TETRA TECH

December 15, 2016

Mr. Paul Doherty
EPA On-Scene Coordinator
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Subject: **Emergency Response Report**
Hydrogen Chloride – MGP, Atchison, Kansas
U.S. EPA Region 7 START 4, Contract No. EP-S7-13-06, Task Order No. 0001.031
Task Monitor: Paul Doherty, EPA On-Scene Coordinator

Dear Mr. Doherty:

Tetra Tech, Inc. (Tetra Tech) is submitting the attached Emergency Response Report regarding the Hydrogen Chloride – MGP site in Atchison, Kansas. If you have any questions or comments, please contact the Project Manager at (816) 268-0213.

Sincerely,

for Mark Zipf
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

cc: Debra Dorsey, START Project Officer (cover letter only)

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EMERGENCY RESPONSE REPORT

HYDROGEN CHLORIDE – MGP, ATCHISON, KANSAS

Superfund Technical Assessment and Response Team (START) 4
Contract No. EP-S7-13-06, Task Order No. 0001.031

Prepared For:

U.S. Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

December 15, 2016

Prepared By:

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1.0 INCIDENT

At about 0800 hours on October 21, 2016, a tanker truck was offloading sulfuric acid at the MGP Ingredients Inc. (MGP) wastewater pre-treatment plant in downtown Atchison, Kansas (between 10th and 14th Streets, south of Main Street [see Appendix A, Figure 1]), when the hose from the truck was inadvertently connected to piping leading to a 6,500-gallon aboveground storage tank (AST) containing sodium hypochlorite. A chemical reaction resulted from mixing of these chemicals, causing a large, thick, white plume of gaseous hydrogen chloride and/or chlorine to discharge from the sodium hypochlorite tank and spread to the north over several square miles (see Appendix B). The plume discharged via an open manhole on the AST, the cover of which had been ejected as a result of the chemical reaction. It took 30 to 40 minutes to stop the transfer by closing the valve on the tanker truck. The Atchison Fire Department (AFD) began applying a deluge wash to the sodium hypochlorite tank, knocking down the escaping cloud of gas. Nearby businesses, residences, and schools (including Benedictine College) were evacuated, while others were advised to shelter in place. Some roads were closed for 1-2 hours, including State Route 7 (K-7), U.S. Highway 73, and U.S. Highway 59.

Atchison is a town of approximately 11,000 people in northeast Kansas, about 50 miles northwest of Kansas City. Approximately 100 people sought medical attention for respiratory distress as a result of the release, including five City employees. Mosaic Life Care set up a portable decontamination tent to treat individuals experiencing site-related symptoms of exposure.

At approximately 0930 hours, EPA was notified of the incident and requested assistance from the Tetra Tech Superfund Technical Assessment and Response Team (START) to assess the site. START members Mark Zipf and Nick Wiederholt responded to the incident. The EPA On-Scene Coordinator (OSC) for the response was Paul Doherty.

2.0 FACILITY BACKGROUND

MGP has operated at the Atchison location since 1941 and employs about 200 people at two locations. MGP processes wheat flour into food ingredients; byproducts from this process are mixed with corn to make alcohol additives used in distilled beverages, food, and pharmaceuticals. Distilled alcohol products, including gin, bourbon, and rye whiskey are also produced. In addition, the company makes plant-based polymers for petroleum-based plastic items, such as disposable cutlery and compact disk cases.

In February 2016, a small explosion occurred at the Atchison plant that resulted in no injuries. However, another explosion occurred at the facility in 2002 when alcolohol vapors escaped through a manhole at the distillery and ignited, injuring two workers who required medical care at a hospital. According to the Kansas Department of Health and Environment (KDHE), MGP has incurred more than $50,000 in penalties since 2006 for issues including exceedance of air pollution limits and failure to install appropriate emissions devices.

3.0 EMERGENCY RESPONSE ACTIVITIES

EPA and START arrived at the site at about 1250 hours on October 21, 2016. By that time, the airborne plume had largely dispersed, and the imminent threat to human health appeared to have diminished substantially. First responders and many local, state, and federal government agency personnel were on site. OSC Doherty met with authorities, including the Atchison City Manager, County Emergency Management Director, AFD Incident Commander, KDHE, MGP representatives, and others. Residents who had been advised to shelter in place were cleared to leave their homes.

