Established in 1927 as Toledo Testing Laboratory, TTL Associates, Inc. has grown into a full-service environmental, industrial hygiene, geotechnical engineering, materials testing and drilling firm, serving local, regional and federal clients across the country from our headquarters in Toledo, Ohio and branch offices located in Plymouth, Michigan and Washington, DC.

**Safety**
Safety and protection of associates, clients and the community is a top priority. This concern for safety extends from field operations to laboratories, offices and to our shop facilities. Every associate shares the responsibility for safety and should report unsafe conditions without fear or reprisal.

Established under the leadership of Retired Lt. Col. Thomas R. Uhler, P.E., CEO, TTL is recognized as a verified Service Disabled Veteran Owned Small Business (SDVOSB). Robert S. Ruse, Ph.D., P.E., serves as TTL’s President. In addition, TTL is an “Encouraging Diversity, Growth and Equity” (EDGE) certified firm with the State of Ohio.

**Expertise**
TTL’s associates include certified industrial hygienists, professional engineers, certified professional geologists, hazardous materials managers and technicians, certified safety professionals, environmental scientists, AHERA building inspectors and management planners, lead-based paint inspectors and risk assessors, environmental project management analysts, biologists, environmental research scientists and technicians, drilling experts, construction materials testing engineering technicians and geotechnical engineers.

**Markets**
Our markets include commercial, development/redevelopment, education, energy, healthcare, federal government, local/state government, industrial, retail and transportation.

**Quality**
TTL’s Management Team is “hands-on,” involved with your project from beginning to end, and is available to answer your questions at any time.

Our team strives to be responsive, honest and committed to providing you with experience, manpower, resources and the equipment needed for a successful project.

*Contact us at [www.ttlassoc.com](http://www.ttlassoc.com)*
We invest our time and resources in activities that are beneficial to enhance our communities, our employees and our clients.

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Established in 1927, TTL Associates, Inc. (TTL) has grown into a full-service construction materials testing, environmental, industrial hygiene, and geotechnical engineering firm. Our markets include federal government/military, local/state government, energy, healthcare, industrial, transportation, education, commercial, retail and development/redevelopment. We have experience working with our clients throughout the Mid-Atlantic and across the United States.

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Environmental & Industrial Hygiene
Asbestos Laboratory Testing
Brownfield Redevelopment and Management
Environmental Drilling
Environmental Site Assessments
Hazardous Materials Assessments and Management
Indoor Air Quality
Industrial Hygiene Consulting
National Environmental Policy Act (NEPA) Assessment
Property Condition Assessments
Radon Testing
Spill Control & Countermeasure Plans
Underground Storage Tanks
Wetlands Determination & Delineation

Geotechnical Engineering
Field Engineering & Testing
Flexible & Rigid Pavement Design
Foundation & Specialty Analysis
Groundwater & Drainage
Hard Rock Tunneling
Retaining Walls
Roadway & Transportation Studies & Pavement Designs
Shallow & Deep Foundation Systems
Soil Laboratory Testing
Soil Permeability
Soils Related Construction Procedures
Slope Stability

Testing & Inspection
Aggregate
Asphalt
Caissons
Concrete
Foundation
Masonry/Walls
Parking Lot Assessment Programs
Roofing Evaluations
Soils
Structural Steel

Drilling
Abandon Wells
Environmental Drilling
Geoprobe Services
Monitoring Well Installation
Rock Coring

Awards
U.S. Dept. of Veterans Affairs Enterprising Veteran Award
U.S. SBA Veteran Small Business Champion
NASA Program Manager’s Commendation
NASA Space Flight Awareness Team
ESGR Seven Seals & Patriotic Employer
Structural integrity is only as dependable as the materials used in the construction process. TTL performs construction quality control testing of soils, concrete, asphalt, masonry, and steel. Our Engineering Technicians are certified by the National Institute for Certification in Engineering Technologies (NICET). Typically the first requirements for a building project may include the following.

