NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
U.S. DEPARTMENT OF COMMERCE

Date of Issue:
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SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 2710a
SRM Name: Montana I Soil
Highly Elevated Trace Element Concentrations
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended primarily for use in the analysis of soils, sediments, or other materials of a similar matrix. One unit of SRM 2710a consists of 50 g of the dried, powdered soil, blended with lead oxide.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
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2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Carcinogen – Category 1B
Reproductive Toxicity – Category 1A
Specific Target Organ Toxicity, Repeated Exposure – Category 2

Label Elements

Symbol:



Signal Word: DANGER

Hazard Statement(s):

H350	May cause cancer.
H360	May damage fertility or the unborn child.
H373	May cause damage to organs (nervous system, kidneys, liver, blood) through prolonged or repeated exposure.

Precautionary Statement(s):

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust.
P264	Wash hands thoroughly after handling.
P270 + P271	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves, protective clothing, and eye protection.

P308 + P313 If exposed or concerned: Get medical attention.

P405 Store locked up.

P501 Dispose of contents and container in accordance with local regulations.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. Composition and Information on Hazardous Ingredients

Substance: Contaminated Soil

Other Designations: Not applicable.

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the NIST Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Contaminated Soil	Not available	Not available	100
Individual Constituent(s)			
Lead oxide	1317-36-8	215-267-0	0.55

4. First Aid Measures

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes. If necessary, seek medical attention.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: If a large amount is swallowed, seek medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Cancer, birth defects, reproductive effects.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present or suspected, seek medical attention if needed.

5. Fire Fighting Measures

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Use extinguishing media appropriate for the surrounding area.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Notify safety personnel of spills. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry.

7. Handling and Storage

Safe Handling Precautions: Avoid generating dust. See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handling in accordance with all current regulations and standards.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

OSHA (PEL): 30 µg/m^3 (Action Level, see 29 CFR 1910.1025, as Pb)
5 mg/m^3 TWA (See 29 CFR 1910.1025, as Pb)
ACGIH (REL): 0.05 mg/m^3 TWA (as Pb, related Lead compounds)
NIOSH (REL): 0.05 mg/m^3 TWA (as Pb, related Lead compounds)
NIOSH (REL): 100 mg/m^3 IDLH (as Pb, related Lead compounds)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eyewash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:

Appearance (physical state, color, etc.):	powder
Molecular Formula:	not applicable
Molar Mass (g/mol):	not applicable
Odor:	not available
Odor threshold:	not available
pH:	not available
Evaporation rate:	not available
Melting point/freezing point (ºC):	not available
Relative Density (g/L):	not available
Vapor Pressure (mmHg):	not available
Vapor Density (air = 1):	not available
Viscosity (cP):	not available
Solubility(ies):	not available
Partition coefficient (n-octanol/water):	not available
Particle Size:	< 74 µm

Thermal Stability Properties:

Autoignition Temperature (ºC):	not applicable
Thermal Decomposition (ºC):	not applicable
Initial boiling point and boiling range (ºC):	not applicable
Explosive Limits, LEL (Volume %):	not applicable
Explosive Limits, UEL (Volume %):	not applicable
Flash Point (ºC)	not applicable
Flammability (solid, gas):	not applicable

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: No data available.

Conditions to Avoid: Avoid generating dust. Keep out of water supplies and sewers.

Incompatible Materials: Metal carbide, metals, combustible materials, halo carbons, reducing agents, acids, metal salts, metal oxides.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Oxides of lead and carbon.

Hazardous Polymerization: _____ Will Occur __X__ Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: __X__ Inhalation __X__ Skin _____ Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Fatigue, weakness, anorexia, anemia, jaundice, encephalopathy.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Absorption of large amounts of lead may cause a metallic taste, thirst, a burning sensation in the mouth and throat, salivation, abdominal pain with severe colic, vomiting, diarrhea of black or bloody stools, constipation, and fatigue. Chronic exposure to lead compounds may result in accumulation in body tissues resulting in adverse effects on the blood, nervous system, heart, kidneys, endocrine and reproductive systems. Lead has been shown to cause cancer and birth defects.

Skin Contact: No toxicity data available; dust may result in mechanical irritation.

Eye Contact: No toxicity data available; dust may cause mechanical irritation.

Ingestion: Absorption of large amounts of lead from the intestinal tract may cause effects as detailed in acute inhalation. The fatal dose of absorbed lead is approximately 0.5 grams. Lead is a cumulative toxin and repeated exposures can cause high levels to build up. Over exposure to lead, or lead compounds either through acute or chronic exposure, can result in severe damage to the nervous system, urinary system, and reproductive system. Lead has been shown to cause cancer and birth defects.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified.
Lead: Rat Oral LD50: >10000 mg/kg

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye damage/ Eye irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Category 1B

Listed as a Carcinogen/Potential Carcinogen __X__ Yes _____ No

NTP lists lead compounds as "reasonably anticipated to be human carcinogens".
IARC lists inorganic lead compounds in Group 2A (probably carcinogenic to humans). Lead is not listed by OSHA.

Reproductive Toxicity: Category 1A; lead crosses the placenta and may affect the fetus causing birth defects, mental retardation, behavioral disorders, and death during the first year of childhood.
Lead: Oral Mouse TDLo: 4099.2 mg/kg

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Category 2; lead can accumulate in body tissues.

Aspiration Hazard: Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data:

Lead oxide Fish Toxicity: Fathead minnow (*Pimephales promelas*) LC50 (static): 0.298 mg/L (96 h).

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. Hazardous Waste Number(s): D008 for lead. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level of 5.0 mg/L.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	No.
CHRONIC HEALTH:	Yes.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:

California Proposition 65:

WARNING! This product contains a chemical (lead) known to the state of California to cause cancer and reproductive/developmental effects.

U.S. TSCA Inventory: Lead oxide is listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations:

WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 13 January 2026

Sources: ChemAdvisor, Inc., SDS *Lead Oxide*, 09 December 2015.

Center for Disease Control (CDC) NIOSH Pocket Guide to Chemical Hazards, *Particulates Not Otherwise Regulated*; available at https://www.cdc.gov/niosh/npg/npgd0480.html (accessed Jan 2026).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists
ALI	Annual Limit on Intake
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOT	Department of Transportation
EC50	Effective Concentration, 50 %
EINECS	European Inventory of Existing Commercial Chemical Substances
EPCRA	Emergency Planning and Community Right-to-Know Act
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IDLH	Immediately Dangerous to Life and Health
LC50	Lethal Concentration, 50 %
LD50	Lethal Dose, 50 %
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PNOR	Particulates Not Otherwise Regulated
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit
RM	Reference Material
RQ	Reportable Quantity
RTECS	Registry of Toxic Effects of Chemical Substances
SARA	Superfund Amendments and Reauthorization Act
SCBA	Self-Contained Breathing Apparatus
SRM	Standard Reference Material
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
UEL	Upper Explosive Limit
WHMIS	Workplace Hazardous Materials Information System

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Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; e-mail srmmsds@nist.gov; or via the Internet at https://www.nist.gov/srm.