GUIDE TO USING THE NCP PRODUCT SCHEDULE NOTEBOOK

MAY 2010
(5/11/2010)

FOREWORD

The U.S. Environmental Protection Agency's (EPA) Office of Emergency Management Regulatory and Policy Division compiled the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Product Schedule, as required by the Clean Water Act, the Oil Pollution Act of 1990 (OPA 90), and the NCP. This NCP Product Schedule Notebook contains a compilation of product bulletins summarizing technical information and test results for those products listed on EPA's NCP Product Schedule.

Manufacturers/contacts of products on the Schedule are required to amend their technical product bulletins whenever there are changes in product formulation, application rates, and handling procedures. Updates to this Notebook, such as the addition of new products to the Schedule, or modifications and/or deletions of listed products, will be indicated in bold.

For further information, please leave a message on EPA's NCP Information Line at (202) 260-2342, or contact Leigh DeHaven (EPA Office of Emergency Management (OEM)) at (202) 564-1974 or Nick Nichols (EPA OEM) at (202) 564-1970.

Written requests may be mailed to:

NCP Product Schedule Manager
U.S. Environmental Protection Agency
Office of Emergency Management (OEM)
Regulation and Policy Development Division
Ariel Rios Building
1200 Pennsylvania Avenue, NW (Room 6450EE, Mail Code 5104A)
Washington, DC 20460

Currently Listed Products by Category:

Dispersants	14
Surface Washing Agents	**27**
Surface Collecting Agents	0
Bioremediation Agents	15
Biological Additives (10)	
--Microbiological Cultures (9)	
--Enzyme Additives (1)	
Nutrient Additives (5)	
Miscellaneous Oil Spill Control Agents	10
Total	**66**

Note changes to the Schedule:	JD-109 (D-6), JD-2000™ (D-7), and RAPIDGRAB 2000™ (M-24) updated contact numbers
Note new listings to the Schedule:	NOKOMIS 5-W (SW-38); and re-listing COREXIT® EC7664A (SW-1)
Note new deletions from the Schedule:	None for this update
Note no longer manufactured:	INIPOL EAP (B-10) and PRISTINE SEA II (B-54)
Note contact information not verified as of 12/01/2008:	NEOS AB3000 (D-2); MARE CLEAN (D-3); INIPOL EAP (B-10); BET BIOPETRO (B-48); PRISTINE SEA II (B-54); and LAND AND SEA RESTORATION PRODUCT 001 (VELITE) (B-55)

All changes and additions to the NCP Product Schedule are indicated in bold.

Updated: 5/11/2010

ALPHABETICAL LISTING - NCP PRODUCT SCHEDULE NOTEBOOK

NCP PRODUCT SCHEDULE NOTEBOOK LISTING BY PRODUCT TYPE

SURFACE COLLECTING AGENTS **PRODUCT NUMBER**

NONE LISTED

BIOREMEDIATION AGENTS **PRODUCT NUMBER**

TECHNICAL PRODUCT BULLETIN #D-1
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: MARCH 10, 1978
REVISED LISTING DATE: DECEMBER 18, 1995
"COREXIT® EC9527A"
(formerly COREXIT 9527)

I. NAME, BRAND, OR TRADEMARK
COREXIT® EC9527A
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Nalco Energy Services, L.P.
P.O. Box 87
Sugar Land, TX 77487-0087
Customer Services:
Phone: (800) 333-3714
Product Management:
Office: (281) 263-7336
Mobile: (281) 202-8126
E-mail: kapreston@nalco.com
(Ms. Kathryn Preston)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Nalco Energy Services, L.P.
P.O. Box 87
Sugar Land, TX 77487-0087
Customer Services:
Phone: (800) 333-3714
Product Management:
Office: (281) 263-7336
Mobile: (281) 202-8126
E-mail: kapreston@nalco.com
(Ms. Kathryn Preston)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
COREXIT® EC9527A is not classified as flammable by either DOT or IMO regulations.
2. Ventilation:
Avoid prolonged breathing of vapors. Use with ventilation equal to unobstructed outdoors in moderate breeze.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid eye contact. In case of eye contact, immediately flush eyes with large amounts of water for

at least 15 minutes. Get prompt medical attention.
Avoid contact with skin and clothing. In case of skin contact, immediately flush with large amounts of water, and soap if available. Remove contaminated clothing, including shoes, after flushing has begun. If irritation persists, seek medical attention. For open systems where contact is likely, wear long sleeve shirt, chemical resistant gloves, and chemical protective goggles.
4.a. Maximum storage temperature: 170°F
4.b. Minimum storage temperature: -30°F
4.c. Optimum storage temperature range: 40°F to 100°F
4.d. Temperatures of phase separations and chemical changes:
COREXIT® EC9527A is not adversely affected by changes in storage temperature unless evaporation is allowed to occur.

V. SHELF LIFE

The shelf life of unopened drums of COREXIT® EC9527A is unlimited. Containers should always be capped when not in use to prevent contamination and evaporation of solvents.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:
COREXIT® EC9527A is most effectively applied by aircraft, however, application with boat spray booms, boat fire monitors, and by hand held sprayers and back packs has been successfully done on a number of spills and trials.
Aerial Spraying - Aircraft provide the most rapid method of applying dispersants to an oil spill and a variety of aircraft can be used for spraying. For aerial spraying, COREXIT® EC9527A is applied undiluted. Typical application altitudes of 30 to 50 feet have been used, although higher altitudes may be effective under certain conditions. Actual effective altitudes will depend on the application equipment, weather and aircraft. Careful selection of spray nozzles is critical to achieve desired dose levels, since droplet size must be controlled. Many nozzles used for agricultural spraying are of low capacity and produce too fine a spray. A quarter-inch open pipe may be all that is necessary if the aircraft travels at 120 mph (104 knots) or more, since the air shear at these speeds will be sufficient to break the dispersant into the proper sized droplets.
Boat Spraying - COREXIT® EC9527A may be applied by workboats equipped with spray booms mounted ahead of the bow wake or as far forward as possible. The preferred and most effective method of application from a workboat is to use a low-volume, low-pressure pump so the chemical can be applied undiluted. Spray equipment designed to provide a five to ten percent diluted dispersant solution to the spray booms can also be used. COREXIT® EC9527A should be applied as droplets, not fogged or atomized. Natural wave or boat wake action usually provides adequate mixing energy to disperse the oil.
Recent tests have indicated that a fire monitor modified with a screen cap for droplet size may also be useful for applying COREXIT® EC9527A. Due to the increased volume output and the greater reach of the fire monitor, significantly more area can be covered in a shorter period of time.
System Calibration - Spray systems should be calibrated at temperatures anticipated to insure successful application and dosage control.

2. Concentration/Application Rate:
A treatment rate of about 2 to 10 U.S. gallons per acre, or a dispersant to oil ratio of 1:50 to 1: 10 is recommended. This rate varies depending on the type of oil, degree of weathering, temperature, and thickness of the slick.
3. Conditions for Use:
As with all dispersants, timely application ensures the highest degree of success. Early treatment with COREXIT® EC9527A, even at reduced treat rates, can reduce the "mousse" forming tendencies of the spilled oil. COREXIT® EC9527A is useful on oil spills in salt water.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
COREXIT® EC9527A	Menidia beryllina	14.57 96-hr
	Mysidopsis bahia	24.14 48-hr
No. 2 Fuel Oil	Menidia beryllina	10.72 96-hr
	Mysidopsis bahia	16.12 48-hr
COREXIT® EC9527A &	Menidia beryllina	4.49 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	6.60 48-hr
Reference Toxicant (DSS)	Menidia beryllina	7.07 96-hr
	Mysidopsis bahia	9.82 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.
b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL

Oil	Effectiveness (%)
Prudhoe Bay Crude	37.4
South Louisiana Crude	63.4
Average of Prudhoe Bay and South Louisiana Crudes	50.4

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: 163°F
2. Pour Point: < - 40°F
3. Viscosity: 160 cst at 32°F
4. Specific Gravity: 0.98 - 1.02
5. pH: 6.1
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: Water, Propylene Glycol, 2-Butoxyethanol
8. Additives: CONFIDENTIAL
9. Solubility: Complete

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

Compound	Concentration (ppm)
Arsenic	<0.005
Cadmium	<0.01
Chromium	1.0
Copper	<0.2
Lead	<0.1
Mercury	<0.003
Nickel	<0.1
Zinc	0.1
Cyanide	<0.01
Chlorinated Hydrocarbons	<0.01

EPA HAS NOT RECEIVED UPDATED CONTACT INFORMATION FOR THIS PRODUCT as of 12/01/08

TECHNICAL PRODUCT BULLETIN #D-2
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: APRIL 22, 1985
REVISED LISTING DATE: JANUARY 26, 1996
"NEOS AB3000"

I. NAME, BRAND, OR TRADEMARK
NEOS AB3000
Type of Product: Dispersant (Hydrocarbon Solvent Based)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
NEOS Company Limited
Daisan Kendai Building
1-2, 3-chome Isobedori
Chuo-ku, Kobe, 651-0084 Japan
Phone: (81) 78-331-9384
Fax: (81) 78-272-4649
(Mr. T. Ishii, Manager)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
NEOS Company Limited
Daisan Kendai Building
1-2, 3-chome Isobedori
Chuo-ku, Kobe, Japan
Phone: (81) 78-331-9384
Fax: (81) 78-272-4649
(Mr. T. Ishii, Manager)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
NEOS AB3000 is flammable; keep away from open flame.
2. Ventilation:
Special ventilation is not required; however, natural ventilation is recommended.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Contact may cause skin and eye irritation. Goggles and rubber clothing are recommended during application.
In case of contact with skin or eye, flush with copious amounts of fresh water. If severe, consult a doctor.
4.a. Maximum storage temperature: 158°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: 50°F to 140°F

4.d. Temperatures of phase separations and chemical changes:
Phase separation and chemical changes do not appear between the temperature range of 32°F to 158°F.

V. SHELF LIFE
The shelf life is five (5) years.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Spray neat concentrate on the oil slick in atomized form by means of a manual pump, or spray with a pump system incorporating an ejector system for drawing concentrate from the drum or stock tank.
For aerial application, use a spray boom with pressure nozzles or rotating atomizers mounted on helicopters or airplanes.
2. Concentration/Application Rate:
The application rate is 65 gallons of dispersant per ton of oil.
Five (5) to fifteen (15) parts of dispersant to suctioned water is recommended for ejector systems.
For aerial application, 75 to 125 gallons per ton of oil is recommended.
3. Conditions for Use:
NEOS AB3000 can be used in salt water. It is effective with crude and residual heavy oil. The dispersant is also effective at controlling volatile emissions from the oil.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
NEOS AB3000	Menidia beryllina	91.1 96-hr
	Mysidopsis bahia	33.0 48-hr
No. 2 Fuel Oil	Menidia beryllina	201.8 96-hr
	Mysidopsis bahia	11.5 48-hr
NEOS AB3000 &	Menidia beryllina	57.0 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	25.0 48-hr
Reference Toxicant (DSS)	Menidia beryllina	1.5 96-hr
	Mysidopsis bahia	9.3 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.
b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL

Oil	Effectiveness (%)
Prudhoe Bay Crude	19.7
South Louisiana Crude	89.8
Average of Prudhoe Bay and South Louisiana Crudes	54.8

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: No flash point to 212°F
2. Pour Point: Less than 32°F
3. Viscosity: 30.7 cSt at 104°F
4. Specific Gravity: 0.924 at 59°F
5. pH: 8.0 (5wt % aq., at 77°F)
6. Surface Active Agents: Nonionic and Cationic surfactants
7. Solvents: Paraffins
8. Additives: None
9. Solubility: NA

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

Compound	Concentration (ppm)
Arsenic	<0.1
Cadmium	<0.1
Chromium	0.26
Copper	<0.05
Lead	0.21
Mercury	<0.001
Nickel	0.076
Zinc	1.1
Cyanide	<0.05
Chlorinated Hydrocarbons	<0.10

EPA HAS NOT RECEIVED UPDATED CONTACT INFORMATION FOR THIS PRODUCT as of 12/01/08

TECHNICAL PRODUCT BULLETIN #D-3
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: FEBRUARY 23, 1988
REVISED LISTING DATE: JANUARY 26, 1996
"MARE CLEAN 200"
(formerly MARE CLEAN 505)

I. NAME, BRAND, OR TRADEMARK
MARE CLEAN 200
Type of Product: Dispersant (Solvent-Based)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Taiho Industries Co., Ltd.
21-44, 2-chome, Takanawa
Minatoku, Tokyo, Japan
Phone: (81) 33-445-8111
Fax: (81) 33-443-6333
(Mr. Y. Abe)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Klinview Corporation
8001 Irvine Center Drive, Suite 450
Irvine, CA 92618
Phone: (949) 753-0821
Fax: (949) 753-0812
(Mr. T. Tanaka)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
The flash point is 212 @ 20°F
2. Ventilation:
Is required. Use in closed room is not recommended.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Use protective goggles to avoid eye contact. In case of eye contact, wash immediately with plenty of water and consult with physician.
4.a. Maximum storage temperature: 122°F
4.b. Minimum storage temperature: 21°F
4.c. Optimum storage temperature range: 32°F to 86°F
4.d. Temperatures of phase separations and chemical changes:
Phase separation does not relate to temperatures. Chemical changes may occur at temperatures above 194°F.

V. SHELF LIFE

The shelf life of MARE CLEAN 200 is 10 years when stored indoors. (Container will deteriorate before contents.)

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

Sprinkle the dispersant on the oil spill, then 5-10 minutes later stir the surface intensively. For convenience, MARE CLEAN 200 may be diluted with water if desired.

2. Concentration/Application Rate:

Use 53-66 gallons of MARE CLEAN 200 per ton of oil

3. Conditions for Use:

The performance of MARE CLEAN 200 is not affected by water salinity. At temperatures below 40 F or in case of heavy crude oil spill, MARE CLEAN 200 should be used without dilution. MARE CLEAN 200 is an effective dispersant for any liquid hydrocarbon.

VII. TOXICITY AND EFFECTIVENESS

1. Toxicity:

Material Tested	Species	LC50 (ppm)	
MARE CLEAN 200	Menidia beryllina	1996.00	96-hr
	Mysidopsis bahia	938.00	48-hr
No. 2 Fuel Oil	Menidia beryllina	10.72	96-hr
	Mysidopsis bahia	16.12	48-hr
MARE CLEAN 200 and	Menidia beryllina	42.00	96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	9.84	48-hr
Reference Toxicant (SDS)	Menidia beryllina	7.07	96-hr
	Mysidopsis bahia	9.82	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.

b. Effectiveness:

SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OILS

Oil	Effectiveness (%)
Prudhoe Bay Crude	63.97
South Louisiana Crude	84.14
Average of Prudhoe Bay and South Louisiana Crudes	74.06

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: 212 @ 20°F
2. Pour Point: 14 @ 10°F
3. Viscosity: 2.4 @ 5 cst at 104°F

4. Specific Gravity: 0.95 @ 0.03 at 77°F
5. pH: 7.7 @ 1.0 (10% solution)
6. Surface Active Agents:
A mixture of sorbitan fatty acid esters, polysorbates, and polyoxyethylene fatty acid esters.
7. Solvents: Paraffinic hydrocarbons (CAS 74664-93-0)
8. Additives: None
9. Solubility: NA

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

Compound	Concentration (ppm)
Arsenic	<0.50
Cadmium	<0.100
Chromium	<0.500
Copper	<0.250
Lead	<2.50
Mercury	<0.0200
Nickel	<0.250
Zinc	0.611
Cyanide	<0.01
Chlorinated Hydrocarbons	<0.10

TECHNICAL PRODUCT BULLETIN #D-4
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: APRIL 13, 1994
REVISED LISTING DATE: DECEMBER 18, 1995
"COREXIT® EC9500A"
(formerly COREXIT 9500)

I. NAME, BRAND, OR TRADEMARK
COREXIT® EC9500A
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Nalco Energy Services, L.P.
P.O. Box 87
Sugar Land, TX 77487-0087
Customer Services:
Phone: (800) 333-3714
Product Management:
Office: (281) 263-7336
Mobile: (281) 202-8126
E-mail: kapreston@nalco.com
(Ms. Kathryn Preston)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Nalco Energy Services, L.P.
P.O. Box 87
Sugar Land, TX 77487-0087
Customer Services:
Phone: (800) 333-3714
Product Management:
Office: (281) 263-7336
Mobile: (281) 202-8126
E-mail: kapreston@nalco.com
(Ms. Kathryn Preston)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
IMO - Non-flammable; DOT - Non-hazardous.
2. Ventilation:
Use with ventilation equal to unobstructed outdoors in moderate breeze.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid eye contact. In case of eye contact, immediately flush eyes with large amounts of water for at least 15 minutes. Get prompt medical attention.

Avoid contact with skin and clothing. In case of skin contact, immediately flush with large amounts of water, and soap if available. Remove contaminated clothing, including shoes, after flushing has begun. If irritation persists, seek medical attention.
For open systems where contact is likely, wear long sleeve shirt, chemical resistant gloves, and chemical protective goggles.
4.a. Maximum storage temperature: 170°F
4.b. Minimum storage temperature: -30°F
4.c. Optimum storage temperature range: 40°F to 100°F
4.d. Temperatures of phase separations and chemical changes: None

V. SHELF LIFE
The shelf life of unopened drums of COREXIT® EC9500A is unlimited. Containers should always be capped when not in use to prevent contamination and evaporation of solvents.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
COREXIT® EC9500A contains the same surfactants present in COREXIT® EC9527A and a new improved oleophilic solvent delivery system.
Aerial Spraying - Aircraft provide the most rapid method of applying dispersants to an oil spill and a variety of aircraft can be used for spraying. For aerial spraying, COREXIT® EC9500A is applied undiluted. Typical application altitudes of 30 to 50 feet have been used, although higher altitudes may be effective under certain conditions. Actual effective altitudes will depend on the application equipment, weather and aircraft. Careful selection of spray nozzles is critical to achieve desired dose levels, since droplet size must be controlled. Many nozzles used for agricultural spraying are of low capacity and produce too fine a spray. A quarter-inch open pipe may be all that is necessary if the aircraft travels at 120 mph (104 knots) or more, since the air shear at these speeds will be sufficient to break the dispersant into the proper sized droplets.
Boat Spraying - COREXIT® EC9500A may also be applied by workboats equipped with spray booms mounted ahead of the bow wake or as far forward as possible. The preferred and most effective method of application from a workboat is to use a low-volume, low-pressure pump so the chemical can be applied undiluted. Spray equipment designed to provide a five to ten percent diluted dispersant solution to the spray booms can also be used. COREXIT® EC9500A should be applied as droplets, not fogged or atomized. Natural wave or boat wake action usually provides adequate mixing energy to disperse the oil.
Recent tests have indicated that a fire monitor modified with a screen cap for droplet size control may also be useful for applying COREXIT® EC9500A. Due to the increased volume output and the greater reach of the fire monitor, significantly more area can be covered in a shorter period of time.
System Calibration - Spray systems should be calibrated at temperatures anticipated to insure successful application and dosage control. Application at sub-freezing temperatures may require larger nozzle, supply lines and orifices due to higher product viscosity.
2. Concentration/Application Rate:
A treatment rate of about 2 to 10 U.S. gallons per acre, or a dispersant to oil ratio of 1:50 to 1:10 is recommended. This rate varies depending on the type of oil, degree of weathering, temperature, and thickness of the slick.

3. Conditions for Use:
As with all dispersants, timely application ensures the highest degree of success. Early treatment with COREXIT® EC9500A, even at reduced treat rates, can also counter the "mousse" forming tendencies of the spilled oil. COREXIT® EC9500A is useful on oil spills in salt water.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity

Material Tested	Species	LC50 (ppm)
COREXIT® EC9500A	Menidia beryllina	25.20 96-hr
	Mysidopsis bahia	32.23 48-hr
No. 2 Fuel Oil	Menidia beryllina	10.72 96-hr
	Mysidopsis bahia	16.12 48-hr
COREXIT® EC9500A &	Menidia beryllina	2.61 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	3.40 48-hr
Reference Toxicant (SDS)	Menidia beryllina	7.07 96-hr
	Mysidopsis bahia	9.82 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.

b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OILS

Oil	Effectiveness (%)
Prudhoe Bay Crude	45.3
South Louisiana Crude	54.7
Average of Prudhoe Bay and South Louisiana Crudes	50.0

VIII. MICROBIOLOGICAL PROPERTIES
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: 181.4°F
2. Pour Point: <-71°F
3. Viscosity: 22.5 cst at 104°F
4. Specific Gravity: 0.95 at 60°F
5. pH: 6.2
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: CONFIDENTIAL
8. Solvents: CONFIDENTIAL
9. Additives: None
10. Solubility: Miscible

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

Compound	Concentration (ppm)
Arsenic	0.16
Cadmium	ND
Chromium	0.03
Copper	0.10
Lead	ND
Mercury	ND
Nickel	ND
Zinc	ND
Cyanide	ND
Chlorinated hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #D-5
USEPA, OIL PROGRAM CENTER
LISTING DATE: APRIL 22, 1999
"DISPERSIT SPC 1000™"
(aka, SEACARE E.P.A. (ECOSPERSE™ POLLUTION ABATEMENT))

I. NAME, BRAND, OR TRADEMARK
DISPERSIT SPC 1000™
Type of Product: Dispersant (Water Based)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
U.S. Polychemical Corp.
584 Chestnut Ridge Road
Chestnut Ridge, NY 10977
Phone: (845) 356-5530
Fax: (845) 356-6656
E-mail: bruceg@uspoly.com
(Mr. Bruce Gebhardt)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Maritime Solutions, Inc.
17 Battery Pl. Suite 913
New York, NY 10004
Phone: (201) 541-0939
(212) 747-9044
Fax: (212) 747-9240
(Mr. Chris Constantine / Mr. Richard Fredricks)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
IMO: Non-flammable
DOT: Non-hazardous
2. Ventilation:
None normally required. Adequate to maintain fume levels below the TLV.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid prolonged contact with skin and eyes. Flush eyes with plenty of water for at least 15 minutes. Get medical attention. Wear long sleeve shirt, chemical resistant gloves, and chemical protective goggles in case of exposure to mist.
4.a. Maximum storage temperature: 180°F
4.b. Minimum storage temperature: -25°F
4.c. Optimum storage temperature range: 40°F to 140°F
4.d. Temperatures of phase separations and chemical changes: None

V. SHELF LIFE
The shelf life of DISPERSIT SPC 1000™ is unlimited in unopened containers. Containers must be kept closed when not in use to prevent contamination.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
The dispersant may be applied by any conventional methods such as 1) aerial spraying and 2) boat spraying to accommodate weather conditions.
2. Concentration/Application Rate:
A dispersant to oil ratio ranging from 1 part dispersant to 50 parts oil to 1 part dispersant to 10 parts oil; or an application rate of about 2-10 gallons (7.6 liters- 37.9 liters) per acre (4840 square meters) is suggested. These rates will be dependent on the type of oil, degree of weathering, temperature and extent of oil slick.
3. Conditions for Use:
Timely application ensures the highest degree of successful dispersion of the oil spill.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
DISPERSIT SPC 1000™	Menidia beryllina	3.5 96-hr
	Mysidopsis bahia	16.6 48-hr
No. 2 Fuel Oil	Menidia beryllina	11.6 96-hr
	Mysidopsis bahia	11.7 48-hr
DISPERSIT SPC 1000™	Menidia beryllina	7.9 96-hr
& No. 2 Fuel Oil (1:10)	Mysidopsis bahia	8.2 48-hr
Reference Toxicant (SDS)	Menidia beryllina	6.3 96-hr
	Mysidopsis bahia	11.7 48-hr

b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL

Oil	Effectiveness (%)
Prudhoe Bay Crude	40
South Louisiana Crude	105
Average of Prudhoe Bay and South Louisiana Crudes	73

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point, ASTM D-56-87: 208°F
2. Pour Point, ASTM D-97-87: <-20°C
3. Viscosity, ASTM D-445-88: 144CPS, @ 68°F
4. Specific Gravity, ASTM D-1298-85(90): 0.995, @ 68°F
5. pH, ASTM D-1293-84(90): 10.0
6. Surface Active Agents: Anionic and non-ionic, proprietary, surfactants

7. Solvents: Proprietary, non-petroleum based
8. Additives: None
9. Solubility in Water: Complete

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

Compound	Concentration (ppm)
Arsenic	<1.00
Cadmium	<2.00
Chromium	<2.00
Copper	<2.00
Lead	<1.00
Mercury	<0.04
Nickel	<10.00
Zinc	<2.00
Cyanide	<2.00
Chlorinated Hydrocarbons	<5.00

UPDATED INFORMATION IN BOLD

TECHNICAL PRODUCT BULLETIN #D-6
USEPA, OIL PROGRAM CENTER
LISTING DATE: SEPTEMBER 20, 2000
"JD-109"

I. NAME, BRAND, OR TRADEMARK
JD-109
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
GlobeMark Resources Ltd.
1205 Pine Heights Drive
Atlanta, GA 30324
Mobile: (254) 231-2251
E-mail: joannie@globemarkresouces.com
Web Site: http://www.globemarkresources.com
(Ms. Joannie Docter)
E-mail: mikeclmail@gmail.com
(Mr. Mike Peterson)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
GlobeMark Resources Ltd.
1205 Pine Heights Drive
Atlanta, GA 30324
Mobile: (254) 231-2251
E-mail: joannie@globemarkresouces.com
Web Site: http://www.globemarkresources.com
(Ms. Joannie Docter)
E-mail: mikeclmail@gmail.com
(Mr. Mike Peterson)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
IMO - Nonflammable; DOT - Nonhazardous
2. Ventilation:
Use with ventilation equal to unobstructed outdoors in a moderate breeze.
3. Skin and eye contact, protective clothing, treatment in case of contact:
Avoid skin and clothing contact. If skin contact occurs, immediately wash with large amounts of soap and water (if possible). Remove any contaminated clothing and shoes. Launder before reusing. If irritation persists, seek medical assistance. For areas where contact is likely, wear long sleeve shirt, chemical resistant gloves, and chemical resistant goggles.
4.a. Maximum storage temperature: 120°F

4.b. Minimum storage temperature: - 4°F
4.c. Optimum storage temperature range: 32°F to 90°F
4.d. Temperatures of phase separations and chemical changes: None

V. SHELF LIFE
The shelf life of unopened drums of JD-109 in unlimited. Containers should be capped when not being used to prevent contamination and evaporation.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method: The most rapid and effective method of applying JD-109 to a oil spill is by spraying. Temperature ranges for application should not drop below 32 F or exceed 120 F. Aerial Spraying - Typical application altitudes of 30 to 50 feet are advised although higher altitudes may be used if conditions warrant. Spray nozzle should be about ¼ inches in diameter flying at 104 knots or more to create enough water shear sufficient to break the dispersant into proper sized droplets. A ½ inch diameter nozzle may be needed for temperatures below 50 F. Boat Spraying - JD-109 can also be applied by workboats with spray booms mounted as far forward as possible of the bow or wake. The most effective application from a workboat is a low-volume, low-pressure pump.
2. Concentration/Application Rate: A treatment rate of about 2 to 10 US gallons (7.6 to 37.9 liters) per acre (4,840 square meters) or a dispersant to oil ratio of 1:50 to 1:10 is recommended. The rate may vary depending on the type of oil, degree of weathering, temperature and thickness of slick.
3. Conditions for Use: As with any oil related spill, timely application of a dispersant will ensure the highest degree of success. Timely treatment with JD-109, even at low application rates, can counter the "mousse" forming effect of the spilled oil.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
JD-109	Menidia beryllina	1.90 96-hr
	Mysidopsis bahia	1.18 48-hr
No. 2 Fuel Oil	Menidia beryllina	9.35 96-hr
	Mysidopsis bahia	3.13 48-hr
JD-109 & No. 2 Fuel Oil	Menidia beryllina	3.84 96-hr
(1:10)	Mysidopsis bahia	3.51 48-hr
Reference Toxicant (SRT)	Menidia beryllina	2.63 96-hr
	Mysidopsis bahia	8.06 48-hr

b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL

Oil	Effectiveness (%)
Prudhoe Bay Crude	26
South Louisiana Crude	91
Average of Prudhoe Bay and South Louisiana Crudes	58.5

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point, ASTM D3278-89: 93°C
2. Pour Point, ASTM D97-87: -19°C
3. Viscosity, ASTM D445-88: 202.9 cst
4. Specific Gravity, ASTM D1298-85 (90): 1.02
5. pH, ASTM D1293-84 (90): 9.45
6. Surface Active Agents: Anionic and nonionic, proprietary, surfactants
7. Solvents: Proprietary, ester based
8. Additives: None
9. Solubility in Water: Miscible in oil, water, and solvents

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

Compound	Concentration (ppm)
Arsenic	<10
Cadmium	<10
Chromium	<10
Copper	<10
Lead	<10
Mercury	<1
Nickel	<10
Zinc	<10
Cyanide	<0.5
Chlorinated Hydrocarbons	<1.4

UPDATED INFORMATION IN BOLD

TECHNICAL PRODUCT BULLETIN #D-7
USEPA, OIL PROGRAM CENTER
LISTING DATE: AUGUST 06, 2001
"JD-2000™"

I. NAME, BRAND, OR TRADEMARK
JD-2000™
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
GlobeMark Resources Ltd.
1205 Pine Heights Drive
Atlanta, GA 30324
Mobile: (254) 231-2251
E-mail: joannie@globemarkresouces.com
Web Site: http://www.globemarkresources.com
(Ms. Joannie Docter)
E-mail: mikeclmail@gmail.com
(Mr. Mike Peterson)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
GlobeMark Resources Ltd.
1205 Pine Heights Drive
Atlanta, GA 30324
Mobile: (254) 231-2251
E-mail: joannie@globemarkresouces.com
Web Site: http://www.globemarkresources.com
(Ms. Joannie Docter)
E-mail: mikeclmail@gmail.com
(Mr. Mike Peterson)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
IMO - Non-flammable. This product is not regulated by DOT when shipped domestically by land.
2. Ventilation:
Use with ventilation equal to unobstructed outdoors in a moderate breeze.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid skin and clothing contact. If skin contact occurs, immediately wash with large amounts of soap and water (if possible). Remove any contaminated clothing and shoes. Launder before reusing. If irritation persists, seek medical assistance. For areas where contact is likely, wear long sleeve shirt, chemical resistant gloves, and chemical resistant goggles.

4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: -30°F
4.c. Optimum storage temperature range: 30°F to 90°F
4.d. Temperatures of phase separations and chemical changes: None

V. SHELF LIFE

The shelf life of unopened drums of JD-2000™ is unlimited. Containers should be capped when not being used to prevent contamination and evaporation. Opened container should be used within 1 year for optimal performance. Poly containers are recommended for storage near wet environments, i.e., ships, harbors, ports, etc.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method: JD-2000™ is free of phosphates, aromatic chlorinated solvents, branched ethoxylated alcohols, and hydrotreated distillates. Optimum temperature for application is above 30°F.

Aerial Spraying - Typical application altitudes of 30 to 50 feet are advised although higher altitudes may be used if conditions warrant. Spray nozzle should be about ¼ inch in diameter flying at 104 knots or more to create enough air shear sufficient to break the dispersant into proper sized droplets. A ½ inch diameter nozzle may be needed for temperatures from 30 F to 30°F.

Boat Spraying - JD-2000™ can also be applied by workboats with spray booms mounted as far forward as possible of the bow or wake. The most effective application from a workboat is a low-volume, low-pressure pump.

2. Concentration/Application Rate: JD-2000™ is an oil spill dispersant concentrate that may be diluted by 5 to 10 percent with water if needed. A treatment rate of about 2 to 10 U.S. gallons (7.6 to 37.9 liters) per acre (4,840 square meters) or a dispersant to oil ratio of 1:50 to 1:10 is recommended. The rate may vary depending on the type of oil, degree of weathering, temperature, and thickness of slick.

3. Conditions for Use: As with any oil related spill, timely (preferably within 48 hours) application of a dispersant will ensure the highest degree of success. Timely treatment with JD-2000™, even at low application rates, can counter the “mousse” forming effect of the spilled oil.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)
JD-2000™	Menidia beryllina	407.00 96-hr
	Mysidopsis bahia	90.50 48-hr
No. 2 Fuel Oil	Menidia beryllina	8.39 96-hr
	Mysidopsis bahia	2.58 48-hr
JD-2000™ & No. 2 Fuel Oil	Menidia beryllina	3.59 96-hr
(1:10)	Mysidopsis bahia	2.19 48-hr
Reference Toxicant (SDS)	Menidia beryllina	2.22 96-hr
	Mysidopsis bahia	10.50 48-hr

2. Effectiveness:

SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL

Oil	Effectiveness (%)
Prudhoe Bay Crude	60.4
South Louisiana Crude	77.8
Average of Prudhoe Bay and South Louisiana Crudes	69.1

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1.Flash Point (SW1010): 212°F
2.Pour Point (ASTM D97): -36°F
3.Viscosity (ASTM D445):65.2 cst
4.Specific Gravity 60/60 (ASTM D287): 0.99
5.pH (EPA 150.1): 7.54
6.Surface Active Agents: CONFIDENTIAL
7.Solvents: CONFIDENTIAL
8. Additives: None
9.Solubility in Water: Dispersible in fresh and salt water. Miscible in oil, water, and solvents

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

Compound	Concentration (ppm)
Arsenic	<0.24
Cadmium	<0.10
Chromium	<0.10
Copper	<0.10
Lead	0.43
Mercury	<0.10
Nickel	<0.10
Zinc	0.11
Cyanide	<0.20
Chlorinated Hydrocarbons	<2.00

TECHNICAL PRODUCT BULLETIN #D-8
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: MARCH 04, 2002
REVISED LISTING DATE:
"NOKOMIS 3-F4"

I. NAME, BRAND, OR TRADEMARK
NOKOMIS 3-F4
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Mar-Len Supply, Inc
23159 Kidder Street
Hayward, CA 94545
Phone: (510) 782-3555
Fax: (510) 782-2032
(Mr. Frank Winter)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Mar-Len Supply, Inc
23159 Kidder Street
Hayward, CA 94545
Phone: (510) 782-3555
Fax: (510) 782-2032
(Mr. Frank Winter)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable (water based)
2. Ventilation:
No special requirements
3. Skin and eye contact; protective clothing; treatment in case of contact:
In case of eye contact, flush with water; in case of skin contact, wash with water; and if swallowed, drink water to dilute and induce vomiting.
4.a. Maximum storage temperature: 212°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: 50°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
15 years or more if stored correctly in plastic drums.