Coordinates for the AST containing sodium hypochlorite where the release occurred were determined to be 39.558716 degrees north latitude and 95.132491 degrees west longitude. START was tasked to perform perimeter real-time air monitoring. START used a MultiRAE Pro multi-gas detector (with oxygen, combustible gas, chlorine, volatile organic compound [VOC], and gamma radiation sensors) and a MultiRAE Plus multi-gas detector that included a hydrogen sulfide sensor to acquire and record readings at 11 locations around the MGP facility. The readings were taken between 1430 hours and 1620 hours, and all readings were non-detect except for oxygen, which was 20.9% at all locations. A summary of the air monitoring locations is in Table 1 below. The air monitoring locations are also shown on Figure 2 in Appendix A.

TABLE 1

REAL-TIME AIR MONITORING READINGS
HYDROGEN CHLORIDE – MGP SITE, ATCHISON, KANSAS

Location[1]	Description	Latitude (°N)	Longitude (°W)	O_2 (%)	LEL (%)	Cl_2 (ppm)	VOCs (ppm)[2]	H_2S (ppm)
MRPro1	Gasoline Alley (maintenance building)	39.55902892	95.13120859	20.9	0	0	0	NA
MR2	Hwy 73 and Gasoline Alley	39.55942542	95.12768081	20.9	0	0	0	0
MR3	Hwy 59 and Hwy 73 (NW corner)	39.55890893	95.12754444	20.9	0	0	0	0
MR4	Leopoldo's Greenhouse	39.55785398	95.13154546	20.9	0	0	0	0
MR5	14th Street and Hwy 59 (NE corner)	39.55731628	95.13524939	20.9	0	0	0	0
MR6	Bridge on 14th Street (E side)	39.55918198	95.13541974	20.9	0	0	0	0
MR7	14th Street and Main Street (NW corner)	39.56076037	95.13541915	20.9	0	0	0	0
MR8	13th Street and Main Street (S side)	39.56082889	95.13320306	20.9	0	0	0	0
MR9	MGP parking lot (E side of plant)	39.56063279	95.13116215	20.9	0	0	0	0
MR10	10th Street and Main Street (SW corner)	39.56057726	95.12872512	20.9	0	0	0	0
MR11	Incident site (30 feet N of tanks)	39.55880026	95.13252413	20.9	0	0	0	0

Notes:

[1] See Figure 2 in Appendix A
[2] Concentration above background level

Cl_2	Chlorine
E	East
H_2S	Hydrogen sulfide
Hwy	Highway
LEL	Lower explosive limit
MR	MultiRAE Plus (instrument used to obtain air monitoring readings)
MRPro	MultiRAE Pro (instrument used to obtain air monitoring readings)
N	North
NA	Not applicable
NE	Northeast
NW	Northwest
O_2	Oxygen
ppm	Parts per million
S	South
SW	Southwest
VOC	Volatile organic compound
W	West
°	Degrees
%	Percent

An MGP contractor (Haz-Mat Response Inc.) was on site at the time START and EPA arrived. Although the valve on the tanker truck had been closed for a few hours, it was necessary for the tanker to depressurize before the hose could be disconnected. The AFD stayed on site until the hose from the tanker truck could be disconnected. As soon as the AFD left at 1650 hours, Haz-Mat Response Inc. began deploying 2,000-gallon portable tanks to the site; contents of the 6,500-gallon sodium hypochlorite tank would be transferred to the portable tanks. Completion of the transfer operation was expected by 2200 hours.

Another MGP contractor, the Center for Toxicology and Environmental Health (CTEH), was also on site to conduct air monitoring at the facility and throughout the Atchison community, and to provide information to the public regarding health impacts from exposure to the airborne release. EPA and START left the site at 1745 hours.

