

**TRADITIONAL TASKS PERFORMED
BY FLORIDA PROFESSIONAL GEOLOGISTS
Or Professional Engineer's Qualified in Geology**
(Compiled by the Florida Board of Professional Geologists)

The Florida Board of Professional Geologists has received numerous requests from various professionals, agency representatives, and the public for clarification regarding what constitutes "professional geological services" in Florida. Related to this request, is the desire for the Department of Business and Professional Regulation to be able to more easily identify what would be considered "unlicensed activity" or "bad professional practice" in the realm of professional geologic services. The Board in cooperation with many participants at their public meetings and the Florida Association of Professional Geologists has put together a listing of "traditional tasks" which would typically be performed by a Licensed Professional Geologist. In some circumstances a Licensed Professional Engineer who is qualified in geology (as defined by Chapter 492 Florida Statutes) could also carry out said activity in the appropriate sub discipline of the geosciences. The following topical listing gives a good summary of the typical activities and services professional geologists are involved in throughout the State of Florida. Professional Geologist activities in other states would include additional and different services specific to the terrain and geologic structure appropriate for their respective state.

I. Background Research

- A. Location and evaluation of geological and hydrogeological data and literature sources related to a site or area.
- B. Analysis of the quality of geological and hydrogeological data obtained for a site or area.
- C. Evaluation of geological and hydrogeological data.

II. Field Geology/Site Assessment

- A. Examination of outcrops to assess the geology of a site or area, including:
 - 1. Determination of site stratigraphy.
 - 2. Determination of rock types.
 - 3. Determination of sediment types.
 - 4. Determination if the sediments have been disturbed.
 - 5. Determination of the presence of fill materials.
 - 6. Determination of the presence of hazardous conditions, including the presence of waste materials, unstable rock or sediment, areas subject to erosion, and hydrogeologically sensitive areas.
- B. Interpretation and evaluation of geological / hydrogeologic maps.
 - 1. Determination of the presence of geologic formation or structures, such as:
 - a. faults
 - b. sinkholes
 - c. lithostratigraphic, time stratigraphic, and hydrostratigraphic units

- d. economic mineral deposits
- 2. Determination of the presence of aquifer units.
- 3. Assessment of surface hydrology, such as:
 - a. flood-prone areas
 - b. drainage patterns
 - c. erosion and deposition areas.
 - d. aquifer recharge areas.
- C. Interpretation and evaluation of topographic maps, aerial photographs and satellite images such as:
 - 1. Identification of cultural features.
 - 2. Identification of photoliner features (fracture traces, joints, faults).
 - 3. Identification of geological structures.
 - 4. Identification of geomorphic features.
- D. Review and evaluation of maps including hydrologic maps such as:
 - 1. Determination of whether a location is within a flood plain.
 - 2. Determination of highest flood level and ordinary high water line..
- E. Conduct drilling operations
 - 1. Plan drilling program
 - a. determine types of wells – monitor, exploration, production – layout and spacing of wells and if cores or cuttings are to be taken.
 - 2. Determine if cores and cuttings are to be archived with the Florida Geological Survey.
- F. Examine rock or sediment borings, logs, and tests to assess the geology of a site or area, such as:
 - 1. Determination of lithostratigraphy.
 - 2. Determination of sediment types.
 - 3. Determination if the sediments have been disturbed.
 - 4. Determination of the presence of fill materials.
 - 5. Determination of indicators of the presence of hazardous conditions, such as waste materials, sinkhole activity, abnormal fluid pressures, adverse water quality conditions.
 - 6. Determination of the presence and value of mineral resources.
 - 7. Determination of the presence (or absence) and condition of groundwater in aquifer systems.
- G. Interpretation of coastal erosional and depositional patterns.

