



Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Noah Valenstein
Secretary

July 25, 2018

Via Electronic Mail to Mr. Jay Lawson at JLawson@progressenv.com

Mr. Jay Lawson
Director of Ecological Services
Progress Environmental Group, Inc.
P.O. Box 5884
Winston-Salem NC 27113

Re: **Enviro-BAC**
The FDEP Innovative Technology Application Number: 1670

Dear Mr. Lawson:

The Florida Department of Environmental Protection's Division of Waste Management (Division) hereby accepts Enviro-BAC for enhancing the in-situ bioremediation of petroleum hydrocarbons in groundwater and soil. The subject formulation consists of a proprietary blend of *Bacillus* bacteria spores. Per Progress Environments, Inc., the microbial strains in Enviro-BAC are all naturally occurring facultative anaerobes

Enclosure 1 is a voucher for a confidential disclosure of the proprietary ingredients submitted by Progress Environmental, Inc. Enclosure 2 contains regulatory information.

For vadose remediation, where the underlying groundwater will not be affected by the leaching of Enviro-BAC, there are no special concerns beyond those that would normally need to be addressed in preparing a Remedial Action Plan and conducting a cleanup in accordance with Chapters 62-780 and 62-777, F.A.C. However, for in situ groundwater remediation, via direct injection of Enviro-BAC into an aquifer, there are underground injection control regulations that must be observed. Since injection-type, in situ aquifer remediation is likely to be the most common application of Enviro-BAC, the bulk of the regulatory requirements discussed herein will be directed to that topic.

While the Florida Department of Environmental Protection (FDEP) 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 safety. Vendors, upon receipt of an acceptance, must market their product or process on its merits regarding performance, cost, and safety in comparison to competing alternatives in the marketplace. This acceptance letter shall not be construed as either an approval of the product or a certification of its performance.

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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.

It is not a requirement that a remediation product or process obtain an acceptance from the Department in order to be proposed for use in a site-specific Remedial Action Plan, but the plan must contain information to show that it meets all applicable and appropriate rules and regulations. For Enviro-BAC, a copy of this acceptance letter containing regulatory compliance advice should be included in the appendix of each site-specific Remedial Action Plan that proposes its use.

The Department reserves the right to revoke its acceptance of a product or process if it has been falsely represented.

If you have any questions, contact Elena Compton at 850-245-8911, through Mail Station 4535 at the letterhead address, or by e-mail at Elena.Compton@floridadep.gov.

Sincerely,



Elena Compton, M.S., P.E.
Professional Engineer II
District & Business Support Program
Division of Waste Management, FDEP
850-245-8911

Enclosures: (1) Voucher; (2) Regulatory Information

ENCLOSURE 1
VOUCHER

Enviro-BAC



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Re: **Enviro-BAC**

Dear Mr. Lawson:

The Division of Waste Management hereby acknowledges the submittal of confidential disclosures dated May 7, 2018 (received May 19, 2018) by Progress Environmental, Inc. The disclosures provided the proprietary ingredients and their concentrations in Enviro-BAC. Having reviewed the disclosures, the Division hereby vouches for the information. Without this voucher for the disclosures and the advice provided by the Division in Enclosure 2 based on its review of all the ingredients, users of Enviro-BAC listed above would not know how to comply with the requirements of Rule 62-520.310(8)(c), Florida Administrative Code (F.A.C.) for a temporary Zone of Discharge.

For underground injection control purposes, aquifer remediation plans proposing the use of Enviro-BAC must indicate the volume and complete chemical composition of the fluid to be injected. Since the identities of some ingredients are proprietary, it will suffice to indicate just the overall volume, concentration, and specific name/ number of the Enviro-BAC to be injected, and then provide a footnote indicating that the confidential disclosure dated May 7, 2018, is already on file with the Division.

Please note: the concentration of Enviro-BAC prior to injection into subsurface must not exceed 0.04%. Please direct questions regarding this voucher to Elena Compton at 850-245-8911.

Sincerely,

A handwritten signature in blue ink that reads "Elena G. Compton".

Elena Compton, M.S., P.E.
Professional Engineer II
District & Business Support Program
Division of Waste Management, FDEP
850-245-8911

