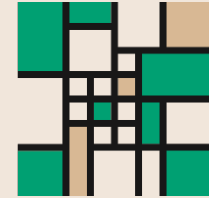


Health Impacts Survey Rockton Chemtool Fire

One-Year Follow-up



W C H D

Winnebago County Health Department

Serving Our Whole Community

Date: February 7, 2023

Presentation To: Representatives From The Village of Rockton Community and Local Response Agencies



Outline

- Partner Support
- Background
- Environmental Impacts
- Health Impacts – Quantitative
- Health Impacts – Qualitative
- Summary – Lessons Learned



Winnebago County

Health Department

Partners

Partners - Federal

- Centers for Disease Control and Prevention (CDC)/Agency for Toxic Substances and Disease Registry (ATSDR)
 - Motria Caudill, PhD – Regional Representative
 - Peter DeJonge, PhD – Epidemic Intelligence Officer
 - D. Kevin Horton, DrPH – Epidemiologist
 - Stacey Konkle, PhD – Epidemiologist
 - Maureen Orr, MS, BS – Epidemiologist
 - Lance R. Owen, PhD – Geospatial Researcher
 - Ahlia Sekkarie, PhD – Epidemic Intelligence Officer



Partners – State and Local

- Illinois Department of Public Health
 - Sarah L. Patrick, MPH, PhD – Chief, Division of Emerging Health Issues
 - Aaron Martin, LEHP – Chief, Toxicology Section
 - Brian Koch, MS – Program Manager, Environmental Toxicology
- Winnebago County Health Department
 - Abby Kittler, MPH – Epidemiologist
 - Sandra Martell RN, DNP – Public Health Administrator
 - Patrick Ngum – Director, Data and Quality



Winnebago County

Health Department

Background

Chemtool Production Facility

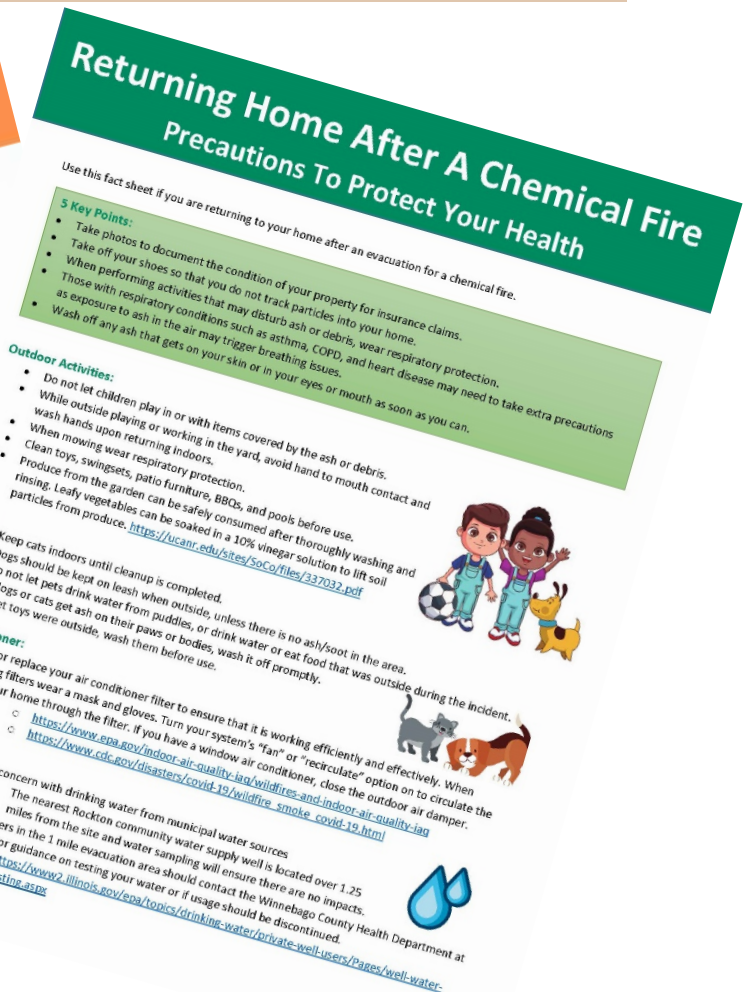
- Fluid, lubricant, and grease manufacturer
- Owned by Lubrizol
- Located in Rockton, Illinois
- Former Superfund Site - Beloit Corporation
 - 20 Acre Site
 - Clean-up completed in 2017



Image courtesy WREX: <https://wrex.com/2021/06/14/4-alarm-fire-breaks-out-at-chemtool-manufacturing-plant-in-rockton/>

