EMID-700145

*N3B – Los Alamos*
600 6th Street
Los Alamos, New Mexico 87544
(303) 489-2471

GROUND WATER
DEC 07 2018
BUREAU

*Environmental Management*
Los Alamos Field Office
P.O. Box 1663, MS M984
Los Alamos, New Mexico 87545
(505) 665-5658/FAX (505) 606-2132

*Date*: DEC 07 2018
*Refer To*: N3B-18-0332

Steve Pullen, Section Manager
Ground Water Quality Bureau
New Mexico Environment Department
1190 S. Saint Francis Drive
Santa Fe, NM 87502-5469

**Subject: Notice of Intent to Conduct a Sodium Iodide Tracer Study at Los Alamos National Laboratory**

Dear Mr. Pullen:

In accordance with 20 New Mexico Administrative Code (NMAC) 6.2.1201, Subsection A, the U.S. Department of Energy Environmental Management Los Alamos Field Office and Newport News Nuclear BWXT – Los Alamos, LLC (N3B) are filing this notice of intent (NOI) to conduct a tracer study at Los Alamos National Laboratory. The study will be conducted to evaluate the fate and transport of a sodium iodide tracer that is injected through a piezometer (CrPZ-1) into the regional aquifer beneath Mortandad Canyon.

N3B is proposing to use potable water or groundwater extracted from CrEX-2. CrEX-2 is located approximately 75 ft from CrPZ-1 and has chromium concentrations of up to 300 ppb. In accordance with 20 NMAC 6.2.3101.A(2), "…if the existing concentration of any water contaminant in ground water exceeds the standard of Section 20.6.2.3103 NMAC, no degradation of ground water beyond the existing concentration will be allowed." N3B believes that reintroducing groundwater with up to 300 ppb of chromium near the location where the groundwater was extracted will not cause any degradation of the groundwater.

Enclosed is a completed New Mexico Environment Department Ground Water Quality Bureau NOI form with Attachments 1 and 2 that provide information to support the NOI.

If you have any questions regarding this NOI, please contact Christian Maupin at (505) 695-4281 (christian.maupin@em-la.doe.gov).

Sincerely,

Frazer Lockhart
Program Manager
Regulatory and Stakeholder Interface
N3B – Los Alamos

Sincerely,

Cheryl L. Rodriguez,
Program Manager, FPD-II
Environmental Management
Los Alamos Field Office

FL/CR/CM

Enclosure(s): One hard copy – Completed New Mexico Environment Department Ground Water Quality Bureau Notice of Intent to Discharge form (EM2018-0125) and attachments to the form

Cy: (letter and enclosure[s] emailed)
Shelly Lemon, NMED-SWQB
John Kieling, NMED-HWB
Bruce Yurdin, NMED-WPD
Andrew Romero, NMED-GWQB
David Rhodes, DOE EM-LA
David Nickless, DOE EM-LA
Cheryl Rodriguez, DOE EM-LA
Arturo Duran, DOE EM-LA
Hai Shen, DOE EM-LA
Nick Lombardo, N3B
Joe Legare, N3B
Frazer Lockhart, N3B
Emily Day, N3B
Christian Maupin, N3B
Kristin Henderson, N3B
Erich Evered, N3B
Bruce Robinson, N3B
Danny Katzman, N3B
Steve White, N3B
emla.docs@em.doe.gov
N3B Records
PRS Website

New Mexico Environment Department
Ground Water Quality Bureau

# Ground Water Quality Bureau
# Notice of Intent to Discharge

**For Department use Only:**

**Agency Interest Number**_____
**PRD Assigned** _____

1. **Name and mailing address of person proposing to discharge (Responsible Person):**

Steve S. White
Newport News Nuclear BWXT – Los Alamos, LLC
600 6th Street
Los Alamos, NM 87544

Work Phone: (505) 309-1370
Cell/Home Phone: (505) 309-1370
Fax: Not Applicable
Email: steve.white@em-la.doe.gov

2. **Name and Position of person Completing Form:**

Christian T. Maupin
Regulatory Compliance
Environmental Professional

Work Phone: (505) 695-4281
Cell/Home Phone: (505) 695-4281
Fax: Not Applicable
Email: christian.maupin@em-la.doe.gov

3. **Name of facility:**

Los Alamos National Laboratory (LANL)

4. **Physical location of the discharge (if applicable, give street address, township, range, section, distance from closest town or landmark, directions to facility, location map):**

LANL Technical Area 05 in Township 19N, Range 6E, Section 24. Attachment 1 contains a location map of the project site.