VI. RECOMMENDED APPLICATION PROCEDURES
1. Application Method: Application of the product may be made directly from 33 and 35 gallon

drums (marketing sizes) by fitting the drum with a "T" connection and pumping fresh or salt water across the junction, which will pull the dispersant from the drum into the water stream and onto the oil spill.
2. Concentration/Application Rate: For heavy concentrations of crude or Bunker C oil, apply the product undiluted. Where lighter fractions of petroleum are involved, the product can be diluted up to one part dispersant to 30 parts water.
3. Conditions for Use: Effective in salt water, and can be used on water of any temperature.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)
NOKOMIS 3-F4	Menidia beryllina	29.80 96-hr
	Mysidopsis bahia	32.20 48-hr
No. 2 Fuel Oil	Menidia beryllina	100.00 96-hr
	Mysidopsis bahia	72.70 48-hr
NOKOMIS 3-F4 &	Menidia beryllina	100.00 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	58.40 48-hr
Reference Toxicant (DSS)	Menidia beryllina	159.60 96-hr
	Mysidopsis bahia	267.70 48-hr

b. Effectiveness:

SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL

Oil	Effectiveness (%)
Prudhoe Bay Crude	62.20
South Louisiana Crude	64.90
Average of Prudhoe Bay and South Louisiana Crudes	63.55

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: None
2. Pour Point: 28°F
3. Viscosity: 290 cps at 20C (68°F)
4. Specific Gravity: 1.0065g/cc at 20°C (68°F)
5. pH: 10.3 (at room temperature)
6. Surface Active Agents: Confidential
7. Solvents: None
8. Additives: None
9. Solubility: Completely water soluble

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

Compound	Concentration (ppm)
Arsenic	0.30
Cadmium	<5.00
Chromium	<10.00
Copper	<10.00
Lead	<10.00
Mercury	<0.05
Nickel	<10.00
Zinc	<10.00
Cyanide	<2.00
Chlorinated Hydrocarbons	<1.00

TECHNICAL PRODUCT BULLETIN #D-9
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JUNE 28, 2002
REVISED LISTING DATE:
"BIODISPERS"
(formerly PETROBIODISPERS)

I. NAME, BRAND, OR TRADEMARK
BIODISPERS
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Petrobiotech LLC
P.O. Box 813
Newport, NH 03773
Phone: (203) 966-4573
Fax: (561) 966-0920
(Mr. Frances Sullivan)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Petrobiotech LLC
P.O. Box 813
Newport, NH 03773
Phone: (203) 966-4573
Fax: (561) 966-0920
(Mr. Frances Sullivan)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable
2. Ventilation:
Use general ventilation to minimize exposure to vapor or mist.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Skin contact - immediately flush with copious amounts of water. Remove and wash contaminated clothing and shoes. If irritation persists, see a doctor. Eye contact - may cause eye irritation. In case of contact, immediately flush eyes with plenty of water. If irritation persists, immediately see a doctor. Hygenic practices - wear safety glasses. Wear gloves in accordance with routine laboratory safety precautions.
4.a. Maximum storage temperature: >70°C
4.b. Minimum storage temperature: -25°C
4.c. Optimum storage temperature range:
4.d. Temperatures of phase separations and chemical changes:
No phase or chemical separation observed.

V. SHELF LIFE
The product has unlimited shelf life.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Recommended application is by aircraft, fireboat monitors or similar apparatus.
2. Concentration/Application Rate:
Concentration varies with spilled material - Solvents at 5%, light oils at 10%, medium oils at 10%, and heavy oils at 10%.
3. Conditions for Use:
Data is for water temperature of 40°F to 65°F. There are no known application restrictions.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
BIODIPSERS	Menidia beryllina	13.46 96-hr
	Mysidopsis bahia	78.90 48-hr
No. 2 Fuel Oil	Menidia beryllina	12.42 96-hr
	Mysidopsis bahia	2.82 48-hr
BIODIPSERS &	Menidia beryllina	5.95 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.66 48-hr
Reference Toxicant (SDS)	Menidia beryllina	11.84 96-hr
	Mysidopsis bahia	21.81 48-hr

b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL

Oil	Effectiveness (%)
Prudhoe Bay Crude	51.0
South Louisiana Crude	63.0
Average of Prudhoe Bay and South Louisiana Crudes	57.0

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point, ASTM Method D56: 193°F
2. Pour Point, ASTM Method D97: - 26°F
3. Viscosity at 40 C, ASTM Method D445: Initial boil point 104.2°C, at 50 mL 109°C, at 70 mL 111°C, at 80 mL 113.7°C, final temperature 307.1°C)
4. Specific Gravity: 0.965
5. pH: 7
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: Water
8. Additives: None

9. Solubility: Product is 100% soluble in water.

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

Compound	Concentration (ppm)
Arsenic	<2.50
Cadmium	<0.75
Chromium	<0.75
Copper	<0.50
Lead	<5.00
Nickel	<1.20
Zinc	<0.50
Cyanide	3.90*
Chlorinated Hydrocarbons	<5.00

*During the analysis of cyanide on sample #V202057-01 (Petrotech Dispersant) analyst encountered interferences due to the matrix of sample. Soapy residue created a false positive for cyanide. Sample showed no traces of cyanide. Value related to the soap film turbidity.

TECHNICAL PRODUCT BULLETIN #D-10
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: NOVEMBER 26, 2002
REVISED LISTING DATE:
"SEA BRAT #4"

I. NAME, BRAND, OR TRADEMARK
SEA BRAT #4
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Alabaster Corp.
6921 Olson
Pasadena, TX 77505
Phone: (281) 487-5482
(800) 609-2728
Fax: (281) 487-9014
E-mail: alabastercorp@aol.com
(Mr. Charles A. Sheffield)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Garner Environmental Services
3197 Main Street
LaMarque, TX 77568
Phone: (800) 935-0308
Fax: (409) 935-0678
E-mail: alabastercorp@aol.com
(Mr. Jack Campbell)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable
2. Ventilation:
Normal.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Wear safety glasses or goggles, gloves, and rubber boots. Wash after each shift. Remove and wash contaminated clothing before reuse. No respiratory protection is required. Local exhaust is desirable. Mechanical exhaust is helpful in congested areas.
Skin contact - flush with water. Seek medical attention if irritation persists. Eye contact - flush with water using eye cup or fountain for 15 minutes. Seek medical attention if irritation persists. Ingestion - seek medical attention. Inhalation - no medical attention is required with inhalation.
4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: 35°F
4.c. Optimum storage temperature range: NA

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

V. SHELF LIFE
Indefinite when stored properly.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Spray affected area with a high pressure pump. Always apply in compliance with federal, state, and local laws.
2. Concentration/Application Rate:
Dilution ratios of 1 part SEA BRAT #4 to 9 parts water for a 10 percent solution.
3. Conditions for Use:
May be applied to the coastal waters of the U.S. It is designed for hydrocarbon spills on water temperatures between 50°F and 90°F. It is best applied with nozzle pressure of between 80 psi and 100 psi, with a direct hard spray and continuously moving the stream of water over the entire surface.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
SEA BRAT #4	Menidia beryllina	30.00 96-hr
	Mysidopsis bahia	14.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	16.00 96-hr
	Mysidopsis bahia	14.00 48-hr
SEA BRAT #4 &	Menidia beryllina	23.00 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	18.00 48-hr
Reference Toxicant (DSS)	Menidia beryllina	1.14 96-hr
	Mysidopsis bahia	0.98 48-hr

b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL
VENDOR LAB REPORT:

Oil	Effectiveness (%)
Prudhoe Bay Crude	53.55
South Louisiana Crude	60.65
Average of Prudhoe Bay and South Louisiana Crudes	57.10

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES

1. Flash Point, ASTM Method D56: 200°F
2. Pour Point, ASTM Method D97: 4°F
3. Viscosity (furol seconds): 380 at 77°F
4. Specific Gravity (g/cc): 0.994 at 70°F
5. pH: 9.45
6. Surface Active Agents: Surfactants
7. Solvents: Propylene glycol
8. Additives: None
9. Solubility: Soluble in all ratios.

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

Compound	Concentration (ppm)
Arsenic	<0.05
Cadmium	<0.05
Chromium	<0.05
Copper	<0.05
Lead	<0.05
Mercury	<0.0002
Nickel	<0.05
Zinc	0.215
Cyanide	<0.05
Chlorinated Hydrocarbons	<0.05

TECHNICAL PRODUCT BULLETIN #D-11
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JANUARY 30, 2003
REVISED LISTING DATE:
"FINASOL® OSR 52"
(aka, SEACARE ECOSPERSE 52)

I. NAME, BRAND, OR TRADEMARK
FINASOL® OSR 52
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
TOTAL FLUIDES
51, Esplanade du Général de Gaulle
92907 Paris La Défense Cédex
France
Phone: +33-141-356-101
U.S.: (713) 483-5712
24-hour Emergency Number: +33-1-41-35-65-00
E-mail: abdallah.bouhlassi@total.com
Web Site: www.totalspecialfluids.com
(Mr. Abdallah Bouhlassi)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Importer/U.S. Distributor
TOTAL PETROCHEMICALS USA, INC.
1201 Louisiana St., Suite 1800
Houston, TX 77002
Phone: (713) 483-5712
Fax: (713) 483-5700
Web Site: www.totalspecialfluids.com
(Mr. Peter Egan)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Keep well away from sources of ignition and heat. Avoid the accumulation of static electricity. Provide grounding.
2. Ventilation:
Keep containers closed when not in use. Do not inhale vapors, fumes, or mists. In case of inhalation, take the person into fresh air. Ensure adequate ventilation is provided if there is any risk of vapors, mists, or aerosols forming. In the event of serious problems, call a doctor or summon medical assistance urgently.
3. Skin and eye contact; protective clothing; treatment in case of contact:

Wear appropriate long sleeve shirts, chemical resistant gloves and goggles. Avoid contact with skin and eyes. In case of contact, wash immediately with plenty of water. Avoid contact with clothing. In case of contact, wash immediately and remove contaminated clothing. Prolonged and repeated contact with the skin may cause skin disorders. In case of ingestion, do not induce vomiting to prevent aspiration into the respiratory tract.
4.a. Maximum storage temperature: 65°C
4.b. Minimum storage temperature: -20°C
4.c. Optimum storage temperature range: 5 - 35°C
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
The shelf life of unopened drums of FINASOL OSR 52 is three years from the production date when the product is stored indoors in optimum conditions between 5 and 35°C. The shelf life can be extended after effectiveness testing.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
FINASOL OSR 52 is applied effectively by aircraft or from boats. It can also be applied by hand held sprayers as well as with backpack spray units. Spraying must not give too fine or atomized droplets as in fog. It must be done as moderately coarse droplets, with diameters in the range of 500 - 1000 m, whether application is by surface vessel, aircraft, or land-based equipment.
2. Concentration/Application Rate:
Use FINASOL OSR 52 from 1:5 to 1:50, according to the nature of the oil, its state of weathering, temperature, thickness of the slick, and other circumstances of the spill. A 1:10 ratio would correspond appreciatively to 26 gallons per ton of oil.
Aerial spraying - FINASOL OSR 52 is sprayed undiluted when applied from aircrafts, usually between 30 and 50 feet altitude, or at higher altitude in poor weather conditions.
Boat spraying - FINASOL OSR 52 is sprayed undiluted using a low-pressure system. Spraying equipment providing 5 to 10% dilution of FINASOL OSR 52 can also be used.
3. Conditions for Use:
Diluted application in low salinity water is not recommended. Use only receptacles, joints, pipes, etc. which are resistant to hydrocarbons. Do not spray at high pressure (> 3 bar). FINASOL OSR 52 is designed to treat spills in salt water.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
FINASOL OSR 52	Menidia beryllina	11.66 96-hr
	Mysidopsis bahia	9.37 48-hr
No. 2 Fuel Oil	Menidia beryllina	5.95 96-hr
	Mysidopsis bahia	2.37 48-hr
FINASOL OSR 52 &	Menidia beryllina	5.40 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.37 48-hr
Reference Toxicant (SDS)	Menidia beryllina	8.54 96-hr
	Mysidopsis bahia	21.81 48-hr

b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL
VENDOR LAB REPORT:

Oil	Effectiveness (%)
Prudhoe Bay Crude	32.50
South Louisiana Crude	71.60
Average of Prudhoe Bay and South Louisiana Crudes	52.10

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point, ASTM Method D-3278-89: 110°C
2. Pour Point, ASTM Method D-97-87: -27°C
3. Viscosity, ASTM Method D-445-88: 58.5 cSt
4. Specific Gravity, ASTM Method D-1298-85 (90): 1.01
5. pH, ASTM Method D-1293-84 (90): 8.57
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: CONFIDENTIAL
8. Additives: CONFIDENTIAL
9. Solubility: Dispersible in water.

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

Compound	Concentration (ppm)
Antimony	<10.0
Arsenic	<10.0
Barium	<10.0
Cadmium	<10.0
Chromium	<10.0
Copper	<10.0
Lead	<10.0
Mercury	<1.0
Nickel	<10.0
Selenium	<10.0
Silver	<10.0
Zinc	<10.0
Cyanide	<0.4
Chlorinated Hydrocarbons	<4.4

TECHNICAL PRODUCT BULLETIN #D-12
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JANUARY 03, 2005
REVISED LISTING DATE:
"SAF-RON GOLD"
(aka, SF-GOLD DISPERSANT)

I. NAME, BRAND, OR TRADEMARK
SAF-RON GOLD
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Sustainable Environmental Technologies Inc.
P.O. Box 30516
Mesa, AZ 85275
Customer Services:
Phone: (877) 853-2947
(800) 347-8950
Fax: (877) 853-2947
(480) 461-8798
24-hour Emergency Number:
(877) 853-2947
E-mail: info@sustainable-corp.com
bruce@sustainable-corp.com
Web Site: www.sustainable-corp.com
www.saf-ron.com
(Mr. Bruce Richards)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
TRK Enterprises, LLC
2000 Market St.
2530 Scottsville Road
Suite 12
Bowling Green, KY 42104
Phone: (270) 782-0882
(Mr. Karl Niles or Mr. Thomas W. Sprouse)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
Special ventilation is not required.
3. Skin and eye contact; protective clothing; treatment in case of contact:
No special equipment required; however, goggles are recommended. Skin contact - if irritation

occurs flush with water; seek medical attention if irritation persists. Eye contact - flush with plenty of water; seek medical attention if irritation persists.
4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: 40 - 120°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
The shelf life is unlimited in unopened containers.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Sprayer, Boat, Aircraft.
2. Concentration/Application Rate:
A dispersant to oil ratio ranging from 1:50 to 1:10 is recommended. For heavy high-viscosity oils - 8 gallons of SAF-RON GOLD will disperse approximately 70 gallons of crude oil or bunker C. Also for use with heavy high viscosity oils, SAF-RON GOLD can be used as a concentrate or diluted at a dispersant to water ratio of 1:10. For lighter oils, SAF-RON GOLD can be diluted at mixtures of 1:20 to 1:100. A recommended dispersant to water ratio of 1:40 can be used for most spills. Ratios are dependent upon type of oil and weather conditions.
3. Conditions for Use:
Any applicable condition determined by authorities for dispersant use.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
SAF-RON GOLD	Menidia beryllina	29.43 96-hr
	Mysidopsis bahia	63.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	16.76 96-hr
	Mysidopsis bahia	5.93 48-hr
SAF-RON GOLD	Menidia beryllina	9.25 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	3.04 48-hr
Reference Toxicant (SLS)	Menidia beryllina	15.94 96-hr
	Mysidopsis bahia	9.83 48-hr

b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL
VENDOR LAB REPORT:

Oil	Effectiveness (%)
Prudhoe Bay Crude	84.80
South Louisiana Crude	53.80

Average of Prudhoe Bay and South Louisiana Crudes 69.30

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point, ASTM Method D-56: >100°C
2. Pour Point, ASTM Method D-97: -2.5°C
3. Viscosity @40°C, ASTM Method D-445: 1.42 cSt
4. Specific Gravity @60°F/60°F, ASTM Method D-287: 1.014
5. pH: 8.8
6. Surface Active Agents: Proprietary blend of surface-active agents.
7. Solvents: None.
8. Additives: None.
9. Solubility: Fully water soluble.

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

Compound	Concentration (ppm)
Arsenic	<0.01
Cadmium	<0.005
Chromium	0.140
Copper	0.324
Lead	<0.005
Mercury	<0.020
Nickel	<0.005
Zinc	0.0671
Cyanide	<0.20
Chlorinated Hydrocarbons	<0.80

TECHNICAL PRODUCT BULLETIN #D-13
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JUNE 16, 2005
REVISED LISTING DATE:
"ZI-400"
(aka, ZI-400 OIL SPILL DISPERSANT)

I. NAME, BRAND, OR TRADEMARK
ZI-400
Type of Product: Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Z.I. Chemicals
8605 Santa Monica Boulevard, #38201
Los Angeles, CA 90069
Phone: (818) 827-1301
E-mail: sales@zichemicals.com
Web site: www.zichemicals.com
(Mr. Barnaby Zelman)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Z.I. Chemicals
8605 Santa Monica Boulevard, #38201
Los Angeles, CA 90069
Phone: (818) 827-1301
E-mail: sales@zichemicals.com
Web site: www.zichemicals.com
(Mr. Barnaby Zelman)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable (DOT: Non-Hazardous).
2. Ventilation:
No special requirements.
3. Skin and eye contact; protective clothing; treatment in case of contact:
No special equipment or clothing required; however, goggles are recommended. If eye or skin irritation occurs, flush with plenty of water.
4.a. Maximum storage temperature: 120°F continuous, 140°F up to 5 days
4.b. Minimum storage temperature: 35°F
4.c. Optimum storage temperature range: 40 - 120°F
4.d. Temperatures of phase separations and chemical changes: Stable

V. SHELF LIFE
Unlimited in sealed polydrums of totes (as delivered).

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
ZI-400 may be applied by the usual method of aerial or boat spraying. For smaller spills a drum pump with sprayer may be used, mixing with water as required depending on the type and viscosity of oil being treated.
2. Concentration/Application Rate:
On heavy oils use ZI-400 directly on the spill, or up to approximately a 1:10 dilution ratio (product:water). Lighter oils will require a 1:10 to 1:30 product to water dilution ratio. Warmer waters (greater than 78°F) and/or good agitation during application will require less product.
3. Conditions for Use:
No limitations as to usage within optimum temperature parameters (application may be made at or above 35°F, with optimum above 48°F).

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
ZI-400	Menidia beryllina	31.76 96-hr
	Mysidopsis bahia	20.96 48-hr
No. 2 Fuel Oil	Menidia beryllina	18.05 96-hr
	Mysidopsis bahia	2.66 48-hr
ZI-400	Menidia beryllina	8.35 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	1.77 48-hr
Reference Toxicant (SLS)	Menidia beryllina	16.13 96-hr
	Mysidopsis bahia	27.80 48-hr

b. Effectiveness:
SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL
VENDOR LAB REPORT:

Oil	Effectiveness (%)
Prudhoe Bay Crude	50.10
South Louisiana Crude	89.80
Average of Prudhoe Bay and South Louisiana Crudes	69.90

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point, ASTM D-56: >93°C
2. Pour Point, ASTM D-97: 12.6°F

3. Viscosity, ASTM D-445: 18.80 cSt @ 40°C
4. Specific Gravity, ASTM D-1298: 1.026 @ 60°F
5. pH, ASTM D-1293: 10.9
6. Surface Active Agents: Proprietary
7. Solvents: Proprietary
8. Additives: None.
9. Solubility: Miscible in oil, water, and solvents.

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

Compound	Concentration (ppm)
Arsenic	<10
Cadmium	<10
Chromium	<10
Copper	<10
Lead	<10
Mercury	<1
Nickel	<10
Zinc	<10
Cyanide	<0.5
Chlorinated Hydrocarbons	<1.0

TECHNICAL PRODUCT BULLETIN #D-14
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JULY 31, 2008
REVISED LISTING DATE:
"NOKOMIS 3-AA"

I. NAME, BRAND, OR TRADEMARK
NOKOMIS 3-AA
Type of Product: Water-Based Dispersant

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Mar-Len Supply, Inc
23159 Kidder Street
Hayward, CA 94545
Phone: (510) 782-3555
Fax: (510) 782-2032
(Mr. Frank Winter)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Mar-Len Supply, Inc
23159 Kidder Street
Hayward, CA 94545
Phone: (510) 782-3555
Fax: (510) 782-2032
(Mr. Frank Winter)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable (water based)
2. Ventilation:
No special requirements
3. Skin and eye contact; protective clothing; treatment in case of contact:
In case of eye contact, flush with water; in case of skin contact, wash with water; and if swallowed, drink water to dilute and induce vomiting.
4.a. Maximum storage temperature: 160°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: 32 - 140°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
In excess of 24 months or more if stored correctly in plastic drums.

VI. RECOMMENDED APPLICATION PROCEDURES

1. Application Method:

Aerial applied dispersant – spray from an aircraft flying with a controllable speed at altitudes of 30 to 50 feet. Spray nozzles should be sized to cover an area using 5 gallons per surface acre.

Spray from boat: NOKOMIS 3-AA can be applied by ships of workboat with spray booms mounted as far forward as possible. NOKOMIS 3-AA will generally be marketed in 55 gallon plastic drums. Application of the products may be made directly from the drum. By using a direct connection from pump to drum NOKOMIS 3-AA can be applied at full strength to the oil spill. The determination of whether to use NOKOMIS 3-AA at full strength or diluted with water must be determined by observations and evaluations made on-site at the oil spill.
Portable engine powered centrifugal water pumps are a satisfactory means of moving the dispersant from the container to the spill's surface. Diesel-powered larger capacity pump may also be used. If the spill is confined to a small area, a hand-pump connected directly to the 55 gallon drum can be used. Hose diameters and lengths will relate to capacities required for the specific situation and distances from the pump to container and the spill. Fire hose has been successfully used, and with hand pumps small diameter hose is adequate. Fog nozzles on the dispersing end of the hose provide a fine spray of NOKOMIS 3-AA full strength or diluted as appropriate. Any type of hose nozzle can be used, but preferable one with the ability to produce a spray rather than a coarse stream.

2. Concentration/Application Rate: NOKOMIS 3-AA may be applied to oil spills at full strength, or diluted with sea water. Where large areas of water may be covered with heavy concentrations of crude or Bunker C oil, it may be advantageous to apply NOKOMIS 3-AA at full strength. Where lighter fractions of petroleum are involved it is possible that dilutions of up to one part NOKOMIS 3-AA to 30 parts water may be applicable. Approximately 5 gallons of NOKOMIS 3-AA can be used for one surface acre of oil spill.

3. Conditions for Use: Once NOKOMIS 3-AA is applied to the water's surface, to obtain the most efficient emulsification of the oil it is necessary to agitate and mix dispersant, oil, and water thoroughly. In open unconfined areas, the use of ship propellers has been determined a practical way of accomplishing this purpose. By passing over the spill area on a grid system, the vessel's propellers will churn the water, causing the needed mixing. For a large spill, two or more vessels may be needed to apply the product and agitate the water. In and around piers and similar confined areas it is necessary to apply the product from small boats, the shore, or pier itself. Where it is impossible or impractical to supply agitation with propellers of a vessel it is necessary to use pumps and a hose, applying salt water in the coarse stream and under sufficient pressure to cause surface turbulences and subsequent mixing.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)
NOKOMIS 3-AA	Menidia beryllina	34.22 96-hr
	Mysidopsis bahia	20.16 48-hr
No. 2 Fuel Oil	Menidia beryllina	22.50 96-hr
	Mysidopsis bahia	11.07 48-hr
NOKOMIS 3-AA &	Menidia beryllina	7.03 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	5.56 48-hr
Reference Toxicant ($CuSO_4$)	Menidia beryllina	5.36 96-hr
	Mysidopsis bahia	7.83 48-hr

b. Effectiveness:

SWIRLING FLASK DISPERSANT EFFECTIVENESS TEST WITH SOUTH LOUISIANA (S/L) AND PRUDHOE BAY (P/B) CRUDE OIL

Oil	Effectiveness (%)
Prudhoe Bay Crude	63.20
South Louisiana Crude	65.70
Average of Prudhoe Bay and South Louisiana Crudes	64.50

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: None
2. Pour Point: 25 °F
3. Viscosity: 72.3 sus at 100°F
4. Specific Gravity: 1.031 at 60°F
5. pH: 9.0
6. Surface Active Agents: Confidential
7. Solvents: Propyleneglycol and Water
8. Additives: None
9. Solubility: Completely water soluble

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

Compound	Concentration (ppm)
Arsenic	<0.12
Cadmium	<0.25
Chromium	<0.25
Copper	<0.25
Lead	<0.12
Mercury	<0.0016
Nickel	<0.25
Zinc	<1.0
Cyanide	0.034

Chlorinated Hydrocarbons	<0.10

PRODUCT RE-LISTING

TECHNICAL PRODUCT BULLETIN #SW-1 (formerly D-4)
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: NOVEMBER 1, 1978
REVISED LISTING DATE: SEPTEMBER 27, 1995
RE-LISTING DATE: MAY 2, 2010
"COREXIT® EC7664A"
(formerly COREXIT 7664)

I. NAME, BRAND, OR TRADEMARK
COREXIT® EC7664A
Type of Product: Surface Washing Agent (Water Based)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Nalco Energy Services, L.P.
P.O. Box 87
Sugar Land, TX 77487-0087
Customer Services:
Phone: (800) 333-3714
Product Management:
Office: (281) 263-7336
Mobile: (281) 202-8126
E-mail: kapreston@nalco.com
(Ms. Kathryn Preston)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Nalco Energy Services, L.P.
P.O. Box 87
Sugar Land, TX 77487-0087
Customer Services:
Phone: (800) 333-3714
Product Management:
Office: (281) 263-7336
Mobile: (281) 202-8126
E-mail: kapreston@nalco.com
(Ms. Kathryn Preston)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
The flash point of COREXIT® EC7664A is 116°F. It is therefore classified as flammable by IMO rules, but not by DOT rules. Keep away from heat, sparks, and open flame.
2. Ventilation:
Avoid prolonged breathing of vapors. Use with ventilation equal to unobstructed outdoors in

moderate breeze.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid contact with skin or eyes and breathing mist or vapors. The use of gloves and goggles is recommended. In case of contact flush exposed area with water.
4.a. Maximum storage temperature: 130°F
4.b. Minimum storage temperature: 10°F
4.c. Optimum storage temperature range: 40°F to 100°F
4.d. Temperatures of phase separations and chemical changes:
No phase separations or chemical changes are expected unless evaporation is allowed to occur.

V. SHELF LIFE
The shelf life of unopened drums of COREXIT® EC7664A is unlimited. Partially used containers should be kept tightly closed to retard evaporation of solvents.

VI. RECOMMENDED APPLICATION PROCEDURE
1.Application Method:
Spray from boats, aircraft, fire education systems on boats, helicopter buckets, hand-held or backpack sprayers, or from hoses attached to small pumps. COREXIT® EC7664A should be applied in the form of small droplets - never as a fog or mist.
2. Concentration/Application Rate:
COREXIT® EC7664A diluted 1-3 percent in water sprayed on the shoreline before the oil comes ashore will protect the beaches, marshes, rocks, etc. from oil contamination. Full strength COREXIT® EC7664A can be sprayed onto the surf which washes the shoreline.
3. Conditions for Use:
COREXIT® EC7664A (1-3 percent in water) will protect beaches, marshes, rocks, and other shoreline structures from oil contamination if applied before the oil comes in contact with them. The dilute solution is sprayed on the shoreline area. COREXIT® EC7664A is also useful in washing oil from beaches, sea walls, docks, boats, and spill cleanup equipment. Use a 1-3 percent solution of COREXIT® EC7664A in water, and apply from portable sprayers. If oil deposits are heavy or weathered, a short pre-soak with a hydrocarbon-based shoreline cleaner like COREXIT® EC9580A is recommended.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material tested	Species	LC50 (ppm)
COREXIT® EC7664A	Menidia beryllina	87.06 96-hr
	Mysidopsis bahia	583.91 48-hr
No. 2 Fuel Oil	Menidia beryllina	10.72 96-hr
	Mysidopsis bahia	16.12 48-hr
COREXIT® EC7664A &	Menidia beryllina	15.16 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	18.34 48-hr
Reference Toxicant (DSS)	Menidia beryllina	7.02 96-hr
	Mysidopsis bahia	9.82 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.
b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: 116°F
2. Pour Point: 7°F
3. Viscosity: 25 cst at 100°F, 34 cst at 60°F
4.Specific Gravity: 1.02 at 60°F, 1.01 at 100°F
5. pH: 6.14
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: Isopropanol, Water
8. Additives: None
9. Solubility: NA

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

Compound	Concentration (ppm)
Arsenic	0.2
Cadmium	<0.05
Chromium	1.0
Copper	<0.2
Lead	0.1
Mercury	0.003
Nickel	0.4
Zinc	0.15
Cyanide	<0.01
Chlorinated Hydrocarbons	<0.01

TECHNICAL PRODUCT BULLETIN #SW-2 (formerly #D-20)
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JANUARY 7, 1985
REVISED LISTING DATE: AUGUST 21, 1995
"TOPSALL #30"
(aka, SUPERALL #38)

I. NAME, BRAND, OR TRADEMARK
TOPSALL #30 (aka, SUPERALL #38)
Type of Product: Surface Washing Agent (Oil and Petroleum Cleaning Agent)

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

Stutton North Corporation	Superall Products LLP
P.O. Box 724	22215 Tuwa Rd.
Mandeville, LA 70470	Tomball, TX 77375
Phone: (985) 626-3900	Phone: (281) 351-4800
Fax: (985) 674-0476	Fax: (281) 351-4855
(Mr. David Anton)	(Mr. Sammy Roberts)

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

Stutton North Corporation	Exper-tech LLP
P.O. Box 724	22215 Tuwa Rd.
Mandeville, LA 70470	Tomball, TX 77375
Phone: (985) 626-3900	Phone: (281) 351-4800
Fax: (985) 674-0476	Fax: (281) 351-4855
(Mr. David Anton)	(Mr. Sammy Roberts)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
TOPSALL #30 (aka, SUPERALL #38) is non-flammable.
2. Ventilation:
Normal type household ventilation is adequate for handling and storage.
3. Skin and eye contact; protective clothing; treatment in case of contact:
In case of contact with eyes, wash thoroughly with large amounts of water. If irritation persists, seek medical attention.
Use protective gloves for manual cleaning.
4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: 20°F
4.c. Optimum storage temperature range: 40°F to 100°F
4.d. Temperatures of phase separations and chemical changes:
TOPSALL #30 (aka, SUPERALL #38) has a pour point of 20°F and a boiling point of 212°F.

V. SHELF LIFE
TOPSALL #30 (aka, SUPERALL #38) has a shelf life of not less than two years.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
For general use, apply by spray, mop, etc. Agitate severe spots and rinse thoroughly for a residue-free surface.
2. Concentration/Application Rate:
Normal cleaning (rigs and platforms, bilges, decks, waterline scum, shop machinery and equipment) use 1 part TOPSALL #30 (aka, SUPERALL #38) to up to 20 parts water.
Heavy cleaning (degassing tanks and barges, engine rooms and soot, oil stained concrete, petroleum based drilling muds) use 1 part TOPSALL #30 (aka, SUPERALL #38) to up to 15 parts water.
Severe cleaning (Black magic, Bunker C, crude oil, holding tanks, grease traps) use 1 part TOPSALL #30 (aka, SUPERALL #38) to up to 5 parts water.
Steam cleaning use 1 part TOPSALL #30 (aka, SUPERALL #38) to up to 50 parts of water.
Pressure wash use 1 part TOPSALL #30 (aka, SUPERALL #38) to up to 30 parts water.
DO NOT USE UNDILUTED ON COMPOSITION FLOORS, WATER BASED PAINTED SURFACES, OR ALUMINUM.
3. Conditions for Use:
Recommended for cleaning petroleum fractions from decks, platforms, bilges, rigs, and other seagoing equipment, as noted above.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
TOPSALL #30	Menidia beryllina	156.60 96-hr
(aka, SUPERALL #38)	Mysidopsis bahia	115.80 48-hr
No. 2 Fuel Oil	Menidia beryllina	6.40 96-hr
	Mysidopsis bahia	1.30 48-hr
TOPSALL #30	Menidia beryllina	4.60 96-hr
(aka, SUPERALL #38) &	Mysidopsis bahia	5.00 48-hr
No. 2 Fuel Oil (1:10)		
Reference Toxicant (DSS)	Menidia beryllina	1.60 96-hr
	Mysidopsis bahia	10.00 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.
b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES

1. Flash Point: >212°F
2. Pour Point: 20°F
3. Viscosity: 30.53 SUS at 100°F
4. Specific Gravity: 1.06 at 70°F
5. pH: 12.6
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: None
8. Additives: CONFIDENTIAL
9. Solubility: Miscible with water

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

Compound	Concentration (ppm)
Arsenic	0.05
Cadmium	<0.002
Chromium	0.031
Copper	0.25
Lead	0.02
Mercury	<0.01
Nickel	<0.01
Zinc	0.25
Cyanide	<0.1
Chlorinated Hydrocarbons	<0.1

TECHNICAL PRODUCT BULLETIN #SW-9
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: MAY 25, 1989
REVISED LISTING DATE: APRIL 16, 1996
"CN-110"

I. NAME, BRAND, OR TRADEMARK
CN-110
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER
Chemex, Inc.
107-B Balboa Drive
Broussard, LA 70518
Phone: (337) 837-9148
Fax: (337) 837-2648
E-mail: chemex@msn.com
(Mr. Gale Campbell)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Chemex, Inc.
107-B Balboa Drive
Broussard, LA 70518
Phone: (337) 837-9148
Fax: (337) 837-2648
E-mail: chemex@msn.com
(Mr. Gale Campbell)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
None needed.
3. Skin and eye contact; protective clothing; treatment in case of contact:
As in handling any industrial chemical, the standard precautions of wearing chemical-resistant gloves and eye protection are recommended.
4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: -40°F
4.c. Optimum storage temperature range: 70°F-80°F
4.d. Temperatures of phase separations and chemical changes: Product does not lose effectiveness between temperatures of -40°F through 120°F, although it will become hazy if the temperature is sustained at less than 30°F over a 24-hour period.

