Soil-Sement®

Dust and Erosion Control Agent

Environmental Data

Midwest Industrial Supply, Inc.
P.O. Box 8431 Canton, Ohio 44711 U.S.A.
1-800-321-0699
(330) 456-3121 FAX (330) 456-3247
www.midwestind.com
e-mail: custserv@midwestind.com

Soil~Sement® is a polymer emulsion. Polymers which are non-hazardous by OSHA definition are used in the manufacture of Soil~Sement®. The formulation contains no hazardous solvents. Soil~Sement® is non-toxic and is non-hazardous per OSHA, EPA and the DOT. Soil~Sement® does not trigger any EPA reporting requirements. In fact, Soil~Sement® assists in complying with NPDES (National Pollution Discharge Elimination System) requirements for erosion control and EPA reductions of particulate matter (PM_{10} and $PM_{2.5}$).

Midwest Industrial Supply, Inc. is in the business of controlling environmental problems ... we do not create them. In the following pages you will find data which support the facts that Soil~Sement® Dust and Erosion Control Agent is non-hazardous, non-toxic, and an environmentally friendly product.

Toxicity

One area of primary concern when discussing any chemical is toxicity. We have had acute toxicity studies of Soil~Sement® performed on rainbow trout and Daphnia Magna on two separate occasions. The LC5O of concentrated Soil~Sement® on rainbow trout was 216 ppm in 1991. In 1996 it was 720 ppm. The LC50 of Soil~Sement® concentrate on Daphnia Magna is above 1500 ppm. These are the results of the concentrate; once diluted, the results will typically increase by the dilution factor. Products are labeled "toxic to fish" if the LC50 is less than 1.0 ppm. Soil~Sement® is considered to have very low toxicity to fish.

Lethal toxicity studies were performed per California's Title 22 on Fathead Minnow. A material is deemed hazardous if the LC50 is less than 500 mg/L. The LC50 of Soil~Sement® is greater than 750 mg/L and therefore not considered hazardous by the California Department of Substance Control.

No animal toxicity tests have been performed using Soil~Sement®. However toxicity studies have been performed on individual polymer emulsions used in blending Soil~Sement®. These studies indicate that Soil~Sement® has very low toxicity to animals and is not considered an irritant to humans.

Short-Term Environmental Impact

Once Soil~Sement® has cured, it will not migrate from its site of application. It will not increase the BOD or COD level of storm water run-off, ground water or any body of water. Soil~Sement® will not leach from the soil nor will it contribute any pollutants or toxic materials to ground water, storm water run-off, or any body of water.

Soil~Sement® is not considered reportable under the "oil sheen regulation" of the NPDES. The EPA has developed a reportable quantity (RQ) for oil and associated products. This regulation stipulates that the RQ for oil is the amount of oil that violates applicable water quality standards or causes a sheen or film on the surface of the water or sludge to be deposited on the shoreline. Soil~Sement® does not fit into either category. It does not contain any substance which will violate water quality standards, nor will it migrate from the sur-

face and produce a sheen, film, or sludge on any body of water.

Midwest Industrial Supply, Inc. randomly submits samples of Soil~Sement® for testing on metals, organics and pesticides.

All of these tests were performed using TCLP (Toxicity Characteristic Leaching Procedure) extraction techniques. Soil~Sement® was first dried and cured. The solids were then diluted and the solution analyzed via atomic absorption. These tests are particularly significant because they have been performed on the cured Soil~Sement® rather than the liquid. In practice, Soil~Sement® is only in the liquid form for a short period of time, but can remain in the cured form for years.

In 1995, Midwest was involved with the Ohio EPA in evaluating the use of Soil~Sement® as an alternative intermediate cover at a residual waste landfill. The EPA's conditions for the test required that the customer have the storm water run-off analyzed after the first rain. This occurred five days after the application of the Soil~Sement®. Typical storm water tests were performed. The results were deemed to be "at acceptable levels". Midwest continues to seal the landfill with Soil~Sement®. Monitoring will be conducted as requested in the Ohio EPA approval.

Many of the analyses for metals, volatile organic compounds (VOC's) and semi-volatiles have been repeated through the years. In early 1999, Midwest treated an environmentally sensitive area with Soil~Sement®. Testing was performed to verify that Soil~Sement® did not contain harmful levels of metals, VOC's or semi-volatiles. Soil~Sement® was applied at the site and resulted in no harm to the highly sensitive desert tortoise habitat.

