nature and extent of contamination in environmental media (soil, bedrock, groundwater, and sediment), and provide input to determine, design, and monitor remediation technologies. Environmental Geologists work within a highly interdisciplinary matrix of Chemists, Risk Assessors, and Remediation Engineers. Environmental Geologists also support the development and protection of water supply. Environmental Geologists can provide primary support on critical mission areas, including, but not limited to:

(1) Hazardous, Toxic, and Radioactive Waste (HTRW) site investigation and remediation;

(a) Remedial investigations;

(b) Drilling and sampling environmental media for chemical analysis;

(c) Installing monitoring wells to characterize groundwater quality;

(d) Delineation of nature and extent of contamination in environmental media;

(e) Contaminant fate and transport;

(f) Groundwater modeling using analytical and numerical methods;

(g) Evaluation of groundwater flow in fractured bedrock, employing surface geophysics, borehole geophysics, air photo analysis, fracture trace analysis, and bedrock mapping;

(h) Groundwater-surface water interaction; and

(i) Input to remedial designs involving removal and/or treatment for soil, sediment, groundwater, and other environmental media;

(2) Water supply;

(a) Review site information and data to develop Conceptual Site Model;

(b) Groundwater distribution, flow, and volume calculations and modeling;

(c) Installation of groundwater instrumentation and monitoring systems;

- (d) Aquifer testing;
  - (e) Identification of producing zones in overburden and bedrock aquifers;
  - (f) Design water supply wells;
  - (g) Calculation of sustainable yield and contribution area; and
  - (h) Wellhead protection to ensure water quality.
- (3) Ecosystem restoration;
  - (4) Environmental stewardship;
  - (5) Environmental assessments;
  - (6) Research and development;
  - (7) Mineral, rock, and soil assessments for their formation and potential use as resources or waste disposal sites;
  - (8) Quality Assurance and Quality Control; and
  - (9) Identification of land for site selection, land-use planning, and environmental impact analysis.

9. Nature and Scope of Geological Engineering. Geological engineering is a blend of the Engineering Geologist and the Geotechnical Engineer that fit into a portion of civil engineering that deals with all aspects of the theory and practice of soil and rock mechanics. Geological Engineers typically qualify for both 0810 (Geotechnical) and 1350 (Geologist) positions within USACE and can perform the duties of either position. Given that this is a cross-disciplinary degree and position, it is strongly recommended that Geological Engineers maintain both a professional geologist and professional engineering license. Although this field includes the components of geotechnical engineering and engineering geology listed above, it is not limited to and also includes:

- (1) Engineering of earth materials for engineering projects;
  - (a) Embankments and dams;
  - (b) Cutoff wall design and construction;
  - (c) Ground and foundation improvement;

(d) Rock slope and slope stability analysis;

(e) Tunnels; and

(f) Excavations.

(2) Design safety measures to minimize risk of excavations, reservoirs, dams, embankments, and levees against natural hazards such as earthquakes, landslides, and other phenomena which effect the ground, including permafrost, swamps, and bogs;

(3) Evaluation, monitoring, repair, and prevention of stream bank and shoreline erosion;

(4) Development of blasting plans for hazard reduction and efficiency;

(5) Development and enforcement of environmental standards;

(6) Development of procedures for the suitability of construction materials; and

(7) Identification of geological factors associated with risks that could affect construction projects.

10. Nature and Scope of Materials Engineering. Materials engineering is an important facet of the USACE mission. Technical capabilities are unique and need to be maintained to ensure the integrity of various Water Resource projects. Close attention to materials is needed for new construction, rehabilitation of structures, and for maintaining existing features. This requires a work force knowledgeable in CW design, materials, and construction methods. Material engineering includes concrete, stone, and other ancillary materials. Capabilities include, but are not limited to:

a. Knowledge of current and changing material standards, availability, and test methods;

b. Knowledge of material characteristics and production methods;

c. Knowledge of concrete constituents, characteristics, properties, and performance;

d. Knowledge to specify materials to control deleterious reactions and maximize service life;

e. Knowledge of concrete production and placement methods;

f. Knowledge of construction means and methods;

g. Ability to put knowledge into practice;

h. Identification of project material property requirements;

- i. Coordination with designers to optimize material requirements;
- j. Perform material property investigations and studies;
- k. Perform material availability studies;
- l. Identification of geologic characteristics of rock for aggregates and stone protection;
- m. Identification, understanding, and evaluation of pertinent material test methods;
- n. Evaluation and identification of concrete production requirements;
- o. Perform and actively participate in concrete evaluations including mixture proportioning and thermal studies;
- p. Identification, evaluation, and specification of materials ancillary to concrete, such as formwork, joint design and materials, sealants, and repair materials;
- q. Identification, evaluation, and specification of materials other than concrete, such as asphalt, aggregate base and drainage layers, foundation materials, and erosion protection;
- r. Document material investigations and studies;
- s. Development of material specifications and instructions to construction personnel;
- t. Review of overall design, specifications, and plans to ensure material requirements are met;
- u. Visit construction sites, meet with field personnel, and support field office activities;
- v. Monitoring and evaluation of construction performance;
- w. Investigation and evaluation of existing project performance;
- x. Evaluation of material impact on operational performance;
- y. Identification of material issues and formulation of remediation methods; and
- z. Perform periodic assessments and periodic inspections.

#### 11. Nature and Scope of Emergency Operations Within Geotechnics Professions.

a. General. Under Public Law 84-99, Flood Control and Coastal Emergencies, USACE has the authority to provide emergency response and disaster assistance, including disaster preparedness, advance measures, emergency operations (disaster response and post flood response), rehabilitation of flood control works threatened or destroyed by flood, protection or repair of federally authorized shore protection works threatened or destroyed by coastal storms,

provision of emergency water due to drought or contaminated sources, emergency dredging, and flood related rescue operations.

b. Under Public Law 93-288, USACE may be tasked by Federal Emergency Management Agency to use its available personnel, supplies, facilities, and other resources to provide technical assistance, engineering expertise, construction management, and other support to prevent, prepare for, respond to, and/or recover from an Incident of National Significance.

c. USACE must maintain a cadre of trained and experienced professional geologists and professional engineers to help execute emergency operations. According to the Federal Response Plan, the Department of Defense/USACE is responsible for, but is not limited to:

- (1) Emergency Support Function #3 - Public Works and Engineering
  - (a) Technical advice and evaluations;
  - (b) Engineering services;
  - (c) Construction management and inspection;
  - (d) Emergency contracting;
  - (e) Emergency power;
  - (f) Debris removal and disposal;
  - (g) Emergency protective measures;
  - (h) The repair, replacement, or restoration of disaster-damaged public facilities; and
  - (i) Foundation design.

## 12. Professional Development.

### a. General.

(1) Professional development is multifaceted. It may include, but is not limited to, formal academic education, short-term and long-term training, seminars, correspondence courses, on-the-job training, on-the-job developmental assignments, developmental assignments on other than assigned job, and involvement in professional societies, associations, and activities.