V. SHELF LIFE:
CN-110 has a shelf life of 2 years.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
There are no application restrictions. The preferred application method is by spraying and/or applying the product over the pollutant (primarily oil of any viscosity) on the stained area. Immediately, the product begins to work on breaking the physical bond between the oil and the object desired to be cleaned. The full effect of CN-110 on hard, porous and most non-porous materials usually takes a minimum of 30 minutes with a maximum retention time of 60 minutes. Then the freed oil is sprayed off with available water. The oil is then safely and effectively skimmed without dispersed oil remaining in the affected waters.
If "herding" or "corralling" a slick is desired, CN-110 can also be applied without the increased toxicities by dispersing minute particles of oil into the affected water stream.
2. Concentration/Application Rate:
Application concentration for cleaning shorelines is approximately 1 gallon per 75-100 square feet of affected area. Depending on depths of shorelines, this amount will give a residual of much less than 1 ppm of CN-110 in the affected waters. This residual should be lower than the toxicity of the spilled oil.
If "herding" is desired, the application concentration should be in its original state while either spraying CN-110 around the slick or dropping small amounts from a plane. The resulting residual concentration in this case should be the same as shoreline cleaning or less.
If it is desired that CN-110 be added to a high-pressure cleaning system or steam, the dilution rate should be no lower than 10%. This will lower the CN-110 residual in the affected waters to the parts per billion range.
3. Conditions for Use:
Preferably fresh water, at temperature of 32 F.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
CN-110	Menidia beryllina	52,233.00 96-hr
	Mysidopsis bahia	12,262.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	1.90 96-hr
	Mysidopsis bahia	0.90 48-hr
CN-110	Menidia beryllina	7.40 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	1.19 48-hr
Reference Toxicant (DSS)	Menidia beryllina	1.80 96-hr
	Mysidopsis bahia	5.90 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.
b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA
IX. PHYSICAL PROPERTIES
1. Flash Point: None
2. Pour Point: 30°F
3. Viscosity: 45.7 cst at 78°F
4. Specific Gravity: 1.025
5. pH: 11.4
6. Surface Active Agents: Trace amounts of a sulfonated compound
7. Solvents: None
8. Additives: Complex silicate solution
9. Solubility: NA

X. ANALYSIS FOR HEAVY METALS, CYANIDES, AND CHLORINATED HYDROCARBONS

Compound	Concentration (ppm)
Arsenic	<0.22
Cadmium	<0.088
Chromium	0.109/0.131*
Copper	0.238/0.234*
Lead	<0.275
Mercury	<0.0001
Nickel	<0.11
Zinc	<0.374/<0.369*
Cyanide	0.25
Chlorinated Hydrocarbons	ND

* Duplicate Analyses

TECHNICAL PRODUCT BULLETIN #SW-10 (formerly #D-38)
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JULY 21, 1989
REVISED LISTING DATE: SEPTEMBER 27, 1995
"COREXIT® EC9580A"
(formerly COREXIT 9580 SHORELINE CLEANER)

I. NAME, BRAND, OR TRADEMARK
COREXIT® EC9580A
Type of Product: Surface Washing Agent (hydrocarbon based)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Nalco Energy Services, L.P.
P.O. Box 87
Sugar Land, TX 77487-0087
Customer Services:
Phone: (800) 333-3714
Product Management:
Office: (281) 263-7336
Mobile: (281) 202-8126
E-mail: kapreston@nalco.com
(Ms. Kathryn Preston)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Nalco Energy Services, L.P.
P.O. Box 87
Sugar Land, TX 77487-0087
Customer Services:
Phone: (800) 333-3714
Product Management:
Office: (281) 263-7336
Mobile: (281) 202-8126
E-mail: kapreston@nalco.com
(Ms. Kathryn Preston)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
IMO nonflammable; DOT combustible

2. Ventilation:
Use with ventilation equal to unobstructed outdoors in moderate breeze.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid contact with eyes, skin and clothing. Wash skin with soap and water. Flush eyes with

plenty of water until irritation subsides. Remove to fresh air.
4.a. Maximum storage temperature: 170°F
4.b. Minimum storage temperature: -30°F
4.c. Optimum storage temperature range: 40°F-100°F
4.d. Temperatures of phase separations and chemical changes: None

V. SHELF LIFE
The shelf life of unopened drums of COREXIT® EC9580A is unlimited.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
COREXIT® EC9580A contains a balanced formula of specifically selected biodegradable surfactants in a de-aromatized hydrocarbon solvent system. COREXIT® EC9580A has a very low degree of toxicity to marine and shoreline organisms.
Shorelines, Mangroves, and Seagrasses - COREXIT® EC9580A is sprayed directly on the oiled rocky shorelines, mangroves or seagrasses full strength as supplied. After a soak time of zero to thirty minutes, rinse the cleaner and the oil released from the shoreline surface into the water where it can be readily recovered by conventional means such as skimmers or absorbents. The soak time may vary with temperature, oil density and degree of weathering.
2. Concentration/Application Rate:
The recommended dosage is approximately 1 gallon per 100 square feet but this can vary depending on the amount of weathering and oiling. The product should be applied full strength as supplied. Since it is hydrocarbon-based, the product should not be diluted with water during application as this will greatly reduce effectiveness.
3. Conditions for Use:
COREXIT® EC9580A is useful on shorelines in fresh or salt water. It is effective on all types of oil including heavily weathered and emulsified oil ("chocolate mousse") containing up to 50 percent water.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
COREXIT® EC9580A	Menidia beryllina	86.88 96-hr
	Mysidopsis bahia	31.96 48-hr
No. 2 Fuel Oil	Menidia beryllina	10.72 96-hr
	Mysidopsis bahia	16.12 48-hr
COREXIT® EC9580A &	Menidia beryllina	13.20 96-hr
No.2 Fuel Oil (1:10)	Mysidopsis bahia	9.06 48-hr
Reference Toxicant (DSS)	Menidia beryllina	7.02 96-hr
	Mysidopsis bahia	9.82 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
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: 174°F
2. Pour Point: -65°F
3. Viscosity: 8 cst at 104°F, 28 cst at 32°F
4. Specific Gravity: 0.810 at 60°F
5. pH: Not Applicable
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: De-aromatized Hydrocarbon
8. Additives: None
9. Solubility: Not Applicable

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

Compound	Concentration (ppm)
Arsenic	<0.06
Cadmium	<0.002
Chromium	0.003
Copper	<0.001
Lead	<0.009
Mercury	<0.0002
Nickel	0.01
Zinc	0.041
Cyanide	<0.05
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-12 (formerly D-41)
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: AUGUST 11, 1989
REVISED LISTING DATE: NOVEMBER 2, 1995
"PREMIER 99"

I. NAME, BRAND, OR TRADEMARK
PREMIER 99
Type of Product: Surface Washing Agent (Water Based)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Gold Coast Chemical Products
2790 South Park Road
Pembroke Park, FL 33009
Phone: (954) 893-0044
Fax: (954) 893-8884
E-mail: noslime@goldcoastchemical.com
(Mr. Eli Finkelberg or Ms. Sue Freid)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Gold Coast Chemical Products
2790 South Park Road
Pembroke Park, FL 33009
Phone: (954) 893-0044
Fax: (954) 893-8884
E-mail: noslime@goldcoastchemical.com
(Mr. Eli Finkelberg or Ms. Sue Freid)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
None
2. Ventilation:
Adequate ventilation is needed if in closed environment.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Skin and eye contact: Detergents will defat skin and eyes. May cause irritation.
Protective clothing: Use protective gloves for manual cleaning and splash goggles.
Treatment in case of contact: If splashed on skin, wash with copious amounts of water. If ingested, drink diluted vinegar or lemon juice. Get medical attention.
4.a. Maximum storage temperature: 125°F
4.b. Minimum storage temperature: 0°F
4.c. Optimum storage temperature range: 0°F - 75°F
Avoid freezing the product. If material freezes and separation is experienced, it should be warmed and mixed together.
4.d. Temperatures of phase separations and chemical changes: No separation expected down to

20°F.

V. SHELF LIFE

Unopened material - at least 5 years is expected.
Opened material - at least 2 years is expected.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

Apply by spray, mop, or pressure washer, etc. Agitate severe spots. Rinse thoroughly for residue free surface.

2. Concentration/Application Rate:

Normal Cleaning - 1 part PREMIER 99 to up to 20 parts water.
Heavy Cleaning - 1 part PREMIER 99 to up to 15 parts water.
Severe Cleaning - 1part PREMIER 99 to up to 5 parts water.
Steam Cleaning - 1 part PREMIER 99 to up to 50 parts water.
Pressure Wash - 1 part PREMIER 99 to up to 30 parts water.

3. Conditions for Use:

Water salinity, water temperature, types and ages of pollutants are not determined.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)	
PREMIER 99	Menidia beryllina	565.70	96-hr
	Mysidopsis bahia	94.70	48-hr
No. 2 Fuel Oil	Menidia beryllina	10.20	96-hr
	Mysidopsis bahia	2.10	48-hr
PREMIER 99 &	Menidia beryllina	8.20	96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.50	48-hr
Reference Toxicant (DSS)	Menidia beryllina	1.55	96-hr
	Mysidopsis bahia	7.96	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.

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: 160°F
2. Pour Point: NA
3. Viscosity: 15 cps
4. Specific Gravity: 1.01
5. pH: 10 - 11.5

6. Surface Active Agents: Active 8000* - Purity Chemical <10%
7. Solvents: <5%
8. Additives: <5%
9. Solubility: Complete in Water
*NOTE: Particular chemical composition of Active 8000 is considered by Purity Chemical as a trade secret. More detailed information can be given by Purity Chemical - Mr. Jim Palmer, 1800 NW 70th Ave., Miami, FL 33126, 1-800-654-0235, FAX (305) 592-2601.

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

Compound	Concentration (ppm)
Arsenic	< 0.01
Cadmium	< 0.0005
Chromium	< 0.1
Copper	< 0.1
Lead	< 0.005
Mercury	< 0.001
Nickel	< 0.5
Zinc	< 0.1
Cyanide	< 0.005
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-15 (formerly D-46)
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: APRIL 23, l990
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: (562) 592-3830
(Ms. Carol Chapin)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Sunshine Makers, Inc.
15922 Pacific Highway
Huntington Harbor, CA 92649
Phone: (800) 228-0709 / (562) 795-6000
Fax: (562) 592-3830
(Ms. Carol Chapin)

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 AND EFFECTIVENESS
a. 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® &	Menidia beryllina	8.30 96-hr
No. 2 Fuel Oil (1:10)	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)
Arsenic	<5.0000
Cadmium	<0.0233
Chromium	0.1150
Copper	<0.7500
Lead	0.0776
Mercury	<0.0125
Nickel	<2.3000
Zinc	<4.4000
Cyanide	<1.0000
Chlorinated Hydrocarbons	<1.0

TECHNICAL PRODUCT BULLETIN #SW-16 (formerly D-52)
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JULY 8, 1991
REVISED LISTING DATE: JUNE 14, 1995
"AQUACLEAN"

I. NAME, BRAND, OR TRADEMARK
AQUACLEAN
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Madison Chemical Company, Inc.
3141 Clifty Drive
Madison, IN 47250
Phone: (812) 273-6000
Fax: (812) 273-6002
E-MAIL: cara.cyrus@madchem.com
(Ms. Cara Cyrus)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Madison Chemical Company, Inc.
3141 Clifty Drive
Madison, IN 47250
Phone: (812) 273-6000
Fax: (812) 273-6002
E-MAIL: cara.cyrus@madchem.com
(Ms. Cara Cyrus)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
Handle in a well ventilated space. Local exhaust is recommended if TLV's are exceeded.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid eye and skin contact. In case of such contact, immediately flush with large amount of cool water for at least 15 minutes, and call a physician.
Wear protective eye goggles, impermeable protective gloves, and protective clothing when handling the product. Wash contaminated protective equipment (including clothing, shoes, eye goggles, gloves, etc.) thoroughly in soap and water, rinse repeatedly in clean water and dry before reuse.
Avoid ingestion, breathing dusts, mists, or fumes. In case of ingestion, induce vomiting, give water and call a physician. In case of inhalation, move the affected person to fresh air, and call a physician.
4.a. Maximum storage temperature: 140°F

4.b. Minimum storage temperature: 50°F
4.c. Optimum storage temperature range: >50°F to <104°F
4.d. Temperatures of phase separations and chemical changes: <50°F, >104°F

V. SHELF LIFE
18 months if stored between 50°F and 104°F, and away from acids.

VI. RECOMMENDED APPLICATION PROCEDURES
1. Application Method:
AQUACLEAN may be introduced with a pressure spray to cover the affected area, after the appropriate dilution or concentration is prepared. After application, agitate spill area with water using a solid stream flow.
For manual cleaning with AQUACLEAN, follow instructions in the product data sheet provided by the manufacturer.
2. Concentration/Application Rate:
For small spills, dilute 3 to 1 with water and apply as above.
For large spills, prepare a 33% solution of AQUACLEAN and apply through a foam eductor at 6% setting with approximately 90 gallons per minute flow at the nozzle.
For spills on shorelines and beaches, dilute AQUACLEAN 50% with fresh water and apply using a pressure spray to cover the entire contaminated area. Then rinse with fresh water.
3. Conditions for Use:
Water temperature should be above 41 F.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material tested	Species	LC50 (ppm)
AQUACLEAN	Menidia beryllina	70.7 96-hr
	Mysidopsis bahia	32.7 48-hr
No. 2 Fuel Oil	Menidia beryllina	4.4 96-hr
	Mysidopsis bahia	1.8 48-hr
AQUACLEAN and	Menidia beryllina	6.5 96-hr
No. 2 Fuel (1:10)	Mysidopsis bahia	2.1 48-hr
Reference Toxicant (DSS)	Menidia beryllina	1.4 96-hr
	Mysidopsis bahia	4.9 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.
b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES

1. Flash Point: None detected
2. Pour Point: -20°F
3. Viscosity: 16.5 cP at 25°C (77°F)
4. Specific Gravity: 1.06 at 25°C (77°F)
5. pH: 11.8 (at full strength)
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: Anionic and nonionic synthetic surfactants.
8. Solvents: CONFIDENTIAL
9. Additives: CONFIDENTIAL
10. Solubility: Completely soluble

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

Compound	Concentration (ppm)
Arsenic	1.10
Cadmium	0.16
Chromium	0.20
Copper	0.66
Lead	1.83
Mercury	<0.01
Nickel	0.80
Zinc	0.29
Cyanide	0.06
Chlorinated hydrocarbons	4.20

TECHNICAL PRODUCT BULLETIN #SW-17 (formerly D-14)
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: SEPTEMBER 30, 1984
REVISED LISTING DATE: JULY 25, 1996
"PETRO-GREEN ADP-7"

I. NAME, BRAND, OR TRADEMARK
PETRO-GREEN ADP-7
Type of Product: Surface Washing Agent (Water Based Concentrate)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER
Petro-Green, Inc.
P.O. Box 814665
Dallas, TX 75381
Phone/Fax: (972) 484-7336
E-mail: petrogreen@hotmail.com
(Mr. Arnold Paddock)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Petro-Green, Inc.
P.O. Box 814665
Dallas, TX 75381
Phone/Fax: (972) 484-7336
E-mail: petrogreen@hotmail.com
(Mr. Arnold Paddock)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
Use normal household type ventilation when storing and handling.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid contact with skin and eyes. In the event of contact, flush with clean water. Prolonged contact with skin can cause drying. Treat skin with common hand lotion. The use of gloves and goggles is recommended.
4.a. Maximum storage temperature: 140°F
4.b. Minimum storage temperature: 26°F
4.c. Optimum storage temperature: 40°F to 110°F
4.d. Temperatures of phase separations and chemical changes:
No phase separations or chemical changes within storage temperature range.

V. SHELF LIFE
PETRO-GREEN ADP-7 has an indefinite shelf life.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

For spills on soils, sandy or rocky areas: The ADP-7 can be pre-mixed into water, or educted into a water flow, to be sprayed directly onto the oil spill.

2. Concentration/Application Rate:

For spills on land: Typical dilution is one gallon of ADP-7 diluted in one barrel (42 gallons) of water (about 2.4%), which is enough to wash one barrel of oil on the surface. After loose oil is vacuumed off soil surfaces, the application rate is 100 barrels of solution per acre.

3. Conditions for Use:

The conditions for each spill dictate proper choice of surface washing agent. PETRO-GREEN ADP-7 has been tested in both tropical and arctic environments, as well as with fresh water and a variety of produced water salinities. It has been found to be effective over these ranges. PETRO-GREEN ADP-7 has also been tested on a wide variety of fresh crude oil and product spills. There are no specific limitations to use, however, and an aged spill is likely to be non-responsive as it would be to any environmentally sound surface washing agent. For aged or asphaltic spills, the solution may be heated to 150 F in a hot water washing rig, or a common oil field "hot oiler" truck to increase effectiveness.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)
PETRO-GREEN ADP-7	Menidia beryllina	11.61 96-hr
	Mysidopsis bahia	10.56 48-hr
No. 2 Fuel Oil	Menidia beryllina	19.00 96-hr
	Mysidopsis bahia	1.51 48-hr
PETRO-GREEN ADP-7	Menidia beryllina	10.95 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	1.12 48-hr
Reference Toxicant (DSS)	Menidia beryllina	1.50 96-hr
	Mysidopsis bahia	7.60 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.

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: >212°F
2. Pour Point: 22°F
3. Viscosity: 103.1 at 60°F
4. Specific Gravity: 1.035 at 60°F
5. pH: 10.5
6. Surface Active Agents: CONFIDENTIAL

7. Solvents: CONFIDENTIAL
8. Additives: CONFIDENTIAL
9. Solubility: NA

X. ANALYSIS FOR HEAVY METALS AND CHLORINATED HYDROCARBONS

Compound	Concentration (ppm)
Arsenic	ND
Cadmium	0.12
Chromium	ND
Copper	0.4
Lead	0.6
Mercury	0.004
Nickel	0.75
Zinc	1.32
Cyanide	0.074
Chlorinated Hydrocarbons	<1.0*

*NOTE: Surfactant activity interfered with the extraction and chemical analyses; this was the practical limit of detection.

TECHNICAL PRODUCT BULLETIN #SW-18
USEPA, OIL PROGRAM CENTER
LISTING DATE: OCTOBER 23, 1996
"NATURE'S WAY HS"
(aka, MICRO CLEAN, NATURE'S WAY PC, POWERCLEAN)

I. NAME, BRAND, OR TRADEMARK
NATURE'S WAY HS
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER
Integra Environmental, Ltd.
5825 Centralcrest
Houston, TX 77092
Phone: (713) 680-1234
Fax: (713) 680-1608
E-mail: info@integraenvironmental.com
(Ms. Cathy Kaiser)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Integra Environmental, Ltd.
5825 Centralcrest
Houston, TX 77092
Phone: (713) 680-1234
Fax: (713) 680-1608
E-mail: info@integraenvironmental.com
(Ms. Cathy Kaiser)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
No special precautions are required, but in case of inhalation, move person to fresh air.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Flush contaminated skin with plenty of water for at least 15 minutes. Consult a physician if irritation develops. Protective gloves are recommended for extended or prolonged contact, (e.g., immersing hands). Tight fitting safety goggles are recommended for handling product in concentrated form, especially if contacts are worn.
4.a. Maximum storage temperature: 130°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature: 90°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
NATURE'S WAY HS has a five year shelf life.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
NATURE'S WAY HS may be applied by spraying, pouring, dispensing equipment, or by manual or automatic scrubber machines. Do not mix the product with any other cleaner nor allow any other cleaners to contact surfaces where HS is being used. Hot water should never be used.
2. Concentration/Application Rate:
Apply NATURE'S WAY HS full strength (undiluted) to surface area with sprayer, concentrating on areas with heaviest contamination first. To speed clean-up of shorelines and beaches, pressure spray into cracks and crevices prior to scrubbing. Agitate and scrub well using power brushes, hand brushes, brooms or mops. If possible, allow the scrubbed solution to remain on the surface for at least 15 minutes. If allowed to soak overnight, the next morning the treated surface must be re-wet with water, reagitated, and rinsed. Additional product will not be necessary at that time.
3. Conditions for Use:
For heavily contaminated surfaces, NATURE'S WAY HS should always be used full strength. For moderate accumulations HS may be diluted to as little as 2 oz. per gallon of cool water for cleaning light contamination. For average contamination, a dilution of 12 oz. per gallon is recommended (1 part NATURE'S WAY HS to 10 parts water). For light use, 4 to 6 oz. of product per gallon water will be sufficient.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity

Material Tested	Species	LC50 (ppm)
NATURE'S WAY HS	Menidia beryllina	152.14 96-hr
	Mysidopsis bahia	193.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	3.15 96-hr
	Mysidopsis bahia	0.96 48-hr
NATURE'S WAY HS	Menidia beryllina	3.91 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	1.07 48-hr
Reference Toxicant (DSS)	Menidia beryllina	- 96-hr
	Mysidopsis bahia	5.71 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.
a. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: NA

2. Pour Point: Flowable at all temperatures above freezing
3. Viscosity: <100 CPS
4. Specific Gravity: 1.01
5. pH: 8 - 9.5
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: CONFIDENTIAL
8. Additives: CONFIDENTIAL
9. Solubility: NA

X. ANALYSIS FOR HEAVY METALS AND CHLORINATED HYDROCARBONS

Compound	Concentration (ppm)
Arsenic	<0.003
Cadmium	<0.005
Chromium	<0.010
Copper	0.020
Lead	<0.002
Mercury	<0.0002
Nickel	<0.030
Zinc	0.260
Cyanide	<0.020
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-19
US EPA, OIL PROGRAM CENTER
LISTING DATE: JANUARY 30, 1997
"CYTOSOL"

I. NAME, BRAND, OR TRADEMARK
CYTOSOL
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER
CytoCulture International, Inc.
249 Tewksbury Avenue
Point Richmond, CA 94801-3829
Phone: (510) 233-0102
Fax: (510) 233-3777
Mobile: (561) 762-5440
E-mail First Response: vwedel@aol.com
E-mail: rvw@cytoculture.com
Web site: http://www.cytoculture.com
(Dr. Randall von Wedel)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
CytoCulture International, Inc.
249 Tewksbury Avenue
Point Richmond, CA 94801-3829
Phone: (510) 233-0102
Fax: (510) 233-3777
Mobile: (561) 762-5440
E-mail First Response: vwedel@aol.com
E-mail: rvw@cytoculture.com
Web site: http://www.cytoculture.com
(Dr. Randall von Wedel)

Foss Environmental, Inc.
7440 West Marginal
Seattle, WA 98108-4141
Phone: (206) 768-1450
Fax: (206) 767-3460
(Mr. Larry Pintler)

Advanced Cleanup Tech. Inc
20928 Lamberton Ave.
Carson, CA 90810
Phone: (800) 334-2284
Fax: (310) 763-9076
(Mr. Walt Dorn)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable. However, keep the product away from heat and avoid contact with strong oxidizing agents. Ensure proper disposal of product-saturated absorbents, rags, and combustible

materials to avoid the possibility of spontaneous combustion.
2. Ventilation:
Product is not volatile. However, in the event of aerosol inhalation, immediately move victim to fresh air. If victim has stopped breathing, give artificial respiration, preferably by mouth to mouth. Get medical attention immediately.
3. Skin and eye contact; protective clothing; treatment in case of contact:
The CYTOSOL contains no volatile hydrocarbons or petroleum constituents. However, as a precautionary measure, wear gloves and safety glasses meeting the specifications of ANSI Standard Z87.1. Avoid breathing aerosols. Avoid prolonged contact with skin.
4.a. Maximum storage temperature: 110°F
4.b. Minimum storage temperature: 39°F
4.c. Optimum storage temperature: 55°F
4.d. Temperatures of phase separations and chemical changes:
Avoid freezing. At temperatures below the cloud point (43°F), the product may become cloudy, but will return to normal upon warming, with no effect on performance. Store product in airtight containers, if possible, without excessive exposure to moisture.

V. SHELF LIFE
Closed container: 10 years in a dry environment.
Open container: 1 year in a warm, humid environment.
The product does not deteriorate appreciably over time, but will grow bacteria if water condensation accumulates in the container.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
The CYTOSOL is applied to oiled shorelines to extract and recover weathered petroleum by flotation with passive water deluges from header pipes or manual spraying. Remaining residual hydrocarbons are biodegraded, either passively by intrinsic bioremediation, or aggressively by enhancing the process with controlled amounts of nutrients and/or acclimated cultures of bacteria cultured from the site, when approved by local, state and federal agencies.
The CYTOSOL process is most suitable for the treatment of heavily oiled shorelines that do not respond well to conventional treatments, or that are considered too sensitive for mechanical/pressure wash strategies. Prior to the application of CYTOSOL, collection booms, oil skimmers, sorbent pads, or other appropriate containment and collection mechanisms must be deployed and operational.
2. Concentration/Application Rate:
CYTOSOL may be applied with a variety of spraying or washing equipment, depending upon the scale and type of shoreline to be cleaned. The product is to be used only neat and undiluted, for direct application to spilled oil. For large beach areas, CYTOSOL can be sprayed from water trucks or work boats equipped with pumps, hoses, and nozzles to deliver the product as an aerial spray. In smaller applications, CYTOSOL may be applied with hand sprayers or portable pumps to spray the product directly onto oiled surfaces. Dose rates will vary with the type and amount of petroleum spilled, the extent of weathering, and other site specific conditions, including temperature, porosity of shoreline, and residence time available to let the product contact the oil. In general, the ratio of applied CYTOSOL to crude oil is between 0.5:1 and 1:1. The quantity of CYTOSOL applied should be approximately equivalent to the quantity of petroleum accumulated on the shoreline, or as required to dissolve and remove weathered oil. After application, the product should be allowed to penetrate and dissolve the weathered petroleum for

at least one hour, preferably longer. Cold weather applications will require more contact time before initiating recovery. In tidal areas, it is advisable to apply the CYTOSOL as the tide is ebbing (receding) to maximize contact time. Trapped oil may continue to be released for several days, requiring that containment devices be left in place.

3. Conditions for Use:

The following shoreline types are appropriate for the use of CYTOSOL: Coarse sand beaches where petroleum has penetrated into sand; marsh areas and vegetated wetlands where oil has coated plants and become trapped; concrete bulkheads, rip rap and piers that may have trapped oil; oiled pilings; gravel or cobble shorelines and rocky shores, where oil has become trapped in pockets; and, public beaches, fisheries, hatcheries, river banks, and other sensitive or high impact sites. The CYTOSOL has been fielded tested successfully for removing oil from mussel beds and intertidal zones, pilings and concrete rip rap. The CYTOSOL also proved effective in facilitating the removal of oil from the banks and vegetation along an oiled creek.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity

Material Tested	Species	LC50 (ppm)
CYTOSOL	Menidia beryllina	738.0 96-hr
	Mysidopsis bahia	124.0 48-hr
No. 2 Fuel Oil	Menidia beryllina	38.9 96-hr
	Mysidopsis bahia	5.9 48-hr
CYTOSOL	Menidia beryllina	24.3 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	7.0 48-hr
Reference Toxicant (DSS)	Menidia beryllina	13.8 96-hr
	Mysidopsis bahia	22.2 48-hr

NOTE: This toxicity data was derived with the EPA protocols for dispersants using a blender to emulsify the product into the water for testing organisms. The CYTOSOL emulsion created microdroplets of product which may have had direct physical effects on the test larvae. Since the solubility of the product in water is so low (14 ppm or less), it is probable that the observed effects on the test organisms was caused by larvae having direct contact with droplets of product rather than by a true chemical toxicity from the trace amount of dissolved product. In practice, the CYTOSOL would not be emulsified to any great extent during application. See Section VI of this bulletin for information regarding the manufacturer's recommendations for concentrations and application rates for field use.

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: 360°F
2. Pour Point: 10°F
3. Viscosity: 4.15 CST @ 104°F
4. Specific Gravity: 0.8877 @ 60°F

5. pH: Neutral
6. Surface Active Agents: None
7. Solvents: No Petroleum Distillates
8. Additives: CONFIDENTIAL
9. Solubility: 14 ppm in fresh water, 7 ppm in sea water

X. ANALYSIS FOR HEAVY METALS AND CHLORINATED HYDROCARBONS

Compound	Concentration
Arsenic	ND
Cadmium	ND
Chromium	ND
Copper	ND
Lead	ND
Mercury	ND
Nickel	ND
Zinc	ND
Cyanide	ND
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-20
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: MARCH 21, 1997
"BIOSOLVE® HYDROCARBON MITIGATION™ AGENT"

I. NAME, BRAND, OR TRADEMARK
BIOSOLVE® HYDROCARBON MITIGATION™ AGENT
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER
The Westford Chemical Corporation®
98 Concord Road
Westford, MA 01886
Phone: (978) 392-0689 or (800) 225-3909 or (508) 878-5895
Fax: (978) 692-3487
Web site: http://www.biosolve.com
E-mail: president@biosolve.com
(Mr. Ron LaRoche or Mr. Stephen LaRoche)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
The Westford Chemical Corporation®
98 Concord Road
Westford, MA 01886
Phone: (978) 392-0689 or (800) 225-3909 or (508) 878-5895
Fax: (978) 692-3487
Web site: http://www.biosolve.com
E-mail: president@biosolve.com
(Mr. Ron LaRoche or Mr. Stephen LaRoche)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable
2. Ventilation:
Normal
3.Skin and eye contact; protective clothing; treatment in case of contact:
Flush contaminated eyes thoroughly with water for 15 minutes, and get medical attention. Remove contaminated clothing, wash exposed area with soap and water, wash clothing before reuse. Get medical attention if irritation develops. Get medical attention for ingestion. No medical attention is necessary with inhalation. There are no special storage requirements or special handling precautions; use good normal hygiene.
4.a. Maximum storage temperature: 120°F (50°C)
4.b. Minimum storage temperature: 35°F (1.5°C)
4.c. Optimum storage temperature: 60°F (15°C)
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
BIOSOLVE® has a 10+ year shelf life if unopened.

VI. RECOMMENDED APPLICATION PROCEDURE
1.Application Method:
Dilute or use eductors to specified rate and apply through fire hose, power washers, steam powered units, or chemical boom sprayers with nozzles that produce a shearing action. Special nozzles to apply the solution as droplets are not necessary. For shoreline cleanup involving heavy or weathered crude, presoak to a 6% solution may be necessary.
2. Concentration/Application Rate:
BIOSOLVE® is a highly concentrated product and must be diluted with water before use. Dilution ratios vary depending on site specific conditions. Dilution ratio's normally run at 6%, 3%, or 1%. For heavy, mousse, or weathered oil, a 3% to 6% solution should be applied. For light or refined products, apply at 2% to 3%. For sheens, apply at .5 to 1%. Since testing shows that BIOSOLVE® quickly emulsifies weathered crude, it is not critical to apply immediately after a spill occurs; impact considerations can be fully considered prior to action taken.
Surface Washing Applications: BIOSOLVE® applied through power washers in light dilution is very effective in attaining the removal of oils from rock, cobblestone, shorelines, and sea walls. In marsh or wetland applications, BIOSOLVE® prevents the oil from clinging to grasses and mangroves.
Rigs and Platforms: BIOSOLVE® is used to inert undersea pipelines before plugging and abandonment, degas tanks and platforms during workover operations, and to wash drill cuttings to remove oils and prevent sheens on surface waters.
3. Conditions for Use:
May be used with salt or fresh water. Temperature is not relevant.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)	
BIOSOLVE®	Menidia beryllina	6.4	96-hr
	Mysidopsis bahia	3.6	48-hr
No. 2 Fuel Oil	Menidia beryllina	5.6	96-hr
	Mysidopsis bahia	2.7	48-hr
BIOSOLVE® &	Menidia beryllina	7.4	96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	1.3	48-hr
Reference Toxicant (SDS)	Menidia beryllina	7.2	96-hr
	Mysidopsis bahia	13.4	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.
b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
(Liquid concentrate)
1. Flash Point: NA, Water based >200°F (93.3°C)
2. Pour Point: 32.9°F (0.5°C)
3. Viscosity: 77.5 Centistrokes (concentrate), 490 centipoise (concentrate), 15 centipoise at 6%, at 60.08°F or 15.6°C
4. Specific Gravity: 1.025 at 60°F or 15.5°C
5. pH: 9.37 +/- .5
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: CONFIDENTIAL
8. Solvents: CONFIDENTIAL
9. Additives: CONFIDENTIAL
10. Solubility: Complete-true solution formed with water

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

Compound	Concentration (ppm)
Arsenic	ND<0.2
Cadmium	ND<0.18
Chromium	ND<0.5
Copper	ND<0.6
Lead	ND<0.2
Mercury	ND<0.07
Nickel	ND<0.6
Silver	ND<0.4
Zinc	0.51
Cyanide	ND<0.01
Chlorinated Hydrocarbons	ND<0.5

TECHNICAL PRODUCT BULLETIN #SW-21
USEPA, OIL PROGRAM CENTER
LISTING DATE: MARCH 2, 1998
"PETROTECH 25"

I. NAME, BRAND, OR TRADEMARK
PETROTECH 25
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER
Petrotech America Corporation
P.O. Box 46
Newport, NH 03773
Phone: (203) 966-4573
Fax: (561) 966-0920
(Mr. Frances Sullivan)

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

Petrotech America Corporation
P.O. Box 46
Newport, NH 03773
Phone: (203) 966-4573
Fax: (561) 966-0920
(Mr. Frances Sullivan)

Manufacturing Plant:
Clariant Corp.
Charlotte, NC

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
Normal.
3. Skin and eye contact; protective clothing; treatment in case of contact:
No special handling is required beyond that prescribed under the general OSHA rules for non-hazardous, non-flammable and noncorrosive liquids. This is not to suggest that contact with eyes and skin is totally without risk for allergy. Contact with eyes and skin is to be avoided, as suggested under OSHA procedures.
4.a. Maximum storage temperature: +45°C
4.b. Minimum storage temperature: -5°C (can be stored below its freezing point without detectable loss of performance provided that it is warmed to within liquid range prior to application.)
4.c. Optimum storage temperature: >-5°C and <+45°C
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
PETROTECH 25 has an unlimited shelf-life when maintained in the factory sealed containers and stored within the prescribed temperature limits. Climatic factors such as humidity have no effect on closed container storage although the product is hygroscopic and will absorb water if left for long periods in open containers.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method

It is recommended that the surface washing agent PETROTECH 25 be applied to contaminated surfaces in one of three ways: (a) a mixture of ten parts PETROTECH 25 to ninety parts water, either fresh or saltwater, should be discharged over the surface by commercial pressure washer, hot or cold; (b) the same mixture discharged on the surface using standard fire fighting apparatus preferably at a nozzle pressure of 100 PSI plus; or (3) PETROTECH 25 in concentrated form can be applied to the surface and manually or mechanically brushed and then water applied.

2. Concentration/Application Rate:

Generally, PETROTECH 25 is applied neat in its factory supplied concentrate form. However, for lighter oils where educting or proportioning equipment is available, an aqueous solution of PETROTECH 25 between 3 and 10 percent may be used. Broadly speaking, PETROTECH 25 has no solvent action. For any given oil spill of a specific nature, the application rate is unaffected by neat or diluted application as long as the concentrate to oil ratio remains the same. Applications of diluted PETROTECH 25 in the 6 - 10 percent range via fire fighting equipment can be used on automobile and aviation gasoline's together with the lighter oils such as diesel and all jet fuels.

The dosage of PETROTECH 25 to be used depends upon two factors:1) The nature of the oil, and 2) The energy used in its application to the contaminated substrate.

3. Conditions for Use:

May be used with salt or fresh water. Temperature is not relevant.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)	
PETROTECH 25	Menidia beryllina	601.0	96-hr
	Mysidopsis bahia	350.0	48-hr
No. 2 Fuel Oil	Menidia beryllina	2.8	96-hr
	Mysidopsis bahia	1.8	48-hr
PETROTECH 25 & No. 2 Fuel Oil	Menidia beryllina	3.4	96-hr
(1:10)	Mysidopsis bahia	1.0	48-hr
Reference Toxicant (DSS)	Menidia beryllina	7.9	96-hr
	Mysidopsis bahia	19.8	48-hr

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

(Liquid concentrate)

1. Flash Point: None
2. Pour Point: 0°C
3. Viscosity: 700 CP

4. Specific Gravity: 1.03
5. pH: 7.5

6. Chemical Name and Percentage by Weight of Total Formulation: CONFIDENTIAL
7. Surface Active Agents: CONFIDENTIAL
8. Solvents: CONFIDENTIAL
9. Additives: CONFIDENTIAL
10. Solubility: 100%

X. ANALYSIS FOR HEAVY METALS AND CHLORINATED HYDROCARBONS

Compound	Concentration (ppm)
Arsenic	<0.10
Cadmium	<0.08
Chromium	<0.10
Copper	<0.26
Lead	0.047
Mercury	<0.0005
Nickel	<0.40
Zinc	0.256
Cyanide	0.70
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-22
USEPA, OIL PROGRAM CENTER
LISTING DATE: NOVEMBER 12, 1998
"SPLIT DECISION SC (formerly Split Decision)"
(aka, CLEAN SPLIT, DUO-SPILT)

I. NAME, BRAND, OR TRADEMARK
SPLIT DECISION SC
Type of Product: Surface Washing Agent (Water Based)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Mantek
Division of NCH Corporation
P.O. Box 660196
Dallas, TX 75266-0196
Phone: (972) 438-0202 / (800) 527-9919 ext. 2020
E-mail: gzimmerm@nch.com
(Mr. George Zimmerman)

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

For SPLIT DECISION SC:
Mantek
Division of NCH Corporation
P.O. Box 660196
Dallas, TX 75266-0196
Phone: (972) 438-0202
or (800) 527-9919 ext. 2020
E-mail: gzimmerm@nch.com
(Mr. George Zimmerman)

For DUO-SPLIT:
Chemsearch
Division of NCH Corporation
Irving, TX 75015
Phone: (972) 438-0202
or (800) 527-9919 ext. 2020
E-mail: gzimmerm@nch.com
(Mr. George Zimmerman)

For CLEAN SPLIT:
Certified Laboratories
Division of NCH Corporation
P.O. Box 2493
Ft. Worth, TX 76113-2493
Phone: (972) 438-0202
or (800) 527-9919 ext. 2020
E-mail: gzimmerm@nch.com
(Mr. George Zimmerman)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Not flammable
2. Ventilation:

Not required
3. Skin and eye contact; protective clothing; treatment in case of contact: SPLIT DECISION SC is not aggressive to skin and will not cause irritation in the majority of users. Avoid contact with eyes, irritation may result. Wear safety glasses with side shields if the method of use presents the likelihood of eye contact. No special precautions or additional protective equipment are required during handling or use.
4.a. Maximum storage temperature: 140°F
4.b. Minimum storage temperature: 27°F
4.c. Optimum storage temperature range: 32-140°F
4.d. Temperatures of phase separations and chemical changes: SPLIT DECISION SC is stable and phase separation will not occur at temperatures within the above storage range. Repetitive freeze/thaw cycles may cause stratification. This stratification is readily dispersed by minimal mixing.

