ASBG®

Tasks of A Professional Geologist

Statement by the National Association of State Boards of Geology

The National Association of State Boards of Geology (ASBG®) is a non-profit organization, comprised of state boards which license/registry geologists. ASBG® develops national competency examinations used by these Member Boards. The ASBG® examinations have been adopted by all of the states in the U.S. and the territory of Puerto Rico which have geologic practice acts. The following areas of professional practice contain generalized, and some specific, activities which may be performed by qualified, professional geologists.

Professional geologists uniquely qualified to perform these activities based on their formal education, training and experience. Under each major heading is a group of activities associated with that specific area of geoscience practice. The major areas of professional, geologic practice include, but are not limited to: Research; Field Methods and Communications; Geochemistry; Mineralogy; Petrology; Stratigraphy; Historical, Structural, Paleontologic; Geomorphology; Geophysics; Hydrogeology; Environmental, Geochemistry; Engineering Geology, Economic Geology; Mining Geology and Energy Resources. These areas are not intended to be all inclusive, as these ASBG® examinations assure geologic competency. Again, this list represents only a cross-section of possible activities, and does not include all possible professional practice activities.

Also included in this publication is a listing of “Other related activities which may be performed by qualified Professional Geologists.” These activities, although not specifically described in content, may be performed by a qualified, professional geologist.

RESEARCH, FIELD METHODS AND COMMUNICATIONS
• Plan and conduct field operations including human and ecological health, safety, and regulatory considerations
• Evaluate property/mineral rights
• Interpret regulatory constraints
• Select and interpret appropriate base maps for field investigations
• Determine scales and distances from remote imagery and/or maps
• Identify, locate and utilize available data sources
• Plan and conduct field operations and procedures to ensure public protection
• Construct borehole and trench logs
• Design and conduct laboratory programs and interpret results
• Evaluate historic land use or environmental conditions from remote imagery
• Develop and utilize Quality Assurance/Quality Control procedures
• Construct and interpret maps and other graphical presentations
• Write and edit geologic reports
• Interpret and analyze aerial photos, satellite and imagery data
• Perform geologic interpretations from aerial photos, satellite and other imagery
• Design geologic monitoring programs
• Interpret data from geologic monitoring programs
• Read/interpret topographic and bathymetric maps
• Perform geologic research in field and laboratory
• Prepare soil, sediments and geological logs
• Prepare lithological logs
• Interpret dating, isotopic, and/or tracer studies
• Plan and evaluate remediation and restoration programs
• Construct geologic models, lineaments, or fracture systems from surface or remote imagery
• Select, construct, and evaluate maps, cross-sections, and other data for field investigations
• Design, apply, and interpret analytical or numerical models

MINERALOGY/PETROLOGY
• Identify minerals and their physicochemical properties
• Identify mineral assemblages
• Determine probable genesis and sequence of mineral assemblages
• Predict subsurface mineral characteristics on the basis of exposures and drill holes
• Identify and classify major rock types
• Determine physical properties of rocks
• Determine geotechnical properties of rocks
• Determine types, clasts, and/or degrees of rock and mineral alteration
• Determine suites of rock types
• Characterize mineral assemblages and probable genesis
• Plan and conduct mineralogic or petrologic investigations
• Identify minerals and rocks and their characteristics
• Identify and interpret rock and mineral sequences, associations, and genesis

STRATIGRAPHY/HISTORICAL GEOLOGY
• Plan and conduct sedimentologic, and stratigraphic investigations
• Identify and interpret sedimentary structures, depositional environments, and sediment provenance
• Identify and interpret sediment or rock sequences, positions, and ages
• Establish relative position of rock units
• Determine relative ages of rocks
• Interpret depositional environments and structures and evaluate pre-depositional changes
• Perform facies analyses
• Correlate rock units
• Interpret geologic history
• Determine and establish basis for stratigraphic correlation and regional cross-sections
• Establish stratigraphic correlations and interpret rock sequences, positions, and ages
• Establish provenance of sedimentary deposits

NEOLOGY/PETROLOGY
• Plan and conduct field operations including human and ecological health, safety, and regulatory considerations
• Evaluate property/mineral rights
• Interpret regulatory constraints
• Select and interpret appropriate base maps for field investigations
• Determine scales and distances from remote imagery and/or maps
• Identify, locate and utilize available data sources
• Plan and conduct field operations and procedures to ensure public protection
• Construct borehole and trench logs
• Design and conduct laboratory programs and interpret results
• Evaluate historic land use or environmental conditions from remote imagery
• Develop and utilize Quality Assurance/Quality Control procedures
• Construct and interpret maps and other graphical presentations
• Write and edit geologic reports
• Interpret and analyze aerial photos, satellite and imagery data
• Perform geologic interpretations from aerial photos, satellite and other imagery
• Design geologic monitoring programs
• Interpret data from geologic monitoring programs
• Read/interpret topographic and bathymetric maps
• Perform geologic research in field and laboratory
• Prepare soil, sediments and geological logs
• Prepare lithological logs
• Interpret dating, isotopic, and/or tracer studies
• Plan and evaluate remediation and restoration programs
• Construct geologic models, lineaments, or fracture systems from surface or remote imagery
• Select, construct, and evaluate maps, cross-sections, and other data for field investigations
• Design, apply, and interpret analytical or numerical models