(2) Appendix B lists the professional development available for the geotechnics professional to acquire the technical competencies which are needed to perform essential tasks at a given grade level. This list only includes GS-5/7/9 through GS-13 as training at levels greater than GS-13 tends to be leadership focused and that is shown in Appendix A. The training suggested

in Appendix B is not all inclusive and can be taken at lower or higher grades than listed. Professional development can be divided into three categories: formal training, on-the-job training, and developmental assignments. These categories are discussed below.

b. Formal Training:

(1) Short-term training. This type of training usually consists of organized study offered as short courses by various government sources (e.g., the Proponent Sponsored Engineer Corps Training Program [PROSPECT] courses) and nongovernment vendors in a traditional classroom setting. Officially, short-term training is less than 120 days in duration. The length of short-term training varies. Also included in this category are formal distance learning courses and developmental assignments or programs less than 120 days in duration. For the purposes of this guidance, developmental assignments are listed separately from formal training.

(2) Long-term training. Training and education to which a member is assigned on a continuous, full-time basis for more than 120 calendar days is counted as long-term training. Selection of members for long-term training is competitive. The assignment may be to either Government or non-Government facilities, such as the senior service colleges, fellowship programs, and university programs. Academic Degree Training falls in this category. See the ACTEDS Training Catalog for additional information on long-term training.

(3) On-the-job training.

(a) On-the-job training (OJT) is one of the most effective ways to learn a new task/skill. OJT may consist of intensive short-term instruction and practice or may be a long-term continuous process. While OJT does not have to take the form of traditional formal instruction, OJT should be planned to teach essential elements of the task/skill in a sequential manner which will facilitate learning. As the name implies, OJT is done at the job site, usually in a one-on-one situation between the learner and a skilled task performer who serves as a mentor for the learning of that task/skill.

(b) Positive aspects of OJT include the opportunity to learn the task/skill from a member who currently performs the task, the opportunity to perform the task on an actual project while using actual materials and equipment, the mentor's review of the learner's work, and the feedback provided by the mentor to the learner. Examples of OJT could be drilling and subsurface exploration field work and materials testing at a USACE lab.

c. Developmental Assignments. Developmental assignments are temporary and focused on gaining diverse experience that can provide an opportunity for professionals to develop new knowledge, skills, and abilities for providing useful input on unique jobs. The knowledge, skills, and abilities may lead to future capabilities for the organization as well as foster individual career development. Developmental assignments less than 120 days are counted as short-term, while assignments in excess of 120 days are counted as long-term training. (See paragraphs 12b (1) and (2) above.)

### 13. Professional Registration.

a. Professional registration in a state of an individual's choice should be a career goal of every geotechnics professional in USACE. Many supervisory and higher-level technical positions require professional registration. ER 1110-1-8152 identifies key positions in the district, Major Subordinate Command (MSC), and Headquarters which require professional registration. Additionally, ER 1110-2-1156, Safety of Dams, identifies numerous positions which require professional engineering registration and states it "cannot be over emphasized that inspections other than routine inspections should be performed with licensed Professional Engineers or Professional Geologists present." Team members aspiring to fill one of these key positions should include development of knowledge, skills, and abilities which would enable them to acquire the required registration in their IDPs.

b. Professional registration is the highest standard of competency for geotechnical engineers and geologists and indicates that the registered will uphold the highest technical and ethical standards of the profession and protect the safety and welfare of the public. Professional registration also aids long-term career growth and development for USACE positions as in industry, consulting, or academia.

14. Professional Society Participation. Participation in a professional society or organization provides for the exchange of technical information and experiences with other federal and private practice geotechnical engineers. Geotechnics professionals are encouraged to be active members in the professional societies of their choice. Membership in these organizations provides self-development, enhances the individual's professional network, and assists in maintaining state-of-the-art technical knowledge and capabilities in USACE. Individual membership fees in professional societies are maintained at self-expense.

15. USACE Technical Committees. Geotechnics professionals are encouraged to actively participate as a member of USACE technical committees and task groups. These activities assist in the evaluation of methods, procedures, and practices in USACE and the civil engineering profession for applicability in the design, construction, and operation of CW projects. Task groups also assist in establishing technical criteria and standards by drawing on the individual experiences and expertise in the geotechnical community.

16. Summary. The individual employee is responsible for establishing his or her career goals and developing the plan to achieve them. The immediate supervisor is responsible to guide and advise the employee and provide appropriate assignments consistent with the IDP. Senior geotechnical engineers and senior geologists should make themselves available to serve in the role of mentor for new engineers and geologists.

Appendix A  
Geotechnics Professionals Career Maps

NOTE: The minimum education/professional license requirements, and knowledge, skills, and abilities may vary based on the position and local requirements (e.g., state regulations).

<b>Geotechnical Engineering Career Map</b>	
<b>GS-05/07/09 Intern</b>	<b>GS-11</b>
Interns rotate through developmental assignments in Planning, Program Management, Engineering, Construction, and Operations. Typically, they will spend the last 6 to 9 months in target office.	Receives assignments that are designed to orient, train, and increase the incumbent's knowledge of geotechnical engineering skills and to enhance the ability of the incumbent to address assigned portions of geotechnical projects.
<b>Knowledge, Skills, and Abilities</b>	
<ul style="list-style-type: none"> <li>• Understands the CW, IIS, and MILCON Missions and learns about our business processes and regulations.</li> <li>• Learns about the roles of cost engineering, planning, construction, and project management.</li> <li>• Learns about dam and levee safety by helping senior staff review instrumentation data and participating in inspections.</li> <li>• Learns how to scope and oversee subsurface investigations. Learns to log boreholes and test pits.</li> <li>• Starts to contribute to design efforts (plans and specs).</li> <li>• Applies standard techniques, procedures, and criteria to perform assigned tasks as part of a broader assignment.</li> <li>• Exercises limited judgment on details of work and in application of standard methods for conventional work.</li> <li>• Develops broad knowledge/skills during rotations.</li> <li>• Evaluates and applies standard techniques and criteria to perform a task for projects with few complex features.</li> <li>• Knowledge of basic geotechnical engineering principles.</li> <li>• Skilled in use of computer hardware and software.</li> </ul>	<ul style="list-style-type: none"> <li>• Masters subsurface investigations. Able to scope and oversee subsurface investigations and produce a geotechnical baseline report for future design efforts.</li> <li>• Becomes proficient producing plans and specs for specialized competencies with some oversight from senior staff.</li> <li>• Becomes licensed in engineering.</li> <li>• Prepares scopes, budgets, and schedules for assignments.</li> <li>• Designs geotechnical aspects of assigned projects using standard practices and software application packages.</li> <li>• Assists in and/or design instrumentation systems.</li> <li>• Evaluates materials for construction.</li> <li>• Performs site reconnaissance and site inspections.</li> <li>• Performs and documents results of dam and levee safety inspections.</li> <li>• Performs foundation design, slope stability, and seepage analyses.</li> <li>• Skilled in computer applications as applied in geotechnical engineering.</li> <li>• Prepares plans and specifications.</li> </ul>
<b>Communication/Leadership Skills</b>	
<ul style="list-style-type: none"> <li>• Knowledge/ability to communicate technical information orally and in written formats.</li> <li>• Ability to interrelate effectively with individuals and teams.</li> </ul>	<ul style="list-style-type: none"> <li>• Works well as part of a team.</li> <li>• Prepares reports and specifications.</li> <li>• Able to explain technical information to internal USACE audience, both technical and non-technical.</li> <li>• Participates in local Leadership Development Program.</li> </ul>
<b>Minimum Education/License</b>	
Bachelor's degree in Engineering Engineer in Training: Fundamentals of Engineering Exam	Bachelor's degree in Engineering Engineer in Training: Fundamentals of Engineering Exam
<b>Minimum Years of Experience</b>	
0 to 2 years	2+ years

