

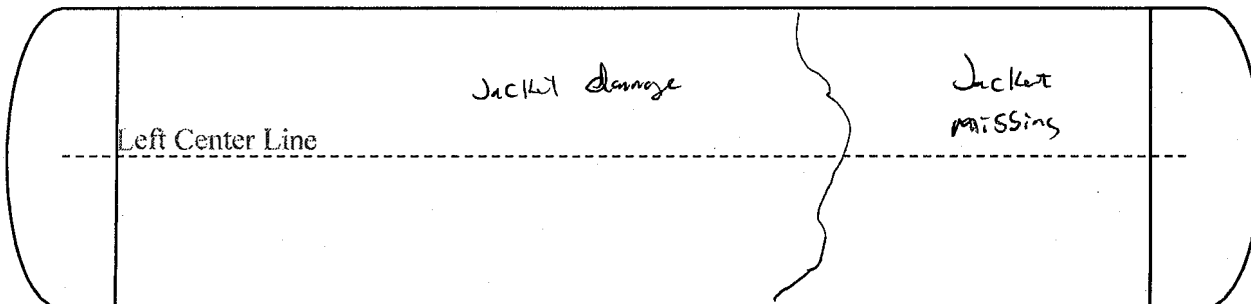
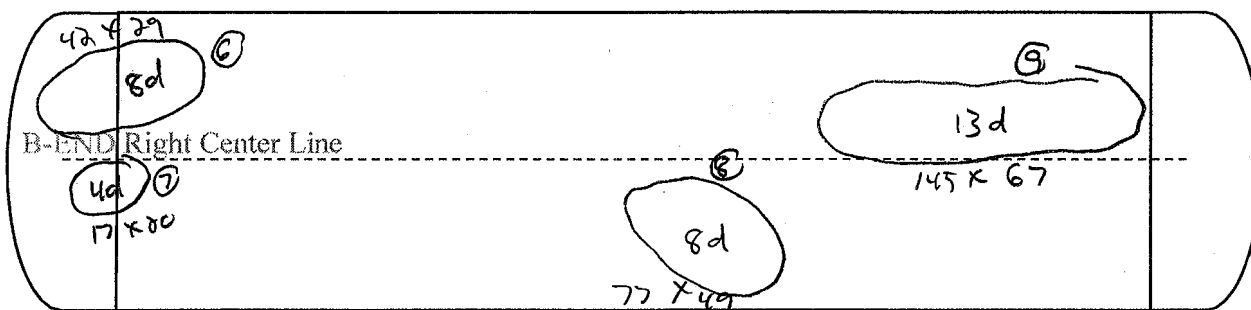
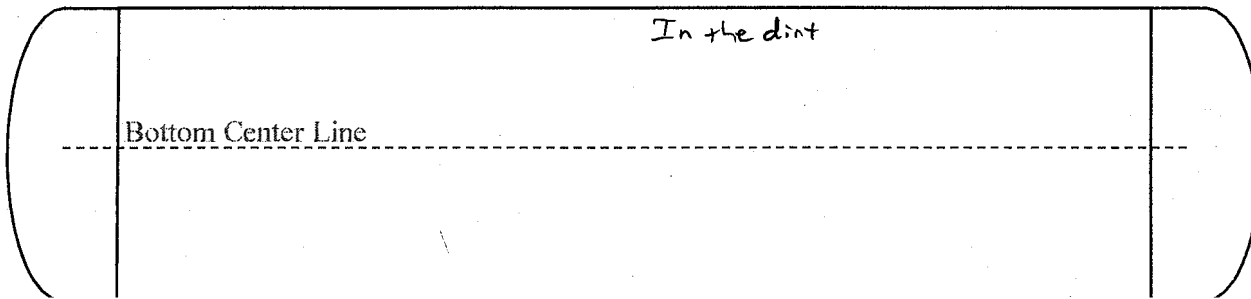
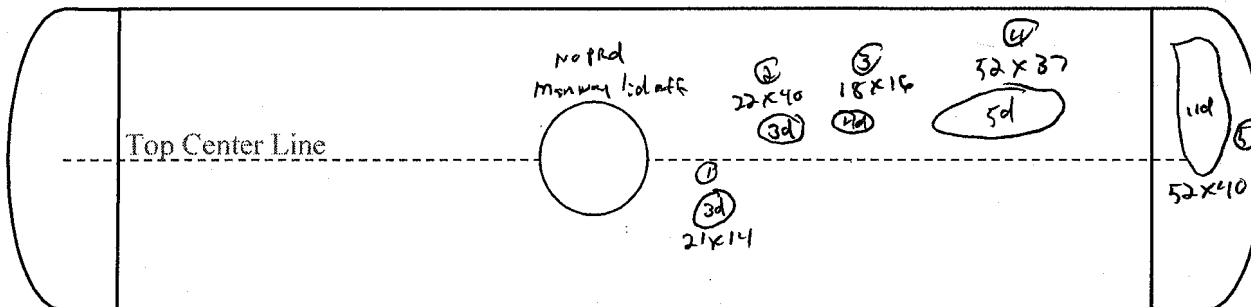


