



# SLOW RELEASE SUBSTRATE ZERO VALENT IRON (SRS<sup>®</sup>-Z) SAFETY DATA SHEET

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## 1. Product Identification

<b>Synonyms:</b>	Slow Release Substrate Zero Valent Iron (SRS <sup>®</sup> -Z), Emulsified Vegetable Oil (EVO) and Zero Valent Iron (ZVI)
<b>Recommended Use:</b>	Treatment of groundwater contaminated with chlorinated solvents and other anaerobically degradable compounds.
<b>Supplier:</b>	Terra Systems, Inc. 130 Hickman Road, Suite 1 Claymont, Delaware 19703 Telephone (302) 798-9553 Fax (302) 798-9554 <a href="http://www.terrasystems.net">www.terrasystems.net</a>

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## 2. Hazards Identification

### Emergency Overview

**Caution:** May cause eye irritation.

**Health Rating:** 1 - Slight

**Flammability Rating:** 1 - Slight

**Reactivity Rating:** 1 - Slight

**Contact Rating:** 1 - Slight

**Protective Equipment:** Goggles; Proper Gloves

**Storage Color Code:** Green (General Storage)

### Potential Health Effects

**Inhalation:** Not expected to be a health hazard. May irritate lungs and mucous membranes and cause irritation, dizziness, and nausea. Remove to fresh air.

**Ingestion:** Not expected to be a health hazard via ingestion. Large doses may produce abdominal spasms, diarrhea.

**Skin Contact:** No adverse effects expected. May cause irritation or sensitization in sensitive individuals.

**Eye Contact:** May cause irritation, watering, and possible reddening.

**Chronic Exposure:** No information found.

**Aggravation of Pre-existing Conditions:** No information found.

### 3. Composition/Information on Ingredients

Ingredient	Synonyms	CAS #	Percent	Hazardous
Soy bean oil	Soya oil	8001-22-7	30-40%	No
Iron powder	ZVI	7439-89-6	10-40%	No
Emulsifiers and proprietary nutrient package containing nitrogen, phosphorus and vitamin B <sub>12</sub>		Mixture	3-6%	No
Sodium lactate	L-Lactic acid sodium salt	72-17-3	2-4%	Yes
Water		7732-18-5	10-55%	No

The emulsifiers and nutrient package mixture is a trade secret and consists of ingredients of unknown acute toxicity.

### 4. First Aid Measures

<b>Inhalation:</b>	Not expected to require first aid measures. Remove to fresh air. Get medical attention for any breathing difficulty.
<b>Ingestion:</b>	If large amounts were swallowed, give water to drink and get medical advice.
<b>Skin Contact:</b>	Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.
<b>Eye Contact:</b>	Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

### 5. Fire Fighting Measures

<b>Fire:</b>	The zero valent iron powder, when dry, may self-combust and has the potential to catch paper towels, rags, etc. on fire. Avoid airborne dispersion of fine powder in an enclosed area to reduce potential dust ignition. Keep SRS <sup>®</sup> -Z wet and avoid contact with combustible materials.
<b>Explosion:</b>	May generate hydrogen gas vapors that can cause explosion when exposed to a spark or flame. Closed containers may explode if exposed to extreme heat.
<b>Fire Extinguishing Media:</b>	Dry chemical, sand, foam, graphite, or carbon dioxide. Water spray may be ineffective on fire, but can protect fire-fighters and cool closed containers. Use fog nozzles if water is used.
<b>Special Information:</b>	In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

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## 6. Accidental Release Measures

Clean-up personnel may require protective clothing. Absorb in sand, paper towels, “Oil Dry”, or other inert material. Scoop up and containerize for disposal. Flush trace residues to sewer with soap and water. Containerized waste may be sent to an approved waste disposal facility.

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## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material are not hazardous when empty since they do not contain vapors or harmful substances; observe all warnings and precautions listed for the product. Do not store above 49 C (120 F). Keep container tightly closed and upright when not in use to prevent leakage.