## Geotechnical Engineering Career Map

GS-12	GS-13 Technical
<p>Functions as technical authority with expert knowledge and skills in geotechnical engineering. Leads multidisciplinary teams on large complex projects. Provides technical support to others and mentors junior engineers and technicians.</p>	<p>Functions as the district or regional technical authority with expert knowledge and skills in geotechnical engineering. Applies the latest concepts and techniques in managing complex and non-standard engineering projects at a District and Division level. Provides technical support to others and mentors at all levels.</p>
Knowledge, Skills, and Abilities	
<ul style="list-style-type: none"> <li>• Ability to produce designs that only require few minor corrections in the review process.</li> <li>• Capable of serving as the geotechnical lead on projects.</li> <li>• Capable of performing DQC within technical area.</li> <li>• Registered and validated in Corps of Engineers Reviewer Certification and Access Program (CERCAP) to serve on ATR Teams.</li> <li>• Has a clear understanding of USACE business processes and regulations.</li> <li>• Develops new techniques and/or improved processes, materials, or products.</li> <li>• Prepares detailed scope of geotechnical work.</li> <li>• Develops detailed field investigations and conduct special purpose geotechnical and materials investigations.</li> <li>• Develops and leads geotechnical design of large and complex projects.</li> <li>• Knowledge of dam safety policies, practices, and regulatory requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Serves as the technical specialist in the application of advanced geotechnical concepts, principles, and methods.</li> <li>• Masters specialized competencies.</li> <li>• Masters levee and dam safety responsibilities.</li> <li>• Plans, schedules, or coordinates the preparation of designs, and documents for multiple major projects.</li> <li>• Represents the agency regionally as a technical expert.</li> <li>• Develop policy, technical criteria and standards for geotechnical input to project formulation.</li> <li>• Leads and performs Independent Technical Review.</li> <li>• Leads multidisciplinary teams to complete large projects.</li> <li>• Plans, conducts, and leads special purpose geotechnical and materials investigations.</li> <li>• Prepares technical guidelines, design guidance, and reports.</li> <li>• Develops technical expertise specific to region and geotechnical specialty.</li> <li>• Applies USACE policies on technical review and quality assurance for products and services.</li> <li>• Applies policies, practices, and regulatory requirements for dam and levee safety.</li> <li>• Serves as geotechnical expert in legal disputes in claims against the government.</li> <li>• Performs forensic geotechnical investigations.</li> <li>• CERCAP registered and validated.</li> </ul>
Communication/Leadership Skills	
<ul style="list-style-type: none"> <li>• Ability to effectively lead teams and conduct meetings.</li> <li>• Serves as a mentor to newer staff members.</li> <li>• Ability to explain technical information to internal and external audiences.</li> <li>• Presents technical papers at conferences and represent the organization at public meetings.</li> <li>• Member or co-lead of a Risk Cadre.</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to develop effective interpersonal relationships.</li> <li>• Mentors junior and mid-career staff.</li> <li>• Presents technical papers at conferences and represent the organization at public meetings.</li> <li>• Ability to effectively lead multidisciplinary teams.</li> <li>• Leads dam and levee safety inspections.</li> <li>• Leads periodic assessments.</li> <li>• Participates in MSC Leadership Programs</li> <li>• Executive Leadership Development Program (ELDP)</li> </ul>
Minimum Education/License	
Bachelor's degree in Engineering Professional License in Engineering	Master's degree in Engineering Professional License in Engineering
Minimum Years of Experience	
6+ years	12+ years

## Geotechnical Engineering Career Map

GS-13 Supervisor	GS-14 Technical
Section Chief: Supervises a geotechnical or geology section as section chief. Makes assignments in terms of broadly defined missions or functions and provides administrative and policy direction. Has complete responsibility and authority to plan, design, prioritize and schedule the execution of the section. Exercises full range of supervisory duties and responsibilities.	Functions as senior technical authority/national specialist with expert knowledge and skills in the development of policy, regulation, and technical procedures. Recognized expert in the field or headquarters/command. Functions as enterprise and command program managers.
Knowledge, Skills, and Abilities	
<ul style="list-style-type: none"> <li>• Supervises a staff of engineers, geologist and/or technicians.</li> <li>• Provides geotechnical resources to support the production of geotechnical products.</li> <li>• Provides technical expertise and information to respond to global disasters and other emergency situations.</li> <li>• Supervises technical experts and provide technical supervision for planning and engineering products and services.</li> <li>• CECAP registered and validated.</li> <li>• Ability to perform DQC for all geotechnical products.</li> <li>• Mentors and leads staff within the section.</li> <li>• Responsible for quality of the work of the section.</li> <li>• Responsible for budgets and schedules for the section.</li> <li>• Responsible for execution of administration duties within the section, including, but not limited to, completion of timesheets, travel orders, vouchers, and overtime and leave requests</li> <li>• Responsible for implementation of training and technical development of staff</li> </ul>	<ul style="list-style-type: none"> <li>• Serves as a regional or national level technical specialist in the application of advanced geotechnical concepts, principles, and methods.</li> <li>• Develops policy, technical criteria and standards for geotechnical input to project formulation.</li> <li>• Leads multidisciplinary teams to complete large projects.</li> <li>• Prepares technical guidelines, design guidance, and reports.</li> <li>• Applies USACE policies on technical review and quality assurance for products and services.</li> <li>• Applies policies, practices, and regulatory requirements for dam and levee safety.</li> <li>• Serves as geotechnical expert in legal disputes in claims against the government.</li> <li>• Performs forensic geotechnical investigations.</li> <li>• Serves on regional boards, as officer in professional organizations, or USACE task groups.</li> <li>• Represents the organization on national and international review and policy boards for technical specialties.</li> </ul>
Communication/Leadership Skills	
<ul style="list-style-type: none"> <li>• Possesses exceptional communication skills.</li> <li>• Routinely interacts with organization leaders, clients, customers, officials, contractors, and others.</li> <li>• Initiates and maintains extensive contacts with key engineers and officials, or other organizations and companies.</li> </ul>	<ul style="list-style-type: none"> <li>• Routinely interacts with customers, officials, contractors, and others.</li> <li>• Leads project meetings and makes presentations.</li> <li>• Represents the agency at public meetings.</li> <li>• Instructs in PROSPECT geotechnical short courses/seminars.</li> </ul>
Leader Development	
<ul style="list-style-type: none"> <li>• Civilian Education System (CES) Advanced Course</li> <li>• Supervisor Development Course</li> <li>• Fiscal Law</li> </ul>	<ul style="list-style-type: none"> <li>• CES Advanced Course</li> <li>• Facilities Engineering Level I and II</li> <li>• Fiscal Law</li> </ul>
Education/License	
Master's degree in Engineering or Geology Professional License in Engineering or Geology	Master's degree in Engineering or Geology Professional License in Engineering or Geology
Years of Experience	
12+ years	15+ years

