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GOVERNOR

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ENVIRONMENT DEPARTMENT
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RON CURRY
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DEPUTY SECRETARY

July 7, 2005

Jim Romero
Española City Manager
405 Paseo de Oñate
Española, NM 87532

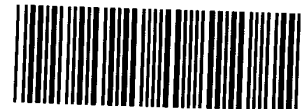
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LA/NM BRANCH

RE: Request for Continued Access and Discharge of Treated Wastewater at the North Railroad Avenue Plume Superfund Site, Española, New Mexico

Dear Mr. Romero:

The New Mexico Environment Department's (NMED) is requesting the City of Española's permission for continued access to city property and for the discharge of treated wastewater from the proposed remediation system operation. Work will be carried out as part of the on-going CERCLA activities at the North Railroad Avenue Plume (NRAP) Superfund site as prescribed in EPA's Record of Decision dated September 2001 and subsequent Remedial Design Report dated December 2003.

NMED proposes that access to city properties be conducted pursuant to the current Consent to Access from the City of Española dated October 14, 1999 (Attachment 1). The Remedial Design includes the installation of two well clusters and four additional monitoring wells on City property. The cluster wells and two monitoring wells would be located in the eastern part of the Plaza de Española, and two monitoring wells would be installed in Railroad Street and Calle Chavez. The cluster wells will consist of 3 injection and 3 monitoring wells each. Attachment 2 is a site map showing the locations of the proposed wells. The location of the proposed well clusters will be moved slightly due to the planned highway construction project. NMED will also work with the City on the well locations in regards to planned construction activities at the Plaza. The wells will be used to inject bioremediation amendments into the deeper portion of the aquifer in order clean up the tetrachloroethene (PCE) contaminated ground water beneath the site. The wells would require periodic access for the injection of bio-amendments through the use of a portable (trailer mounted) treatment system. All wells will be



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completed at grade with a 12-inch traffic rated manhole and 6-inch concrete pad similar to the previous well installations. Traffic control plans will also be submitted to the Planning and Zoning Department prior to drilling. In addition, access to all monitoring wells located on city property is required for periodic sampling. NMED will contact the City prior to each event as required in the Consent to Access. Drilling is scheduled to begin on July 25, 2005 and will last approximately 2 months.

The NMED also requests permission to discharge approximately 540,000 gallons of treated water to the City's wastewater treatment plant. The treated water is produced as part of the Surfactant Enhanced Aquifer Remediation (SEAR) operation which is critical to the overall success of remediation at this site because it will remove the majority of the mass of contamination associated with the site and cut down on the overall time required to remediate the site. Operation of the SEAR system includes the injection of surfactant and brine solution into the contaminated groundwater followed by extraction of the solution and contaminated ground water. All extracted ground water will be processed through a wastewater treatment system prior to release to the City's POTW.

The SEAR system will use approximately 2035 gallons of the surfactant, Aerosol MA80I, and a brine solution of food grade, iodine free sodium chloride (7600 lbs) and calcium chloride (1470 lbs) for injection into the aquifer in order to mobilize and remove the free phase PCE from the source area. The extracted ground water will be processed through the treatment system designed to meet the following performance criteria:

- less than or equal to 900 milligrams/liter (mg/L) chemical oxygen demand (COD) primarily as 4-methyl- 2-pentanol at 303 mg/L
- less than or equal to 5 micrograms/liter (ug/L) tetrachloroethene (PCE)
- less than or equal to 5 ug/L trichloroethene (TCE), and
- Air emission control greater than or equal to 95% removal of both PCE and TCE.

The 4-methyl- 2-pentanol is the primary chemical compound from the surfactant after it has undergone reaction in the treatment system. The treatment system will be tested at various concentrations prior to full-scale operation to ensure that it can handle the anticipated concentrations. In addition, effluent from the treatment system will also be sampled during the SEAR operation to ensure that the treatment system meets the performance criteria. Attachment 3 provides the water treatment system design specifications, treatment system process flow diagram, and the surfactant's material safety data sheet.

