

WASTE MANAGEMENT AND RADIATION CONTROL BOARD  
 Executive Summary  
 REQUEST FOR A SITE-SPECIFIC TREATMENT VARIANCE  
 EnergySolutions LLC  
 April 14, 2016

<p><b>What is the issue before the Board?</b></p>	<p>EnergySolutions LLC has requested a site-specific treatment variance from the Utah Hazardous Waste Management Rules to dispose of High Concentration Arsenic Waste following macroencapsulation.</p>
<p><b>What is the historical background or context for this issue?</b></p>	<p>The Mixed Waste Facility has received approximately 105 cubic feet of Natural Gas Sweetener Filter Media. This waste, made of clay pellets, retains hazardous waste codes for arsenic, cadmium and benzene.</p> <p>EnergySolutions proposes to treat this waste by macroencapsulation in the Mixed Waste Landfill Cell following chemical stabilization of the other contaminants. Macroencapsulation will isolate the waste from precipitation and potential leaching.</p> <p>This request is based on the fact that the facility has attempted a variety of treatment formulas and has been unsuccessful in attaining treatment levels for the arsenic. The other contaminants have been treated below Land Disposal Restriction levels.</p> <p>A notice for public comment was published in the <i>Salt Lake Tribune</i>, the <i>Deseret News</i> and the <i>Tooele County Transcript Bulletin</i> on March 1, 2016. The comment period began March 1, 2016 and ended March 30, 2016. No comments were received.</p>
<p><b>What is the governing statutory or regulatory citation?</b></p>	<p>Variances are provided for in 19-6-111 of the Utah Solid and Hazardous Waste Act and R315-2-13 of the Utah Administrative Code. This is a one-time, site-specific variance from an applicable treatment standard as allowed by R315-13-1 (40 CFR 268.44(h)(2) by reference).</p>

<b>Is Board action required?</b>	Yes, this is an action item before the Board.
<b>What is the Division/Director's recommendation?</b>	The Director recommends approval of this variance request based on the following findings: the proposed alternative treatment method meets the regulatory basis for a variance, will be as safe to human health and the environment as the required method and the facility has made several unsuccessful attempts to treat the arsenic contaminants in the waste.
<b>Where can more information be obtained?</b>	For technical questions, please contact Otis Willoughby (801) 536-0220.  For legal questions, please contact Raymond Wixom at (801) 536-0290.



Div of Waste Management  
and Radiation Control

JAN 22 2016

DSHW - 2016 - 002241

January 22, 2016

Mr. Scott T. Anderson  
Director  
Division of Waste Management and Radiation Control  
195 North 1950 West  
Salt Lake City, UT 84114-4880

CD16-0019  
**RECEIVED**  
JAN 22 2016

DEPARTMENT OF  
ENVIRONMENTAL QUALITY

Subject: EPA ID Number UTD982598898  
Request for a Site-Specific Treatment Variance for  
High Concentration Arsenic Waste

Dear Mr. Anderson:

EnergySolutions hereby requests an exemption from the treatment standards of 40 CFR 268.40(a)(2) for waste that contains high concentrations of arsenic (up to 2500 mg/L) that cannot be treated to the specified treatment standard.

This request is submitted in accordance with R315-13-1 (40 CFR 268.44 incorporated by reference) which allows a site-specific variance from an applicable treatment standard provided the following condition is met:

40 CFR 268.44(h)(1) It is not physically possible to treat the waste to the level specified in the treatment standard.

This request is submitted in accordance with the requirements of 40 CFR 260.20(b).

**40 CFR 260.20(b)(1):** This petition is being submitted by

EnergySolutions LLC  
299 South Main Street, Suite 1700  
Salt Lake City, UT 84111

**40 CFR 260.20(b)(2):** EnergySolutions requests approval to stabilize, macroencapsulate and dispose, in EnergySolutions' Clive Facility Mixed Waste Landfill Cell, approximately 105 cubic feet of Natural Gas Sweetner Filter Media (clay pellets) that is manifested characteristically hazardous for arsenic (D004), cadmium (D006), and benzene (D018). The stabilization treatment process will meet Universal Treatment Standards (as described in R315-13, which incorporates 40 CFR 268) for all contaminants except arsenic. All actions requested in this variance will be performed in accordance with EnergySolutions' State-issued Part B Permit.

**40 CFR 260.20(b)(3):** EnergySolutions proposes that the stabilization treatment residue (which will meet all treatment standards except arsenic) be formed into monoliths and macroencapsulated in accordance with permit requirements, and disposed in the Mixed Waste Landfill Cell.

**40 CFR 260.20(b)(4):** The need and justification for this action are as follows.

This variance is being requested for approximately 105 cubic feet of Natural Gas Sweetner Filter Media waste that was received on September 25, 2015. The waste was profiled by the generator as a solid material with up to 5% aqueous liquids and contains arsenic at concentrations up to 2,500 mg/L. Upon receipt at the Clive Facility, Permit required samples were collected of both phases of the waste. Results of these analyses detected several metals, as well as benzene and toluene, above treatment standards; arsenic was detected at 69,700 mg/L in the aqueous liquid phase (a small portion of the waste) and 1,800 mg/L in the solid.

Using this data as a baseline, treatability studies were performed on this waste in accordance with Attachment II-1-1, *Waste Analysis Plan and Formula Development for Treatment Wastes*, in EnergySolutions' State-issued Part B Permit. Over the course of two months, eight separate treatability studies of increasing intensity were conducted. Both single phase and multiple phase formulas were attempted with all contaminants meeting treatment standards except arsenic. Arsenic was reduced from the baseline concentration to approximately 130 mg/L (a reduction factor of approximately 16) with a formula dilution up to 5:1 reagents to waste. This concentration is greatly reduced from the baseline concentration, but remained greater than 25 times the treatment standard of 5.0 mg/L.

40 CFR 268.44(h)(1) allows a variance if it can be demonstrated that because the "physical or chemical properties of the waste differ significantly from waste analyzed in developing the treatment standard, the waste cannot be treated to the specified level or by the specified method." The treatment standard was developed using a finely grained soil-like material; this filter media is physically different in that it is coarser clay pellets; thereby making it more difficult for intimate reagent-waste contact to treat the high concentration arsenic. Furthermore, the results described above demonstrate that copious amounts of absorbent would be needed to meet the treatment standard, if it could be met. This would bring into question whether actual treatment was occurring or whether dilution was causing the reduction in arsenic concentration.

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As an alternative to chemical treatment of arsenic to its treatment standard, EnergySolutions proposes to first treat the waste such that all contaminants other than arsenic meet their respective treatment standards and the treated waste is formed into solid monoliths, then macroencapsulate the monoliths in accordance with requirements in Attachment II-1-5, *Macroencapsulation Plan*, of the State-issued Part B Permit. Macroencapsulation is a permitted process that significantly reduces the potential for migration (leaching) of waste. This process would ensure protection of public health and the environment.

EnergySolutions requests that a variance be granted to allow macroencapsulation and land disposal of waste that will meet all treatment standards except the treatment standard for arsenic.

The name, phone number, and address of the person who should be contacted to notify EnergySolutions of decisions by the Director is:

Mr. Vern C. Rogers  
Manager, Compliance and Permitting  
EnergySolutions LLC  
299 South Main Street, Suite 1700  
Salt Lake City, UT 84111  
(801) 649-2000

Should there be any questions to this request, please contact me at 801-649-2144.

Sincerely,



Timothy L. Orton, P.E.  
Environmental Engineer

cc: Don Verbica, DWMRC

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.