



BROWNFIELD
ENVIRONMENTAL ENGINEERING

Soil & Water Sampling Report
City of LaSalle, IL
Carus Chemical Co. Fire Precipitation



Date: February 7, 2023

Brownfield Project No. 141-002

Prepared for:

City of LaSalle

745 Second Street

La Salle, IL 61301-2501

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1.0 Executive Summary

Brownfield Environmental Engineering Resources, LLC (Brownfield) has prepared this report to document the findings of the site assessment and sampling activities conducted within the City of LaSalle, IL in response to the fire that occurred on January 11, 2023 at the Carus chemical plant, located at 1500 8th Street in LaSalle, Illinois.

The intent of Brownfield's site assessment and sampling activities was to evaluate the potential environmental impacts and health risks from the fire precipitate and fallout on nearby homes and parks.

The Carus chemical plant manufactures potassium permanganate, an inorganic chemical compound widely utilized in the treatment of drinking water, wastewater, and industrial chemicals. The fire began from within the Carus chemical warehouse, and the cause of the fire is still undetermined.

The Brownfield site assessment and sampling activities included the collection of sixteen (16) topsoil samples, two (2) water samples, and one (1) sample of granular material from the residential areas of LaSalle, IL. Each sample was laboratory analyzed for manganese and potassium. Samples were collected from the residential areas of LaSalle, IL deemed to be most representative of the overall area affected by the fire precipitate. Sampling locations are illustrated in **Appendix A**.

The granular material and topsoil sampling results were compared to the Illinois Environmental Protection Agency (IEPA) Tiered Approach to Corrective Action Objectives (TACO) Tier I Soil Remediation Objectives (SROs) and the "background level" concentrations of inorganic chemicals in soil throughout the State of Illinois. The water sampling results were compared to the IEPA TACO Class I & II Groundwater Remediation Objectives (GROs). Tables comparing the laboratory analytical results to the IEPA TACO SROs and GROs and statewide background concentration are included in **Appendix B**.

The levels of manganese and potassium in the topsoil and water samples collected were found to be substantially below the IEPA cleanup objectives for manganese and within the background range of manganese and potassium for soils in Illinois, outside of metropolitan statistical areas. Based on the concentrations of manganese and potassium below the IEPA SROs, Brownfield does not recommend additional testing of topsoil or surface water.

2.0 Brownfield Site Assessment and Sampling Activities

On January 20, 2023, Bradley A. Brown, P.E. with Brownfield performed reconnaissance and sampling activities within select residential neighborhoods of LaSalle, IL to evaluate the potential health risks and environmental impacts caused by the Carus fire. A single water sample and seven (7) topsoil samples were collected. The samples were submitted to a state-certified laboratory to be analyzed for manganese and potassium.

On January 24, 2023, Cole Cameron, EIT, Environmental Engineer with Brownfield performed reconnaissance and sampling activities within select residential neighborhoods of LaSalle, IL to further evaluate the potential health risks and environmental impacts caused by the Carus fire. Nine (9) topsoil samples, one (1) water sample, and one (1) sample of granular material were collected to be analyzed for manganese and potassium.

All samples were collected from within the residential areas of LaSalle, IL deemed to be most representative of the overall area affected by the fire precipitate. The Brownfield sampling locations are illustrated in **Appendix A** and a Photo Log documenting site conditions and sampling locations is included in **Appendix C**.

3.0 Analytical Results & Discussion

In total, sixteen (16) topsoil samples, two (2) water samples, and one (1) sample of granular material were submitted to First Environmental Laboratories, Inc. in Naperville, IL, a state-certified laboratory, for analysis of manganese and potassium. The laboratory analytical reports are included in **Appendix D**.

The topsoil sampling results were compared to the IEPA TACO SROs, specifically the residential ingestion and inhalation SROs, as well as the statewide background levels for metals outside of a metropolitan statistical area. The water sampling results were compared to the IEPA TACO Class I & II GROs.

Topsoil Sampling

Manganese and potassium were detected in all topsoil samples analyzed. However, none of the topsoil samples exhibited concentrations of manganese exceeding the IEPA SROs for residential ingestion or residential inhalation, and the detected levels of manganese were within the background levels as established by the IEPA.

The IEPA has not established remediation objectives for potassium and has noted, “this chemical is of no concern for soil ingestion and no data are available to assess other routes of exposure. There is no soil concentration limit established for this constituent.” However, levels of potassium in the topsoil samples collected were found to be within the IEPA-established range of background levels.

Water Sampling

Two water samples were collected to evaluate the potential impacts of fire precipitate fallout. One sample of roof runoff water was collected by a resident at 1409 Porter Street and provided to the Brownfield engineer for analysis. This sample is designated as “1409 Porter-2” and was found to contain 0.865 mg/L of manganese, which exceeds the Class I GRO of 0.15 mg/L. The sample contained 1,210 mg/L of potassium, for which the IEPA has not established GROs. The roof runoff sample likely contains elevated concentrations of manganese and potassium due to the fire precipitate and fallout and was compared to the IEPA GROs as a reference only.

The other water sample collected and analyzed for manganese and potassium was collected from the pond at Rotary Park and is designated as RP-1. The pond sample was found to contain 0.02 mg/L of manganese, which is well below the Class I and Class II GROs of 0.15 mg/L and 0.10 mg/L, respectively. The sample contained 6.4 mg/L of potassium.

Granular Material Sampling

The granular material sample of fire precipitate provided by the homeowner at 1409 Porter was analyzed for manganese and potassium with the following levels:

Manganese 276,000 mg/kg
Potassium 133,000 mg/kg

4.0 Findings & Recommendations

Topsoil Sampling

Based on the comparison of topsoil sample analytical results to the IEPA residential ingestion and inhalation remediation objectives for manganese, all topsoil samples collected and analyzed were found to be significantly under the SROs. The IEPA has not established remediation objectives for potassium and has noted, “this chemical is of no concern for soil ingestion and no data are available to assess other routes of exposure. There is no soil concentration limit established for this constituent.”

