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Open Letter Regarding Use of Simple Green® and Crystal Simple Green® as Surface Washing Agent for Oil Spills

Simple Green – USA
World Headquarters
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Huntington Harbour, CA 92649
562-795-6000 • 800-228-0709
Facsimile: 562-592-3034
www.simplegreen.com

To Whom It May Concern:

Sunshine Makers, Inc., the makers of Simple Green products, defines our cleaning technology as MPF – Micro-Particulate-Fractionalization. This is a term that characterizes Simple Green's and Crystal Simple Green's unique ability to create the *extreme micellization of larger molecules*. In conversation more easily understood, MPF means that Simple Green and Crystal Simple Green have a much greater capacity to create and to emulsify oil micelles within water than other detergents. This is a particularly beneficial quality with regard to how they interact with the natural environment, because micellization of hydrocarbons enables enhanced bioavailability. The greater the micellization, the greater the food source for resident bacteria.

In other words, oil micellization (in conjunction with non-toxic Simple Green and Crystal Simple Green) provides a unique benefit: The consumption of the hydrocarbons and the ready biodegradation of the cleaner, either in soil or in water.

But there is another phenomenon that occurs. Test data from Duke University School of the Environment – Marine Laboratory (enclosed), shows that Simple Green alone in a bacterial broth does not significantly increase or decrease the bacteria count; and hydrocarbons alone in the same bacterial broth do not significantly increase or decrease the bacteria count. However, bacterial broth that has been introduced with *both* Simple Green and hydrocarbons shows marked bacteria colony growth in a short period of time. Therefore, in soils or water with minimal resident bacteria, this process creates rapid bacterial colony growth. And with greater bacteria comes greater consumption of hydrocarbons, greater growth in the bacteria colony, even greater consumption of hydrocarbons, and so forth, until the hydrocarbons are eliminated. Once the hydrocarbons are eliminated, the bacteria colony dies back to previous levels and the Simple Green or Crystal Simple Green cleaner completes its biodegradation within the soil or water.

Finally, since 1990, Simple Green has been included in the US Environmental Protection Agency's National Contingency Plan Product Schedule for use as a surface washing agent. Crystal Simple Green is also appropriate for the same use, as it is the same formulation as Simple Green without the green colorant and fragrance additives found in original Simple Green. Therefore all test data for Simple Green is completely applicable to Crystal Simple Green as well.

If there are further questions or requirements for further data, please contact me directly. Thank you for your interest in, and choice of Simple Green products.

Sincerely,

Carol Chapin

Carol Chapin

Senior Director, Research & Development

Sunshine Makers, inc. / SIMPLE GREEN

Phone: 800/228-0709 Fax: 562/592-3830 Email: cchapin@simplegreen.com

Encl. ● Technical Product Bulletin #SW-15 – from www.epa.gov/oilspill/ncp/simplegr.htm 3 pgs.

● Final Reports – Simple Green in Soil Bioremediation & Environmental Bioremediation and Simple Green by Duke University School of the Environment – Marine Laboratory 3 pgs.

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TECHNICAL PRODUCT BULLETIN #SW-15 (formerly D-46)
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: APRIL 23, 1990
REVISED LISTING DATE: AUGUST 30, 1995
"SIMPLE GREEN"

I.NAME, BRAND, OR TRADEMARK

SIMPLE GREEN

Type of Product: Surface Washing Agent (Water Based)

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

Sunshine Makers, Inc.

15922 Pacific Coast Highway

Huntington Harbor, CA 92649

Phone: (800) 228-0709 / (562) 795-6000

Fax: (310) 562-3034

(Mr. Bruce P. FaBrizio)

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

Sunshine Makers, Inc.

15922 Pacific Highway

Huntington Harbor, CA 92649

Phone: (800) 228-0709 / (310) 795-6000

Fax: (310) 592-3034

(Mr. Milton Krause)

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

1.Flammability:

Non-flammable

2.Ventilation:

Not required

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

SIMPLE GREEN is safe for use on skin and will not cause irritation in the majority of users. Avoid contact with eyes, irritation may result. Wear splash goggles or full face-shield and have eye washing equipment available in areas where potential is high for eye contact. No special precautions or additional protective equipment are required during handling or use. SIMPLE GREEN is provided with a Material Safety Data Sheet (No. 1002).

4.a.Maximum storage temperature: 140 F

4.b.Minimum storage temperature: 34 F

4.c.Optimum storage temperature range: > 32 F and < 140 F

4.d. Temperatures of phase separations and chemical changes:
SIMPLE GREEN is stable and phase separation will not occur at temperatures within the above storage range.

V. SHELF LIFE

SIMPLE GREEN has an unlimited shelf life.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

Spray on oily surface.

2. Concentration/Application Rate:

For open water, spray concentrated product directly on surface of oil at a ratio of 4 parts of oil to 1 part of SIMPLE GREEN®. Site conditions may warrant alternative procedures to maintain effectiveness.

