

Department of Environmental Protection

Jeb Bush
Governor

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

Colleen M. Castille
Secretary

August 30, 2006

Steve Perry
ConSeal International Incorporated
90 Kerry Place, Suite 2
Norwood, Massachusetts 02062

Re: **BioSurf 425-NF**

Dear Mr. Perry:

The Bureau of Petroleum Storage Systems hereby accepts BioSurf 425-NF, a surfactant for the remediation of petroleum and other suitable contaminants in groundwater and soil, in situ and ex situ. As ConSeal has indicated, BioSurf 425-NF is a proprietary, aqueous blend of non-toxic, biodegradable, alkylpolyglucoside surfactants. It is shipped as a concentrate that is diluted with 66 percent clean water by the user prior to application. This is a dilution ratio of approximately 1 part clean water to 1.5 parts BioSurf 425-NF concentrate. Since the concentrate has a density close to that of water, the 1 to 1.5 dilution can be made on the basis of either volume or weight. Enclosure 1 is a voucher for the confidential disclosure of the proprietary ingredients.

This acceptance applies to the regulatory jurisdiction of the Bureau of Petroleum Storage Systems, which is primarily the cleanup of subsurface petroleum contamination pursuant to Chapter 62-770, Florida Administrative Code (F.A.C.). Other bureaus 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.

For injection-type, in situ groundwater remediation via direct injection of BioSurf 425-NF into an aquifer, there are underground injection control regulations that must be observed. Since injection-type remediation is likely to be the most common application of this product, the bulk of the regulatory requirements discussed herein will be directed to that topic.

The Bureau recognizes BioSurf 425-NF as a viable product for the cleanup of petroleum-contaminated sites in Florida. There are no objections to its use provided: (a) the considerations of this letter are taken into account; (b) a Remedial Action Plan is submitted pursuant to Chapter 62-770, F.A.C., and approved by the Department for each site where the use of BioSurf 425-NF is proposed; and (c) the requirements of rule 62-522.300(2)(c), F.A.C., are met in order to obtain permission for an injection zone of discharge for surfactant. The major regulatory considerations that apply to BioSurf 425-NF are listed in enclosure 2.

While the Department of Environmental Protection does not provide endorsement of 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 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 be construed as

"More Protection, Less Process"

Visit Our Internet Site At: www.dep.state.fl.us/waste/categories/pcp/default.htm

Printed on recycled paper.

Mr. Steve Perry
August 30, 2006
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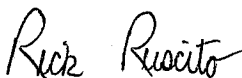
Department certification of performance. Additionally, the Department emphasizes a distinction between its regulatory acceptance and an approval. Products and processes are accepted but they are not approved.

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.

Those who prepare Remedial Action Plans are advised to 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 the environmental acceptability of BioSurf 425-NF. To aid those reviewers, the Bureau of Petroleum Storage Systems provides supplemental information as enclosure 3.

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 design details must be provided in a site-specific Remedial Action Plan. You may contact me at (850) 877-1133, extension 3722 if there are any questions.

Sincerely,



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

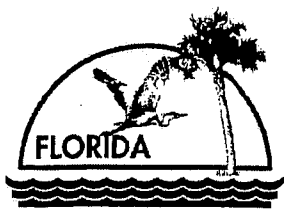


Rebecca S. Lockenbach
FDEP Section Leader
Bureau of Petroleum Storage Systems
Petroleum Cleanup Section 6

c: T. Conrardy - FDEP/Tallahassee

PPL #136
May 2001

PPL #304
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ENCLOSURE 1

BioSurf 425-NF
August 30, 2006

Department of Environmental Protection

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

Colleen M. Castille
Secretary

August 30, 2006

Steve Perry
ConSeal International Incorporated
90 Kerry Place, Suite 2
Norwood, Massachusetts 02062

Re: **Proprietary Ingredients Voucher for BioSurf 425-NF**

Dear Mr. Perry:

The Bureau of Petroleum Storage Systems hereby acknowledges receipt of a confidential disclosure on June 13, 2001 from ConSeal International Incorporated regarding the proprietary ingredients and their proportions in BioSurf 425-NF, a surfactant for the cleanup of petroleum and other suitable contaminants in groundwater and soil. Although the disclosure has been on file at the Florida Department of Environmental Protection since June 2001, and the product has been in use since that time, it was only recently that the need for a formal acceptance arose. Having reviewed the confidential disclosure, the Bureau hereby vouches for the composition.

Without divulging any proprietary information, BioSurf 425-NF is an aqueous blend of non-toxic, biodegradable, alkylpolyglucoside surfactants. It is shipped as a concentrate that is diluted with clean water by the user prior to application. The amount of dilution water is 66%, or a ratio of approximately 1 part clean water to 1.5 parts BioSurf 425-NF concentrate. The 1 to 1.5 ratio is roughly the same for dilution on either a volumetric or weight basis.

