



FOCUS ENVIRONMENTAL, INC.

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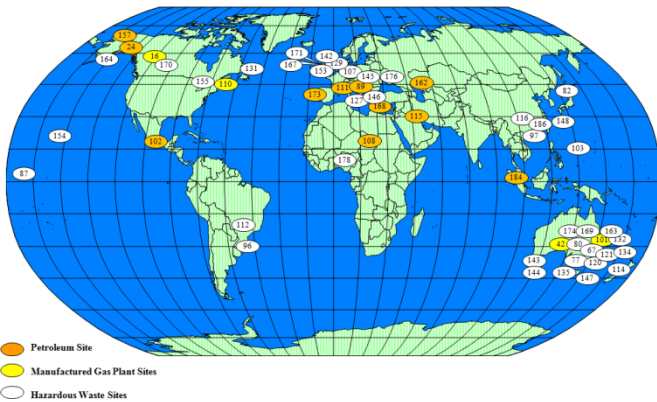
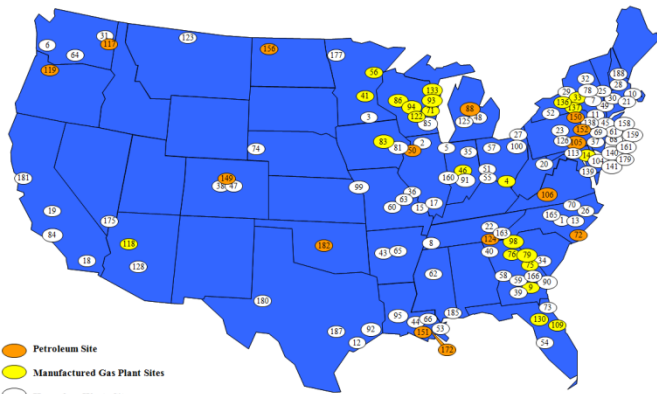


# Thermal Desorption Remediation Capabilities

## OUR SERVICES

Focus is internationally recognized for our expertise in the application of thermal treatment technologies on the most demanding projects in the world. Focus has been involved in about 40% of the top 100 largest thermal remediation projects that have been conducted worldwide. Focus has performed all aspects of thermal remediation projects, including:

including thermal desorption systems, incinerators, and cement kilns. Specific types of equipment that Focus has worked with include rotary kiln incinerators, cement kilns, direct and indirect rotary dryers, thermal screws, batch treatment systems, in-pile treatment systems, and in-situ thermal desorption systems. This experience provides a basis for evaluating alternative thermal treatment technologies for treating waste matrices that may be encountered at a specific site. Focus can evaluate the technical aspects of applying a specific technology, estimate remediation costs, and manage the execution of the remedy.



Site Investigations
Feasibility Studies
Treatability Testing
Remedial Design
Permitting
Contractor Procurement
Dispersion Modeling
Ambient Air Monitoring
Performance Testing
Remedial Action Oversight
Field Operations Support
Expert Witness Services

## Approach

Focus has extensive experience with numerous types of thermal treatment technologies that are used to treat contaminated soil and other types of remediation wastes,



## Site Investigations

Conducting a detailed site investigation is critical to the



successful implementation of a thermal treatment project. Focus can conduct or collaborate with other firms to conduct site investigations to

determine the types and extent of contamination and to gather specific types of data that are necessary to implement a thermal treatment remedy.

## Feasibility Studies

Focus' understanding of thermal technologies allows us to quickly assess how well a specific technology will work for a site and to accurately estimate the cost and schedule for implementing a thermal treatment technology. A feasibility study typically includes a data gap analysis, screening potentially applicable thermal treatment technologies, performing mass and energy balances to estimate waste feed rates, utility requirements, and stack emissions, and developing a remedial cost estimate. Focus has developed a proprietary mass and energy balance computer program that can be used to model virtually any type of thermal treatment and air pollution control equipment. The program is used for both design and regulatory compliance purposes.