**Deep Foundations Inspections**
- Auger cast pile
- Caisson inspections
- Pile driving

**Site Soil Testing**
- Monitoring structural fill
- Relative density
- Soil/aggregate compaction
- Soil bearing for shallow foundations

Testing is important in confirming concrete and asphalt design properties, as well as determining that quality aggregates are used in the project materials. These tests are performed using current DOT, ASTM and AASHTO test methods.

**Concrete Testing**
- Bridge decks, piers, and abutments
- Buildings (foundations, floors, and walls)
- Roadways, curbs, and sidewalks

Concrete may be tested in the plastic state for slump, air content and unit weight with compressive and/or flexural specimens being cast. In addition, test cylinders and beams can be cast to determine compressive and flexural strength. Concrete form and reinforcing steel inspection is also provided. TTL can perform Concrete AVA Testing, Concrete Resistivity Testing and Concrete Plant Inspections.

**Asphalt Testing**
- Pavement design mixes, plant monitoring, and on-site density control can ensure quality pavement performance.
  - Extraction/gradation/hot bin analysis
  - Marshall mix design and density
  - Performance grade binder testing
  - Specific gravity of compacted mix
  - Superpave mix design

In-house laboratory asphalt cement testing is performed for viscosity, penetration and multigrade cements, emulsions, and cutbacks.

**Special Inspections and Testing**
- Concrete condition surveys
- Floor flatness, levelness, surveys
- Inspection services
- Masonry, mortar, grout, and brick testing
- Pre-blast survey and blast monitoring
- Roof installation inspection/moisture surveys
- Special inspections
- Sprayed on fireproof thickness testing
- Structural steel inspection/welder certification
- Underwater bridge inspections
Offering a full range of drilling services for a variety of geotechnical and environmental projects, TTL has the solution for your drilling requirements. TTL’s drilling fleet consists of two truck-mounted rigs (CME 75 models), two rubber-tired ATV rigs (CME 45 and CME 550 with angle-drilling capabilities), and two Geoprobes (5410 and 7822DT models). We are capable of providing rotary coring and auger drilling which are performed by experienced crews.

We can provide the proper equipment and personnel to complete your environmental and geotechnical project needs:
- Standard penetration testing
- Shelby tube sampling
- Vane shear testing
- Piston sampling
- Rock coring
- Split spoon sampling
- Concrete and asphalt coring
- Percolation tests
- Piezometers and monitoring wells
- Vibrating wire Piezometer
- Inclinometers
- Chemical remediation injection

Drilling services performed for environmental projects include:
- Groundwater monitoring well installations
- Well development
- Pressure grouting
- Air and water rotary drilling
- Air and water diamond core drilling
- Packer testing

TTL’s major drilling and support qualifications include:
- Geoprobes
- Hollow stem augers (2-1/4” to 10-1/4”)
- Roller bits (2-3/8” to 8”)
- NX and wire line core equipment
- OSHA 30-Hour Construction trained
- All rigs have automatic hammer calibrated every 2 years per ODOT specs
- Experienced professional personnel
- Trained personnel in soil classification
- Associates with 40-hour OSHA 29 CFR 1910 and annual 8-hour refresher
- All drilling associates receive a yearly comprehensive physical which covers all parameters for medical monitoring in 29 CFR 1910

TTL has access to a complete inventory of casings, screens, bentonite, Portland cement, and sand. In addition, well materials of PVC, as well as galvanized and stainless steel, are available.
TTL geotechnical professionals provide field testing and drilling services, including comprehensive soil laboratory testing, and geotechnical design and construction recommendations for structures, pavements, embankments and containment facilities.

**Subsurface Investigations and Geotechnical Reports for:**
- Shallow & Deep Foundation Systems
- Retaining Walls
- Flexible & Rigid Pavement Design
- Soils Related Construction Procedures
- Slope Stability
- Groundwater Control & Drainage
- Soil Permeability
- Hard Rock Tunneling
- Field Engineering
- Drilling

**Soil and Rock Laboratory Testing Includes:**
- Atterberg Limits
- Grain Size Analysis
- Unconfined Compressive Strength (Soil & Rock)
- Moisture-density Relationship Determination (Proctors)
- One-dimensional Consolidation
- California Bearing Ratio (CBR)
- Triaxial Shear Tests (UU and CU Strength)
- Direct Shear
- Specific Gravity Determination
- Flexible Wall & Constant Head Permeability
- Electrical Resistivity
- Organic Content Determination for Loss On Ignition (LOI)
- Lime and Cement Mix Design for Soil Stabilization
- Slake Durability