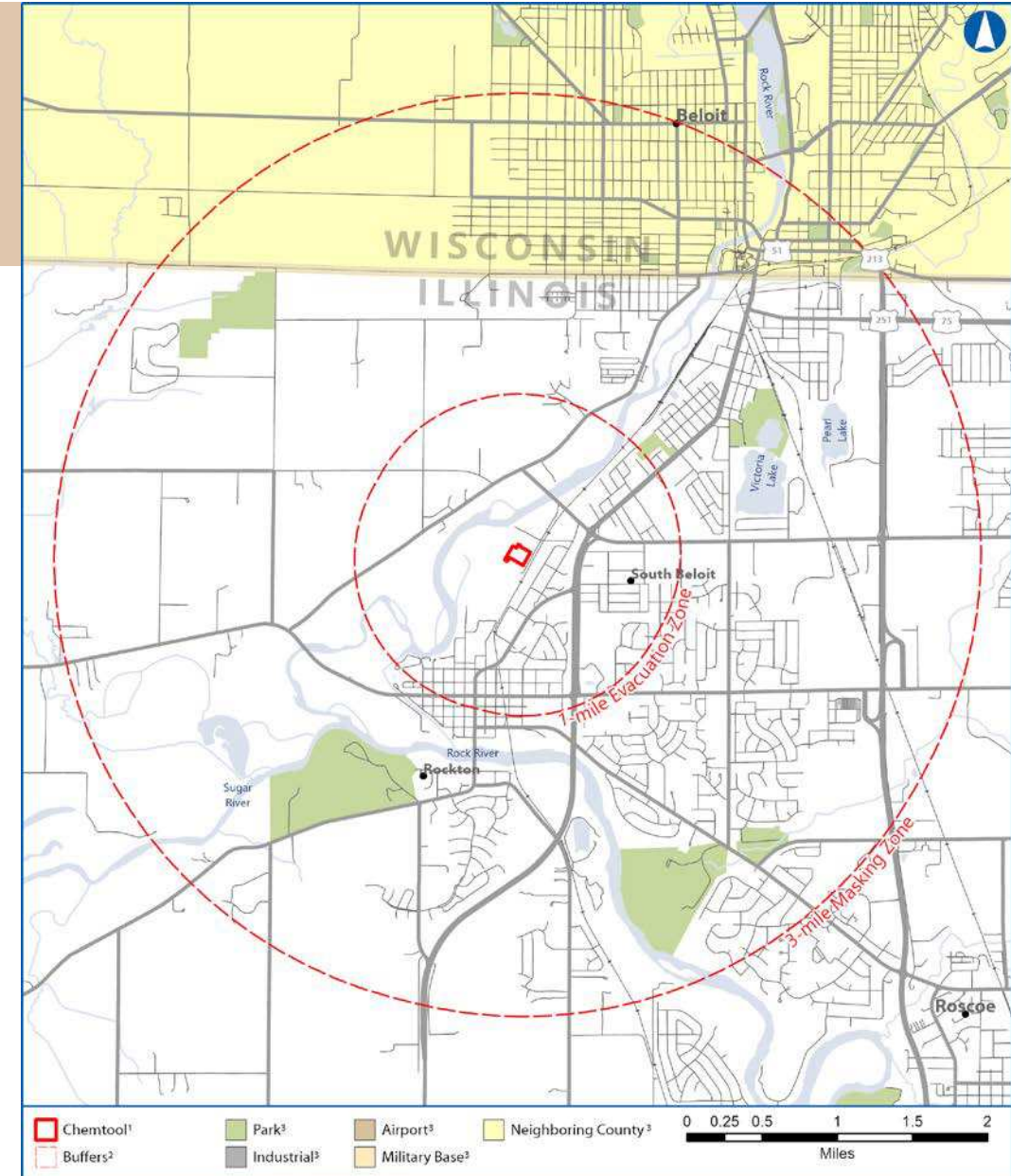
Timeline of Incident Response

- Monday, June 14, 2021
 - 6:50 am – Fire Alarm activated
 - 8:35 am – 1 mile evacuation zone order
 - 10:00 am – 3 mile masking zone recommended
- Wednesday, June 16, 2021
 - 1:00 pm – 3 mile masking zone recommendation lifted
- Friday, June 18, 2021
 - 10:00 am – 1 mile evacuation zone order lifted



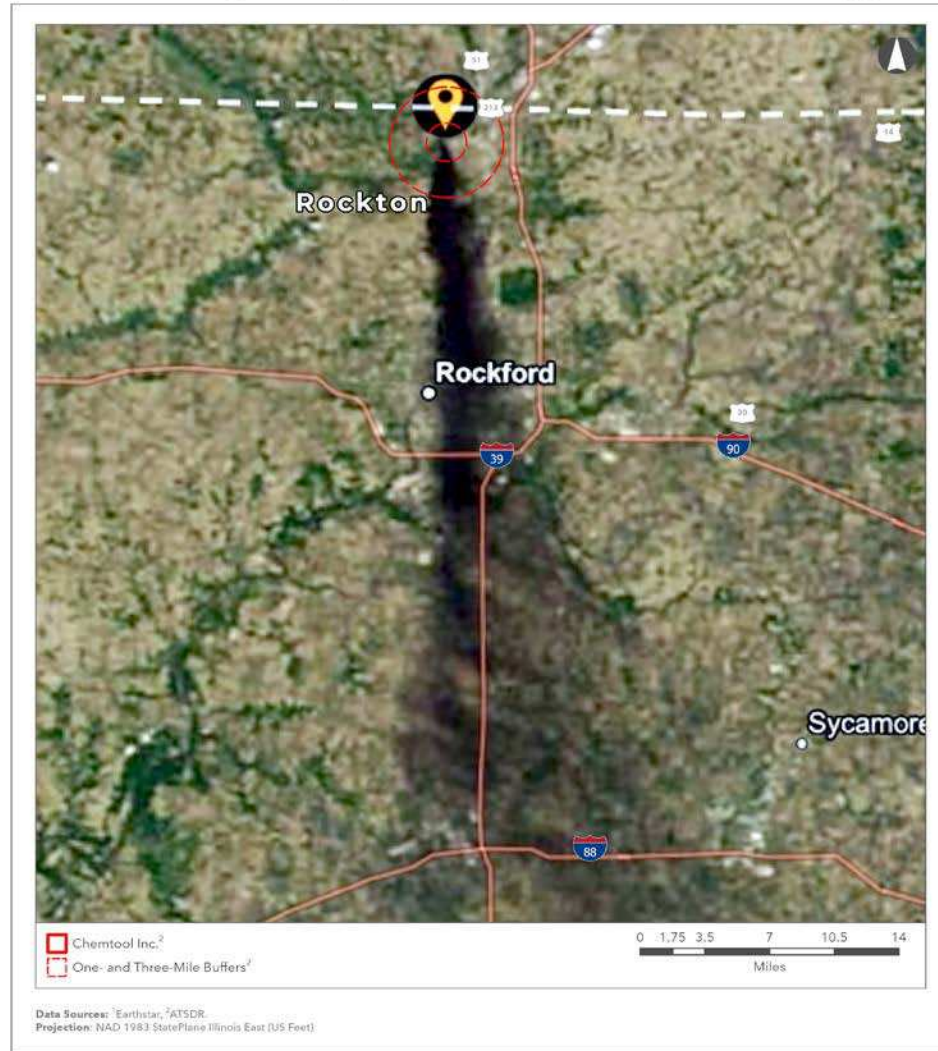
Incident Response

- 1-mile Evacuation Order
 - *Rockton Fire Department*
 - *Winnebago County Health Department*
- 3-mile Masking Advisory
 - *Winnebago County Health Department*
- Environmental Sampling
 - Uncertainty about which chemicals to test for
 - Multiple response agencies
 - US Environmental Protection Agency (US EPA)
 - Illinois Environmental Protection Agency (IEPA)
 - Illinois Civil Support Team (CST)
 - Chemtool Contractor Center for Toxicology and Environmental Health (CTEH)



Environmental Impacts

Retrospective Review



Data Sources: Earthstar, ATSDR
Projection: NAD 1983 StatePlane Illinois East (US Feet)

Centers for Disease Control and Prevention
Agency for Toxic Substances and Disease Registry

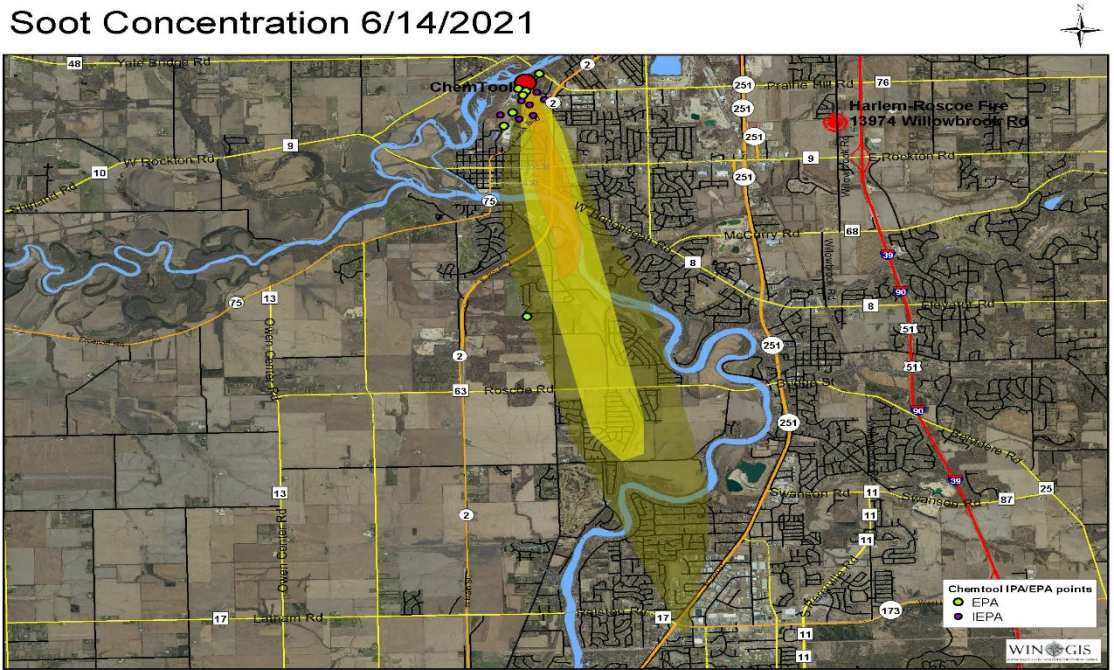
Geospatial Research, Analysis and Services Program

PRJ ID 06105 | AUTHOR Lance Owen
FINAL - FOR PUBLIC RELEASE
8/16/2021

Plume Images

Plume indicated a predominate **southeast** directional flow.

