



# Department of Environmental Protection

Jeb Bush  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Colleen M. Castille  
Secretary

May 17, 2005

Mr. Roger Dunham  
Remediation Solutions, Inc.  
14250 North 145<sup>th</sup> East Avenue  
Collinsville, Oklahoma 74021

Re: **Mobile Low Temperature Thermal Desorption Unit**

Dear Mr. Dunham:

The Bureau of Petroleum Storage Systems hereby accepts the Mobile Low Temperature Thermal Desorption Unit (MLTTDU) for the onsite, ex situ, thermal treatment of petroleum-contaminated soil. As indicated by Remediation Solutions Incorporated (RSI), the intended application is for the cleanup of petroleum-contaminated sites pursuant to Chapter 62-770, Florida Administrative Code (F.A.C.), for which Department-approved, site-specific Remedial Action Plan Approval Orders have been issued. It is not RSI's intent at this time to operate the unit as a commercial mobile treatment facility.

This acceptance applies only to the regulatory jurisdiction and the remediation needs of the Bureau of Petroleum Storage Systems, which is the cleanup of petroleum contamination pursuant to Chapter 62-770, F.A.C. There are no objections to the use of the MLTTDU provided the considerations of this letter are taken into account, and a site-specific Remedial Action Plan is submitted pursuant to Chapter 62-770, F.A.C. Applicable regulations are cited in Enclosure 1. Other agencies and local governments may choose to recognize this acceptance if their needs and regulations are similar. This Bureau, however, is not responsible for applications beyond its jurisdiction.

While the Department of Environmental Protection does not provide endorsement of specific remediation products or processes, it does recognize the need to determine their acceptability from a regulatory standpoint, and the interests of public health and safety. Vendors must then market the products and processes on their own merits regarding performance, cost, and safety in comparison to competing alternatives in the marketplace. In no way, however, shall this regulatory acceptance letter be construed as Department certification of performance. Additionally, the Department emphasizes a distinction between its regulatory "acceptance" letters and an approval. Products and processes are accepted but they are not approved.

Also, it is not a requirement that a particular remediation product or process have an official acceptance letter in order for it to be proposed in a site-specific Remedial Action Plan. The plan, however, must contain sufficient information about the product or process to show that it meets all applicable and appropriate rules and regulations.

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Those who prepare Remedial Action Plans may include a copy of this letter in the appendix, and call attention to it in the text of their document. In this way, technical reviewers throughout the state will be informed that you have contacted the Department of Environmental Protection to inquire about the acceptability of the MLTTDU. To aid those reviewers, the Bureau of Petroleum Storage Systems provides supplemental information in Enclosure 2.

The Department reserves the right to revoke its acceptance of a product or process if it has been falsely represented. Additionally, Department acceptance of any product or process does not imply it has been deemed applicable for all cleanup situations, or that it is preferred over other treatment or cleanup techniques in any particular case. A site-specific evaluation of applicability and cost-effectiveness must be considered for any product or process, whether conventional or innovative, and adequate site-specific design details must be provided in a Remedial Action Plan. Please contact Rick Ruscito at (850) 877-1133, extension 29, if there are any questions.

Sincerely,

Rick Ruscito, P.E.  
Ecology and Environment, Inc.  
Bureau of Petroleum Storage Systems  
Petroleum Cleanup Section 6

Rebecca S. Lockenbach  
FDEP Section Leader  
Bureau of Petroleum Storage Systems  
Petroleum Cleanup Section 6

enc: (1) Regulatory Information  
(2) Supplemental Information

c: T. Conrardy - FDEP, Tallahassee/MS 4530

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## REGULATORY INFORMATION

1. Applicable cleanup target regulations: The onus is on RSI and users of the MLTTDU to comply with all applicable and appropriate rules and regulations. For soil remediation, the applicable chapters of the Florida Administrative Code (F.A.C.) include but are not necessarily limited to Chapter 62-777, for cleanup target levels, and 62-770, for petroleum cleanup.
2. Permits: For on-site remediation of petroleum-contaminated soil by the MLTTDU, pursuant to Section 62-770.700, F.A.C., under the authorization of a Department-approved site-specific Remedial Action Plan, no permit is needed.

However, if RSI in the future should decide to market the MLTTDU as a stationary or mobile, commercial soil treatment facility pursuant to Chapter 62-713, F.A.C., then a permit is needed for such a facility.