Additionally, the levels of manganese and potassium were found to be within the background range for soils outside of metropolitan statistical areas.

The topsoil sample analytical results do not show elevated levels of manganese and potassium above IEPA SROs and background levels. Therefore, additional topsoil testing to assess the effects of the fire precipitate is not recommended at this time.

Water Sampling

Roof Water Runoff

The roof water runoff sample collected by the resident at 1409 Porter Street showed elevated levels of manganese and potassium, likely due to the fire precipitate and fallout. The Illinois Department of Public Health (IDPH) recently set a drinking water Action Level for manganese of 0.5 mg/L to ensure protection against manganese toxicity. This Action Level is consistent with the World Health Organization guidance level for manganese in drinking water. The drinking water standard is being provided as a reference, as there are no regulatory exposure limits or levels of manganese in water for the absorption exposure pathway. Collected stormwater runoff in the affected area should be avoided and pets should not be allowed to drink the water.

Rotary Park Pond

The water sample collected from the pond at Rotary Park contained 0.02 mg/L of manganese, which is significantly below the Class I and Class II GROs, and the pond does not appear to be impacted by the fire precipitate with regards to elevated levels of manganese and potassium. No additional testing for manganese and potassium is recommended at this time.

However, we may want to consider testing the pond for phytoplankton and zooplankton, which make excellent indicators of environmental conditions and aquatic health within ponds because they are sensitive to changes in water quality. They respond to low dissolved oxygen levels, high nutrient levels, toxic contaminants, poor food quality or abundance, and predation.

The level of manganese at 0.02 mg/L is considered low, as the concentrations often become higher than that in deeper strata of lakes and supply reservoirs due to anaerobic respiration. Oxidized manganese is not soluble and would be expected to slowly settle out of the water column. As the sample wasn't collected immediately after the fire precipitation event, there could have been an initial toxicity event. It would be prudent to collect and examine a zooplankton sample, as zooplankton are used for toxicity testing. If live populations of zooplankton are present (cladocera, copepods, etc.) aquatic impacts are expected to be minimal. If no live zooplankton are present, it would suggest that an initial toxic event occurred, and a follow-up toxicity test would be necessary.

Other than the elevated levels of manganese and potassium in the collected roof runoff sample, the levels of manganese and potassium were not found to be elevated in the topsoil and pond water samples collected as a result of the recent fire at the Carus chemical plant.

Granular Material Sampling

The granular material testing of fire precipitate provided by the homeowner at 1409 Porter with levels of Manganese at 276,000 mg/kg and Potassium at 133,000 mg/kg are in line with the base chemical compounds found in Potassium Permanganate. Precautionary measures for handling or cleaning up the material should be implemented as outlined in the CAIROX® Potassium Permanganate Material Safety Data Sheet included in **Appendix E**. Safety measures include but are not limited to the use of rubber or plastic gloves, face shields, goggles, or safety glasses, and respiratory protection if conditions of exposure are above the Threshold Limit Value – Time Weighted Average (TLV-TWA).





Bradley A. Brown, P.E.
Principal



Cole Cameron, E.I.T
Environmental Engineer

APPENDIX A



 <p>BROWNFIELD ENVIRONMENTAL ENGINEERING</p> <p>645 Third Street, Suite 250, Beloit, WI 53511 (608) 856-5434 (815) 713-9165 www.brownfieldusa.com</p>	Sample Location Map	
	LOCATION:	La Salle, IL
	CLIENT:	City of La Salle
	PROJECT:	Carus Fire
	DATE:	February 3, 2023
		


APPENDIX B

Table 1 (Page 1 of 2)
 Soil Analytical Results Summary
 Carus Fire
 LaSalle, IL

Sample ID	MP-1	MP-2	Fire Sta #2	HP-1	HP-2	RP-2	1448 Zinc	Residential Ingestion Remediation Objective	Residential Inhalation Remediation Objective	Metals Background Outside Metropolitan Statistical Area	Background	
Date Collected	1/20/2023	1/20/2023	1/20/2023	1/20/2023	1/20/2023	1/20/2023	1/20/2023				Range	Median

Parameters

Manganese (mg/kg)	543	525	676	588	587	875	722	1600	69000	630	61.5 - 3710	784
Potassium (mg/kg)	1430	1350	1060	1390	1370	2370	1490	-	-	1100	280 - 5600	1210

 = Indicates a concentration exceeds a residential remediation objective

Notes:

MP-1: Matthiessen Park Playground

MP-2: Matthiessen Park Baseball Diamond

Fire Station No. 2, southwest corner of Sterling and Hwy 6

HP-1: Hegeler Park, playground west

HP-1: Hegeler Park, playground east

RP-2: Rotary Park, south side of pond

1448 Zinc: 1448 Zinc Street

Table 1 (Page 2 of 2)
 Soil Analytical Results Summary
 Carus Fire
 LaSalle, IL

Sample ID	1524 Zinc	1446 Porter	1409 Porter-3	1649 Zinc	1266 O'Conor	1618 Lharpe	1214 Porter	950 Grant-1	950 Grant-2	Residential Ingestion Remediation Objective	Residential Inhalation Remediation Objective	Metals background Outside Metropolitan Statistical Area	Background	
Date Collected	1/24/2023	1/24/2023	1/24/2023	1/24/2023	1/24/2023	1/24/2023	1/24/2023	1/24/2023	1/24/2023				Range	Median

Parameters

Manganese (mg/kg)	885	493	248	514	697	794	672	812	955	1600	69000	630	61.5 - 3710	784
Potassium (mg/kg)	1550	1860	1900	2550	1750	2460	2340	1340	1530	-	-	1100	280 - 5600	1210

= Indicates a concentration exceeds a residential remediation objective

Notes:
 950 Grant-1: St. Mary's Park, Baseball Diamond
 950 Grant-2: St. Mary's Park, Playground

Table 2 (Page 1 of 1)
 Water Analytical Results Summary
 Carus Fire
 LaSalle, IL

Sample ID	RP-1 (Pond)	1409 Porter-2 (Roof Runoff)	Class I Groundwater remediation Objectives	Class II Groundwater remediation Objectives
Date Collected	1/20/2023	1/24/2023		

Parameters

Manganese (mg/L)	0.02	0.865	0.15	10
Potassium (mg/L)	6.4	1210	-	-

= Indicates a concentration exceeds a groundwater remediation objective

Notes:

RP-1: Rotary Park Pond Sample

1409 Porter-2: Roof Runoff Provided by Resident

APPENDIX C

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 1

Date: 1-20-2023

Time: 1041

Location: Matthiessen Park

Direction: North

Description: Soil sample location at playground



Photo No. 2

Date: 1-20-2023

Time: 1044

Location: Matthiessen Park

Direction: North

Description: Soil sample location at ballfield first base line. Facing North.