Soot Concentration 6/14/2021



Source: NOAA National Environmental Satellite Data and Information Service

Environmental Impact Assessment - Public

- Illinois EPA lead agency supported by:
 - US EPA Superfund Emergency Response
 - Illinois Civil Support Team (part of Illinois National Guard)
- Conducted multi-media environmental sampling
 - Air
 - Land/soil
 - Water
- Results posted on agency websites
 - Illinois EPA <https://www2.illinois.gov/epa/topics/community-relations/sites/Chemtool/Pages/default.aspx>
 - US EPA https://response.epa.gov/site/site_profile.aspx?site_id=15241



Environmental Impact Assessment - Private

- Chemtool Contractors

- Air Monitoring

- CTEH – Center for Toxicology and Environmental Health

- <https://www.cteh.com/>

- Debris pick-up and disposal

- Clean Harbors

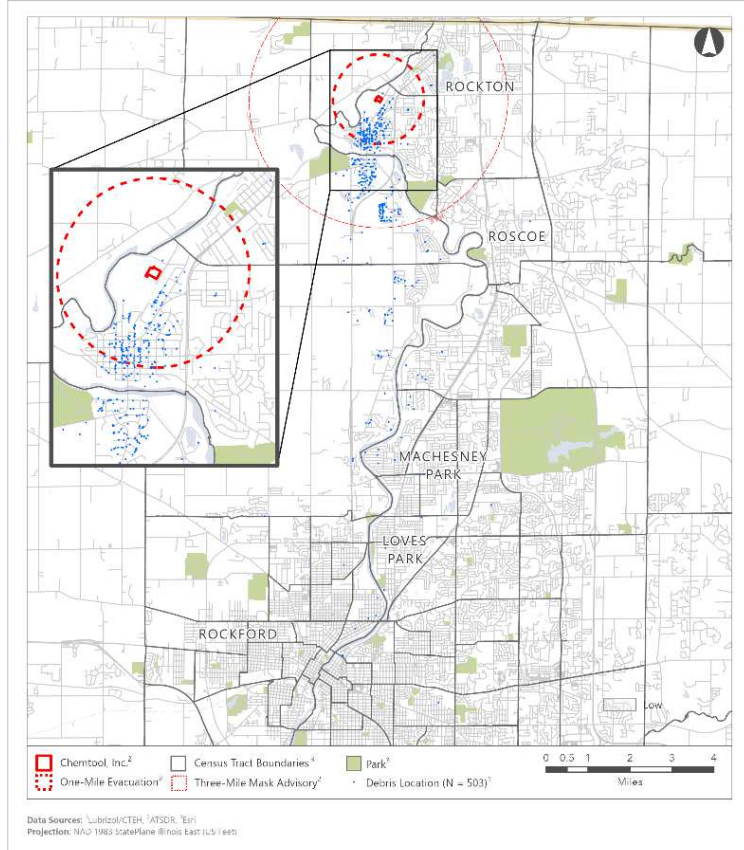
- <https://www.cleanharbors.com/>



Locations of Reported Fire Debris

Chemtool Incorporated Fire
Rockton, Winnebago County Illinois

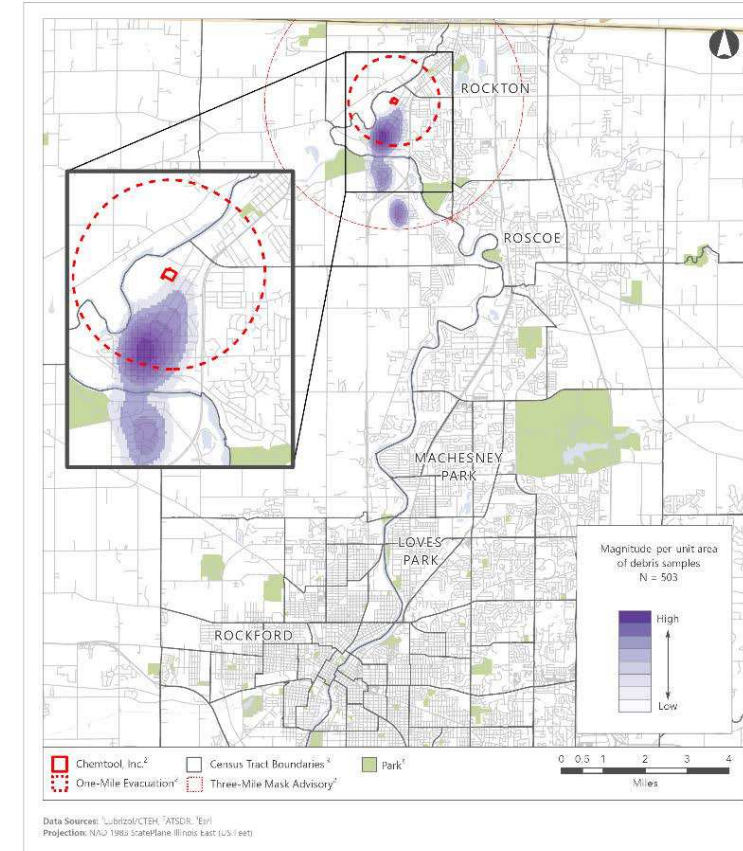
Sample Locations¹
DEBRIS FIELD
DEBRIS LOCATIONS | Samples Collected from June 17-24, 2021



Location of individual properties with Fire debris; found up to 15 miles from Chemtool facility

Chemtool Incorporated Fire
Rockton, Winnebago County Illinois

Sample Locations¹
DEBRIS FIELD
KERNEL DENSITY | Samples Collected from June 17-24, 2021