## Geotechnical Engineering Career Map

<b>GS-14 Supervisor</b>	<b>GS-15</b>
Branch Chief: Makes assignments in terms of broadly defined missions or functions and provides administrative and policy direction. Has complete responsibility and authority to plan, design, prioritize, and schedule the execution of major programs and leads a multidisciplinary group of engineers and technicians. Exercises full range of supervisory duties and responsibilities.	Division Chief: Has complete responsibility and authority to plan, design, prioritize and schedule the execution of major programs, projects and studies. Makes authoritative decisions and recommendations with broad influence that are conclusive and affect the District/Division.
<b>Knowledge, Skills, and Abilities</b>	
<ul style="list-style-type: none"> <li>• Supervises several organizational segments or teams.</li> <li>• Represents the agency regionally and at public meetings.</li> <li>• Coordinates required geotechnical resource management input with other offices in order to accomplish planning and engineering products and services.</li> <li>• Develops geotechnical policy and procedures.</li> <li>• Manages geotechnical related programs, i.e., dam safety, levee safety, and HTRW.</li> <li>• Advises the Commander on geotechnical technical issues.</li> <li>• Advises Dam Safety Officer/committee on dam safety remedial designs and repairs.</li> <li>• Advises Dam Safety Officer/committee on funding needs for routine dam safety/levee safety monitoring and inspections.</li> <li>• Supervises the coordination and development of the geotechnical, materials, and geology technology transfer plans.</li> <li>• Responsible for budgets for the Branch.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides advice, counsel, and instructions on work and administrative matters accomplished in the Division.</li> <li>• Supervises the development of technical practices and procedures for implementation in the District/USACE.</li> <li>• Serves as the functional representative for Geotechnical Engineers, Materials Engineers and Engineering Geologists at District, Division or HQ level.</li> <li>• Represents USACE on federal and non-federal committees and working groups.</li> <li>• Provides technical consultation within USACE and to other Federal agencies, and state and local governments.</li> <li>• Serves as the Dam Safety and Levee Safety Officer at the District or Division Level.</li> <li>• Serves in positions such as Chief of Engineering, Chief of Construction or Chief of Engineering and Construction in a District.</li> </ul>
<b>Communication/Leadership Skills</b>	
<ul style="list-style-type: none"> <li>• Possesses exceptional communication skills.</li> <li>• Routinely interacts with organization leaders, clients, customers, officials, contractors, and others.</li> <li>• Initiates and maintains extensive contacts with key engineers and officials, or other organizations and companies.</li> <li>• Represents USACE on federal and non-federal committees and working groups.</li> </ul>	<ul style="list-style-type: none"> <li>• Possesses exceptional communication skills.</li> <li>• Routinely interacts with organization leaders, clients, customers, officials, contractors, and others.</li> <li>• Initiates and maintains extensive contacts with key engineers and officials, or other organizations and companies.</li> <li>• Represents USACE on federal and non-federal committees and working groups.</li> <li>• Leads the district's dam and levee safety programs.</li> <li>• Leads large group of engineers, scientists, technicians, and administrative staff.</li> </ul>
<b>Leader Development</b>	
<ul style="list-style-type: none"> <li>• Manager Development Course</li> <li>• Defense Leadership and Management Program</li> <li>• Continuing Education for Senior Leaders</li> </ul>	<ul style="list-style-type: none"> <li>• Defense Leadership and Management Program</li> <li>• Senior Service College</li> <li>• Continuing Education for Senior Leaders</li> </ul>
<b>Minimum Education/License</b>	
Master's degree or higher in Engineering or Geology Professional License in Engineering or Geology	Master's degree or higher in Engineering or Geology Professional License in Engineering or Geology
<b>Minimum Years of Experience</b>	
15+ years	20+ years

## Geology Career Map

GS-1350-05/07/09	GS-1350-11
<p>Interns will typically rotate through developmental assignments in Planning and Geographic Information System (GIS), Program and Project Management, Geotechnical Engineering, Construction, and Operations. Typically, they will spend the last 6 to 9 months in their target office. Non-interns will begin to receive assignments to assist senior and more experienced geologists.</p>	<p>Receives assignments that are designed to orient, train and increase the incumbent's knowledge of geotechnical engineering skills, and to enhance the ability of the incumbent to address assigned portions of geotechnical projects.</p>
Knowledge, Skills, and Abilities	
<ul style="list-style-type: none"> <li>• Understands the CW, Environmental, IIS, and MILCON Missions and learn about the USACE business processes and regulations.</li> <li>• Learns about the roles of cost engineering, planning, construction, GIS, and project management.</li> <li>• Learns about dam and levee safety by assisting senior staff review instrumentation data and participating in inspections.</li> <li>• Learns how to scope and oversee subsurface investigations. Learn to log boreholes and test pits.</li> <li>• Starts to contribute to design efforts (plans and specs).</li> <li>• Exercises limited judgment on details of work and in application of standard methods for conventional work.</li> <li>• Develops broad knowledge/skills during rotations.</li> <li>• Evaluates and applies standard techniques, and criteria to perform a task for projects with few complex features.</li> <li>• Ability to make minor adaptations to procedures and accepted practices.</li> <li>• Ability to apply established technology in routine ways on moderate sized projects and to support larger projects using less established technology.</li> <li>• Knowledge of basic to advanced geologic theories and principles.</li> <li>• Knowledge of accepted geologic standard methods, techniques, and procedures.</li> <li>• Ability to work within established guidelines, methods, and instructions exercising sound technical judgment.</li> <li>• Ability to plan, perform, and complete a variety of tasks, performing preliminary analyses with increased experience.</li> <li>• Ability to handle unexpected conditions arising in the normal course of the work.</li> <li>• Ability to work independently on well-defined projects.</li> <li>• Knowledge of basic contracting principles and procedures.</li> </ul>	<ul style="list-style-type: none"> <li>• Masters levee and dam safety responsibilities. Able to perform all dam safety functions independently.</li> <li>• Masters subsurface investigations. Able to scope and oversee subsurface investigations and assist in produce a geotechnical baseline report for future design efforts.</li> <li>• Becomes licensed in the Fundamentals of Geology.</li> <li>• Prepares scopes, budgets, and schedules for assignments.</li> <li>• Assists in and/or design instrumentation systems.</li> <li>• Performs site reconnaissance and site inspections.</li> <li>• Performs and documents results of dam and levee safety inspections.</li> <li>• Performs foundation design, slope stability, and seepage analyses.</li> <li>• Skilled in computer applications as applied in geology and geotechnical engineering.</li> <li>• Prepares plans and specifications.</li> <li>• Ability/skilled in specialized geological techniques such as viz., engineering geology; environmental geology; geochemistry; hydrogeology; exploration geophysics; rock mechanics, subsurface exploration/investigations techniques; aspects of rock foundation, rock slope &amp; tunnel designs; engineering rock property testing; analytical lab techniques; and terrain analysis.</li> <li>• Knowledge of construction methods and processes with respect to geologic aspects of projects.</li> <li>• Ability/skill to execute plan and execute complex investigations and studies.</li> <li>• Knowledge of geological construction materials and their applications.</li> <li>• Knowledge of risk and uncertainty.</li> <li>• Knowledge of engineering guidance documents and state-of-the-art USACE guidance and criteria such as ER, EM, ETL, and engineering literature/journals.</li> <li>• Knowledge of advanced contracting principles and procedures.</li> </ul>