V. SHELF LIFE
The recommended shelf life is one year.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Spray on oily surface. SPLIT DECISION SC forms a loose emulsion with oil that separates within seconds. Oil displaced from surface can be skimmed from the rinse water or absorbed with an oil absorbent.
2. Concentration/Application Rate:
For heavy oil apply at a concentration of 1 part SPLIT DECISION SC to 3 parts water. For lighter oil on non-porous substrates use at up to 1 part SPLIT DECISION SC to 30 parts water. For application by hot water pressure washers or steam cleaner, SPLIT DECISION SC may be diluted with as much as 50 parts water.
3. Conditions for Use:
Effective in fresh water, estuarine, and marine environments at normal climatic temperatures. SPLIT DECISION SC contains no known EPA Priority Pollutants.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity

Material Tested	Species	LC50 (ppm)
SPLIT DECISION	Menidia beryllina	8.27 96-hr
	Mysidopsis bahia	8.20 48-hr
No. 2 Fuel Oil	Menidia beryllina	12.26 96-hr
	Mysidopsis bahia	4.30 48-hr
SPLIT DECISION SC &	Menidia beryllina	0.25 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.06 48-hr
Reference Toxicant (DSS)	Menidia beryllina	13.80 96-hr
	Mysidopsis bahia	22.20 48-hr

b. Effectiveness
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES

1. Flash Point: None
2. Pour Point: NA
3. Viscosity: 20 cps - Brookfield #1 spindle @ 20 rpm at 73°F
4. Specific Gravity: 1.075 at 73°F
5. pH: 7.0
6. Surface Active Agents: Confidential
7. Solvents: Water
8. Additives: CONFIDENTIAL
9. Solubility in Water: Complete

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

Compound	Concentration (ppm)
Arsenic	<0.05
Cadmium	<0.03
Chromium	<0.03
Copper	0.20
Lead	<0.05
Mercury	<0.03
Nickel	<0.03
Zinc	0.08
Cyanide	<0.1
Chlorinated Hydrocarbons	<0.1

TECHNICAL PRODUCT BULLETIN #SW-23
USEPA, OIL PROGRAM CENTER
LISTING DATE: MARCH 1, 1999
"PETRO-CLEAN"

I. NAME, BRAND, OR TRADEMARK
PETRO-CLEAN
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Alabaster Corp.
6921 Olson Lane
Pasadena, Texas 77505
Phone: (281) 487-5482 or (800) 609-2728
Fax: (281) 487-9014
E-mail: alabastercorp@aol.com
(Mr. Charles Sheffield)

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

Alabaster Corp.
6921 Olson Lane
Pasadena, Texas 77505
Phone: (281) 487-5482 or (800) 609-2728
Fax: (281) 487-9014
E-mail: alabastercorp@aol.com
(Mr. Charles Sheffield)

Garner Environmental Services, Inc.
1717 West 13th Street
Deer Park, Texas 77536
Phone: (281) 930-1200
Fax: (281) 478-0296
Web Site: http://www.garner-es.com

Four Alarm Fire Equipment
P.O. Box 448
South Houston, Texas 77587
Phone: (713) 948-0484
Fax: (713) 910-3300

Garner Environmental Services, Inc.
3197 Main Street
LaMarque, Texas 77568
Phone: (800) 935-0308
Fax: (409) 935-0678
(Mr. Jack Campbell)

A.N. Rusche Distributing Company
9223 Eastex Freeway
Houston, Texas 77093

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability: Non-flammable
2. Ventilation: Normal
3. Skin and eye contact: Protective clothing; treatment in case of contact. Eyes-flush with water using eye cup of fountain for 15 minutes. Seek medical attention if irritation persists. Wash contaminated clothing and footwear before reuse. Ingestion - seek medical attention. Inhalation - no medical attention is required.
4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: 35°F

4.c. Optimum storage temperature range:
4.d. Temperatures of phase separations and chemical changes: None

V. SHELF LIFE
Indefinite when stored properly.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method: PETRO-CLEAN is applied through power washers or even garden type sprayers in light dilution is very effective in removing petrochemical hydrocarbons from rocks, shorelines, sea walls, bridges, and highways. In wetland applications, PETRO-CLEAN prevents hydrocarbons from attaching to grasses, trees, rocks, etc.
2. Concentration/Application Rate: Dilute or use eductors to specified rate and apply through fire hose, power washers, or sprayers to contaminated area. PETRO-CLEAN is a highly concentrated product and must be diluted before use. Dilution ratios vary depending on the specific conditions of the contaminated site. Normal recommended dilutions are from 0.5% to 6%. On heavy or weathered crude, pre-soaking with 6% may be necessary. For light or refined products, apply as 3% to 6% solution. For sheens on water apply a 0.5% to 1.0% solution.
3. Conditions for Use: May be used with salt or fresh water

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity

Material Tested	Species	LC50 (ppm)	
PETRO-CLEAN	Menidia beryllina	100	96-hr
	Mysidopsis bahia	110	48-hr
No. 2 Fuel Oil	Menidia beryllina	110	96-hr
	Mysidopsis bahia	110	48-hr
PETRO-CLEAN &	Menidia beryllina	115	96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	105	48-hr
Reference Toxicant (DSS)	Menidia beryllina	1.14	96-hr
	Mysidopsis bahia	0.98	48-hr

b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: > 200°F
2. Pour Point: -17°F
3. Viscosity: 1.26 at 75°F
4. Specific Gravity: 0.99 at 75°F
5. pH: 8.05 (10% solution, s.u.)
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: None
8. Additives: CONFIDENTIAL

9. Solubility in Water: 100 percent

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

Compound	Concentration (ppm)
Arsenic	<0.10
Cadmium	<0.10
Chromium	<0.01
Copper	<0.01
Lead	<0.002
Mercury	<0.01
Nickel	<0.01
Zinc	<0.01
Cyanide	<2.0
Chlorinated Hydrocarbons	<1.0

TECHNICAL PRODUCT BULLETIN #SW-24
USEPA, OIL PROGRAM CENTER
LISTING DATE: JULY 14, 2000
"DO-ALL #18"

I. NAME, BRAND, OR TRADEMARK
DO-ALL #18
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Radcob Solutions, Inc.
4800 North State Road 7, Suite #105
Lauderdale Lakes, FL 33319
Phone: (954) 249-2178
Fax: (954) 894-6826
(Mr. Adam Goldberg)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Radcob Solutions, Inc.
4800 North State Road 7, Suite #105
Lauderdale Lakes, FL 33319
Phone: (954) 249-2178
Fax: (954) 894-6826
(Mr. Adam Goldberg)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
DO-ALL #18 is water based, contains no solvents and is non-flammable.
2. Ventilation:
Normal room ventilation.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid contact with skin, eyes, and clothing. Wear safety glasses or goggles and protective gloves when handling. In case of eye contact, flush immediately with water for at least 15 minutes. If persistent irritation occurs, call a physician. For skin contact, wash thoroughly with soap and water.
4.a. Maximum storage temperature:100°F
4.b. Minimum storage temperature: 35°F
4.c. Optimum storage temperature range: 40°F to 100°F
4.d. Temperatures of phase separations and chemical changes: DO-ALL #18 has a pour point of 32°F and phase separation occurs at 105°F.

V. SHELF LIFE
DO-ALL #18 has a shelf life of at least two (2) years.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

May be diluted with fresh or salt water. For general use, apply by spray, mop, etc. Agitate severe spots, rinse thoroughly for residue-free surface.

2. Concentration/Application Rate:

To clean oil from beaches, rocks, and piers as a shore-line cleaner, first use a pre-treatment or soaking, using one (1) part DO-ALL #18 diluted with three (3) parts of water. Allow 30 to 45 minutes to soften viscous oil deposits (soak time may vary with temperature, oil density, and degree of weathering). After the soaking period, dilute one (1) part of DO-ALL #18 with 15 parts of water and apply with a high pressure water hose (50 - 100 PSI). Oil released can then be removed by vacuuming, skimmers, or absorbents.

For normal cleaning of shop machinery, bilges, decks, waterline scum, rigs, and platforms, dilute one (1) part DO-ALL #18 with up to 20 parts of water.

For heavy cleaning and degreasing of tanks, barges, engine rooms and soot, oil stained concrete, and petroleum based drilling muds, dilute one (1) part DO-ALL #18 with up to 15 parts of water.

For severe cleaning of holding tanks, grease traps, black magic, crude oil, and Bunker C, dilute one (1) part DO-ALL #18 with up to five (5) parts of water.

For steam cleaning, dilute one (1) part of DO-ALL #18 with up to 50 parts of water.

For pressure washing, dilute one (1) part DO-ALL #18 with up to 30 parts of water.

DO NOT USE UNDILUTED ON COMPOSITION FLOORS, WATER-BASED PAINTED SURFACES, OR ALUMINUM,

3. Conditions for Use:

Recommended for cleaning petroleum fractions from beaches, rocks, piers, bilges, decks, waterline scum, rigs, platforms, tanks, barges, engine rooms, machinery, holding tanks, and grease traps.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity

Material Tested	Species	LC50 (ppm)
DO-ALL #18	Menidia beryllina	66.10 96-hr
	Mysidopsis bahia	288.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	9.10 96-hr
	Mysidopsis bahia	0.65 48-hr
DO-ALL #18 & No. 2 Fuel Oil	Menidia beryllina	9.38 96-hr
(1:10)	Mysidopsis bahia	0.57 48-hr
Reference Toxicant (SDS)	Menidia beryllina	6.36 96-hr
	Mysidopsis bahia	16.53 48-hr

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: >200°F
2. Pour Point: 32°F
3. Viscosity: 1.8 at 68°F

4. Specific Gravity: 1.07 at 68°F
5. pH:13.1
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: None
8. Additives: CONFIDENTIAL
9. Solubility in Water: Soluble with water.

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

Compound	Concentration (ppm)
Arsenic	ND (<0.02)
Cadmium	ND (<0.02)
Chromium	ND (<0.02)
Copper	0.33
Lead	ND (<0.02)
Mercury	ND (<0.00)
Nickel	ND (<0.10)
Zinc	0.28
Cyanide	0.26
Chlorinated Hydrocarbons	ND (<0.30)

TECHNICAL PRODUCT BULLETIN #SW-25
USEPA, OIL PROGRAM CENTER
LISTING DATE: JULY 9, 2001
"SC-1000™"

I. NAME, BRAND, OR TRADEMARK
SC-1000™
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
GEMTEK® Products
3808 North 28th Avenue
Phoenix, AZ 85017
Emergency Number: (602) 265-8586
Phone: (800) 331-7022
Fax: (602) 265-7241
E-mail: techsupport@infogemtek.com
(Ms. Kim Kristoff)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
GEMTEK® Products
3808 North 28th Avenue
Phoenix, AZ 85017
Emergency Number: (602) 265-8586
Phone: (800) 331-7022
Fax: (602) 265-7241
E-mail: techsupport@infogemtek.com
(Ms. Kim Kristoff)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
General room ventilation is satisfactory.
3.Skin and eye contact; protective clothing; treatment in case of contact:
Non-irritating, no first aid needed. May be an eye irritant. Do not spray into eyes; safety glasses are recommended. If irritation does occur, rinse thoroughly with water.
4.a. Maximum storage temperature: None.
4.b. Minimum storage temperature: Room temperature.
4.c. Optimum storage temperature range: 70°F to 90°F
4.d. Temperatures of phase separations and chemical changes: Low temperature can cause handling problems; viscosity of material will increase. The product is an organic compound and it will not typically stratify. The cloud point is 54°F. At 212°F it will boil and at somewhat less (around 130°F) water vapor will form. Repeat freeze/thaw/boiling cycles over a 30-day period has not demonstrated noticeable break down of the product.

V. SHELF LIFE
Minimum of 5 years.

VI. RECOMMENDED APPLICATION PROCEDURE
1.Application Method: SC-1000™ is a highly concentrated cleaning compound capable of a multitude of cleaning applications with dilutions ranging from full strength to far in excess of 1:350. Depending on the specific factors in the cleaning environment, the desired cleaning speed with the least amount of SC-1000™ can be determined. When diluting, it is recommended that SC-1000™ be added to premeasured water to minimize foaming in the solution.
2.Concentration/Application Rate:
Beach Waterfront, Rocky Soils, Break Water Structures, and Pier Facilities: For beach sands or light rocky soils, burning or creating a temporary shallow wash tank is most successful. Fill one-half of the tank with contaminated beach sand, then add a solution of SC-1000™ and clean water (ocean or fresh) to cover the sand. Gentle agitation will release the oil to the surface of the tank where it can be collected. For rocky surfaces spray with a 20 percent solution of SC-1000™ using a horizontal eductor sprayer, spraying side-to-side, allowing the soil to dwell for several minutes before spraying top-to-bottom with clean ocean or fresh water to rinse oil into perimeter oil booms, blankets or impermeable sheeting.
Washing Marine Vegetation - Use a non-pressure/impact spraying equipment to dispense a 0.01 percent SC-1000™ solution and allow to stand for 5-10 minutes before a final rinsing with fresh or ocean water.
Washing Marine Equipment - For wet oils and bunker crude, use SC-1000™ at 20 percent solution (preferably warmer than 80 F) and spray or wipe. Apply directly to equipment, allow to dwell for 1-2 minutes and then spray rinse with fresh or ocean water. For hardened oils, fuels, and viscous lubricants, apply SC-1000™ blended with SC-Supersolve™ (a non-toxic, low aromatic, water miscible solvent) at the ratio of 80/20 then dilute with water to a 50 percent solution, spray or wipe onto surface, let stand for 1-2 minutes before rinsing.
Heavy Cleaning Examples - Dilution full strength 1:5; diesel engines, auto parts, baked on oil or lube grease, dried oil/enamel, latex paints, thick food syrups, insect smears, dried animal or vegetable fats, hard resins, thick dust-laden oily dirt, asphalt and grass or plant stains.
Average Cleaning Examples - Dilution 1:5 up to 1:20; automotive work counters and tools, food and beverage processing equipment, oily or food-laden floors, manufacturing work areas, vehicle maintenance, shipping containers, utility equipment, and parts washers.
General Maintenance Examples - 1:20 up to 1:100; vehicle washing, general janitorial for offices/schools/hospitals/recreation and related equipment, pressure sprayers, food preparation and storage, painted/plastic laminate surfaces, sports equipment, general cleaning, immersion tanks, and ultrasonics.
3.Conditions for Use:
SC-1000™ may be used on any surface that is compatible with water. The product may tarnish some soft aluminum surfaces if not adequately diluted and rinsed with water.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity

Material Tested	Species	LC50 (ppm)
SC-1000™	Menidia beryllina	26.40 96-hr
	Mysidopsis bahia	15.20 48-hr
No. 2 Fuel Oil	Menidia beryllina	8.85 96-hr
	Mysidopsis bahia	1.57 48-hr
SC-1000™ & No. 2 Fuel Oil	Menidia beryllina	4.72 96-hr
	Mysidopsis bahia	2.13 48-hr
Reference Toxicant (SDS)	Menidia beryllina	2.22 96-hr
	Mysidopsis bahia	10.5 48-hr

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: >212°F
2. Pour Point: 25°F
3. Viscosity: <10 cps @ 25°C
4. Specific Gravity: 1.009
5. pH: 10.2 - 10.5
6. Surface Active Agents: CONFIDENTIAL.
7. Solvents: None.
8. Additives: CONFIDENTIAL.
9. Solubility in Water: Soluble in water.

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

Compound	Concentration (ppm)
Arsenic	1.33
Cadmium	ND
Chromium	ND
Copper	0.100
Lead	ND
Mercury	ND
Nickel	ND
Zinc	0.20
Cyanide	ND
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-26
USEPA, OIL PROGRAM CENTER
LISTING DATE: AUGUST 06, 2001
"GOLD CREW SW"

I. NAME, BRAND, OR TRADEMARK
GOLD CREW SW
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Gold Crew Products & Services, LLC
P.O. Box 12032
Orange, CA 92869
Phone: (714) 288-8781
Fax: (714) 288-8730
E-mail: jfigueira@goldcrew.net
(Mr. Jim Figueira)

ECS
10421 Burnham Drive, NW Building 1-B
P.O. Box 2029
Gig Harbor, WA 98335
(Mr. Ed Grubbs)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Gold Crew Products & Services, LLC
P.O. Box 12032
Orange, CA 92869
Phone: (714) 288-8781
Fax: (714) 288-8730
E-mail: jfigueira@goldcrew.net
(Mr. Jim Figueira)

ECS
10421 Burnham Drive, NW Building 1-B
P.O. Box 2029
Gig Harbor, WA 98335
(Mr. Ed Grubbs)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
Normal.

3. Skin and eye contact; protective clothing; treatment in case of contact:
Extensive testing indicates that GOLD CREW SW is non-hazardous and non-toxic to humans; however, good hygiene practices should always be followed as outlined below:
Eyes- flush with water; get medical attention if required; Skin - remove contaminated clothing, wash exposed area, and wash clothing before use. If irritation develops get medical attention; Ingestion - get medical attention if required; Inhalation - none considered necessary.
4.a. Maximum storage temperature: When above 120°F, keep container closed and stored in a cool dark place. Evaporation may change product's characteristics.
4.b. Minimum storage temperature: Product will freeze below 25°F. No phase separation will occur. If frozen, thaw, and stir well.
4.c. Optimum storage temperature range: 25°F to 120°F
4.d. Temperatures of phase separations and chemical changes: No separation at any temperature between 32-120°F. No tendency to "layer out" or separate, standing for 30 days. No separation of layering after freezing.

V. SHELF LIFE
20 years (unopened).

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Apply through hand pump sprayer and allow to soak.
2. Concentration/Application Rate:
As a presoak dilute 20 parts water to 1 part SW. For crude oil, allow about 1 hour. For medium distillates, allow 30 minutes. For light distillates, allow 15 minutes. Time may vary depending on weather conditions. After allowing the solution to presoak, wash the area in the following manner: Apply through a power washer or through a steam powered unit at 1 percent, 3 percent, or 5 percent depending on oil viscosity and temperature.
3. Conditions for Use: Equally effective with salt or fresh water.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
GOLD CREW SW	Menidia beryllina	13.80 96-hr
	Mysidopsis bahia	20.40 48-hr
No. 2 Fuel Oil	Menidia beryllina	6.75 96-hr
	Mysidopsis bahia	2.82 48-hr
GOLD CREW SW &	Menidia beryllina	6.34 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.70 48-hr
Reference Toxicant (SDS)	Menidia beryllina	2.22 96-hr
	Mysidopsis bahia	9.52 48-hr

b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: >200

2. Pour Point: 25°F
3. Viscosity: 33.87 CST
4. Specific Gravity: 1.035
5. pH: 9.76 +/- 0.01
6. Surface Active Agents: CONFIDENTIAL.
7. Solvents: None.
8. Additives: CONFIDENTIAL.
9. Solubility in Water: Complete.

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

Compound	Concentration (ppm)
Arsenic	<1.0
Cadmium	<0.10
Chromium	<1.0
Copper	<1.0
Lead	<0.5
Mercury	<0.02
Nickel	<1.0
Zinc	0.44
Cyanide	ND
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-28
USEPA, OIL PROGRAM CENTER
LISTING DATE: NOVEMBER 05, 2001
"NALE-IT"

I. NAME, BRAND, OR TRADEMARK
NALE-IT
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
SPL Control LLC
P.O. Box 627
Elemore City, OK 73433
Phone: (580) 788-2187
E-mail: splcontrol@aol.com
(Mr. Tom Lester)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
SPL Control LLC
P.O. Box 627
Elemore City, OK 73433
Phone: (580) 788-2187
E-mail: splcontrol@aol.com
(Mr. Tom Lester)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable
2. Ventilation:
Workers should be in well ventilated areas; if in a confined area, use a respirator.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Workers should wear protective goggles or safety glasses. Prolonged contact with skin may result in dryness.
4.a. Maximum storage temperature: NA
4.b. Minimum storage temperature: >32°F
4.c. Optimum storage temperature range: 40°F to 200°F
4.d. Temperatures of phase separations and chemical changes: No phase separation or hazardous polymerization will occur.

V. SHELF LIFE
Indefinite.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

NALE-IT may be applied using a pressure sprayer.

2. Concentration/Application Rate:

For pit closures, surface hydrocarbon spills, compressor stations, pipeline and flow line leaks, well head and tank farm leaks, and highway spills. (petroleum products) mix 1 part NALE-IT with 20 parts water.

3. Conditions for Use:

Equally effective with fresh or salt water.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)	
NALE-IT	Menidia beryllina	273.30	96-hr
	Mysidopsis bahia	69.00	48-hr
No. 2 Fuel Oil	Menidia beryllina	6.93	96-hr
	Mysidopsis bahia	2.29	48-hr
NALE-IT & No. 2 Fuel Oil	Menidia beryllina	3.82	96-hr
(1:10)	Mysidopsis bahia	1.84	48-hr
Reference Toxicant (SDS)	Menidia beryllina	2.60	96-hr
	Mysidopsis bahia	8.56	48-hr

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: >212°F
2. Pour Point: 30°F
3. Viscosity: 1.18
4. Specific Gravity: 1.02
5. pH: 6.8 - 7.2
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: None
8. Additives: CONFIDENTIAL
9. Solubility in Water: Soluble in fresh and sat water.

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

Compound	Concentration (ppm)
Arsenic	0.82
Cadmium	ND
Chromium	ND
Copper	0.173

Lead	ND
Mercury	ND
Nickel	ND
Zinc	0.18
Cyanide	ND
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-30
USEPA, OIL PROGRAM CENTER
LISTING DATE: JULY 24, 2002
"F-500"

I. NAME, BRAND, OR TRADEMARK
F-500
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Hazard Control Technologies, Inc.
150 Walter Way
Fayetteville, GA 30214
Phone: (770) 719-5112
Fax: (770) 719-5117
(Mr. Brian Balmes)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Hazard Control Technologies, Inc.
150 Walter Way
Fayetteville, GA 30214
Phone: (770) 719-5112
Fax: (770) 719-5117
(Mr. Brian Balmes)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
Local exhaust - no special requirements.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Eye contact - may cause eye irritation, flush with water. Wear splash proof protection goggles or full-face shield. If irritation persists contact a physician. Skin contact - may cause mild irritation, flush with water. Wear rubber and vinyl gloves and apron. Product has been tested and found to be non-skin sensitizing per OECD 406. Ingestion - may cause gastrointestinal irritation. Drink plenty of water to dilute. Do not induce vomiting. If irritation persists contact a physician. Inhalation - elevated temperature vapors may cause irritation to respiratory tract. Remove to fresh air.
4.a. Maximum storage temperature: 130°F
4.b. Minimum storage temperature: 17°F
4.c. Optimum storage temperature range: 35°F - 130°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE

The shelf life is 15 years when stored between 35°F - 130°F in unopened containers.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Standard fire apparatus spray nozzle with agitation onto and into spill.
2. Concentration/Application Rate:
1 part F-500:8 parts hydrocarbon:32 parts water (fresh or salt)
3. Conditions for Use:
Water temperature: 33°F - 211°F
Effective on both polar and non-polar hydrocarbons

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
F-500	Menidia beryllina	<10.00 96-hr
	Mysidopsis bahia	32.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	56.00 96-hr
	Mysidopsis bahia	100.00 48-hr
F-500 & No. 2 Fuel Oil	Menidia beryllina	<10.00 96-hr
(1:10)	Mysidopsis bahia	32.00 48-hr
Reference Toxicant (DSS)	Menidia beryllina	1.14 96-hr
	Mysidopsis bahia	0.98 48-hr

b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: >200°F
2. Pour Point: -17°F
3. Viscosity: 54-56 centistokes @ 72°F
4. Specific Gravity: 0.99 g/cc at 72°F
5. pH: 7.00
6. Surface Active Agents: PROPRIETARY/CONFIDENTIAL
7. Solvents: None
8. Additives: None
9. Solubility in Water: Complete

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

Compound	Concentration (ppm)
Arsenic	<0.03
Cadmium	<0.01
Chromium	<0.01
Copper	<0.05
Lead	<0.025
Mercury	<0.005
Nickel	<0.02
Zinc	<0.07
Cyanide	<0.02
Chlorinated Hydrocarbons	<0.10

TECHNICAL PRODUCT BULLETIN #SW-31
USEPA, OIL PROGRAM CENTER
LISTING DATE: OCTOBER 27, 2003
"ENVIROCLEAN"
(formerly ENVIRO CLEAN 165)

I. NAME, BRAND, OR TRADEMARK
ENVIROCLEAN
(formerly ENVIRO CLEAN 165)
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Enviro Clean Services, LLC
P.O. Box 721090
Oklahoma City, OK 73172-1090
Phone: (405) 373-4545
Fax: (405) 373-4549
E-mail: info@envirocleanps.com
(Mr. Jonathan Behymer)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Enviro Clean Services, LLC
P.O. Box 721090
Oklahoma City, OK 73172-1090
Phone: (405) 373-4545
Fax: (405) 373-4549
E-mail: info@envirocleanps.com
(Mr. Jonathan Behymer)

Enviro Clean Products & Services
110 Airport Drive, Suite A
Wappingers Falls, NY 12590
Phone: (800) 477-2461
Fax: (845) 463-4573
E-mail: jjordan@envirocleanps.com
Web: www.envirocleanps.com
(Mr. Joe Jordan)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
Normal.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Use good normal hygiene and avoid contact with skin and eyes. Gloves and goggles are recommended for field application and product handling. If contact with eyes flush with water for 15 minutes and seek medical attention. For contact with skin, wash area with soap and water.

May cause redness, edema, and drying of skin. Seek medical attention if irritation develops. In case of ingestion, seek medical attention. Not considered an inhalation risk.
4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: 28°F
4.c. Optimum storage temperature range: 30°F - 120°F
4.d. Temperatures of phase separations and chemical changes: Temperature fluctuations will not cause separation or deterioration of product. Product blend is stable and will not undergo phase separation of ingredients or stratification of contents over time.

V. SHELF LIFE
Unlimited if unopened.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Dilute product with water prior to use. Apply product via manual pressure applicator (i.e., hand pump), or other delivery equipment, to impacted surfaces. Allow product to soak prior to rinse/recovery if heavily saturated with oil. On hard surfaces, product may be applied and agitated with a brush or other physical means prior to recovery of effluent. Product may also be pre-mixed and used in a batch tank or through an eduction/metering system for flushing and recovery operations.
2. Concentration/Application Rate:
ENVIROCLEAN is a concentrated product and must be diluted prior to use. Concentrations vary based upon type of oil and degree of surface saturation. For light ends (i.e., gas condensate/gasoline) a 1% - 2% solution may be used to flush area to containment. (A higher concentration solution of 6% should be used if flammable vapor presents an explosion hazard.) For lighter oils (i.e., No. 2 Fuel Oil) a 3% solution may be used to flush impacted areas to containment. For heavy ends (i.e., crude oil/No. 6 Fuel Oil) a 6% solution of ENVIROCLEAN should be applied and allowed to soak into containment/substrate for up to an hour to allow for release of oil. The surface should then be flushed to containment with a 1% - 3% solution of ENVIROCLEAN. Product may be used as noted above through any pressure or steam equipment. The use of a “hot” unit is recommended when oils are at low temperature or have been weathered.
3. Conditions for Use:
ENVIROCLEAN may be diluted with hard, soft, brackish, salt, or most waters of sufficient quality for operations.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)
ENIVROCLEAN	Menidia beryllina	27.80 96-hr
	Mysidopsis bahia	22.60 48 hr
No. 2 Fuel Oil	Menidia beryllina	8.77 96-hr
	Mysidopsis bahia	1.53 48-hr
ENVIROCLEAN&		
No. 2 Fuel Oil (1:10)	Menidia beryllina	8.13 96-hr
	Mysidopsis bahia	1.76 48 hr
Reference Toxicant (DSS)	Menidia beryllina	1.83 96-hr
	Mysidopsis bahia	3.37 48 hr

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: >200°F
2. Pour Point: 28.8°F
3. Viscosity: 9 Centipose
4. Specific Gravity: 1.028
5. pH: 8.63
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: None
8. Additives: CONFIDENTIAL
9. Solubility in Water: Complete

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

Compound	Concentration (ppm)
Arsenic	<0.002
Cadmium	<0.001
Chromium	<0.005
Copper	<0.002
Lead	<0.005
Mercury	<0.0002
Nickel	<0.005
Zinc	<0.002
Cyanide	<0.1
Chlorinated Hydrocarbons	<0.05

TECHNICAL PRODUCT BULLETIN #SW-32
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JULY 21, 2006
REVISED LISTING DATE:
"BG-CLEAN™ 401"

I. NAME, BRAND, OR TRADEMARK
BG-CLEAN™ 401
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
BioGenesis Enterprises, Inc.
610 W Rawson Avenue
Oak Creek, WI 53154
Phone: (414) 571-6230
Fax: (414) 571-6231
(Dr. Mohsen Amiran)
Phone: (414) 768-7100
Fax: (414)768-7106
E-mail: skelling@aol.com
(Mr. Scott Kelling)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
BioGenesis Enterprises, Inc.
610 W Rawson Avenue
Oak Creek, WI 53154
Phone: (414) 571-6230
Fax: (414) 571-6231
(Dr. Mohsen Amiran)

BioCenter, Inc.
610 W Rawson Avenue
Oak Creek, WI 53154
Phone: (414) 768-7100
Fax: (414) 768-7106
E-mail: skelling@aol.com
(Mr. Scott Kelling)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
BG-CLEAN™ 401 is not classified as flammable by either USDOT or IMO regulations.
2. Ventilation:
Avoid prolonged breathing of vapors.
3. Skin and eye contact; protective clothing; treatment in case of contact:

BG-CLEAN™ 401 is an organic compound with a slightly alkaline pH. No extraordinary precautions are required during handling. Avoid unnecessary contact with skin or eyes. No special protective clothing is required. Body areas exposed to BG-CLEAN™ 401 may be flushed with water to clean off the chemical.
4.a. Maximum storage temperature: 180°F
4.b. Minimum storage temperature: -25°F
4.c. Optimum storage temperature range: 68°F
4.d. Temperatures of phase separations and chemical changes: BG-CLEAN™ 401 is not adversely affected by changes in storage temperature unless evaporation is allowed to occur. Phase separation does not occur when the product is stored in below freezing conditions. BG-CLEAN™ 401 is ready for use as soon as it is rewarmed to approximately 34-40°F. Product will expand when frozen.

V. SHELF LIFE
The shelf life of unopened containers of BG-CLEAN™ 401 is unlimited. Containers should always be capped when not in use to prevent contamination and evaporation.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
BG-CLEAN™ 401 is applied by one of two methods. 1) For situations where cleanup starts shortly after contamination and the oil has not yet weathered, use a high pressure spray. BG-CLEAN™ 401 is proportioned into a stream of water and sprayed directly on the surface to be cleaned at a rate of 60-70 gpm. 2) For difficult cleaning situations such as weathered crude oil on a rocky beach, a three step procedure should be used. First presoak the contaminated area by proportioning BG-CLEAN™ 401 into a low pressure stream of water at a rate of about 20 gpm. Allow the spray to soak for 15-30 minutes. Then proportion BG-CLEAN™ 401 into a high pressure water stream and apply at a rate of 60-70 gpm. Selection of the best procedure depends on site conditions.
BG-CLEAN™ 401 effectiveness is increased when applied with water heated to between 100 F and 180 F. As ambient temperature decreases, the benefits of applying heated spray increase. The efficiency of BG-CLEAN™ 401 depends directly on mixing of the BG-CLEAN™ 401 molecules with the hydrocarbon molecules. Given good mixing, BG-CLEAN™ 401 can be used on all hydrocarbons except asphalt.
2. Concentration/Application Rate:
Dilute BG-CLEAN™ 401 water. The amount of spray required varies with the amount of oil. Concentrations ranging from 5:1 to 100:1 have been found useful depending on hydrocarbon concentrations and viscosity. During application, adjust the concentration of BG-CLEAN™ 401 to suit the cleaning effect desired.
3. Conditions for Use:
BG-CLEAN™ 401 is recommended as a cleaner for piers, seawalls, pilings, ship's hulls, and rocky beaches. It can be used on metal, wood, and plastics. BG-CLEAN™ 401 is also highly useful for cleaning contaminated solids such as soil. This includes a range from normal soil aggregate to 100% sand. Two conditions are required for maximum cleaning; thorough mixing of BG-CLEAN™ 401 with the oil and an adequate concentration of BG-CLEAN™ 401.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)	
BG-CLEAN™ 401	Menidia beryllina	787.00	96-hr
	Mysidopsis bahia	477.00	48-hr
No. 2 Fuel Oil	Menidia beryllina	16.90	96-hr
	Mysidopsis bahia	2.92	48-hr
BG-CLEAN™ 401 No. 2 Fuel Oil (1:10)	Menidia beryllina	13.10	96-hr
	Mysidopsis bahia	2.86	48-hr
Reference Toxicant (SDS)	Menidia beryllina	3.93	96-hr
	Mysidopsis bahia	8.80	48-hr

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point, ASTM D-93: >76.6°C (>170°F)
2. Pour Point, ASTM D-97: -4°C
3. Viscosity, ASTM D-88: 24 SUS@ 100°F
4. Specific Gravity, ASTM D-1298: 1.00604 @ 60°F
5. pH: 8.227
6. Surface Active Agents: Proprietary
7. Solvents: Proprietary
8. Additives: Proprietary
9. Solubility: Miscible in water.