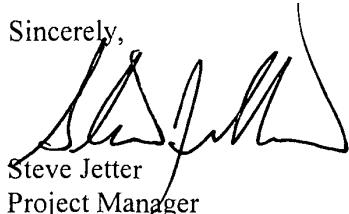
Operation of the SEAR system and discharge will occur over a one-month time period beginning in January 2006. Discharge over this one-month period will be on a continuous basis of 15 gallons per minute or 21,600 gallons per day. Discharge to the POTW will occur through a sewer connection at the site.

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The NMED plans to begin construction activities on July 25, 2005. Therefore, NMED requests a determination on site access for remedial action construction activities by July 20, 2005.

NMED appreciates the City's continued cooperation in this matter. If you have any questions or concerns regarding this request, please contact me at (505) 827-0072.

Sincerely,



Steve Jetter
Project Manager
Superfund Oversight Section

Attachments: Access Agreement
 Proposed well locations
 Treatment system specifications

Cc w/attachments: Petra Sanchez, Remedial Project Manager, EPA

Cc w/o attachments: Don William, Team Leader, EPA
 Dana Bahar, Manager, Superfund Oversight Section, NMED

ATTACHMENT 1

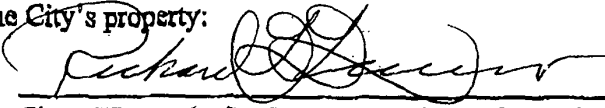
CONSENT FOR ACCESS TO PROPERTY

NAME OF PROPERTY OWNER: City of Española
LOCATION OF PROPERTY: All City of Española property shown in the circled area on Attachment A.
PURPOSE OF CONSENT: Give access to NMED to perform CERCLA activities needed for investigation and remediation of the North Railroad Avenue Plume site

This is our consent and authorization to the New Mexico Environment Department officers, employees, contractors, and authorized representatives (all collectively NMED) for entry and continued access to the property shown in Attachment A for the following purposes:

1. Collect surface and subsurface soil and sediment samples to test for contamination from hazardous substances and to determine subsurface lithology;
2. Collect samples of waste materials;
3. Conduct subsurface borings and install ground water monitor wells;
4. Draw samples periodically from the wells and sample any liquids on the surface or in the subsurface to test for contamination from hazardous substances and ground water parameters needed to evaluate contaminant migration;
5. Implement and maintain remedial systems; and
6. Collect other information NMED may need to determine if the site poses a significant threat to public health or the environment.

NMED will notify the following City of Española's contacts at least 48 hours prior to mobilizing personnel or equipment to the City's property:

Name: 
Address: City of Española, PO Drawer 37, Española, NM 87532
Telephone: (505) 753-2523

The Department will choose locations for soil borings, monitor wells, and remediation systems; the Department will give the Owner an opportunity to comment on the location of borings, wells remediation systems, and will take the comments into account where possible.

It has been explained to me that NMED will bring equipment and related vehicles onto my property at various times. Upon completion of each phase of activity, NMED will promptly remove all equipment from the property. Except during activities where heavy equipment on-site may create obstructions, nothing installed on Property will interfere with the movement of vehicles; nor will any installation impede building ingress or egress, or interfere with Owner activities. Holes made in pavement will be patched with asphalt or concrete patch. In paved areas, monitor wells will be completed at-grade. This consent is given with the understanding that NMED will act in a reasonable manner consistent with its investigation requirements.

From

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CONSENT FOR ACCESS TO PROPERTY

City of Española

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This access shall continue indefinitely until NMED completes the CERCLA activities pertaining to the North Railroad Avenue Plume site. The City shall give the NMED at least thirty (30) days prior notice if during the pendency of this consent, the City determines to build in a location occupied by NMED's wells. The City's notice may be given orally to Robin Brown or the current North Railroad Avenue Plume site project manager for the Ground Water Quality Section at (505) 827-2434. NMED and the City are each governmental entities whose liabilities for property damage and personal injury to each other and to third parties are governed by the New Mexico Tort Claims Act, NMSA 1978, §§41-1-1 *et seq.*