**Field Testing Includes:**
- Foundation Inspection
- Field CBR Tests
- Static Plate Load Tests
- Field Resistivity Tests
- Caisson Inspection
- Pile-Driving and Load Testing Inspection
- Rock Permeability Packer Testing

**TTL determines the best and most economical design and construction recommendation solutions when sites contain poor soil conditions.**

All tests are in accordance with recognized standards.
Brownfield Redevelopment

U.S. EPA Brownfield Grants & Brownfield Remediation & Redevelopment

Environmental Site Assessments

Phase I and Phase II Environmental Site Assessments

Hazardous Materials Assessment & Management

Hazardous Materials, Asbestos, Laboratory, Lead Based Paint, Mold

Indoor Air Quality (IAQ)

IAQ Evaluations, Water Quality Testing

Industrial Hygiene Consulting

Asbestos/Lead Management, Air Sampling, Mold Surveys

National Environmental Policy Act (NEPA)

NEPA Environmental Assessments (EAs)

Property Condition Assessments

Site/Building Improvements, Mechanical, Plumbing & Electrical Systems

Spill Control & Countermeasure (SPCC) Plans

Preparation and Certification of SPCC Plans

Underground Storage Tank (UST) Assessment & Closure

Environmental Oversight of UST Systems and Remedial Activities Associated with UST Releases

Wetland Determinations, Delineations, Permitting & Mitigation

Meet all Federal, State and Local Standards Concerning Wetlands
TTL understands the Brownfield development process and brings proven expertise in cost-effectively investigating and remediating contaminated properties under state Brownfield regulations, as well as obtaining grants and tax incentives for our clients.

TTL’s team of experienced environmental professionals assists our clients in the assessment and redevelopment of Brownfield sites through the preparation of grant applications, managing and implementing grants, conducting investigations of contaminated properties, and remediating the properties in accordance with applicable state regulations. Through this experience, many properties that had been vacant and underutilized and posed health threats to the surrounding community were redeveloped, revitalized, and returned to tax rolls.

**U.S. EPA Brownfield Grants**

TTL assists our municipal clients in obtaining and implementing U.S. EPA Brownfield Assessment and Revolving Loan Fund (RLF) grants. TTL prepares grant applications, assists communities in the identification and prioritization of sites for assessment, performs the assessment activities under strict U.S. EPA procedures, and prepares quarterly reports for submittal to the U.S. EPA. Under RLF grants, TTL prepares analyses of brownfield cleanup alternatives, community relations plans, remediation work plans and budgets, remediation specifications, and assisted communities in the selection, management, and supervision of remediation contractors.

**Brownfield Remediation and Redevelopment**

TTL assists private companies and municipal agencies in the investigation and cleanup of Brownfield sites. TTL completes the characterization of the site and develops remediation strategies in conjunction with the planned redevelopment. In many cases, development features such as building foundations and pavements in conjunction with institutional controls can be used to ensure safe reuse of a site without costly remediation. Through these efforts, TTL has obtained NFA letters for our clients in several states. In addition, TTL has assisted our clients with the receipt of tax credits and tax increment financing to offset eligible redevelopment activities.
Phase I Environmental Site Assessments

The liability and risk of owning/financing an environmentally impaired site or building can be greatly reduced with a Phase I Environmental Site Assessment performed by an experienced environmental professional. A Phase I ESA will identify potential environmental risks and/or liability before a site is purchased or leased.

TTL’s Phase I ESAs are performed by a team of experienced environmental professionals in accordance with ASTM E1527-13 and All Appropriate Inquiry requirements. During the Phase I ESA, TTL completes a visual site inspection; interviews site owners and occupants; reviews Federal, state, local and tribal environmental databases; reviews historical site use information such as aerial photographs and historic maps; and reviews municipal and regulatory agency files. Based on TTL’s observations and the information collected, TTL prepares a written report that presents the information and provides conclusions. TTL provides client and project-specific recommendations based on the findings and the nature of the business transaction. TTL also performs Vapor Encroachment Screenings in conjunction with the Phase I ESA, when requested by our clients.

