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Jan 21, 1997

OFFICE OF SOLID WASTE
AND EMERGENCY RESPONSE

Verde Environmental, Inc.
7309 Schneider Street
Houston, Texas 77093

Thank you for providing the additional technical product data required by the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, on the Bioremediation Agent "Micro-Blaze." Your data submission satisfies the requirements contained in Title 40 of the CFR section 300.915 of the NCP. "Micro-Blaze" will remain on the NCP Product Schedule under Bioremediation Agents and may be authorized for use by Federal On-Scene Coordinators in accordance with 40 CFR section 300.910. The technical data for this product will be kept on file by the Oil Program Center pursuant to 40 CFR section 300.920

Enclosed are some of the relevant provisions in the NCP on restrictions regarding the listing of your product. Please note, you are required to notify the Environmental Protection Agency (EPA) of any changes in composition, formulation, handling procedures, or application of your product. Based on this notice, EPA may require retesting of the product. Also, note that the listing of "Micro-Blaze" on the NCP Product Schedule does not constitute approval, certification, authorization, licensing or promotion of the product; nor does it imply compliance with any criteria or minimum standards for such agents. Failure to comply with these restrictions or the making of any improper reference to EPA in an attempt to demonstrate approval or acceptance of the product will constitute grounds for removal of the product from the schedule.

If you have questions, please contact Ms. Gail Thomas in the Oil Program Center at (703) 603-8736.

Sincerely,

A handwritten signature in black ink, which appears to read "David Lopez". To the right of the signature, there is a handwritten note in parentheses: "(H/T for)".

David Lopez, Director
Oil Program Center (5203G)

DEFINITIONS FROM THE U.S. EPA

AGENCY REGISTER / Vol.59, No.178 /
Thursday, September 15, 1994 / Rules and Regulations

BIOREMEDIATION AGENT: Microbiological cultures, enzyme additives, or nutrient additives that are deliberately introduced into an oil discharge and that will significantly increase the rate of biodegradation to mitigate the effects of the discharge.

DISPERSANTS: Those chemical agents that emulsify, disperse, or solubilize oil into the water column or promote the surface spreading of oil slicks to facilitate dispersal of the oil into the water column.

MISCELLANEOUS OIL SPILL CONTROL AGENT: Any product, other than a dispersant, sinking agent, surface washing agent, surface collecting agent, bioremediation agent, burning agent, or sorbent that can be used to enhance oil spill clean-up, removal, treatment or mitigation.

SURFACE COLLECTING AGENTS: Those chemical agents that form a surface film to control the layer thickness of oil.

SURFACE WASHING AGENT: Any product that removes oil from solid surfaces, such as beaches and rocks through a detergency mechanism and does not involve dispersing or solubilizing the oil into the water columns.

[Please Note: If you are using any EPA-NCP listed product, make sure the product is listed for the requirement you need.- Verde.]

Note: As required by EPA regulations: Disclaimer: "Micro-Blaze Emergency Liquid Spill Control is on the U.S. Environmental Protection Agency's NCP Product Schedule as a bioremediation agent. This listing does not mean the EPA approves, recommends, licenses, certifies, or authorizes the use of Micro-Blaze Emergency Liquid Spill Control on an oil discharge. This listing means only that data have been submitted to EPA as required by subpart J of the National Contingency Plan § 300.915."

TECHNICAL PRODUCT BULLETIN #B-41
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: DECEMBER 18,1991
REVISED LISTING DATE: JANUARY 21, 1997
“MICRO-BLAZE®”

I. NAME, BRAND, OR TRADEMARK

MICRO-BLAZE®

Type of Product: Biological Additive

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT

Verde Environmental, Inc.

P.O. Box 8706

Houston, TX 77249-8706

Phone: (713) 691-6468

(800) 626-6598

Fax: (713) 691-2331

Web site: <http://www.micro-blaze.com>

E-mail: bscogin@micro-blaze.com

(Mr. William L. Scogin)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS

Verde Environmental, Inc.

P.O. Box 8706

Houston, TX 77249-8706

Phone: (713) 691-6468

(800) 626-6598

Fax: (713) 691-2331

Web site: <http://www.micro-blaze.com>

E-mail: bscogin@micro-blaze.com

(Mr. William L. Scogin)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION

1. Flammability:

Non-flammable

2. Ventilation:

Normal room ventilation

3. Skin and eye contact; protective clothing; treatment in case of contact:

Avoid eye contact. Wear protective gloves, and wash hands with soap and water after handling the product. Wash contaminated clothing and footwear before reuse.

4. Optimum Storage Conditions:

4.a. Maximum storage temperature: 120°F

4.b. Minimum storage temperature: 35°F

4.c. Optimum storage range temperature: NA

4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE

Minimum 10 years, with proper storage, in original containers. Freezing will not kill these

microbes; however, extreme heat (over 180°F) for long periods of time will kill the microbes.

VI. RECOMMENDED APPLICATION PROCEDURE

MICRO-BLAZE® is a liquid formulation of several microbial strains, surfactants, and nutrients designed to bioremediate organics and hydrocarbons in soil and water as well as control odors.