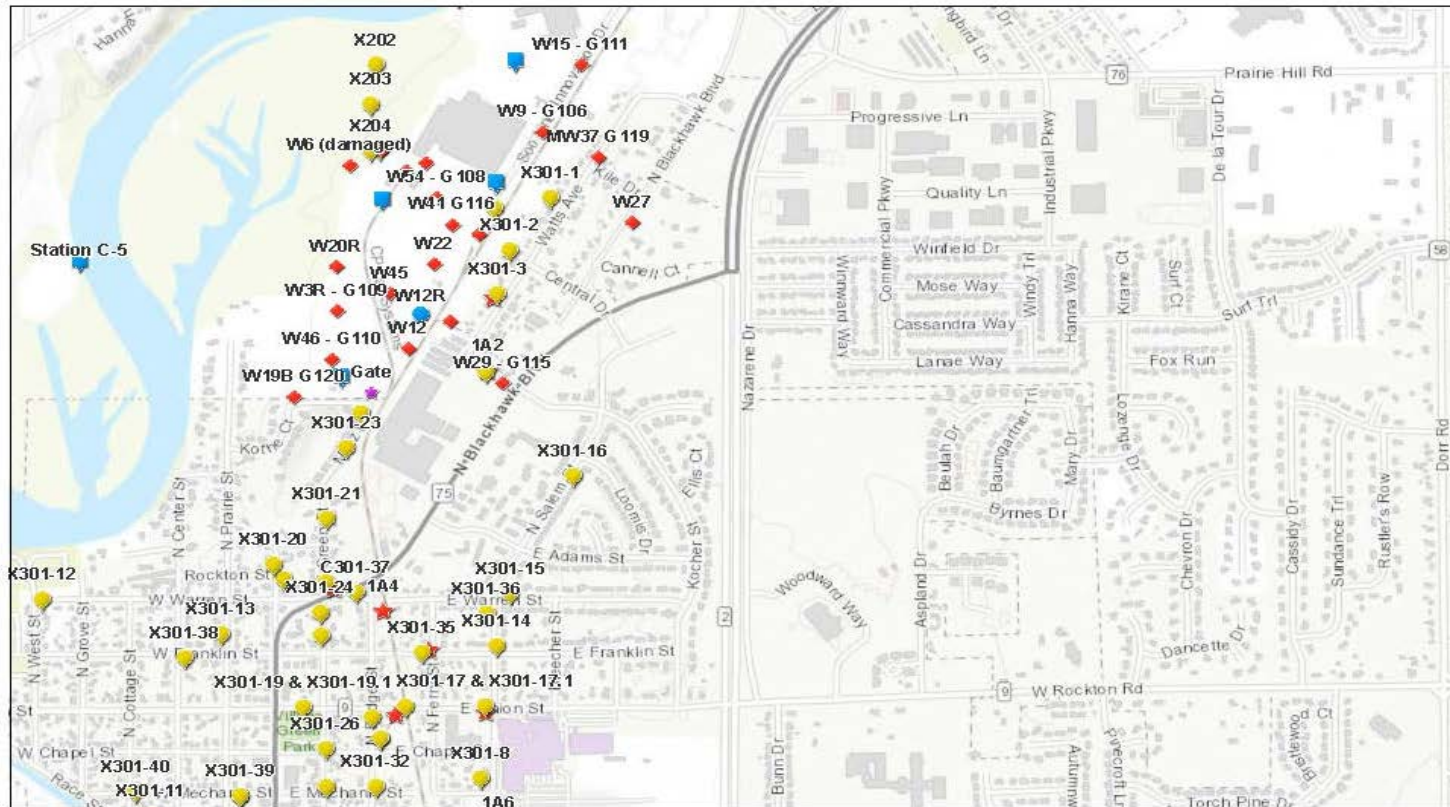


Density plot showing where most of the Fire debris was found

Source: Chemtool contractors

Water and Soil Sampling Locations – Illinois EPA

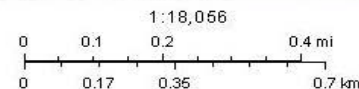
Chemtool Investigation - Illinois EPA



Soil sampling = 35 sites
Water sampling = 23 sites

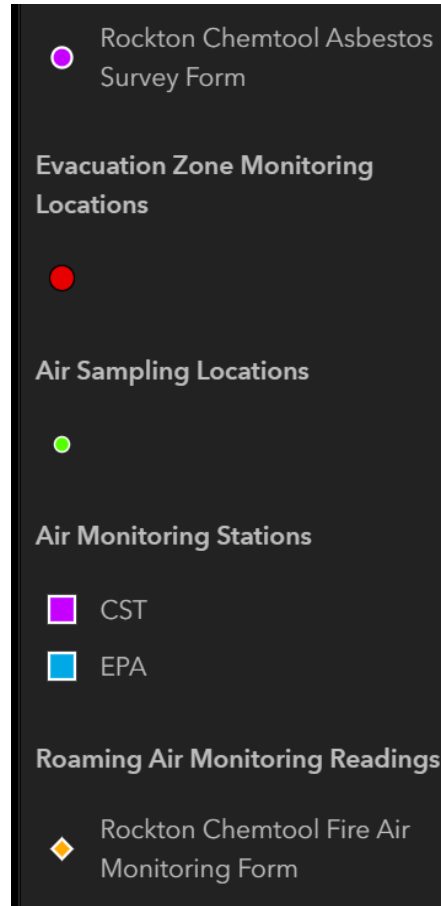
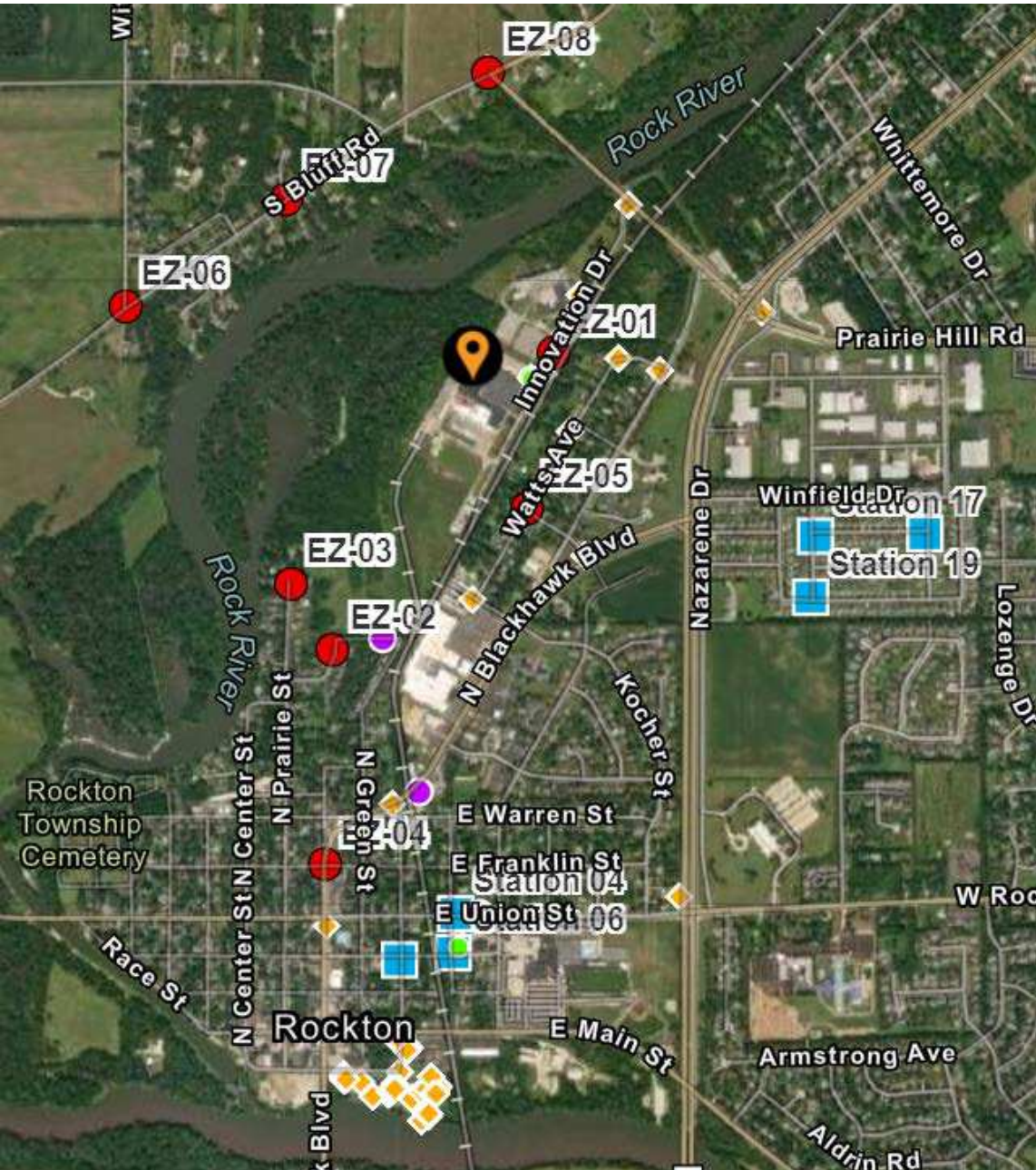
7/14/2021, 4:23:49 PM