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 3
 Date: 1-20-2023
 Time: 1049
 Location: Matthiessen Park
 Direction: Northeast
 Description: Matthiessen Park entrance



Photo No. 4
 Date: 1-20-2023
 Time: 1222
 Location: SW Quadrant of intersection between Highway 6 and Sterling Street.
 Direction: Southwest
 Description: Location of soil sample Fire Sta. #2

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 5

Date: 1-20-2023

Time: 1232

Location: 1448 Zinc Street

Direction: East

Description: Location of soil sample
1448 Zinc



Photo No. 6

Date: 1-20-2023

Time: 1245

Location: Hegeler Park

Direction: South

Description: West playground,
Location of soil sample
HP-1

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 7

Date: 1-20-2023

Time: 1247

Location: Hegeler Park

Direction South

Description: East playground, Location of soil sample HP-2



Photo No. 8

Date: 1-20-2023

Time: 1330

Location: Rotary Park Pond

Direction: Northwest

Description: Location of water sample RP-1

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 9

Date: 1-20-2023

Time: 1331

Location: Rotary Park

Direction: South

Description: Location of sample RP-2



Photo No. 10

Date: 1-20-2023

Time: 1331

Location: Rotary Park

Direction: N/A

Description: Brown specks appear to be MnO₂ on pond rip rap.

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 11

Date: 1-20-2023

Time: 1331

Location: Rotary Park

Direction: N/A

Description: Brown specks on curb appear to be MnO₂.



Photo No. 12

Date: January 24, 2023

Time: 1340

Location: 1524 Zinc Street

Direction: East

Description: Location of soil sample 1524 Zinc

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 13

Date: January 24, 2023

Time: 1351

Location: 1466 Porter Avenue

Direction: Southwest

Description: Location of soil sample
1466 Porter



Photo No. 14

Date: January 24, 2023

Time: 1423

Location: 1409 Porter Avenue

Direction: East

Description: Water sample 1409
Porter – 2 provided by
resident

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 15

Date: January 24, 2023

Time: 1424

Location: 1409 Porter Avenue

Direction: West

Description: Location of soil sample
1409 Porter - 3



Photo No. 16

Date: January 24, 2023

Time: 1433

Location: 1649 Zinc Street

Direction: West

Description: Location of soil sample
1649 Porter

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 17

Date: January 24, 2023

Time: 1442

Location: 1266 O'Conor Avenue

Direction: Southeast

Description: Location of soil sample
1266 O'Conor



Photo No. 18

Date: January 24, 2023

Time: 1451

Location: 1618 Laharpe Street

Direction: East

Description: Location of soil sample
1618 Laharpe

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 19

Date: January 24, 2023

Time: 1501

Location: 1214 Porter Avenue

Direction: South

Description: Location of soil sample
1214 Porter



Photo No. 20

Date: January 24, 2023

Time: 1513

Location: 950 Grant Avenue

Direction: Northwest

Description: Location of soil sample
950 Grant - 1

Project #:	141-002
Client:	City of La Salle
Address:	La Salle, IL 61301



Photo No. 21

Date: January 24, 2023

Time: 1517

Location: 950 Grant Avenue

Direction: South

Description: Location of soil sample
950 Grant - 2

APPENDIX D



January 24, 2023

Mr. Brad Brown
BROWNFIELD ENVIRONMENTAL ENGINEERING
645 Third Street
Suite 250
Beloit, WI 53511

Project ID: 141-002
First Environmental File ID: 23-0554
Date Received: January 23, 2023

Dear Mr. Brad Brown:

The above referenced project was analyzed as directed on the enclosed chain of custody record.

All Quality Control criteria as outlined in the methods and current IL ELAP/NELAP have been met unless otherwise noted. QA/QC documentation and raw data will remain on file for future reference. Our accreditation number is 100292 and our current certificate is number:

1002922022-8: effective 02/10/2022 through 02/28/2023.

I thank you for the opportunity to be of service to you and look forward to working with you again in the future. Should you have any questions regarding any of the enclosed analytical data or need additional information, please contact me at (630) 778-1200.

Sincerely,

Ryan Gerrick
Project Manager



Case Narrative

BROWNFIELD ENVIRONMENTAL ENGINEERING

Lab File ID: **23-0554**

Project ID: **141-002**

Date Received: **January 23, 2023**

All quality control criteria, as outlined in the methods, have been met except as noted below or on the following analytical report.

The results in this report apply to the samples in the following table:

Laboratory Sample ID	Client Sample Identifier	Date/Time Collected
23-0554-001	MP-1	1/20/2023 10:35
23-0554-002	MP-2	1/20/2023 10:40
23-0554-003	Fire Sta #2	1/20/2023 12:18
23-0554-004	HP-1	1/20/2023 12:45
23-0554-005	HP-2	1/20/2023 12:50
23-0554-006	RP-1	1/20/2023 13:30
23-0554-007	RP-2	1/20/2023 13:35
23-0554-008	1448 Zinc	1/20/2023 12:30

Sample Batch Comments:

Sample acceptance criteria were met.

Method Comments

Lab Number	Sample ID	Comments:
23-0554-006	RP-1	<i>Total Metals</i> Chemical preservation pH adjusted in lab.