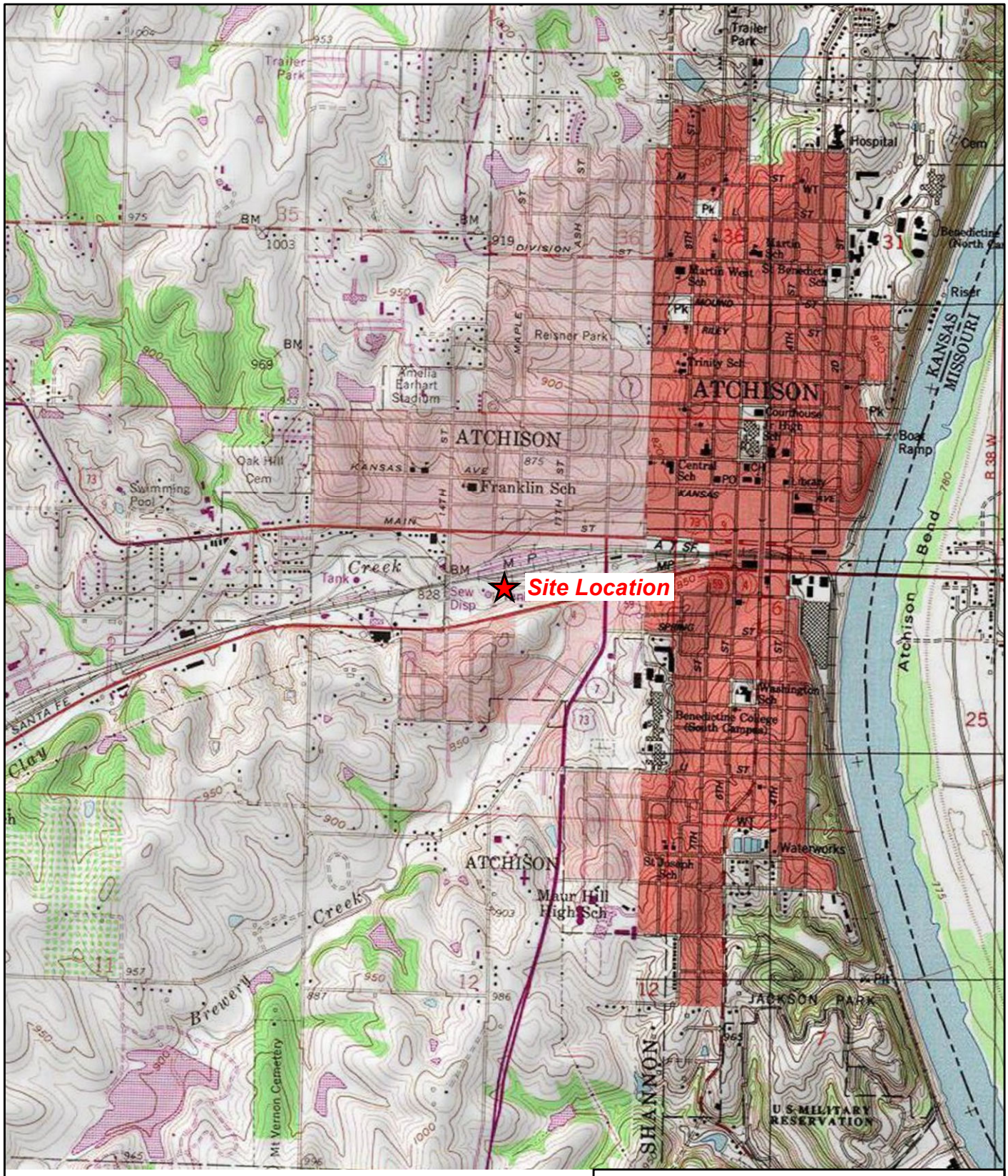
4.0 SUMMARY

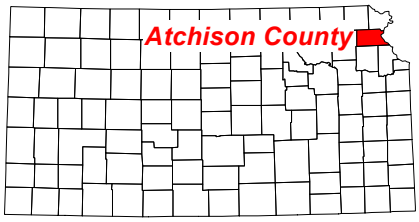
On October 21, 2016, START assisted EPA with emergency response activities at the MGP Ingredients, Inc. facility in Atchison, Kansas. The response was to assess an accidental release of a hydrogen chloride and/or chlorine gas plume. The release was caused by mixing of sulfuric acid and sodium hypochlorite, which initiated an immediate reaction that resulted in expulsion of a manhole cover from an AST containing the sodium hypochlorite. The airborne plume spread over several square miles. It took 30 to 40 minutes to close the valve on the tanker truck delivering the sulfuric acid. START was tasked to perform perimeter air monitoring and found no readings for chlorine, hydrogen sulfide, or VOCs above background levels. Also, no explosive atmospheres or oxygen-enriched/suppressed conditions were identified.