I understand that these actions by NMED are undertaken pursuant to its responsibilities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Sections 9604, 9606, 9611, and 9619; the New Mexico Department of Environment Act, NMSA 1978, Section 9-7A-1 *et seq.*; the New Mexico Environmental Improvement Act, NMSA 1978, Sections 74-1-1 *et seq.*, the New Mexico Hazardous Waste Act, NMSA 1978, Sections 74-4-1 *et seq.*, and the New Mexico Water Quality Act, NMSA 1978, Sections 74-6-1 *et seq.*

This consent is given voluntarily on behalf of the City of Española after having had a chance to ask questions and having had all my questions answered to my satisfaction and with knowledge of my right to refuse to give consent voluntarily. I understand that I may revoke my consent at any time upon giving 10 days written notice via certified mail to Robin Brown or the current North Railroad Avenue Plume site project manager.

Signed: Richard L. LuceroDate: 10-14-99Name: Richard L. LuceroTitle: Mayor

ATTACHMENT 2

ATTACHMENT 3

SECTION 11399

LIQUID PHASE AND VAPOR PHASE TREATMENT SYSTEM

PART 1 GENERAL

1.1 DESCRIPTION

Work specified in this section shall consist of furnishing all labor, equipment and materials to design, fabricate, deliver, operate, and remove a self-contained treatment system for water produced from surfactant-enhanced aquifer remediation (SEAR) operations. Some of the water treatment processes will generate vapor streams, which must also be treated by this system.

1.2 QUALITY ASSURANCE

- A. Manufacturer's Experience: The manufacturer of the treatment system shall satisfactorily demonstrate previous experience by letter of certification with references and telephone numbers. Certification shall indicate that the manufacturer has produced and has had at least five (5) similar systems in satisfactory service for a period of not less than two (2) years.
- B. Manufacturer's Warranty. The treatment system shall be designed and fabricated in accordance with this specification. The delivered system shall be warranted by the manufacturer to be free from defects in workmanship for the period of operation, anticipated to be less than one calendar month. The manufacturer shall convey the warranty to the New Mexico Environment Department (NMED) Project Manager (PM) at the completion of the assembly of the system.

1.3 SUBMITTALS

- A. System flow diagrams, manufacturer's catalog data, with literature and illustrations, specifications, and engineering data shall be submitted with the bid price, for all components of the system. The following submittals will be due during the Shop Drawing review period:
- B. Catalog data for distribution panelboard, pump control panels, and motor starters.
- C. Power plan showing wiring of the system.
- D. Operation and Maintenance Manual.

PART 2 PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. The treatment system shall be transportable and self-contained.
- B. The system shall be capable of treating a minimum of 15 gallons per minute (gpm) of water from a system of six extraction wells. Drawing C-2 illustrates a plan of the SEAR well and piping system. Drawing P-3 illustrates the process flow throughout the treatment system. NMED has interest in this system only for brief operation at this site, so quote price on a lump-sum basis as a service, including design, approvals, fabrication, complete assembly, delivery, testing, operation, and removal from the site.

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- C. The system shall contain all of the equipment and instrumentation shown on Drawing P-3, with details as specified below. Any item shown on the Drawings and not specified in detail herein shall be furnished as shown on the Drawings and operated to meet the performance requirements specified herein.
- D. Performance criteria include the following:
 - 1. Final aqueous effluent less than or equal to 900 mg/l chemical oxygen demand (COD);
 - 2. Final aqueous effluent less than or equal to 5 ug/l tetrachloroethene (PCE);
 - 3. Final aqueous effluent less than or equal to 5 ug/l trichloroethene (TCE); and
 - 4. Air emission control greater than or equal to 95% removal of both PCE and TCE.
- E. The following guidance is provided for the contractor's use in designing a system that will accomplish the above performance for the duration of the SEAR operation. Bids shall be based upon the system presented herein, and alternate proposals will be considered. As described in Part 3 of this specification, bidders shall propose pilot testing of one or more of the system components to enhance the basis for design of the proposed system.