Long-Term Environmental Impact

Midwest Industrial Supply, Inc. has not performed tests to determine the actual products of degradation of Soil~Sement® Dust and Erosion Control Agent. However, the chemistry involved in Soil~Sement® backbone degradation is quite straight forward. Soil~Sement® is a formulation of polymers. When Soil~Sement®'s polymers degrade, the products are primarily water, carbon dioxide, carbon monoxide, hydrogen and alcohols. Soil~Sement® does not contain inorganics that will leach or migrate from the soil.

Soil~Sement® is in the class of polymers considered to be slow to degrade in landfill conditions, primarily because of the lack of oxygen. However, when degradation does occur, Soil~Sement® decomposes into common compounds which are easily assimilated into the surrounding area, causing no environmental hazards.

There are a variety of means by which polymers can degrade, including: thermal degradation, chemical degradation, biodegradation, and photo degradation. Soil~Sement® in typical applications can experience photo, chemical, and biodegradation.

Photo degradation occurs when the UV rays in sunlight act to de-stabilize the polymer. This can occur only to the surface coating of Soil~Sement®, because sunlight does not penetrate beneath the surface. Nothing is added to Soil~Sement® to accelerate photo degradation,

therefore, it would not account for the bulk of the degradation.

Chemical degradation occurs to the polymer backbone, most often via oxidation. Oxidation reactions by definition occur when electrons are transferred and do not necessarily require oxygen. However, in the case of Soil~Sement®, oxygen presence is a vital factor. Heat and light can act to speed the reaction.

Biodegradation is facilitated by living organisms, most of which are aerobic (requiring oxygen). In both the chemical and biological degradative processes, oxygen is required, but not readily available. Soil~Sement® is applied to surfaces, then penetrates beneath to provide solid bonding. The greater the penetration, the less polymer on the surface and the slower the degenerative process.

Soil~Sement® is safe for animals and the environment. It contains no hazardous or toxic ingredients per OSHA or the DOT. It will not trigger any EPA reporting requirements.

As I stated before, Midwest Industrial Supply, Inc. is in the business to help control environmental problems, not create problems. Soil~Sement® will control dust and erosion without harming wildlife or the surrounding landscape. It is considered non-toxic to fish. Heavy metals and organics that are labeled harmful to the environment are not present in Soil~Sement®. Soil~Sement® will not migrate from the soil and contaminate storm water run-off, ground water, or any body of water. Even if migration of Soil~Sement® were possible, it does not contain any hazardous ingredients to trigger any EPA or NPDES reporting requirements.

A book containing all supporting test data is available upon request. Please feel free to contact me via phone at (330)456-3121, FAX (330)456-3247, or at my e-mail address, cheryl@midwestind.com should you have any questions or require further information.

Sincerely,

MIDWEST INDUSTRIAL SUPPLY, INC.

Cheryl Detloff, Chief Chemist

Midwest Industrial Supply, Inc.
P.O. Box 8431
Canton, Ohio 44711
www.midwestind.com

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Soil-Sement

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Material Safety Data Sheet

Section 1

Soil-Sement®

Environmental Data

Section I

Trade Name:	Soil-Sement
Chemical Name:	Polymer Emulsion
Synonyms:	Dust and Erosion Control Agent
Chemical Family:	
Molecular Weight:	N/A
Formula:	Aqueous acrylic vinyl acetate polymer emulsion
CAS Registry No.:	Product a blend -- no number assigned

Section II -- Ingredients

			OSHA*			ACGIH
Name	**CAS Reg. No.**	**Wt.%**	**TWA**	**STEL**	**TLV**	**STEL**
Acrylic & Vinyl Acetate Polymer	Non-Hazardous	5-50	None	None	None	None
Water	7732-18-5	95-50	None	None		

Section III -- Physical Data

Boiling / Melting Point @ 760mm Hg:	212°F
Vapor Pressure mm Hg @ 20°C:	17
Specific Gravity or Bulk Density:	1.01 to 1.15
Solubility in Water:	Dilutable
Appearance:	Milky White Liquid
Odor:	Characteristic Acrylic Odor
pH:	4.0 to 9.5

Section IV -- Fire and Explosion Hazard Data

Flash Point (Test Method):	Non-Combustible
Autoignition Temperature:	N/A
Extinguishing Medium:	N/A
Special Firefighting Procedures:	N/A
Unusual Fire and Explosion Hazards:	Material can splatter above 212°F. Dried polymer film can burn but will not support combustion.

Emergency Telephone Numbers:

(Plant)
330-456-3121
(If no answer at plant)
330-453-0666
330-862-3712

Section V -- Health Hazard Data

Effect of Overexposure:

Inhalation:	Vapor from stored, undiluted product can cause headache and nausea.
Skin:	Stored, undiluted product is slightly irritating to skin.
Eyes:	Slightly irritating to eyes.
Ingestion:	May be irritating to digestive tract.

