

SAFETY DATA SHEET

Rma #
1808CH22

1. Identification

Product identifier TMA UNIT, GROUP B (STREAMS 305, 408, 502, 802, 808)

Other means of identification

SDS number 1002

Recommended use This material is a process intermediate stream.

Recommended restrictions Other uses are not recommended unless an assessment is completed, prior to commencement of that use, which demonstrates that the use will be controlled.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer Flint Hills Resources Joliet, LLC
23425 Amoco Road
Channahon, IL
60410
United States

Telephone numbers - 24 hour emergency assistance

FHR Joliet, LLC 815-467-3209
Chemtrec 800-424-9300 (CCN:8586)

Telephone numbers - general assistance

(8-5 M-F, CST) SDS Assistance 316-828-7988
Email: msdsrequest@fhr.com

2. Hazard(s) identification

Physical hazards Flammable liquids Category 3
Corrosive to metals Category 1

Health hazards Skin corrosion/irritation Category 1A
Serious eye damage/eye irritation Category 1
Sensitization, respiratory Category 1
Sensitization, skin Category 1
Carcinogenicity (inhalation) Category 1A
Reproductive toxicity Category 1B
Specific target organ toxicity, single exposure Category 3 respiratory tract irritation

Environmental hazards Hazardous to the aquatic environment, acute hazard Category 2
Hazardous to the aquatic environment, long-term hazard Category 2

OSHA defined hazards Not classified.

Label elements



Signal word

Danger

Hazard statement

Flammable liquid and vapor. May be corrosive to metals. Causes severe skin burns and eye damage. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause cancer. May damage fertility or the unborn child. May cause respiratory irritation. Toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention

Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilation/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Wear protective gloves/protective clothing/eye protection/face protection. Keep only in original container. Do not breathe mist or vapor. Wash thoroughly after handling. In case of inadequate ventilation wear respiratory protection. Contaminated work clothing must not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Avoid release to the environment.

Response

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If inhaled: Remove person to fresh air and keep comfortable for breathing.

If swallowed: Rinse mouth. Do NOT induce vomiting.

Specific treatment (see first aid instruction on this label). Immediately call a poison center/doctor. In case of fire: Use water spray, dry chemical, carbon dioxide or fire-fighting foam to extinguish. Absorb spillage to prevent material damage. Wash contaminated clothing before reuse.

Storage

Store in a well-ventilated place. Keep cool. Store in corrosive resistant container with a resistant inner liner. Store locked up. Keep container tightly closed.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)

None known.

Supplemental information

None.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
ACETIC ACID		64-19-7	20 - 80
TRIMELLITIC ACID		528-44-9	≤ 70
WATER		7732-18-5	≤ 30
BENZENE POLYCARBOXYLIC ACIDS		Not Applicable	≤ 10
TRIMELLITIC ANHYDRIDE	5-Isobenzofurancarboxylic acid, 1,3-dihydro-1,3-dioxo-TMA TMA LOA	552-30-7	≤ 5
CERIUM SALTS		Mixture	< 1
COBALT INORGANIC SALTS, SOLUBLE		N/A	< 1
MANGANESE INORGANIC SALTS, SOLUBLE		Not Applicable	< 1
ZIRCONIUM SALTS		Not Applicable	< 1

Composition comments

Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

This Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information.

4. First-aid measures

Inhalation

Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). Treat symptomatically and supportively.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