Case Narrative

BROWNFIELD ENVIRONMENTAL ENGINEERING

Lab File ID: **23-0554**

Project ID: **141-002**

Date Received: **January 23, 2023**

All quality control criteria, as outlined in the methods, have been met except as noted below or on the following analytical report.

The following is a definition of flags that may be used in this report:

Flag	Description	Flag	Description
A	Method holding time is 15 minutes from collection. Lab analysis was performed as soon as possible.		
B	Analyte was found in the method blank.	L	LCS recovery outside control limits.
<	Analyte not detected at or above the reporting limit.	M	MS recovery outside control limits; LCS acceptable.
C	Sample received in an improper container for this test.	P	Chemical preservation pH adjusted in lab.
D	Surrogates diluted out; recovery not available.	Q	Result was determined by a GC/MS database search.
E	Estimated result; concentration exceeds calibration range.	S	Analysis was subcontracted to another laboratory.
G	Surrogate recovery outside control limits.	T	Result is less than three times the MDL value.
H	Analysis or extraction holding time exceeded.	W	Reporting limit elevated due to sample matrix.
I	ICVS % rec outside 95-105% but within 90-110%		
J	Estimated result; concentration is less than routine RL but greater than MDL.	N	Analyte is not part of our NELAC accreditation or accreditation may not be available for this parameter.
RL	Routine Reporting Limit (Lowest amount that can be detected when routine weights/volumes are used without dilution.)	ND	Analyte was not detected using a library search routine; No calibration standard was analyzed.



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: MP-1
Sample No: 23-0554-001

Date Collected: 01/20/23
Time Collected: 10:35
Date Received: 01/23/23
Date Reported: 01/24/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/23/23				
Total Solids	79.69		%	
Total Metals		Method: 6010C		
Analysis Date: 01/24/23				
		Preparation Method 3050B		
Preparation Date: 01/24/23				
Manganese	543	0.5	mg/kg	
Potassium	1,430	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: MP-2
Sample No: 23-0554-002

Date Collected: 01/20/23
Time Collected: 10:40
Date Received: 01/23/23
Date Reported: 01/24/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/23/23				
Total Solids	79.17		%	
Total Metals		Method: 6010C		
Analysis Date: 01/24/23				
		Preparation Method 3050B		
Preparation Date: 01/24/23				
Manganese	525	0.5	mg/kg	
Potassium	1,350	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: Fire Sta #2
Sample No: 23-0554-003

Date Collected: 01/20/23
Time Collected: 12:18
Date Received: 01/23/23
Date Reported: 01/24/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/23/23				
Total Solids	79.40		%	
Total Metals		Method: 6010C		
Analysis Date: 01/24/23				
		Preparation Method 3050B		
Preparation Date: 01/24/23				
Manganese	676	0.5	mg/kg	
Potassium	1,060	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: HP-1
Sample No: 23-0554-004

Date Collected: 01/20/23
Time Collected: 12:45
Date Received: 01/23/23
Date Reported: 01/24/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/23/23				
Total Solids	76.21		%	
Total Metals		Method: 6010C		
Analysis Date: 01/24/23				
		Preparation Method 3050B		
Preparation Date: 01/24/23				
Manganese	588	0.5	mg/kg	
Potassium	1,390	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: HP-2
Sample No: 23-0554-005

Date Collected: 01/20/23
Time Collected: 12:50
Date Received: 01/23/23
Date Reported: 01/24/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/23/23				
Total Solids	79.15		%	
Total Metals		Method: 6010C		
Analysis Date: 01/24/23				
		Preparation Method 3050B		
Preparation Date: 01/24/23				
Manganese	587	0.5	mg/kg	
Potassium	1,370	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: RP-1
Sample No: 23-0554-006

Date Collected: 01/20/23
Time Collected: 13:30
Date Received: 01/23/23
Date Reported: 01/24/23

Analyte	Result	R.L.	Units	Flags
Total Metals	Method: 6010C	Preparation Method 3010A		
Analysis Date: 01/24/23		Preparation Date: 01/24/23		
Manganese	0.020	0.005	mg/L	
Potassium	6.4	0.5	mg/L	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: RP-2
Sample No: 23-0554-007

Date Collected: 01/20/23
Time Collected: 13:35
Date Received: 01/23/23
Date Reported: 01/24/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/23/23				
Total Solids	78.18		%	
Total Metals		Method: 6010C		
Analysis Date: 01/24/23				
		Preparation Method 3050B		
Preparation Date: 01/24/23				
Manganese	875	0.5	mg/kg	
Potassium	2,370	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1448 Zinc
Sample No: 23-0554-008

Date Collected: 01/20/23
Time Collected: 12:30
Date Received: 01/23/23
Date Reported: 01/24/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/23/23				
Total Solids	78.56		%	
Total Metals		Method: 6010C		
Analysis Date: 01/24/23				
		Preparation Method 3050B		
Preparation Date: 01/24/23				
Manganese	722	0.5	mg/kg	
Potassium	1,490	50	mg/kg	



First Environmental Laboratories, Inc.

First Environmental Laboratories
 1600 Shore Road, Suite D
 Naperville, Illinois 60563
 Phone: (630) 778-1200 • Fax: (630) 778-1233
 E-mail: firstinfo@firstenv.com • www.firstenv.com
 IEPA Certification #100292

CHAIN OF CUSTODY RECORD

Company Name: BROWNFIELD ENVIRONMENTAL ENGINEERING
 Street Address: 645 THIRD ST, SUITE 250
 City: BELoit State: WI Zip: 53511
 Phone: 608-856-5434 e-mail: BRAO@BROWNFIELDUS.A.COM
 Send Report To: BRAO BROWN
 Sampled By: BRAO BROWN

Project ID: 141-002

P.O. #:

Date/Time Taken	Sample Description	Matrix	Parameter(s)	Hold-Do Not Analyze	Comments	Lab ID.
1/20/02 1035	MP-1	S	POTASSIUM			001
1040	MP-2	S	MANGANESE			002
1218	FIRE STA #2	S				002
1245	HP-1	S				004
1250	HP-2	S				005
1330	RP-1	W				006
1335	RP-2	S				007
1230	1448 ZINC	S				008