First Aid Procedures:

Inhalation:	Move subject to fresh air.
Skin:	Flush with large amount of water or wash with soap and water.
Eyes:	Flush eyes with flowing water at least 15 minutes, get medical attention.
Ingestion:	Give water to drink. Call a physician. **Never give fluids or induce vomiting if patient is unconscious or having convulsions.**

Section VI -- Reactivity Data

Stability:	Stable
Chemical Incompatibility:	No hazardous reactions are expected to occur under normal industrial conditions.
Hazardous Decomposition Products:	Thermal decomposition in the presence of air may yield carbon monoxide and/or carbon dioxide and traces of monomer.
Hazardous Polymerization:	Does not occur.
Conditions to Avoid:	N/A
Corrosive to Metal:	No
Oxidizer:	No

Section VII -- Special Protection Information

Respiratory Protection:	None required if good ventilation is maintained
Ventilation:	Mechanical exhaust at point of contaminant
Eye Protection:	Chemical splash, goggles recommended
Protective Clothing:	Impervious gloves recommended
Other:	Under normal handling conditions, the risk of exposure to residual monomer is negligible.

Section VIII -- Spill, Leakage, Disposal Procedure

Spill and Leak Procedures: Dike and control spill. Transfer liquid to containers for recovery or disposal. Keep spills out of municipal sewers and open bodies of water.

Waste disposal Method: Coagulate the emulsion by the stepwise addition of ferric chloride and lime. Remove the clear supernatent liquid and flush to a chemical sewer or landfill. Incinerate solids and the contaminated diking material according to local, state, and federal regulations.

Container Disposal: Do not re-use containers. Do not weld on metal containers.

Section IX-- Shipping Data

D.O.T. Proper Shipping Name (49CFR172.101): None
Hazardous Substance (40CFR116): N/A
Reportable Quantity (RQ): N/A
D.O.T. Hazard Classification (49CFR172.101): Non-regulated
D.O.T. Labels Required (49CFR172.101): None
D.O.T. Placards Required: None
Poison Constituent (49CFR173.343): N/A
Bill of Lading Description: Liquid plastic, NOI
C No.:
UN/NA Code:

Section X-- Additional Information

Soil-Sement is not a restricted article according to the Department of Transportation and International Air Transport Association regulations.

EPA SARA Title III Hazard Class: None

OSHA HCS Hazard Class: Non-OSHA hazardous (29CFR1910.1200)

EPA SARA Title III Section 313 (40CFR372) Toxic Chemicals present in quantities greater than the "de minimes" level are: None

This product is not a "controlled product" under the Canadian Workplace Hazardous Material Information System (WHMIS).

Soil-Sement is a trademark of Midwest Industrial Supply, Inc.

MIDWEST INDUSTRIAL SUPPLY, INC.

Product Specifications and Technical Data

Section 2

Soil-Sement®

Environmental Data

Product Description

Soil-Sement® Dust and Erosion Control Agent is a polymer-based emulsion which provides excellent dust control as well as soil stabilization properties.

Soil-Sement® is a liquid concentrate which is easily diluted with water and applied as a topical application to road-ways or storage piles. Once Soil-Sement® is dry and has had time to cure, it is not re-emulsifiable.

The key to the outstanding performance of Soil-Sement® is its unique ability to pene-trate, saturate, and bond surface dust and aggregate together and "cement" this to the sub-base to create a complete, hard, dust-free, water-resistant and resilient surface.

Soil-Sement®'s effectiveness results form the length and strength of its polymer molecules and their ability to bond with surface materials. Soil-Sement®'s unique chemical structure is made of molecules attached in relatively straight-linked chains and then cross-linked between other chains or grids that may be 1,000,000 molecules long. (It is a true giant compared to the much smaller molec-ular structure or oil, calcium, petroleum resin, and asphalt emulsion products which range from 100 to 10,000 mole-cules.)

As a result, Soil-Sement® can be as strong as steel or as resilient as rubber.

Proper application and re-application insures a surface which is resistant to erosion from rain, wind, or vehicle traffic.

Soil-Sement® is environmentally safe, non-toxic, non-corrosive, non-flammable, does not pollute underground water sup-plies, does not disturb vegetation, and does not increase the alkalinity or acidity of soil.