Federal Railroad Administration Tank Car Damage Assessment Form

Reporting Marks	GATX 69298		Car Location City/State	Reed Point, Montana
Date inspected	6/29/23	Railroad	MRL	DOT Specification
	UN2448		Was product released?	Yes
(Jacket thickness)	Jacket 0.1196	Non-jacketed	Does car contain product	Yes
Car builder	TILX	Stub Sill Design	Built Date	12/1/1990
Capacity (GAL)	13,856		LD Limit (LB)	20,300

Indicate number on figures below within damaged areas. (Sketched in by inspector.)

A-END

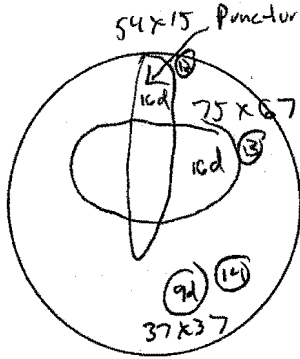
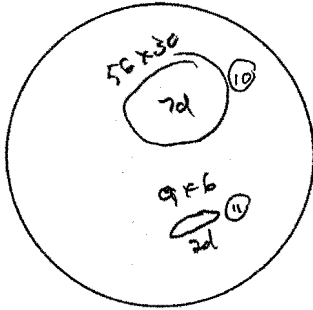




Federal Railroad Administration
Tank Car Damage Assessment Form

B-Head

A-Head



	Station Stencil	Qual.	Due
Tank Qual.	MRN	2013	2023
Thickness	MRN	2013	2023
Serv. Equip.	GACA	2019	2025
PRD			
Lining	GACA	2019	2025
Rule 88	MRN	2013	2023
Stub Sill	MRN	2013	2023

Comments:

A Head puncture with 1/4 of jacket material missing. B head dented with no jacket.

TANK OR JACKET DAMAGE

1. Document estimated location of damage on Figures located on page 1 of this report and document dimensions coinciding with number below. (Photos should be numbered and attached to coincide with numbers below.)

1	Affected?	Tank	Location?	Top, Middle	Dimensions:	Length	21	Width		Depth	3
-	Defect type?	Dent	Shape?	Circle	Possible Cause?	Derailment off a bridge into river.					
2	Affected?	Tank	Location?	Top, Middle	Dimensions:	Length	22	Width	40	Depth	3
-	Defect type?	Dent	Shape?	Circle	Possible Cause?	Derailment off a bridge into river.					
3	Affected?	Tank	Location?	Top, Middle	Dimensions:	Length	18	Width	16	Depth	4
-	Defect type?	Dent	Shape?	Circle	Possible Cause?	Derailment off a bridge into river.					
4	Affected?	Tank	Location?	Top, Middle	Dimensions:	Length	52	Width	37	Depth	5
-	Defect type?	Dent	Shape?	Oval	Possible Cause?	Derailment off a bridge into river.					
5	Affected?	Tank	Location?	Top, B end	Dimensions:	Length	52	Width	40	Depth	11
-	Defect type?	Dent	Shape?	Oval	Possible Cause?	Derailment off a bridge into river.					
6	Affected?	Tank	Location?	Right, B end	Dimensions:	Length	42	Width	29	Depth	8
-	Defect type?	Dent	Shape?	Oval	Possible Cause?	Derailment off a bridge into river.					
7	Affected?	Tank	Location?	Right, B end	Dimensions:	Length	17	Width	20	Depth	4
-	Defect type?	Dent	Shape?	Oval	Possible Cause?	Derailment off a bridge into river.					
8	Affected?	Tank	Location?	Right, Middle	Dimensions:	Length	77	Width	49	Depth	8
-	Defect type?	Dent	Shape?	Oval	Possible Cause?	Derailment off a bridge into river.					
9	Affected?	Tank	Location?	Right, A end	Dimensions:	Length	145	Width	67	Depth	13
-	Defect type?	Dent	Shape?	Oval	Possible Cause?	Derailment off a bridge into river.					
10	Affected?	Tank	Location?	B Head	Dimensions:	Length	56	Width	30	Depth	7
-	Defect type?	Dent	Shape?	Circle	Possible Cause?	Derailment off a bridge into river.					
11	Affected?	Tank	Location?	B Head	Dimensions:	Length	9	Width	6	Depth	2
-	Defect type?	Dent	Shape?	Oval	Possible Cause?	Derailment off a bridge into river.					
12	Affected?	Tank	Location?	A Head	Dimensions:	Length	54	Width	15	Depth	16
-	Defect type?	Puncture	Shape?	Oval	Possible Cause?	Derailment off a bridge into river.					
13	Affected?	Tank	Location?	A Head	Dimensions:	Length	75	Width	67	Depth	16
-	Defect type?	Dent	Shape?	Oval	Possible Cause?	Derailment off a bridge into river.					
14	Affected?	Tank	Location?	A Head	Dimensions:	Length	37	Width	37	Depth	9
-	Defect type?	Dent	Shape?	Circle	Possible Cause?	Derailment off a bridge into river.					