<b>Geology Career Map continued</b>	
GS-1350-05/07/09	GS-1350-11
<b>Communication/Leadership Skills</b>	
<ul style="list-style-type: none"> <li>• Knowledge/ability to effectively communicate technical information orally and in written formats.</li> <li>• Ability to prepare professional and comprehensive technical documents, correspondence, and reports.</li> <li>• Ability to work well with others outside of discipline including engineers, project managers, and drill crews.</li> </ul>	<ul style="list-style-type: none"> <li>• Works well on teams.</li> <li>• Prepares reports and specifications.</li> <li>• Ability to explain technical information to internal USACE audience, both technical and non-technical.</li> <li>• Ability to provide technical guidance and instructions to lower graded professional or technical employees.</li> <li>• Ability to efficiently manage their time and others time while in the field working on multiple duties to accomplish deadlines.</li> </ul>
<b>Minimum Education/License</b>	
Bachelor's degree in Geology Geologist in Training: Fundamentals of Geology Exam	Bachelor's degree in Geology Geologist in Training: Fundamentals of Geology Exam
<b>Minimum Years of Experience (with field work)</b>	
0 to 2 years	2+ years

## Geology Career Map

GS-1350-12	GS-1350-13 Technical
<p>Functions as technical authority with expert knowledge and skills in geotechnical engineering. Leads multidisciplinary teams on large complex projects. Provides technical support to others and mentors junior engineers and technicians.</p>	<p>Functions as the district or regional technical authority with expert knowledge and skills in geology. Applies the latest concepts and techniques in managing complex and non-standard engineering projects at a District and Division level. Provides technical support to others and mentors at all levels.</p>
Knowledge, Skills, and Abilities	
<ul style="list-style-type: none"> <li>• Masters specialized competencies.</li> <li>• Ability to produce completed work that only requires few minor corrections in the review process.</li> <li>• Ability to perform duties of project/lead geologist.</li> <li>• Capable of serving as the technical lead on projects.</li> <li>• Capable of performing DQC within technical area.</li> <li>• Registered and validated in CERCAP to serve on ATR Teams.</li> <li>• Has a clear understanding of USACE business processes and regulations.</li> <li>• Develops new techniques and/or improved processes, materials, or products.</li> <li>• Prepares detailed scope of geological work.</li> <li>• Develops detailed field investigations and conduct special purpose geotechnical and materials investigations.</li> <li>• Develops and lead geological design of large and complex projects.</li> <li>• Knowledge of dam safety policies, practices, and regulatory requirements.</li> <li>• Ability/skill in conducting effective meetings and briefings.</li> <li>• Knowledge of the geological aspects of emergency management and operations.</li> <li>• Knowledge of budgeting principles for non-financial managers.</li> <li>• Ability to manage technical design processes for geological products and services.</li> <li>• Ability to develop/execute the technical aspects of contract documents and/or scopes of work for AE contracts.</li> <li>• Knowledge of dam safety policies, practices, and regulatory requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Serves as the technical specialist in the application of advanced geological concepts, principles, and methods.</li> <li>• Plans, schedules, or coordinates the preparation of designs, and documents for multiple major projects.</li> <li>• Represents the agency regionally as a technical expert in geology.</li> <li>• Develops policy, technical criteria, and standards for geological input to project formulation.</li> <li>• Plans, conducts, and leads special purpose geological and materials investigations.</li> <li>• Prepares technical guidelines, design guidance, and reports.</li> <li>• Develops technical expertise specific to region and geological specialty.</li> <li>• Applies USACE policies on technical review and quality assurance for products and services.</li> <li>• Applies policies, practices, and regulatory requirements for dam and levee safety.</li> <li>• Serves as geological expert in legal disputes in claims against the government.</li> <li>• Performs forensic geological investigations.</li> <li>• CERCAP registered and validated.</li> <li>• Ability to execute technical aspects of the planning process.</li> <li>• Ability to apply USACE policies on technical review and quality assurance for products and services.</li> <li>• Ability to apply value-engineering principles to geological aspects of projects.</li> <li>• Ability to apply policies, practices, and regulatory requirements for dam safety.</li> <li>• Ability to perform forensic geological investigations.</li> <li>• Ability to serve as geological expert in legal disputes in claims against the government.</li> </ul>

<b>Geology Career Map continued</b>	
<b>GS-1350-12</b>	<b>GS-1350-13 Technical</b>
<b>Communication/Leadership Skills</b>	
<ul style="list-style-type: none"> <li>• Ability to effectively lead diverse technical teams and conduct meetings.</li> <li>• Serves as a mentor to newer staff members.</li> <li>• Able to explain and present technical information to internal and external audiences.</li> <li>• Ability to lead dam and levee safety inspections.</li> <li>• Ability to lead periodic assessments and/or is part of a Risk Cadre.</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to develop effective interpersonal relationships.</li> <li>• Mentors junior and mid-career staff.</li> <li>• Leads and performs Independent Technical Reviews.</li> <li>• Leads multidisciplinary teams to complete large and complex projects.</li> <li>• Presents technical papers at conferences and represent the organization at public meetings.</li> <li>• Ability to lead periodic assessments.</li> <li>• Member of a Risk Cadre.</li> </ul>
<b>Minimum Education/License</b>	
Bachelor's degree in Geology Professional License in Geology	Master's degree in Geology Professional License in Geology
<b>Minimum Years of Experience (with field work)</b>	
6+ years	12+ years