Physical Properties

General Appearance:	milky white liquid
Odor:	characteristic acrylic odor
Specific Gravity:	1.01 - 1.15
Density:	8.4 - 9.5 lbs/gal
Ph:	4.0 - 9.5
Solubility in Water:	dilutable
Composition:	acrylic and vinyl acetate polymer ..... blend
Total Solids:	minimum of 40 %
Storage:	keep from freezing

Toxicity Rainbow Trout

Section 3

Soil-Sement®

Environmental Data

Summary of Test Results

Performed By: BAR Environmental, Inc.
Report Date: June 21, 1991

Summary: The acute lethal toxicity of Soil-Sement® to rainbow trout was conducted in accordance with the procedures outlined by the Ontario Ministry of the Environment. Tests were run using both concentrate and dilute (9:1, water:Soil-Sement®) Soil-Sement®.

Certified disease-free rainbow trout were used for testing. The laboratory-controlled environmental conditions were monitored on both the test and control chambers. Observations for mortality and immobility were recorded after 4, 24, 48, 72, and 96 hours. The concentration of Soil-Sement® which is lethal to half of the test specimens in 96 hours is the LC50.

Results: **Soil-Sement® concentrate -- LC50 (96hrs.) = 216.2 ppm**
Soil-Sement® solution -- LC50 (96hrs.) = 2341.4 ppm

Toxicity Daphnia Magna

Section 4

Soil-Sement®

Environmental Data

Summary of Test Results

Performed By: BAR Environmental, Inc.
Report Date: September 25, 1990

Summary: The acute lethal toxicity of Soil-Sement® to daphnia magna was conducted in accordance with the procedures outlined by the Ontario Ministry of the Environment. Tests were run on the concentrate form.

The Daphnia magna used for testing were obtained from an established culture stock. The laboratory-controlled environmental conditions were monitored on both the test and control chambers. Mortality observations were made after 48 hours. The concentration of Soil-Sement® which is lethal to half of the test specimens in 48 hours is the LC50.

Results: **Soil-Sement® concentrate -- LC50 (48 hrs.) = 3482.8 ppm**

MIDWEST INDUSTRIAL SUPPLY, INC.

Toxicity Rainbow Trout

Section 5

Soil-Sement®

Environmental Data

Summary of Test Results

Performed By: BAR Environmental, Inc.
Report Date: July 1996

Summary: The acute lethal toxicity of Soil-Sement® to rainbow trout was conducted in accordance with USEPA (1991) methods. Tests were run using both concentrate and dilute (9:1, water:Soil-Sement®) Soil-Sement®.

Rainbow trout eggs were obtained from a licensed fish hatchery and remained in controlled surroundings until reaching the proper size for testing. The laboratory-controlled environmental conditions were monitored on both the test and control chambers. Observations for mortality and immobility were made and recorded after 24, 48, 72, and 96 hours. The concentration of Soil-Sement® which is lethal to half of the test specimens in 96 hours is the LC50.

Results:

Soil-Sement® concentrate -- LC50 (96hrs.) = 0.72ml/L (720 ppm)
Soil-Sement® solution -- LC50 (96hrs.) = 7.03ml/L (7030 ppm)

MIDWEST INDUSTRIAL SUPPLY, INC.

Toxicity Daphnia Magna

Section 6

Soil-Sement®

Environmental Data

Summary of Test Results

Performed By: BAR Environmental, Inc.
Report Date: July 1996

Summary: The acute lethal toxicity of Soil-Sement® to daphnia magna was conducted in accordance with USEPA (1991) methods. Tests were run using both concentrate and dilute (9:1 water:Soil Sement®) Soil-Sement®.

The initial brood stock of the Daphnia magna specimens was obtained from the Ontario Ministry of the Environment. The laboratory-controlled environmental conditions were monitored on both the test and control chambers. Observations of mortality and immobility were made and recorded after 24 and 48 hours. The concentration of Soil-Sement® which is lethal to half of the test specimens in 48 hours is the LC50.

Results: **Soil-Sement® concentrate -- LC50 (48 hrs.) = 1.5ml/L (1,500 ppm)**
Soil-Sement® dilute -- LC50 (48 hrs.) = 21.2ml/L (21,200 ppm)

MIDWEST INDUSTRIAL SUPPLY, INC.

Animal Toxicity Studies

Section 7

Soil-Sement®

Environmental Data

Summary of Test Results

Performed By: Various Suppliers
Report Date: Various

Summary: Data from animal toxicity and irritancy tests was gathered from various suppliers. Acute oral and dermal toxicity tests were performed on rats and rabbits respectively. Acute inhalation (aerosol) toxicity was also performed on rats. Irritancy tests were performed on both rabbits (eye) and humans (skin).