- BOL Sample Locations
- Water Sample
 - Soil Sample
 - ◆ Monitoring Well
 - ★ Other Point
 - ★ US Army Sample Locations
 - BOW Sample Locations



Esri, Canada, Esri, HERE, Garmin, INCREMENT P, USGS, METINASA, EPA, USDA, Esri, HERE, ITC

Air Monitoring Locations



Winnebago County

Health Department

Environmental Monitoring Data

Chemical	Air					Dust (wipes)	Debris	Soil (0-1" grabs)	Surface Water
	Real time monitoring			8 hr SUMMA	Particle filters				
	Dust Tracker	SPM	AreaRAE						
Particulate matter	X								
-PM10	X								
-PM2.5	X								
VOCs			X	X					X-IEPA
Hydrogen cyanide (HCN)		X							
Sulfur dioxide (SO ₂)		X							
Hydrogen sulfide (H ₂ S)		X							
Benzene			X-CTEH						X-IEPA
PFAS									X-IEPA
Metals					X	X-IEPA	X-IEPA	X-IEPA	X-IEPA
SVOCs				X		X-IEPA	X-IEPA	X-IEPA	X-IEPA
PAHs									X-IEPA
Asbestos					X				

Data collected by USEPA, IEPA/Civil Support Team, CTEH

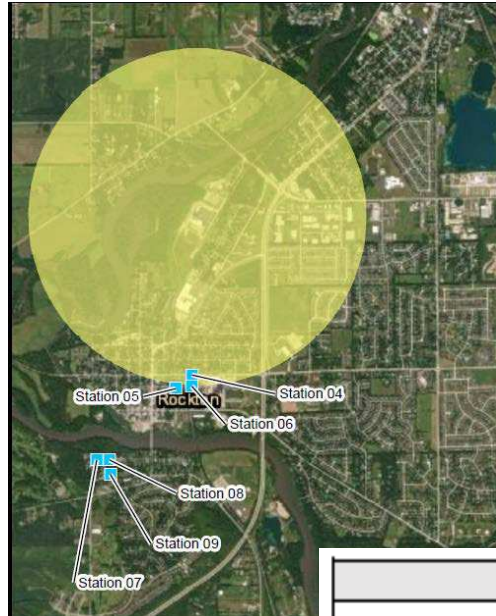
Monitoring Results



Monday, June 14 (1:10 pm) to Tuesday, June 15 (5:50 pm)

Station 2: Chemtool Facility						
Instrument	Analyte	Chemtool Public Health Screening Level ¹	Public Health Screening Level Exceeded?	Number of 1-Hour Periods	1-Hour Period Concentration Range	Average of All 1-Hour Periods
DustTrak 203	PM _{2.5} (mg/m ³)	0.025 mg/m ³	Yes (8)	17	0.01 to 0.08	0.03
	PM ₁₀ (mg/m ³)	0.05 mg/m ³	Yes (5)	17	0.01 to 0.09	0.03
AreaRae 1 (S/N: W01A00000642)	VOC (ppm)	1 ppm	No	27	0.0 to 0.2	0.1
	CO (ppm)	--	No	27	0.0 to 0.2	0.0
	O ₂ (%)	--	No	27	20.0 to 20.2	20.1
	H ₂ S (ppm)	0.1 mg/m ³	No	27	0.0 to 0.1	0.0
	LEL (%)	--	No	27	0.0 to 0.0	0.0

Monitoring Results



Legend

- EPA Air Monitoring Station
- 1 Mile Evacuation Radius

Note: Monitoring station locations subject to change based on weather and operational objectives.

Source: Esri 2020

Contract No.: 18-46-0019-00000 100 HOUR No.: 180 10/18/2018 11:58 AM

Tuesday, June 15 (5:10 pm) to Wednesday, June 16 (5:03 pm)

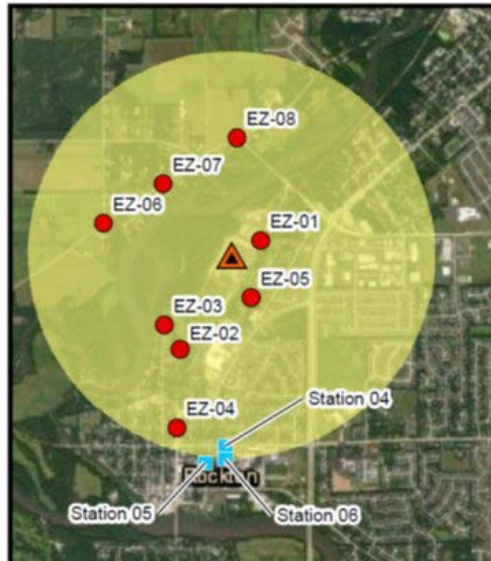
Station 6: Corner of Union and Ferry (NET1-D)						
Instrument	Analyte	Chemtool Public Health Screening Level ¹	Public Health Screening Level Exceeded?	Number of 1-Hour Periods	1-Hour Period Concentration Range	Average of All 1-Hour Periods
DustTrak 212	PM _{2.5} (mg/m ³)	0.025 mg/m ³	Yes (2)	7	0.00 to 0.09	0.03
	PM ₁₀ (mg/m ³)	0.05 mg/m ³	Yes (2)	7	0.00 to 0.09	0.03



Winnebago County

Health Department

Monitoring Results



Thursday, June 17 (3:00 am) to Friday, June 18, (1:53 am)

Station EZ-08: 1001-1199 Prairie Hill Rd					
Instrument	Analyte	Chemtool Public Health Screening Level ¹	Public Health Screening Level Exceeded?	Number of Measurements	Concentration Range
MultiRAE Pro	H ₂ S (ppm)	0.1 ppm	No	14	0.0 to 0.0
	HCN	1 ppm	No	14	0.0 to 0.0
	VOC (ppm)	1 ppm	No	14	0.0 to 0.0
Handheld DustTrak	PM _{2.5} (mg/m ³)	0.025 mg/m ³	Yes	4	0.007 to 0.075
	PM ₁₀ (mg/m ³)	0.05 mg/m ³	Yes	4	0.008 to 0.085
SPM Flex	SO ₂ (ppb)	0.2 ppm	No	14	0.0 to 0.0