Skin contact	Immediately flush skin with plenty of water, for at least 15 minutes, after removing contaminated clothing and shoes. In case of chemical burns, cover area with sterile dry dressing, bandage securely but not too tightly. GET IMMEDIATE MEDICAL ATTENTION.
Eye contact	Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods. Flush immediately with large amounts of water for at least 30 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. GET IMMEDIATE MEDICAL ATTENTION.
Ingestion	Do not induce vomiting. Rinse mouth out with water. If victim is conscious and alert, give 1-3 glasses of water or milk to dilute stomach contents.
Most important symptoms/effects, acute and delayed	Never give anything by mouth to an unconscious person. GET IMMEDIATE MEDICAL ATTENTION. INHALATION: May cause severe burns and tissue damage to the respiratory tract. Symptoms may include throat burns, constriction of the windpipe (bronchospasms), severe pulmonary edema and death, depending on the concentration and duration of exposure. Trimellitic anhydride (TMA) is a respiratory sensitizer. In susceptible individuals, i.e., those that have developed antibodies to TMA, repeated inhalation of dust or vapor may result in an immediate onset of asthma-like symptoms (coughing, sneezing, tightness in the chest, and wheezing) or delayed respiratory effects.
Indication of immediate medical attention and special treatment needed	SKIN: CORROSIVE. Contact can cause burns and permanent damage to eye tissue. Skin contact may cause harmful effects in other parts of the body. EYES: CORROSIVE. Contact can cause burns and permanent damage to eye tissue. Can cause blindness. INGESTION: CORROSIVE. Swallowing this material may be harmful or cause death. Harmful effects include burns and permanent damage to the digestive tract, including the mouth, throat, stomach and intestines. Symptoms may include severe abdominal pain and vomiting of blood. Blood loss through damaged tissue can lead to low blood pressure and shock. INGESTION: This material is primarily an irritant and corrosive. As a corrosive, give attention to potential complication of esophagus or stomach perforations if ingested. Use of emetics and lavage are contraindicated. Necrosis and associated inflammatory processes peak at about 48 hours, but may extend up to four days. Initial healing processes occur during the period 4 to 14 days, but the esophageal wall is weakest during this period. Signs and symptoms of CNS depression, confusion and convulsions should be considered in the assessment and treatment of victims of exposures. INHALATION: Treat as corrosive material. Monitor for possible pharyngeal and pulmonary edema. Onset may be delayed up to 24 hours from the time of exposure. Administer supplemental oxygen with assisted ventilation, as required.

5. Fire-fighting measures

Suitable extinguishing media	Small Fires: CO ₂ , dry chemical, dry sand, alcohol-resistant foam. Large Fires: Water spray, fog or alcohol resistant foam.
Unsuitable extinguishing media	Small Fires: Do not use water. Large Fires: Do not use a solid water stream as it may scatter and spread fire.
Specific hazards arising from the chemical	Combustion may produce CO _x , reactive hydrocarbons, irritating vapors, and other decomposition products in the case of incomplete combustion. Material will burn in a fire. Vapors may travel considerable distance to a source of ignition and flash back. Vapors may travel considerable distance to a source of ignition and flash back. Fire will produce irritating, corrosive and/or toxic gases. Reacts with most metals to produce hydrogen gas which can form an explosive mixture with air. Explosion hazard if exposed to extreme heat.

Special protective equipment and precautions for firefighters

Do not add water. Water applied directly can result in the evolution of heat. This material can react with metals to liberate flammable hydrogen gas. Always stay away from tanks engulfed in flame. Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor, cool adjacent structures, and to protect personnel attempting to stop a leak.

Containers can build up pressure if exposed to heat (fire). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire. Always stay away from tanks engulfed in flame. Use water spray to cool adjacent structures and to protect personnel. Do not get water inside containers. Shut off source of flow, if possible.

Firefighters must wear NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. For spills in confined areas, ensure adequate ventilation. For spills outdoors, stay upwind. IF TANK, RAILCAR OR TANK TRUCK IS INVOLVED IN A FIRE, isolate for 800 meters (1/2 mile) in all directions. Evacuate area endangered by release as required. Wear appropriate personal protective equipment. See Exposure Controls/Personal Protection (Section 8).

Methods and materials for containment and cleaning up

Keep unnecessary people away. Isolate area for at least 50 meters (150 feet) in all directions to preserve public safety. For large leaks, consider initial evacuation for at least 300 meters (1000 feet).

Keep ignition sources out of area and shut off all ignition sources. Use non-sparking tools and grounded equipment for clean-up. Small spills may be covered with dry sand or other non-combustible material. Use non-sparking tools to collect material and place in a vented non-reactive container for disposal. Large spills may be neutralized with dilute alkaline solutions of soda ash, or lime.

Use vapor suppressing foam to reduce vapors. Do not touch or walk through spilled material. Avoid clean up procedures that may result in water pollution. Stop leak when safe to do so. See Exposure Controls/Personal Protection (Section 8).

Environmental precautions

Prevent entry into water ways, sewers, basements or confined areas. Notify local, provincial and/or federal authorities, if required.