Results:

LC50 (oral) rat = >5000mg/kg
LC50 (dermal) rabbit = >2000mg/kg
LC50 (inhalation) rat = >7.9mg/L

Eye irritant, rabbit = slight to moderate
Repeat insult patch, human = irritant - negative
fatiguing agent - negative
sensitizer - negative

MIDWEST INDUSTRIAL SUPPLY, INC.

ANIMAL TOXICITY STUDIES

EMULSION NUMBER	A	B	C	D
Acute Oral - Rat LD50, mg/kg	>5,000	>5,000	>50,000	>5,000
Acute Dermal - Rabbit LD50, mg/kg 0-8 Scale, 8 = Most Severe	>5,000 3.2	>5,000 3.2	>5,000 2.6	>2,000 1.0
Eye Irritant - Rabbit	S1-Mod.	S1	S1-Mod.	----
Acute Inhalation (Aerosol) - Rat LC50, mg/liter -1 hour	>38	>9.56	>7.9	>25 (4 hr.)
Repeated Insult Patch Test - Humans Irritant Fatiguing Agent Sensitizer	 Negative Negative Negative	 Negative Negative Negative	 Negative Negative Negative	 Negative Negative Negative

Summary of Test Results

Performed By: Cas Chem Laboratories Inc.
Report Date: September 1992

Summary: Toxicity Characteristics Leaching Procedure (TCLP) is a sample preparation technique and battery of tests which can determine the presence of various elements and chemical compounds. In this test, Soil-Sement® is dried and the substances being tested for are leached or extracted from the Soil-Sement®. Heavy metals and numerous organic compounds were tested for in this series of tests.

Results:

HEAVY METALS

metal	result(mg/L)	LOD(mg/L)	Regulatory level(mg/L)
Silver	BDL	0.025	5.0
Arsenic	BDL	0.005	5.0
Barium	BDL	0.25	100.0
Chromium	BDL	0.05	5.0
Selenium	BDL	0.005	1.0
Lead	BDL	0.05	5.0
Mercury	0.003	0.001	0.2
Nickel	BDL	0.025	----
Cadmium	BDL	0.01	1.0

ORGANICS

compound	result(mg/L)	LOD(mg/L)	Regulatory level(mg/L)
Benzene	ND	0.005	0.5
Carbon Tetrachloride	ND	0.005	0.5

MIDWEST INDUSTRIAL SUPPLY, INC.

Summary of Test Results

ORGANICS (continued)

compound	result(mg/L)	LOD(mg/L)	Regulatory level(mg/L)
Chlordane	ND	0.002	0.03
Chlorobenzene	ND	0.005	100.0
Chloroform	ND	0.005	6.0
O-Creosol	ND	0.1	200.0
M-Creosol	ND	0.1	200.0
P-Creosol	ND	0.1	200.0
1,4-Dichloro-benzene	ND	0.005	7.5
1,2-Dichloro-ethane	ND	0.005	0.5
1,1-Dichloro-ethylene	ND	0.005	0.7
2,4-Dinitro-toluene	ND	0.1	0.13
Heptachlor	ND	0.001	0.008
Heptachlor-Epoxide	ND	0.001	0.008
Hexachloro-benzene	ND	0.1	0.13
Hexachloro-1,3-Butadiene	ND	0.1	0.5
Hexachloro-ethane	ND	0.1	3.0
Methyl Ethyl Ketone	ND	0.100	200.0
Nitrobenzene	ND	0.1	2.0
Pentachloro-phenol	ND	0.1	100.0

MIDWEST INDUSTRIAL SUPPLY, INC.

Summary of Test Results

ORGANICS (continued)

compound	result(mg/L)	LOD(mg/L)	Regulatory level(mg/L)
Pyridine	ND	0.1	5.0
Tetrachloro-ethylene	ND	0.005	0.7
Trichloro-ethylene	ND	0.005	0.5
2,4,5-Trichloro-phenol	ND	0.1	400.0
2,4,6-Trichloro-phenol	ND	0.1	2.0
Vinyl Chloride	ND	0.010	0.2
Endrin	ND	0.001	0.02
Lindane	ND	0.001	0.40
Methoxychlor	ND	0.010	10.0
Toxaphene	ND	0.010	0.50

LOD - limit of detection
BDL - below detection limit
ND - not detected

MIDWEST INDUSTRIAL SUPPLY, INC.

Summary of Test Results

Performed By: Cas Chem Laboratories Inc.
Report Date: December 1994

Summary: A sample of Soil-Sement® concentrate was analyzed to determine the presence of various heavy metals as well as chloride.