Health Impacts of Particulate Matter

- Significant association between particulate matter (PM)
 - Cardiovascular – arrhythmias, heart attacks
 - Pulmonary/respiratory – asthma, bronchitis
 - Restricted activity days – lost work or school
 - Increased emergency department visits
- PM size matters
 - Smaller/fine (PM 2.5) → greatest risk since they can go deep
 - Larger/course (PM 10 – 2.5) → irritant to eyes, nose, and throat



Health Impacts – Quantitative Data

Physical Health and Mental Health

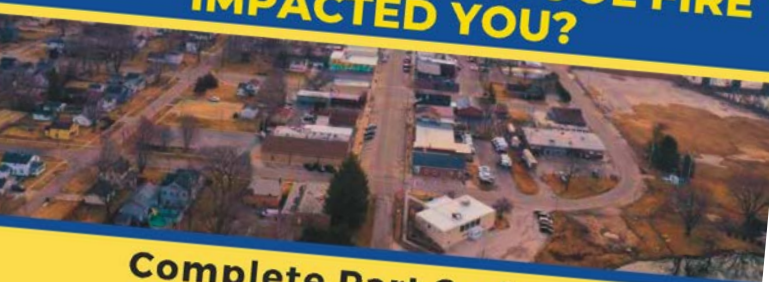
Methods

- Adaptation of initial survey developed in 2021 for the Chemtool Fire based on ASTDR Assessment of Chemical Exposures toolkit (ACE).
 - Included additional questions related to mental health
- Self-Administered
 - Emailed to follow-up survey to the 2,020 individuals who had completed the survey in 2021.
 - Promoted via social media, news outlets, websites – Village of Rockton, Winnebago County Health Department
- Semi-structured Interviews conducted by CDC/ATSDR team
 - Telephone follow-up based on response to self-administered survey.
 - Door-to-door interviews of neighborhood residences on Watts Avenue.

Methods



1 YEAR LATER HOW HAS THE CHEMTOOL FIRE IMPACTED YOU?



Complete Part 2 of the Health Impact Survey



Online At
www.wchd.org/fire



In Person
Staff is going door-to-door to homes
in Rockton on Monday, August 1 &
Thursday, August 4, 10am - 7pm

Open Until Monday, August 8 at 5pm
Individual responses to this survey are confidential.

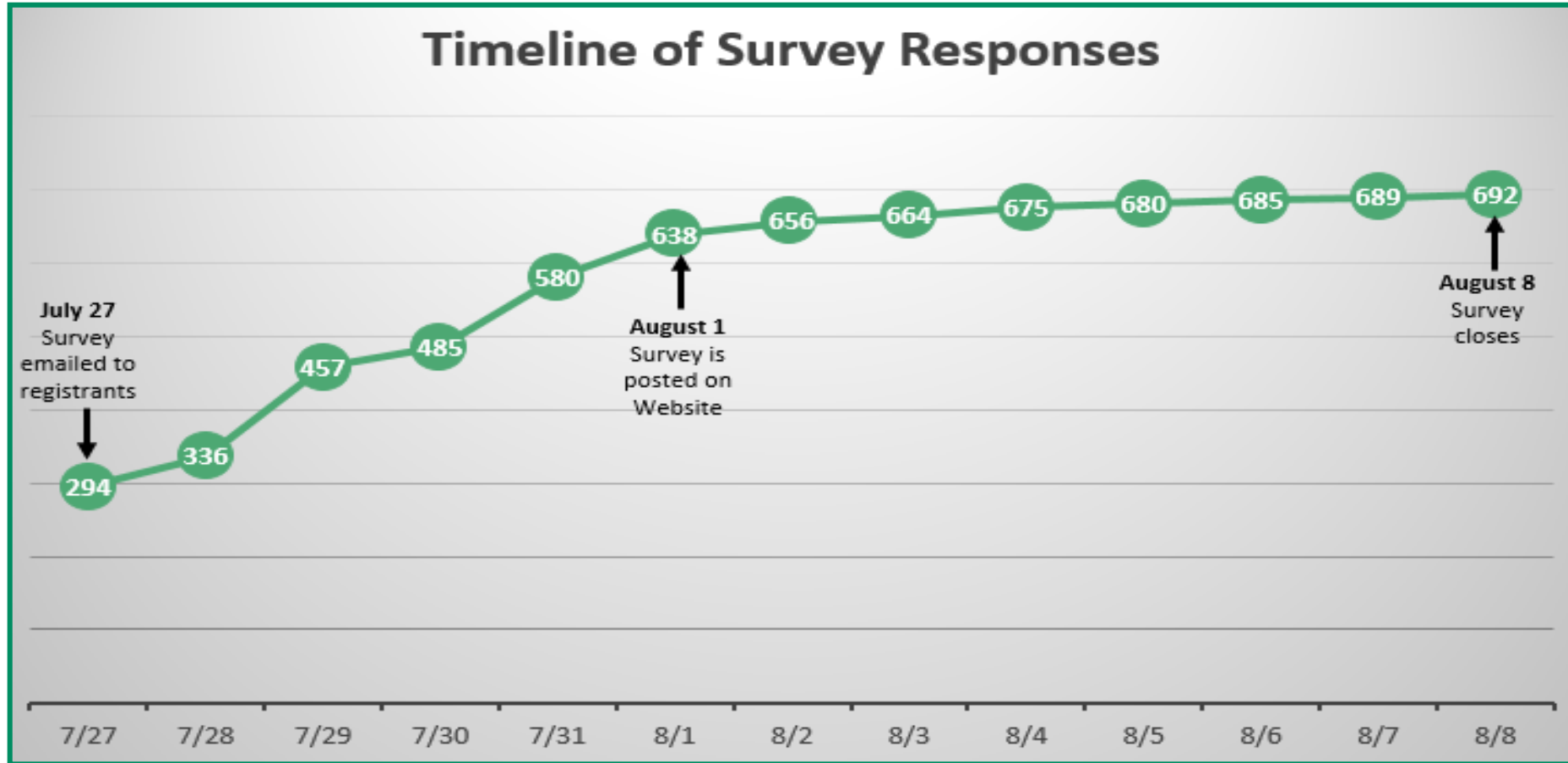
This survey is being conducted by the Winnebago County Health Department (WCHD), in collaboration with the Illinois Department of Public Health (IDPH) and the Centers for Disease Control and Prevention's Agency for Toxic Substances and Disease Registry (CDC/ATSDR). It is important to note that the issuance of this survey does not mean there were any health effects from the event, but is a way to assess the community's health in case there are any health concerns that can be identified. Participants can refuse or decline to answer any questions in the survey. Refusing to participate in the survey does NOT affect any government benefits you may receive.