Federal Railroad Administration
Tank Car Damage Assessment Form

-	Defect type?		Shape?		Possible Cause?						
15	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
16	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
17	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
18	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
19	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
20	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
21	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
22	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
23	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
24	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
25	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
26	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
27	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
28	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						
29	Affected?		Location?		Dimensions:	Length		Width		Depth	
-	Defect type?		Shape?		Possible Cause?						

2. Was this tank car exposed to fire? (Indicate one) Yes No
3. How long was the car exposed to fire? _____ N/A
4. What percentage/locations of the tank were exposed to fire? _____ % Indicate location in figures on page 1.
5. What material burned to create the fire that the car was exposed to?
6. To what degree did the car roll? Initially _____ degrees and stopped at _____
7. Distance traveled from track center? B-end? _____ A-end? _____ Center? _____
8. Brief description of details of surfaces tank was exposed to in transit to present location? E.g. mud, track, rocks, etc...

Rocks, mud, broken rail/bridge and river.



Federal Railroad Administration
Tank Car Damage Assessment Form

VALVE DAMAGE

Utilize Form TCAD-1.2 and supplement description as indicative of damage below:

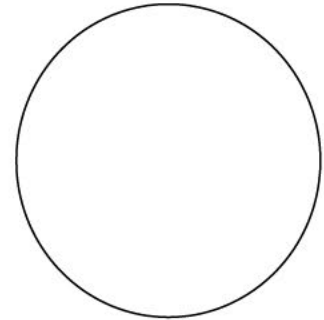
TOP

1. Number of damaged valves? _____ Document station stencil if other than qual. Decal _____

a	Type of damaged valve?		Manufacturer?		Cause?	
-	Gasket Type?		O-ring type?		Serial Number	
b	Type of damaged valve?		Manufacturer?		Cause?	
-	Gasket Type?		O-ring type?		Serial Number	
c	Type of damaged valve?		Manufacturer?		Cause?	
-	Gasket Type?		O-ring type?		Serial Number	
d	Type of damaged valve?		Manufacturer?		Cause?	
-	Gasket Type?		O-ring type?		Serial Number	
e	Type of damaged valve?		Manufacturer?		Cause?	
	Gasket Type?		O-ring type?		Serial Number	

Sketch in dome or dual housing arrangement information in relation to valve location in provided figure. Valve Lettering should coincide with lettering above, along with any attached pictures.

A-End



BOTTOM

2. Description of damage? Valve, Coils etc... _____ Document station stencil if other than qual. Decal _____

a	Type of damaged valve?		Manufacturer?		Cause?	
-	Gasket Type?		O-ring type?		Serial Number	
b	Type of damaged valve?		Manufacturer?		Cause?	
-	Gasket Type?		O-ring type?		Serial Number	
c	Type of damaged valve?		Manufacturer?		Cause?	
-	Gasket Type?		O-ring type?		Serial Number	
d	Type of damaged valve?		Manufacturer?		Cause?	
-	Gasket Type?		O-ring type?		Serial Number	
e	Type of damaged valve?		Manufacturer?		Cause?	
	Gasket Type?		O-ring type?		Serial Number	

Other information or description deemed pertinent by inspector:

Jacket ripped off from the middle of the tank car to the B head. A head puncture, manway cover missing which released hazmat into the environment. Bottom outlet valve handle securement structure was missing and valve was partway open but the bottom outlet valve was intact. Tank car recovered from the river due to derailment/bridge collapse.

Inspector's Name (print Anthony W. Emery II) Inspector's Signature



GATX 69298 A end.



GATX 69298 left side, A end.



GATX 69298 B end.



GATX 69298 left side B end.

Message Header			
Partner: AWI	Control #: 19729589	Type: 404	Date/Time: 2023-06-21 09:08:00.0
Correlation Id: 1687356475747.132277926AX	Base Correlation Id:	Interface: E	Message Source Cd: A3
Protocol Cd: MQ	App Data Format:	Transmit Cd: O	From Env Cd:
Message Size: 887			