7. Handling and storage

Precautions for safe handling

Bond and ground lines and equipment (tank, transfer lines, pump, floats, etc.) used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not use electronic devices while handling, unless the device is certified as intrinsically safe as they could present ignition sources. Avoid contact with strong oxidizers, strong bases/alkalis, strong reducing agents, active metals, and soluble carbonates. Prevent small spills to minimize slip hazard or release to the environment. Do not cut, grind, drill, weld (or introduce any other ignition source) on empty containers. Do not reuse containers unless adequate precautions are taken. Keep from any possible contact with water. Do not use with materials or equipment sensitive to acidic solutions.

Avoid personal contact with this material. Always observe good personal hygiene measures, such as removing contaminated clothing and protective equipment, washing after handling the material and before entering public areas. Restrict eating, drinking and smoking to designated areas to prevent personal chemical contamination. Routinely wash work clothing and protective equipment to remove contaminants. Do not breathe fumes or vapor. See Section 8 of the SDS for Personal Protective Equipment.

Conditions for safe storage, including any incompatibilities

Avoid contact with strong oxidizers, strong bases/alkalis, strong reducing agents, active metals, and soluble carbonates. Store in tightly closed containers in cool, dry area away from heat and incompatibles. Store in corrosive resistant container with a resistant inner liner. Empty containers may contain material residue. Do not reuse without adequate precautions.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
ACETIC ACID (CAS 64-19-7)	TWA	10 ppm	

Material Name: TMA UNIT, GROUP B (STREAMS 305, 408, 502, 802, 808)

SDS US

1002 Version #: 03

Version Date: 01-12-2018

4 / 12

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
COBALT INORGANIC SALTS, SOLUBLE	PEL	0.1 mg/m3	Dust and fume.
MANGANESE INORGANIC SALTS, SOLUBLE	Ceiling	5 mg/m3	Fume.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
ACETIC ACID (CAS 64-19-7)	STEL	15 ppm	
	TWA	10 ppm	
COBALT INORGANIC SALTS, SOLUBLE	TWA	0.02 mg/m3	
MANGANESE INORGANIC SALTS, SOLUBLE	TWA	0.1 mg/m3	Inhalable fraction.
		0.02 mg/m3	Respirable fraction.
TRIMELLITIC ANHYDRIDE (CAS 552-30-7)	STEL	0.002 mg/m3	Inhalable fraction and vapor.
	TWA	0.0005 mg/m3	Inhalable fraction and vapor.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
ACETIC ACID (CAS 64-19-7)	STEL	15 ppm	
	TWA	10 ppm	
COBALT INORGANIC SALTS, SOLUBLE	TWA	0.05 mg/m3	Dust and fume.
MANGANESE INORGANIC SALTS, SOLUBLE	STEL	3 mg/m3	Fume.
	TWA	1 mg/m3	Fume.
TRIMELLITIC ANHYDRIDE (CAS 552-30-7)	TWA	0.04 mg/m3	
		0.005 ppm	
ZIRCONIUM SALTS	STEL	10 mg/m3	
	TWA	5 mg/m3	

Biological limit values
ACGIH Biological Exposure Indices

Components	Value	Form	Determinant	Specimen	Sampling Time	Notes
COBALT INORGANIC SALTS, SOLUBLE	15 µg/l	Urine	Cobalt	Urine	*	Urine
	1 µg/l	Blood	Cobalt	Blood	*	Blood

* - For sampling details, please see the source document.

Exposure guidelines

NOTE: The preceding components are the only components of the material which have a PEL, TLV, or other recommended exposure limit. At this time, the other components have no known exposure limit.

US ACGIH Threshold Limit Values: Skin designation

TRIMELLITIC ANHYDRIDE (CAS 552-30-7)

Can be absorbed through the skin.

Appropriate engineering controls

Ventilation and other forms of engineering controls are the preferred means for controlling exposures below occupational exposure limits and guidelines.

Generally, this material is contained within vessels and piping designed to withstand expected operating conditions. Certain operations, such as loading, unloading and on-line sampling, generally involve higher risk of exposure, and special equipment is often designed for these activities.

Individual protection measures, such as personal protective equipment
Eye/face protection

Keep away from eyes. Eye contact can be avoided by using chemical/dust goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

Skin protection**Hand protection**

Prevent any skin contact with this material. Use appropriate chemical resistant gloves. Glove suitability for a job must be determined by the user for specific use conditions. Contact the glove manufacturer for specific advice on glove selection regarding permeability and breakthrough times for your use conditions. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Other

Dermal exposure to this chemical may add to the overall exposure.