5. **Type of operation generating the discharge (e.g., agricultural facility, domestic wastewater discharge, industrial discharge, mining operation, etc.):**

This tracer study will be conducted to evaluate the fate and transport of water mixed with tracer that will be introduced into the regional aquifer via a piezometer (CrPZ)-1 near chromium extraction well (CrEX)-2. Extracted groundwater from CrEX-2 (chromium concentration of 300 ppb or lower) or potable water from the Los Alamos County municipal supply will be mixed with tracer before injection into the piezometer.

6. **Source(s) of the discharge. Describe how the wastewater, sludge, or other discharges processed and/or disposed at your facility are generated. Identify all sources. Attach additional pages if needed:**

A total of 3000 gal. of extracted groundwater or portable water will be mixed with 5 kg of sodium iodide (NaI) tracer in a tank. The tracer solution will then be injected into CrPZ-1. Upon completion of the tracer injection, 3000 gal. of extracted groundwater or potable water will be used to rinse the tracer solution tank. The rinse water will then be injected into CrPZ-1.

Attachment 2 provides the safety data sheet for the NaI.

7. **Expected contaminants in the discharge (e.g., nitrate-nitrogen, metals, organic compounds, salts, etc.) Include estimated concentration if known, and copies of results of laboratory analyses, if available:**

The NaI tracer will be introduced at the quantity specified in Section 6 above. Chromium levels in the extracted groundwater less than 300 ppb.

8. **Describe all components of wastewater processing, treatment, storage, and disposal system (e.g., pre-treatment units, impoundments(s), septic tank/leachfield, etc.). Include sizes, site layout map, plans, and specifications, etc. if available:**

Regional aquifer piezometer CrPZ-1. NaI tracer. Extracted groundwater with chromium concentrations of 300 ppb or less. Potable water from the Los Alamos County municipal supply.

9. **Estimated maximum daily discharge volume in gallons per day. Provide water usage records or system sizing criteria if available:**

Daily maximum discharge of tracer solution is approximately 3000 gal.

10. **Estimated depth to ground water (ft):** 900 to 1100 ft **Source of information:** Engineering Design Spec.

11. **Current Total Dissolved Solids Concentration in Groundwater:** 150 mg/L (average)

**Signature:** _____ **Date:** 11/26/18

**Printed name:** Steve White **Title:** Geologist

**Certification by Responsible Person**

**I,** FRAZER R. LOCKHART **, hereby certify that the information and data submitted in this application are true and accurate as possible, to the best of my knowledge and professional expertise and experience.**

