# Brett D. Smith PE, PG
## Senior Geophysicist
## Senior Environmental Engineer

Mr. Smith is a registered Professional Engineer and a licensed Professional Geologist with more than 25 years experience as an environmental engineer and exploration geophysicist. He has extensive experience performing potential-field and seismic refraction investigations, starting with his Geophysics master's thesis entitled *A Gravity Study of the Geologic Boundary Separating the Klamath Mountains and Cascade Range Provinces in Northern California*. Since that time, Mr. Smith has worked in the oil industry and in the environmental services industry, where he currently assists clients in characterizing contaminated commercial / industrial sites, oftentimes utilizing geophysical surveying methods. Such methods include electrical resistivity, magnetics, electromagnetics, GPR and refraction seismic to determine bedrock depth, soils properties, the occurrence of buried metallic debris, drums and utilities, as well as delineating landfill boundaries and determining soil conductivity.

## QUALIFICATIONS

### Education

- M.S. – Geophysics, Colorado School of Mines, 1984
- B.S. – Biology, University of Utah, 1975

### Registrations / Certifications

- Professional Engineer, WA (No. 37083)
- Professional Engineer, OR (No. 85846)
- Professional Geologist, WA (No. 1478)
- Aboveground Tank Inspector (AST R11171)
- Nuclear Density Gauge (No. 31919)
- Arkansas State PG, inactive (No. 15)
- Tennessee State PG (No. 1613)

### Specialized Training

- OSHA 40-Hour Hazardous Waste Operations Safety Training; 1989
- OSHA 8-Hour Hazardous Waste Operations Refresher; annual since 1989

## SELECTED PROFESSIONAL EXPERIENCE

**Depth to Bedrock Investigation of Former Refinery Facility** — Recently finished a multi-electrode electrical resistivity investigation of a former refinery site in Montana. Deliverables include UTM-based Bedrock Surface and Water Depth maps that will assist client in better locating additional groundwater monitoring wells needed to address compliance requirements ordered by the Montana Department of Environmental Quality.

**Depth to Bedrock Investigation of Large Land Tract for Developer** — Designed and performed a reconnaissance VLF survey and subsequent multi-electrode electrical resistivity investigation of a large tract of land at a confidential location in California. The purpose of the integrated geophysical investigation was to locate productive water-bearing zones for water-well placements. Deliverables included Latitude / Longitude (Lat/Lon) based resistivity models (profiles) that assisted client in identifying optimal locations for additional water-supply wells.

**Depth to Bedrock / Metallic Debris Investigation at Hazardous Waste Landfill** — Designed and performed a 5-ft spaced EM-31 terrain conductivity (EMI) survey in tandem with ReMi™ surveys at a closed 8-acre waste disposal site near The Dalles, Oregon. The goals of this integrated geophysical investigation were to 1) detect landfill boundaries, 2) identify locations of buried metallic debris / drums and 3) to determine the depth to competent (non-rippable) basalt bedrock. All three goals were successfully achieved.

**Refraction / ReMi™ Surveys at Proposed Wind Energy Project in Washington** — Designed and performed seismic refraction / ReMi™ surveys at 22 proposed Wind Turbine Generator sites for the primary purpose of obtaining shear-wave (Vs) and compressional-wave (Vp) velocities. This information enabled the client (major geotechnical firm) to augment drilling information and provide accurate subsurface design criteria recommendations.

**Magnetic and EMI Investigation at a Solid Waste Landfill** — Designed and performed a total-field magnetometer survey in tandem with an EMI survey of a closed landfill located east of Pasco, Washington. Survey was designed to detect buried metallic debris and drums. The in-phase component of the EMI method successfully identified locations of ferrous and non-ferrous metals and the magnetic method confirmed the burial locations of suspected 55-gallon drums. Performed detailed data reduction and provided Client with UTM-based color-contour maps.

**Magnetic / EMI Surveys at Holloman Air Force Base, New Mexico** — Designed and performed total-field magnetometer surveys in tandem with EMI surveys of approximately 53 acres of closed landfills at an Air Force base in New Mexico. Survey was designed to detect buried metallic debris and soil conductivity. The magnetic method identified numerous burial locations and the EMI method delineated boundaries of old landfill sites. Performed detailed data reduction and provided Client with Lat/Lon-based line-contour and color-contour maps.

**GPR and EMI Surveys at an Air Force Site in the Mojave Desert of California** — Designed and performed tandem GPR / EMI surveys of nine closed landfill sites at an abandoned Air Force gunnery range. Surveys detected burial trenches and buried metallic debris. The GPR method identified numerous trench locations and the EMI method confirmed metallic debris contained therein. Performed detailed data reduction and provided Client with GPR profiles and UTM-based color-contour maps. Was hired (following two years) to perform final phases of this investigation whose findings enabled effective and economical remedial excavation activities.

**Magnetic Survey of Northwest Arkansas (Graduate School project)** — Designed and performed a total-field magnetic survey in northwest Arkansas, in order to augment existing data (U.S. Geological Survey) that strongly indicate a large igneous mass at depth. All survey "loops" were properly closed and double checked for accuracy before leaving the project area. Manually reduced data and performed forward modeling of same in order to determine the vertical distance to the top of the body; interpreted to be approximately 17,000 feet deep.

**Simulated Borehole Gravity Survey (Graduate School project)** — Designed and performed "piggybacked" gravity traverses above and within the Department of Defense's experimental tunnel at Idaho Springs, Colorado. This project determined the apparent density of the tunnel overburden. Location and elevation surveying was performed at all stations, in order to eliminate terrain related effects. Received an A+ grade for this innovative and unique project.

**Gravity Survey in Northern California (Graduate thesis)** — Designed and performed multiple-traverse surveys across the geologic boundary between the Eastern Klamath Mountains and Cascade Range provinces. Elevation surveying of gravity stations was performed utilizing non-GPS elevation surveying methods. All survey "loops" were properly closed and double checked for accuracy before leaving the project area. Data processing incorporated sophisticated computerized terrain-corrections at all gravity stations, utilizing high resolution digital elevation data. Performed forward modeling of reduced (Complete Bouguer Anomaly) data to yield a geologically plausible interpretation of the complex subsurface geology in the Mt. Shasta area of northern California.