III. Geophysics

- A. Use of wireline geophysical instruments to evaluate hydrostratigraphic and lithostratigraphic horizons (aquifers and confining units, formations).
- B. Litho- and hydrostratigraphic interpretation of wireline logs.
- C. Evaluation of the characteristics of sediment and fluid within sediment using electric logs.
- D. Establishment of the presence of subsurface cavities using geophysical techniques such as gravity, electrical resistivity, terrain conductivity, ground-penetrating radar, wireline logs (sonic or caliper logs).
- E. Conducting and interpreting surface resistivity testing.
- F. Interpretation of reflection and refraction seismic data and ground-penetrating radar.
- G. Interpretation of EM data

H. Interpretation of video logs down wells to assess porosity, well construction/condition

IV. Petrology and Mineralogy

- A. Identification of minerals and rocks.
- B. Determination of the composition, crystallography, texture, and fabric of minerals and rocks.
- C. Determination of the uses and characteristics of minerals and rocks.

V. Lithostratigraphy and Hydrostratigraphy

- A. Identification of rock formation and hydrostratigraphic horizons.
- B. Identification of fossils.
- C. Identification of stratigraphic boundaries.
- D. Correlation of stratigraphic units utilizing wireline logs, wells, cores, and/or outcrops.
- E. Preparation of lithostratigraphic and hydrostratigraphic interpretations.

VI. Sedimentology

- A. Rock and sediment description, assessment and/or evaluation, including porosity, permeability, sedimentary structures, matrix or cement, depositional environment, texture, diagenetic changes and mineralogy of sediment or rock.
- B. Determination of the extent of rock or sediment bodies.
- C. Determination of the homogeneity of sedimentary bodies.

VII. Geochemistry

- A. Assessment of the quality of water.
 - 1. Determination of hydrochemical facies.
 - 2. Formulation of quality assurance plans for water quality sampling and analysis.
 - 3. Formulation of sampling plans for ground- and surface-water quality determination.
 - 4. Determination of sorption/desorption reactions based upon aquifer mineralogy.
- B. Determination of the fate of chemicals in water.
 - 1. Definition of ground- and surface-water flow systems.
 - 2. Assessments of the dispersion and sorptive properties of an aquifer system.
 - 3. Assessment of the behavior of volatile organics and two-phase flow in ground- and surface water.
 - 4. Development of site remediation programs.
 - 5. Conduct risk assessment and risk audits.
 - 6. Assessment of saltwater encroachment.
- C. Determination of geochemistry of sediments, rocks and minerals.
 - 1. mineralogical analyses.
 - 2. elemental analyses.

VIII. Economic Geology

- A. Assessment of the quantity, quality, and development potential of a mineral or water resource (resource and reserve assessments for both energy and non-

energy minerals). Includes assessment of overburden and economic viability of development which may include assessment of land-use regulations, market, transportation, beneficiation costs, etc.

B. Determination of the water-supply properties of an aquifer.

C. Determination of ground-water flow systems.

D. Assessment of structural and other complications of resource accessibility.

E. Assessment of changes in ground-water flow system upon withdrawal of waters, including changes in potentials, storage flow directions, and position of freshwater / saltwater transition zones.

F. Evaluation of the environmental impact or resource exploitation.

G. Preparation of ground-water contamination assessments.

H. Assessment of risks associated with disposal of wastes in natural systems.

IX. Groundwater modeling

A. Determine aquifer parameters.

B. Conduct aquifer performance tests, well specific capacity tests.

C. Develop conceptual model of ground-water flow.

D. Develop water balance for hydrologic system.

E. Develop/use ground-water models for use in water supply planning/development or for ground-water remediation.

F. Develop/use analytical, particle tracking or mass transport models for delineation of well source-water areas or contaminant transport.

X. Data Synthesis and Map Preparation

A. Preparation and interpretation of cross-sections, geologic / hydrogeologic maps, subsurface contour maps (isopach, facies, and structure), final reports and mineral and water resource maps.

B. Preparation and interpretation of geologic reports and maps, such as for:

1. waste disposal suitability.

2. land planning or zoning purposes.

3. Springshed delineation.

4. Geologic hazards including sinkholes and swelling clay.