Message Detail

ISA*00* *00*LRICHAR *02*AWI *02*BNSF *230621*0907*U*00503*019729589*1*P*~
GS*SR*AWI*BNSF*20230621*0907*19729589*X*005030
ST*404*19729589
BX*00*R*PP**BNSF*L*B*S
BNX*A
M3*B*20230621*0907*CT
N9*RP*AWI1134912**20230621*0907*CT
N9*6O*AWI-UNIQUE-19729589**20230621*0907*CT
N9*BM*411650**20230621*0907*CT
N7*GATX*69298*196910*N*****RR
F9**LAUREL*MT
D9**DON*ID
N1*SH*CHS INC*C5*143597859
N3*803 US HWY 212 S
N4*LAUREL*MT*59044-8731
PER*NT*LINDSAY EDELMAN*TE*406 [REDACTED]
N1*CN*J R SIMPLOT
N3*1150 W HWY 30
N4*DON*ID*83201
N1*PF*INTERNATIONAL CHEMICAL CO
N3*1887 E. 71ST ST.
N4*TULSA*OK*741363922
R2*MRL*I
R2*BNSF*S*SVRBO***R
R2*UP*1***R
LX*1
L5*1*SULFUR*4945770*T
L0*1***0* ***1*TKR
LS*1
LH1*C4*1*NA2448**4945770*****III
LH2*9*P
LH3*SULFUR, MOLTEN*D
PER*HM*CHEMTREC CCN23163*TE*800-424-9300
LE*1
LH6*BRANDON GAUTHIER

Message Detail

SE*34*19729589

GE*1*19729589

IEA*1*019729589

Waybill Copy

BNSF 06/25 05:02:47 WME
- 777

777 - BNSF RAILWAY COMPANY

* H A Z M A T *

GATX 69298 T98 128 3 98 062108 06/21/23 886437 UP

04066 DON

ID

30855 LAUREL

MT

MISSOULA

MT

S

BNSF SVRBO UP

CHS

411650

803 US HWY 212 S

0000

JR SIMPLOT CO
1150 W HWY 30

DON

ID

WWIB WEIGHT AGREEMENT

YES
TO BE PREPAID

4945770

HAZARDOUS SHIPMENT TOTAL LADING WT 196910
1 TNK // 196910 LB

NA2448 // SULFUR, MOLTEN
9 // PG III

EMERGENCY CONTACT: 800-424-9300
SHIPPER CONTACT: CHEMTREC CCN23163

HAZMAT STCC=4945770
NATURAL KEY WB-ID 3708-06-21-09.08.01.662023 WB-VRSN 002

EDI 404 WGHT CD: A
SULFUR

VOLUME 196910 LB

HAZ CERT BRANDON GAUTHIER

EDI 404 RECVD FROM AWI MSG SEQ# 19729589 ON 20230621 AT 0908 BILL CD S

Spec Cond Codes N9 TN overridden by WBMSPLAC 06/21/23 09:08

PROJ RT I BNSF SVRBO I UP

HTUA SPEED RESTRICTION MAY APPLY. SEE SSI.

GATX 69298 PAGE 1 OF 2

TP INTLCHEMICAL 1887 E 71ST ST
ZS LOUPLOGISTIC
ZS MARKITSERVIC
ZS SHIPXPRESS
SERVICE SCHEDULING
2023-06-21 04.45.00 2023-06-21 08.08.02

WEIGHT AND CHARGE TO FOLLOW PREPAID
TULSA OK 0755660001

YRDPDRCR
S B JOINER

***** Yard System *****
- Car Inquiry -

06/25/23
03:02:49PT 4 >
STCC: 4945770

GATX 69298 <T98/T50> on trn M-LAUMIS1-23A seq 47 departed LAURMT 06/24 0505 23
IN POOL P0000 LENGTH = 42 FT 1 in

L	Online	J	RAJP/	Offline	Dest	Evnt				Station
E	Destin	T	IndNum	Care of/Cust	Contents	CdSt	Trk	Date	Time	Train
L	SILBOW	UP		SILBOWMT	HAZMAT	TD	207	0624	0505	M-LAUMIS1-23ALAURMT
L	SILBOW	UP		SILBOWMT	HAZMAT	SWWE	207	0622	1849	Y-LAU2242-22GLAURMT
L	SILBOW	UP		SILBOWMT	HAZMAT	SWWE	203	0622	0410	Y-LAU3362-21GLAURMT
L	SILBOW	UP		SILBOWMT	HAZMAT	SWWE	210	0622	0210	Y-LAU2151-21ILAURMT
L	SILBOW	UP		SILBOWMT	HAZMAT	SWWE	300	0621	2022	Y-LAU2151-21ILAURMT
L	SILBOW	UP		SILBOWMT	HAZMAT	SWWE	298	0621	0853	Y-LAU3151-21GLAURMT
L	SILBOW	UP		SILBOWMT	HAZMAT	WBOA	900	0621	0808	LAUREL MT
L	LAURMT			T/BLAUCHS	LOAD	RIPR	900	0621	0445	Y-LAU3151-21GLAURMT
L	LAURMT			T/BLAUCHS	LOAD	RIRL	1204	0621	0444	LAUREL MT
E	LAURMT	120406	CHS		HAZMAT	APIP	1204	0619	1915	Y-LAU2151-19ILAURMT
E	LAURMT	120406	CHS		HAZMAT	OTIP	1208	0619	1052	LAUREL MT
E	LAURMT	120801	CHS		HAZMAT	PNFN	1208	0617	2005	LAUREL MT
E	LAURMT	120801	CHS		HAZMAT	APPL	1208	0617	1943	Y-LAU2151-17ILAURMT
E	LAURMT	120801	CHS		HAZMAT	SWWE	128	0617	1544	Y-LAU1161-17GLAURMT
E	LAURMT	120801	CHS		HAZMAT	OT	305	0617	1210	LAUREL MT

Car is ordered using-CISS

***** End of Data *****

06/21/2023 CHS INC B/L # 411650

Shipper CHS INC LAUREL MT 59044-8731
 803 US HWY 212 S

Consignee J R SIMPLOT DON ID 83201
 1150 W HWY 30

Third Party Pay INTERNATIONAL CHEMICAL CO TULSA OK 741363922
 1887 E. 71ST ST.