2.2 COMPONENTS

- A. The system shall contain a separator to allow dense nonaqueous-phase liquid (DNAPL) and sediment particles to settle. This separator shall be designed for this specific purpose, with a hydraulic residence time of at least two hours. This separator shall be airtight, and fitted with a vapor phase granular activated carbon (VPGAC) unit to capture organic vapors in the headspace before allowing the headspace gas to enter the atmosphere. The bottom of the separator shall be fitted with a positive displacement pump to remove settled DNAPL and solids from the bottom of the separator to an airtight storage unit such as a 55-gallon drum, to be provided as part of the system by the Contractor. Sediment and DNAPL from the separator shall be removed periodically to maintain efficient operating conditions.
- B. The system shall include an Alkaline Hydrolysis system downstream of the DNAPL separator and upstream of the liquid-liquid separator. The Alkaline Hydrolysis system shall be capable of continuously reacting NaOH with MA-80I and creating 4-methyl-2-pentanol within approximately 20 minutes. The treatment system shall consist of a process tank, an immersion or in-line heater to maintain temperature in the reactor at 55 deg C, discharge pump, proportional valve, and two pH control loops, as shown on the Drawings. The process tank shall be a completely mixed reactor, airtight, with offgas routed passively to the air pollution control system as specified below.
- C. At times of peak concentrations, the 4-methyl 2-pentanol concentration in the alkaline hydrolysis reactor effluent may exceed its solubility. Therefore, furnish and install a separator to provide flotation and skimming of separate-phase 4 -methyl 2 -pentanol as shown on the Drawings.
- D. The system shall include a liquid-liquid extraction separator capable of removing 4-methyl-2-pentanol from the Alkaline Hydrolysis/separator effluent stream prior to discharge to the air stripper. The liquid-liquid centrifugal separator, Model BXP360P Rousselet Robatel or approved equal, shall maintain not less than a 95% removal rate for 4-methyl-2-pentanol (or less than 303 mg/l of 4-methyl-2-pentanol). The system shall be

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capable of combined liquid inlet stream of 15 gpm (minimum) and shall be constructed of materials that will not be corroded or dissolved by the contaminants in the water or extraction liquid (Isotridecyl alcohol (ITDA, Marlupal™, or approved equal)). The ITDA to 4-methyl-2-pentanol ratio of 3:1 shall be consistently maintained throughout the separation process. Based on bench-scale treatability tests, when the concentration of 4-methyl 2-pentanol exceeds approximately 2,600 mg/l, the removal efficiency to be expected in one pass (91 to 93%) will not likely result in an effluent concentration lower than 303 mg/l (approximately 900 mg/l COD based on theoretical oxygen demand). At such times, provide capability to stay within the limit of 900 mg/l COD being discharged to the municipal wastewater collection system. This capability may be provided either by shipment of the untreated liquid to a properly licensed hazardous waste disposal facility for the duration of peak concentrations (using the storage capacity of the frac tanks specified elsewhere), or adding another liquid-liquid extraction reactor in series with the one specified above in this paragraph.

- E. The system shall include an air stripper to remove PCE from the liquid-liquid separator system aqueous effluent, to less than 5 µg/L, Model 24.6 Sieve Tray Air Stripper by QED Environmental Systems or approved equal. Air flow rate of 1400 cfm. Effluent shall contain less than 5 µg/L PCE.
- F. The system shall include a VPGAC unit capable of treating the combined air flows from the separators, reaction tanks, and the air stripper, as indicated on the Drawings. The carbon unit shall maintain not less than a 95% removal rate for PCE. When the removal rate drops below 95%, the granular activated carbon (GAC) shall be replaced with fresh carbon.
- G. See Drawing P-3 for process control requirements. The liquid and vapor phase system specified herein will operate for less than one month, so it shall be a stand-alone system independent of the biotreatment supervisory control and data acquisition systems.
- H. The treated water discharge shall be connected to a 6-inch drain line to the municipal sewer.
- I. The system shall be equipped with sampling ports which allow for the collection of representative vapor and liquid samples as shown on Drawing P-3. A flow meter shall be provided on the vapor discharge line, and a totalizing flow meter shall be provided on the water discharge line. Other instrumentation shall be provided as shown on Drawing P-3.
- J. The vapor phase treatment units shall include a detection device to detect breakthrough of contaminant. The device shall shut down the system and provide an alarm signal with an auto dialer. The type of signal source shall be determined by the NMED PM.
- K. The system shall contain an adequate fire suppression system.
- L. The system shall be designed to be capable of operating in sub-freezing temperatures and winter conditions as well as in extreme heat during summer months.
- M. The complete electrical system shall be provided, including but not limited to:
 - 1. Main 480 volt, 3-phase circuit breaker distribution panelboard suitable for use as service entrance equipment.
 - 2. Lighting and power distribution panel, 120/240-volt, single phase.
 - 3. All motor starters and controls.
 - 4. Lighting, switches, and receptacles.