GEOCHEMISTRY
• Evaluate geochemical data and/or construct geochemical models of rocks and minerals
• Establish analytical objectives and methods
• Make determinations of sorption/desorption reactions based upon aqueous mineralogy
• Assess the behavior of dissolved phase and free phase contaminant flow in groundwater and surface water systems
• Assess salt water intrusion
• Design, implement and interpret fate and transport models
• Identify minerals and rocks based on their chemical properties and constituents

STRUCTURAL GEOLOGY
• Plan and conduct structural and tectonic investigations
• Develop deformational history through structural analyses
• Identify structural features and their interrelationships
• Determine orientation of structural features
• Map structural features
• Perform qualitative and quantitative structural analyses
• Correlate separated structural features
• Develop and interpret tectonic history through structural analyses

GEOLOGY/PALEONTOLOGY
• Evaluate geomorphic processes and development of landforms and soils
• Identify and classify landforms
• Plan and conduct geomorphic investigations
• Determine geomorphic processes and development of landforms and soils
• Determine absolute or relative age relationships of environments
• Identify potential hazardous geomorphological conditions
• Determine flood plain extent
• Determine high water (i.e. flood) levels
• Evaluate stream or shoreline erosion and transport processes
• Evaluate regional geomorphology

PHYSICS
• Select methods of geophysical investigations
• Perform geophysical investigations in the field
• Perform geophysical interpretation of geophysical data
• Design, implement, and interpret data from surface or subsurface geophysical programs including data from borehole geophysical programs
• Identify and interpret geophysical conditions by using geophysical techniques
• Use wireline geophysical instruments to delineate stratigraphic/lithologic units
• Conduct geophysical field surveys and interpretations, e.g.: petrophysical well bore logging; seismic data (reflection and refraction); radiological, radar, remote sensing, electro-conductive or resistive surveys. Includes delineation of mineral and hydrocarbon deposits, interpretation of depositional environments, formation boundaries, faults, salt water contamination-intrusion, contaminant plume delineation and other structural/lithologic interpretations.
• Identify and delineate earthquake/seismic hazards
• Interpret paleoseismic history

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HYDROGEOLOGY/ENVIRONMENTAL GEOCHEMISTRY
- Plan and conduct hydrogeological, geochemical, and environmental investigations.
- Develop and interpret groundwater models.
- Design and interpret data from hydrologic testing programs including monitoring plans.
- Utilize geochemical data to evaluate hydrologic conditions.
- Apply geophysical methods to analyze hydrologic conditions including geophysical logging analysis and interpretation.
- Determine physical and chemical properties of aquifers and vadose zones.
- Define and characterize groundwater flow systems.
- Develop water well abandonment plans including monitoring and public water supply wells.
- Develop/interpret analytical, particle tracking and mass transport models.
- Design and conduct aquifer performance tests.
- Define and characterize saturated and vadose zone flow and transport.
- Evaluate, manage, and protect groundwater supply resources.
- Conduct radiometric surface mapping and interpretation.
- Design and install groundwater exploration, development, monitoring, and pumping/injection wells.
- Develop groundwater resources management programs.
- Plan and evaluate remedial-corrective action programs based on geologic factors.
- Evaluate, predict, manage, protect, or remediate surface water or groundwater resources from anthropogenic (man's) environmental effects.
- Characterize or determine hydraulic properties.
- Interpret dating, isotopic, and/or tracer surveys.
- Assess relationship of aquifer to surface water and groundwater systems.
- Make determinations of sorption/desorption reactions based upon aquifer mineralogy.
- Assess the behavior of dissolved phase and free phase contaminant flow in groundwater and surface water systems.
- Assess and develop well head protection plans and surface water assessment delineations.

ENGINEERING GEOLOGY
- Provide geological information and interpretations for engineering design.
- Identify, map, and evaluate potential seismic and other geologic-geomorphological conditions and/or hazards.
- Provide geological consultation during and after construction.
- Develop and interpret engineering geology investigations, characterizations, maps, and cross sections.

OTHER RELATED ACTIVITIES WHICH MAY BE PERFORMED BY QUALIFIED PROFESSIONAL GEOLOGISTS
- Provide data and complete permit applications for RCorrelated/Waste, NESHAP/POW, Storm Water, Sludge, Water supply, Solid Waste Sites, UC Wetlands, and Mining
- Conduct water well inventories

OTHER RELATED ACTIVITIES WHICH MAY BE PERFORMED BY QUALIFIED PROFESSIONAL GEOLOGISTS
- Develop and implement site safety plans and environmental sampling plans
- Provide educational outreach related to geological, geotechnical, hydrologic, emergency response and other activities.
- Respond to natural disaster events (i.e. floods, earthquakes, etc.) for protection of human health and the environment.
- Participate in pre-planning for spill events in coastal or other environmentally sensitive environments.
- Develop resource(s) and infrastructure vulnerability assessment plans and reports related to potable and non-potable water supplies, waste water treatment facilities, etc.