Origin: LAUREL MT Prepared by: LINDSAY EDELMAN
 Destination: DON ID Phone Number: 4066285208
 Sec 7 (Y/N): Yes
 Freight Charges: "To Be Prepaid"

Route Details:

Origin Switch Road: MRL Junction: Delivery Switch Road: Junction:
 Route: BNSF SVRBO UP
 Rule 11 (Y/N): No
 Contract(s) #:
 SULFUR 4945770 Loaded 1 Tank Car Agreement Weights
 Net Weights
 196,910 Pounds

HAZARDOUS MATERIALS
 1 Carload
 NA2448 // SULFUR, MOLTEN
 9 // PG III

Emergency Telephone : 800-424-9300
 Emergency Offeror & Contract# or Holder : CHEMTREC CCN23163
 HAZMAT STCC = 4945770

This is to certify that the above-named materials are properly classified,
 described, packaged, marked and labeled, and are in proper condition for
 transportation according to the applicable regulations of the department of
 transportation.

BRANDON GAUTHIER

SULFUR

INIT NUMBER	WEIGHT	SEALS	DUNNAGE REFERENCE
GATX 69298	196910		0

STATUS: Accepted-824 Date: 06/21/2023 Time: 09:07 CST WAYBILL #: 886437

Outage Calculation for Sulfur Railcars

Car Number GATX 69298

Load Limit 203000

Capacity 13856

Load Temperature 221

Select Weight Per Gal 14.9997022

Outage Gallons 888

10"

ACTUAL outage 30"



Attention
Needed

Sulfur Tank Car Inspection

Car Number GATX 69298 ✓ Track/Spot 1204 Spot 6 Date Tuesday, June 20, 2023
 Placard NA2448 Product SULFUR Tank car Capacity 13856 ✓
 Order # 2000 Manway Style GATX3 RR Load Limit 203000 ✓

Pre-Loading Inspection

All information above is accurate with the Car and the Loading HMI/Accuload. The Car has sufficient capacity, by weight and volume, to contain the product being loaded	X
Qualification stencils have been reviewed, and the Car is not overdue for any tests, qualifications, or inspections <i>due 23/25</i>	X
Car has good overall integrity with no damage or visible defects and shows no signs of leakage	X
All placard holder, ladders, handrails, running boards, and platforms are not corroded or damaged	X
All safety appliances are in proper condition and have no residue or corrosion	X
The Car has no items attached that may indicate a security breach	X
All Fittings, valves, gaskets and fasteners are in proper condition • Materials are not corroded, torn, worn, stripped or damaged	X
Any residue in the car is less than 3" and compatible with the product being loaded.	X
All wheels, trucks, brakes, springs in good condition • Materials are not corroded, torn, worn, stripped or damaged	X
Both couplers are double shelf couplers	X
All caps, plugs or removable components are properly chained to the tank car	X
The bottom outlet caps, valves, gaskets and plugs are in proper condition and have no signs of leakage from bottom unloading components	X
The bottom outlet valve is confirmed to be fully closed	X
The manway and cover assembly is functional, properly aligned, and centered on the manway nozzle	X
The manway cover and area adjacent to the gasket sealing surface is free of commodity or other build up	X
The manway nozzle sealing surface is free of gouges, nicks, corrosion, displaced metal, residual commodity and remnants of old gaskets	X
The Manway hinge pins and eyebolts are in place and in proper condition • Hing pins operate freely and are not bent, cut, or damaged • Safety eyebolts are present at the proper location across from the nozzle hinges • Eyebolt slots and ears are not bent, worn, damaged, or deformed • Eyebolt, nuts and washers are not bent, damaged, corroded, and are free of excessive paint or commodity • Eyebolt nuts are sized fully to bridge the eyebolt slots and washers are not cupped/deformed	X
The Manway gasket is designed and approved by CHS for the car and commodity, is in place, fully intact, and has not taken a permanent compression set that interferes with the sealing	X
The car is properly placarded	X
Rupture Disk has been removed and carefully inspected for corrosion or damage and properly replaced.	X
MOLTEN SULFUR is stenciled on both sides of the tank car	X