Prevent any skin contact with this material. Use appropriate chemical resistant gloves, clothing and eye/face protection.

Respiratory protection

A NIOSH approved air purifying respirator with an appropriate acid gas cartridge may be used in circumstances where airborne concentrations may exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. See OSHA 29 CFR 1910.134 for more information regarding respiratory protection and Assigned Protection Factors (APFs).

Thermal hazards

No special precautions required.

9. Physical and chemical properties**Appearance****Physical state**

Liquid.

Form

Not applicable

Color

Pale yellow

Odor

Acrid, Vinegar-like.

Odor threshold

Not available.

pH

< 3

Melting point/freezing point

Not available

Initial boiling point and boiling range

> 240 °F (> 115.6 °C) (estimated)

Flash point

> 100 °F (> 37.78 °C) (estimated)

Evaporation rate

Not available

Flammability (solid, gas)

Not applicable.

Upper/lower flammability or explosive limits**Explosive limit - lower (%)**

Not available.

Explosive limit - upper (%)

Not available.

Vapor pressure

Not available

Vapor density

Not available

Relative density

Not available.

Solubility(ies)**Solubility (water)**

Not available.

Partition coefficient (n-octanol/water)

Not available

Auto-ignition temperature

Not available

Decomposition temperature

Not available.

Viscosity

Not available

10. Stability and reactivity**Reactivity**

See statements below.

Chemical stability

Material is stable under normal conditions.

Possibility of hazardous reactions

Not anticipated under normal conditions.

Conditions to avoid

Avoid unventilated areas, heat, open flames, sparks and ungrounded electrical equipment.

Incompatible materials

Avoid contact with strong oxidizers, strong bases/alkalis, strong reducing agents, active metals, and soluble carbonates. See precautions under Handling & Storage (Section 7).

Hazardous decomposition products

Not anticipated under normal conditions.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Likely route of exposure
Skin contact	Likely route of exposure
Eye contact	Likely route of exposure
Ingestion	Likely route of exposure

Symptoms related to the physical, chemical and toxicological characteristics

INHALATION:
May cause severe burns and tissue damage to the respiratory tract. Symptoms may include throat burns, constriction of the windpipe (bronchospasms), severe pulmonary edema and death, depending on the concentration and duration of exposure.

Trimellitic anhydride (TMA) is a respiratory sensitizer. In susceptible individuals, i.e., those that have developed antibodies to TMA, repeated inhalation of dust or vapor may result in an immediate onset of asthma-like symptoms (coughing, sneezing, tightness in the chest, and wheezing) or delayed respiratory effects.

SKIN:
CORROSIVE. Contact can cause skin burns and permanent skin damage. Skin contact may cause harmful effects in other parts of the body.

EYES:
CORROSIVE. Contact can cause burns and permanent damage to eye tissue. Can cause blindness.

INGESTION:
CORROSIVE. Swallowing this material may be harmful or cause death. Harmful effects include burns and permanent damage to the digestive tract, including the mouth, throat, stomach and intestines. Symptoms may include severe abdominal pain and vomiting of blood. Blood loss through damaged tissue can lead to low blood pressure and shock.

Information on toxicological effects

Acute toxicity Not classified.

Components	Species	Test Results
ACETIC ACID (CAS 64-19-7)		
<u>Acute</u>		
Inhalation		
Vapor		
LC50	Rat	11.4 mg/l, 4 hr
Oral		
LD50	Rat	3200 - 3500 mg/kg
COBALT INORGANIC SALTS, SOLUBLE		
<u>Acute</u>		
Dermal		
LD50	Rat	> 2000 mg/kg
Oral		
LD50	Rat	766 mg/kg
MANGANESE INORGANIC SALTS, SOLUBLE		
<u>Acute</u>		
Inhalation		
LC50	Rat	> 4.5 mg/l
Oral		
LD50	Rat	275 - 1082 mg/kg
TRIMELLITIC ACID (CAS 528-44-9)		
<u>Acute</u>		
Dermal		
LD50	Rabbit	2000 mg/kg