## Geology Career Map

GS-1350-13 Supervisor	GS-1350-14 Technical
<p style="text-align: center;">Section Chief:</p> <p>Supervises a geotechnical or geology section. Makes assignments in terms of broadly defined missions or functions and provides administrative and policy direction. Has complete responsibility and authority to plan, design, prioritize, and schedule the execution of the section. Exercises full range of supervisory duties and responsibilities.</p>	<p>Functions as senior technical authority/national specialist with expert knowledge and skills in the development of policy, regulation and technical procedures. Recognized expert in the field or headquarters/command. Functions as enterprise and command program managers.</p>
Knowledge, Skills, and Abilities	
<ul style="list-style-type: none"> <li>• Supervises a staff of engineers, geologist and/or technicians.</li> <li>• Provides geology resources to support the production of geotechnical and geological products.</li> <li>• Provides geologic technical expertise and information to respond to global disasters and other emergency situations.</li> <li>• Supervises technical experts and provide technical supervision for planning and engineering and geologic products and services.</li> <li>• CECAP registered and validated.</li> <li>• Ability to perform DQC for all geologic products.</li> <li>• Responsible for quality of the work of the section.</li> <li>• Responsible for budgets and schedule for the section.</li> <li>• Responsible for execution of administration duties within the section, including, but not limited to, completion of timesheets, travel orders, vouchers, and overtime and leave requests.</li> <li>• Responsible for implementation of training and technical development of staff.</li> <li>• Ability to supervise and manage a large, diverse technical organization.</li> <li>• Ability to execute responsibilities and requirements of contracting officer's representative.</li> <li>• Ability to identify customers and their requirements.</li> <li>• Knowledge of software packages for use in planning equipment requirements, budget projects, workload execution, and training requirements.</li> <li>• Knowledge of partnering principles and applications.</li> <li>• Knowledge/ability (advanced) in all geological aspects of projects and organizations.</li> <li>• Knowledge/ability in contract negotiations.</li> <li>• Knowledge/ability in adult learning principles and instructional methods.</li> </ul>	<ul style="list-style-type: none"> <li>• Serves as a regional or national level technical specialist in the application of advanced geologic concepts, principles, and methods.</li> <li>• Develops policy, technical criteria and standards for geotechnical input to project formulation.</li> <li>• Prepares technical guidelines, design guidance, and reports.</li> <li>• Applies USACE policies on technical review and quality assurance for products and services.</li> <li>• Applies policies, practices, and regulatory requirements for dam and levee safety.</li> <li>• Serves as geotechnical expert in legal disputes in claims against the government.</li> <li>• Performs forensic geological investigations.</li> <li>• Serves on regional boards, as officer in professional organizations, or USACE task groups.</li> <li>• Represent organization on national and international review and policy boards for technical specialties.</li> <li>• Ability to execute technical aspects of the planning process.</li> <li>• Ability to apply USACE policies on technical review and quality assurance for products and services.</li> <li>• Ability to apply value-engineering principles to geological aspects of projects.</li> <li>• Ability to apply policies, practices, and regulatory requirements for dam safety.</li> <li>• Ability to perform forensic geological investigations.</li> <li>• Ability to serve as geological expert in legal disputes in claims against the government.</li> </ul>

## Geology Career Map continued

GS-1350-13 Supervisor	GS-1350-14 Technical
<b>Communication/Leadership Skills</b>	
<ul style="list-style-type: none"> <li>• Possesses exceptional communication skills.</li> <li>• Routinely interacts with organization leaders, clients, customers, officials, contractors, and others.</li> <li>• Initiates and maintains extensive contacts with key engineers and officials, or other organizations and companies.</li> <li>• Mentors and leads staff within the section.</li> </ul>	<ul style="list-style-type: none"> <li>• Routinely interacts with customers, officials, contractors, and others.</li> <li>• Leads project meetings and makes presentations.</li> <li>• Represents agency at public meetings.</li> <li>• Instructs in PROSPECT courses/seminars with a geologic focus.</li> <li>• Leads multidisciplinary teams to complete large and complex projects.</li> <li>• Ability to lead periodic assessments.</li> <li>• Member of a Risk Cadre.</li> </ul>
<b>Leader Development</b>	
<ul style="list-style-type: none"> <li>• CES Advanced Course</li> <li>• Supervisor Development Course</li> <li>• Fiscal Law</li> </ul>	<ul style="list-style-type: none"> <li>• CES Advanced Course</li> <li>• Facilities Engineering Level I and II</li> <li>• Fiscal Law</li> </ul>
<b>Education/License</b>	
Master's degree in Geology Professional License in Geology	Master's degree in Geology Professional License in Geology
<b>Years of Experience</b>	
12+ years	15+ years

## Geology Career Map

GS-1350-14 Supervisor	GS-1350-15 Supervisor
<p><b>Branch Chief:</b></p> <p>Makes assignments in terms of broadly defined missions or functions and provides administrative and policy direction. Has complete responsibility and authority to plan, design, prioritize, and schedule the execution of major programs and leads a multidisciplinary group of engineers and technicians. Exercises full range of supervisory duties and responsibilities.</p>	<p><b>Division Chief:</b></p> <p>Has complete responsibility and authority to plan, design, prioritize, and schedule the execution of major programs, projects, and studies. Makes authoritative decisions and recommendations with broad influence that are conclusive and affect the District/Division.</p>
Knowledge, Skills, and Abilities	
<ul style="list-style-type: none"> <li>• Supervises several organizational segments or teams.</li> <li>• Represents the agency regionally and at public meetings.</li> <li>• Coordinates the required geologic resource management input with other offices in order to accomplish planning and engineering products and services.</li> <li>• Develops geology policy and procedures.</li> <li>• Manages geologic related programs, i.e., dam safety, levee safety, HTRW, drilling and exploration and, instrumentation.</li> <li>• Advises the Commander on geologic technical issues.</li> <li>• Advises dam safety officer/committee on dam safety remedial designs and repairs.</li> <li>• Advises Dam Safety Officer/committee on funding needs for routine dam safety/levee safety monitoring and inspections.</li> <li>• Supervises the coordination and development of the geotechnical, materials and geology technology transfer plans.</li> <li>• Responsible for budgets for the Branch.</li> <li>• Ability to supervise and manage a large, diverse technical organization.</li> <li>• Ability to execute responsibilities and requirements of contracting officer's representative.</li> <li>• Ability to identify customers and their requirements.</li> <li>• Knowledge of software packages for use in planning equipment requirements, budget projects, workload execution, and training requirements.</li> <li>• Knowledge of partnering principles and applications.</li> <li>• Knowledge/ability (advanced) in all geological aspects of projects and organizations.</li> <li>• Knowledge/ability in contract negotiations.</li> <li>• Knowledge/ability in adult learning principles and instructional methods.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides advice, counsel, and instructions on work and administrative matters accomplished in the Division.</li> <li>• Supervises the development of technical practices and procedures for implementation in the District/USACE.</li> <li>• Serves as the functional representative for Geotechnical Engineers, Materials Engineers and Engineering Geologists at District, Division or HQ level.</li> <li>• Represents USACE on federal and non-federal committees and working groups.</li> <li>• Provides technical consultation within USACE and to other federal agencies, and state and local governments</li> <li>• Serves as the Dam Safety and Levee Safety Officer at the District or Division Level.</li> <li>• Serves in positions such as Chief of Engineering, Chief of Construction, or Chief of Engineering and Construction in a District.</li> <li>• Ability to plan, set priorities, schedule, and supervise activities of an organization.</li> <li>• Ability to assess the technical needs and requirements of a large engineering organization.</li> <li>• Ability to identify the technical criteria, standards, and practices that are needed to support the organizational missions, goals, and objectives.</li> <li>• Ability to establish technical policy and procedures for a large engineering organization.</li> <li>• Ability to provide sound and timely technical advice to senior agency officials.</li> <li>• Ability to represent the agency in federal, non-federal, and foreign government technical activities.</li> </ul>