Phase II Environmental Site Assessments

TTL develops site-specific Phase II ESA Work Plans to investigate sites appropriate for the needs of our clients. The Phase II ESA further evaluates the suspected environmental impacts and can be used to determine the nature and extent of surface and subsurface contamination. The Phase II ESA may include various sampling and investigative methods, including a geotechnical survey to assess for abandoned tanks, soil borings, soil and groundwater sampling, soil gas surveys, and laboratory analysis by an accredited laboratory. The Phase II ESA results are compared with Federal and state guidelines and recommendations are provided to cost-effectively address any identified impacts.
Hazardous Materials Professionals
TTL’s experienced team of professionals maintains the necessary credentials and certifications to perform professional evaluations, management planning, abatement project design, abatement project management, air monitoring and clearance sampling for hazardous materials including PCBs, Mercury, Asbestos, Lead, and Mold.

Asbestos Sampling & Analysis

“In-house” Asbestos Laboratory for Analysis
Bulk samples are collected of suspected ACM and transported to TTL’s laboratory for Polarized Light Microscopy analysis. TTL’s in-house analytical laboratory is part of the National Voluntary Laboratory Accreditation Program administered by the National Institute of Standards and Technology.

Bulk samples are analyzed by the U.S. EPA “Interim Method for the Determination of Asbestos in Bulk Insulation Samples,” EPA-600/M4-82-020, and the U.S. EPA “Method for the Determination of Asbestos in Bulk Building Materials,” EPA 600-R-93-116, requires that all multiple, distinct layers must be analyzed individually. Therefore, sample analysis results are provided for each distinct layer of each sample submitted to the laboratory.

Lead Paint Inspection Surveys & Analysis
TTL’s licensed and certified lead inspectors conduct comprehensive lead paint inspections to generate preliminary lead inspection reports that contain detailed information on the location of painted surfaces that contain lead, the amount of lead present, and the physical condition of the painted surfaces.

Mold Identification, Monitoring & Abatement
TTL uses several sampling procedures to identify visible and non-visible colonies of mold or fungi. Samples are collected and sealed for analysis by an accredited laboratory. Indoor Air Quality Monitoring identifies airborne fungal spores within the problem area that are compared to an outdoor air sample for comparison.

After a visual inspection and sampling, TTL’s professionals provide recommendations to resolve the mold issue and resolve the moisture infiltration that has been vital in facilitating fungal growth.

After mold abatement activities, TTL conducts a visual inspection and air clearance sampling.
TTL provides owners, property managers, facility managers of commercial, industrial, residential, and public properties with experienced and certified professionals who assess indoor air quality conditions.

TTL successfully implements a customized approach for remediation from a simple investigation to an ongoing annual service contract.

**An Indoor Air Quality Evaluation includes:**
- Airborne Microbial Sampling
- Airborne Particles
- Air Flow/Air Pressure
- CO/CO2/Miscellaneous Gases
- Measurement of Temperature/Relative Humidity
- Outdoor Analysis of Dusts, Gases, Bacteria, Fungi, Temperature & Relative Humidity

**TTL Water Quality Testing**
- Legionella Bacteria Identification and Counting
- Microbial Analysis of Cooling Towers, Condensate Pans & Humidifier Reservoirs
- Total Microbe Count

**Certified Professionals Provide:**
- Mechanical System Reviews
- Measurement of Indoor Contaminants
- Inspection & Specification Development
- Proactive Preventive Monitoring Program
- Identification of Potential Future Problems
- Documentation of Existing/Potential Problems
- Temperature Differential through Infrared Thermal Imaging
- Baseline Sampling
- Post-Clearance Assessment & Evaluation
- Post-Abatement Sampling

**TTL’s Reporting Methodology Includes:**
- Air Supply/Exhaust/Conditioning System
- List of Tests Conducted
- Test Results
- Discussion & Comparison of Test Results
- Relevant Standards
- Summary of Analysis & Findings
- Photographic Record
- Practical Correction/Actions Recommended

**Industry Guidelines**
- EPA
- OSHA
- American Conference of Governmental Industrial Hygienists
- American Industrial Hygiene Association
Workplace hazards are now recognized as a serious concern for employees and the community. They have prompted companies to develop and implement an industrial hygiene program.