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

Compound	Concentration (ppm)
Arsenic	<0.118
Cadmium	<0.020
Chromium	<0.125
Copper	0.049
Lead	0.166
Mercury	<0.02
Nickel	<0.125
Zinc	0.280
Cyanide	0.002
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-33
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: NOVEMBER 27, 2006
REVISED LISTING DATE:
"E-SAFE©"

I. NAME, BRAND, OR TRADEMARK
E-SAFE©
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
PLUTUS Environmental Technologies, Inc.
P.O. Box 5104
Sevierville, TN 37864-5104
Phone: (865) 453-0060
Fax: (865) 908-6652
E-mail: CEO@plutusonline.com
(Mr. James Hatcher)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
PLUTUS Environmental Technologies, Inc.
P.O. Box 5104
Sevierville, TN 37864-5104
Phone: (865) 453-0060
Fax: (865) 908-6652
E-mail: CEO@plutusonline.com
(Mr. James Hatcher)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable until >170ºF
2. Ventilation:
Handle in a well ventilated space. Local exhaust is recommended if TLV's are exceeded.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid eye and (sensitive) skin contact. In case of contact, immediately flush with large amount of cool water of at least 5 minutes. Wear protective eye goggles when using any chemicals. Impermeable protective gloves are recommended for sensitive skin types. Protective clothing is not required. Rinse contaminated clothing, shoes, goggles, and gloves in simple tap water to remove any chemical residue. Avoid ingestion, breathing dusts, mists, or fumes. In case of ingestion drink several glasses of water. Do not induce vomiting. In case of inhalation, move affected person to fresh air.
4.a. Maximum storage temperature: 160°F
4.b. Minimum storage temperature: -15°F
4.c. Optimum storage temperature range: 40°F – 110ºF
4.d. Temperatures of phase separations and chemical changes: No phase separations will occur. Continued exposure to direct sunlight may cause a change in color, but performance is not

affected.

V. SHELF LIFE
Unlimited if left in unopened containers stored at 40ºF - 110ºF and away from direct sunlight.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
E-SAFE© may be introduced with a pressure spray to cover the affected area. The contaminated area should be thoroughly moistened. Following the spray application the treated area should be soaked with water to facilitate penetration. Heavy soil such as clay will be cleaned by E-SAFE©, but tilling or aerating the soil will rapidly shorten penetration time. Sand or loam ay require heavy dosage with E-SAFE© because hydrocarbon migration is so rapid in these soil types. Treatment of fouled beach areas should have E-SAFE© sprayed on all contaminated surfaces. Any remaining hydrocarbons may then be effectively vacuumed or wiped away from the treated surfaces. Incidental wave action or rainfall will enhance coverage and penetration by E-SAFE©.
2. Concentration/Application Rate:
E-SAFE© should be applied full strength. Beginning treatment for hydrocarbon contaminated surface is one gallon of E-SAFE© per 100 square foot of surface area. This dosage is recommended when the ambient temperature is 72ºF and humidity is moderate. Higher temperature or lower humidity will increase the need for repeated applications or a higher volume of E-SAFE© per application.
3. Conditions for Use:
E-SAFE© works on all soil types and weather conditions that allow hydrocarbon penetration. E-SAFE© follows the same path, channel, or gradient as the contaminant. When visible detection reveals that E-SAFE© has been absorbed by, or has penetrated the soil, water should be applied to the site. E-SAFE© is soluble in water and also breaks the surface tension of the transporting water molecules.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)	
E-SAFE©	Menidia beryllina	329.00	96-hr
	Mysidopsis bahia	257.00	48-hr
No. 2 Fuel Oil	Menidia beryllina	5.45	96-hr
	Mysidopsis bahia	10.20	48-hr
E-SAFE©	Menidia beryllina	8.77	96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	14.20	48-hr
Reference Toxicant (SDS)	Menidia beryllina	8.07	96-hr
	Mysidopsis bahia	16.00	48-hr

b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES

1. Flash Point, ASTM D-93: >170°F
2. Pour Point, ASTM D-97: -27ºC
3. Viscosity, ASTM D-88: 11SFS@ 100°F
4. Specific Gravity, ASTM D-1298: 1.0118 @ 60°F
5. pH: 8.04
6. Surface Active Agents: Confidential
7. Solvents: Confidential
8. Additives: Confidential
9. Solubility: Soluble

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

Compound	Concentration (ppm)
Arsenic	<0.005
Cadmium	<0.0008
Chromium	<0.025
Copper	0.061
Lead	0.082
Mercury	<0.007
Nickel	<0.003
Zinc	0.214
Cyanide	0.200
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-34
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: NOVEMBER 27, 2006
REVISED LISTING DATE:
"SHEEN-MAGIC©"

I. NAME, BRAND, OR TRADEMARK
SHEEN-MAGIC©
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
PLUTUS Environmental Technologies, Inc.
P.O. Box 5104
Sevierville, TN 37864-5104
Phone: (865) 453-0060
Fax: (865) 908-6652
E-mail: CEO@plutusonline.com
(Mr. James Hatcher)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
PLUTUS Environmental Technologies, Inc.
P.O. Box 5104
Sevierville, TN 37864-5104
Phone: (865) 453-0060
Fax: (865) 908-6652
E-mail: CEO@plutusonline.com
(Mr. James Hatcher)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable until >170ºF
2. Ventilation:
Handle in a well ventilated space. Local exhaust is recommended if TLV's are exceeded.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid eye and (sensitive) skin contact. In case of contact, immediately flush with large amount of cool water of at least 5 minutes. Wear protective eye goggles when using any chemicals. Impermeable protective gloves are recommended for sensitive skin types. Protective clothing is not required. Rinse contaminated clothing, shoes, goggles, and gloves in simple tap water to remove any chemical residue. Avoid ingestion, breathing dusts, mists, or fumes. In case of ingestion drink several glasses of water. Do not induce vomiting. In case of inhalation, move affected person to fresh air.
4.a. Maximum storage temperature: 160°F
4.b. Minimum storage temperature: -8°F
4.c. Optimum storage temperature range: 40°F – 110ºF

4.d. Temperatures of phase separations and chemical changes: No phase separations will occur.

V. SHELF LIFE
Unlimited if left in unopened containers stored at 40ºF - 110ºF and away from direct sunlight.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
SHEEN-MAGIC© recommended treatment is light misting of contaminated surface. Heavier hydrocarbons such as crude oil should be boomed or vacuumed away as much as possible before application of the SHEENMAGIC©. Treatment of fouled beach areas should have SHEEN-MAGIC© sprayed on all contaminated surfaces. Incidental wave action or rainfall will enhance coverage and penetration by SHEEN-MAGIC©. Any remaining hydrocarbons may then be effectively vacuumed or wiped away from the treated surfaces. Aerial application should be delivered at height and air speed that will create air shear necessary to deliver droplets as per nozzle manufacturer's recommendations. Mist spray from surface vehicles may be delivered from power fogger units. Hand sprayers are generally used for small treatment areas.
2. Concentration/Application Rate:
One ounce per 50 square yards of surface is the normal treatment for diesel spills. Heavier hydrocarbon sheens may require additional treatment to remove the contaminant. 3. Conditions for Use:
SHEEN-MAGIC© works in all weather conditions that allow hydrocarbon penetration. SHEEN-MAGIC© should be used as soon as the temperature and weather conditions allow delivery to the spill area. Heavier concentrations may be required when the temperature/humidity will cause rapid evaporation of the spray.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
SHEEN-MAGIC©	Menidia beryllina	183.00 96-hr
	Mysidopsis bahia	161.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	4.57 96-hr
	Mysidopsis bahia	3.04 48-hr
SHEEN-MAGIC©	Menidia beryllina	7.82 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	5.75 48-hr
Reference Toxicant (SDS)	Menidia beryllina	11.70 96-hr
	Mysidopsis bahia	5.36 48-hr

b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point, ASTM D-93: >170°F
2. Pour Point, ASTM D-97: -22ºC
3. Viscosity, ASTM D-88: 11SFS@ 100°F
4. Specific Gravity, ASTM D-1298: 1.0127 @ 60°F
5. pH: 8.10

6. Surface Active Agents: Confidential
7. Solvents: Confidential
8. Additives: Confidential
9. Solubility: Soluble

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

Compound	Concentration (ppm)
Arsenic	<0.005
Cadmium	<0.0008
Chromium	0.026
Copper	0.023
Lead	0.085
Mercury	<0.007
Nickel	<0.003
Zinc	0.231
Cyanide	0.200
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-35
USEPA, OIL PROGRAM CENTER
LISTING DATE: JUNE 16, 2008
"PROCLEANS"

I. NAME, BRAND, OR TRADEMARK
PROCLEANS
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Eximco International, Inc.
5252 Gulfton, #2-B
Houston, TX 77081
Phone: (713) 432-7889
E-mail: procleans@procleans.com
(Mr. Nat Brown)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Eximco International, Inc.
5252 Gulfton, #2-B
Houston, TX 77081
Phone: (713) 432-7889
E-mail: procleans@procleans.com
(Mr. Nat Brown)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
Normal.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Flush contaminated eyes thoroughly with water for 15 minutes, and get medical attention. Remove contaminated clothing, wash exposed area with soap and water, and wash clothing before use. Get medical attention if irritation develops. Get medical attention if ingested. No medical attention is necessary if inhaled.
4.a. Maximum storage temperature: 130°F
4.b. Minimum storage temperature: 35°F
4.c. Optimum storage temperature range: 50°F to 100°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
Approximately 2 years at recommended temperatures if unopened.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Apply specified dilute solution using fire hoses or heated pressure washers onto the contaminated solid surface of the spill.

2. Concentration/Application Rate:
Use ten parts water to one part product. Dilution rates may be adjusted to suit different job conditions. Apply 10 to 15 gallons of diluted PROCLEANS to one cubic yard of contamination.
3. Conditions for Use: May be used with fresh or salt water. Warmer temperatures may improve results. Most effective if used on solid surfaces such as shoreline beaches and rocks contaminated with light and medium weight crude oils and refined petroleum products.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
PROCLEANS	Menidia beryllina	83.73 96-hr
	Mysidopsis bahia	83.98 48-hr
No. 2 Fuel Oil	Menidia beryllina	7.41 96-hr
	Mysidopsis bahia	11.68 48-hr
PROCLEANS &	Menidia beryllina	4.78 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	11.68 48-hr
Reference Toxicant ($CuSO_4$)	Menidia beryllina	0.73 96-hr
	Mysidopsis bahia	0.77 48-hr

b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: >186°F
2. Pour Point: 34.6°F
3. Viscosity: 2.41 cST @ 104°F
4. Specific Gravity: 1.01 @ 25°C
5. pH: 6.8
6. Surface Active Agents: Anionic and nonionic
7. Solvents: None.
8. Additives: None
9. Solubility in Water: NA

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

Compound	Concentration (ppm)
Arsenic	0.690
Cadmium	ND
Chromium	ND
Copper	ND
Lead	ND
Mercury	ND
Nickel	ND

Zinc	0.738
Cyanide	ND
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #SW-36
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: MARCH 30, 2009
"SPILLCLEAN"
SPILLCLEAN ["Concentrate"]
(aka, FIREMAN'S BRAND SPILLCLEAN)

I. NAME, BRAND, OR TRADEMARK
SPILLCLEAN
SPILLCLEAN ["Concentrate"] = 30% Active Ingredients and 70% Water
(aka, FIREMAN'S BRAND SPILLCLEAN)
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Super Sat Ventures, Inc.
611 Riverview Drive
Thiensville, WI 53092
Phone: (414) 840-9223
(Mr. Daniel W. Klein)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Super Sat Ventures, Inc.
611 Riverview Drive
Thiensville, WI 53092
Phone: (414) 840-9223
(Mr. Daniel W. Klein)

Aramsco
1201 Gateway Drive
Elgin, IL 60124
Phone: (800) 767-6933
(Mr. Rick Swift)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability: >210°F
2. Ventilation:
General room ventilation is expected to be satisfactory.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Product may cause mild skin irritation. Wear impervious gloves, safety goggles, and full cover clothes. Eye wash and safety shower should be accessible. If eye contact, flush immediately with water for at least 15 minutes. If skin contact, wash with soap and water. If swallowed, give two glasses of water (do not induce vomiting). Seek medical attention for eye and skin contact and ingestion.
4.a. Maximum storage temperature: <210°F

4.b. Minimum storage temperature: >32°F
4.c. Optimum storage temperature range: 50°F – 70°F
4.d. Temperatures of phase separations and chemical changes: <32°F and >210°F

V. SHELF LIFE
3 years. Avoid extreme heat and store in a dry, cool area.

VI. RECOMMENDED APPLICATION PROCEDURES
Please note:
SPILLCLEAN comes in two forms "Concentrate" and "Original Formula." SPILLCLEAN ["Concentrate"] is 30% Active Ingredients and 70% Water while SPILLCLEAN ["Original Formula"] is 10% Active Ingredients and 90% Water.

SPILLCLEAN ["Concentrate"] and SPILLCLEAN ["Original Formula"] are for on land and surface use only. They should not be used around or near bodies of water when there is a reasonable chance of mixing in with water. Once the contaminant/SPILLCLEAN ["Concentrate"] solution mixes with the body of water, "control" of the contaminant will be lost since SPILLCLEAN is water soluble.

SPILLCLEAN is a formula designed to solubilize and emulsify oil and oil-type products such as motor oil, gasoline, diesel fuel, and transmission fluid. When such products are accidentally spilled and need to be cleaned up from hard surfaces such as streets and driveways, SPILLCLEAN is an effective material to use. Being a surfactant-type material, SPILLCLEAN allows the spilled contaminant to be emulsified and then lifted and separated from the hard surface. The resulting spill/contaminant can then be picked up, vacuumed up, or flushed with water, all in accordance with federal, state, and local regulations.

1. Application Method:
SPILLCLEAN ["Concentrate"] 30% Active Ingredients and 70% Water – squeeze product directly around outside perimeter of oil/gasoline/antifreeze spill using squeeze bottle container. This process is designed to "contain" the contaminant and keep if from migrating down a hard surface like a city street, parking lot, or garage floor. SPILLCLEAN ["Concentrate"] is more viscous than oil/gasoline, and will "hold" the contaminant in place. Once the contaminant is contained, the user can apply SPILLCLEAN ["Original Formula"] over the "body" of the contaminant if the spill is large (over 2 gallons). If the spill is small (less than 2 gallons), the user can apply either SPILLCLEAN ["Concentrate"] or SPILLCLEAN ["Original Formula"] to the "body" of the contaminant spill. Using a broom or broom-like applicator, sweep SPILLCLEAN in with the contaminant until thoroughly blended in place. The original bright red color of SPILLCLEAN ["Concentrate"] and SPILLCLEAN ["Original Formula"] will dissipate when it is thoroughly mixed with the contaminant.

SPILLCLEAN ["Original Formula"] 10% Active Ingredients and 90% Water – apply over the "body" of the contaminant if the spill is large (over 2 gallons). If the spill is small (less than 2 gallons), the user can apply SPILLCLEAN ["Concentrate"] or SPILLCLEAN ["Original Formula"] to the "body" of the contaminant spill. SPILLCLEAN ["Original Formula"] is designed to "attach" to a contaminant and remove it from a hard surface like a city street, parking lot, or garage floor. It is recommended to be used on any size contaminant spill, large or small. This product is designed to penetrate into the surface pores and molecularly "attach" with the

contaminant, thus making the contaminant "water soluble." The contaminant can be removed from the pores (of the asphalt, concrete, epoxy surface, etc.) with a 60psi water supply. The user can then dispose of the resulting mixture according to regulations. This product can be applied using a vast number of different applicators, especially with regard to firefighting equipment. Using a broom or broom-like applicator, sweep SPILLCLEAN in with the contaminant until thoroughly blended in place. The original bright red color of SPILLCLEAN ["Concentrate"] and SPILLCLEAN ["Original Formula"] will dissipate when it is thoroughly mixed with the contaminant.

When SPILLCLEAN'S bright red color has dissipated (upon mixing) with the contaminant, it can be wiped clean with a rag or wet-vacuumed, collected, and disposed of according to EPA, federal, state, and local regulations. Additionally, a dry sorbent may be applied to the resulting SPILLCLEAN/contaminant/water mixture, shoveled up and disposed of according to applicable regulations.

2. Concentration/Application Rate:
For Surface and Land Application Only:

SPILLCLEAN ["Concentrate"] 30% Active Ingredients and 70% Water – for spills less than 2 gallons squeeze a one-half inch ribbon of straight product around the perimeter of the oil/gasoline spill, followed by an "X" pattern over the body of the spill. For spills greater than 2 gallons squeeze a one-half inch ribbon of straight product around the perimeter of the oil/gasoline spill. The general purpose of SPILLCLEAN ["Concentrate"] is to "contain" the contaminant from migrating, and therefore should not be diluted with water during application.

SPILLCLEAN ["Original Formula"] 10% Active Ingredients and 90% Water – concentration rate is based on equipment used and disposal method. Typical usage will be (0 to 100 parts water) plus 1 part SPILLCLEAN ["Original Formula"] all applied to 1 part contaminant (oil/gasoline spill).

The resulting mixture of SPILLCLEAN and oil must be disposed of in accordance with EPA, federal, state, and local agencies that regulate disposal of contaminant. The resulting SPILLCLEAN contaminant mixture should be wet-vacuumed up and placed in a proper container and disposed.

3. Conditions for Use:
Water Salinity: Water soluble, not applicable for use on water
Water Temperature: >32°F and <120°F
Types of Pollutants: Automobile motor oil, gasoline, diesel fuel, and transmission fluid
Ages of Pollutants: 0 to 20 years old

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
SPILLCLEAN ["Concentrate"]	Menidia beryllina	24.30 96-hr

	Mysidopsis bahia	10.00	48-hr
No. 2 Fuel Oil	Menidia beryllina	6.60	96-hr
	Mysidopsis bahia	2.20	48-hr
SPILLCLEAN [“Concentrate”] &	Menidia beryllina	3.30	96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	1.30	48-hr
Reference Toxicant (SDS)	Menidia beryllina	8.90	96-hr
	Mysidopsis bahia	10.70	48-hr

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point:
SPILLCLEAN [“Concentrate”] = >210°F
2. Pour Point:
SPILLCLEAN [“Concentrate”] = 27.0°F
3. Viscosity:
SPILLCLEAN [“Concentrate”] = 6400cPs@25°C
4. Specific Gravity:
SPILLCLEAN [“Concentrate”] = 1.030
5. pH:
SPILLCLEAN [“Concentrate”] = 7.20
6. Surface Active Agents: Confidential
7. Solvents: Confidential
8. Additives: Confidential
9. Solubility: Water soluble

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

Compound	Concentration (ppm)
Arsenic	0.02
Cadmium	<0.007
Chromium	<0.01
Copper	<0.01
Lead	<0.02
Mercury	<0.00003
Nickel	<0.01
Zinc	<0.01
Cyanide	0.137
Chlorinated Hydrocarbons	<0.01

TECHNICAL PRODUCT BULLETIN #SW-37
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: MARCH 15, 2010
"TXCHEM HE-1000™"

I. NAME, BRAND, OR TRADEMARK
"TXCHEM HE-1000™"
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Texas EnviroChem, Inc.
11659 Jones Road, PMB #348
Houston, TX 77070
Phone: (281) 728-3217

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Texas EnviroChem, Inc.
11659 Jones Road, PMB #348
Houston, TX 77070
Phone: (281) 728-3217

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability: Not flammable
2. Ventilation: Recommended, respirator in confined area
3. Skin and eye contact; protective clothing; treatment in case of contact:
Wear rubber gloves and eye protection. If eye contact, wash eyes thoroughly for 15 minutes; including upper and lowers lids, and seek medical attention. For skin contact, irritation is possible, wash with soap and water for 15 minutes. If irritation persists, seek medical attention.
4.a. Maximum storage temperature: 95°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: 75°F
4.d. Temperatures of phase separations and chemical changes: No phase changes have been observed.

V. SHELF LIFE
One year in a sealed container.

VI. RECOMMENDED APPLICATION PROCEDURES
1. Application Method: TXCHEM HE-1000™ is applied by pressure sprayer, heated pressure washer, fire hoses or mixing on or into hydrocarbon contaminated media.

2. Concentration/Application Rate: TXCHEM HE-1000™ should be diluted to a one (1) part concentrated chemical to ten (10) parts water solution. Apply ten to fifteen gallons of diluted solution to one cubic yard of contaminated media. Agitate to slurry. Dilution rate may change due to level of hydrocarbon contamination. Please see manufacturer's instructions for additional application dilutions. Excess washing solution should be disposed of according to local, state, and federal regulations.

3. Conditions for Use: Pollutants should be of hydrocarbon in nature. Greater results occur at ambient temperatures greater than 50°F. Fresh or salt water can be used with no performance change.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)
TXCHEM HE-1000™	Menidia beryllina	91.33 96-hr
	Mysidopsis bahia	65.52 48-hr
No. 2 Fuel Oil	Menidia beryllina	5.84 96-hr
	Mysidopsis bahia	2.17 48-hr
TXCHEM HE-1000™ &	Menidia beryllina	7.07 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.11 48-hr
Reference Toxicant (SLS)	Menidia beryllina	15.27 96-hr
	Mysidopsis bahia	12.84 48-hr

b. Effectiveness: NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: >210°F
2. Pour Point: 23.0°F
3. Viscosity: 1.99cSt
4. Specific Gravity: 0.999
5. pH: 7.20
6. Surface Active Agents: Confidential
7. Solvents: NA
8. Additives: Confidential
9. Solubility: NA

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

Compound	Concentration (ppm)
Arsenic	Non Detect
Cadmium	Non Detect
Chromium	0.0366
Copper	0.0402
Lead	0.0189
Mercury	Non Detect
Nickel	0.0125

Zinc	0.29
Cyanide	<0.05
Chlorinated Hydrocarbons	Non Detect

NEW PRODUCT LISTING

TECHNICAL PRODUCT BULLETIN #SW-38
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: MAY 11, 2010
"NOKOMIS 5-W"

I. NAME, BRAND, OR TRADEMARK
NOKOMIS 5-W
Type of Product: Surface Washing Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Mar-Len Supply, Inc
23159 Kidder Street
Hayward, CA 94545
Phone: (510) 782-3555
Fax: (510) 782-2032
(Mr. Frank Winter)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Mar-Len Supply, Inc
23159 Kidder Street
Hayward, CA 94545
Phone: (510) 782-3555
Fax: (510) 782-2032
(Mr. Frank Winter)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability: Non-flammable (water based)
2. Ventilation: No special requirements
3. Skin and eye contact; protective clothing; treatment in case of contact: In case of eye contact, flush with water; in case of skin contact, wash with water; and, if swallowed drink water to dilute and induce vomiting.
4.a. Maximum storage temperature: 212°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: 50°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
15 years or more if stored correctly in plastic drums.

VI. RECOMMENDED APPLICATION PROCEDURES
1. Application Method: NOKOMIS 5-W is a concentrated liquid, non-hazardous cleaner. Can be used full strength or diluted with fresh or salt water. NOKOMIS 5-W is marketed in plastic containers.
2. Concentration/Application Rate: Dilution ratios are determined by the individual cleaning application. For washing equipment contaminated with soluble crude and/or bunker fuel oil use a

5:1 cleaning solution. Spray or brush onto surface, agitate with a stiff bristle brush, and rinse with fresh or salt water. For pressure washing, pre-spray surface with concentrate and allow to dwell on surface one to ten minutes (depending on age of oil). For shoreline areas and beaches with rocky, breakwaters contain the area of beach sand and gravel by creating a sand bather around a small contaminated area. Spray contaminated area with a 10:1 solution. Add salt or freshwater, agitate surface to help release oil from sand. Allow time for oil to surface and recover oil. To clean larger tidal rock surfaces, apply 5:1 or 20 percent mixture of NOKOMIS 5-W. Spray solution onto rocks with a garden type pump sprayer. Agitate with a stiff bristle brush. Allow to dwell on surface until surface looks soluble. Contain with a boom or use oil absorbent pads to recover oil.
3. Conditions for Use: Fresh or salt water can be used.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity:

Material Tested	Species	LC50 (ppm)
NOKOMIS 5-W	Menidia beryllina	10.46 96-hr
	Mysidopsis bahia	21.52 48-hr
No. 2 Fuel Oil	Menidia beryllina	4.25 96-hr
	Mysidopsis bahia	2.11 48-hr
NOKOMIS 5-W	Menidia beryllina	3.07 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.24 48-hr
Reference Toxicant (SLS)	Menidia beryllina	13.01 96-hr
	Mysidopsis bahia	9.05 48-hr

b. Effectiveness: NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: None
2. Pour Point: 28°F
3. Viscosity: 31.00 cps
4. Specific Gravity: 1.0065 g/cc
5. pH: 10.4
6. Surface Active Agents: Confidential
7. Solvents: None
8. Additives: None
9. Solubility: Completely water soluble

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

Compound	Concentration (ppm)
Arsenic	0.037
Cadmium	<0.050
Chromium	<0.050

Copper	<0.050
Lead	<0.025
Mercury	<0.0064
Nickel	<0.050
Zinc	1.7
Cyanide	0.042
Chlorinated Hydrocarbons	<0.500

PRODUCT NO LONGER MANUFACTURED

EPA HAS NOT RECEIVED UPDATED CONTACT INFORMATION FOR THIS PRODUCT as of 12/01/08

TECHNICAL PRODUCT BULLETIN #B-10
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JULY 9, 1985
REVISED LISTING DATE: JANUARY 11, 1996
"INIPOL EAP 22"

I. NAME, BRAND, OR TRADEMARK
INIPOL EAP 22
Type of Product: Biological Additive

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Société CECA S.A.
12 place de l'Iris - Cédex 54
92062 Paris-la-Défense
France
Phone: 011.33.1.47.96.92.91
Telex: CECAS 611444F
Fax: 011.33.1.47.96.92.33
E-mail: serge.kuchto@ceca.fr
(Mr. Serge Kuchto)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Elf Atochem North America, Inc.
2000 Market Street, Suite 1900
Philadelphia, PA 19103

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
INIPOL EAP 22 is non-flammable.
2. Ventilation:
Ventilation of the work place is not necessary.
3. Skin and eye contact; protective clothing; treatment in case of contact:
In case of contact with skin or eyes, wash with plenty of water.
4.a. Maximum storage temperature: 122°F
4.b. Minimum storage temperature: 52°F
4.c. Optimum storage temperature range: 55°F-65°F
4.d. Temperatures of phase separations: <52°F and >122°F

V. SHELF LIFE

The recommended shelf life is one year. However, if the product is stored indoors within the optimum temperature range, this shelf life can be extended. For instance, the shelf life can reach 400 days if the product is stored at 60°F. On the contrary, if the storage temperature is higher than the optimum range, the shelf life will decrease. At 86°F the shelf life will be only 100 days.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

Application of INIPOL EAP 22 can be made by using any spreading system, including typical spreading systems for marine dispersants. It can be sprayed from airplanes, helicopters, or ships equipped with spray racks. It can also be sprayed with firehose nozzles or any other means allowing product spreading.

2. Concentration/Application Rate:

The application rate is 10% based on amount of oil, i.e., 26 gallons per ton of oil.

3. Conditions for Use:

INIPOL EAP 22 should be used in sea waters with temperatures above 52°F.
It is effective on weathered oils and is recommended for shore cleanup.

VII. TOXICITY AND EFFECTIVENESS

a. Effectiveness

Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:

Summary Data Table

DAYS	PRODUCT 3 REPS/PROD	TOTAL MEAN ALKANES (ppm)	RED% 28 DAYS	TOTAL MEAN AROMATICS (ppm)	RED% 28 DAYS
0	CONTROL	29965.2	0	5620.5	0
	NUTRIENT	31494.8	0	6660.2	0
	INIPOL EAP 22	30823.2	0	5483.4	0
7	CONTROL	30101.5	0	5610.1	0
	NUTRIENT	8073.9	0	5026.6	0
	INIPOL EAP 22	18804.7	0	5349.8	0
28	CONTROL	28785.6	3.94	5512.7	1.92
	NUTRIENT	706.2	97.76	4863.7	26.97
	INIPOL EAP 22	1888.6	93.87	4208.5	23.25

Results of Gravimetric Analysis:

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

Control	Nutrient	Product (INIPOL EAP 22)
-6.41%	50.91%	49.95%

b. Toxicity

Material Tested	Species	LC50 (ppm)
INIPOL EAP 22	Menidia beryllina	135.0 96-hr
	Mysidopsis bahia	23.0 48-hr
No. 2 Fuel Oil	Menidia beryllina	280.0 96-hr
	Mysidopsis bahia	47.0 48-hr
INIPOL EAP 22 &	Menidia beryllina	125.0 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	35.0 48-hr
Reference Toxicant (DSS)	Menidia beryllina	2.7 96-hr
	Mysidopsis bahia	7.0 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

In the presence of crude oil treated by INIPOL EAP 22, a considerable growth of the heterotrophic microflora can be observed; the number of bacteria increases from 1,000 per ml. to 1,000,000 per ml. This activity remains constant during the whole test period, while crude oil, just by its presence, creates a fall in the metabolic activities.

IX. PHYSICAL PROPERTIES

1. Flash Point: >212°F
2. Pour Point: 52°F
3. Viscosity: 34 Furol sec at 72°F, (250 cPo at 68°F)
4. Specific Gravity: 0.996
5. pH of 10% Solution: 7.0
6. Solubility: in sea water dispersible, in raw water dispersible, in hydrocarbons soluble

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

NA: INIPOL EAP 22 is a microemulsion containing nitrogen and phosphorus compounds in assimilated form. It does not contain any heavy metal, cyanide or chlorinated hydrocarbons.

TECHNICAL PRODUCT BULLETIN #B-19
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JUNE 18, 1990
REVISED LISTING DATE: JANUARY 11, 1996
"WMI-2000"

I. NAME, BRAND, OR TRADEMARK
WMI-2000
Type of Product: Biological Additive

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
WMI International, Inc.
4901 Milwee, Suite 109
Houston, TX 77092
Phone: (713) 956-4001
Evening: (713) 526-5829
Fax: (713) 956-7305
E-mail: wmi@wt.net
E-mail: wmi.meor@yahoo.com
(Mr. Frank Lemmond)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
WMI International, Inc.
4901 Milwee, Suite 109
Houston, TX 77092
Phone: (713) 956-4001
Evening: (713) 526-5829
Fax: (713) 956-7305
Email: wmi@wt.net
E-mail: wmi.meor@yahoo.com
(Mr. Frank Lemmond)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
WMI-2000 is non-flammable.
2. Ventilation:
Avoid breathing dust or aerosol due to possibility of sensitization. Use adequate ventilation.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Minimize contact with eyes, skin, and clothing. Wash hands thoroughly after handling culture.
4.a. Maximum storage temperature: 100°F
4.b. Minimum storage temperature: 35°F
4.c. Optimum storage temperature range: 45°F - 90°F
Store in a cool, dry location. Keep partially-used containers tightly closed. Prolonged exposure to high temperature and humidity, may lower activity of product.
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE

The shelf life of WMI-2000 is 2 years if stored at ambient temperatures

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

The culture should be activated for 2 hours in water, when applicable. Conditions for use vary depending on substrate concentration and type, pH, temperature, availability of nutrients, oxygen content, and liquid medium (static or flowing).

2. Concentration/Application Rate:

Inoculation concentration is 5-9 billion spores per gram.

3. Conditions for Use:

Temperature requirements are between 35°F and 100°F. The optimum dissolved oxygen content is 2 ppm at the sludge-to-water interface. Nitrogen and phosphorous are key nutrients which promote cultural growth, and should be maintained at concentrations of 15-20 ppm and 2.5-5 ppm, respectively. The optimum pH range is between 7.0 and 8.0.

VII. TOXICITY AND EFFECTIVENESS

a. Effectiveness:

Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:

Summary Data Table

DAYS	**PRODUCT**	**TOTAL MEAN**	**RED%**	**TOTAL MEAN**	**RED%**
	3 REPS/PROD	**ALKANES (ppm)**	**28 DAYS**	**AROMATICS (ppm)**	**28 DAYS**
0	CONTROL	2626.7	0	1850.0	0
	NUTRIENT	2763.3	0	2030.0	0
	WMI-2000	2453.3	0	1880.0	0
7	CONTROL	2246.7	0	1823.3	0
	NUTRIENT	1920.0	0	1666.7	0
	WMI-2000	1243.3	0	1456.7	0
28	CONTROL	2240.0	14.7	1866.7	-0.9
	NUTRIENT	1210.0	56.2	1480.0	27.0
	WMI-2000	973.3	60.3	1253.0	33.3

Results of Gravimetric Analysis:

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

Control	Nutrient	Product (WMI-2000)
0%	25%	44%

b. Toxicity:

NA

VIII. MICROBIOLOGICAL ANALYSIS

1. Listing of all microorganisms by species and percentage in the composition:
CONFIDENTIAL
2. Optimum pH, temperature, and salinity ranges for use of the additives:
Optimum pH: 7.0
Optimum temperature: 45°F - 90°F
Optimum salinity: Fresh water to sea water
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:
pH: 6.0 - 8.0
Temperature: 40°F - 120°F
Salinity range: Fresh to sea water
4. Special nutrient requirements:
None
5. Test results regarding the determination of the following:
Salmonella - Negative
Fecal Coliform - Negative
Shigella - Negative
Staphylococcus Coagulase positive - Negative
Beta hemolytic Streptococcus - Negative

IX. PHYSICAL PROPERTIES
NA

X. ANALYSIS FOR HEAVY METALS, CYANIDE, AND CHLORINATED HYDROCARBONS
NA

TECHNICAL PRODUCT BULLETIN #B-36
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JULY 17, 1991
REVISED LISTING DATE: OCTOBER 6, 1996
"OPPENHEIMER FORMULA"
(aka, THE OPPENHEIMER FORMULA I, GENISIS WE-F, MIGHTY MIKE BPT, NATURAL ENVIRO 8000 BIOREMEDIATION, PETRO-TREAT)

I. NAME, BRAND, OR TRADEMARK
OPPENHEIMER FORMULA
Type of Product: Biological Additive

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Oppenheimer Biotechnology, Inc.
P.O. Box 5919
Austin, TX 78763
Phone: (512) 474-1016
Fax: (512) 472-2909
E-mail: jen.neve@obio.com
(Ms. Jen Neve)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Oppenheimer Biotechnology, Inc.
P.O. Box 5919
Austin, TX 78763
Phone: (512) 474-1016
Fax: (512) 472-2909
E-mail: jen.neve@obio.com
(Ms. Jen Neve)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable
2. Ventilation:
Special ventilation is not required. Treat product as an hygroscopic powder. In closed spaces use dust protective measures.
3. Skin and eye contact; protective clothing; treatment in case of contact:
The application of the dry powder requires the usual precautions of a dust irritant to membranes. The material is easily removed by washing or flushing, and in confined areas or use, a protective mask and eye glasses are recommended.
4.a. Maximum storage temperature: 130°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: 82°F

V. SHELF LIFE
The shelf life of the product is approximately 5 year.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Optimal application is by powder seeding directly at the source of oil contamination.
Application over larger areas of water surface can be accomplished by aerial powder dusting, spraying a water mixture of nutrients/formula over the oil area, or by dusting with mechanical powder pumps.
2. Concentration/Application Rate:
The application rate at the source oil slick is 1 pound per cubic yard of oil.
In the open sea slick, the basic application rate is 10 pounds per acre, but this may vary in different situations related to speed of clean up.
In estuaries, a larger biomass is recommended and may be at a rate of up to 100 pounds per acre, depending on the oil type and concentration.
Heavier oils may require a higher biomass than light oils.
3. Conditions for Use:
THE OPPENHEIMER FORMULA may be used in a wide range of environmental conditions of temperature and salinities, ranging from fresh to 100 ppt salts. The formula is especially valuable in grass flats, marshes and the open sea. It has also proved effective in soil and fresh water oil clean up and municipal waste treatment, septic tanks and grease traps.