## Geology Career Map continued

GS-1350-14 Supervisor	GS-1350-15 Supervisor
<b>Communication/Leadership Skills</b>	
<ul style="list-style-type: none"> <li>• Possesses exceptional communication skills.</li> <li>• Routinely interacts with organization leaders, clients, customers, officials, contractors, and others.</li> <li>• Initiates and maintains extensive contacts with key engineers and officials, or other organizations and companies.</li> <li>• Represents USACE on federal and non-federal committees and working groups.</li> </ul>	<ul style="list-style-type: none"> <li>• Possesses exceptional communication skills.</li> <li>• Routinely interacts with organization leaders, clients, customers, officials, contractors, and others.</li> <li>• Initiates and maintains extensive contacts with key engineers and officials, or other organizations and companies.</li> <li>• Represents USACE on federal and non-federal committees and working groups.</li> <li>• Leads the district's dam and levee safety programs.</li> <li>• Leads large group of engineers, scientists, technicians and administrative staff.</li> </ul>
<b>Leader Development</b>	
<ul style="list-style-type: none"> <li>• Manager Development Course</li> <li>• Defense Leadership and Management Program</li> <li>• Continuing Education for Senior Leaders</li> </ul>	<ul style="list-style-type: none"> <li>• Defense Leadership and Management Program</li> <li>• Senior Service College</li> <li>• Continuing Education for Senior Leaders</li> </ul>
<b>Minimum Education/License</b>	
Master's degree or higher in Geology Professional License in Geology	Master's degree or higher in Geology Professional License in Geology
<b>Minimum Years of Experience</b>	
15+ years	20+ years

## Geology Career Map

### GS-1350-15 Technical

Functions as senior technical authority/national specialist with expert knowledge and skills in the development of policy, regulation, and technical procedures. Recognized expert in the field or headquarters/command. Functions as enterprise and command program managers.

### Knowledge, Skills, and Abilities

- Serves as a regional or national level technical specialist in the application of advanced geologic concepts, principles, and methods.
- Develops policy, technical criteria, and standards for geotechnical input to project formulation.
- Prepares technical guidelines, design guidance, and reports.
- Applies USACE policies on technical review and quality assurance for products and services.
- Applies policies, practices, and regulatory requirements for dam and levee safety.
- Serves as geotechnical expert in legal disputes in claims against the government.
- Performs forensic geological investigations.
- Serves on regional boards, as officer in professional organizations, or USACE task groups.
- Represents the organization on national and international review and policy boards for technical specialties.
- Knowledge of the state-of-the-art geologic principles, practices and procedures as they relate to geological investigations and designs for critical CW projects.
- Ability to develop technical criteria and standards from the state-of-the-practice that are suitable for use in USACE CW program.
- Ability to work on interagency task groups.
- Ability to provide sound, thorough, and timely technical advice and consultation on complex geological problems and issues.
- Ability to manage large, diverse, and novel technical programs.

### Communication/Leadership Skills

- Possesses exceptional communication skills.
- Routinely interacts with organization leaders, clients, customers, officials, contractors, and others.
- Initiates and maintains extensive contacts with key engineers and officials, or other organizations and companies.
- Represents USACE on federal and non-federal committees and working groups.

### Leader Development

- Manager Development Course
- Defense Leadership and Management Program
- Continuing Education for Senior Leaders

### Minimum Education/License

- Master's degree or higher in Geology
- Professional License in Geology

### Minimum Years of Experience

20+ years

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Appendix B  
Geotechnics Professionals Training Opportunities

<b>Training Opportunities</b>	
<b>GS-05/07/09 Intern</b>	<b>GS-11</b>
<p><b><u>General:</u></b></p> <ul style="list-style-type: none"> <li>• USCS Soil Classification</li> <li>• Dam Safety: PROSPECT</li> <li>• Levee Inspection: PROSPECT</li> <li>• Levee Safety Fundamentals: PROSPECT</li> <li>• Earthwork Construction Quality Verification: PROSPECT</li> <li>• Drilling Fundamentals: Visiting Scholars Program (VSP)</li> <li>• Applications of Engineering Geology: PROSPECT</li> <li>• GPS for GIS Applications: PROSPECT</li> <li>• Environmental Remediation Technologies: PROSPECT</li> <li>• Dredging Fundamentals: PROSPECT</li> <li>• GIS Intermediate: PROSPECT</li> <li>• Technical Writing</li> </ul> <p><b><u>On-The-Job Training</u></b></p> <ul style="list-style-type: none"> <li>• Geotechnical field investigations</li> <li>• Rotations through Construction, Design Branch, Planning and GIS, Program and Project Management, and H&amp;H.</li> <li>• Drilling with a drill crew.</li> <li>• Installation and maintenance of field equipment.</li> </ul> <p><b><u>Outside Agencies and Organizations:</u></b></p> <ul style="list-style-type: none"> <li>• Earth School: Reclamation</li> <li>• Safety Evaluation of Existing Dams (SEED): Reclamation</li> <li>• Engineering Geology or Applied geology college or graduate course</li> <li>• Association of State Dam Safety Officials (ASDSO): Basic Soil Mechanics Related to Earthen Dams</li> <li>• ASDSO: Conduits, Gates, &amp; Valves</li> <li>• ASDSO: Seepage Through Earthen Dams</li> <li>• Princeton Groundwater: Groundwater Pollution and Hydrology</li> <li>• Princeton Groundwater: The Remediation Course</li> <li>• UT Austin: Grouting Fundamentals and Current Practice</li> </ul>	<p><b><u>General:</u></b></p> <ul style="list-style-type: none"> <li>• Drilling Fundamentals: VSP</li> <li>• Instrumentation and Performance Monitoring of Dams and Levees: Prospect (recommended)</li> <li>• Applications of Engineering Geology: PROSPECT</li> <li>• Seepage and Piping: PROSPECT</li> <li>• Strength and Stability of Constructed Slopes: PROSPECT</li> <li>• Architect-Engineer Contracting: PROSPECT</li> <li>• Construction Contract Administration: PROSPECT</li> </ul> <p><b><u>Materials Specialty:</u></b></p> <ul style="list-style-type: none"> <li>• Concrete Fundamentals: PROSPECT</li> <li>• Earthwork Construction Quality Verification: PROSPECT</li> <li>• Maintenance and Rehabilitation of Pavements: PROSPECT</li> <li>• Pavement Evaluation and Design: PROSPECT</li> <li>• Concrete Maintenance and Repair: PROSPECT</li> </ul> <p><b><u>Coastal/Ecosystems:</u></b></p> <ul style="list-style-type: none"> <li>• Stream Bank Erosion and Protection: PROSPECT</li> <li>• Ecosystem Restoration: PROSPECT</li> <li>• Basics of Coastal Processes for Engineers and Planners</li> <li>• Coastal Engineering Projects and Design: PROSPECT</li> </ul> <p><b><u>Outside Agencies:</u></b></p> <ul style="list-style-type: none"> <li>• Earth School: Reclamation</li> <li>• SEED: Reclamation</li> </ul> <p><b><u>On-The-Job Training</u></b></p> <ul style="list-style-type: none"> <li>• Applicable Dam Safety Action Classification (DSAC) University Opportunities</li> <li>• Drilling with a drill crew.</li> <li>• Installation and maintenance of field equipment.</li> </ul>