TTL’s industrial hygienists are experienced professionals who develop and implement industrial hygiene programs that include:

Asbestos/Lead Management Programs
Air Sampling Monitoring & Analysis
Lead Testing
Mold Surveys & Evaluations

The evaluation starts with an initial on-site walk-through, development of sampling and measurement plans, implementation, data analysis, and if necessary, corrective action recommendations.

**Indoor Air Quality**
Indoor air quality assessments include mold investigations, air contaminant monitoring and ventilation evaluations.

**Employee & Management Training Programs**
TTL’s professionals provide training for employees and management to meet programs that include:

OSHA Hazard Communication
Worker Right-to-Know Programs
Emergency Response Planning

**Industrial Hygiene Health Hazard Evaluations**
TTL professionals assist in recognizing and evaluating health hazards and make recommendations to control and minimize hazards in the workplace.

**TTL keeps you up-to-date on current and pending regulations from the EPA and OSHA.**
TTL has the experience and in-depth knowledge necessary to provide clients with the comprehensive NEPA analysis required for Federal agencies and Federally-funded projects. TTL provides an appropriate level of NEPA analysis based on the nature and potential effects of the proposed action.

TTL’s NEPA Environmental Assessments (EAs) include a formal purpose and need statement for the proposed action, and a description of the development and screening of various action alternatives. The EA investigates and characterizes the existing baseline conditions in the region of influence of the proposed action, and evaluates the potential effects of the considered action alternatives and the no action alternative on the baseline environmental, human and cultural resources. Best management practices and mitigation measures, if applicable, are provided to reduce potential adverse effects of the considered alternatives to less than significant levels. TTL assists the Federal agency with issuing the Public Draft EA, responding to public comments, and ultimately issuing a Final EA/Finding of No Significant Impact (FONSI).

Each NEPA analysis is prepared under the provisions of, and in accordance with, the National Environmental Policy Act of 1969 (NEPA; 42 USC 4321 et seq.), the Council of Environmental Quality (CEQ) regulations implementing the procedural provisions of NEPA (40 CFR 1500-1508), and the Federal agency-specific implementing results and guidance.

View from atop a building in Houston, Texas, where TTL performed a NEPA Environmental Assessment (EA) for the installation of a solar photovoltaic renewable energy system.
A Property Condition Assessment begins with an on-site visit to the property to review all external and internal building components, available documentation, and public records, and necessary interviews to define and analyze present conditions with recommendations for repair or further review.

A summary of the condition of the property is assembled into a report that includes a description to the property defining the site, buildings, history, code compliance, maintenance, and addresses the following concerns:

**Site Improvements**
Access, parking, paving/drainage, walks/curbs, utilities, lighting, landscaping/irrigation, fences/walls, signage and disabled accessibility/ADA.

**Building Improvements**
Foundation, structure, floor construction, exterior wall construction, roof and canopy construction, windows, doors, balconies/terraces, stairs, interior floors and walls, appliances, cabinets, disabled accessibility/ADA.

**Building Mechanical, Plumbing & Electrical Systems**
HVAC, plumbing, electrical, vertical transportation, fire protection/life safety systems.

**Tenant Spaces**
Interior finishes, kitchen appliances, HVAC, plumbing/fixtures, electrical, fire protection/life safety systems.

**Other Issues**
Asbestos, lead and hazardous material identification, fixtures, furnishings and equipment for hotels, detailed mechanical studies, detailed ADA compliance surveys are available.