ENCLOSURE 2
REGULATORY INFORMATION

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1. Groundwater cleanup standards: The onus shall be on users of Enviro-BAC to ensure that all applicable groundwater standards will be met at the time of project completion for the contaminants of concern being remediated, and any by-products produced as a result of chemical or biochemical reactions induced or assisted by Enviro-BAC listed in the subject letter. The following chapters of the Florida Administrative Code (F.A.C.) are cited: Chapter 62-550, F.A.C., for primary and secondary water quality standards; Chapter 62-520, F.A.C., for groundwater classes, for groundwater permitting, and for monitoring requirements; Chapter 62-528, F.A.C., for underground injection control, particularly Part V, for Class V, Group 4 aquifer remediation projects; Chapters 62-780 F.A.C., for cleanup criteria, allowance of alternative cleanup target levels and conditional closure requirements; and Chapter 62-777, F.A.C., for cleanup target levels.
2. Injection well permit: Per Rule 62-528.630(2)(c), F.A.C., the issuance of an enforceable, site-specific Remedial Action Plan Approval Order by the Department for injection-type aquifer remediation constitutes the granting of a Class V injection well construction/clearance permit.
3. Underground Injection Control (UIC): Remedial Action Plans proposing injection-type aquifer remediation shall include the information required by Rules 62-528.630(2)(c)1 through 6, F.A.C., for the purposes of the UIC program. Reviewers of those plans, upon issuance of a Department-enforceable Remedial Action Plan Approval Order, must transmit this information to the UIC program in Tallahassee by submitting a completed copy of the "UIC Notification". The notification is in the form of a memorandum currently located on the Internet at www.dep.state.fl.us/waste/categories/pcp/pages/innovative.htm.
4. General information about temporary Zones of Discharge (ZOD): For groundwater remediation, the composition of a fluid to be injected must meet the primary and secondary drinking water standards set forth in Chapter 62-550, F.A.C., and the minimum groundwater criteria of Chapter 62-520, F.A.C. [and Chapter 62-777], pursuant to UIC Rule 62-528.600(2)(d), F.A.C. Aquifer remediation products that do not meet these requirements must seek relief from water quality criteria by one of two mechanisms as follows. Permission for a temporary ZOD may be obtained via Rule 62-520.310(8)(c), F.A.C. If permission for a ZOD cannot be obtained by rule, then it will be necessary to seek a variance from Department rules in accordance with Section 120.542, Florida Statutes.

Rule 62-520.310(8)(c), F.A.C., allows for a temporary ZOD for closed-loop re-injection systems, for the prime constituents of the reagents used to remediate site contaminants, and for groundwater secondary standards. In order to obtain permission for a temporary ZOD by rule, a site-specific Remedial Action Plan must indicate: (a) the chemical ingredients of concern in the fluid to be injected that will be present in excess of groundwater standards; (b) the size of the ZOD that is needed; (c) the amount of time that the ZOD will be needed; and (d) a plan for monitoring the injected chemical ingredients of concern.

The size of the temporary ZOD will usually be the injection well radius of influence when the treatment system is a single injection point. For a multiple point system, the ZOD can usually be expressed and illustrated as the total area covered by all the injection points, located side-by-side with overlapping radii of influence.

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5. Upon expiration of the time period granted for the ZOD by way of Rule 62-520.310(8)(c), F.A.C., the concentrations of the above referenced analytes must meet their respective groundwater standards or their natural-occurring background values at the specific cleanup site, whichever is less stringent.

Conditional closure is also allowable provided the closure criteria of Chapter 62-780.680, F.A.C., are met and there are no exceedances of a primary standard due to impurities in the product. Note that such conditional closure may require a modification of the size or duration of the ZOD. This modification must be approved in an enforceable order of the department, such as a conditional Site Rehabilitation Completion Order.

6. Site-specific Remedial Action Plans shall describe the volume and concentration of Enviro-BAC that will be injected.

Please note: the concentration of Enviro-BAC prior to injection into subsurface must not exceed 0.04%. In order to achieve this concentration, one (1) kilogram of Enviro-BAC needs to be dissolved in at least 700 (seven hundred) gallons of water.

7. At the maximum 0.04% Enviro-BAC injecting concentration, possible maximum 150 mg/L of sodium and 229 mg/L of chloride are reasonably below the primary groundwater standard for sodium of 160 mg/L and below the secondary standard for chloride of 250 mg/L and do not impose immediate environmental threat. However, due to the tendency of sodium to accumulate in the subsurface, any repetitive injections may be prescribed cautiously.

8. Specific ZOD information for Enviro-BAC:

- a. Permission for a temporary injection ZOD by way of Rule 62-520.310(8)(c), F.A.C., is not required, provided that Enviro-BAC concentration prior to injection does not exceed 0.04% [refer to paragraph 6 (six) above]. The Underground Injection Control (UIC) Section needs to be notified by placing a checkmark the UIC Notification memorandum as follows:

“☒ No ZOD needed.”

- b. While no UIC ZOD monitoring is required at the maximum accepted 0.04% injection concentration, groundwater baseline and post Enviro-BAC injection analyses for sodium and chloride are required. Please refer to paragraph 7 (seven) for more information.
- c. For concentrations exceeding 0.04%, permission for a temporary ZOD for sodium cannot be obtained via Rule 62-520.310(8)(c), F.A.C. When permission for a ZOD cannot be obtained by rule, then it will be necessary to seek a variance from Department rules in accordance with Section 120.542, Florida Statutes.

9. Injection operations:

- a. Avoidance of migration: For injection-type in-situ aquifer remediation projects, injection of Enviro-BAC shall be performed in such a way and at such a rate and volume that no migration of Enviro-BAC or the contaminants of concern in the aquifer or surface water results, pursuant to Rule 62-528.630(3), F.A.C.

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- b. 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 contamination plume is expected to accompany the 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.
- 10. Abandonment of wells: Upon issuance of a 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.
- 11. Open-pit application: There is no objection to the introduction of Enviro-BAC to an open excavation pit in which the groundwater has been exposed. Open-pit application is not injection, and it is not necessary to notify the Underground Injection Control Section, but this should not be construed as carte blanche to introduce to the pit any substance at any concentration with no regard to potential toxicological effects. The Division of Waste Management therefore recommends that the groundwater in the area of the pit be monitored for the same zone of discharge parameters that would have been monitored (if any) had the application actually been an injection.