1. Application Method:

Use normal spray equipment, fire or response equipment, eductor setups, water trucks, etc. as methods of application. Mix MICRO-BLAZE®/water mixture with contaminated soils and liquids thoroughly for maximum contact. Pick up treated contamination after volatile hazard has been negated per local regulatory parameters.

For general bioremediation: For in-situ soils, mix MICRO-BLAZE®/water mixture can be tilled into the contaminated area. For shallower contamination, areas can be over sprayed with normal spray equipment, eductor setups, water trucks, etc. For deeper contamination, application can be applied through underground setups using perforated piping per regulatory recommendations.

For wastewater and other operational by-product sludges and soils extracted from contaminated areas, a bioslurry or bioreactor can be setup using MICRO-BLAZE® and water in the process.

2. Concentration/Application Rate:

For more viscous or less hazardous contamination, apply MICRO-BLAZE® at a 3% solution mixed with water (3 parts MICRO-BLAZE®, 97 parts water). When bioremediating soils, generally, per every 10 cubic yards of contaminated soils, use one gallon of concentrate, diluted with water according to contamination type.

3. Conditions for Use:

Water Salinity: Can be mixed with any fresh, brackish or brine. However, brine reduces the effectiveness by 10%.

Water Temperature: 35°F - 180°F

pH: 4 to 11.5

Temperature: 32°F - 120°F

Nutrient Requirements: Nutrients for microbes are included in product. However, for longer-term bioremediation projects, additional applications for Bio-Catalyst may be added to boost microbial activity.

Type and Ages of Pollutants: For use on organics and hydrocarbon-based materials. These strains of bacteria provide the capability of biodegrading various straight chained, branched chained, aromatic and polynuclear aromatic hydrocarbons found in diesel and other fuels. Age of contamination is not a factor as much as its density. Tar-like substances may need to be cut for timely remediation.

VII. TOXICITY AND EFFECTIVENESS

Non-toxic, naturally-occurring spore-forming microorganisms common to soil and water. Non-pathogenic, certified by count; will not mutate.

a. Effectiveness:

Bioremediation Agent Effectiveness Test (40 CFR 300,900) Federal Register September 15, 1994.

Microbiological Results - Average

Day 0 - 1.7×10^9 Day 7 - 8.43×10^8 Day 28 - 5.2×10^7

The organisms in this product convert to a spore state (dormant) to survive an unfavorable

environment and will reactivate upon favorable conditions. Documentation available from Verde Environmental.

Summary Data Table

DAYS	PRODUCT	TOTAL MEAN	RED%	TOTAL MEAN	RED%
	3 REP/PROD	ALKANES (ppm)	28 DAYS	AROMATICS (ppm)	28 DAYS
0	CONTROL	31258.6	0	973	0
	NUTRIENT	28251.8	0	976.6	0
	MICRO-BLAZE®	29548.9	0	1081.2	0
7	CONTROL	31401.73	0	990.5	0
	NUTRIENT	20728.3	26.6	619.1	36.6
	MICRO-BLAZE®	12870.5	56.4	496.3	54.1
28	CONTROL	32465.8	0	925.7	0
	NUTRIENT	1787.2	93.7	722.6	26.0
	MICRO-BLAZE®	1758.2	94.1	566.9	47.6

Alkanes showed significant reductions with aromatic components less dramatic but still significant.

Results of Gravimetric Analysis:

Percentage (%) Decrease in Weight of Oil on Day 28

<u>Control</u>	<u>Nutrient</u>	<u>Product (MICRO-BLAZE®)</u>
<1%	17.6%	12%

CONCLUSIONS: The MICRO-BLAZE® product shows an initial rapid consumption of all measured hydrocarbons at seven (7) days. This rate apparently slows over 28-day period in a closed environment which may be due to a change in the environment of the flask due to the rapid degradation rates. Because of the high microbial population at the end of the test, it is to be assumed that the quantity of metabolites might account for the increased weight as determined by the gravimetric analysis.

b. Toxicity:

NA

VIII. MICROBIOLOGICAL ANALYSIS

1. Listing of all microorganisms by species and percentage in the composition:

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2. Optimum pH, temperature, salinity ranges for use of the additive:

pH: 7.5

Temperature: 45°F - 105°F

Salinity: 0-10%

3. Minimum and maximum pH, temperature, salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:

pH: <5.9, >9.0

Temperature: <32°F, >180°F

Salinity: <0%, 10%

4. Special nutrient requirements: None

5. Test results regarding the determination of the presence of the following:

Product is determined to be free of gram negative contamination.

Salmonella: Negative

Fecal coliform: Negative

Shigella: Negative

Staphylococcus Coagulase positive: Negative

Beta hemolytic Streptococci: Negative

IX. PHYSICAL PROPERTIES

NA

X. ANALYSIS OF HEAVY METALS, CYANIDE, AND CHLORINATED HYDROCARBONS

NA