FOR LAB USE ONLY:

Cooler Temperature: 0-6°C Yes No -1.10 °C
 Received within 6 hrs. of collection: Yes No
 Ice Present: Yes No

LAB COURIER USE ONLY:

Sample Refrigerated: Yes No
 Refrigerator Temperature: _____ °C

Notes and Special Instructions: 100', RUSH TAT

Program: TACO/SRP CCDD NPDES LUST SDWA
 *Matrix Code Key: S-Soil SL-Sludge DW-Drinking Water
 WW-Wastewater GW-Groundwater WIPE-Wipe O-Other

Relinquished By: BRAO BROWN Date/Time: 1/23/02 0940 Received By: [Signature] Date/Time: 1/23/02 0940
 Relinquished By: _____ Date/Time: _____ Received By: _____ Date/Time: _____



January 26, 2023

Mr. Cole Cameron

BROWNFIELD ENVIRONMENTAL ENGINEERING

645 Third Street

Suite 250

Beloit, WI 53511

Project ID: 141-002

First Environmental File ID: 23-0625

Date Received: January 25, 2023

Dear Mr. Cole Cameron:

The above referenced project was analyzed as directed on the enclosed chain of custody record.

All Quality Control criteria as outlined in the methods and current IL ELAP/NELAP have been met unless otherwise noted. QA/QC documentation and raw data will remain on file for future reference. Our accreditation number is 100292 and our current certificate is number:

1002922022-8: effective 02/10/2022 through 02/28/2023.

I thank you for the opportunity to be of service to you and look forward to working with you again in the future. Should you have any questions regarding any of the enclosed analytical data or need additional information, please contact me at (630) 778-1200.

Sincerely,

Ryan Gerrick
Project Manager



Case Narrative

BROWNFIELD ENVIRONMENTAL ENGINEERING

Lab File ID: **23-0625**

Project ID: **141-002**

Date Received: **January 25, 2023**

All quality control criteria, as outlined in the methods, have been met except as noted below or on the following analytical report.

The results in this report apply to the samples in the following table:

Laboratory Sample ID	Client Sample Identifier	Date/Time Collected
23-0625-001	1524 Zinc	1/24/2023 13:38
23-0625-002	1446 Porter	1/24/2023 13:46
23-0625-003	1409 Porter-1	1/24/2023 14:00
23-0625-004	1409 Porter-2	1/24/2023 14:10
23-0625-005	1409 Porter-3	1/24/2023 14:21
23-0625-006	1649 Zinc	1/24/2023 14:31
23-0625-007	1266 O'Conor	1/24/2023 14:40
23-0625-008	1618 Laharpe	1/24/2023 14:47
23-0625-009	1214 Porter	1/24/2023 14:58
23-0625-010	950 Grant-1	1/24/2023 15:10
23-0625-011	950 Grant-2	1/24/2023 15:15

Sample Batch Comments:

Sample acceptance criteria were met.

Method Comments

Lab Number	Sample ID	Comments:
23-0625-004	1409 Porter-2	<i>Total Metals</i> Chemical preservation pH adjusted in lab.



Case Narrative

BROWNFIELD ENVIRONMENTAL ENGINEERING

Lab File ID: **23-0625**

Project ID: **141-002**

Date Received: **January 25, 2023**

All quality control criteria, as outlined in the methods, have been met except as noted below or on the following analytical report.

The following is a definition of flags that may be used in this report:

Flag	Description	Flag	Description
A	Method holding time is 15 minutes from collection. Lab analysis was performed as soon as possible.		
B	Analyte was found in the method blank.	L	LCS recovery outside control limits.
<	Analyte not detected at or above the reporting limit.	M	MS recovery outside control limits; LCS acceptable.
C	Sample received in an improper container for this test.	P	Chemical preservation pH adjusted in lab.
D	Surrogates diluted out; recovery not available.	Q	Result was determined by a GC/MS database search.
E	Estimated result; concentration exceeds calibration range.	S	Analysis was subcontracted to another laboratory.
G	Surrogate recovery outside control limits.	T	Result is less than three times the MDL value.
H	Analysis or extraction holding time exceeded.	W	Reporting limit elevated due to sample matrix.
I	ICVS % rec outside 95-105% but within 90-110%		
J	Estimated result; concentration is less than routine RL but greater than MDL.	N	Analyte is not part of our NELAC accreditation or accreditation may not be available for this parameter.
RL	Routine Reporting Limit (Lowest amount that can be detected when routine weights/volumes are used without dilution.)	ND	Analyte was not detected using a library search routine; No calibration standard was analyzed.



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1524 Zinc
Sample No: 23-0625-001

Date Collected: 01/24/23
Time Collected: 13:38
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/25/23				
Total Solids	75.00		%	
Total Metals		Method: 6010C		
Analysis Date: 01/26/23				
		Preparation Method 3050B		
Preparation Date: 01/25/23				
Manganese	885	0.5	mg/kg	
Potassium	1,550	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1446 Porter
Sample No: 23-0625-002

Date Collected: 01/24/23
Time Collected: 13:46
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/25/23				
Total Solids	71.05		%	
Total Metals		Method: 6010C		
Analysis Date: 01/26/23				
		Preparation Method 3050B		
Preparation Date: 01/25/23				
Manganese	493	0.5	mg/kg	
Potassium	1,860	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1409 Porter-1
Sample No: 23-0625-003

Date Collected: 01/24/23
Time Collected: 14:00
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on an "as received" basis.