VII. TOXICITY AND EFFECTIVENESS
a. Effectiveness:
Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:
Summary Data Table

DAYS	**PRODUCT**	**TOTAL MEAN**	**RED%**	**TOTAL MEAN**	**RED%**
	3 REPS/PROD	**ALKANES (ppm)**	**28 DAYS**	**AROMATICS (ppm)**	**28 DAYS**
0	CONTROL	29965.2	0	5620.5	0
	NUTRIENT	31494.8	0	6660.2	0
	OPPENHEIMER	31140.6	0	5528.2	0
7	CONTROL	30101.5	0	5610.1	0
	NUTRIENT	8073.9	0	5086.6	0
	OPPENHEIMER	5019.7	0	4338.9	0
28	CONTROL	28785.6	3.9	5512.7	1.9
	NUTRIENT	706.2	97.8	4863.7	27.0
	OPPENHEIMER	3396.8	89.1	3417.8	38.2

Results of Gravimetric Analysis:
Percentage (%) Decrease in Weight of Oil on Day 28

Control	Nutrient	Product (Oppenheimer)
- 6.4 %	50.9 %	10.4 %

b. Toxicity:
NA

VIII. MICROBIOLOGICAL ANALYSIS
1. Listing of all microorganisms by species and percentage in the composition:
Natural, ubiquitous, hydrocarbon-oxidizing, microorganisms for use in removing hydrocarbons and organic materials from soils, fresh and salt waters by natural oxidative pathways.
2. Optimum pH, temperature, and salinity ranges for use of the additive:
pH: 7.6
Temperature: 82°F
Salinity: Fresh water to 20 percent salts
Optimal: 0.5 to 3.5%
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:
pH: 5.5-11
Temperature: 32°F-140°F
Salinity: Fresh to 15%
4. Special nutrient requirements:
NA
5. Test results regarding the determination of the presence of the following:
Salmonella: Negative
Fecal coliform: <90/100 ml
Shigella: Negative
Staphylococcus Coagulase positive: Negative
Beta hemolytic Streptococci: Negative

IX. PHYSICAL PROPERTIES
NA

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

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

Control	Nutrient	Product (MICRO-BLAZE®)
<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:
CONFIDENTIAL
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

BULLETIN UPDATES IN BOLD

TECHNICAL PRODUCT BULLETIN #B-42
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JANUARY 3, 1992
REVISED LISTING DATE: FEBRUARY 5, 1997
"VB591™, VB997™, BINUTRIX® (formerly MYCOBAC TX-20)"

I. NAME, BRAND, OR TRADEMARK
VB591™, VB997™, BINUTRIX® – Patented, partial encapsulated oleophilic (oil-loving) nutrient
Type of Product: Biological Additive (a nutrient additive that contains no microorganisms)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
BioNutraTech Inc.
P.O. Box 2342
Branson, MO 65615
Phone: (417) 858-1150
Fax: (417) 858-1152
E-mail: shruza@bionutratech.com
Web Site: http://www.bionutratech.com
Mobile: (713) 301-0254
(Ms. Sandra L. Hruza)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
United States
BioNutraTech Inc.
P.O. Box 2342
Branson, MO 65615
Phone: (417) 858-1150
Fax: (417) 858-1152
E-mail: shruza@bionutratech.com
Web Site: http://www.bionutratech.com
(Ms. Sandra L. Hruza)

International

BioGreen Technologies International
26322 Alpine Rose Lane
Katy, TX 77494
Phone: (281) 347-4216
E-mail: ruedajose@hotmail.com
(Mr. Jose Rueda)

SMG Global Partners
526 Kirkwood Drive, Suite 124
Kingwood, TX 77339
Phone: (832) 414-9346
E-mail: joeygee@suddenlink.net
(Mr. Joe Gautier)

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

1. Flammability:

Non-flammable

2. Ventilation:

Normal ventilation is adequate.

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

Normal precautions and protective equipment for handling any type of powder, such as dust protectors and eye shield. Avoid contact with eyes and do not take internally. Upon contact with eyes, flush with water immediately for a minimum of 15 minutes. If redness or irritation continues, contact a physician. Avoid breathing dust.

4.a. Maximum storage temperature: >140°F

4.b. Minimum storage temperature: NA

4.c. Optimum storage temperature range: 50°F to 80°F

4.d. Temperature phase separations and chemical changes: NA

V. SHELF LIFE

The shelf life is approximately three years if kept dry. Store in dry location and avoid contact with moisture. Prolonged storage may result in the formation of soft clumps, which are easily broken by mechanical disruption.

VI. RECOMMENDED APPLICATION PROCEDURE

VB591™, VB997™, BINUTRIX® is a powder, and can be applied using conventional powder spraying equipment. No pre-mixing or dilution is required.

1. Application Method:

Application for localized spills can be done using hand-held pressurized dust blowers.

For inland waterways, ship channels, marinas or coastal wetlands, large dust blowers mounted on barges or ships can be employed to apply the product.

Application by aircraft using conventional dust spraying systems is recommended for treatment of large uncontained spreading spills or spills in open waters or at sea.

2. Concentration/Application Rate:

Recommended initial application rate is 5 to 15 pounds of VB591™, VB997™, BINUTRIX® per barrel of spilled oil. Follow-up applications at 48 to 72 hour intervals should be adjusted to allow for reduction in oil due to clean-up activities and natural loss by evaporation, droplet formation and dispersion and microbial activity.

Applications should not exceed 250 pounds per acre per application.

3. Conditions for Use:

VB591™, VB997™, BINUTRIX® should be applied to spilled oil as soon as possible following spillage to stimulate natural oil utilizing microbial populations to maximize biodegradation activity.

Application of VB591™, VB997™, BINUTRIX® to spilled oil does not significantly alter the physical consistency of the spilled oil, and as such will not adversely affect conventional cleanup activities, nor will conventional and removal activities adversely affect the activity of VB591™, VB997™, BINUTRIX®. Dispose of waste in accordance with local, state, and federal regulations.

Information regarding use of VB591™, VB997™, BINUTRIX® in conjunction with chemical dispersing agents is at present not available.

VII. TOXICITY AND EFFECTIVENESS

a. Effectiveness:

Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:

Summary Data Table

DAYS	PRODUCT	TOTAL MEAN	RED%	TOTAL MEAN	RED%
	3 REPS/PROD	**ALKANES (ppm)**	**28 DAYS**	**AROMATICS (ppm)**	**28 DAYS**
0	CONTROL	31041.7	0	973.1	0
	NUTRIENT	28251.8	0	976.6	0
	VB591™, VB997™, BINUTRIX®	28813.8	0	932.8	0
7	CONTROL	31436.33	0	990.5	0
	NUTRIENT	20728.3	26.6	619.1	36.6
	VB591™, VB997™, BINUTRIX®	14637.4	49.2	733.1	21.4
28	CONTROL	32465.8	0	925.7	0
	NUTRIENT	1787.2	93.7	722.6	26.0
	VB591™, VB997™, BINUTRIX®	937.97	96.8	290.8	73.1

Results of Gravimetric Analysis:

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

Control	Nutrient	Product
<1%	17.6%	18.0%

b. Toxicity:

NA

VIII. MICROBIOLOGICAL ANALYSIS

VB591™, VB997™, BINUTRIX® is an oleophilic nutrient additive and contains no preserved natural or mutated microorganisms of any type.

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

None

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

VB591™, VB997™, BINUTRIX® may be used under any conditions where natural populations of oil-degrading microbes are active.

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

pH: NA

Temperature: NA
Salinity: NA
4. Special nutrient requirements:
None
5. Test results regarding the determination of the presence of the following:
Salmonella: NA
Fecal coliform: NA
Shigella: NA
Staphylococcus coagulase positive: NA
Beta hemolytic Streptococci: NA

IX. PHYSICAL PROPERTIES
NA

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

TECHNICAL PRODUCT BULLETIN #B-43
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: MARCH 12, 1992
REVISED LISTING DATE: MARCH 21, 1997
"STEP ONE"
(aka, B&S INDUSTRIAL)

I. NAME, BRAND, OR TRADEMARK
STEP ONE
Type of Product: Biological Additive

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
B&S Research, Inc.
4345 Highway 21
Embarrass, MN 55732
Phone: (218) 984-3757
Fax: (218) 984-3212
E-mail: soilplus@2z.net
(Mr. H. W. Lashmett)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
B&S Research, Inc.
4345 Highway 21
Embarrass, MN 55732
Phone: (218) 984-3757
Fax: (218) 984-3212
E-mail: soilplus@2z.net
(Mr. H. W. Lashmett)

Bioremediation International
4345 Highway 21
Embarrass, MN 55732
Phone: (218) 984-3757
Fax: (218) 984-3212
(Mr. H. W. Lashmett)

Farm for Profit Research
and Development
4345 Highway 21
Embarrass, MN 55732
Phone: (800) 232-7692
Fax: (218) 984-3212
(Mr. H. W. Lashmett)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
None
2. Ventilation:
Normal ventilation is adequate
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid contact with skin, especially when there are open wounds. In case of skin contact, wash with soapy water. The use of protective gloves is recommended. Avoid contact with eyes. In case of eye contact, immediately flush
eyes with plenty of water continuously for at least 15 minutes. Consult a physician. The use of

protective goggles is recommended. Avoid inhalation and ingestion. It is recommended that workers wear dust mask and not eat or smoke while handling the product(s).
4.a. Maximum storage temperature: 90°F
4.b. Minimum storage temperature: -30°F
4.c. Optimum storage temperature range: 32°F to 70°F
4.d. Temperature phase separations and chemical changes: NA

V. SHELF LIFE
Over 3 years

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Components of the product STEP ONE (BC101) and STEP ONE (MSE2.5) are only sold together. B&S Research will make application recommendations based on contamination and ppm of contamination at time of purchase
order and employ specified application methods (spray, plowing, agitation, etc.) appropriate for a particular situation.
2. Concentration/Application Rate:
Nominally, the STEP ONE water mixture can be used on most hydrocarbons, including crude and refined petroleum products, pesticides, etc., on land, fresh water or ocean water. Laboratory tests also indicate effectiveness in destruction of PCB's. In certain circumstances, B&S Research, Inc. may require laboratory soil and water contamination tests before the product may be used (see VI 1. above).

VII. TOXICITY AND EFFECTIVENESS
a. Effectiveness:
Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:
Summary Data Table

DAYS	PRODUCT 3 REPS/PROD.	TOTAL MEAN ALKANES (ppm)	RED % 28 DAYS	TOTAL MEAN AROMATICS (ppm)	RED % 28 DAYS
0	CONTROL	29959.5		5391.8	
	NUTRIENT	29008.5		5163.0	
	STEP ONE	30477.8		5499.8	
7	CONTROL	33471.3		5720.9	
	NUTRIENT	22723.7		5050.1	
	STEP ONE	24196.8		3110.2	
28	CONTROL	30997.4	0.0 %	5388.9	0.0 %
	NUTRIENT	1103.9	96.19%	4582.4	11.23%
	STEP ONE	17059.4	44.03%	2501.9	54.51%

Results of Gravimetric Analysis:
Percentage (%) Decrease in Weight of Oil on Day 28

Control	Nutrient	Product (STEP ONE)
0%	19%	51%

b. Toxicity:
NA

VIII. MICROBIOLOGICAL ANALYSIS
1. Listing of all microorganisms by species and percentages in the composition:
CONFIDENTIAL
2. Optimum pH, temperature, and salinity ranges for use of the
additive:
pH: 6-8
Temperature: 70°F to 90°F
Salinity: Fresh or salt (ocean <110 ppm) water, land or dry surfaces
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:
pH: <5 or <9, (apply neutralizing agents -- lime or P205
Temperature: <50°F or >135°F
Salinity: <0 or >110 ppm
4. Special nutrient requirements:
None
5. Test results regarding the determination of the presence of the following:
Salmonella: Negative
Fecal coliform: Negative
Shigella: Negative
Staphylococcus Coagulase positive: Negative
Beta hemolytic Streptococci: Negative

IX. PHYSICAL PROPERTIES
1. Flash Point: >212°F
2. Pour Point: -7°F
3. Viscosity: 2.8 cst at 50°F
3.5 cst at 32°F
5.9 cst at -4°F
4. Specific Gravity: 1.03 at 59°F
5. pH: 7.2 (1:2.5:80 BC101:MSE2.5:water mixture)
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: Noedal
8. Solvents: None
9. Additives: Phosphoric acid as P205
3% emulsifier <.5% by weight
10. Solubility: Infinite

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

Compound	Concentration
Arsenic	<0.0200

Cadmium	<0.0030
Chromium	0.0859
Copper	0.0177
Lead	0.0090
Mercury	0.0002
Nickel	<0.0080
Zinc	0.0602
Cyanide	0.2830
Chlorinated Hydrocarbons	<0.0050

TECHNICAL PRODUCT BULLETIN #B-45
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: JANUARY 28, 1993
REVISED LISTING DATE: NOVEMBER 14, 1995
"SYSTEM E.T. 20" (formerly MCW.B 20)

I. NAME, BRAND, OR TRADEMARK
SYSTEM E.T. 20
Type of Product: Biological Additive

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Environmental Restoration Services
9211 Lakewood Drive
Windsor, CA 95492
E-mail: ERS.BTI@gmail.com
Phone: (619) 253-0664
(Mr. John Chase)
Phone: (760) 746-5145
Fax: (760) 746-2034
(Mr. Jack Roberts)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Environmental Restoration Services
14384 Highland Valley Road
Escondido, CA 92025
E-mail: ERS.BTI@gmail.com
Phone: (619) 253-0664
(Mr. John Chase)
Phone: (760) 746-5145
Fax: (760) 746-2034
(Mr. Jack Roberts)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
SYSTEM E. T. 20 is non-flammable
2. Ventilation:
No special ventilation is required under normal use.
3. Skin and eye contact; protective clothing; treatment in case of contact:
In its primary form, no special handling or storage is required.
Avoid excessive inhalation, and protect the nose and mouth with a dust protection mask.
Wear protective gloves, and wash hands with soap and water after handling the product.
4.a. Maximum storage temperature:
4.b. Minimum storage temperature:
4.c. Optimum storage temperature range: 4°C - 20°C (39°F - 68°F). Place in a dry area, shaded from sunlight.
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
2 years if maintained at 4°C (39°F).

VI. RECOMMENDED APPLICATION PROCEDURE
SYSTEM E. T. 20 can be used on a broad range of hydrocarbon compounds (including PAH's) found in open and closed water systems (salt or fresh) or in soil (beach, sands, or inland soil types). SYSTEM E.T. 20 protocols can be used with indigenous and introduced bacteria. SYSTEM E.T. 20 is an oleophilic, non-water soluble nutrient, which releases nitrogen and phosphorous enzymatically, thus allowing SYSTEM E.T. 20 to be used in water and soil applications including: conditions requiring fast degradation rates due to regulations, limited space or cost; under conditions where weathered or heavy oils, sludges or PAH's exist that require consistently high populations of hydrocarbon degrading bacteria to metabolize these long or more complex carbon chains; tropical or sub-tropical conditions that support large, indigenous, non-beneficial bacterial populations that would otherwise dilute the effectiveness of standard bioaugmentation approaches; aqueous conditions in which soluble or time release nutrient compounds would be washed away or diluted, i.e., beaches, frequent rains, floods, streams, stream banks, estuaries and areas affected by tides; sensitive environmental conditions that demand low or no toxicity; toxicity in soil or water during bioremediation may be stimulated by adding broadly available nutrients which may activate disease carrying bacilli or pathogens; controlled nutrient release to SYSTEM E. T. 20 bacteria prevents over-nitrification; conditions requiring the elimination of oil discoloration caused by the presence of polar fractions; and conditions where salt water conditions exist or where only salt water is available for bacteria application.
1. Application Methods:

Biopile	Land farm	Pump and Treat
Bioreactor	Bio slurry	
In situ	Windrow	

Topical application to discolored rocks or soil.
Topical application to beaches.
2. Concentration/Application Rate:
Concentration and rate of application will vary from site to site depending upon the type of contaminant and the area contaminated. Contact QET for specific information.
3. Conditions for Use:
Before applying SYSTEM E. T. 20, QET recommends that the site be evaluated for its physical and chemical soil characteristics (i.e., pH, salinity, conductivity, physical parameters, moisture content, hydrocarbon type and concentration, nitrogen content, etc.), and toxicity of both the soil and the contaminant, by biological screening tests.
Basic biological requirements of SYSTEM E. T. 20, site conditions and SYSTEM E. T. 20 capabilities dictate the appropriate procedures for application of SYSTEM E. T. 20.
Biological requirements for SYSTEM E. T. 20 bacteria are nutrients, adequate oxygen supply, hydrocarbon food source, neutral pH and a 15% minimum moisture level for soil remediation applications.

VII. TOXICITY AND EFFECTIVENESS

a. Effectiveness:
Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:
Summary Data Table

DAYS	PRODUCT	TOTAL MEAN	RED%	TOTAL MEAN	RED%
	3 REPS/PROD	ALKANES (ppm)	28 DAYS	AROMATICS (ppm)	28 DAYS
0	CONTROL	29959.5	0	5391.8	0
	NUTRIENT	29008.5	0	5163.0	0
	SYSTEM E.T. 20	30476.1	0	5311.3	0
7	CONTROL	33471.3	0	5720.9	0
	NUTRIENT	22723.7	0	5050.1	0
	SYSTEM E.T. 20	3837.1	0	2928.8	0
28	CONTROL	30997.4	0	5383.9	0.2
	NUTRIENT	1103.9	96.2	4582.4	11.2
	SYSTEM E.T. 20	261.9	99.1	1188.0	77.0

Results of Gravimetric Analysis:
Percentage (%) Decrease in Weight of Oil on Day 28

Control	Nutrient	Product (SYSTEM E.T. 20)
0%	19%	18%

b. Toxicity:
NA

VIII. MICROBIOLOGICAL ANALYSIS
1. Listing of all microorganisms by species and percentage in the composition:
CONFIDENTIAL
2. Optimum pH, temperature, and salinity ranges for use of the additive: pH: 7.5, (6.5 to 8.5)
Temperature: 4°C to 35°C (39°F to 95°F)
Salinity: Fresh to 2.5% (average ocean salt level)
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:
pH: <6.5 and >8.5
Temperature: <5°C and >35°C (<41°F and >95°F)
Salinity: >3%
4. Special nutrient requirements:
Recommendation is for a non-soluble nutrient. The specific types of nutrients will be dependent on the site requirements.
5. Test results regarding the determination of the presence of the following:
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

EPA HAS NOT RECEIVED UPDATED CONTACT INFORMATION FOR THIS PRODUCT as of 12/01/08

TECHNICAL PRODUCT BULLETIN #B-48
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: NOVEMBER 10, 1993
REVISED LISTING DATE: AUGUST 31, 2000
"BET BIOPETRO"
(formerly BET BIOPETRO HEAVY)

I. NAME, BRAND, OR TRADEMARK
BET BIOPETRO
Type of Product: Biological Additive

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
BioEnviroTech
14615 FM 2920
Tomball, Texas 77375
(Mr. Warren Butler)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
BioEnviroTech
14615 FM 2920
Tomball, Texas 77375
(Mr. Warren Butler)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-Flammable
2. Ventilation:
Normal ventilation
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid eye and skin contact. In case of eye contact, flush eyes with water or eyewash, and refrain from rubbing. For skin contact, wash with mild soap and apply hand cream if itching or redness occurs. Avoid inhalation. In case of inhalation, seek fresh air. Repeated inhalation has been associated with respiratory allergy in some persons. Such allergic individuals should wear protective clothing and eye goggles. In enclosed buildings, workers should wear single use nuisance dust masks appropriate for fine particulate dust. In outdoor field applications, no dust mask is required.
4.a. Maximum storage temperature: 105°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: 50°F to 75°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
More than 3 years in unopened original shipping container, stored in cool dry area.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
BET BIOPETRO is a powder containing granules of bacterial product formulated to provide performance in the bioremediation of heavy refined and crude hydrocarbon contaminants in both soil and water environments.
Application procedure and treatment schedule will vary with specific environmental conditions and bioremediation requirements. Contact BET for specific technical advice.
2. Concentration/Application Rate:
Dosage will vary with specific environmental conditions and bioremediation requirements. Contact BET for specific technical advice.
3. Conditions for Use:
BET BIOPETRO should be used at temperatures in the range of 45°F to 100°F, pH range of 5.5 to 8.5, and dissolved oxygen level of 3 to 5 mg/l. The product is effective in both salt and fresh waters. However, where extreme salinity is projected, testing and evaluation of the bacteria in bioremediation are advised. BET BIOPETRO cultures exhibit some resistance to toxic shocks from strong chemicals. Nonetheless, highly chlorinated compounds, acids, caustics, disinfectants, germicides, and chlorine will render the cultures ineffective, just like other bacteria. Where such chemicals are anticipated, testing and evaluation of the bacteria in bioremediation are advised.
BET BIOPETRO cultures require supplemental nutrients for optimum performance (See section VIII. 4).

VII. TOXICITY AND EFFECTIVENESS
a. Effectiveness:
Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:
Summary Data Table

DAYS	PRODUCT 3 REPS/PROD	TOTAL MEAN ALKANES (ppm)	RED% 28 DAYS	TOTAL MEAN AROMATICS (ppm)	RED% 28 DAYS
0	CONTROL	29965.2	0	5620.5	0
	NUTRIENT	31494.8	0	6660.2	0
	BET BIOPETRO	25914.5	0	5569.1	0
7	CONTROL	30101.5	0	5610.1	0
	NUTRIENT	8073.9	0	5086.6	0
	BET BIOPETRO	373.0	0	1220.0	0
28	CONTROL	28785.6	4.0	5512.7	2.0
	NUTRIENT	706.2	98.0	4863.7	27.0
	BET BIOPETRO	350.3	99.0	1882.9	67.0

Results of Gravimetric Analysis:
Percentage (%) Decrease in Weight of Oil on Day 28

Control	Nutrient	Product (BET BIOPETRO)
0%	51%	30%

b. Toxicity:
NA

VIII. MICROBIOLOGICAL ANALYSIS
1. Listing of all microorganisms by species and percentage in the composition:
CONFIDENTIAL
2. Optimum pH, temperature, and salinity ranges for use of the additive
pH: 6.6 to 7.4
Temperature: 70°F to 95°F
Salinity: Fresh to Salt water
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity.
pH: <5.5 and >8.5
Temperature: <45°F and >105°F
Salinity: Extreme salinity
4. Special nutrient requirements
BioEnviroTech, Inc. recommends nutrient supplements for optimum performance of the product in bioremediation application. The required nutrients are dependent upon hydrocarbon contamination levels. Contact BET for specific nutrient dosing requirements.
5. Test results regarding the determination of the presence of the following:
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

TECHNICAL PRODUCT BULLETIN #B-53
USEPA, OFFICE OF EMERGENCY MANAGEMENT
REGULATION AND POLICY DEVELOPMENT DIVISION
ORIGINAL LISTING DATE: AUGUST 26, 1996
REMOVAL DATE: AUGUST 16, 2005
RELISTING DATE: SEPTEMBER 18, 2009
"OIL SPILL EATER II (OSE II)"

I. NAME, BRAND, OR TRADEMARK
OIL SPILL EATER II (OSE II)
Type of Product: Bioremediation Agent (Biological Enzyme Additive [previously listed as a Nutrient Additive])

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
OSEI Corporation (Formerly Sky Blue Chems)
P.O. Box 515429
Dallas, TX 75251-5429
Phone: (972) 669-3390
E-mail: oseicorp@msn.com
Web Site: www.osei.us
(Mr. Steven Pedigo, Chairman, CEO, Inventor)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
OSEI Corporation (Formerly Sky Blue Chems)
P.O. Box 515429
Dallas, TX 75251-5429
Phone: (972) 669-3390
E-mail: oseicorp@msn.com
Web Site: www.osei.us
(Mr. Steven Pedigo, Chairman, CEO, Inventor)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability: Water-based, non-flammable
2. Ventilation: Needs no ventilation; aqueous-based product; does not emit hazardous vapors
3. Skin and eye contact; protective clothing; treatment in case of contact: OSE II is not a primary dermal irritant. Avoid eye contact, and wear goggles if possible for the spray to come in direct contact with eyes. Facilities for quick and copious eye flushing should be provided and prompt medical attention should be sought if exposure and irritation persists. Protective rubber gloves are suggested during handling. Before mixing the product has a smell of fermentation. The product does not give off any harmful vapors.
4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: None; OSE II can freeze and thaw without adverse effects
4.c. Optimum storage temperature range: 72°F
4.d. Temperatures of phase separations and chemical changes: 120°F

V. SHELF LIFE

OSE II has a recommended shelf life of 5 years. After 5 years at optimum storage temperature, there is an approximate 10% decrease per year in product capability.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

A. Use surface spray apparatus, such as small hand held tanks, back pack, large mixing tanks with mechanical pumping devices, vessels with booms for spraying wide paths, or spray devices on airplanes or helicopters.
B. OSE II can be applied by eductor systems from vessels, fire trucks, etc. Set the eductor system to 2% and apply 1 gallon of mixed OSE II to each spilled gallon of hydrocarbon.

2. Concentration/Application Rate:

General – OSE II generally takes 3 to 30 minutes to penetrate the molecular walls of hydrocarbons. However, once you spray OSE II on the hydrocarbons, OSE II attaches itself and will eventually engulf the hydrocarbons regardless of where the hydrocarbons may spread on the surface of salt or fresh water. Additionally, once you spray OSE II, the hydrocarbons cannot attach itself to the shoreline, rocks, or any equipment in its path. OSE II breaks down the adhesion properties of hydrocarbons and causes hydrocarbons to float, thereby, eliminating secondary contamination of the water column or any other areas, and holding the contaminated area to the waters surface, the original contaminated area.

- If OSE II is to be used on ocean spills or on intertidal zones OSE II should be mixed with ocean water.
- If OSE II is to be used on lakes, rivers, streams, ponds, or on land mix the product with water from a lake, stream, or pond.
- If you are performing a clean up, make sure the water used to mix with OSE II, and the water used to keep the area saturated, is the type of water normally associated with that area.
- If you use fresh water in an area normally contacted with salt water or vice versa, the different types of bacteria and competition could occur, not to mention the problems with salinity for fresh water organisms.

[Note: Do not mix tap water with OSE II if possible: Chlorine in tap water slows bacterial enhancement]

Spills on Water:

Dilute each gallon of OSE II with 50 gallons of fresh, brackish, or salt water – depending on the water associated with the area that has been impacted by the spill. Apply OSE II at a ratio of 1 gallon mixed OSE II to each gallon of hydrocarbon spilled. Apply using hand held sprayers, tank sprayers, booms from vessels, helicopters, or airplanes; by spraying the perimeter first then working toward the middle of the spilled area. Next spray the entire surface of the spill. If the spill is very heavy (more than 2 inches thick) it is recommended that OSE II be applied every day until you have met a 1:1 ratio of OSE II and water mixture to spilled oil/hydrocarbons.

- Use 1 gallon OSE II for every 50 gallons of hydrocarbons.
- Use 1 drum of OSE II for every 2,750 gallons of hydrocarbons.
- If you know gallons of hydrocarbons spilled, multiply gallons of hydrocarbons by 0.02 to get amount of OSE II needed [gallons of hydrocarbons x 0.02 = gallons of OSE II].
- If you know barrels of crude oil spilled, multiply barrels of crude oil by 0.015 to get drums of OSE II needed [barrels of crude oil x 0.015 = drums of OSE II].

- If you do not know gallons of hydrocarbons or barrels of crude oil, multiply size of spill by 0.0023 to get drums of OSE II needed or by 0.12 to get gallons of OSE II needed [(yards long x yards wide x inches thick) x 0.0.0023 = drums of OSE II or (yards long x yards wide x inches thick) x 0.015 = gallons of OSE II].

Intertidal Zone:
Mix each 55 gallon drum of OSE II with 2,750 gallons of fresh, brackish, or salt water. The water used is determined by the type of water associated with the site. OSE II should be applied as the tide recedes (if there is a tide) and once the tide comes in the application should cease until the tide recedes again. Additional applications should only be warranted if spill has been allowed time to percolate into the depths of the soil.

If there is no tide, but waves have pushed the spill into the intertidal zone, then there will be direct access to the spill at all times. If possible use string or stakes to grid off the beach or intertidal zone area, and then you can calculate how much premixed OSE II to apply to a given area. If unable to grid off an area then calculate how much OSE II to apply and then determine how much premixed OSE II will flow through a nozzle (gallons per minute) then let application technician know how many gallons to apply in a given area and this can be determined by applying product for a certain time period to get the correct amount of OSE II applied to gain the 1:1 ratio.

Note: If the intertidal zone is associated with the sea then mix OSE II with salt water. If the spill area is in an area of brackish water then mix OSE II with brackish water. If the intertidal zone is associated with fresh water such as lakes, rivers, streams, ponds, creeks, aquifers, or drinking water wells then use fresh water to mix OSE II.
3. Conditions for Use:
- OSE II can remediate hydrocarbon-based material including chlorinated hydrocarbons, PCB's, dioxins, and some pesticides.
- As the age of spilled hydrocarbons increases, the time necessary for bioremediation increases. In general, fresh crude, gasoline of BTEX takes from 72 hours to 30 days to completely bioremediate.
- Variations of sea water salinity should have no effect, but as long as microbial life can exist, then OSE II will be effective.
- OSE II bioremediation slows somewhat at temperatures below 40°F. OSE II however, will continue to work at any liquid water temperature that will sustain microbial life.

VII. TOXICITY AND EFFECTIVENESS

a. Effectiveness:

Summary Data Table

DAYS	PRODUCT 3 REPS/PROD	TOTAL MEAN ALKANES (ppm)	RED% 28 DAYS	TOTAL MEAN AROMATICS (ppm)	RED% 28 DAYS
0	CONTROL	43,170	-	11,435	-
	NUTRIENT	40,569	-	11,785	-
	OSE II	41,730	-	12,155	-
7	CONTROL	39,250	9.1	10,355	9.4
	NUTRIENT	34,815	14.2	9,898	16.0
	OSE II	26,316	36.9	8,072	33.6
28	CONTROL	35,797	17.1	9,534	16.6
	NUTRIENT	26,507	34.7	8,938	24.2
	OSE II	4,273	89.8	1,268	89.6

Results of Gravimetric Analysis:

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

Control	Nutrient	Product
16.5%	52.0%	85.4%

b. Toxicity: NA

VIII. MICROBIOLOGICAL ANALYSIS

1. Listing of each component of the total formulation, other than enzymes, by chemical name and percentage by weight: CONFIDENTIAL
2. Enzyme Names: CONFIDENTIAL
3. I.U.B.: CONFIDENTIAL
4. Source of Enzymes: Fermentation process
5. Units: No less than 1% and no more than 50% by weight
6. Specific Gravity: 1.05
7. Optimum Conditions:
    a. pH: 7.0
    b. Temperature: 72°F
    c. Salinity Ranges: Fresh water to salt water
    d. Maximum and Minimum pH: 3.5 – 8.0
    e. Maximum and Minimum Temperature: 28°F – 128°F
    f. Maximum and Minimum Salinity Levels – Salinity level above that will support microbial activity will adversely effect OSE II's performance
    g. Enzyme Shelf Life: Up to 5 years when properly stored
    h. Enzyme Optimal Storage Conditions: 72°F is optimal, enzyme range is freezing to 120°F, never leave OSE II in direct sunlight for more than a couple of hours

IX. PHYSICAL PROPERTIES
NA

X. ANALYSIS FOR HEAVY METALS, CYANIDE, AND CHLORINATED HYDROCARBONS
NA

PRODUCT NO LONGER MANUFACTURED

EPA HAS NOT RECEIVED UPDATED CONTACT INFORMATION FOR THIS PRODUCT as of 12/01/08

TECHNICAL PRODUCT BULLETIN #B-54
USEPA, OIL PROGRAM CENTER
LISTING DATE: JUNE 28, 1999
"PRISTINE SEA II (formerly MICROPRO D)"

I. NAME, BRAND, OR TRADEMARK
PRISTINE SEA II
Type of Product: Bioremediation Agent (Biological Additive)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Fluid Tech, Inc.
6450 Spring Mountain Road, Suite 9
Las Vegas, NV 89146
Phone: (702) 871-1884
Fax: (702) 871-3269
(Mr. Stan True)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Fluid Tech, Inc.
6450 Spring Mountain Road, Suite 9
Las Vegas, NV 89146
Phone: (702) 871-1884
Fax: (702) 871-3269
(Mr. Stan True)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
PRISTINE SEA II is non-flammable.
2. Ventilation:
Provide adequate ventilation in enclosed areas. Avoid creating dust.
3. Skin and eye contact:
In case of eye or skin contact, flush affected areas thoroughly with water. Wear protective gloves, safety glasses, and dust respirators in dusty conditions. Provide eye wash facility and washing area. Exercise reasonable personal cleanliness.
4.a. Maximum storage temperature: 48°C
4.b. Minimum storage temperature: 6°C
4.c. Optimum storage temperature range: 24°C - 30°C
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
As a dry bacterial blend, the shelf life is 1 year, and as a liquid bacterial mixture, the shelf life is 6 months.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Soak at a rate of 1 kg to 4 L influent waste and 4 L tap water, or add directly to system.
2. Concentration/Application Rate:
Product dosage will vary according to contaminant, matrix, and environmental conditions. Contact technical representatives for recommendations.
3. Conditions for Use:
PRISTINE SEA II can be used to treat (degrade) refinery and petrochemical waste constituents (i.e., alkanes and aromatics) such as phenol, PAHs, creosols, paraffinic intermediates, sulfides, alcohols, and related solvents. The product also improves settling and minimizes foam formation and/or production.

VII. TOXICITY AND EFFECTIVENESS
a. Effectiveness
PRISTINE SEA II is expected to be effective in the degradation of refinery and petrochemical wastes. These bioremediation test results are provided by EPA's Risk Reduction Laboratory, Cincinnati, Ohio.