Components	Species	Test Results
Inhalation		
LC50	Rat	> 2.33 mg/m³, 4 hr
Oral		
LD50	Rat	2730 mg/kg
TRIMELLITIC ANHYDRIDE (CAS 552-30-7)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
<i>Dust</i>		
LC50	Rat	> 2.33 mg/m³, 4 hr
Oral		
LD50	Rat	2730 mg/kg
WATER (CAS 7732-18-5)		
Acute		
Oral		
LD50	Rat	> 89800 mg/kg
Skin corrosion/irritation	Causes severe skin burns and eye damage.	
Serious eye damage/eye irritation	Causes serious eye damage.	
Respiratory or skin sensitization		
ACGIH sensitization		
TRIMELLITIC ANHYDRIDE, INHALABLE FRACTION AND VAPOR (CAS 552-30-7)	Dermal sensitization	
	Respiratory sensitization	
Respiratory sensitization	May cause allergy or asthma symptoms or breathing difficulties if inhaled.	
Skin sensitization	May cause an allergic skin reaction.	
Germ cell mutagenicity	Not classified.	
Carcinogenicity	May cause cancer by inhalation.	
ACGIH Carcinogens		
COBALT INORGANIC SALTS, SOLUBLE (CAS N/A)	A3	Confirmed animal carcinogen with unknown relevance to humans.
MANGANESE INORGANIC SALTS, SOLUBLE (CAS Not Applicable)	A4	Not classifiable as a human carcinogen.
ZIRCONIUM SALTS (CAS Not Applicable)	A4	Not classifiable as a human carcinogen.
IARC Monographs. Overall Evaluation of Carcinogenicity		
COBALT INORGANIC SALTS, SOLUBLE (CAS N/A)	2B	Possibly carcinogenic to humans.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)		
Not regulated.		
US. National Toxicology Program (NTP) Report on Carcinogens		
COBALT INORGANIC SALTS, SOLUBLE (CAS N/A)	Reasonably Anticipated to be a Human Carcinogen.	
Reproductive toxicity	May damage fertility or the unborn child.	
Specific target organ toxicity - single exposure	May cause irritation to the respiratory system.	
Specific target organ toxicity - repeated exposure	Not classified.	
Aspiration hazard	Not classified.	
Toxicological data		
ACETIC ACID: Severe eye and nasal irritation can occur at concentrations above 25 ppm. Air concentrations above 50 ppm are considered intolerable. Repeated exposures to high concentrations can cause conjunctival lesions, blackening of the hands, hyperkeratosis of the skin, teeth erosion, congestion and edema of the pharynx, bronchial constriction, and respiratory tract irritation.		

COBALT: Pneumoconiosis has been reported in studies of workers in the tungsten carbide tool industry where inhalation exposure to cobalt occurred. Symptoms including cough, dyspnea, decreased pulmonary function, diffuse nodular fibrosis and respiratory hypersensitivity have been observed in workers exposed to cobalt metal fumes and dust. Cardiomyopathy has been observed in person who consumed large quantities of beer containing cobalt. Respiratory tract lesions characterized by nodular accumulation of Type II epithelial cells, accumulations of enlarged highly vacuolated macrophages, interstitial inflammation and fibrosis were observed in sub-chronic inhalation studies in laboratory animals exposed. Other adverse effects observed in laboratory animal studies of cobalt oxides include changes in peripheral blood, hypoglycemia, and decreased thyroid function, and pathological changes in the liver and kidney. Portal-of-entry and other systemic tumors were observed in studies of laboratory animals receiving cobalt, cobalt oxides and cobalt sulfide by parenteral and subcutaneous injection. Respiratory tract tumors were observed in laboratory animals receiving cobalt oxides by intratracheal installation. Cobalt compounds have tested positive in some genotoxicity tests. The International Agency for Research on Cancer (IARC) has classified cobalt and cobalt compounds as possibly carcinogenic (2B) to humans.

MANGANESE COMPOUNDS: Inhalation of high concentrations of manganese dust has resulted in an increased incidence of respiratory disease, and has been reported to cause central nervous system effects if inhaled over a period of years. Symptoms may include irritability, difficulty in walking, speech disturbances, compulsive behavior and a Parkinson-like syndrome. Ingestion of large amounts of manganese salts can cause irritation of the gastrointestinal tract.