## Treatability Testing

Focus has extensive experience in conducting treatability tests using lab-scale, pilot-scale, and full-scale equipment. Treatability tests are conducted to determine operating conditions required to meet soil treatment standards for contaminants of concern, estimate air emissions, and estimate the amounts of process residual streams. Focus can develop the treatability test plan, manage the execution of the testing conducted by a third party laboratory or thermal equipment operator, and develop the treatability test report. Focus maintains a detailed database of information from previous treatability tests and full-scale operations that can, in some cases, eliminate the need to conduct treatability tests. The database can be

used to evaluate the probability of meeting cleanup goals for contaminants of concern at a given site. The data include the type of testing equipment or process equipment used, feed and treated soil contaminant concentrations, and treatment temperatures.

## Test Execution

Focus' hands-on participation assures that the system is operated at the appropriate conditions and that all test preparations of the system have been made. The testing will be managed on-site by an experienced Focus testing engineer who is present during the entire testing process. The Focus engineer coordinates between the plant management and supervision, system operators, regulatory observers, spiking suppliers, and emissions testing personnel to achieve a smooth and seamless test execution. Focus oversees the testing activities to assure the target operating parameters are demonstrated and that all the samples specified by the test plan are appropriately captured, labeled, preserved, stored, and transported for analysis. Focus works to identify and resolve any test plan deviations in a way that will be mutually acceptable to the regulatory and facility personnel, and in order to preserve the integrity of the test data.

## Remedial Design

Focus has developed a standard set of thermal



remediation specifications that can easily be modified for site specific applications. The specifications consist of approximately 50

modules. The major categories of modules include contractor procurement procedures, project management procedures, general requirements, planning and design, site work, and treatment operations. These specifications have been used to manage numerous thermal remediation projects with less than 2% cost growth.

## Permitting

Focus personnel have assisted clients in developing permits or licenses or complying with applicable or relevant and appropriate requirements. Permits have

been developed to comply with a variety of regulatory statutes, including the Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), Clean Air Act (CAA), and numerous state and foreign regulatory programs. Focus' services include preparing permit applications, negotiating permit conditions with regulatory agencies, and developing and delivering operator training programs to comply with permit requirements.

### Contractor Procurement

Focus has first-hand experience with virtually all of the



U.S. based thermal remediation contractors and with many foreign contractors as well. This allows Focus to rapidly screen contractors and

determine those with the most appropriate types and sizes of equipment for a specific application. Focus can develop project specifications and documentation for a bid package that is easy for prospective contractors to respond to and expedites the bid solicitation and evaluation process. Focus understands the best way to organize the bid items to properly allocate risk and minimize padding of bids by contractors to address undefined risks. A detailed bid evaluation program for ranking and comparing contractor proposals has been developed based on technical approach, project schedule, personnel qualifications, demonstrated project experience, corporate financial status, and project costs.

Focus has compiled a world-wide database of over 400 remediation projects where mobile thermal technologies have been used to remediate contaminated sites. The database includes information such as thermal remediation contractor, site size, types of contaminants, type of thermal process used, costs, task durations, and numerous other project related information. This database is useful for screening potential contractors and equipment for application at specific site and estimating remediation costs.

### Dispersion Modeling

Estimating the magnitude and impact of air emissions from sources on sensitive receptors is a critical element for the design and permitting of industrial processes. Emission estimates are based on results from treatability studies, full-scale data from similar sources, or engineering evaluations based on the characteristics of the waste, and design and operating parameters for the emission control devices. Focus has conducted dispersion modeling for numerous sources using U.S. EPA dispersion models, including SCREEN3, TSCREEN, and AIRMOD.

### Ambient Air Monitoring

Focus has planned, implemented, and/or managed ambient air monitoring programs at a number of sites. Services have included performing dispersion modeling to assist in selecting monitoring locations, developing perimeter ambient air monitoring plans, installation and operation of monitoring equipment, management of monitoring data, and report preparation. Monitoring studies have been conducted for a number of parameters, including particulates, polychlorinated biphenyls (PCBs), dioxins and furans, pesticides, volatile organic compounds, and semi-volatile organic compounds.