Print Inspectors Name

Date

Car is ok to Load		6/20/23
-------------------	--	---------



Sulfur Tank Car Inspection

Car Number GATX 69298 Track/Spot 1204 Spot 6 Date Tuesday, June 20, 2023
 Placard NA2448 Product SULFUR Tank car Capacity 13856
 Order # 2000 Manway Style GATX3 RR Load Limit 203000

Final Inspection

		Initials
ALL valves, fittings, closures, plugs, caps and fasteners verified closed and tool tight with a 36" pipe wrench		
Manway cover is properly secured per CHS manway procedures		
Car shows no signs of vapor or liquid leaking		
Car is clean and free of spillage		
Car Seal Numbers		
Final Torque on Manway Bolts	250	
Bottom Outlet Valve Handle	2728105	
Protective Housing	2728750	
Manway Cover	2728104	
Date Completed if other than Pre-inspection		

T-1850
 T-221° 0.40in 30in out



VSP# 2340

VSP-MCC#: P27-250-VSP# 2340
 Material: VSP 367 PEG
 Thickness: 1/4
 ID X OD: 20 X

800-

www.vsptechnologies.com



Sulfur

Safety Data Sheet

Version 004 — Last revision on 2015-02-27

SECTION 1 — IDENTIFICATION

Product Name: Sulfur
Product ID: CNX-004
Synonyms: None
Molecular Formula: S
Chemical Family: Pure element
Product Use: Petroleum refining product
Manufacturer: CHS, Inc.
P.O. Box 909
Laurel, Montana 59044, USA
Telephone: 406.628.5200 (*General*)
800.424.9300 (*Emergency – Within USA & Canada*)

SECTION 2 — HAZARD(S) IDENTIFICATION

Emergency Overview

WARNING



Flammable solid (H228).
May be harmful if swallowed (H303).
May be harmful in contact with skin (H313).
Causes skin irritation (H315).
May be harmful if inhaled (H333).

PREVENTION

Do not handle until all safety precautions have been read and understood (P202).
Keep away from heat, sparks, open flames, hot surfaces, etc. No smoking (P210).
Use explosion-proof equipment (P241).
Wash hands thoroughly after handling (P264).
Wear gloves and eye protection (P280).

Use personal protective equipment as required (P281).

RESPONSE

IF ON SKIN: Wash with plenty of soap and water (P302 + P352).

IF INHALED: Call a poison center or doctor/physician if you feel unwell (P304 + P312).

Call a poison center or doctor/physician if you feel unwell (P312).

IF SKIN IRRITATION OCCURS: Get medical advice/attention (P332 + P313).

Take off contaminated clothing and wash before reuse (P362).

IN CASE OF FIRE: Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide for extinction (P370 + P378).

Hazard Classifications (OSHA / GHS)

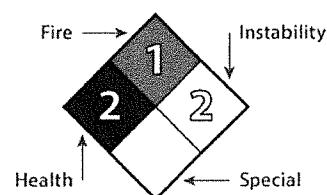
Acute toxicity, dermal – Category 5

Acute toxicity, inhalation – Category 5

Acute toxicity, oral – Category 5

Skin corrosion/irritation – Category 2

NFPA



Potential Health Effects

Eye Health Effects: Causes eye irritation.

Skin Health Effects: May be harmful if absorbed through skin. Causes skin irritation.

Inhalation Health Effects: May be harmful if inhaled. Causes respiratory tract irritation. Combustion generates dangerous sulfur dioxide (SO₂). Additionally, molten sulfur reacts with hydrocarbons to form carbon disulfide and hydrogen sulfide (H₂S), which are highly toxic gases. Exposure to high concentrations of H₂S (> 1000 ppm) will cause immediate unconsciousness and death through respiratory paralysis. Signs and symptoms of overexposure to hydrogen sulfide include respiratory and eye irritation, dizziness, nausea, coughing, a sensation of dryness and pain in the nose, and loss of consciousness. Odor does not provide a reliable indicator of the presence of hazardous levels in the atmosphere.

Ingestion Health Effects: May be harmful if swallowed.

Carcinogenic Effects: Not a suspected carcinogen.

Potential Environmental Effects

Environmental Effects: Spills into watercourses may be harmful to organisms and bottom feeders.

SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredients				
Name	CAS #	RTECS #	EINECS #	% (Weight)
Sulfur	7704-34-9	WS4250000	231-722-6	< 99

SECTION 4 — FIRST-AID MEASURES

NOTE: See *Section 11* for symptoms and effects.

Eye Contact

Flush eyes immediately with clear water for at least 15 minutes. Remove contact lenses if present and easy to do. If irritation persists, seek medical attention.

Skin Contact

Wash area of contact thoroughly with soap and plenty of water. If irritation persists, seek medical attention.

Inhalation

If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If breathing difficulties develop, oxygen should be administered by qualified personnel. If victim is not breathing, clear airway and immediately begin artificial respiration. Seek immediate medical attention.

Ingestion

Do not induce vomiting. Seek medical attention.