If the BioSurf 425-NF will be applied by injection, then the requirements of Rule 62-522.300(2)(c), Florida Administrative Code, must be met in order to obtain "permission by rule" for a temporary injection zone of discharge for surfactant. Please see enclosure 2 for more information about this rule, and for a list of the major regulations that may apply to the use of BioSurf 425-NF.

Remediation plan reviewers for petroleum-contaminated site applications involving BioSurf 425-NF may contact me at (850) 877-1133, extension 3722.

Sincerely,

Rick Ruscito

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

Rebecca S. Lockenbach

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

ENCLOSURE 2

REGULATORY CONSIDERATIONS

- a. Groundwater cleanup standards: The onus shall be on users of BioSurf 425-NF to ensure that all applicable groundwater contaminant standards will be met at the time of project completion, for petroleum, other contaminants that may be present, any residuals associated with the ingredients of BioSurf 425-NF, and any byproducts produced as a result of chemical or biochemical reactions involving those ingredients. The following chapters of the Florida Administrative Code are cited: Chapter 62-550, F.A.C., for primary and secondary water quality standards; Chapter 62-520, F.A.C. for groundwater classes and standards, and minimum criteria; Chapter 62-522, F.A.C., for groundwater permitting and monitoring requirements; Chapter 62-528, F.A.C., for underground injection control, particularly Part V, for Class V, Group 4 aquifer remediation projects; Chapter 62-770, F.A.C., for petroleum cleanup criteria; and Chapter 62-777, F.A.C., also for minimum groundwater criteria.

A noteworthy aspect of the minimum criteria set forth in Chapter 62-520, F.A.C., is that it requires groundwater to be free from substances that are harmful to plants, animals, and organisms, and free from substances that are carcinogenic, mutagenic, teratogenic or toxic to human beings. In effect, these "free from" requirements form a catchall. They close what would otherwise be a loophole in the regulations by preventing injection of a potentially harmful product in the event that any of its ingredients is not regulated as a specific primary or secondary drinking water contaminant.

- b. Injection well permit: The issuance of a site-specific Remedial Action Plan Approval Order or other enforceable mechanism by the Florida Department of Environmental Protection for injection-type aquifer remediation constitutes the granting of a Class V injection well permit. [62-528.630(2)(c), F.A.C.]
- c. Groundwater injection standards: For in situ aquifer remediation, the composition of an injected fluid must meet the drinking water standards set forth in Chapter 62-550, F.A.C., and the minimum groundwater criteria set forth in Chapter 62-520, F.A.C., pursuant to underground injection control Rule 62-528.600(2)(d), F.A.C.
- d. Temporary injection zone of discharge: Since the concentration of surfactant in the BioSurf 425-NF fluid to be injected will be in excess of the 0.5-milligram per liter (mg/L) secondary drinking water standard for foaming agents (i.e. surfactants) set forth in Chapter 62-550, F.A.C., it will be necessary to obtain permission for a temporary injection zone of discharge. In order to obtain permission, each site-specific Remedial Action Plan proposing the injection of BioSurf 425-NF must: (a) indicate that the concentration of alkylpolyglucoside surfactant in the groundwater may temporarily exceed the 0.5-mg/L secondary standard for surfactants; (b) specify the size of the zone of discharge that is needed (usually expressed as an injection point's radius of influence); (c) indicate the amount of time that a temporary injection zone of discharge will be needed (i.e. the length of time that the groundwater may contain more than the allowable 0.5-mg/L limit of surfactant); and (d) provide for the monitoring of surfactant in the groundwater. The frequency of monitoring will be site-specific, but as a rule-of-thumb, in most cases, quarterly should suffice.