An investigation of the incident by the U.S. Chemical Safety Board (CSB) subsequently occurred. The CSB is an independent federal agency that investigates industrial chemical accidents. CSB investigations evaluate various aspects of chemical accidents, including physical causes such as equipment failures, as well as improper adherence to regulations, industry standards, and safety management systems. The U.S. Food and Drug Administration (FDA) and the Occupational Safety and Health Administration (OSHA) also conducted investigations.

APPENDIX A

FIGURES





N

0 1,000 2,000

Feet

Source: USGS Atchison East, KS 7.5 Minute Topo Quad, 1985;
USGS Atchison West, KS 7.5 Minute Topo Quad, 1978.

Hydrogen Chloride - MGP
Atchison, Kansas

Figure 1
Site Location Map

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Date: 10/25/2016 Drawn By: Nick Wiederholt Project No: X9025.14.0001.031

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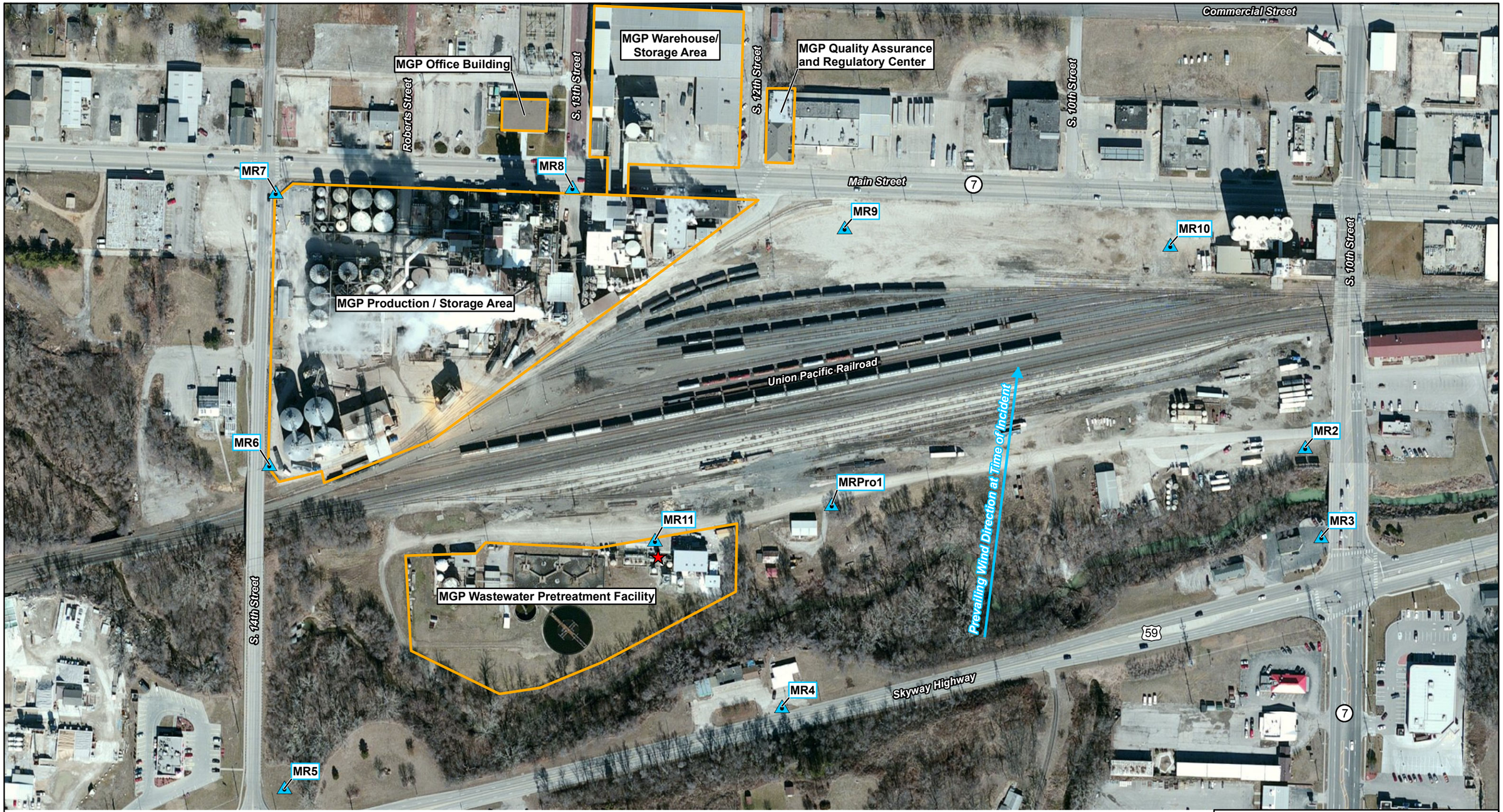