**Signed this** 26th **day of** November **,** 2018**, upon my oath or affirmation, before a notary of the State of**

_____

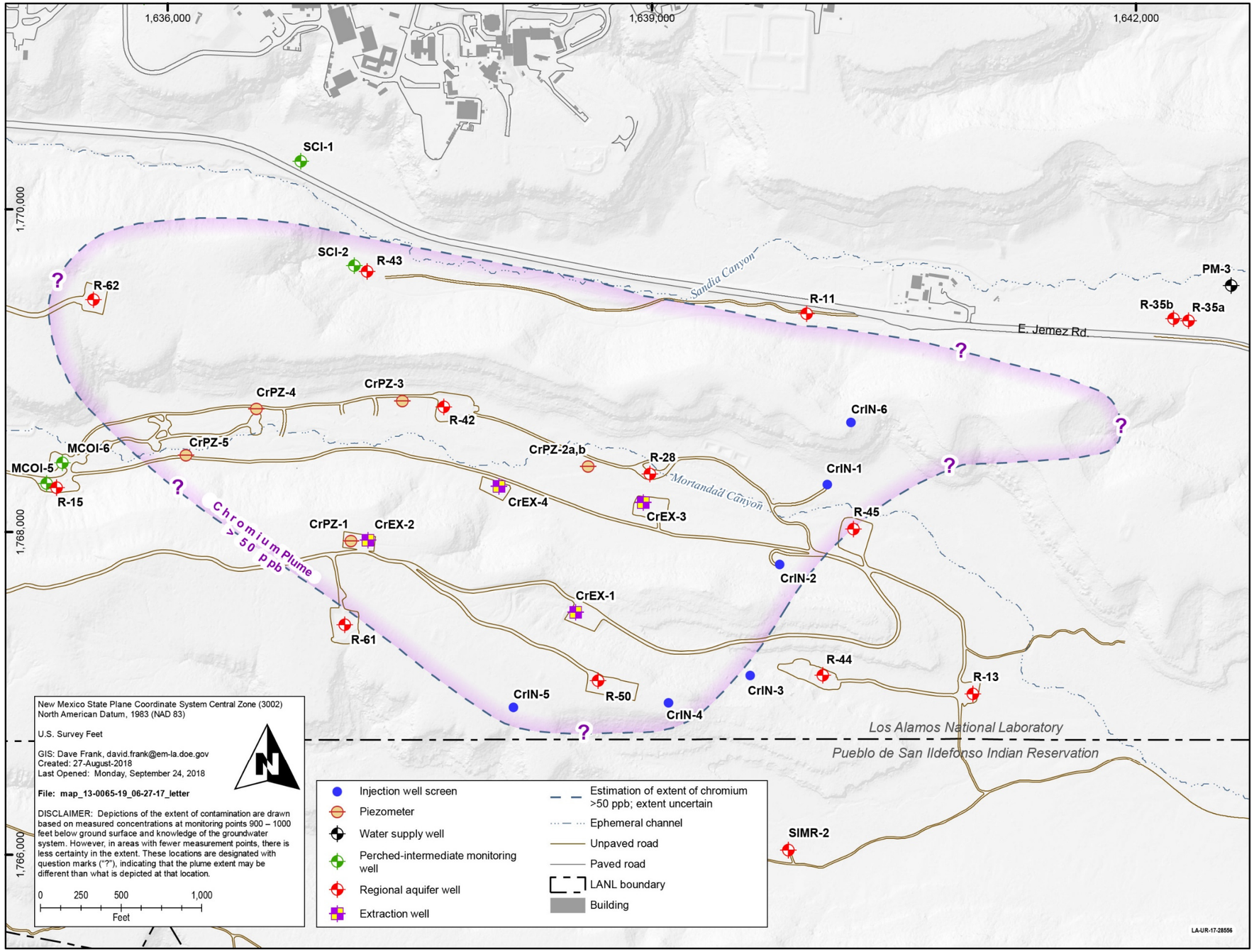
OFFICIAL SEAL
Alexandria Sanchez
NOTARY PUBLIC
STATE OF NEW MEXICO
Commission Expires: June 5, 2019

Please return this form to:
NMED Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Telephone: 505-827-2900
Fax: 505-827-2965

# Attachment 1

*Location Map of Project Site*




Note: Locations of monitoring wells, piezometers, extraction wells, and injection wells are also shown.

# Attachment 2

*Safety Data Sheets for the Proposed Tracers*

# SAFETY DATA SHEET

Version 4.8
Revision Date 12/11/2017
Print Date 10/19/2018

## 1. PRODUCT AND COMPANY IDENTIFICATION

### 1.1 Product identifiers

Product name : Sodium iodide

Product Number : 409286
Brand : Aldrich

CAS-No. : 7681-82-5

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

### 1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

### 1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

### 2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)

| | |
|---|---|
| H315 | Causes skin irritation. |
| H319 | Causes serious eye irritation. |
| H410 | Very toxic to aquatic life with long lasting effects. |

Precautionary statement(s)

| | |
|---|---|
| P264 | Wash skin thoroughly after handling. |
| P273 | Avoid release to the environment. |
| P280 | Wear protective gloves/ eye protection/ face protection. |
| P302 + P352 | IF ON SKIN: Wash with plenty of soap and water. |
| P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P321 | Specific treatment (see supplemental first aid instructions on this label). |

| | |
|---|---|
| P332 + P313 | If skin irritation occurs: Get medical advice/ attention. |
| P337 + P313 | If eye irritation persists: Get medical advice/ attention. |
| P362 | Take off contaminated clothing and wash before reuse. |
| P391 | Collect spillage. |
| P501 | Dispose of contents/ container to an approved waste disposal plant. |