3. Conditions for Use:

Equally effective in fresh water, estuarine, and marine environments at all temperatures. SIMPLE GREEN® contains no known EPA Priority Pollutants.

VII. TOXICITY

Material Tested	SPECIES	LC50 (ppm)
SIMPLE GREEN	Menidia beryllina	27.90 96-hr
	Mysidopsis bahia	77.60 48-hr
No. 2 Fuel Oil	Menidia beryllina	6.50 96-hr
	Mysidopsis bahia	3.70 48-hr
SIMPLE GREEN & No. 2 Fuel Oil (1:10)	Menidia beryllina	8.30 96-hr
	Mysidopsis bahia	4.40 48-hr
Reference Toxicant (DSS)	Menidia beryllina	7.80 96-hr
	Mysidopsis bahia	21.20 48-hr

NOTE: This toxicity data was derived using the concentrated product. See Section VI of this bulletin for information regarding the manufacturer's recommendations for concentrations and application rates for field use.

VIII. MICROBIOLOGICAL ANALYSIS

SIMPLE GREEN contains no microorganisms, enzymes, or biological material.

IX. PHYSICAL PROPERTIES

1. Flash Point: > 200 F
 2. Pour Point: None
 3. Viscosity: 2.0 Centistokes at 78 F
 4. Specific Gravity: 1.0257 g/ml at 72 F
 5. pH: 9.5
 6. Surface Active Agents: CONFIDENTIAL
 7. Solvents: CONFIDENTIAL
 8. Additives: CONFIDENTIAL
 9. Solubility: Infinitely miscible.
- (Increasing salt concentrations in marine ecosystems will lead to complexes

with SIMPLE GREEN that may become visible at ratios above one part SIMPLE GREEN to 99 parts seawater.)

**X ANALYSIS FOR HEAVY METALS, CYANIDE, AND
CHLORINATED HYDROCARBONS**

COMPOUND	CONCENTRATION (ppm)
Aluminium	10.0000
Arsenic	< 5.0000
Cadmium	< 0.0233
Chromium	0.1150
Copper	< 0.7500
Lead	0.0776
Mercury	< 0.0125
Nickel	< 2.3000
Selenium	< 1.0000
Zinc	< 4.4000
Cyanide	< 1.0000
Chlorinated Hydrocarbons	< 1.0

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URL: <http://www.epa.gov/oilspill/ncp/simplegr.htm>
Last updated on June 8, 2000
Comments: oilinfo@epa.gov

FINAL REPORTS

SIMPLE GREEN IN SOIL BIOREMEDIATION
Effects of Simple Green on Three Different Mixtures
of Soil Bacteria
(RTI Task #4909-025)

and

ENVIRONMENTAL BIOREMEDIATION AND SIMPLE GREEN
Potential for Simple Green to Enhance Degradation
of Hydrocarbons by Surfactant or Chelation Modes of Action
(RTI Task #4909-026)

SUBCONTRACT: Duke University School of the Environment
Marine Laboratory

SPONSOR: Sunshine Makers, Inc.
15922 Pacific Coast Highway
Huntington Harbour, CA 92649

TESTING FACILITY: Research Triangle Institute
Post Office Box 12194
Research Triangle Park, NC 27709

STUDY DATES: Start: November 15, 1992
Termination: November 5, 1993

PERSONEL:

For Duke University: Celia Bonaventura
Professor of Cell Biology
Principal Investigator

Hassan Bedair
Research Associate

Giulia Ferruzzi
Jennifer Kahler
Research Technicians

For RTI: Fred De Serres
Project Officer

AMENDMENTS: A. Test-levels of Simple Green Elevated
B. Selection of Soil Bacteria From a Test-Site
Before and After Treatment as Test Species
C. Inclusion of Oil with Other Nutrients

B3. EFFECTS OF SIMPLE GREEN ON L-104 GROWTH UNDER LOW NUTRIENT CONDITIONS WITH AND WITHOUT OIL ADDITION

When L-104 is introduced into conditions of low nutrients established by diluting regular broth to 1/20th its standard concentration, the growth rate is slower and somewhat irreproducible, sometimes showing an initial increase as a result of a transient utilization of nutrients carried-over from the nutrient-rich conditions of the seed culture. Enhanced growth can be obtained by addition of oil (Pennzoil or waste oil) to the nutrient-poor medium, so that the bacteria can then be seen to be making use of the hydrocarbons of the oil as a major nutrient source. Under these conditions, Simple Green can greatly stimulate bacterial growth, while without oil addition Simple Green has little effect on bacterial growth.

The above conclusions are shown by the results of Figure B3. The bar graph documents the optical density observed after 30 hours under varied conditions.

Figure B4 presents representative growth curves in support of the conclusions above, from which the Bar Graph of Figure B3 was generated. Since growth under nutrient-poor conditions is variable, the results are not as reproducible as with undiluted broth. Consequently, there is considerable variability in the degree of growth stimulation by Simple Green at any given concentration.

FIGURE B3

Effects of Simple Green on Bacterial Growth