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## 8. Exposure Controls/Personal Protection

<b>Airborne Exposure Limits:</b>	None established.
<b>Ventilation System:</b>	Not expected to require any special ventilation.
<b>Personal Respirators (NIOSH Approved):</b>	Not expected to require personal respirator usage.
<b>Skin Protection:</b>	Wear protective gloves and clean body-covering clothing.
<b>Eye Protection:</b>	Use chemical safety goggles and/or a full face shield where splashing is possible. Provide readily accessible eye wash stations and safety showers.
<b>Slips, Trips, and Falls:</b>	Material is slippery when spilled. Clean up with sand, paper towels, “Oil Dry”, or other inert material.

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## 9. Physical and Chemical Properties

<b>Appearance:</b>	Gray viscous liquid.
<b>Odor:</b>	Vegetable oil.
<b>Solubility:</b>	Not soluble in water.
<b>Specific Gravity (water=1):</b>	1.44 (12 pounds per gallon)
<b>pH:</b>	6-8
<b>% Volatiles by volume @ 21C (70F):</b>	Negligible.
<b>Boiling Point:</b>	≥ 100C (≥ 212F)
<b>Melting Point:</b>	No information found.
<b>Flash Point (F):</b>	No information found.
<b>Autoignition Temperature:</b>	No information found.
<b>Decomposition Temperature:</b>	No information found.
<b>Vapor Density (Air=1):</b>	No information found.
<b>Vapor Pressure (mm Hg):</b>	< 1.0 @ 20C (68F).
<b>Evaporation Rate (BuAc=1):</b>	No information found.
<b>Viscosity @ 23 C (73 F):</b>	3000 centipoises



**Partition Coefficient (octanol/water):** No information found.

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## 10. Stability and Reactivity

**Stability:** Stable under ordinary conditions of use and storage. May generate hydrogen gas.

**Reactivity:** Not reactive under ordinary conditions.

**Hazardous Decomposition Products:** Carbon dioxide and carbon monoxide may form when heated to decomposition.

**Hazardous Polymerization:** Will not occur.

**Incompatibilities:** Strong oxidizers, acids.

**Conditions to Avoid:** Incompatibles. Isolate from heat and open flame.

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## 11. Toxicological Information

**Soybean Oil:** No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.

**Emulsifier/Nutrient Mixture:** No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.

**Sodium Lactate:** Oral rat LD50: 2000 mg/kg. Irritation for sodium lactate: standard Draize 100 mg - mild. This compound is not listed as a carcinogen by IARC, NTP, NIOSH, OSHA, or ACGIH.

**Zero Valent Iron:** No information found on toxicology. It is not a carcinogen listed by IARC, NTP, NIOSH, OSHA, or ACGIH.

**SRS-Z:** The toxicity of the mixture has not been measured.

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## 12. Ecological Information

**Environmental Fate:** No information found.

**Environmental Toxicity:** No information found.

**Degradability:** This SRS is completely biodegradable under both aerobic and anaerobic conditions.

**Soil Mobility:** SRS will move with groundwater until the adsorbed onto the soil. Degradation products may be mobile. The ZVI portion will not be mobile.

**Bioaccumulation Potential:** No information found.

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## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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## 14. Transport Information

Not regulated.

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## 15. Regulatory Information

**OSHA STATUS:** This product is not hazardous under the criteria of the Federal OSHA hazard Communication Standard 29 CFR 1910.1200. However, thermal processing and decomposition fumes from this product may be hazardous as noted in Section 10.

**TSCA STATUS:** No component of this product is listed on the TSCA inventory.

**CERCLA (Comprehensive Response Compensation, and Liability Act):** Not reportable.

**SARA TITLE III (Superfund Amendments and Reauthorization Act)**

Section 312 Extremely Hazardous Substances: None

Section 311/312 Hazard Categories: Non-hazardous Under Section 311/312

Section 313 Toxic Chemicals: None

**RCRA STATUS:** If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

**CALIFORNIA PROPOSITION 65:** The following statement is made in order to comply with the California safe Drinking Water and Toxic Enforcement Act of 1986. The product contains no chemicals known to the State of California to cause cancer.

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## 16. Other Information

**NFPA Ratings:**

Health: **1** Flammability: **1** Reactivity: **1**

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March 28, 2014

**Revision Information:**

SDS Section(s) changed since last revision of document include: None.

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