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5. Lighting and miscellaneous power transformer, 480-120/240 volt, single phase.
 6. Electric unit heater.
- N. All electrical equipment shall be UL listed.
- O. All electrical work shall be in accordance with the National Electrical Code and electrical codes applicable in Española, New Mexico.

PART 3 EXECUTION

3.1 GENERAL

- A. The manufacturer shall provide a complete and operative system to the construction site in Española, New Mexico.
- B. The electrical system, including lighting and convenience outlets, shall be provided completely wired and requiring only connection to a 480-volt, 3-phase power supply source for operation.

3.2 TESTING

- A. The liquid-liquid extraction system as specified has been proven at bench scale. Contractor shall propose pilot testing to confirm treatment efficiency at or near full scale (15 gpm). Such pilot testing shall cover a range of influent concentrations of 4-methyl 2-pentanol (e.g., 1,000, 5,000, and 10,000 mg/l), and may be conducted at the site or at other facilities proposed by the Contractor. Based on the results, and consultation among the NMED Project Manager, Contractor, and Engineer, the NMED Project Manager will determine a course of action for the campaign of water treatment.
- B. The manufacturer shall give the NMED PM notice two (2) weeks prior to completion of the system and make arrangements for the NMED PM or Representative to witness performance testing of the treatment system. A 24-hour test is required. Criteria for successful performance include the following:
1. No leakage
 2. Proper function of all instrumentation and controls
 3. Flow rates of water and air within 5 percent of specifications.
- B. Upon successful completion of performance testing, the manufacturer shall provide the NMED PM certification of testing for acceptance.

3.3 START-UP, TRAINING, OPERATION, AND MAINTENANCE

- A. The manufacturer shall provide a qualified operator for the period of two (2) days on site in Española, New Mexico, for start-up and balancing.
- B. The Contractor shall provide training for the designated personnel on system operation during system start-up. All training shall be for not less than four (4) hours.
- C. The Contractor shall provide four (4) operations and maintenance manuals upon site acceptance of the treatment system.
- D. The Contractor shall operate and maintain the system for the period of wastewater treatment, expected to be approximately four weeks.

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- E. As shown on Drawing P-3, the discharge piping allows flow to the SEAR injection wells, to the POTW (municipal sewer), or both. Subject to pilot test results (Section 3.2A, above), monitoring data in the field operation of the SEAR, and instructions from the NMED PM, Contractor shall plan the following sequence of discharge:

| Days after startup of SEAR operation | Flow to sewer (gpm) | Flow to frac tanks for storage (gpm) | Flow from frac tanks to SEAR injection wells (gpm) | Treated discharge Flow to SEAR injection wells (gpm) |
|--|------------------------|--|--|--|
| 0 to 2 | 15 | 0 | 0 | 0 |
| 3 to 5 | 0 | 15 | 0 | 0 |
| 6 to 9 | 7.5 | 0 | 0 | 7.5 |
| 10 to 15 | 7.5 | 0 | 3 | 4.5 |

END OF SECTION



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Technology ahead of its time™

MSDS: 0000043
Date: 01/05/2004
Supersedes: 07/01/1997

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: AEROSOL® MA 80% Surfactant
Synonyms: Sodium dihexyl sulfosuccinate in mixture of ethanol and water
Chemical Family: Ester
Molecular Formula: C₁₆H₂₉O₇NaS (active ingredient)
Molecular Weight: 388 (Active ingredient)

CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA, WEST PATERSON, NEW JERSEY 07424, USA
For Product Information call 1-800/652-6013. Outside the USA and Canada call 1-973/357-3193.
EMERGENCY PHONE: For emergency involving spill, leak, fire, exposure or accident call CHEMTREC: 1-800/424-9300. Outside the USA and Canada call 1-703/527-3887.