Notes to Physicians

This material may liberate hydrogen sulfide (H₂S). At high concentrations H₂S may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Nitrite therapy (found in the cyanide antidote kit) has been suggested as a therapy for H₂S exposure. Amyl nitrite is given by inhalation (for 30 seconds every minute until an intravenous line is established) followed by intravenous sodium nitrite (300 mg over absolutely no less than 5 minutes). This may aid recovery by forming sulfmethemoglobin, thus removing sulfide from combination in tissue. The antidotal efficacy of nitrite therapy is controversial, but is currently recommended if it can be started within the first few minutes after exposure. Nitrite therapy should not be allowed to interfere with the establishment of adequate ventilation and oxygenation. (*Source: ATSDR Toxic Substances Portal – Hydrogen Sulfide*).

Medical Conditions Aggravated by Exposure

Not available.

SECTION 5 — FIRE-FIGHTING MEASURES

NFPA 704 Hazard Classes:

Health: 2 (Moderate)
Flammability: 1 (Slight)
Instability: 2 (Moderate)
Other Hazards: Not applicable

Unusual Fire and Explosion Hazards

Flammable in the presence of a source of ignition, or through friction or retained heat. Dust may form explosive mixtures in air. This dust cloud may be exploded by flame or spark.

Extinguishing Media

Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.

Protection of Firefighters

Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Wear self-contained breathing apparatus. In addition, wear other appropriate protective equipment as conditions warrant (see *Section 8*).

Firefighting Procedures

Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Use fine spray or fog to control fire by preventing its spread and absorbing some of its heat. Use water spray to keep fire-exposed containers cool. Water or foam may cause frothing of molten sulfur. Extinguish fire using agent suitable for surrounding fire. Dry chemical extinguishers may not extinguish this type of fire. Fire watch should be posted for a minimum of four (4) hours after any fire.

Other Information

Combustion Products: Sulfur dioxide, carbon disulfide, fumes, smoke, carbon monoxide, and aldehydes.

Flammable Properties: See *Section 9* for Flash Point, Explosive Limits, etc.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

Personal Precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing dust, vapors, mist, or gas. Ensure adequate ventilation. Wear appropriate protective equipment as conditions warrant (see *Section 8*).

Environmental Precautions

Do not let material enter drains. Assure conformity with applicable government regulations.

Containment Procedures

Not available.

Clean-up Procedures

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

SECTION 7 — HANDLING AND STORAGE

Handling

Keep product away from heat, sparks, pilot lights, static electricity, and open flame. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust may be formed.

Storage

Keep container tightly closed in a dry and well-ventilated place. Keep dry.

SECTION 8 — EXPOSURE CONTROLS / PERSONAL PROTECTION

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, and/or engineering professionals.

Personal Protective Equipment



Respiratory Protection:	For nuisance exposures, use type P95 particle respirator. For higher level protection, use type OV/AG/P99 respirator cartridges. Use respirators and components tested and approved under appropriate government standards, such as NIOSH.
Eye/Face Protection:	The use of eye protection (such as safety glasses) that meets or exceeds ANSI Z.87.1 is recommended. Depending on conditions of use, a face shield may be necessary.
Skin Protection:	Wear gloves to protect against skin contact. Depending on conditions of use, additional protection may be necessary to prevent skin contact, such as face shield, apron, body suit, long sleeves, etc.
General Considerations:	When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practice.

Engineering Controls

Provide ventilation sufficient to prevent exceeding recommended exposure limits or buildup of explosive concentrations of dust in air. Use explosion-proof equipment.

Exposure Limits / Guidelines

Component	ACGIH TLV	NIOSH REL	OSHA PEL
Nuisance dust, total	TWA: 10 mg/m ³	---	TWA: 15 mg/m ³

Note: State, local, or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical Form	Powder
Appearance	Light yellow
Odor	Slight-sweet to mercaptan
Odor Threshold	<i>Not available</i>
pH	<i>Not available</i>
Freezing Point	243 – 248 °F (117 – 120 °C)
Boiling Point	832.5 °F (445 °C)
Flash Point	334 °F (168 °C) by closed cup
Flammability	Flammable
Explosive Limits	0.17 % (LEL) – 6.83 % (UEL)
Evaporation Rate	<i>Not available</i>
Vapor Pressure	8 mmHg at 475 °F (246 °C); 1 mmHg at 363 °F (184 °C)
Vapor Density	<i>Not available</i>
Specific Gravity	<i>Not available</i>
Density	2.05 g/cm ³
Solubility	Insoluble
Partition Coefficient	<i>Not available</i>
Auto-ignition Temperature	450 °F (232 °C)
Decomposition Temperature	<i>Not available</i>
Viscosity	<i>Not available</i>
Molecular Formula	S
Molecular Weight	32.07 g/mol

SECTION 10 — STABILITY AND REACTIVITY

Stability:	Stable under normal temperature conditions and recommended use.
Conditions to Avoid:	Heat, flames and sparks; extremes of temperature and direct sunlight.
Incompatible Materials:	Strong oxidizing agents, amines, and bases.
Hazardous Polymerization:	Not known to occur.