DAYS	**PRODUCT**	**RED%**
11	CONTROL	28
	ALKANE	93.6
	AROMATIC	86
20	CONTROL	26
	ALKANE	95.5
	AROMATIC	90

b. Toxicity
NA

VIII. MICROBIOLOGICAL ANALYSIS
CONFIDENTIAL

IX. PHYSICAL PROPERTIES
NA

X. ANALYSIS FOR HEAVY METALS, CYANIDE, AND CHLORINATED HYDROCARBONS
NA

EPA HAS NOT RECEIVED UPDATED CONTACT INFORMATION FOR THIS PRODUCT as of 12/01/08

TECHNICAL PRODUCT BULLETIN B-55
USEPA, OIL PROGRAM CENTER
LISTING DATE: SEPTEMBER 10, 1999
"LAND AND SEA RESTORATION PRODUCT 001 (VELITE)"

I. NAME, BRAND, OR TRADEMARK
"LAND AND SEA RESTORATION PRODUCT 001 (VELITE)"
Type of Product: Bioremediation Agent (Nutrient Additive)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Land and Sea Restoration LLC
4147 Acorn Hill
San Antonio, TX 78217
Phone: (210) 650-5556
Fax: (210) 650-5567
(Mr. T. Shawn Parker)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Land and Sea Restoration LLC
4147 Acorn Hill
San Antonio, TX 78217
Phone: (210) 650-5556
Fax: (210) 650-5567
(Mr. T. Shawn Parker)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Flash Point 250°C (482°F)
2. Ventilation:
Normal ventilation
3. Skin and eye contact; protective clothing; treatment in case of contact: Protective clothing and glasses. In case of eye contact, flush eyes with water or eyewash and refrain from rubbing. For skin contact, wash with mild soap and apply cream if itching or redness occurs. Avoid inhalation. In case of inhalation, seek fresh air. Wear protective clothing and eye goggles. Workers should wear single use nuisance dust masks appropriate for fine particulate dust.
4.a. Maximum storage temperature: 65°C (150°F)
4.b. Minimum storage temperature: 0°C (32°F)
4.c. Optimum storage temperature range: 0°C to 65°C (32 to 150°F)
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
More than 5 years in unopened original shipping container, store in a cool, dry place. Avoid moisture prior to use.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method: On water, spread over contaminated area at 1 to 3 ratios. On soil, blend to depth equivalent to contamination level. On hard surfaces, spread over contaminated area. Make sure the spill is completely absorbed. For best results agitate with broom. (Will not damage cured asphalt if used as an absorbent for spills.) Remove and dispose of in accordance with all state and federal laws, after absorption is complete.
2. Concentration/Application Rate:
1 part 001 to 3 parts hydrocarbon.
3. Conditions for Use:
NA

VII. TOXICITY AND EFFECTIVENESS
a. Effectiveness:
Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:
Summary Data Table

DAYS	PRODUCT 3 REPS/PROD	TOTAL MEAN ALKANES (ppm)	RED% 28 DAYS	TOTAL MEAN AROMATICS (ppm)	RED% 28 DAYS
0	CONTROL	13.8239	0	0.0443	0
	001	13.5856	0	0.0509	0
7	CONTROL	14.3292	0	0.0473	0
	001	10.1005	29.52	0.0437	0
28	CONTROL	14.4675	0	0.0401	0
	001	8.2629	42.92	0.0273	31.92

Results of Gravimetric Analysis:
Percentage (%) Decrease in Weight of Oil on Day 28

Control	Product (001)
0%	25.18%

b. Toxicity: NA

VIII. MICROBIOLOGICAL ANALYSIS
1. Listing of all microorganisms by species and percentages in the composition:
CONFIDENTIAL
2. Optimum pH, temperature, and salinity ranges for use of the additive:
pH: 6 to 8
Temperature: 25°C to 30°C (77°F to 86°F)

Salinity: Fresh to salt water
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:
pH: NA
Temperature: NA
Salinity: NA
4. Special nutrient requirements:
The product “001” is a nutrient, therefore no nutrients are required.
5. Test results regarding the determination of the presence of the following:
Salmonella: Negative
Fecal coliform: <3
Shigella: Negative
Staphylococcus Coagulase positive: <10
Beta hemolytic Streptococci: 1,100

IX. PHYSICAL PROPERTIES
1. Flash Point: 250°C (482°F)
2. Pour Point: NA
3. Viscosity: NA
4. Specific Gravity: NA
5. pH: NA
6. Surface Active Agents: NA
7. Solvents: NA
8. Additives: NA
9. Solubility in Water: NA

X. ANALYSIS FOR HEAVY METALS, CYANIDE, AND CHLORINATED HYDROCARBONS
NA

TECHNICAL PRODUCT BULLETIN B-56
USEPA, OIL PROGRAM CENTER
LISTING DATE: JULY 24, 2002
"S-200"
(aka, SHEENCLEAN, S-200C, BILGE CLEAR)

I. NAME, BRAND, OR TRADEMARK
S-200
Type of Product: Bioremediation Agent (Nutrient Additive)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
International Environmental Products, LLC
Two Villanova Center
795 E. Lancaster Ave., Suite 280
Villanova, PA 19085
Phone: (610) 520-7665
Fax: (610) 520-7663
E-mail: info@iepusa.com
(Mr. Jim Lynn)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
International Environmental Products, LLC
Two Villanova Center
795 E. Lancaster Ave., Suite 280
Villanova, PA 19085
Phone: (610) 520-7665
Fax: (610) 520-7663
E-mail: info@iepusa.com
(Mr. Jim Lynn)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable.
2. Ventilation:
Ventilation of the work place is not necessary.
3. Skin and eye contact; protective clothing; treatment in case of contact:
In case of contact with skin or eyes, wash with plenty of water.
4.a. Maximum storage temperature: 132°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: 55°F - 85°F
4.d. Temperatures of phase separations and chemical changes: <32°F and >140°F

V. SHELF LIFE
The recommended shelf life of S-200 is 1½ years if kept in the unopened original container.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

S-200 is a light amber liquid, and as such can be sprayed with traditional liquid spraying equipment, such as pressurized sprayers or backpack sprayers.

2. Concentration/Application Rate:

The recommended application rate is approximately 10% by of the S-200 as compared to the hydrocarbon being remediated. In other words, use 1 pound of S-200 for every 10 pounds of hydrocarbon you are remediating.

For applications on soil contaminated below 1 foot, the soil is turned and the material is applied. This allows air to circulate and thereby maintains an aerobic condition.

On a surface application, the amount to use is approximately 0.1 to 1 pound of S-200 for every square yard of surface area. The amount sprayed is dependent on the amount of hydrocarbon on the surface you are spraying.

To remediate a sheen on water, the same application ratio for a surface application is used.

3. Conditions for Use: S-200 is a bioremediation accelerator used for the remediation of hydrocarbon spills or leaks. It is a non-intrusive, cost effective remedy for the cleanup of these hydrocarbons. These hydrocarbons include but are not limited to gasoline, No. 2 up to No. 6 diesel fuel, jet fuels, kerosene, lubricating oils, hydraulic oils, and crude oils.

VII. TOXICITY AND EFFECTIVENESS

a. Effectiveness:

Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:

Summary Data Table

DAYS	PRODUCT 3 REPS/PROD	TOTAL MEAN ALKANES (ppm)	RED% 28 DAYS	TOTAL MEAN AROMATICS (ppm)	RED% 28 DAYS
0	CONTROL	27666	0	5600	0
	S-200	29333	0	5666	0
7	CONTROL	21333	0	4333	0
	S-200	11000	0	4400	0
28	CONTROL	18771	32	5597	0.05
	S-200	660	98	5073	10.4

Results of Gravimetric Analysis:
Percentage (%) Decrease in Weight of Oil on Day 28

Control	Product (001)
-18.57%	27.82%

b. Toxicity:

Material Tested	Species	LC50 (ppm)
S-200	Menidia beryllina	39.69 96-hr
	Mysidopsis bahia	21.33 48-hr
No. 2 Fuel Oil	Menidia beryllina	35.36 96-hr
	Mysidopsis bahia	35.36 48-hr
S-200 & No. 2 Fuel Oil (1:10)	Menidia beryllina	25.33 96-hr
	Mysidopsis bahia	17.67 48-hr
Reference Toxicant (SDS)	Mysidopsis bahia	22.96 48-hr

VIII. MICROBIOLOGICAL ANALYSIS
1. Listing of all microorganisms by species and percentages in the composition:
S-200 is a nutrient bioremediation accelerator and does not contain bacterial cultures or amendments. However, with the addition of S-200, the microbiological data shows a continued viability of microbial incubations over time.
2. Optimum pH, temperature, and salinity ranges for use of the additive:
pH: 7.0
Temperature: 86°F
Salinity: Fresh to salt water
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:
pH: 4.5 - 10.0
Temperature: 50°F - 120°F
Salinity: 0% - 10%
4. Special nutrient requirements:
NA

5. Test results regarding the determination of the presence of the following:
Salmonella: Negative
Fecal coliform: Negative
Shigella: Negative
Staphylococcus Coagulase positive: Negative
Beta hemolytic Streptococci: Negative

IX. PHYSICAL PROPERTIES
1. Flash Point: >212°F
2. Pour Point: 40°F
3. Viscosity:100cp@70°F
4. Specific Gravity: 0.996
5. pH: 4.5
6. Surface Active Agents: NA
7. Solvents: NA
8. Additives: NA
9. Solubility in Water: Dispersible

X. ANALYSIS FOR HEAVY METALS, CYANIDE, AND CHLORINATED HYDROCARBONS
S-200 does not contain any heavy metals, cyanide, or chlorinated hydrocarbons.

TECHNICAL PRODUCT BULLETIN B-57
USEPA, OFFICE OF EMERGENCY MANAGEMENT
REGULATION AND POLICY DEVELOPMENT DIVISION
LISTING DATE: JANUARY 8, 2007
"SPILLREMED (MARINE)®"

I. NAME, BRAND, OR TRADEMARK
SPILLREMED (MARINE)®
Type of Product: Bioremediation Agent (Biological Additive: Microbiological Culture)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Sarva Bio Remed, LLC
11 North Willow Street
Trenton, NJ 08608
Phone: (609) 695-4992
Fax: (419) 710-5831
E-mail: sales@sarvabioremed.com
Web Site: www.sarvabioremed.com
(Mr. Satya Ganti)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Sarva Bio Remed, LLC
11 North Willow Street
Trenton, NJ 08608
Phone: (609) 695-4992
Fax: (419) 710-5831
E-mail: sales@sarvabioremed.com
Web Site: www.sarvabioremed.com
(Mr. Satya Ganti)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability: Non-flammable.
2. Ventilation: No special ventilation required.
3. Skin and eye contact; protective clothing; treatment in case of contact: On contact with product, wash with plenty of water and for eye contact consult your physician. Use of gloves is recommended during field application to protect eyes from spray.
4.a. Maximum storage temperature: 100°F
4.b. Minimum storage temperature: 32°F
4.c. Optimum storage temperature range: Ambient
4.d. Temperatures of phase separations and chemical changes: <32°F and >100°F

V. SHELF LIFE
The recommended shelf life is one year.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

SPILLREMED (MARINE)® is a ready to use liquid product. It can be sprayed undiluted over the spill in open water conditions.

2. Concentration/Application Rate:

SPILLREMED (MARINE)® is applied in a product:oil ratio of 1:10. Rate of application is one gallon per 10 minutes.

3. Conditions for Use:

SPILLREMED (MARINE)® is a marine salt formulation and is not effective in fresh water conditions. Optimal effectiveness is in the salinity range of 10 to 35 ppt.

VII. TOXICITY AND EFFECTIVENESS

a. Effectiveness:

Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:

Summary Data Table

DAYS	PRODUCT 3 REPS/PROD	TOTAL MEAN ALKANES (ppm)	RED% 28 DAYS	TOTAL MEAN AROMATICS (ppm)	RED% 28 DAYS
0	CONTROL	48,963.31		13,467.59	
	NUTRIENT	46,963.33		13,779.24	
	SPILLREMED (MARINE)®	52,063.18		14,143.06	
7	CONTROL	47,606.78		11,262.98	
	NUTRIENT	40,853.28		11,329.01	
	SPILLREMED (MARINE)®	43,236.67		11,076.99	
28	CONTROL	45,467.28	7	12,560.37	7
	NUTRIENT	7,210.06	98	9,927.87	28
	SPILLREMED (MARINE)®	1,310.09	97	7,442.71	47

Results of Gravimetric Analysis:

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

Control	Nutrient	Product
6.00%	76%	85%

b. Toxicity:

Material Tested	Species	LC50 (ppm)
SPILLREMED (MARINE)®	Menidia beryllina	392.30 96-hr
	Mysidopsis bahia	343.80 48-hr
No. 2 Fuel Oil	Menidia beryllina	40.50 96-hr
	Mysidopsis bahia	17.40 48-hr

SPILLREMED (MARINE)®			
& No. 2 Fuel Oil (1:10)	Menidia beryllina	37.50	96-hr
	Mysidopsis bahia	22.40	48-hr
Reference Toxicant (SDS)	Menidia beryllina	8.00	96-hr
	Mysidopsis bahia	15.90	48-hr

VIII. MICROBIOLOGICAL ANALYSIS
1. Listing of all microorganisms by species and percentages in the composition:
CONFIDENTIAL
2. Optimum pH, temperature, and salinity ranges for use of the additive:
pH: 7.6
Temperature: 55°F
Salinity: 30 ppt
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:
pH: 6.5 – 6.9
Temperature: 40°F – 90°F
Salinity: 10 ppt – 35 ppt
4. Special nutrient requirements: None
5. Test results regarding the determination of the presence of the following:
Salmonella: Negative
Fecal coliform: Negative
Shigella: Negative
Staphylococcus Coagulase positive: Negative
Beta hemolytic Streptococci: Negative

IX. PHYSICAL PROPERTIES
NA

X. ANALYSIS FOR HEAVY METALS, CYANIDE, AND CHLORINATED HYDROCARBONS
NA

TECHNICAL PRODUCT BULLETIN B-58
USEPA, OFFICE OF EMERGENCY MANAGEMENT
REGULATION AND POLICY DEVELOPMENT DIVISION
LISTING DATE: DECEMBER 3, 2007
"JE1058BS"

I. NAME, BRAND, OR TRADEMARK
JE1058BS
Type of Product: Bioremediation Agent (Nutrient Additive)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Japan Energy Corporation
Business Development Department, Bio Research Center
3-17-35 Niizo-Minami
Toda-shi, Saitama 335-8502
Japan
Phone: (81) 48-433-2191
Fax: (81) 48-444-3223
E-mail: saeki@j-energy.co.jp
(Hisashi Saeki)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Japan Energy Corporation
Business Development Department, Bio Research Center
3-17-35 Niizo-Minami
Toda-shi, Saitama 335-8502
Japan
Phone: (81) 48-433-2191
Fax: (81) 48-444-3223
E-mail: saeki@j-energy.co.jp
(Hisashi Saeki)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability: Non-flammable.
2. Ventilation: Use adequate ventilation. Treat product as a hygroscopic powder.
3. Skin and eye contact; protective clothing; treatment in case of contact: Avoid contact with eyes and do not take internally. Upon contact with eyes, flush with plenty of fresh water. Avoid breathing dust. Normal protective equipment for handling of powder, such as a dust mask and eye shield can be used.
4.a. Maximum storage temperature: 105°F
4.b. Minimum storage temperature: NA
4.c. Optimum storage temperature range: 0°F - 68°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE
The shelf life of the product is approximately 2 years if stored in a cool dry area.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

JE1058BS contains biosurfactant and has an ability to stimulate the biodedgradation of oil by indigenous microorganisms. JE1058BS, which is a powder, can be applied using conventional spraying equipment, for example a powder mist duster attached with boom type multi-hole head.

2. Concentration/Application Rate:

JE1058BS is applied in a product:oil ratio of 1:10. No pre-mixing or dilution by water is required.

3. Conditions for Use:

JE1058BS may be used in a wide range of environmental conditions of temperature and salinities where natural populations of oil-degrading microbes are active. The mechanical removal of as much oil as possible should be done before the product is introduced to the slick.

VII. TOXICITY AND EFFECTIVENESS

a. Effectiveness:

Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:

Summary Data Table

DAYS	PRODUCT 3 REPS/PROD	TOTAL MEAN ALKANES (ppm)	RED% 28 DAYS	TOTAL MEAN AROMATICS (ppm)	RED% 28 DAYS
	CONTROL	48,213		11,413	
0	NUTRIENT	51,833		13,056	
	JE1058BS	52,280		13,211	
	CONTROL	48,030		11,108	
7	NUTRIENT	33,423		11,755	
	JE1058BS	13,453		10,188	
	CONTROL	48,257	0	10,429	8.6
28	NUTRIENT	16,953	67.3	11,837	9.3
	JE1058BS	3,854	92.6	8,061	39.0

Results of Gravimetric Analysis: DATA MISSING

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

Control	Nutrient	Product
5.9%	60.0%	81.8%

b. Toxicity:

Material Tested	Species	LC50 (ppm)
JE1058BS	Menidia beryllina	91.70 96-hr
	Mysidopsis bahia	72.09 48-hr

No. 2 Fuel Oil	Menidia beryllina	5.56 96-hr
	Mysidopsis bahia	2.19 48-hr
JE1058BS & No. 2 Fuel Oil (1:10)	Menidia beryllina	8.68 96-hr
	Mysidopsis bahia	2.44 48-hr
Reference Toxicant (SLS)	Menidia beryllina	12.23 96-hr
	Mysidopsis bahia	11.70 48-hr

VIII. MICROBIOLOGICAL ANALYSIS
1. Listing of all microorganisms by species and percentages in the composition:
CONFIDENTIAL
2. Optimum pH, temperature, and salinity ranges for use of the additive: NA
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:
Store in dry location and avoid contact with moisture
4. Special nutrient requirements: NA
5. Test results regarding the determination of the presence of the following:
Salmonella: Negative
Fecal coliform: Negative
Shigella: Negative
Staphylococcus Coagulase positive: Negative
Beta hemolytic Streptococci: Negative

IX. PHYSICAL PROPERTIES
NA

X. ANALYSIS FOR HEAVY METALS, CYANIDE, AND CHLORINATED HYDROCARBONS
NA

TECHNICAL PRODUCT BULLETIN B-59
USEPA, OFFICE OF EMERGENCY MANAGEMENT
REGULATION AND POLICY DEVELOPMENT DIVISION
LISTING DATE: NOVEMBER 24, 2008
"BIOWORLD BIOREMEDIATION TREATMENT PRODUCTS (BIOWORLD BHTP)"

I. NAME, BRAND, OR TRADEMARK
BIOWORLD BIOREMEDIATION TREATMENT PRODUCTS (BIOWORLD BHTP)
Type of Product: Bioremediation Agent (Microbiological Additive)

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
BioWorld Products
International Headquarters
P.O. Box 2920
8244 W. Hillsdale Court
Visalia, CA 93279
Phone: (559) 651-2042
Fax: (559) 651-9041
E-mail: mail@bioworldusa.com
Web site: www.bioworldusa.com
(Diane R. Barnes)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
BioWorld Products
P.O. Box 2920
8244 W. Hillsdale Court
Visalia, CA 93279
Phone: (559) 651-2042
Fax: (559) 651-9041
E-mail: mail@adbio.com
Web site: www.adbio.com
(Donald E. Damschen)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability: Non-hazardous.
2. Ventilation: Use adequate ventilation. Treat dry product as a hygroscopic powder and avoid ventilation.
3. Skin and eye contact; protective clothing; treatment in case of contact: Avoid contact with eyes and do not take internally. Upon contact with eyes, flush with plenty of fresh water. Avoid breathing dust. Normal protective equipment for handling of powder, such as a dust mask and eye shield are recommended to be used. Wash hands and body contacted areas with soap and water.
4.a. Maximum storage temperature: 110°F
4.b. Minimum storage temperature: 34°F – containers may break if frozen

4.c. Optimum storage temperature range: 34°F - 90°F
4.d. Temperatures of phase separations and chemical changes: <32°F and > 140°F

V. SHELF LIFE
The recommended shelf life exceeds 3 years when stored properly in cool, dry place out of direct sun light.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
BioWorld BHTP is a two part product 1) Bioremediation Enhancer liquid and 2) Hydrocarbon Digesting Microbes in a dry form. Prior to use the microbes are rehydrated in 100°F water for 10 to 300 minutes.
Example for small volume applications – best results are obtained by applying Bioremediation Enhancer first followed by the rehydrated Hydrocarbon Microbe solution in the same location.
Example for large volume applications – the two parts of BioWorld BHTP can be mixed with additional water and applied together to spray over the perimeter and over the top of the spill.
Example for soil and groundwater applications – evenly apply to soils and mix with till or discing equipment. Oxygen additions are periodically used in certain situations and can be applied with mechanical generation and/or by using oxygen release compound products.
2. Concentration/Application Rate:
BioWorld BHTP is applied at an approximate rate of 40 gallons Bioremediation Enhancer liquid and 4 pounds Hydrocarbon Microbes per surface acre treated. Increased quantities and multiple applications may be required to meet shorter cleanup time constraints and desired results.
3. Conditions for Use:
BioWorld BHTP can be used in freshwater conditions, wetlands, rock or sand shorelines, contaminated soil areas, salt marshes and salt water conditions (up to 60 ppt salinity).

VII. TOXICITY AND EFFECTIVENESS
a. Effectiveness:
Bioremediation Agent Effectiveness Test (40 CFR 300.900), Federal Register September 15, 1994:
Summary Data Table

DAYS	PRODUCT 3 REPS/PROD	TOTAL MEAN ALKANES (ppm)	RED% 28 DAYS	TOTAL MEAN AROMATICS (ppm)	RED% 28 DAYS
0	CONTROL	61,234		9,395	
	NUTRIENT	64,803		8,873	
	BioWorld BHTP	63,192		9,220	
7	CONTROL	57,907	5	7,290	22
	NUTRIENT	49,747	14	5,956	18
	BioWorld BHTP	41,480	28	4,405	40
28	CONTROL	49,364	19	6,499	31
	NUTRIENT	21,490	67	5,259	41

	BioWorld BHTP	1,948	97	1,078	88

Results of Gravimetric Analysis:
Percentage (%) Decrease in Weight of Oil on Day 28

Control	Nutrient	Product
21%	64%	96%

b. Toxicity:

Material Tested	Species	LC50 (ppm)
BioWorld BHTP	Menidia beryllina	8,848.70 96-hr
	Mysidopsis bahia	7,348.70 48-hr
No. 2 Fuel Oil	Menidia beryllina	4.50 96-hr
	Mysidopsis bahia	3.21 48-hr
BioWorld BHTP &	Menidia beryllina	13.90 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	7.10 48-hr
Reference Toxicant (SLS)	Menidia beryllina	15.00 96-hr
	Mysidopsis bahia	15.90 48-hr

VIII. MICROBIOLOGICAL ANALYSIS
1. Listing of all microorganisms by species and percentages in the composition:
CONFIDENTIAL
2. Optimum pH, temperature, and salinity ranges for use of the additive:
pH: 6-8
Temperature: 80°F-100°F
Salinity: 0-1 for use of the additive
3. Minimum and maximum pH, temperature, and salinity levels below or above which the effectiveness of the additive is reduced to half its optimum capacity:
pH: 3-10
Temperature: 33°F-120°F
Salinity: >5
Use under any conditions where indigenous populations of oil-degrading microbes are/are not present
4. Special nutrient requirements: Some sites may benefit with various nutrients added depending on project variables
5. Test results regarding the determination of the presence of the following:
Salmonella: Negative
Fecal coliform: <2
Shigella: Negative
Staphylococcus Coagulase positive: <10
Beta hemolytic Streptococci: <10

IX. PHYSICAL PROPERTIES
NA

X. ANALYSIS FOR HEAVY METALS, CYANIDE, AND CHLORINATED HYDROCARBONS
NA

TECHNICAL PRODUCT BULLETIN #M-12
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: AUGUST 31, 1992
REVISED LISTING DATE: SEPTEMBER 13,1995
"PES-51"

I. NAME, BRAND, OR TRADEMARK
PES-51
Type of Product: Miscellaneous Oil Spill Control Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Practical Environmental Solutions (Formerly known as Petroleum Environmental Services)
P.O. Box 12563
San Antonio, Texas 78212
Phone: (210) 493-7172
Fax: (210) 493-7172
E-mail: simsbi@aol.com
(Mr. Bill Sims)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
SEACOR Environmental Product LLC
(206) 378-4100

North America
(866) 644-3677

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
124°F
2. Ventilation:
Handle product in a normal well ventilated place.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Although PES-51 is expected not to pose any specific health hazard, the following precautions are recommended due to possible irritation from the biological by-products contained in the product:
Avoid contact with skin, eyes, and clothing.
Avoid prolonged or repeated contact with skin, breathing mist, and do not take internally.
Keep product away from heat, sparks, and flames, and store in a cool, dry, well ventilated place, away from incompatible materials.
Vent container in warm weather to relieve pressure.
Do not cut, grind, weld, or drill on or near product containers.
Handle empty containers just as would the full ones.
4.a. Maximum storage temperature: NA.
4.b. Minimum storage temperature: NA

4.c. Optimum storage temperature range: NA
4.d. Temperatures of phase separations and chemical changes: Not applicable, but PES-51 freezes at -142°F.

V. SHELF LIFE
6 years (unopened drum), 1 year (opened drum).

VI. RECOMMENDED APPLICATION PROCEDURE
1.Application Method:
The following PES-51 application methods are applicable for the full range of PES-51 industrial uses, including shoreline and surface treatment, tank cleaning and equipment decontamination. The selection of the method(s) will be dependent on the level and extent of hydrocarbon contamination, type of oil, and its degree of weathering/emulsion and the nature and type of surface to be treated or cleaned. Equipment availability, logistics and manpower requirements should also be considered. Application methods may be combined, if necessary. In addition, for shoreline cleaning, the treatment area will be boomed and contained prior to PES-51 usage. For equipment decontamination, the use of portable de-con pools or secondary containment liners are recommended.
PORTABLE EQUIPMENT
Hand Held Spraying - Spray PES-51 on the contaminated area using a Chapin Steel Sprayer #1729 (or equivalent), 2.5 gallons capacity, or the AU 8000 MicroNair sprayer. After application, allow 3 to 5 minutes for soaking without allowing evaporation of PES-51 (weather dependent). When saturation is attained, hydrocarbon will be seen running off the impacted surface.
Rinse the treated surface with available water (fresh or sea water) from the pump until no hydrocarbon remains. The water should be used at ambient temperature. Depending on level and extent of contamination, a pressure washer may also be used for rinsing (ambient may be used).
Collect the effluent hydrocarbons with absorbent booms and pads, and squeeze off the oil contaminants from the booms and pads for reuse as process oil.
Airless Sprayer - Depending on the level and extent of the hydrocarbon contamination and the nature of the impacted surface, an airless type sprayer may be used for direct product application. Common types of airless sprayers are: Airlessco, Graeco or equivalents. These airless sprayers can have single or multi-hose attachments and can include wand extensions as required. Application rate and pressure will vary depending on the equipment type and site specific conditions.
After spraying with PES-51, allow to soak for 3 to 5 minutes (weather dependent) avoiding evaporation, rinse/flush surfaces with pumps, fire hoses, deluge headers or pressure washers (ambient).
Pressure Washer with Syphon Feed System - Depending on the level and extent of the hydrocarbon contamination and the nature of the impacted surface proposed for treatment, a pressure washer may be used for direct product application. In most applications, hot water (greater than 120°F) is not necessary. Common types of pressure washers are: Hotsy and Lambda, or equivalents. These pressure washers have a variable rate "detergent syphon feed" system for PES-51 application and can have single or multi-hose attachments which can include wand extensions. Application rate and pressure will vary depending on equipment type and site specific conditions.
After spraying with PES-51, allow to soak for 3 to 5 minutes (weather dependent) avoiding

evaporation, rinse/flush surfaces with pumps, fire hoses, deluge headers or pressure washers (ambient).
Air Knife (Modified for PES-51 Application) - PES has developed a patent-pending modified air knife system for product application. This method was developed primarily for rocky, cobble, bedrock type shorelines with both surface subsurface oil. The modified air knife delivers the PES-51 in both a liquid stream (125 psi) or as an aerosol. Compressed air is used to dilate subsurface sediments and allow for distribution of the PES-51. The air knife method is also applicable for surface treatment of impacted rocks, bulkheads, seawalls, rip-rap jetties, etc.
After spraying with PES-51, allow to soak for 3 to 5 minutes (weather dependent) avoiding evaporation, rinse/flush surfaces with pumps, fire hoses, deluge headers or pressure washers (ambient). For subsurface treatment, continue flushing with large quantities of low-pressure seawater at ambient temperatures.
MOBILE EQUIPMENT
Boat Spraying - The recommended application rate is 1 to 5 gallons per 200 sq. ft., from a boat with speed of 1 to 3 knots, depending on the sea conditions and oil film thickness on the rocks. For a boat with a mounted AU-8110 MicroNair sprayer (or equivalent sprayer) and a spray swath of about 20 feet, traveling at approximately two knots, 25 acres/hr will be treated.
After spraying, rinse PES-51 off the rocks with a hard, coarse spray of sea water. Standard size pumps with fire hoses or deluge headers may be used. Higher pressure rinses may be required if oil is thick and weathered. The shoreline may also be sprayed from the beach side, which will force the oil into the containment boom.
Helicopter Deployed Spraying - Aerial spraying can be utilized for shore treatments and pretreatment with the AU 5000 atomizer (MicroNair) or equivalent sprayer.
The recommended aerial application of PES-51 is 14 to 23 liters/minute. The AU 5000 (or equivalent) can be used with fixed-wing aircraft and helicopters operating at speeds of 90 MPH (145 km/hr) and more. The smaller AU 7000 sprayer (or equivalent) is recommended for use at airspeeds below 90 MPH.
After spraying, the hydrocarbons can be rinsed off the shore rocks as described above with hand held pumps, deluge headers or boat spraying.
Vehicular Spraying - The recommended vehicular spraying is 50 to 150 ft2/gallon depending on climatic conditions. A MicroNair vehicle-mounted sprayer is recommended. This unit is a self contained sprayer kit that combines the AU 8000 sprayhead (or equivalent) with a powerful 4-stroke engine and a 60 liter chemical tank to give complete product coverage.
After spraying, the hydrocarbons can then be rinsed off the shore rocks as described above with hand held pumps, deluge headers or boat spraying.
2. Concentration/Application Rate:
The product comes already mixed, and ready for use.
For specific application, see rate of application as indicated above.
3. Conditions for Use:
Water temperature and salinity do not effect the product performance. PES-51 is effective against hydrocarbons only, and the age of the hydrocarbon is not relevant.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)
PES-51	Menidia beryllina	137.00 96-hr
	Mysidopsis bahia	54.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	200.00 96-hr
	Mysidopsis bahia	11.50 48-hr
PES-51 &	Menidia beryllina	435.00 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	14.50 48-hr
Reference Toxicant (DSS)	Menidia beryllina	2.20 96-hr
	Mysidopsis bahia	9.80 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.

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: 124°F
2. Pour Point: -50°F at 30 min.
3. Viscosity: 30 cst at 28°C
4. Specific Gravity: 0.840 at 25°C
5. pH: 6.7
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: CONFIDENTIAL
8. Solvents: CONFIDENTIAL
9. Additives: CONFIDENTIAL
10. Solubility: NA

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

Compound	Concentration (ppm)
Arsenic	< 0.005
Cadmium	< 0.01
Chromium	< 0.05
Copper	< 0.05
Lead	< 0.05
Mercury	< 0.005
Nickel	< 0.01
Zinc	< 0.05
Cyanide	< 1.00
Chlorinated Hydrocarbons	< 0.01

TECHNICAL PRODUCT BULLETIN #M-17
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: FEBRUARY 25, 1994
REVISED LISTING DATE: JUNE 14, 1995
"CIAGENT (formerly CI AGENT, CHEAP INSURANCE, & PETRO-CAPTURE)"

I. NAME, BRAND, OR TRADEMARK
CIAGENT (formerly CI AGENT, CHEAP INSURANCE, & PETRO-CAPTURE)
Type of Product: Miscellaneous Oil Spill Control Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
CIAGENT Solutions, LLC
11760 Commonwealth Dr.
Louisville, KY 40299
Phone: (502) 267-0101
(800) 255-6073
Fax: (502) 267-0181
E-mail: dan@ciagent.com
(Mr. Dan Parker)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
CIAGENT Solutions, LLC
11760 Commonwealth Dr.
Louisville, KY 40299
Phone: (502) 267-0101
(800) 255-6073
Fax: (502) 267-0181
E-mail: dan@ciagent.com
(Mr. Dan Parker)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Flammable solid at >210°F.
2. Ventilation:
Normal ventilation is adequate.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Product may cause slight eye irritation if in contact with eyes. Use protective eye goggles when handling the product. In case of eye contact, flush eyes with water. In an enclosed environment, workers should wear a dust mask for personal comfort.
In case of a confined space fire, do not enter without full bunker gear and positive pressure NIOSH approved self-contained breathing apparatus.
Maintain fire watch at 450°F.
4.a. Maximum storage temperature: 190°F
4.b. Minimum storage temperature: None

4.c. Optimum storage temperature range: 50°F - 80°F
4.d. Temperatures of phase separations and chemical changes: None
Avoid contact with strong oxidizing agents due to possible oxidation reaction with the product.

V. SHELF LIFE
> 5 years, if stored in cool dry area, away from direct sunlight.

VI. RECOMMENDED APPLICATION PROCEDURES
1. Application Method:
For small scale spills on water (salt or fresh), CIAGENT can be broadcast directly onto the spill, spreading a thin layer from the outer edge into the middle of the spill. Agitation is not necessary. The product is also available in oil absorbent, water repellant booms and pillows.
For large spills on water (fresh or salt), CIAGENT may be deployed with an air or water stream directed at the leading edge of the spill. Because of its fine particulate nature, static buildup may occur if the product is applied in dry form at a high rate of delivery. Dispensing material should be properly grounded to prevent this. The product is relatively non-abrasive and should not harm machinery or pumping systems. Agitation is not necessary.
The polymer has a specific gravity of less than one and will tend to separate and move to the surface when mixed with water. Therefore, in the case of water carrying media, the product should be introduced "just in time" as the media is sprayed, or agitation will be needed to keep the product suspended.
The product will remove oils and other hazardous hydrocarbon based materials from fresh or salt water. CIAGENT may be used in a flow-through filter to remediate contaminated water. CIAGENT encapsulates and solidifies the oil, while continuing to float even after saturation. The solidified oil or hazardous material may be removed from water using a vacuum pump or fish net. The material should be put into appropriate containers and disposed of in accordance with federal, state and local regulations.
For spills on land, the product would be applied in the same manner as in the water-based spill situation. Agitation is not necessary.
To recover solidified oil or hazardous materials from spills on land, the spent material may be collected and swept up using an industrial vacuum cleaner, broom, or shovel. The material should be put into appropriate containers and disposed of in accordance with federal, state and local regulations.
2. Concentration/Application Rate:
In general, a 10% to 30% by weight application is required to solidify light, medium, and heavy oils. Solidification may occur faster if additional CIAGENT is applied.
3. Conditions for Use:
CIAGENT is equally effective in fresh or salt water, and under any weather conditions; however, colder temperatures may slow the solidification process. The product is most effective on water temperatures between 32°F and 120°F.
Depending on the age and/or viscosity of the material, varying amounts of CIAGENT may be required to obtain complete solidification.
The recovered solidified oil or hazardous materials may be landfilled, incinerated, used as a secondary fuel, or otherwise disposed of according to federal, state and local regulations.

VII..TOXICITY AND EFFECTIVENESS

a. Toxicity

Material Tested	Species	LC50 (ppm)
CIAGENT	Menidia beryllina	2227.00 96-hr
	Mysidopsis bahia	2617.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	4.36 96-hr
	Mysidopsis bahia	1.45 48-hr
CIAGENT &	Menidia beryllina	5.93 96-hr
No. 2 Fuel (1:10)	Mysidopsis bahia	1.73 48-hr
Reference Toxicant (DSS)	Menidia beryllina	3.68 96-hr
	Mysidopsis bahia	6.82 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.

b. Effectiveness:

NA

IX. PHYSICAL PROPERTIES AND COMPONENTS

1. Flash Point: No flash observed at 210 F.
2. Pour Point: Not applicable; solid samples
3. Viscosity: Not applicable; solid samples
4. Specific Gravity: 0.94 g/cm3
5. pH: 7.81
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: None
8. Solvents: None
9. Additives: None
10. Solubility: Negligible

X. ANALYSIS FOR HEAVY METALS AND CHLORINATED HYDROCARBONS

Compound	Concentration (ppm)
Arsenic	<1.0
Cadmium	<2.5
Chromium	<2.0
Copper	<2.5
Lead	<5.0
Mercury	<0.050
Nickel	<5.0
Zinc	<2.5
Cyanide	<0.50
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #M-18
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: MARCH 29, 1994
REVISED LISTING DATE: MARCH 12, 1997
"ZYME-FLOW"
(aka, ZYME-TREAT, MARI-ZYME, UNITED 658 PETRO-ZYME)

I. NAME, BRAND, OR TRADEMARK
ZYME-FLOW
Type of Product: Miscellaneous Oil Spill Control Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
United Laboratories, Inc.
320 37th Avenue
St. Charles, IL 60174
Phone: (630)377-0900
(800) 323-2594
Fax: (630) 377-0960
E-mail: nsherrel@unitedlabsinc.com
(Ms. Nancy Sherrel)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
United Laboratories, Inc.
320 37th Avenue
St. Charles, IL 60174
Phone: (630) 377-0900
(800) 323-2594
Fax: (630) 377-0960
E-mail: nsherrel@unitedlabsinc.com
(Ms. Nancy Sherrel)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable
2. Ventilation:
No mechanical ventilation required
3. Skin and eye contact; protective clothing; treatment in case of contact:
Avoid eye contact due to possible mild eye irritation. In case of eye contact, flush eyes with water.
Protective clothing is normally not required.
4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: 0°F
4.c. Optimum storage temperature range: 0°F - 120°F
4.d. Temperatures of phase separations and chemical changes: > 3 freeze-thaw cycles.
V. SHELF LIFE
1 year minimum.