® indicates trademark registered in the U.S. Outside the U.S., mark may be registered, pending or a trademark. Mark is or may be used under license.

2. COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

| Component / CAS No. | % (w/w) | OSHA (PEL): | ACGIH (TLV) | Carcinogen |
|---|------------|-----------------|------------------------------|------------|
| Sodium di(1,3-dimethylbutyl)sulfosuccinate 2373-38-8 | ~ 78 - 80 | Not Established | Not Established | - |
| Methyl isobutyl carbinol 108-11-2 | < 1.0 | 25 ppm (skin) | 25 ppm (skin) 40 ppm STEL | - |
| Ethanol 64-17-5 | ~ 5.0 | 1000 ppm | 1000 ppm | - |

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR:

Color: clear
Appearance: viscous liquid
Odor: fruity

STATEMENTS OF HAZARD:

**WARNING! FLAMMABLE LIQUID AND VAPOR
CAUSES EYE AND SKIN IRRITATION**

CHRONIC HAZARD WARNING:

REPRODUCTIVE HAZARD - CONTAINS ETHANOL WHICH MAY CAUSE BIRTH DEFECTS OR OTHER ADVERSE EFFECTS ON PREGNANCY

Risk of effects depends on duration and level of exposure

POTENTIAL HEALTH EFFECTS

EFFECTS OF OVEREXPOSURE:

Acute oral (rat) and acute dermal (rabbit) LD50 values are approximately 1.75 g/kg and 5.0 g/kg, respectively. Marked eye and skin irritation were produced during primary irritation studies with rabbits. The 4-hour inhalation LC50 is greater than 20 mg/L.

Direct contact with this material may cause moderate eye and skin irritation. Overexposure to vapors may cause irritation of the respiratory tract and eyes and may cause central nervous system effects. Refer to Section 11 for toxicology information on the regulated components of this product.

4. FIRST AID MEASURES

Ingestion:

If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

Skin Contact:

Remove contaminated clothing and shoes without delay. Wash immediately with plenty of water. Do not reuse contaminated clothing without laundering. Get medical attention if pain or irritation persists after washing or if signs and symptoms of overexposure appear.

Eye Contact:

Rinse immediately with plenty of water for at least 15 minutes. Obtain medical advice if there are persistent symptoms.

Inhalation:

Remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms.

5. FIRE-FIGHTING MEASURES

Extinguishing Media:

Use water spray, alcohol foam, carbon dioxide or dry chemical to extinguish fires. Water stream may be ineffective.

Protective Equipment:

Firefighters, and others exposed, wear self-contained breathing apparatus. Wear full firefighting protective clothing. See Section 8 (Exposure Controls/Personal Protection).

Special Hazards:

Keep containers cool by spraying with water if exposed to fire.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:

Where exposure level is known, wear approved respirator suitable for level of exposure. Where exposure level is not known, wear approved, positive pressure, self-contained respirator. In addition to the protective clothing/equipment in Section 8 (Exposure Controls/Personal Protection), wear impermeable boots.

Methods For Cleaning Up:

Remove sources of ignition. Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush spill area with water.

7. HANDLING AND STORAGE

HANDLING

Precautionary Measures: Keep away from heat, sparks and flame. Avoid contact with eyes, skin and clothing. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

Handling Statements: None

STORAGE

Areas containing this material should have fire safe practices and electrical equipment in accordance with applicable regulations and/or guidelines. Standards are primarily based on the material's flashpoint, but may also take into account properties such as miscibility with water or toxicity. All local and national regulations should be followed. In the Americas, National Fire Protection Association (NFPA) 30: Flammable and Combustible Liquids Code, is a widely used standard. NFPA 30 establishes storage conditions for the following classes of materials: Class I Flammable Liquids, Flashpoint <37.8 °C. Class II Combustible Liquids, 37.8 °C < Flashpoint <60 °C. Class IIIa Combustible Liquids, 60 °C < Flashpoint < 93 °C. Class IIIb Combustible Liquids, Flashpoint > 93 °C.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Measures:

Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure.