**2.3 Hazards not otherwise classified (HNOC) or not covered by GHS** - none

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**3.1 Substances**

| | | |
|---|---|---|
| Formula | : | INa |
| Molecular weight | : | 149.89 g/mol |
| CAS-No. | : | 7681-82-5 |
| EC-No. | : | 231-679-3 |

**Hazardous components**

| Component | Classification | Concentration |
|---|---|---|
| **Sodium iodide** | | |
| | Skin Irrit. 2; Eye Irrit. 2A; Aquatic Acute 1; Aquatic Chronic 1; H315, H319, H410 | 90 - 100 % |

For the full text of the H-Statements mentioned in this Section, see Section 16.

## 4. FIRST AID MEASURES

**4.1 Description of first aid measures**

**General advice**
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

**If inhaled**
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**
Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**4.2 Most important symptoms and effects, both acute and delayed**
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

**4.3 Indication of any immediate medical attention and special treatment needed**
No data available

## 5. FIREFIGHTING MEASURES

**5.1 Extinguishing media**

**Suitable extinguishing media**
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**5.2 Special hazards arising from the substance or mixture**
No data available

**5.3 Advice for firefighters**
Wear self-contained breathing apparatus for firefighting if necessary.

**5.4 Further information**
No data available

## 6. ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions, protective equipment and emergency procedures**
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

**6.2 Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

**6.3 Methods and materials for containment and cleaning up**
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

**6.4 Reference to other sections**
For disposal see section 13.

## 7. HANDLING AND STORAGE

**7.1 Precautions for safe handling**
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

**7.2 Conditions for safe storage, including any incompatibilities**
Keep container tightly closed in a dry and well-ventilated place.

Air, light, and moisture sensitive.
Storage class (TRGS 510): 13: Non Combustible Solids

**7.3 Specific end use(s)**
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Control parameters**

**Components with workplace control parameters**

| Component | CAS-No. | Value | Control parameters | Basis |
|---|---|---|---|---|
| Sodium iodide | 7681-82-5 | TWA | 0.010000 mg/m3 | USA. ACGIH Threshold Limit Values (TLV) |
| | Remarks | Upper Respiratory Tract irritation<br>Hypothyroidism<br>Not classifiable as a human carcinogen<br>varies | | |
| | | TWA | 0.010000 mg/m3 | USA. ACGIH Threshold Limit Values (TLV) |
| | | Upper Respiratory Tract irritation<br>Hypothyroidism<br>Not classifiable as a human carcinogen<br>varies | | |
| | | TWA | 0.01 ppm | USA. ACGIH Threshold Limit Values (TLV) |
| | | Upper Respiratory Tract irritation<br>Hypothyroidism<br>Not classifiable as a human carcinogen<br>varies | | |

**8.2 Exposure controls**

**Appropriate engineering controls**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**Personal protective equipment**

**Eye/face protection**
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection**
For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator.For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Control of environmental exposure**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

| | | |
|---|---|---|
| a) | Appearance | Form: crystalline<br>Colour: white |
| b) | Odour | No data available |
| c) | Odour Threshold | No data available |
| d) | pH | 6.0 - 9.0 at 50 g/l at 20 °C (68 °F) |
| e) | Melting point/freezing point | Melting point/range: 661 °C (1,222 °F) - lit. |
| f) | Initial boiling point and boiling range | 1,304 °C (2,379 °F) at 1,013 hPa (760 mmHg) |
| g) | Flash point | No data available |
| h) | Evaporation rate | No data available |
| i) | Flammability (solid, gas) | No data available |
| j) | Upper/lower flammability or explosive limits | No data available |

| | | |
|---|---|---|
| k) | Vapour pressure | No data available |
| l) | Vapour density | No data available |
| m) | Relative density | 3.670 g/cm3 |
| n) | Water solubility | No data available |
| o) | Partition coefficient: n-octanol/water | No data available |
| p) | Auto-ignition temperature | No data available |
| q) | Decomposition temperature | No data available |
| r) | Viscosity | No data available |
| s) | Explosive properties | No data available |
| t) | Oxidizing properties | No data available |