## Training Opportunities continued

### Leadership Development

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| <ul style="list-style-type: none"><li>• CES: Foundation Course</li><li>• Defense Acquisition University (DAU): Acquisition 101</li><li>• Action Officer Development Course (AODC)</li></ul> | <ul style="list-style-type: none"><li>• CES: Basic Course</li><li>• Facilities Engineering (FE) 201, Intermediate Facilities Engineering</li></ul> |
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### References

CES Courses (online). Enroll through the Civilian Human Resources Training Application System (CHRTAS) (<https://atrrs.army.mil/channels/chrts/>)

Defense Acquisition University Course: Acquisition 101 (online course). Enroll through the Defense Acquisition University ([http://icatalog.dau.mil/onlinecatalog/courses.aspx?crs\\_id=2](http://icatalog.dau.mil/onlinecatalog/courses.aspx?crs_id=2))

Action Officer Development Course (AODC) (online course). Enroll through the Civilian Human Resources Training Application System (CHRTAS) (<https://atrrs.army.mil/channels/chrts/>)

Prospect Courses can be found at: <http://ulc.usace.army.mil/>

Geotechnical, Geology, and Materials Community of Practice Technical Excellence Network: <https://apps.usace.army.mil/sites/TEN/GM/Pages/default.aspx>

DSAC University: Technical Excellence Network: <https://apps.usace.army.mil/sites/TEN/wiki/GGM%20Jobs.aspx>

## Training Opportunities

GS-12	GS-13
<p><b><u>General:</u></b></p> <ul style="list-style-type: none"> <li>• Advanced Geotechnical Site Characterization: VSP</li> <li>• Seismic Stability of Earthen Dams: PROSPECT</li> <li>• Strength and Stability of Constructed Slopes: PROSPECT</li> <li>• Graduate Course in Geotechnical Earthquake Engineering (for those districts with seismic potential)</li> <li>• Advanced Deep Foundations Graduate Course</li> </ul> <p><b><u>Risk Assessment Specialty:</u></b></p> <p><b><u>RMC Courses:</u></b></p> <ul style="list-style-type: none"> <li>• Best Practices in Dam and Levee Safety</li> <li>• Mechanics of Internal Erosion</li> <li>• Risk Assessment for Internal Erosion</li> </ul> <p><b><u>Coastal/Ecosystems:</u></b></p> <ul style="list-style-type: none"> <li>• Advanced Stream Bank Erosion and Protection: PROSPECT</li> </ul> <p><b><u>On-The-Job Training</u></b></p> <ul style="list-style-type: none"> <li>• Developmental Assignment with the Risk Management Center</li> <li>• Developmental Assignment with PPMD</li> </ul> <p><b><u>Long-Term Training at University</u></b></p>	<p><b><u>General:</u></b></p> <ul style="list-style-type: none"> <li>• Continue with courses not already taken</li> <li>• Advanced Geotechnical Modeling Courses (e.g., Fast Lagrangian Analysis of Continua (FLAC), Plaxis, GeoStudio)</li> <li>• Deep Foundations Certification</li> </ul> <p><b><u>Risk Assessment:</u></b></p> <ul style="list-style-type: none"> <li>• Lead Risk Assessments</li> <li>• Facilitate PAs</li> <li>• PA Facilitator’s Course</li> </ul> <p><b><u>Instructor:</u></b></p> <ul style="list-style-type: none"> <li>• Develop and Instruct Courses</li> </ul> <p><b><u>Long-Term Training at University</u></b></p> <p><b><u>On-The-Job Training</u></b></p> <ul style="list-style-type: none"> <li>• Developmental Assignment with Division</li> <li>• Developmental Assignment with HQ as endowed chair for Levee and/or Dam Safety</li> </ul>
<b>Leader Development</b>	
<ul style="list-style-type: none"> <li>• CES Intermediate Course</li> <li>• District Leadership Development</li> <li>• FE 201, Intermediate Facilities Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• CES Advanced Course</li> <li>• Regional Leadership Development Course</li> <li>• FE 302 Advanced Facilities Engineering</li> </ul>
<b>References</b>	
<p>CES Courses (online). Enroll through the Civilian Human Resources Training Application System (CHRTAS) (<a href="https://atrrs.army.mil/channels/chrtas/">https://atrrs.army.mil/channels/chrtas/</a>)</p>	
<p>DAU Course: Acquisition 101 (online course). Enroll through the Defense Acquisition University (<a href="http://icatalog.dau.mil/onlinecatalog/courses.aspx?crs_id=2">http://icatalog.dau.mil/onlinecatalog/courses.aspx?crs_id=2</a>)</p>	
<p>AODC (online course). Enroll through the Civilian Human Resources Training Application System (CHRTAS) (<a href="https://atrrs.army.mil/channels/chrtas/">https://atrrs.army.mil/channels/chrtas/</a>)</p>	
<p>Prospect Courses can be found at: <a href="http://ulc.usace.army.mil/">http://ulc.usace.army.mil/</a></p>	
<p>Geotechnical, Geology, and Materials Community of Practice Technical Excellence Network: <a href="https://apps.usace.army.mil/sites/TEN/GM/Pages/default.aspx">https://apps.usace.army.mil/sites/TEN/GM/Pages/default.aspx</a></p>	
<p>DSAC University: Technical Excellence Network: <a href="https://apps.usace.army.mil/sites/TEN/wiki/GGM%20Jobs.aspx">https://apps.usace.army.mil/sites/TEN/wiki/GGM%20Jobs.aspx</a></p>	