Respiratory Protection:

Where exposures are below the established exposure limit, no respiratory protection is required. Where exposures exceed the established exposure limit, use respiratory protection recommended for the material and level of exposure.

Eye Protection:

Wear eye/face protection such as chemical splash proof goggles or face shield. Eyewash equipment and safety shower should be provided in areas of potential exposure.

Skin Protection:

Avoid skin contact. Wear impermeable gloves and suitable protective clothing. Since this product is absorbed through the skin, care must be taken to prevent skin contact and contamination of clothing.

Additional Advice:

Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use. It is recommended that a shower be taken after completion of workshift especially if significant contact has occurred. Work clothing should then be laundered prior to reuse. Street clothing should be stored separately from work clothing and protective equipment. Work clothing and shoes should not be taken home.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|-----------------------|---|
| Color: | clear |
| Appearance: | viscous liquid |
| Odor: | fruity |
| Boiling Point: | 78 °C 173 °F (value for ethanol/water) |
| Melting Point: | Not available |

| | |
|---|---------------------------------------|
| Vapor Pressure: | Not available |
| Specific Gravity: | 1.13 |
| Vapor Density: | Not available |
| Percent Volatile (By Wt.): | 20 |
| pH: | Not available |
| Saturation In Air (% By Vol.): | Not available |
| Evaporation Rate: | Not available |
| Solubility In Water: | Complete |
| Volatile Organic Content: | Not available |
| Flash Point: | 36 °C 97 °F Pinsky-Martens Closed Cup |
| Flammable Limits (% By Vol): | Not available |
| Autoignition Temperature: | Not available |
| Decomposition Temperature: | Not available |
| Partition coefficient (n-octanol/water): | Not available |
| Odor Threshold: | See Section 2 for exposure limits. |

10. STABILITY AND REACTIVITY

| | |
|--|---|
| Stability: | Stable |
| Conditions To Avoid: | None known |
| Polymerization: | Will not occur |
| Conditions To Avoid: | None known |
| Materials To Avoid: | Strong acids and alkalies promote degradation by hydrolysis; strong oxidizing agents. |
| Hazardous Decomposition Products: | carbon monoxide carbon dioxide oxides of sulfur (includes sulfur di and tri oxides) |

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION.
Toxicological information on the regulated components of this product is as follows:

Methyl isobutyl carbinol has acute oral (rat) and dermal (rabbit) LD50 values of 2.6 g/kg and 3.6 g/kg, respectively. This material has an acute 4-hour inhalation LC50 (rat) >2000 ppm (8.34 mg/L). Acute overexposure to methyl isobutyl carbinol vapor causes mucous membrane irritation and severe eye irritation. Direct contact with this material causes mild skin irritation.

Sodium di(1,3-dimethylbutyl)sulfosuccinate has acute oral (rat) and dermal (rabbit) LD50 values of greater than 1750 mg/kg and 5 ml/kg, respectively. Direct contact with this material may cause moderate to severe eye and skin irritation. This material is not expected to cause allergic skin reaction based tests in guinea pigs.

Ethanol has acute oral (rat) and dermal (rabbit) LD50 values of 7060 mg/kg and 20,000 mg/kg, respectively. The 10-hour inhalation LC50 for ethanol in rats is 20,000 ppm (59.6 mg/L/4hr). Inhalation overexposure may cause respiratory tract irritation. Ethanol is a potent teratogen associated with abnormal fetal formation, growth retardation, neurological damage, and behavioral alterations in children with fetal alcohol syndrome. Chronic ingestion of ethanol may cause damage to the liver, heart and gastrointestinal tract. In a dominant lethal assay, male mice treated with ethanol over a three day period showed significant decrease in average litter size along with increased incidence of dead implants. Ethanol is reported to have shown positive results in in vivo and in vitro screening tests for mutagenicity. Direct contact with ethanol may cause moderate eye irritation and mild skin irritation. May cause central nervous system depression that causes stupor, coma and eventually death if ingested in excessive quantities

12. ECOLOGICAL INFORMATION

This material is not classified as dangerous for the environment.
This material is not readily biodegradable.