Results:

compound	result(mg/L)	LOD(mg/L)
Chloride	BDL	30.0
Silver	BDL	0.01
Arsenic	BDL	0.38
Barium	BDL	0.03
Cadmium	BDL	0.018
Chromium	BDL	0.044
Mercury	BDL	0.0004
Lead	BDL	0.162
Selenium	BDL	0.38

LOD - limit of detection
BDL - below detection limit

Summary of Test Results

Performed By: Wadsworth / Alert Laboratories
Report Date: September 1990

Summary: A sample of Soil-Sement® solution was analyzed for various metal elements.

Results:

element	result(mg/kg)	LOD(mg/kg)
Silver	ND	2.0
Arsenic	ND	1.0
Barium	ND	20.0
Cadmium	ND	2.0
Chromium	ND	5.0
Mercury	ND	0.5
Lead	ND	10.0
Selenium	ND	1.0

ND - none detected
LOD - limit of detection

MIDWEST INDUSTRIAL SUPPLY, INC.

Metals, Pesticides and Herbicide Analysis

Section 11

Soil-Sement®

Environmental Data

Summary of Test Results

Performed By: Advanced Environmental Services
Report Date: December 1987

Summary:

A sample of Soil-Sement® concentrate was analyzed to determine the content of various metals and organics. A small amount of Soil-Sement® was combusted and the residue was extracted then diluted with water. The resulting solution was analyzed via atomic absorption spectroscopy.

Results:

METALS

element	result(mg/kg)	LOD(mg/kg)
Arsenic	BDL	0.5
Barium	BDL	100.0
Cadmium	BDL	4.0
Chromium	BDL	50.0
Lead	BDL	100.0
Mercury	BDL	0.1
Selenium	BDL	0.5
Silver	BDL	10.0

ORGANICS

compound	result(mg/kg)	LOD(mg/kg)
Lindane	BDL	0.50
Endrin	BDL	1.00
Methoxychloro	BDL	1.00
Toxaphene	BDL	5.00
2,4 - D	BDL	0.50
Silvex	BDL	0.50

LOD - limit of detection
BDL - below detection limit

Storm Water Run-off Analysis

Section 12

Soil-Sement®

Environmental Data

Summary of Test Results

Performed By: Environmental Control Laboratories
Report Date: August 1995

Summary:

This analysis was performed not on Soil-Sement®, but on the water run-off of a pile treated with Soil-Sement®. A residual waste landfill wastreated with Soil-Sement®. Storm water run-off was collected from the first rain after the treatment was completed. (5 days.) A typical water analysis was run on both the storm flush (run-off on the landfill) and storm composite (water from a nearby stream which the run-off flows to). The results were deemed acceptable by the Ohio EPA.

Results:

Analyte	Flush Results	Composite Results	LOD
Cadmium, total	BDL	BDL	10µg/L
Chromium, total	BDL	BDL	10µg/L
Copper, total	BDL	BDL	10µg/L
Lead, total	BDL	13	10µg/L
Arsenic	4.7	5.2	2µg/L
pH	8.0	7.9	----
Oil & Grease	2.1	----	2µg/L
Solids, TSS	74.6	85.5	4µg/L
BOD - 5 day	BDL	BDL	2µg/L
COD	15.8	23.5	10µg/L
Zinc, total	37	56	10µg/L
Mercury, total	BDL	BDL	0.2µg/L

LOD - limit of detection
BDL - below detection limit

MIDWEST INDUSTRIAL SUPPLY, INC.

Ash Content (inorganics)

Section 13

Soil-Sement®

Environmental Data

Summary of Test Results

Performed By: Cas Chem Laboratories Inc.
Report Date: July 1996

Summary: A sample of Soil-Sement® concentrate was dried and the residue was combusted. What remained was the non-combustible, inorganic material or ash.

Results: **Ash content = <0.02%**
LOD = 0.02%

LOD = limit of detection

MIDWEST INDUSTRIAL SUPPLY, INC.

Summary of Test Results

Performed By: Free-Col Laboratories, Ltd.
Report Date: February 1999

Summary: A sample of Soil-Sement® concentrate was analyzed to determine the concentration of various metals and organics. Various EPA test methods were used in the analysis of the metals, inorganics, volatile organic compounds (VOC's) and semi-volatiles. This data was used to verify that Soil-Sement® could be used in environmentally sensitive areas, specifically areas inhabited by the endangered desert tortoise.