SECTION 11 — TOXICOLOGICAL INFORMATION

General Toxicity

Signs and Symptoms:	Burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting, dermatitis.
Aspiration Hazard:	<i>Not available.</i>
Sensitization:	<i>Not available.</i>
Specific Target Organs:	<i>Not available.</i>
Carcinogenicity:	Not identified as a possible, probable, or confirmed carcinogen.
Germ Cell Mutagenicity:	<i>Not available.</i>
Reproductive Toxicity:	<i>Not available.</i>

Other Comments

None.

Toxicological Effects of Components

Toxicological Information		
Component	Category	Data
Sulfur (7704-34-9)	Toxicity	Dermal LD50: >2000 mg/kg (rabbit); Oral LD50: >5000 mg/kg (rat); Inhalation LC50: >9.23 mg/L/4 hours (rat).
	Exposure Routes	<i>Not available.</i>
	Symptoms	<i>Not available.</i>
	Target Organs	<i>Not available.</i>
	Short-Term Exposure	Irritates the eyes, the skin, and the respiratory tract. Inhalation of powder of this substance may cause inflammation of the nose and the respiratory tract.
	Long-Term Exposure	Repeated or prolonged contact with skin may cause dermatitis. May have effects on the respiratory tract, resulting in chronic bronchitis.

Note: Data for Toxicity were obtained from the U.S. National Library of Medicine TOXNET. Data for Exposure Routes, Symptoms, and Target Organs were obtained from the NIOSH Pocket Guide to Chemical Hazards. Data for Short- and Long-Term Exposure were obtained from the International Chemical Safety Cards from the International Occupational Safety and Health Information Centre.

SECTION 12 — ECOLOGICAL INFORMATION

Toxicity: *Not available.*

Persistence & Degradability: *Not available.*

Bioaccumulative Potential: *Not available.*

Mobility: *Not available.*

Other Adverse Effects: *Not available.*

SECTION 13 — DISPOSAL CONSIDERATIONS

The generator of a waste is always responsible for making proper hazardous waste determinations. The transportation, storage, treatment, and disposal of this waste material must be conducted in compliance with all applicable federal, state, and local requirements and regulations.

This material, when discarded or disposed of as produced, is not specifically listed as a hazardous waste in federal regulations; however it may be characteristically hazardous if it is considered toxic, corrosive, ignitable, or reactive according to federal definitions (40 CFR 261). Additionally, this material may be designated as hazardous according to state and/or local regulations.

SECTION 14 — TRANSPORTATION INFORMATION

DOT – United States – Department of Transportation

Shipping Name: Sulfur, molten
ID Number: NA2448
Hazard Class: 9
Packing Group: III

SECTION 15 — REGULATORY INFORMATION

United States Regulations

CERCLA/SARA Section 311/312 (Title III Hazard Categories)

Acute Health: No
Chronic Health: No
Fire Hazard: Yes

Pressure Hazard: No
 Reactive Hazard: No

This material may contain one or more of the following chemicals identified by the EPA under Title 40 of the Code of Federal Regulations (CFR), including the EPCRA section 302 (40 CFR Part 355), EPCRA section 304 (40 CFR Part 355), EPCRA sections 311/312 (40 CFR Part 370), EPCRA section 313 (40 CFR Part 372), CERCLA sections 102/103 (40 CFR Part 302), Clean Air Act (CAA) 111(r) (40 CFR Part 68), and/or TSCA (40 CFR 700-766).

This material may contain one or more chemicals identified on individual state hazardous substances lists. Contact each jurisdiction for more information.

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

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

SECTION 16 — OTHER INFORMATION

Preparation & Version Information

Version 004 – Last revision on 2015-02-27.

Prepared by Certified Environmental Management, Ltd. (www.cemih.com).

Guide to Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
CAA	Clean Air Act (United States)
CAS	Chemical Abstracts Service
CEIL	Ceiling Exposure Limit
CERCLA	The Comprehensive Environmental Response, Compensation, & Liability Act (United States)
CFR	Code of Federal Regulations (United States)
EINECS	European chemical Substances Information System
EPA	Environmental Protection Agency (United States)
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LEL	Lower Explosive Limit
NFPA	National Fire Protection Association
NTP	National Toxicology Program (United States)
OSHA	Occupational Safety and Health Administration (United States)
PEL	Permissible Exposure Limit (OSHA)
SARA	Superfund Amendments and Reauthorization Act (United States)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act (United States)
TWA	Time Weighted Average (8 hours)
UEL	Upper Explosive Limit
UN	United Nations

Disclaimer / Statement of Liability

The information presented in this Safety Data Sheet is based on data believed to be accurate as of the date this (Material) Safety Data Sheet was prepared. However, neither CHS, Inc., nor any of their subsidiaries, vendors, or contractors, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use.