### Performance Testing

Planning and executing a thermal treatment system



performance test program is a critical element in the successful implementation of a thermal remediation project. Focus is nationally recognized

for its expertise in performance test planning and management. Our staff has been involved in over 100 performance testing projects which have been conducted to comply with the requirements of RCRA, TSCA, the Clean Air Act and state air quality regulations. Performance testing services include test planning, feed spiking, feed and treated material sampling, stack sampling, analytical services, quality assurance/quality control, and report preparation. In

addition, Focus can assist in regulatory negotiations and in preparing responses to questions from regulatory agencies.

Focus has compiled a detailed database of performance test data for projects where thermal technologies were used to remediate the site. The database includes information such as soil feed rate, contaminant concentration in soil, stack gas flow rates, stack gas temperatures, and mass emission rates and concentration for several parameters (i.e., particulates, oxygen, carbon monoxide, carbon dioxide, sulfur dioxide, sulfur trioxide, nitrogen oxides, total hydrocarbons, hydrochloric acid, chlorine, PCBs, pesticides, dioxins and furans, volatile organic compounds, semi-volatile organic compounds). The database includes sufficient information to calculate destruction and removal efficiency values for many of the analytes.

### Remedial Action Oversight

Focus has provided field oversight services for many high profile thermal remediation projects. Focus works with the client and the remediation contractor to develop the most cost effective approach for developing each of the components of the Remedial Action Work Plan (RAWP). Focus then provides the QA/QC oversight team to ensure that the completed remedial action meets or exceeds all design criteria, remedial design specifications, RAWP requirements, and contractual requirements. Focus' experience in the following areas of remedial action field oversight include: site preparation and construction, thermal treatment system mobilization/erection, thermal treatment system startup and shakedown, performance testing, thermal treatment system process operations, excavation and backfill activities, treated solids and water sampling and analysis, offsite transportation and disposal activities, ambient air monitoring, equipment decontamination and demobilization, site closure, and site restoration.



### Field Operations Support

Focus has provided control room operators, engineering supervisors, maintenance supervisors, and QA/QC personnel for some clients. Focus engineering and field support staff members have practical hands-on field experience with the operation of various types of thermal treatment plant operations. This experience includes erection, commissioning, startup, plant operations, process troubleshooting, developing operating and maintenance procedures, configuring and programming process control systems, testing continuous emissions monitoring systems, and training plant operators.

### Expert Witness Services

Focus personnel have provided expert witness services on a number of topics for thermal remediation projects, in U.S. courts, international courts, and before the United Nations Compensation Commission. Examples of key issues that have been addressed include the reasonableness of thermal remediation costs, cost recovery from insurers, potential costs of thermal treatment to address contamination, contractual issues, and equipment performance issues.

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## COMPANY PROFILE

Focus Environmental, Inc. (Focus) is an employee-owned environmental engineering consulting firm located in Knoxville, Tennessee. Focus specializes in providing engineering and regulatory compliance services for applications involving combustion, waste treatment, and emissions control equipment. Examples of equipment for which Focus has provided services include hazardous waste incinerators, boilers, industrial furnaces, thermal desorbers, glass furnaces, aluminum furnaces, and cement kilns. These services include process engineering, operations support, regulatory compliance support, regulatory compliance testing, and general industrial regulatory compliance support. Focus also supports fixed-based industrial facilities and transportable units used for the thermal remediation of contaminated soils and sediments.

## FOCUS HISTORY

Focus was established in 1988 and has successfully completed over 1,500 projects for more than 400 clients in the chemical, petrochemical, pharmaceutical, explosives, ammunition, metallurgical, biomedical, automotive, textiles, minerals, aluminum, and waste management service industries. In addition to work in these industrial sectors, a number of projects have been completed for site remediation contractors, utilities, and government agencies. These projects have been conducted throughout the United States in all 10 EPA regions, located in 47 states, and internationally in 21 countries.

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## DEMONSTRATED PROFESSIONAL QUALIFICATIONS

We offer our clients a unique blend of technical expertise, regulatory compliance insight, and practical hands-on operating experience. Focus staff includes experienced engineers and scientists with degrees in chemical, civil and environmental engineering, and in environmental science. All of Focus' engineers hold either PE or EIT certifications. Focus' senior principals average over 30 years of experience in the environmental field.

Please contact us if Focus can assist you with your compliance requirements.



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