TRIMELLITIC ANHYDRIDE (TMA) is a known respiratory sensitizer. In susceptible individuals, the immediate onset of asthma-like symptoms may occur within minutes of exposure to dust or vapor. Alternatively, some sensitized individuals develop late onset respiratory systemic syndrome (LRSS also known as "TMA flu"). Symptoms of LRSS generally develop four to eight hours after exposure has ended, and recovery usually occurs within 6-12 hours. Flu-like symptoms include coughing, wheezing, breathlessness, congestion, fever, chills, fatigue, and generalized aching.

In rare instances, a sensitized individual may develop a more serious disorder known as pulmonary disease-anemia (PDA) characterized by homoptysis and hemolytic anemia, requiring hospitalization. This disorder is associated with exposure to fumes resulting from high-temperature vaporization processes. Initially, asthma-like symptoms occur with the possible presence of bloodstained sputum. Following recovery from a reaction, employees should not be assigned to duties where potential exposure may occur. Sensitization to TMA may result in an allergic reaction to other aromatic anhydrides. Likewise, sensitization to other anhydrides may result in allergic reaction to TMA.

Studies in laboratory rats mimic the human effects of TMA and result in immunologically mediated lung changes. Sensitization to TMA has been demonstrated in laboratory animals as a result of dermal (only) exposure. The relevance to humans isn't certain, but it may be assumed that workers may develop sensitization as a result of repeated dermal contact.

12. Ecological information

Ecotoxicity

Toxic to aquatic life with long lasting effects. Because of the high pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.

Components		Species	Test Results
ACETIC ACID (CAS 64-19-7)			
Aquatic			
<i>Acute</i>			
Algae	EC50	Algae	> 1000 mg/l, 72 hr
Crustacea	EC50	Daphnia magna	> 300.82 mg/l, 48 hr
Fish	LC50	Oncorhynchus mykiss	> 1000 mg/l, 96 hr
<i>Chronic</i>			
Fish	EC50	Oncorhynchus mykiss	34.3 mg/l, 21 d
COBALT INORGANIC SALTS, SOLUBLE			
Aquatic			
<i>Acute</i>			
Algae	EC50	Algae	0.1 - 0.2 mg/l, 72 hr
Crustacea	LC50	Daphnia magna	1.1 - 239 mg/l, 48 hr
Fish	LC50	Fish	1.1 - 333 mg/l, 96 hr

Components	Species		Test Results
<i>Chronic</i>			
Crustacea	EC50	Daphnia magna	0.01 mg/l, 21 d
Fish	NOEC	Pimephales promelas	0.21 mg/l, 34 d
MANGANESE INORGANIC SALTS, SOLUBLE			
Aquatic			
<i>Acute</i>			
Algae	NOEC	Algae	30.72 mg/l, 7 d
Crustacea	LC50	Crustacea	3 - 13.7 mg/l, 96 hr
Fish	LC50	Fish	49.9 mg/l, 96 hr
<i>Chronic</i>			
Crustacea	NOEC	Crustacea	20 µg/l, 14 d
Fish	NOEC	Fish	0.55 mg/l, 65 d
TRIMELLITIC ACID (CAS 528-44-9)			
Aquatic			
<i>Acute</i>			
Algae	EC50	Algae	> 739 mg/l, 72 hr
Crustacea	EC50	Daphnia magna	> 792 mg/l, 48 hr
Fish	LC50	Fish	> 957 mg/l, 96 hr
TRIMELLITIC ANHYDRIDE (CAS 552-30-7)			
Aquatic			
<i>Acute</i>			
Algae	EC50	Algae	> 739 mg/l, 72 hr
Crustacea	EC50	Daphnia magna	> 792 mg/l, 48 hr
Fish	LC50	Fish	> 957 mg/l, 96 hr

Persistence and degradability	Readily biodegradable in the environment.
Bioaccumulative potential	Not likely to bioaccumulate in aquatic organisms.
Mobility in soil	May move through soil and reach groundwater. TMA or trimellitic acid released to the environment is expected to partition primarily to the water (99.2%) with small amounts in the soil (<1%) and the air and sediment (<0.1%).
Other adverse effects	No other adverse effects expected.

13. Disposal considerations

Disposal instructions	The transportation, storage, treatment and disposal of waste material must be conducted in compliance with federal, state, and local regulations. Under RCRA it is the responsibility of the user of the material to determine, at the time of disposal, whether this material meets RCRA criteria for hazardous waste. For additional handling information and protection of employees, see Section 7 (Handling and Storage) and Section 8 (Exposure Controls/Personal Protection).
Hazardous waste code	The proper waste code must be evaluated at the time of disposal and should be determined by the user and waste disposal company.
Waste from residues / unused products	Dispose of this material in accordance with all applicable local and national regulations.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal in accordance with government regulations. Packaging may contain residue that can be hazardous.