Analyte	Result	R.L.	Units	Flags
Total Metals				
Analysis Date: 01/26/23				
Manganese	276,000	0.5	mg/kg	
Potassium	133,000	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1409 Porter-2
Sample No: 23-0625-004

Date Collected: 01/24/23
Time Collected: 14:10
Date Received: 01/25/23
Date Reported: 01/26/23

Analyte	Result	R.L.	Units	Flags
Total Metals Analysis Date: 01/26/23	Method: 200.7R4.4	Preparation Method 200.7W Preparation Date: 01/26/23		
Manganese	0.865	0.005	mg/L	
Potassium	1,210	0.5	mg/L	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1409 Porter-3
Sample No: 23-0625-005

Date Collected: 01/24/23
Time Collected: 14:21
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/25/23				
Total Solids	73.28		%	
Total Metals		Method: 6010C		
Analysis Date: 01/26/23				
		Preparation Method 3050B		
Preparation Date: 01/25/23				
Manganese	248	0.5	mg/kg	
Potassium	1,900	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1649 Zinc
Sample No: 23-0625-006

Date Collected: 01/24/23
Time Collected: 14:31
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/25/23				
Total Solids	67.27		%	
Total Metals		Method: 6010C		
Analysis Date: 01/26/23				
		Preparation Method 3050B		
Preparation Date: 01/25/23				
Manganese	514	0.5	mg/kg	
Potassium	2,550	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1266 O'Conor
Sample No: 23-0625-007

Date Collected: 01/24/23
Time Collected: 14:40
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/25/23				
Total Solids	70.46		%	
Total Metals		Method: 6010C		
Analysis Date: 01/26/23				
		Preparation Method 3050B		
Preparation Date: 01/25/23				
Manganese	697	0.5	mg/kg	
Potassium	1,750	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1618 Laharpe
Sample No: 23-0625-008

Date Collected: 01/24/23
Time Collected: 14:47
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/25/23				
Total Solids	72.01		%	
Total Metals		Method: 6010C		
Analysis Date: 01/26/23				
		Preparation Method 3050B		
Preparation Date: 01/25/23				
Manganese	794	0.5	mg/kg	
Potassium	2,460	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 1214 Porter
Sample No: 23-0625-009

Date Collected: 01/24/23
Time Collected: 14:58
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/25/23				
Total Solids	69.39		%	
Total Metals		Method: 6010C		
Analysis Date: 01/26/23				
		Preparation Method 3050B		
Preparation Date: 01/25/23				
Manganese	672	0.5	mg/kg	
Potassium	2,340	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 950 Grant-1
Sample No: 23-0625-010

Date Collected: 01/24/23
Time Collected: 15:10
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/25/23				
Total Solids	71.78		%	
Total Metals		Method: 6010C		
Analysis Date: 01/26/23				
		Preparation Method 3050B		
Preparation Date: 01/25/23				
Manganese	812	0.5	mg/kg	
Potassium	1,340	50	mg/kg	



Analytical Report

Client: BROWNFIELD ENVIRONMENTAL ENGINEERING
Project ID: 141-002
Sample ID: 950 Grant-2
Sample No: 23-0625-011

Date Collected: 01/24/23
Time Collected: 15:15
Date Received: 01/25/23
Date Reported: 01/26/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, total		Method: 2540G 2011		
Analysis Date: 01/25/23				
Total Solids	76.85		%	
Total Metals		Method: 6010C		
Analysis Date: 01/26/23				
		Preparation Method 3050B		
Preparation Date: 01/25/23				
Manganese	955	0.5	mg/kg	
Potassium	1,530	50	mg/kg	



CHAIN OF CUSTODY RECORD

First Environmental Laboratories

1600 Shore Road, Suite D
Naperville, Illinois 60563
Phone: (630) 778-1200 • Fax: (630) 778-1233

E-mail: fristinfo@fristenv.com • www.fristenv.com
IEPA Certification #100292

Company Name: Brown Field Environmental Engineering Resources

Street Address: 645 Third St., Suite 250

City: Beloit State: WI Zip: 53511

Phone: 815-663-7946 e-mail: cole@brownfieldusa.com

Send Report To: cole@brownfieldusa.com

Sampled By: Cole Cameron

Project I.D.: 141-002

P.O. #:

Date/Time Taken	Sample Description	Matrix	Parameter(s)		Hold - Do Not Analyze	Comments	Lab I.D.
			Potassium	Manganese			
1-24-23/1338	1524 Zinc	S	X	X			23-0625-001
1-24-23/1346	1446 Porter	S	X	X			-002
1-24-23/1400	1409 Porter-1	SO	X	X		Granular Material	-003
1-24-23/1410	1409 Porter-2	WW	X	X		Roof runoff	-004
1-24-23/1421	1409 Porter-3	S	X	X			-005
1-24-23/1431	1649 Zinc	S	X	X			-006
1-24-23/1440	1266 O'Connor	S	X	X			-007
1-24-23/1447	1618 Babusape	S	X	X			-008
1-24-23/1458	1214 Porter	S	X	X			-009
1-24-23/1510	950 Grant-1	S	X	X			-010
1-24-23/1518	950 Grant-2	S	X	X			-011

FOR LAB USE ONLY:

Cooler Temperature: 0-1-9°C Yes No
 Received within 6 hrs. of collection: 1.1 °C
 Ice Present: Yes No

LAB COURIER USE ONLY:

Sample Refrigerated: Yes No
 Refrigerator Temperature: _____ °C

Notes and Special Instructions: 100% Bush TAT

- Program: TACOS/SP CCDD NPDES LUST SDWA
- *Matrix Code Key: S-Soil SL-Sludge DW-Drinking Water
 WW-Wastewater GW-Groundwater WIPE-Wipe O-Other

Relinquished By: Cole Cameron Date/Time: 1/24/23/1545 Received By: MS Date/Time: 1/25/23 1000

APPENDIX E

MATERIAL SAFETY DATA SHEET

CAIROX[®] Potassium Permanganate

Section 1 Chemical Product and Company Identification

PRODUCT NAME: CAIROX[®] potassium permanganate, KMnO₄
SYNONYMS: Permanganic acid potassium salt
Chameleon mineral
Condy's crystals
Permanganate of potash