VI. RECOMMENDED APPLICATION PROCEDURE

1.Application Method:

United's ZYME-FLOW is a chemically designed product that will make heavy crudes more pumpable, and break the adhesion between oils and soil, rock or sand.

ZYME-FLOW can be applied where the contaminated soil or sand is temporarily removed and placed into a device that can provide mechanical agitation (e.g., a cement mixer or a fractionating tank). Unagitated tanks may also be used, but more time will be required to achieve the goal.

Add ZYME-FLOW solution to the tank. As agitation continues, oils with a specific gravity of less than one will float, while oils with a specific gravity of greater than one will settle.

The floating or settled oil can then be removed from the soil or sand. As ZYME-FLOW will not emulsify oils, the recovered oils are almost anhydrous, and the water can be collected and reused.

Another method is to physically isolate a small area that is to be cleaned with damming collars, sand bags or other means on the sides and a none permeable layer on the bottom (if possible). Then wash the contaminated area with ZYME-FLOW solution using a pressurized water stream. Keep the area super-saturated with water for several hours to allow oil residues to float to the surface for collection.

ZYME-FLOW can be used to wash the inside or outside of a ship or barge that has been contaminated with oil, using a high pressure sprayer. Bilges of a ship, or barge can also be cleaned using a 1% ZYME-FLOW solution, and allowing the natural movement of the ship to provide the agitation.

2. Concentration/Application Rate:

The exact dilution of ZYME-FLOW will vary between 50:1 and 200:1 depending on temperature, viscosity and type of petroleum product.

3. Conditions for Use:

ZYME-FLOW is effective in all non-frozen waters with greater efficacy as the temperature increases. The product efficiency is not affected by salinity, but it will be affected by tar sand.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

Material Tested	Species	LC50 (ppm)	
ZYME-FLOW	Menidia beryllina	35.00	96-hr
	Mysidopsis bahia	26.00	48-hr
No. 2 Fuel Oil	Menidia beryllina	6.90	96-hr
	Mysidopsis bahia	3.70	48-hr
ZYME-FLOW &	Menidia beryllina	8.70	96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	1.60	48-hr
Reference Toxicant (SDS)	Menidia beryllina	7.07	96-hr
	Mysidopsis Bahia	18.60	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.

b. Effectiveness:

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: None
2. Pour Point: 32°F
3. Viscosity: <10 cps
4. Specific Gravity: 0.99
5. pH: 7.0 - 8.0
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: CONFIDENTIAL
8. Solvents: NA
9. Additives: CONFIDENTIAL
10. Solubility: Soluble

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

Compound	Concentration (ppm)
Arsenic	0.005
Cadmium	0.002
Chromium	0.002
Copper	0.020
Lead	0.007
Mercury	0.0004
Nickel	0.070
Zinc	0.040
Cyanide	0.300
Chlorinated Hydrocarbons	<1.00

TECHNICAL PRODUCT BULLETIN #M-19
USEPA, OIL PROGRAM CENTER
LISTING DATE: APRIL 22, 1996
"WASTE-SET #3200®"

I. NAME, BRAND, OR TRADEMARK
WASTE-SET #3200®
Type of Product: Oil Spill Solidifying Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER
Environmental & Fire Technology, LLC
3374 West River Dr. NW
Grand Rapids, MI 49544
Phone: (616) 784-0770
Fax: (616) 784-5018
E-mail: eandft@comcast.com
(Mr. Cal Blystra)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Environmental & Fire Technology, LLC
3374 West River Dr. NW
Grand Rapids, MI 49544
Phone: (616) 784-0770
Fax: (616) 784-5018
E-mail: eandft@comcast.com
(Mr. Cal Blystra)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Product will not burn unless preheated. Avoid elevated temperatures (>200°F) for extended periods (>5 days).
Product has a tendency to accumulate a static charge during transport, which is a potential fire hazard if used near flammables.
2. Ventilation:
Avoid generating dust clouds.
3. Skin and eye contact; protective clothing; treatment in case of contact:
May cause mild mechanical irritation to eyes, skin and respiratory tract. Dust may cause coughing and watery eyes. Pre-existing eye, skin and respiratory disorders may be aggravated by this product. Wear NIOSH-approved respirator to prevent overexposure. Refer to transitional occupational exposure limits established by OSHA in 29CFR 1910.1000.
Flush eyes with water; wash skin with soap and water; if molten, treat as for burns. Remove person(s) to fresh air if excessive amounts of dust have been inhaled.
Protective gloves and safety glasses should be worn.
If material is released or spilled, sweep up or vacuum and place in an approved container.

4.a. Maximum storage temperature: 200°F
4.b. Minimum storage temperature: None
4.c. Optimum storage temperature range: <200°F
4.d. Temperatures of phase separations and chemical changes: >450°F

V. SHELF LIFE
Unlimited.

VI. RECOMMENDED APPLICATION PROCEDURE
1.Application Method:
Spills on Water - For spills on water, surround the spill with WASTE-SET® 3200 to prevent migration. Reinforce containment line with a boom or sweep if necessary. WASTE-SET® and the resulting reacted material will float.
If the interior of the diked spill is not to be reclaimed, fill in the remaining surface area of the spill by broadcasting additional WASTE-SET® 3200 evenly over the spill until the WASTE-SET® no longer reacts with the spill. Alternatively, the product may be introduced under the surface of the spill to rise and react with oils in the suspension layer.
WASTE-SET® can then be swept or netted from the surface of the water.
Spills on Hard Surfaces - For spills on hard surfaces, apply WASTE-SET 3200® heavily to perimeter of spill to prevent migration. After surrounding the spill, reinforcement of the containment line thus formed with a boom or sweep may be advisable depending on the volume and flow rate.
If the interior of the diked spill is not to be reclaimed, fill in the remaining surface of the spilled material by evenly distributing additional WASTE-SET 3200® until the WASTE-SET® no longer reacts with the spill and remains white and on the surface.
Disposal - Dispose of reacted material in accordance with local, state, and federal regulation. Under the EPA Toxicity Characteristic Leaching Procedures (TCLP), WASTE-SET encapsulated material may be eligible for disposal in landfills. Incineration results in extremely low ash content. Dependent upon the nature of the encapsulated material, it may also be disposed of by incorporation into synthetic surfaces such as asphalt.
WASTE-SET® will effectively "encapsulate" crude oil and petroleum-based products, such as gasoline, kerosene, and diesel fuel; in addition to the various following liquid and vapor-phase contaminants:

Aliphatic hydrocarbons	Esters
Aromatic hydrocarbons	Ethers
Chlorinated hydrocarbons	Ketones
Alcohols	Other hydrocarbons

2. Concentration/Application Rate:
One pound WASTE-SET® per five pounds of oil (May vary with viscosity and temperature).
3. Conditions for Use:
No limitations.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity

Material Tested	Species	LC50 (ppm)
WASTE-SET 3200®	Menidia beryllina	>10000.0 96-hr
	Mysidopsis bahia	5431.0 48-hr
No. 2 Fuel Oil	Menidia beryllina	274.0 96-hr

	Mysidopsis bahia	29.0	48-hr
WASTE-SET 3200® &	Menidia beryllina	552.0	96-hr
No. 2 Fuel Oil	Mysidopsis bahia	58.0	48-hr
Reference Toxicant (SDS)	Menidia beryllina	1.8	96-hr
	Mysidopsis bahia	4.9	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.

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: No flash observed at 310°F
2. Pour Point: NA
3. Viscosity: NA
4. Specific Gravity: 0.94
5. pH: NA
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: NA
8. Solvents: None
9. Additives: None
10. Solubility: Insoluble

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

Compound	Concentration (ppm)
Arsenic	ND
Cadmium	ND
Chromium	0.44
Copper	0.98
Lead	0.08
Mercury	ND
Nickel	0.38
Zinc	3.1
Cyanide	ND
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #M-20
USEPA, OIL PROGRAM CENTER
LISTING DATE: APRIL 22, 1996
"WASTE-SET #3400®"

I. NAME, BRAND, OR TRADEMARK
WASTE-SET #3400®
Type of Product: Oil Spill Solidifying Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER
Environmental & Fire Technology, LLC
3374 West River Dr. NW
Grand Rapids, MI 49544
Phone: (616) 784-0770
Fax: (616) 784-5018
E-mail: eandft@comcast.net
(Mr. Cal Blystra)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Environmental & Fire Technology, LLC
3374 West River Dr. NW
Grand Rapids, MI 49544
Phone: (616) 784-0770
Fax: (616) 784-5018
E-mail: eandft@comcast.net
(Mr. Cal Blystra)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Product will not burn unless preheated. Avoid elevated temperatures (>200°F) for extended periods (>5 days).
Product has a tendency to accumulate a static charge during transport, which is a potential fire hazard if used near flammables.
2. Ventilation:
Avoid generating dust clouds.
3. Skin and eye contact; protective clothing; treatment in case of contact:
May cause mild mechanical irritation to eyes, skin and respiratory tract. Dust may cause coughing and watery eyes. Pre-existing eye, skin and respiratory disorders may be aggravated by this product. Wear NIOSH-approved respirator to prevent overexposure. Refer to transitional occupational exposure limits established by OSHA in 29CFR 1910.1000.
Flush eyes with water; wash skin with soap and water; if molten, treat as for burns. Remove person(s) to fresh air if excessive amounts of dust have been inhaled.
Protective gloves and safety glasses should be worn.
If material is released or spilled, sweep up or vacuum and place in an approved container.
4.a. Maximum storage temperature: 200°F
4.b. Minimum storage temperature: None
4.c. Optimum storage temperature range: <200°F

4.d. Temperatures of phase separations and chemical changes: >450°F

V. SHELF LIFE
Unlimited.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Spills on Water - For spills on water, surround the spill with WASTE-SET® 3400 to prevent migration. Reinforce containment line with a boom or sweep if necessary. WASTE-SET® and the resulting reacted material will float. If the interior of the diked spill is not to be reclaimed, fill in the remaining surface area of the spill by broadcasting additional WASTE-SET 3400® evenly over the spill until the WASTE-SET® no longer reacts with the spill. Alternatively, the product may be introduced under the surface of the spill to rise and react with oils in the suspension layer. WASTE-SET® can then be swept or netted from the surface of the water.
Spills on Hard Surfaces - For spills on hard surfaces, apply WASTE-SET® 3400 heavily to perimeter of spill to prevent migration. After surrounding the spill, reinforcement of the containment line thus formed with a boom or sweep may be advisable depending on the volume and flow rate. If the interior of the diked spill is not to be reclaimed, fill in the remaining surface of the spilled material by evenly distributing additional WASTE-SET® 3400 until the WASTE-SET® no longer reacts with the spill and remains white and on the surface.
Disposal - Dispose of reacted material in accordance with local, state, and federal regulation. Under the EPA Toxicity Characteristic Leaching Procedures (TCLP), WASTE-SET® encapsulated material may be eligible for disposal in landfills. Incineration results in extremely low ash content. Dependent upon the nature of the encapsulated material, it may also be disposed of by incorporation into synthetic surfaces such as asphalt.
WASTE-SET® will effectively "encapsulate" crude oil and petroleum-based products, such as gasoline, kerosene, and diesel fuel; in addition to the various following liquid and vapor-phase contaminants:

Aliphatic hydrocarbons	Esters
Aromatic hydrocarbons	Ethers
Chlorinated hydrocarbons	Ketones
Alcohols	Other hydrocarbons

2. Concentration/Application Rate:
One pound WASTE-SET® per five pounds of oil (May vary with viscosity and temperature).
3. Conditions for Use:
No limitations.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity

Material Tested	Species	LC50 (ppm)
WASTE-SET 3400®	Menidia beryllina	>10000.0 96-hr
	Mysidopsis bahia	>10000.0 48-hr
No. 2 Fuel Oil	Menidia beryllina	274.0 96-hr
	Mysidopsis bahia	29.0 48-hr
WASTE-SET 3400® &	Menidia beryllina	442.0 96-hr
No. 2 Fuel Oil	Mysidopsis bahia	36.0 48-hr
Reference Toxicant (SDS)	Menidia beryllina	1.8 96-hr
	Mysidopsis bahia	4.9 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.

b. Effectiveness:

NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: No flash observed at 350°F
2. Pour Point: NA
3. Viscosity: NA
4. Specific Gravity: 0.91
5. pH: NA
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: NA
8. Solvents: None
9. Additives: None
10. Solubility: Insoluble

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

Compound	Concentration (ppm)
Arsenic	ND
Cadmium	ND
Chromium	0.41
Copper	0.97
Lead	0.08
Mercury	ND
Nickel	3.3
Zinc	4.0
Cyanide	ND
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #M-22
USEPA, OIL PROGRAM CENTER
ORIGINAL LISTING DATE: FEBRUARY 27, 1998
REVISED LISTING DATE: OCTOBER 5, 1998
"PX 700™"

I. NAME, BRAND, OR TRADEMARK
PX 700™
Type of Product: Miscellaneous Oil Spill Control Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Enviro-Tech
1907 Southwest 47th Street
Cape Coral, FL 33914
Phone: (239) 997-6300
Fax: (239) 549-8550
Web site: http://www.px700.com
E-mail: envirotechusa@gmail.com
(Mr. Charlie Jones)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Enviro-Tech
1907 Southwest 47th Street
Cape Coral, FL 33914
Phone: (239) 997-6300
Fax: (239) 549-8550
Web site: http://www.px700.com
E-mail: envirotechusa@gmail.com
(Mr. Charlie Jones)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Not flammable; no special precautions necessary.
2. Ventilation:
None required; no vapor emissions at normal temperatures, summer and winter.
3. Skin and eye contact; protective clothing; treatment in case of contact:
Product contains a surfactant; avoid prolonged skin contact. Mild eye irritant; in case of eye contact, flush with copious amounts of water. No protective clothing required. Contact treatment is to flush with water. Product is acidic (pH 3.5-4.0). Eye protection is recommended as a precaution against splashing.
4.a. Maximum storage temperature: 120°F
4.b. Minimum storage temperature: 30°F
4.c. Optimum storage temperature range: 65°F - 85°F
4.d. Temperatures of phase separations and chemical changes: Separation may occur after 3

months. Separation will not affect product performance.

V. SHELF LIFE
Two years.
VI. RECOMMENDED APPLICATION PROCEDURE
1.Application Method:
To remove oily sheen from areas surrounding an oil spill, spray undiluted PX-700™ directly over area at an application rate of one gallon for every 900 to 1200 square feet of surface area. Dilute PX-700™ 25:1 for cleaning equipment and other surfaces. Either spray or immerse equipment, as applicable. Dilute PX-700™ 50:1 for immersing wildlife to remove oil.
2. Concentration/Application Rate:
At normal temperatures product is free flowing and applied full strength to remove oily sheen from aquatic environments, soils, and wastewater.
3. Conditions for Use:
Water salinity, water temperature, types and ages of pollutants. Do not allow product to freeze, as separation may occur. Product may work more slowly at low temperatures. At full strength or diluted with fresh water, product will have a specific gravity lower than sea water and should float. Use of PX-700™ should aid skimming and other conventional oil recovery operations.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity

Material Tested	Species	LC50 (ppm)
PX-700™	Menidia beryllina	380.00 96-hr
	Mysidopsis bahia	297.00 48-hr
No. 2 Fuel Oil	Menidia beryllina	7.07 96-hr
	Mysidopsis bahia	1.89 48-hr
PX-700™	Menidia beryllina	5.65 96-hr
& No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.77 48-hr
Reference Toxicant (DDS)	Menidia beryllina	6.16 96-hr
	Mysidopsis bahia	23.00 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.
b. Effectiveness
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: Not flammable
2. Pour Point: 30°F
3. Viscosity: Equivalent to water
4. Specific Gravity: 1.0
5. pH: 3.5 to 4.0 standard units
6. Chemical Name and Percentage by Weight of the Total Formulation: CONFIDENTIAL
7. Surface Active Agents: Less than 5% Cocamide
8. Solvents: None

9. Additives: Citric acid for pH control
10. Solubility: 100% soluble

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

Compound	Concentration (ppm)
Arsenic	0.47
Cadmium	ND
Chromium	ND
Copper	0.14
Lead	ND
Mercury	ND
Nickel	ND
Zinc	0.77
Cyanide	ND
Chlorinated Hydrocarbons	CONFIDENTIAL

TECHNICAL PRODUCT BULLETIN #M-23
USEPA OIL PROGRAM CENTER
LISTING DATE: NOVEMBER 23, 1998
"ALSOCUP"

I. NAME, BRAND, OR TRADEMARK
ALSOCUP
Type of Product: Miscellaneous Oil Spill Control Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
REVCOM Associates
1550 Rimpau Ave. #53
Corona, CA 92881
Phone: (951) 737-0104
Fax: (951) 737-5500
E-mail: revcom@sbcglobal.net
(Dave Naylor - President)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Marketed under trade name:
"Oil Lift Super Absorbent"

Environmental Building Science, Inc.
100-9200 Van Horne Way
Richmond, British Columbia
V6Z 1W3 Canada
Web Site: www.oillift.net
Phone: (866) 543-8645
Phone: (604) 279-9994
Fax: (604) 279-9934
(Kevin Daum)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
NA
2. Ventilation:
NA
3. Skin and eye contact; protective clothing; treatment in case of contact:
ALSOCUP is practically non-irritating to the eyes and is non-irritating to the skin. Safety glasses and protective clothing should be worn when applying the material. The product is not expected to cause irritation to the nose, throat, or respiratory tract.
4.a. Maximum storage temperature: 163°F
4.b. Minimum storage temperature: 0°F
4.c. Optimum storage temperature range: 0°F to 163°F
4.d. Temperatures of phase separations and chemical changes: NA

V. SHELF LIFE

ALSOCUP has a shelf life of five years.

VI. RECOMMENDED APPLICATION PROCEDURE

1. Application Method:

ALSOCUP is used to collect petroleum-based products spilled on water or land. When ALSOCUP comes into contact with a petroleum product it chemically bonds and traps the petroleum. Once captured, spilled product cannot be released from ALSOCUP. ALSOCUP does not absorb water and will not sink. The product can be collected by skimming with pumps or mechanical devices.

2. Concentration/Application Rate:

ALSOCUP is used by applying one pound of product to each 10 pounds of spilled petroleum products.

3. Conditions for Use:

Water temperature does not appear to affect the ability of ALSOCUP to collect petroleum products. Heavy seas may prevent containment of an oil spill, and the product would lose efficiency if the oil product dispersed. Booms and dams that contain the petroleum product into an area are most effective when using ALSOCUP. In water the motion of the sea will mix the product with oil. On land a mechanical means is necessary to combine the oil with ALSOCUP. ALSOCUP will collect petroleum products at any stage; however, it is most effective early in the spill before dispersion.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity:

ALSOCUP is a non-toxic substance. The product is generally considered to have a low order of acute oral toxicity.

Material Tested	Species	LC50 (ppm)	
ALSOCUP	Menidia beryllina	>100	96-hr
	Mysidopsis bahia	>100	48-hr
No. 2 Fuel Oil	Menidia beryllina	8.1	96-hr
	Mysidopsis bahia	3.9	48-hr
ALSOCUP & No. 2 Fuel Oil	Menidia beryllina	14.0	96-hr
(1:10)	Mysidopsis bahia	10.0	48-hr
Reference Toxicant (DSS)	Menidia beryllina	NA	
	Mysidopsis bahia	NA	

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES

1. Flash Point: NA
2. Pour Point: NA
3. Viscosity: NA
4. Specific Gravity: NA
5. pH: NA
6. Surface Active Agents: NA
7. Solvents: NA

8. Additives: NA
9. Solubility in Water: NA

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

Compound	Concentration (ppm)
Arsenic	0.0211
Cadmium	0.090
Chromium	0.456
Copper	0.445
Lead	0.454
Mercury	0.00492
Nickel	0.474
Zinc	0.433
Cyanide	ND
Chlorinated Hydrocarbons	NA

UPDATED INFORMATION IN BOLD

TECHNICAL PRODUCT BULLETIN #M-24
USEPA, OIL PROGRAM CENTER
LISTING DATE: JANUARY 26, 2001
"RAPIDGRAB 2000™"

I. NAME, BRAND, OR TRADEMARK
RAPIDGRAB 2000™
Type of Product: Miscellaneous Oil Spill Control Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
GlobeMark Resources Ltd.
1205 Pine Heights Drive
Atlanta, GA 30324
Mobile: (254) 231-2251
E-mail: joannie@globemarkresouces.com
Web Site: http://www.globemarkresources.com
(Ms. Joannie Docter)
E-mail: mikeclmail@gmail.com
(Mr. Mike Peterson)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
GlobeMark Resources Ltd.
1205 Pine Heights Drive
Atlanta, GA 30324
Mobile: (254) 231-2251
E-mail: joannie@globemarkresouces.com
Web Site: http://www.globemarkresources.com
(Ms. Joannie Docter)
E-mail: mikeclmail@gmail.com
(Mr. Mike Peterson)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
IMO - Non-flammable; DOT - Non-hazardous
2. Ventilation:
Use with ventilation equal to unobstructed outdoors in a moderate breeze.
3. Skin and eye contact; protective covering; treatment in case of contact:
Avoid skin and clothing contact. If skin contact occurs, immediately wash with large amounts of water and soap (if possible). Remove any contaminated clothing or shoes. Launder before reusing. If irritation persists, seek medical assistance. For areas where contact is likely, wear long sleeve shirt, chemical resistant gloves, and chemical resistant goggles.
4.a. Maximum storage temperature: 120°F

4.b. Minimum storage temperature: 0°F
4.c. Optimum storage temperature range: 32°F to 90°F
4.d. Temperatures of phase separations and chemical changes: None

V. SHELF LIFE
The shelf life of unopened drums of RAPIDGRAB 2000™ is unlimited. Containers should be capped when not being used to prevent contamination and evaporation.

VI. RECOMMENDED APPLICATION PROCEDURE
1.Application Method:
RAPIDGRAB 2000™ is a non-ionic liquid formulation that may be effectively applied by mist spraying onto floating oil slicks and sheens that are often found in harbors and at sea as the result of oil leakage and spills from ships. It instantly reduces and confines floating oils by the oleophitic synergistic effect of contraction and congealment into a physical state that greatly simplifies cleanup operations. Oil slicks and sheens may be reduced by up to 1,000 percent or more. The broad temperature range for RAPIDGRAB 2000™ sprays are from 32°F to 120°F.
Aerial Spraying - Typical application altitudes of 30 to 50 feet are advised although higher altitudes may be used if condition warrant. Spray nozzle should be about ¼ inches in diameter at 104 knots or more to create enough air shear sufficient to break the RAPIDGRAB 2000™ into proper sized droplets. A ½-inch diameter nozzle may be needed for temperatures below 50°F.
Boat Spraying - Mist sprays may be applied from shipboard by power "foggers."
2. Concentration/Application Rate:
RAPIDGRAB 2000™ should be mist sprayed full strength on surface oil until sufficient herding results are achieved. Results will vary depending on oil type, temperature, wave action, and viscosity.
3. Conditions for Use:
RAPIDGRAB 2000™ is designed to be used after oil has been contained by booms or other similar apparatus. Timely treatment with RAPIDGRAB 2000™, even at low application rates, can help to contain the sheen/spreading effect of the oil slick.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity

Material Tested	Species	LC50 (ppm)
RAPIDGRAB 2000™	Menidia beryllina	5.13 96-hr
	Mysidopsis bahia	2.29 48-hr
No. 2 Fuel Oil	Menidia beryllina	9.34 96-hr
	Mysidopsis bahia	3.12 48-hr
RAPIDGRAB 2000™ &	Menidia beryllina	4.07 96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.60 48-hr
Reference Toxicant (SRTT)	Menidia beryllina	2.97 96-hr
	Mysidopsis bahia	6.71 48-hr

b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES

1. Flash Point: 110°C
2. Pour Point: 30°F
3. Viscosity: 20.2
4. Specific Gravity: 0.84
5. pH: 6.95
6. Surface Active Agents: Oleophitic surfactant
7.Solvents: Proprietary formulation oleophitic surfactants
8. Additives: None
9.Solubility in Water: Miscible in oil and solvents

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

Compound	Concentration (ppm)
Arsenic	ND
Cadmium	ND
Chromium	ND
Copper	ND
Lead	ND
Mercury	<0.1
Nickel	ND
Zinc	ND
Cyanide	2.8
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #M-25
USEPA, OIL PROGRAM CENTER
LISTING DATE: NOVEMBER 9, 2006
"AQUA N-CAP™ POLYMER"
(aka, OIL SOLUTIONS POWDER; SPILL GREEN LS)

I. NAME, BRAND, OR TRADEMARK
AQUA N-CAP™ POLYMER
(aka, OIL SOLUTIONS POWDER; SPILL GREEN LS)
Type of Product: Miscellaneous Oil Spill Control Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
RTA Systems, Inc.
8120 Mid America Boulevard, Suite 200A
Oklahoma City, OK 73135
Phone: (405) 397-9108
Fax: (405) 610-2620
E-mail: bjohnson@RTASys.com
(Mr. Bill Johnson, President)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
RTA Systems, Inc.
8120 Mid America Boulevard, Suite 200A
Oklahoma City, OK 73135
Phone: (405) 397-9108
Fax: (405) 610-2620
E-mail: bjohnson@RTASys.com
(Mr. Bill Johnson, President)

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Non-flammable
2. Ventilation:
Work in a well ventilated area. Avoid excessive inhalation of dust.
3. Skin and eye contact; protective covering; treatment in case of contact:
Skin contact – No recommendation is made specifying the need for personal protective clothing to prevent skin contact. Person(s) should wash daily at the end of each work shift. Exposed areas should be thoroughly washed with water.
Eye contact – Product may cause irritation as any normal dust. Wear appropriate eye protection, compliant with ANSI Standard Z87.1, to prevent eye contact. If eye irritation or redness is experienced, promptly wash eyes with large amounts of water, for at least 15 minutes, occasionally lifting the lower and upper lids. Should eye irritation persist, seek medical attention immediately. Contact lenses should not be worn when working with this product.
Inhalation – Wear appropriate respiratory protection, compliant with OSHA standard 29 CFR 1910.134, to prevent inhalation. If a respiratory disorder is observed, remove person(s) from the work area immediately. Should respiratory disorder persist, seek medical attention immediately.
Ingestion – Rinse mouth with water and seek medical attention immediately.

4.a. Maximum storage temperature: 185°F
4.b. Minimum storage temperature: NA
4.c. Optimum storage temperature range: 185°F
4.d. Temperatures of phase separations and chemical changes: None. Polymer may accumulate static charge during transport, handling, and processing. Static charge can be a potential fire hazard in the presence of volatile or flammable materials or in high airborne dust conditions.

V. SHELF LIFE
Not limited.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
Apply AQUA N-CAP™ along the outer edges of spill area to prevent spill migration. Proceed by applying product onto remaining spill area, until a light white excess of product is observed. AQUA N-CAP™ may be broadcast onto the spill by hand or with a mechanical blower. Lighter hydrocarbons and synthetic oils will clump into a soft cluster like material easily recoverable with a net or other means as appropriate.
2. Concentration/Application Rate:
Apply AQUA N-CAP™ at a rate of 0.5 to 2 lbs per gallon of spilled hydrocarbon. Depending on the type of hydrocarbon and recovery operations employed, more or less product may be used to achieve recoverable solid mat/residue. Allow approximately 30 – 60 minutes of contact time, product will form an elastic or rubber-like mat material. Mat like material may be removed whole or segmented as appropriate.
3. Conditions for Use:
AQUA N-CAP™ differs from traditional sorbents in that it initially behaves like a synthetic sorbent, then as a solidifier as the molecular microencapsulating process occurs. Once encapsulated, the spilled oil is captured within the polymer matrix. AQUA N-CAP™ is designed to cleanup a wide variety of crude oil, refined hydrocarbon products (i.e., fuels, oils, hydraulic fluids), and synthetic fluids spilled on water and surfaces.

VII. TOXICITY AND EFFECTIVENESS
a. Toxicity

Material Tested	Species	LC50 (ppm)	
AQUA N-CAP™	Menidia beryllina	484,000	96-hr
	Mysidopsis bahia	104,000	48-hr
No. 2 Fuel Oil	Menidia beryllina	15.80	96-hr
	Mysidopsis bahia	1.45	48-hr
AQUA N-CAP™ &	Menidia beryllina	22.50	96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	2.13	48-hr
Reference Toxicant (SRTT)	Menidia beryllina	3.65	96-hr
	Mysidopsis bahia	9.55	48-hr

b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS

NA

IX. PHYSICAL PROPERTIES
1. Flash Point: 230ºF
2. Pour Point: NA
3. Viscosity: NA
4. Specific Gravity: 0.91
5. pH: 4.08
6. Surface Active Agents: NA
7. Solvents: NA
8. Additives: None
9. Solubility in Water: Negligible

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

Compound	Concentration (ppm)
Arsenic	<1.0
Cadmium	<0.05
Chromium	<0.325
Copper	17.25
Lead	<0.08
Mercury	0.02
Nickel	<0.225
Zinc	<0.45
Cyanide	<0.1
Chlorinated Hydrocarbons	ND

TECHNICAL PRODUCT BULLETIN #M-26
USEPA, OIL PROGRAM CENTER
LISTING DATE: JUNE 30, 2008
"ELASTOL"
(aka, SEPARATE, LIQUID ELASTOL)

I. NAME, BRAND, OR TRADEMARK
ELASTOL
Type of Product: Miscellaneous Oil Spill Control Agent

II. NAME, ADDRESS, AND TELEPHONE NUMBER OF MANUFACTURER/CONTACT
Action Additives, Inc.
205 Industrial Road
P.O. Box 965
Ducktown, TN 37326
Phone: (423) 496-5000
(800) 496-5110
(Mr. Tim Kaylor)

III. NAME, ADDRESS, AND TELEPHONE NUMBER OF PRIMARY DISTRIBUTORS
Design Engineering Systems Analysis
P.O. Box 293
Alexandria, VA 22313
Phone: (703) 4613912
E-mail: escambos@actionadditivesinc.com
(Mr. Ernest T. Scambos

IV. SPECIAL HANDLING AND WORKER PRECAUTIONS FOR STORAGE AND FIELD APPLICATION
1. Flammability:
Autoignition temperature for product is 392°F. Product is combustible in liquid form and can form combustible mixtures and possibly explosive mixtures above the flash point. Use water spray to cool fire exposed surfaces and to protect personnel. Isolate "fuel" supple from fire. Use foam, dry chemical, or water spray to extinguish fire. Avoid spraying water directly into storage containers due to danger of boil over. Product is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition source where they may ignite.
2. Ventilation:
Product is moderately volatile. Ensure proper ventilation. Avoid formation and inhalation of spray mist and vapors. Do not wear contaminated clothing. Keep away from fire and heated objects. Avoid formation of aerosols. Avoid squirting and use dosage pump when transferring.
3. Skin and eye contact; protective covering; treatment in case of contact:
Protection depends on use and condition of work environment. Ensure good personal hygiene, wash hands regularly with soap and water. Avoid contact with skin and eyes and inhalation of fumes/aerosols. All new protective gear must be of CE standard. There must be an eye rinsing

kit available at the work place. Where there is danger of inhalation, use mask with brown filter. If the product is sprayed and there is a risk of aerosol formation, use mask with combination filter A2-P2. When used regularly, measuring routines for solvent measurement should be implemented. Level of contamination should be kept as low as possible.
4.a. Maximum storage temperature: ~160°F
4.b. Minimum storage temperature: -100°F
4.c. Optimum storage temperature range: 40-70°F
4.d. Temperatures of phase separations and chemical changes: None

V. SHELF LIFE
At least 5 years when stored at temperatures below 150°F.

VI. RECOMMENDED APPLICATION PROCEDURE
1. Application Method:
ELASTOL can be applied to the surface of an oil/water separator tank or added to a waste stream before it enters a separation tank. ELASTOL floats on water, dissolving when it comes in contact with petroleum products (e.g., gasoline, diesel, jet fuel, fuel oil, crude, etc.). It remains effective for long periods, but naturally degrades when exposed to the atmosphere over longer periods. ELASTOL treated oil may increase the performance of containment and recovery equipment:

- Containment booms – may have higher current and tow speed capability
- Mechanical skimming equipment – may be improved 2 to 10 times its normal recovery rates
- Drum skimmers – may recover little or no water with the oil

When applied early to a spill, ELASTOL may reduce emulsification and dispersion of oil. In addition, it may reduce the penetration of oil into porous soils and sandy beaches.
2. Concentration/Application Rate:
ELASTOL can be used at very low concentrations from 100-1,500 ppm (0.01% to 0.15%). The amount of ELASTOL to be used is dependent upon the viscosity of the oil being removed. For example, one gallon of ELASTOL will remove:

- 13 gallons of gasoline
- 34 gallons of diesel
- 84 gallons of medium oil
- 150 gallons of heavy oil

3. Conditions for Use:
ELASTOL may be used on fresh or salt water (under warm or cold temperatures). Prompt application may maximize effectiveness. The older the pollutants the few light oil elements remain in the oil, which may reduce the effectiveness of recovery.

VII. TOXICITY AND EFFECTIVENESS

a. Toxicity

Material Tested	Species	LC50 (ppm)	
ELASTOL	Menidia beryllina	1,333	96-hr
	Mysidopsis bahia	94	48-hr
No. 2 Fuel Oil	Menidia beryllina	5.4	96-hr
	Mysidopsis bahia	3.3	48-hr
ELASTOL &	Menidia beryllina	8.2	96-hr
No. 2 Fuel Oil (1:10)	Mysidopsis bahia	3.7	48-hr
Reference Toxicant (SDS)	Menidia beryllina	7.4	96-hr
	Mysidopsis bahia	10.7	48-hr

b. Effectiveness:
NA

VIII. MICROBIOLOGICAL ANALYSIS
NA

IX. PHYSICAL PROPERTIES
1. Flash Point: 176ºF
2. Pour Point: -71ºF
3. Viscosity: 3.46 cst at 77ºF
4. Specific Gravity: 0.83 at 60ºF
5. pH: 6.8 – 7.0
6. Surface Active Agents: CONFIDENTIAL
7. Solvents: CONFIDENTIAL
8. Additives: CONFIDENTIAL
9. Solubility in Water: Insoluble

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

Compound	Concentration (ppm)
Arsenic	ND
Cadmium	ND
Chromium	ND
Copper	ND
Lead	ND
Mercury	ND
Nickel	ND
Zinc	1.4
Cyanide	ND
Chlorinated Hydrocarbons	ND