- Community Field Work by CDC/ASTDR
 - Follow-up Interviews with:
 - Community Leaders
 - Residents
 - Community Agencies



Winnebago County
Health Department

Timeline of Survey Responses



Winnebago County

Health Department

Elements of Follow-up Health Impact Survey

- Use of healthcare services including self-care
- Mental Health
 - Before, During, After
 - Frequency of Thinking About Chemtool Fire
 - New or Worsening Symptoms
 - Ongoing Symptoms
- Pregnancy – Females
 - Becoming Pregnant
 - Health Issues
 - Pregnancy History
 - Infant Outcomes



Demographics

Variable	2022		2021	
	N	%	N	%
Sex				
Female	438	63.3	1277	63.2
Male	238	34.4	703	34.8
Prefer not to answer	16	2.3	28	1.4
Missing	0	0.0	12	0.6
Race				
Black	15	2.2	65	3.2
White	620	89.6	1744	86.3
Other	29	4.2	42	2.1
Prefer not to answer	28	4.0	94	4.7
Missing	0	0.0	75	3.7
Hispanic or Latino ethnicity	30	4.3	101	5.0
Age group (years)				
0-19	1	0.1	28	1.4
20-44	247	35.7	733	36.3
45-64	303	43.8	892	44.2
65+	140	20.2	360	17.8
Missing	1	0.1	7	0.3

2022 Responses

- 97.7% were from respondents to the initial survey (*follow-up response rate of 33.4%*)
- 2.3% were from the publicly available survey link
- Respondents were primarily adults age 45 – 64, female, and self-reported white
- Similar to 2021 respondents



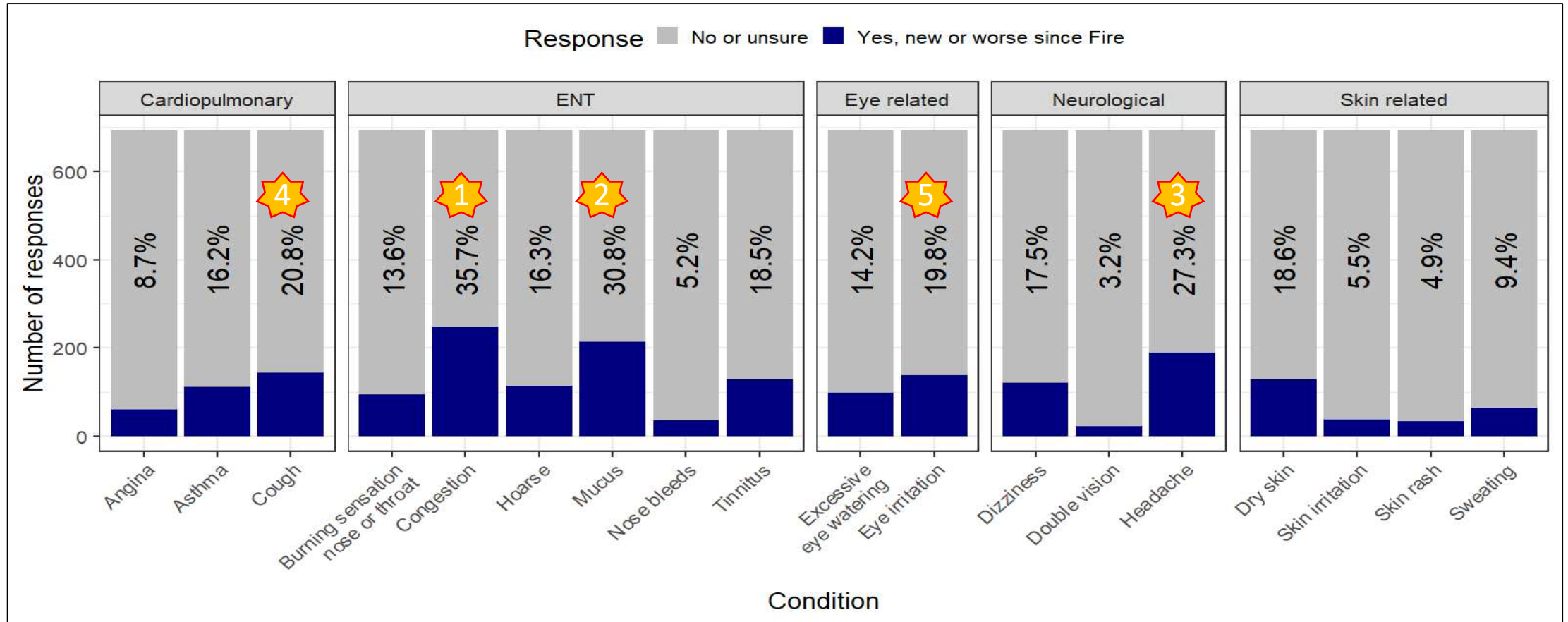
Physical Health Impacts

- 400 respondents (57.8%) noted a *new or worsening* physical health condition since Chemtool Fire.
- 90.2% reported that the condition was persistent at the time of the survey.

Physical Health	Condition still present?			
New or worsening condition since fire?	n/a	No	Yes	Total
No	292 (100%)	0	0	292 (42.2%)
Yes	0	39 (9.8%)	361 (90.2%)	397 (57.8%)
Total	292 (42.2%)	39 (5.6%)	358 (52.2%)	689 (100%)

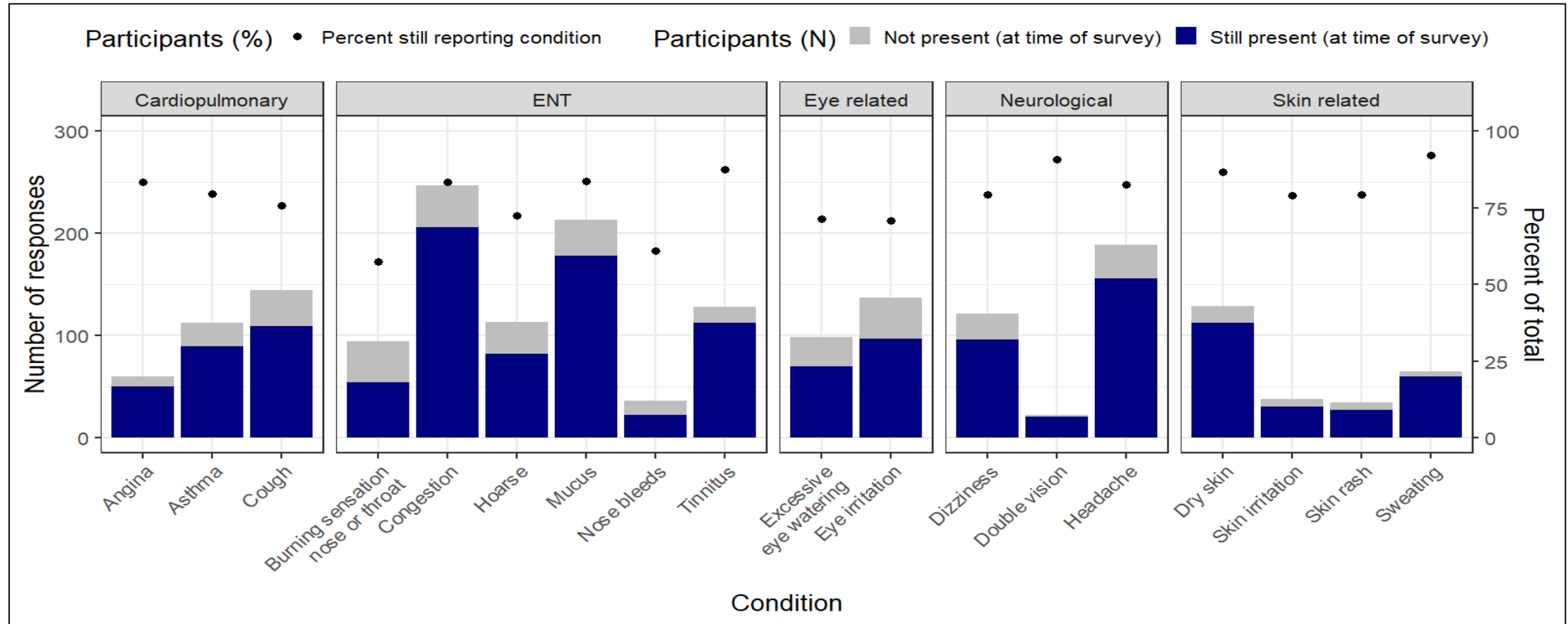


Physical Health Impacts – New or Worsening



Top 5 reported health conditions – congestion, mucus, headache, cough, and eye irritation