TRADE NAME: CAIROX[®] potassium permanganate

TELEPHONE NUMBER FOR INFORMATION: 815/223-1500

EMERGENCY TELEPHONE NO.: 800/435-6856

MANUFACTURER'S NAME: CARUS CHEMICAL COMPANY

AFTER HOURS NO. 815/223-1565
5:00 PM-8:00 AM Central Standard Time
Monday-Friday, Weekends and Holidays

MANUFACTURER'S ADDRESS:
Carus Chemical Company
1500 Eighth Street
P. O. Box 1500
LaSalle, IL 61301

CHEMTREC TELEPHONE NO.: 800/424-9300

Section 2 Composition/Information on Ingredients

<u>Material or component</u>	<u>CAS No.</u>	<u>%</u>	<u>Hazard Data</u>	
Potassium permanganate	7722-64-7	97% min. KMnO ₄	PEL-C	5 mg Mn per cubic meter of air
			TLV-TWA	0.2 mg Mn per cubic meter of air

Section 3 Hazards Identification

- Eye Contact**
Potassium permanganate is damaging to eye tissue on contact. It may cause severe burns that result in damage to the eye.
- Skin Contact**
Contact of solutions at room temperature may be irritating to the skin, leaving brown stains. Concentrated solutions at elevated temperature and crystals are damaging to the skin.
- Inhalation**
Acute inhalation toxicity data are not available. However, airborne concentrations of potassium permanganate in the form of dust or mist may cause damage to the respiratory tract.
- Ingestion**
Potassium permanganate, if swallowed, may cause severe burns to mucous membranes of the mouth, throat, esophagus, and stomach.

Section 4 First Aid Measures

1. Eyes

Immediately flush eyes with large amounts of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Do not attempt to neutralize chemically. Seek medical attention immediately. Note to physician: Soluble decomposition products are alkaline. Insoluble decomposition product is brown manganese dioxide.

2. Skin

Immediately wash contaminated areas with large amounts of water. Remove contaminated clothing and footwear. Wash clothing and decontaminate footwear before reuse. Seek medical attention immediately if irritation is severe or persistent.

3. Inhalation

Remove person from contaminated area to fresh air. If breathing has stopped, resuscitate and administer oxygen if readily available. Seek medical attention immediately.

4. Ingestion

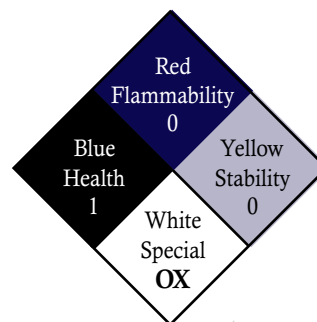
Never give anything by mouth to an unconscious or convulsing person. If person is conscious, give large quantities of water. Seek medical attention immediately.

Section 5 Fire Fighting Measures

NFPA* HAZARD SIGNAL

Health Hazard (less than 1 hour exposure)	1	=	Materials which under fire conditions would give off irritating combustion products. Materials which on the skin could cause irritation.
Flammability Hazard	0	=	Materials that will not burn.
Reactivity Hazard	0	=	Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.
Special Hazard	OX	=	Oxidizer

*National Fire Protection Association 704



FIRST RESPONDERS:

Wear protective gloves, boots, goggles, and respirator. In case of fire, wear positive pressure breathing apparatus. Approach site of incident with caution. Use Emergency Response Guide NAERG 96 (RSPA P5800.7). Guide No. 140.

FLASHPOINT

None

FLAMMABLE OR EXPLOSIVE LIMITS

Lower: Nonflammable

Upper: Nonflammable

EXTINGUISHING MEDIA

Use large quantities of water. Water will turn pink to purple if in contact with potassium permanganate. Dike to contain. Do not use dry chemicals, CO₂, Halon® or foams.

SPECIAL FIREFIGHTING PROCEDURES

If material is involved in fire, flood with water. Cool all affected containers with large quantities of water. Apply water from as far a distance as possible. Wear self-contained breathing apparatus and full protective clothing.



CARUS CHEMICAL COMPANY

Section 6 Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

Clean up spills immediately by sweeping or shoveling up the material. Do not return spilled material to the original container. Transfer to a clean metal drum. EPA banned the land disposal of D001 ignitable waste oxidizers. These wastes must be deactivated by reduction. To clean floors, flush with abundant quantities of water into sewer, if permitted by Federal, State, and Local regulations. If not permitted, collect water and treat chemically (Section 13).

PERSONAL PRECAUTIONS

Personnel should wear protective clothing suitable for the task. Remove all ignition sources and incompatible materials before attempting clean-up.

Section 7 Handling and Storage

WORK/HYGENIC PRACTICES

Wash hands thoroughly with soap and water after handling potassium permanganate, and before eating or smoking. Wear proper protective equipment. Remove contaminated clothing.

VENTILATION REQUIREMENTS

Provide sufficient area or local exhaust to maintain exposure below the TLV-TWA.

CONDITIONS FOR SAFE STORAGE

Store in accordance with NFPA 430 requirements for Class II oxidizers. Protect containers from physical damage. Store in a cool, dry area in closed containers. Segregate from acids, peroxides, formaldehyde, and all combustible, organic or easily oxidizable materials including anti-freeze and hydraulic fluid.

Section 8 Exposure Controls/Personal Protection

RESPIRATORY PROTECTION

In the case where overexposure may exist, the use of an approved NIOSH-MSHA dust respirator or an air supplied respirator is advised. Engineering or administrative controls should be implemented to control dust.

EYE

Faceshield, goggles, or safety glasses with side shields should be worn. Provide eye wash in working area.

GLOVES

Rubber or plastic gloves should be worn.

OTHER PROTECTIVE EQUIPMENT

Normal work clothing covering arms and legs, and rubber or plastic apron should be worn.