FISH TEST RESULTS

Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr.
Species: Bluegill Sunfish (*Lepomis macrochirus*)
>1000 mg/l LC50

Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr
Species: Rainbow Trout (*Oncorhynchus mykiss*)
1200 mg/l LC50

DEGRADATION

Test: Closed Bottle (OECD 301D)
Duration: 28 day **Procedure:** Ready biodegradability
16.7 %

Test: Modified OECD Screening (OECD 301E)
Duration: 28 day **Procedure:** Ready biodegradability
40.3 %

13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the Cytec product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA 'listed hazardous waste' or has any of the four RCRA 'hazardous waste characteristics.' Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA 'listed hazardous waste'; information contained in Section 15 of this MSDS is not intended to indicate if the product is a 'listed hazardous waste.' RCRA Hazardous Waste Characteristics: There are four characteristics defined in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 9 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 2 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed. Cytec encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. Cytec recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. Cytec has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

US DOT

Proper Shipping Name: Alcohols, n.o.s.
Hazard Class: 3
Packing Group: III
UN/ID Number: UN1987
Transport Label Required: Flammable Liquid
Technical Name (N.O.S.): ethanol , methyl isobutyl carbinol
Hazardous Substances:
Not applicable

TRANSPORT CANADA

Proper Shipping Name: Alcohols, n.o.s.
Hazard Class: 3
Packing Group: III
UN Number: 1987
Transport Label Required: Flammable Liquid
Technical Name (N.O.S.): ethanol , methyl isobutyl carbinol

ICAO / IATA

Proper Shipping Name: Alcohols, n.o.s.
Hazard Class: 3
Packing Group: III
UN Number: 1987
Transport Label Required: Flammable Liquid
Packing Instructions/Maximum Net Quantity Per Package:
Passenger Aircraft: 309; 60L
Cargo Aircraft: 310; 220L
Technical Name (N.O.S.): ethanol , methyl isobutyl carbinol

IMO

Proper Shipping Name: Alcohols, n.o.s.
Hazard Class: 3
UN Number: 1987
Packing Group: III

Transport Label Required: Flammable Liquid
Technical Name (N.O.S.): ethanol , methyl isobutyl carbinol

15. REGULATORY INFORMATION

INVENTORY INFORMATION

United States (USA): All components of this product are included on the TSCA Inventory in compliance with the Toxic Substances Control Act, 15 U. S. C. 2601 et. seq.

Canada: Components of this product have been reported to Environment Canada in accordance with Sections 66 and/or 81 of the Canadian Environmental Protection Act (1999), and are included on the Domestic Substances List.

European Union (EU): All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) in compliance with Council Directive 67/548/EEC and its amendments.

Australia: All components of this product are included in the Australian Inventory of Chemical Substances (AICS).

China: All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.

Japan: All components of this product are included on the Japanese (ENCS) inventory or are not required to be listed on the Japanese inventory.

Korea: All components of this product are included on the Korean (ECL) inventory or are not required to be listed on the Korean inventory.

Philippines: All components of this product are included on the Philippine (PICCS) inventory or are not required to be listed on the Philippine inventory.

OTHER ENVIRONMENTAL INFORMATION

The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

This product does not contain any components regulated under these sections of the EPA

PRODUCT HAZARD CLASSIFICATION UNDER SECTION 311 OF SARA

- Acute
 - Chronic
 - Fire
-

16. OTHER INFORMATION

NFPA Hazard Rating (National Fire Protection Association)

Health: 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

Fire: 3 - Liquids and solids that can be ignited under almost all ambient temperature conditions.

Reactivity: 0 - Materials that in themselves are normally stable, even under fire exposure conditions.

Reasons For Issue: New Format
Revised Section 14
Revised Section 15

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