- e. Surfactant analytical method: Drinking water regulations Chapter 62-550, F.A.C., refers to surfactants as foaming agents, albeit not all surfactants cause foam, and makes reference to *Standard Methods for Examination of Water and Wastewater* for laboratory analytical work. Specifically, Standard Method 5540 is for the measurement of surfactant concentrations. Users of BioSurf 425-NF may need to inform the laboratory beforehand that the alkylpolyglucoside surfactants in BioSurf 425-NF are of the nonionic type, since Standard Method SM 5540 distinguishes between nonionics and anionics.
- f. Utilization of wells: If a remediation site has an abundance of monitoring wells, then the Department has no objection to the use of some wells for the application of BioSurf 425-NF. However, no "designated" monitoring well, dedicated to the tracking of remediation progress (by sampling) shall be used to apply BioSurf 425-NF. This will avoid premature conclusions that the entire site meets cleanup goals. By making sure that designated tracking wells are not also used for treatment, there will be more assurance that the treatment process has permeated the entire site and that it did not remain localized to the area immediately surrounding each injection well.
- g. Additives: If a user decides to augment BioSurf 425-NF surfactant with other types of remediation products, then the onus shall be on that user to make sure those other products comply with Chapter 62-528, F.A.C., Underground Injection Control. The critical requirement is that the injected substances meet the drinking water standards of Chapter 62-550, F.A.C., and the general minimum groundwater criteria of Chapter 62-520, F.A.C. Additionally, minimum groundwater criteria for specific chemicals are listed in Chapter 62-777, F.A.C. If any of the other products used in combination with the BioSurf 425-NF do not meet these requirements, then it will be necessary to obtain permission for a temporary injection zone of discharge via rule 62-522.300(2)(c), F.A.C., or by petitioning the Department's Division of Water Resource Management for a variance, depending on the nature of the fluid to be injected.
- h. Groundwater monitoring:
 - 1. Active remediation petroleum monitoring: During the period of active remediation, groundwater shall be monitored in accordance with the requirements set forth in Section 62-770.700, F.A.C. Two noteworthy rules within that section are 62-770.700(3)(i), F.A.C., for frequency of sampling, and 62-770.700(5)(f), F.A.C., which requires a sampling schedule for bioremediation.
 - 2. Post remediation petroleum monitoring: At least one (1) year of quarterly post remediation groundwater monitoring shall be conducted at a minimum of two (2) wells, one located in the area of maximum petroleum contamination, the other downgradient of the area of maximum petroleum contamination, pursuant to Section 62-770.750, F.A.C.
 - 3. Underground injection control monitoring: Since the surfactants in the injected BioSurf 425-NF fluid will not meet the 0.5-mg/L secondary standard of Chapter 62-550, F.A.C., for foaming agents, groundwater monitoring of them for underground injection control purposes is required. The Bureau of Petroleum Storage Systems anticipates that in most cases a quarterly sampling frequency will suffice.

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- i. Underground injection control inventory: Remedial Action Plans proposing injection-type, in situ aquifer remediation shall include information pursuant to Rule 62-528.630(2)(c)1 through 6, F.A.C., for the inventory purposes of underground injection control. Per Rule 62-528.630(2)(c), F.A.C., aquifer remediation projects involving injection wells may be authorized under the provisions of a Remedial Action Plan, provided the construction, operation, and monitoring requirements of Chapter 62-528, F.A.C., are met. A memorandum outlining the inventory information about injection-type aquifer remediation plans to be transmitted by Department reviewers to the Underground Injection Control Section is provided as enclosure 4. Only the Department may approve in situ, injection-type aquifer remediation plans in which the approval constitutes a Class V injection permit. Local programs are not authorized to issue such approvals. See enclosure 3.
- j. Operation:
 1. Avoidance of migration: For injection-type, in situ aquifer remediation projects, injection of BioSurf 425-NF shall be performed in such a way, and at such a rate and volume, that no undesirable migration of either the product's ingredients or the petroleum contaminants in the aquifer results, pursuant to Rule 62-528.630(3), F.A.C.
 2. Underground injection control operating permit: Although an operating permit is not required for aquifer remediation wells pursuant to Rule 62-528.640(1)(b), and 62-528.640(1)(c), F.A.C., since no movement of the petroleum contamination plume is expected to accompany the BioSurf 425-NF treatment process, the Department requests that the information items listed in Rule 62-528.640(1)(b), F.A.C., be considered and included in Remedial Action Plan proposals as a matter of good and thorough design practice. Briefly summarized, they are: quality of water in the aquifer; quality of the injected fluid; existing and potential uses of the affected aquifer; and well construction details. Additionally, each Remedial Action Plan should clearly indicate the total volume of BioSurf 425-NF that will be injected.
- k. Abandonment of wells: Upon issuance of a petroleum Site Rehabilitation Completion Order, or a declaration of "No Further Action", injection wells shall be abandoned pursuant to Section 62-528.645, F.A.C. The Underground Injection Control Section of the Department shall be notified so that the injection wells can be removed from the inventory-tracking list.

ENCLOSURE 3

SUPPLEMENTAL INFORMATION

- a. Department of Environmental Protection reviewers of injection-type, in situ aquifer remediation plans, regardless of whether in Tallahassee or district offices, must fill in the blanks on the enclosure 4 memorandum, whose subject is "Proposed Injection Well(s) for In situ Aquifer Remediation at a Remedial Action Site". The completed form must be submitted to the Underground Injection Control Section at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

Only the Department and its district offices may approve in situ, injection-type aquifer remediation plans in which the approval constitutes the issuance of a Class V injection permit. Local programs are not authorized to issue such approvals. Reason: Although an arrangement between the Environmental Protection Agency and the Department delegated underground injection control authority to the Department, it does not allow the Department to delegate that authority any further. This includes delegation to the Department's contracted remediation review agencies such as those operated by the counties and other local governments. Reviewers in the local programs, however, upon completion of a review, can make arrangements to have the Department issue an official approval.