Section 9 Physical and Chemical Properties

APPEARANCE AND ODOR	Dark purple solid with a metallic luster, odorless
BOILING POINT, 760 mm Hg	Not applicable
VAPOR PRESSURE (mm Hg)	Not applicable
SOLUBILITY IN WATER % BY SOLUTION	6% at 20°C (68°F), and 20% at 65°C (149°F)
PERCENT VOLATILE BY VOLUME	Not volatile
EVAPORATION RATE (BUTYL ACETATE=1)	Not applicable
MELTING POINT	Starts to decompose with evolution of oxygen (O ₂) at temperatures above 150°C (302°F). Once initiated, the decomposition is exothermic and self-sustaining.
OXIDIZING PROPERTIES	Strong oxidizer
SPECIFIC GRAVITY	2.7 @ 20°C (68°F)
VAPOR DENSITY (AIR=1)	Not applicable

Section 10 Stability and Reactivity

STABILITY Under normal conditions, the material is stable.

CONDITIONS TO AVOID Contact with incompatible materials or heat (>150°C/302°F).

INCOMPATIBLE MATERIALS Acids, peroxides, formaldehyde, anti-freeze, hydraulic fluids, and all combustible organic or readily oxidizable inorganic materials including metal powders. With hydrochloric acid, toxic chlorine gas is liberated.

HAZARDOUS DECOMPOSITION PRODUCTS When involved in a fire, potassium permanganate may liberate corrosive fumes.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION Material is not known to polymerize.

Section 11 Toxicological Information

Potassium permanganate: Acute oral LD₅₀(rat) = 780 mg/kg Male (14 days); 525 mg/kg Female (14 days)
The fatal adult human dose by ingestion is estimated to be 10 grams. (Ref. Handbook of Poisoning: Prevention, Diagnosis & Treatment, Twelfth Edition)

EFFECTS OF OVEREXPOSURE

- Acute Overexposure
Irritating to body tissue with which it comes into contact.
- Chronic Overexposure
No known cases of chronic poisoning due to potassium permanganate have been reported. Prolonged exposure, usually over many years, to heavy concentrations of manganese oxides in the form of dust and fumes, may lead to chronic manganese poisoning, chiefly involving the central nervous system.
- Carcinogenicity
Potassium permanganate has not been classified as a carcinogen by OSHA, NTP, IARC.
- Medical Conditions Generally Aggravated by Exposure
Potassium permanganate will cause further irritation of tissue, open wounds, burns or mucous membranes.

Registry of Toxic Effects of Chemical Substances
RTECS #SD6476000



Section 12 Ecological Information

Entry to the Environment

Potassium Permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide (MnO₂).

Bioconcentration Potential

In non-reducing and non-acidic environments manganese dioxide (MnO₂) is insoluble and has a very low bioaccumulative potential.

Aquatic Toxicity

Rainbow trout, 96 hour LC₅₀: 1.8 mg/L
Bluegill sunfish, 96 hour LC₅₀: 2.3 mg/L

Section 13 Disposal Consideration

DEACTIVATION OF D001 IGNITABLE WASTE OXIDIZERS BY CHEMICAL REDUCTION

Reduce potassium permanganate in aqueous solutions with sodium thiosulfate (Hypo), or sodium bisulfite or ferrous salt solution. The thiosulfite or ferrous salt may require some dilute sulfuric acid to promote rapid reduction. If acid was used, neutralize with sodium bicarbonate to neutral pH. Decant or filter, and mix the sludge with sodium carbonate and deposit in an approved landfill. Where permitted, the sludge can be drained into sewer with large quantities of water. Use caution when reacting chemicals. Contact Carus Chemical Company for additional recommendations.

Section 14 Transport Information

U. S. DEPARTMENT OF TRANSPORTATION INFORMATION:

Proper Shipping Name: 49 CFR 172.101 Potassium Permanganate
ID Number: 49 CFR 172.101 UN 1490
Hazard Class: 49 CFR 172.101 Oxidizer
Division: 49 CFR 172.101 5.1
Packing Group: 49 CFR 172.101 II

Section 15 Regulatory Information

TSCA Listed in the TSCA Chemical Substance Inventory

CERCLA **Hazardous Substance**

Reportable Quantity: RQ - 100 lb 40 CFR 116.4; 40 CFR 302.4

RCRA Oxidizers such as potassium permanganate meet the criteria of ignitable waste. 40 CFR 261.21

SARA TITLE III Information

Section 302 Extremely hazardous substance: Not listed
Section 311/312 Hazard categories: Fire, acute and chronic toxicity
Section 313 CAIROX® potassium permanganate contains 97% Manganese Compound as part of the chemical structure (manganese compounds CAS Reg. No. N/A) and is subject to the reporting requirements of Section 313 of Title III, Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372.



Section 15 Regulatory Information (cont.)

STATE LISTS	Michigan Critical Materials Register:	Not listed
	California Proposition 65:	Not listed
	Massachusetts Substance List:	5 F8
	Pennsylvania Hazard Substance List:	E
FOREIGN LISTS	Canadian Domestic Substances List (DSL)	Listed
	Canadian Ingredient Disclosure List	Listed
	European Inventory of Existing Chemical Substances (EINECS)	2317603

Section 16 Other Information

NIOSH	National Institute for Occupational Safety and Health
MSHA	Mine Safety and Health Administration
OSHA	Occupational Safety and Health Administration
NTP	National Toxicology Program
IARC	International Agency for Research on Cancer
TSCA	Toxic Substances Control Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act of 1986
PEL-C	OSHA Permissible Exposure Limit-OSHA Ceiling Exposure Limit
TLV-TWA	Threshold Limit Value - Time Weighted Average (American Conference of Governmental Industrial Hygienists)


Kenneth Krogulski
May 2000


CARUS



The information contained is accurate to the best of our knowledge. However, data, safety standards and government regulations are subject to change; and the conditions of handling, use or misuse of the product are beyond our control. Carus Chemical Company makes no warranty, either express or implied including any warranties of merchantability and fitness for a particular purpose. Carus also disclaims all liability for reliance on the completeness or confirming accuracy of any information included herein. Users should satisfy themselves that they are aware of all current data relevant to their particular uses.

CAIROX® is registered trademark of Carus Corporation.

Responsible Care® is a service mark of the Chemical Manufacturers Association.

Rev. 5/ 00 Form # CX 1028