**TTL defines the physical condition of a property, anticipating the shortcomings that present financial risk or liability to an owner.**
Preparation & Certification of SPCC Plans

In accordance with 40 CFR 112, SPCC Plans are required for most facilities with total aboveground oil storage greater than 1,320 gallons (in aboveground storage tanks, totes and drums) or total below ground oil storage greater than 42,000 gallons to prevent oil spills into Waters of the U.S. and adjoining shorelines. The SPCC Rule applies to petroleum oil and products (gasoline, diesel, etc.), vegetable oils, and animal fats. TTL assesses SPCC Plan needs on a facility-specific basis to efficiently bring clients into compliance with the SPCC Rule. Excluding production facilities, an SPCC Plan must be prepared and implemented before beginning operations. For production facilities, an SPCC Plan must be prepared and implemented within six months of beginning operations.

Licensed Professional Engineers conduct SPCC Plan inspections and evaluations, and prepare and certify the Plans. TTL can prepare Integrated Contingency Plans for facilities required to have multiple Plans.

Services include:

- Assessment of Applicability of Regulations to Facility
- Site Reviews & Evaluations
- SPCC Plan Preparation
- SPCC Plan Certification
- Periodic SPCC Plan Revisions & Re-Certifications
- Oil Spill Contingency Plans
- Integrated Contingency Plans

TTL’s cost-effective solutions to attain and maintain regulatory compliance are accomplished with our focus on each client’s needs, including “big picture” planning and attention to detail.
TTL provides environmental oversight of UST system removals for clients throughout the United States and conducts remedial activities associated with UST releases, as necessary, to obtain No Further Action letters from regulatory agencies.

**TTL’s services include the following:**

- Environmental oversight of UST removal
- Management of petroleum-impacted soils
- Confirmation soil and groundwater sampling
- UST Closure Report preparation
- Installation of groundwater monitoring wells and soil borings
- Release reporting and investigation
- Soil and groundwater remediation
- Drafting Environmental Covenants
- LUST Closure Report/NFA request preparation
- Regulatory agency coordination/negotiation

Reimbursement programs for the assessment and remediation of impacted soils and groundwater associated with releases from USTs are available from many states. TTL will identify if the client and/or site meet the requirements for reimbursement and assist in reimbursement claim preparations.

**Efficient and cost-effective service is routine at TTL. We aim to avoid disruptions in your day-to-day business while helping you comply with all federal, state and local standards.**
Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Wetlands can include grassy meadows, shrubby fields, and mature forests. Wetlands provide natural flood protection, water quality improvement, and important habitat for wildlife, and thus, are highly regulated.

Wetlands and Waters of the U.S. management is generally overseen by the U.S. Army Corps of Engineers (USACE). In addition, many state and local governments have regulations or ordinances protecting wetlands. Permits are required to discharge material into or to modify/destroy a regulated wetland or Waters of the U.S. Failure to obtain a permit or comply with a permit can result in civil and/or criminal penalties. The liability and risk associated with purchasing/developing a property can be greatly reduced with a wetlands determination/delineation by an experienced professional.

**Wetland Determination**
A Wetland Determination is performed to identify the presence or absence of regulated wetlands and Waters of the U.S. and their approximate boundaries and size at a property. This includes a field survey by an experienced professional for the presence of hydrology, hydric soils and hydrophytic vegetation, and a review of available soil, topography and related documentation.

**Wetland Delineation**
A Wetland Delineation will designate regulated wetland boundaries. Soil samples are collected, and vegetation and hydrology are evaluated in order to establish boundaries. The boundaries of any area found to meet the criteria of a jurisdictional wetland and Waters of the U.S. are surveyed and the findings can be submitted to the USACE and other regulatory agencies as required for verification.

**Permitting**
If a regulated wetland is to be disturbed or filled, a permit may be required. Permits are required from Federal and/or state agencies depending on the classification of wetland and the nature of the proposed disturbance or fill. Permits are also required for the filling of areas designated as Waters of the U.S. The type of permit required is confirmed with the Federal and state agencies and then applicable permits are prepared.

**Mitigation**
Often times if there is a disturbance or taking of a wetland or Waters of the U.S., mitigation is required to offset the loss. Depending on the category or classification of the wetland, various mitigation ratios may be required. Mitigation can be completed on-site or on adjacent lands, or agreements may be established for off-site mitigation.