Summary of Test Results

PARAMETER

semi-volatile compounds	results	units	EPA method
Phenol	<5.0	MG/KG	8270C
bis (2-Chloroethyl) ether	<12	MG/KG	8270C
2-Chlorophenol	<5.0	MG/KG	8270C
1,3-Dichlorobenzene	<12	MG/KG	8270C
1,4-Dichlorobenzene	<12	MG/KG	8270C
Benzyl Alcohol	<25	MG/KG	8270C
1,2-Dichlorobenzene	<12	MG/KG	8270C
2-Methylphenol	<12	MG/KG	8270C
bis (2-Chloroisopropyl) ether	<5.0	MG/KG	8270C
4-Methylphenol	<12	MG/KG	8270C
N-Nitrosodi-N-Propylamine	<25	MG/KG	8270C
Hexachloroethane	<25	MG/KG	8270C
Nitrobenzene	<12	MG/KG	8270C
Isophorone	<5.0	MG/KG	8270C
2-Nitrophenol	<5.0	MG/KG	8270C
2,4-Dimethylphenol	<5.0	MG/KG	8270C
Benzoic Acid	<125	MG/KG	8270C
bis (2-Chloroethoxy) methane	<5.0	MG/KG	8270C
2,4-Dichlorophenol	<5.0	MG/KG	8270C
1,2,4-Trichlorobenzene	<12	MG/KG	8270C
Naphthalene	<5.0	MG/KG	8270C
4-Chloroaniline	<25	MG/KG	8270C
Hexachlorobutadiene	<25	MG/KG	8270C

Summary of Test Results

PARAMETER

semi-volatile compounds (continued)	results	units	EPA method
4-Chloro-3-methylphenol (para-chlor)	<5.0	MG/KG	8270C
2-Methylnaphthalene	<25	MG/KG	8270C
Hexachlorocyclopentadiene	<25	MG/KG	8270C
2,4,6-Trichlorophenol	<5.0	MG/KG	8270C
2,4,5-Trichlorophenol	<25	MG/KG	8270C
2-Chloronaphthalene	<5.0	MG/KG	8270C
2-Nitroaniline	<125	MG/KG	8270C
Dimethyl Phthalate	<5.0	MG/KG	8270C
Acenaphthylene	<5.0	MG/KG	8270C
3-Nitroaniline	<125	MG/KG	8270C
Acenaphthene	<5.0	MG/KG	8270C
2,4-Dinitrophenol	<75	MG/KG	8270C
4-Nitrophenol	<75	MG/KG	8270C
Dibenzofuran	<25	MG/KG	8270C
2,4-Dinitrotoluene	<5.0	MG/KG	8270C
2,6-Dinitrotoluene	<5.0	MG/KG	8270C
Diethylphthalate	<5.0	MG/KG	8270C
4-Chlorophenyl Phenyl ether	<5.0	MG/KG	8270C
Fluorene	<5.0	MG/KG	8270C
4-Nitroaniline	<125	MG/KG	8270C
4,6-Dintro-2-methylphenol	<25	MG/KG	8270C
N-nitrosodiphenylamine	<25	MG/KG	8270C
4-Bromophenyl Phenyl ether	<5.0	MG/KG	8270C
Hexachlorobenzene	<5.0	MG/KG	8270C

Summary of Test Results

PARAMETER semi-volatile compounds (continued)	results	units	EPA method
Pentachlorophenol	<25	MG/KG	8270C
Phenanthrene	<5.0	MG/KG	8270C
Anthracene	<5.0	MG/KG	8270C
Di-n-butylphthalate	<5.0	MG/KG	8270C
Fluoranthene	<5.0	MG/KG	8270C
Pyrene	<5.0	MG/KG	8270C
Butyl Benzyl Phthalate	<5.0	MG/KG	8270C
3,3'-Dichlorobenzidine	<25	MG/KG	8270C
Benzo (a) anthracene	<5.0	MG/KG	8270C
bis (2-ethylhexyl) phthalate	<5.0	MG/KG	8270C
Chrysene	<5.0	MG/KG	8270C
Di-n-octyl Phthalate	<5.0	MG/KG	8270C
Benzo (b) fluoranthene	<5.0	MG/KG	8270C
Benzo (k) fluoranthene	<5.0	MG/KG	8270C
Benzo (a) pyrene	<5.0	MG/KG	8270C
Indeno (1,2,3-cd) pyrene	<5.0	MG/KG	8270C
Dibenzo (a,h) anthracene	<12	MG/KG	8270C
Benzo (g,h,i) perylene	<5.0	MG/KG	8270C