**9.2 Other safety information**
No data available

## 10. STABILITY AND REACTIVITY

**10.1 Reactivity**
No data available

**10.2 Chemical stability**
Stable under recommended storage conditions.

**10.3 Possibility of hazardous reactions**
No data available

**10.4 Conditions to avoid**
Exposure to light may affect product quality.
Air sensitive.

**10.5 Incompatible materials**
Oxidizing agents, Strong acids, Bromine trifluorideOxidizing agents, Strong acids, Bromine trifluoride

**10.6 Hazardous decomposition products**
Hazardous decomposition products formed under fire conditions. - Hydrogen iodide, Sodium oxides
Other decomposition products - No data available
In the event of fire: see section 5

## 11. TOXICOLOGICAL INFORMATION

**11.1 Information on toxicological effects**

**Acute toxicity**
LD50 Oral - Rat - 4,340 mg/kg

Inhalation: No data available

Dermal: No data available

No data available

**Skin corrosion/irritation**
Skin - Rabbit
Result: Skin irritation - 24 h

**Serious eye damage/eye irritation**
Eyes - Rabbit
Result: Moderate eye irritation - 24 h

**Respiratory or skin sensitisation**
No data available

**Germ cell mutagenicity**
No data available

**Carcinogenicity**

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity**
No data available

No data available

Developmental Toxicity - Human - female - Oral
Specific Developmental Abnormalities: Endocrine system. Effects on Newborn: Other postnatal measures or effects.

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available

**Additional Information**
RTECS: WB6475000

Prolonged exposure to iodides may produce iodism in sensitive individuals. Symptoms of exposure include: skin rash, running nose, headache and irritation of the mucous membrane. For severe cases the skin may show pimples, boils, hives, blisters and black and blue spots. Iodides are readily diffused across the placenta. Neonatal deaths from respiratory distress secondary to goiter have been reported. Iodides have been known to cause drug-induced fevers, which are usually of short duration., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

## 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

| | |
|---|---|
| Toxicity to fish | LC50 - Oncorhynchus mykiss (rainbow trout) - 860 mg/l - 96 h |
| Toxicity to daphnia and other aquatic invertebrates | EC50 - Daphnia magna (Water flea) - 0.17 mg/l - 48 h |

### 12.2 Persistence and degradability
No data available

### 12.3 Bioaccumulative potential
Bioaccumulation: Chasmichthys gulosus - 20 d - 60 µg/l

Bioconcentration factor (BCF): 344

### 12.4 Mobility in soil
No data available

### 12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

### 12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

**Product**
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging**
Dispose of as unused product.

## 14. TRANSPORT INFORMATION

**DOT (US)**
Not dangerous goods

**IMDG**
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Sodium iodide)
Marine pollutant:yes

**IATA**
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Sodium iodide)

**Further information**
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

## 15. REGULATORY INFORMATION

**SARA 302 Components**
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**
Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**
No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know Components**

| | CAS-No. | Revision Date |
|---|---|---|
| Sodium iodide | 7681-82-5 | |

**New Jersey Right To Know Components**

| | CAS-No. | Revision Date |
|---|---|---|
| Sodium iodide | 7681-82-5 | |

**California Prop. 65 Components**
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

## 16. OTHER INFORMATION

**Full text of H-Statements referred to under sections 2 and 3.**

| | |
|---|---|
| Aquatic Acute | Acute aquatic toxicity |
| Aquatic Chronic | Chronic aquatic toxicity |
| Eye Irrit. | Eye irritation |
| H315 | Causes skin irritation. |
| H319 | Causes serious eye irritation. |

| | |
|---|---|
| H400 | Very toxic to aquatic life. |
| H410 | Very toxic to aquatic life with long lasting effects. |

**HMIS Rating**

| | |
|---|---|
| Health hazard: | 2 |
| Chronic Health Hazard: | * |
| Flammability: | 0 |
| Physical Hazard | 0 |

**NFPA Rating**

| | |
|---|---|
| Health hazard: | 2 |
| Fire Hazard: | 0 |
| Reactivity Hazard: | 0 |

**Further information**


The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

**Preparation Information**

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.8 Revision Date: 12/11/2017 Print Date: 10/19/2018