

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

August 22, 2001

Mr. George Alther
BIOMIN Incorporated
21641 Meyers Road
Oak Park, Michigan 48237

Re: **Oilsorb EC-100**

Dear Mr. Alther:

The Bureau of Petroleum Storage Systems hereby accepts the Oilsorb EC-100 organoclay filtration system for the removal of oils and other non-polar and slightly polar organics from water. Per your indication, the filter media is made from granules of bentonite that are modified with a quaternary amine, giving them the ability to remove contaminants by partition. We also note that the granules are mixed with anthracite in order to prevent early plugging of the pores, and that the system can remove up to seven times as much oil from water as conventional activated carbon. Additional information that we want to convey to potential users of EC-100 is provided as enclosure 1.

This acceptance pertains to applications of EC-100 associated with the subsurface remediation of petroleum-contaminated sites in Florida, which is the extent of this bureau's regulatory jurisdiction, albeit there may be potential uses for the media beyond our jurisdiction. Other state agencies and other bureaus within the Department of Environmental Protection may, at their discretion, recognize this acceptance if their needs and regulations are similar to this bureau's.

For any type of product or process, it is not required that an acceptance letter be obtained in order to propose its use in a site-specific Remedial Action Plan pursuant to Chapter 62-770, Florida Administrative Code. However, the site-specific plan must contain adequate design details, and information to show that the proposed product or process meets all applicable and appropriate rules and regulations.

Although the Bureau of Petroleum Storage Systems does not endorse specific or brand name remediation products or processes, it does recognize the need to determine their acceptability from an environmental standpoint with respect to applicable rules and regulations, and the interests of public health, safety, and welfare. Vendors must then market the products and processes on their own merits regarding performance, cost, and safety in comparison to competing

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alternatives in the marketplace. In no way, however, shall this regulatory acceptance letter be construed as Department certification of performance.

Those who prepare Remedial Action Plans proposing the use of EC-100 may include a copy of this letter in the appendix of plans they submit, 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 its acceptability from a regulatory standpoint.

The Department reserves the right to revoke its acceptance of a product or process if any aspect of its nature, components, constituents, or performance 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 plans prescribing the product or process. You may contact me at 850/487-3299 if there are any questions.

Sincerely,

Rick Ruscito, P.E.
Bureau of Petroleum Storage Systems

c: T. Conrardy - FDEP/Tallahassee

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ENCLOSURE 1

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ADDITIONAL INFORMATION ABOUT EC-100

1. Operating configurations: EC-100 filter media can be used as a pretreatment, post-treatment, or stand-alone filtration process. As a pretreatment, it can be used for bulk removal of contaminants prior to a conventional activated carbon polisher, thereby extending the life of the carbon and lowering costs.
2. EC-100 specifications: Selected specifications are listed below. More information, isotherms, and pressure drop data are available from the manufacturer.

US Mesh Size

80% passes through a No. 8 US Sieve (2.38 mm or .0937 in.)
 5% or less passes through a No. 50 US Sieve (.297 mm or .0117 in.)

Density

As shipped 61 lb./cu.ft.
 Backwashed and settled 54 lb./cu.ft.

Capacity

60% loading capacity (which means that 1 cu.ft. of Oilsorb EC-100, with a density of 55 lbs./cu.ft., will hold up to 33 lbs. of contaminant)

3. Design information:

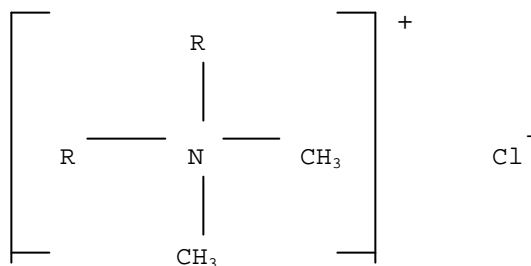
Bed depth	3 ft. min.
Hydraulic loading	2-5 gpm/sq.ft. max.
Bed Expansion (during backwash)	20%
Retention time	7-10 minutes (15 minutes contact time recommended)

4. Packaging: 55 gallon drums (300 lbs) or bulk bags (2000 lbs)
5. Applications: For removal of oils and other non-polar and slightly polar organics from water. Organoclays also have the capability to remove heavy metals.
6. Safety: The Bureau of Petroleum Storage Systems believes safety considerations for remediation systems using EC-100 filters will be similar to those of conventional filters and conventional carbon adsorption systems. Like any other remediation equipment system design, consideration should be given to pressure ratings of vessels, pressure relief, appropriate instruments and gauges, and the National Electrical Code.
7. Disposal of spent media: The manufacturer indicates that spent EC-100 media can be disposed in several ways, depending on the nature of the contaminants that were collected by the EC-100. The

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spent media cannot be regenerated but it can be disposed in a landfill, land farmed, incinerated, bioremediated, or blended as a fuel source for firing cement kilns. The Bureau of Petroleum Storage Systems provides a reminder that the onus shall be on users of EC-100 to properly dispose the spent media from remediation sites in Florida.

8. Effluent: For EC-100 systems, the effluent quality requirements are the same as any other remediation system that produces an effluent, and those requirements will depend on the selected method of disposal. The most common effluent disposal methods for remediation systems are infiltration gallery, sanitary sewer, injection well, and NPDES discharge. All applicable and appropriate rules and regulations for each of these disposal methods should be observed when they are used.
9. pH: From the case histories data provided by the manufacturer, it appears that EC-100 may slightly raise the pH of the fluid that it processes, albeit no more than the pH increase that would be associated with conventional activated carbon. In the data provided, the pH increase was approximately 0.5 pH units. The Bureau of Petroleum Storage Systems does not think that this will be a problem since there should be enough room in the 6.5-8.5 pH range of the secondary drinking water standard to accommodate the slight increase. In fact, at many sites in Florida, it is not unusual to find that the naturally occurring background pH of the groundwater is less than 6.5.
10. Quaternary amines: The quaternary amines that give EC-100 its capability to remove contaminants from water by partition can also leach from the media to some degree. However, in a configuration where an EC-100 filtration vessel is followed by a conventional granular activated carbon polishing vessel, the quaternary amine will be captured by the carbon prior to effluent disposal. BIOMIN has provided the Bureau of Petroleum Storage Systems with copies of pages from the Code of Federal Regulations describing the conditions under which quaternary amines such as dimethyl dialkyl ammonium chloride can be used as a food additive. For those interested in the general chemical structure of a quaternary ammonium salt, it is illustrated below.



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The "R" groups are long chain alkyls, such as C₁₄ (myristyl), C₁₆ (palmityl), and C₁₈ (stearyl).