Summary of Test Results

PARAMETER

volatile compounds	results	units	EPA method
Chloromethane	<1.0	MG/KG	8260B
Bromomethane	<1.0	MG/KG	8260B
Vinyl Chloride	<1.0	MG/KG	8260B
Chloroethane	<1.0	MG/KG	8260B
Methylene Chloride	<0.5	MG/KG	8260B
Acetone	<10	MG/KG	8260B
Carbon Disulfide	<0.5	MG/KG	8260B
1,1-Dichloroethene	<0.5	MG/KG	8260B
1,1-Dichloroethane	<0.5	MG/KG	8260B
1,2-Dichloroethenes (Total)	<0.5	MG/KG	8260B
Chloroform	<0.5	MG/KG	8260B
1,2-Dichloroethane	<0.5	MG/KG	8260B
2-Butanone	<10	MG/KG	8260B
1,1,1-Trichloroethane	<0.5	MG/KG	8260B
Carbon Tetrachloride	<0.5	MG/KG	8260B
Vinyl Acetate	<5.0	MG/KG	8260B
Bromodichloromethane	<0.5	MG/KG	8260B
1,1,2,2-Tetrachloroethane	<0.5	MG/KG	8260B
1,2-Dichloropropane	<0.5	MG/KG	8260B
trans-1,3-Dichloropropene	<0.5	MG/KG	8260B
Trichloroethene	<0.5	MG/KG	8260B
Dibromochloromethane	<0.5	MG/KG	8260B
1,1,2-Trichloroethane	<0.5	MG/KG	8260B

MIDWEST INDUSTRIAL SUPPLY, INC.

Summary of Test Results

PARAMETER			
volatile compounds (continued)	**results**	**units**	**EPA method**
Benzene	<0.5	MG/KG	8260B
cis-1,3-Dichloropropene	<0.5	MG/KG	8260B
2-Chloroethylvinyl ether	<1.0	MG/KG	8260B
Bromoform	<0.5	MG/KG	8260B
2-Hexanone	<5.0	MG/KG	8260B
4-Methyl-2-pentanone	<5.0	MG/KG	8260B
Tetrachloroethene	<0.5	MG/KG	8260B
Toluene	<0.5	MG/KG	8260B
Chlorobenzene	<0.5	MG/KG	8260B
Ethylbenzene	<0.5	MG/KG	8260B
Styrene	<0.5	MG/KG	8260B
Total Xylenes	<0.5	MG/KG	8260B
cis-1,2-Dichloroethene	<0.5	MG/KG	8260B
trans-1,2-Dichloroethene	<0.5	MG/KG	8260B

Summary of Test Results

PARAMETER

metals / inorganics	results	units	EPA method
Aluminum ICP	<10	MG/KG	6010B
Barium ICP	<1	MG/KG	6010B
Cobalt ICP	<5	MG/KG	6010B
Copper ICP	4	MG/KG	6010B
Iron ICP	14	MG/KG	6010B
Nickel ICP	<4	MG/KG	6010B
Vanadium ICP	<5	MG/KG	6010B
Zinc ICP	3.4	MG/KG	6010B
Potassium ICP	70	MG/KG	6010B
Sodium ICP	160	MG/KG	6010B
Antimony G.F.	<1	MG/KG	7041
Arsenic G.F.	<0.2	MG/KG	7060A
Beryllium G.F.	<0.2	MG/KG	7091
Cadmium G.F.	0.04	MG/KG	7131A
Chromium G.F.	0.2	MG/KG	7191
Lead G.F.	1	MG/KG	7420
Selenium G.F.	<0.2	MG/KG	7740
Thallium G.F.	<0.1	MG/KG	7841
Silver G.F.	<0.02	MG/KG	7761
Calcium FLAME	53	MG/KG	7140
Magnesium FLAME	36	MG/KG	7450
Manganese ICP	<1	MG/KG	6010B
Molybdenum ICP	<10	MG/KG	6010B

MIDWEST INDUSTRIAL SUPPLY, INC.

Toxicity Fathead Minnow

Section 15

Soil-Sement®

Environmental Data

Summary of Test Results

Performed By: Block Environmental Servies
Report Date: November 16, 1999

Summary: The 96 hour bioassay (Chapter 11, Article 3, Section 66261.24 (a) (6) of Title 22 Code of Regulations) is used to determine the LC50 of a substance. The LC50 value serves as an indicator of toxicity of the material on aquatic life. The California Department of Substances Control deems a material hazardous of the LC50 is less than 500 mg/L.

Fathead Minnow bioassay was run per California's Title 22 criteria. The concenteration of Soil~Sement® lethal to half the fish is the LC50.
Soil~Sement® is considered non-hazardous.

Results: **Soil-Sement® concentrate -- LC50 > 750 mg/L**

MIDWEST INDUSTRIAL SUPPLY, INC.