

# STATE OF COLORADO

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Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department  
of Public Health  
and Environment

November 5, 2013

Mr. Carter Anderson  
Verde Environmental Technologies, Inc.  
517 W. Travelers Trail  
Burnsville, MN 55337

RE: Activated carbon for disposal of non-hazardous waste pharmaceuticals

Dear Mr. Anderson,

The Hazardous Materials and Waste Management Division (the Division) of the Colorado Department of Public Health and Environment has completed its initial review of your request for approval for use of *Medsaway*, an activated carbon-based system, to dispose of non-hazardous waste pharmaceuticals. The Division has determined that while activated carbon appears suitable to render waste pharmaceuticals unrecoverable for diversion purposes, it does not, by itself, meet the regulatory requirements for long term disposal in a solid waste disposal facility in Colorado. Analytical data available independently to the Division demonstrates that activated carbon will release adsorbed chemical compounds when exposed to an acidic solution during the Toxicity Characteristic Leaching Procedure (TCLP). The Toxicity Characteristic Leaching Procedure is a standardized test used to simulate landfill disposal conditions when an industrial waste is co-disposed with municipal trash. The decomposing trash generates a mildly acidic liquid (leachate) that can extract toxic constituents from the industrial waste and potentially carry those contaminants into groundwater.

The Colorado solid waste regulations (6 CCR 1007-2) specifically list incineration, encapsulation and stabilization as acceptable methods of treatment for non-hazardous waste pharmaceuticals. Adsorption of waste pharmaceuticals onto activated carbon does not meet the regulatory definition for encapsulation or stabilization. Encapsulation means coating the surface of a solid waste with material such as resins or plastics, while stabilization means mixing of a solid waste with Portland cement, or a combination of Portland cement and fly ash or cement kiln dust. To be considered an acceptable pharmaceutical waste treatment technology for disposal purposes under these regulations, an additional treatment step must be incorporated that treats the waste to meet one of these specified methods.

To be considered an acceptable alternative pharmaceutical waste treatment technology for disposal purposes, an additional treatment step must be incorporated that totally destroys the waste as incineration does, or must be capable of substantially reducing the amount of soluble, miscible or suspended contaminants that will leach from the waste as encapsulation and solidification are designed to do. According to the materials you submitted, *Medsaway* contains activated carbon that adsorbed the test pharmaceuticals in the presence of water over a four (4) to seven (7) day period with no agitation. Since most landfills in Colorado are prohibited from acceptance of waste containing free liquids, this additional step must also be able to absorb all free liquids associated with the activated carbon step.

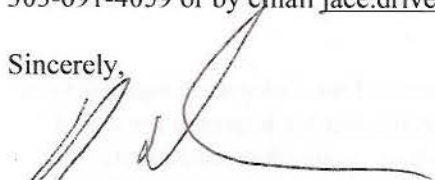
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The additional treatment step must be designed to allow sufficient time for adsorption of the pharmaceuticals onto the activated carbon before the waste is treated to solidify it and reduce leachability. Note that kitty litter or other simple absorbents are not suitable for these purposes.

Treatment technologies must ensure complete treatment of the waste such that no portion of the waste remains untreated. If seeking approval as an alternative pharmaceutical waste treatment technology, you must incorporate recognized standards for determining appropriate validation and verification testing methodology and protocols to verify for the Division that the overall technology performs as designed and is capable of consistently treating the waste to meet at least the minimum treatment standards. This information must also be made available to your customers for inclusion in their medical waste management plans.

Should you have any questions regarding this determination, please contact Jace Driver of my staff at 303-691-4059 or by email [jace.driver@state.co.us](mailto:jace.driver@state.co.us).

Sincerely,



Roger Doak, Unit Leader  
Solid Waste Permitting Unit  
Solid Waste and Materials Management Program  
Hazardous Materials and Waste Management Division

cc: Jace Driver  
Kathy Hotovec  
Daniel Goetz

SW/ADM/ 6.1