- b. Pilot study: Per section 62-770.700, F.A.C., a pilot study proposal shall be submitted for review, and a pilot test shall be performed prior to designing a treatment system. If conditions or the situation at a site do not warrant a pilot study, then a proposal explaining the rationale for the decision not to perform a pilot study shall be submitted for review.
- c. Dosage: ConSeal International Incorporated instructs the user to dilute the BioSurf 425-NF concentrate as supplied with 66% clean water, and then apply the solution at a rate varying from 5%-50% of the contaminant level, but not to exceed 200 parts per million (ppm). Actual field use rates range from 5 ppm to 200 ppm. As the Bureau of Petroleum Storage Systems has indicated, a dilution with 66% clean water is approximately equivalent to a ratio of 1 part clean water to 1.5 parts concentrated BioSurf 425-NF.

Florida Department of
Memorandum Environmental Protection

TO: Richard Deuerling, Mail Station 3530
Division of Water Resource Management
Underground Injection Control Section
Florida Department of Environmental Protection
2600 Blair Stone Road, Tallahassee, FL 32399-2400

FROM: _____ [see Note 1.]

DATE: _____

SUBJ: **Proposed Injection Well(s) for In Situ Aquifer
Remediation at a Remedial Action Site**

Pursuant to paragraph 62-528.630(2)(c), F.A.C., inventory information is hereby provided regarding the proposed construction of temporary injection well(s) for the purpose of in situ aquifer remediation at a contaminated site.

Site name: _____
Site address: _____
City/County: _____
Latitude/Longitude: _____
FDEP Facility Number: _____

Site owner's name: _____
Site owner's address: _____

Well contractor's name: _____ [see Note 2.]

Well contractor's address: _____

Brief description of the in situ injection-type aquifer remediation project:

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Date: _____

Site name: _____
FDEP facility no.: _____

Summary of major design considerations and features of the project:

Areal extent of contamination (square feet): _____

Number of injection wells: _____

Composition of injected fluid [see Note 3.]

(ingredient, wt. %): _____

Injection volume per well (gallons): _____

Single or multiple injection events: _____

Injection volume total (all wells, all
events): _____

A site map showing the areal extent of the groundwater contamination plume, and the location and spacing of injection wells and associated monitoring wells is attached.

The following is a summary description of the affected aquifer:

Name of aquifer: _____

Depth to groundwater (feet): _____

Aquifer thickness (feet): _____

The injection well(s) features are summarized below, and/or a schematic of the injection well(s) is attached.

Direct-push or HSA/Mud rotary (*circle the appropriate well type*)

Diameter of well(s) (i.e., riser pipe & screen) (inches): _____

Total depth of well(s) (feet): _____

Screened interval: _____ to _____ feet below land surface

Grouted interval: _____ to _____ feet below land surface

Casing diameter, if applicable (inches): _____

Cased depth, if applicable: _____ to _____ feet below land surface

Casing material, if applicable: _____

The in situ injection-type aquifer remediation plan for this contaminated site is intended to meet the groundwater cleanup criteria set forth in Chapter 62-777, F.A.C., for the

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Date: _____

Site name: _____
FDEP facility no.: _____

contaminants of concern. Additionally, all other groundwater standards will be met at the time of project completion for any residuals associated with the ingredients of the injected remediation products, and any by-products or intermediates produced as a result of the chemical or biochemical transformation of those ingredients or the contaminants of concern during their use. Applicable primary and secondary drinking water standards are set forth in Chapter 62-550, F.A.C., and additional groundwater quality criteria are set forth in Chapters 62-520 and 62-777, F.A.C.

The remediation plan estimates that site remediation will take _____ months. We will notify you if there are any modifications to the remediation strategy which will affect the injection well design or the chemical composition and volume of the injected remediation product(s).

The proposed remediation plan was approved on _____ by an enforceable approval order. A copy is attached. The remediation system installation is expected to commence within 60 days. Please call me at _____ if you require additional information.

- Note 1. This form is primarily for use by Florida Department of Environmental Protection technical reviewers or Department-designated reviewers. Remediation contractors may fill in all blanks except those labeled "FROM" and "DATE" on page 1, and the approval date and telephone number blanks in the last paragraph. Those blanks should be completed only by a Department reviewer or a Department-designated reviewer.
- Note 2. If an injection well installation contractor has not yet been selected, then indicate the name and address of the project's general remediation contractor/consultant.
- Note 3. Complete chemical analysis of injected fluid is required by Chapter 62-528, F.A.C. Proprietary formulations shall make confidential disclosure. Injected fluids must meet drinking water standards of Chapter 62-550, F.A.C., unless permission for a temporary zone of discharge has been granted by way of Rule 62-522.300(2), F.A.C., or a variance.