Legend

- Incident location
- Air monitoring location
- Area of interest

MGP MGP Ingredients Inc.

Source: The source of this map image is Esri, used by EPA with Esri's permission.

N

0 100 200

Feet

Hydrogen Chloride - MGP
Atchison, Kansas

Figure 2
Site Layout Map

TETRA TECH

Date: 12/15/2016 Drawn By: Nick Wiederholt Project No: X9025.14.0001.031

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APPENDIX B

PHOTOGRAPHIC DOCUMENTATION

Hydrogen Chloride - MGP
Atchison, Kansas

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows a 6,500-gallon aboveground storage tank (AST) containing sodium hypochlorite at the industrial wastewater pretreatment facility operated by MGP Ingredients, Inc. (MGP).	1
	CLIENT	U.S. Environmental Protection Agency (EPA) Region 7	Date
Direction: South	PHOTO SOURCE	P. Doherty (EPA)	10/21/16

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows the pipe manifold where a hose from a tanker truck containing sulfuric acid was inadvertently connected to a sodium hypochlorite receiving line leading to the AST. The pipes are clearly labeled for the product that they are intended to transfer to the holding tanks.	2
	CLIENT	EPA Region 7	Date
Direction: Southeast	PHOTO SOURCE	P. Doherty (EPA)	10/21/16

Hydrogen Chloride - MGP
Atchison, Kansas

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows the gas cloud that was produced when sulfuric acid from the tanker truck was inadvertently transferred to the sodium hypochlorite AST.	3
	CLIENT	EPA Region 7	Date
Direction: West	PHOTO SOURCE	KSHB	10/21/16

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows the chemical fog that covered much of downtown Atchison and spread approximately 10 miles north.	4
	CLIENT	EPA Region 7	Date
Direction: North	PHOTO SOURCE	KCTV5	10/21/16

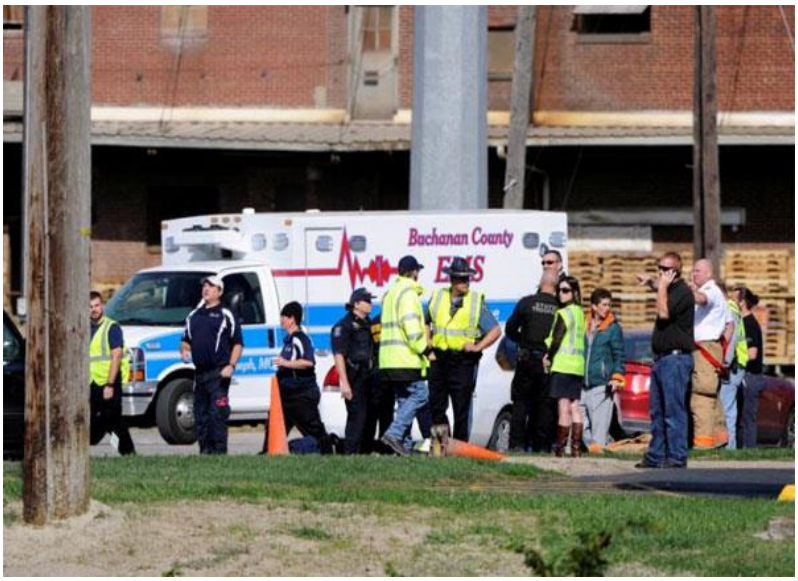
Hydrogen Chloride - MGP
Atchison, Kansas