14. Transport information

General information	Due to the possible variances of this material, shipping classification has not been predetermined. The shipping classification must be evaluated at the time of shipment. Please consult 49 CFR 171 - 180 for specific shipping information or Transportation Compliance System Owner (CSO). The proper shipping name must be determined by analysis or specific generator's knowledge regarding variances of this product.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not classified for MARPOL. Please contact the Transportation Compliance CSO if transportation mode is ship or vessel to determine the need for a MARPOL classification.

15. Regulatory information

US federal regulations

Intermediate streams that are not isolated are not required to be listed on the active TSCA inventory. The active TSCA inventory status for this intermediate stream has not been determined.

This material may contain toxic chemical(s) in excess of the applicable de minimis concentration that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372). This information must be included in all SDSs that are copied and distributed for this material.

This material contains up to 100% volatile organic compounds (VOCs) per 40 CFR Part 51.100.

Check local, regional or state/provincial regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to comply may result in substantial civil and criminal penalties.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

ACETIC ACID (CAS 64-19-7)

Listed.

SARA 304 Emergency release notification

Not regulated.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

COBALT INORGANIC SALTS, SOLUBLE (CAS N/A) 0.1 %

MANGANESE INORGANIC SALTS, SOLUBLE (CAS Not Applicable) 1.0 %

Applicable)

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical

Yes

Classified hazard categories

Flammable (gases, aerosols, liquids, or solids)
Corrosive to metal
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitization
Carcinogenicity
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
COBALT INORGANIC SALTS, SOLUBLE	N/A	< 1

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

COBALT INORGANIC SALTS, SOLUBLE (CAS N/A)

MANGANESE INORGANIC SALTS, SOLUBLE (CAS Not Applicable)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)

Hazardous substance

Safe Drinking Water Act (SDWA)

Not regulated.

FEMA Priority Substances Respiratory Health and Safety in the Flavor Manufacturing Workplace

ACETIC ACID (CAS 64-19-7)

High priority

US state regulations

California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins. For more information go to www.P65Warnings.ca.gov.

16. Other information, including date of preparation or last revision

Issue date	10-30-2014
Revision date	01-12-2018
Version #	03
Further information	Stream 305: Reactor effluent to MD-401 Stream 408: MD-403 Crystallizer Outlet Stream 411: Dilute solvent to MD-801 Stream 501: MM-501 Filter Cake Stream 502: MD-502 Mother Liquor Stream 802: MD-801 Bottom Stream 808: MT-804 Bottoms
HMIS® ratings	Health: 3* Flammability: 2 Physical hazard: 1 * Indicates chronic health hazard
NFPA ratings	Health: 3 Flammability: 2 Instability: 1
Disclaimer	THIS SDS HAS BEEN PREPARED TO COMPLY WITH FEDERAL REGULATIONS THAT ARE INTENDED TO QUICKLY PROVIDE USEFUL INFORMATION TO THE USER(S) OF THIS MATERIAL OR PRODUCT - IT IS NOT INTENDED TO SERVE AS A COMPREHENSIVE DISCUSSION OF ALL POSSIBLE RISKS OF HAZARDS, BUT RATHER PROVIDES INFORMATION GENERALLY ACCEPTED IN THE SCIENTIFIC COMMUNITY AS RELEVANT REGARDING THE POTENTIAL HAZARDS OF THIS PRODUCT. ADEQUATE TRAINING, INSTRUCTION, WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS. USERS SHOULD REVIEW THE INFORMATION IN THE SDS, AND SATISFY THEMSELVES AS TO ITS SUITABILITY AND COMPLETENESS, INCLUDING ENSURING THAT THIS IS THE MOST CURRENT SDS.
Revision Information	Identification: Recommended restrictions Hazard(s) identification: Hazard statement Hazard(s) identification: Response Hazard(s) identification: Supplemental information Composition / Information on Ingredients: Ingredients First-aid measures: General information Physical & Chemical Properties: Multiple Properties Regulatory information: California Proposition 65 Regulatory information: US federal regulations
Completed by	Flint Hills Resources, LP - Operations EH&S