3. Active Remediation phase: For onsite remediation of excavated soil by the MLTTDU during the Active Remediation phase, Section 62-770.700, F.A.C., applies. An approved site-specific Remedial Action Plan is required, and the soil cleanup goals of Chapter 62-777, F.A.C., as referenced by Chapter 62-770, F.A.C., apply. The unconditional cleanup target levels for treated soil are the lower of the direct exposure residential cleanup target levels and the leachability-based cleanup target levels specified in Chapter 62-777, F.A.C., Table II. Treated soil that meets these cleanup target levels can be disposed either onsite or offsite, but responsible parties are advised that federal and local requirements may apply. Although there is an option for either onsite or offsite disposal of treated soil meeting these cleanup levels, the prudent course of action in most cases, from a liability standpoint, may be to return the treated soil to the same excavation pit from which it originated.
4. Safety: As in any remediation project, the user is expected to pay attention to safety in both the design and operation of a MLTTDU remediation system. This includes, but is not necessarily limited to, safety considerations in the following categories: fire, electrical, mechanical, personnel, the handling and compatibility of chemicals, air emissions, and passersby.

## SUPPLEMENTAL INFORMATION

1. General: The Mobile Low Temperature Thermal Desorption Unit (MLTTDU) is designed specifically for the remediation of petroleum-contaminated soils, such as those containing gasoline, diesel, jet fuel, fuel oils, etc. It processes soil at a relatively low (but yet high enough) temperature to desorb and volatilize contaminants. However, the temperature is not so high as to burn the petroleum, which would leave behind an ash residue.
2. Advantages: The MLTTDU offers advantages in convenience and cost. There is no waste, except for debris greater than 2 inches in diameter that may be screened out of the soil prior to treatment. It also eliminates the necessity and cost of transporting contaminated soil offsite to a commercial soil treatment facility, and the cost of clean backfill, since MLTTDU-treated soil does not have to leave the site. It can be returned to the same pit from which it was excavated.
3. Major components: A control room powered by a 350-kilowatt generator; a rotary kiln that is direct-fired by either natural gas or propane; a baghouse; and an afterburner. The mobile MLTTDU is mounted on three trailers.
4. Processing steps: (a) debris greater than 2 inches in diameter is screened out of the soil to be processed; (b) a cold feed bin feeds one end of a rotary kiln in which heat desorbs petroleum from the soil particles and drives it off as a vapor; (c) the dry, treated soil exits the other end of the kiln, where it is re-hydrated and cooled with water. Since the vapors driven off in step (b) could contain airborne particles, a baghouse is used to capture these particles and return them to the end of the kiln where the treated soil is exiting. The vapors that pass through the baghouse are either destroyed by an afterburner, or routed to the kiln's combustion chamber where they can also be destroyed.
5. Operation:

|                            |                                                                                    |
|----------------------------|------------------------------------------------------------------------------------|
| Output                     | 18 to 32 tons per hour                                                             |
| Maximum soil concentration | 10,000 parts per million                                                           |
| Kiln temperature           | 600 to 900 deg. F                                                                  |
| Kiln residence time        | 7 minutes (approx.)                                                                |
| Baghouse filter mesh size  | 10 microns                                                                         |
| Afterburner temperature    | 1,200 to 2000 deg. F.                                                              |
| Afterburner residence time | 1 second at 12,500 cubic feet per minute<br>for 99.9% destruction of contaminants. |
6. Costs: As of May 2005, RSI indicates that the cost per ton of soil processed can range from \$29 to \$45. The Bureau of Petroleum Storage Systems, however, would like to add a reminder that future changes in the market could move costs either significantly higher or lower, and that prospective users of the MLTTDU in the future should contact RSI to inquire about current rates.

As for a cost-effectiveness evaluation of the MLTTDU against other viable methods for the treatment of petroleum-contaminated soil, the Bureau suggests that prospective users make their evaluation on a site-specific basis, using the most recent prices. There may be no reason to consider

the MLTTDU at all for very small projects, for which the total cost of transporting, disposing, and backfilling is still low enough to compete with the mobilization and operating costs of the MLTTDU. But at some point, however, a threshold will be crossed, and the economy of scale and logistics will be shifted in favor of the MLTTDU.

7. Safety: RSI indicates that the MLTTDU is equipped with safety and automated shutdown features, and that the prime areas monitored are temperature settings, flame detection, airflow detection, pressure differentials and material flow. RSI also indicates that the interlocked control system will begin an automated shutdown in the event that sensors detect a failure in any critical portion of the system. The safety items incorporated into the system are as follows:

- Material flow alarm for the feed processor / cold feed bin.
- Transition to a "low-fired" state if soil temperature within the kiln exceeds a preset maximum.
- In the event that the low-fired state does not reduce the soil temperature, then a high temperature limit will be activated and the unit will automatically shut down.
- Instrumented shutdown of items that feed heat to the baghouse, should the baghouse exit temperature become excessive.
- Monitoring of the afterburner for excessive temperature, with automatic transition of the unit to a low-fired state.
- In the event that the low-fired state does not reduce the afterburner temperature, then a high temperature limit will be activated and the MLTTDU will automatically shut down.
- Visual and audible alarms if exit temperature of the soil exceeds a present maximum.
- Visual and audible alarms (for quality assurance) if exit temperature of the soil falls below a preset minimum.
- Visual and audible alarms in the event that the fuel system is interrupted or a flame is not detected in the burner area.