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows the chemical fog at the Casey's General Store at the intersection of Main Street and N. 17th Street in Atchison. Residents were advised to stay indoors, keep windows closed, and turn heating and cooling systems off.	5
	CLIENT	EPA Region 7	Date
Direction: East	PHOTO SOURCE	One America News	10/21/16

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows students evacuating Benedictine College. Students from the high school, middle schools, and alternative schools were also evacuated.	6
	CLIENT	EPA Region 7	Date
Direction: Unknown	PHOTO SOURCE	RT.com	10/21/16

Hydrogen Chloride - MGP
Atchison, Kansas

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows firefighters spraying water to suppress the airborne release. The plume began to dissipate within about an hour after the release occurred.	7
	CLIENT	EPA Region 7	Date
Direction: East	PHOTO SOURCE	NBC News	10/21/16



TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows Buchanan County Emergency Medical Service staff and other officials collaborating in an evacuated area.	8
	CLIENT	EPA Region 7	Date
Direction: Unknown	PHOTO SOURCE	EMTV	10/21/16

Hydrogen Chloride - MGP
Atchison, Kansas

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows an EPA Superfund Technical Assessment and Response Team (START) contractor interviewing an MGP supervisor regarding the incident. EPA and START arrived on scene at about 1300 hours and began air monitoring activities using MultiRAE detectors equipped with chlorine sensors.	9
	CLIENT	EPA Region 7	Date
Direction: West	PHOTO SOURCE	N. Wiederholt (START)	10/21/16

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows evacuated MGP employees and the production and storage facility northwest of the incident site.	10
	CLIENT	EPA Region 7	Date
Direction: Northwest	PHOTO SOURCE	N. Wiederholt (START)	10/21/16

Hydrogen Chloride - MGP
Atchison, Kansas

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph was taken from air monitoring location MR6 and shows the MGP industrial wastewater pretreatment facility south of the railroad tracks.	11
	CLIENT	EPA Region 7	Date
Direction: Southeast	PHOTO SOURCE	N. Wiederholt (START)	10/21/16

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph was taken from the west side of the MGP facility and shows some of the storage tanks.	12
	CLIENT	EPA Region 7	Date
Direction: Northeast	PHOTO SOURCE	N. Wiederholt (START)	10/21/16

Hydrogen Chloride - MGP
Atchison, Kansas

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph was taken from air monitoring location MR8 and shows some of the facility's emission stacks.	13
	CLIENT	EPA Region 7	Date
Direction: Southwest	PHOTO SOURCE	N. Wiederholt (START)	10/21/16

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph was taken from air monitoring location MR9 and shows the truck parking and loading entrance.	14
	CLIENT	EPA Region 7	Date
Direction: West	PHOTO SOURCE	N. Wiederholt (START)	10/21/16

Hydrogen Chloride - MGP
Atchison, Kansas

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows the equipment trailer for the hazardous materials (hazmat) response team that arrived on site to assist with chemical transfer from the 6,500-gallon sodium hypochlorite AST.	15
	CLIENT	EPA Region 7	Date
Direction: Southeast	PHOTO SOURCE	N. Wiederholt (START)	10/21/16

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows a hazmat employee connecting a hose to the sodium hypochlorite tank.	16
	CLIENT	EPA Region 7	Date
Direction: Southwest	PHOTO SOURCE	P. Doherty (EPA)	10/21/16

Hydrogen Chloride - MGP
Atchison, Kansas

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows a hazmat employee unloading a large portable polyethylene tank that was used to contain the contaminated sodium hypochlorite solution.	17
	CLIENT	EPA Region 7	Date
Direction: Southwest	PHOTO SOURCE	N. Wiederholt (START)	10/21/16

TETRA TECH PROJECT NO. X9025.14.0001.031	PHOTO DESCRIPTION	This photograph shows the transfer of contents from the 6,500-gallon sodium hypochlorite tank to portable tanks for characterization and disposal.	18
	CLIENT	EPA Region 7	Date
Direction: Southeast	PHOTO SOURCE	P. Doherty (EPA)	10/21/16