Physical Health Impacts Persist



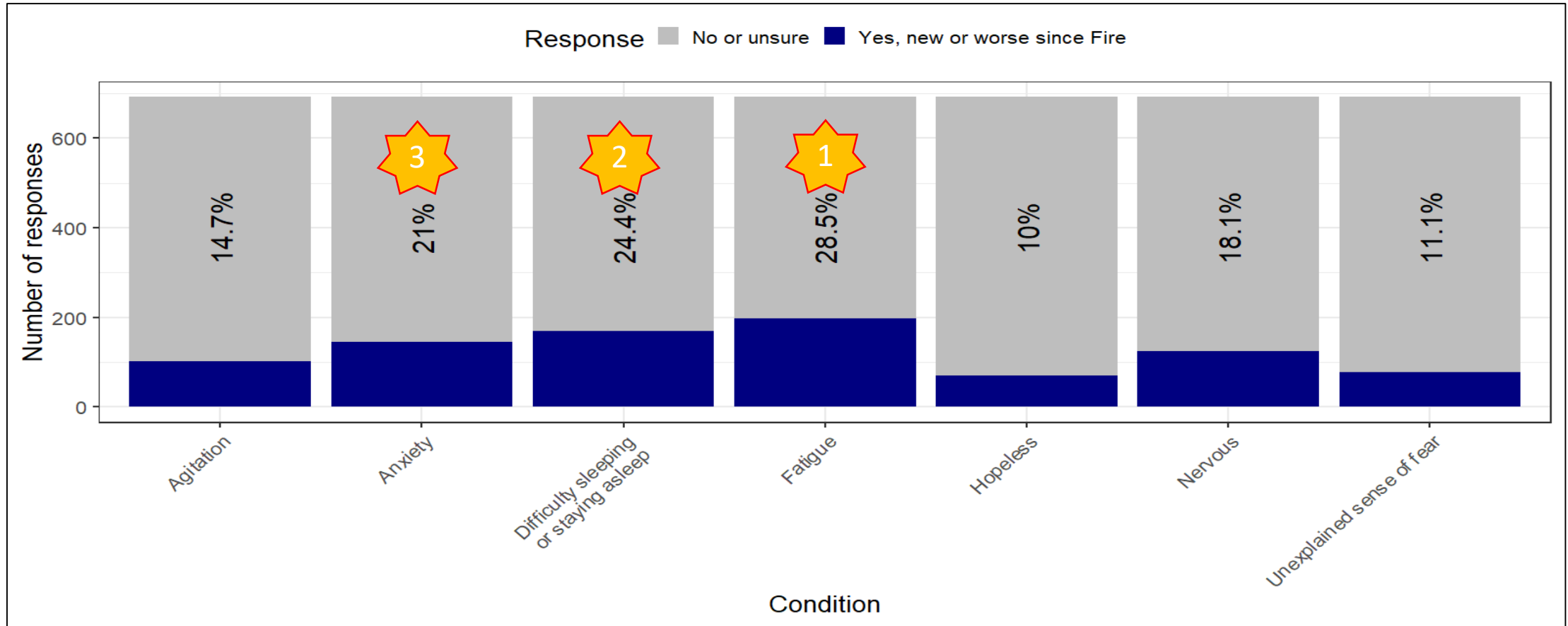
Majority (minimum of 75%) of respondents reporting these symptoms as new or worsening since Chemtool Fire were still experiencing symptoms.

Mental Health Impacts

- 265 Respondents (38.3%) reported a new or worsening mental health condition since the Chemtool Fire.
- 97.7% indicated that they were still experiencing this mental health condition at time of survey.

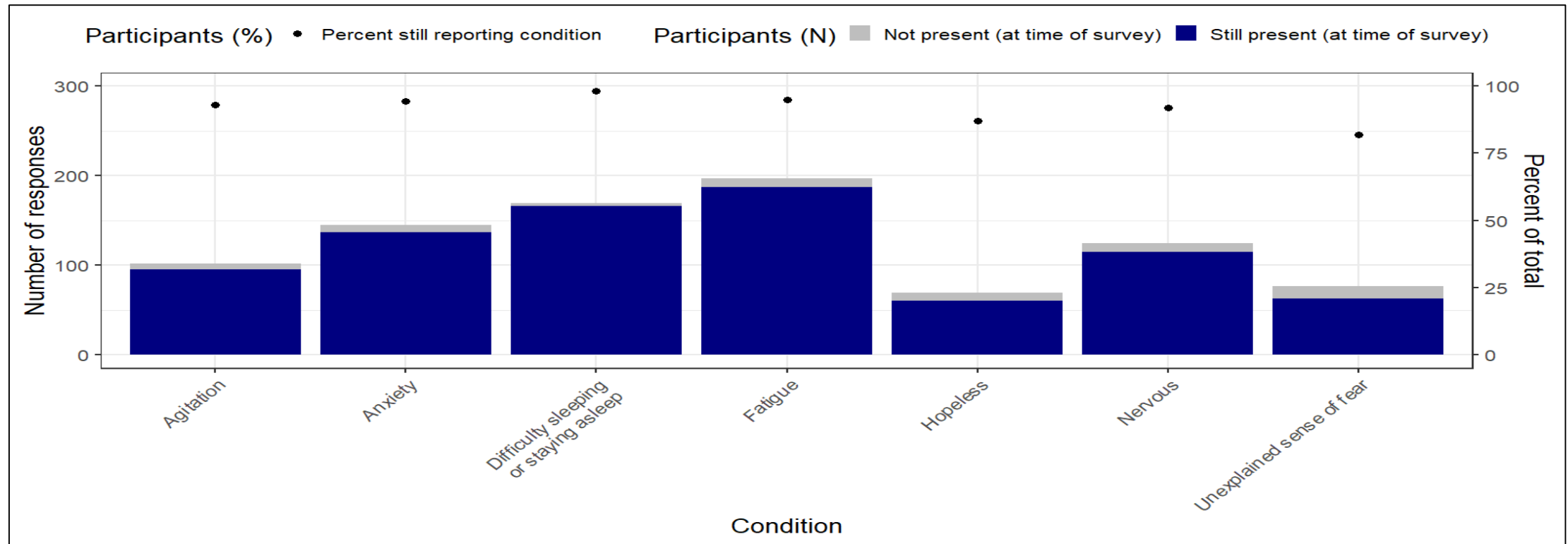
Mental Health	Condition still present?			
New or worsening condition since fire?	n/a	No	Yes	Total
No	427 (100%)	0	0	427 (61.7%)
Yes	0	6 (2.3%)	259 (97.7%)	265 (38.3%)
Total	426 (61.7%)	6 (0.9%)	259 (37.4%)	692 (100%)

Mental Health Impacts – New or Worsening



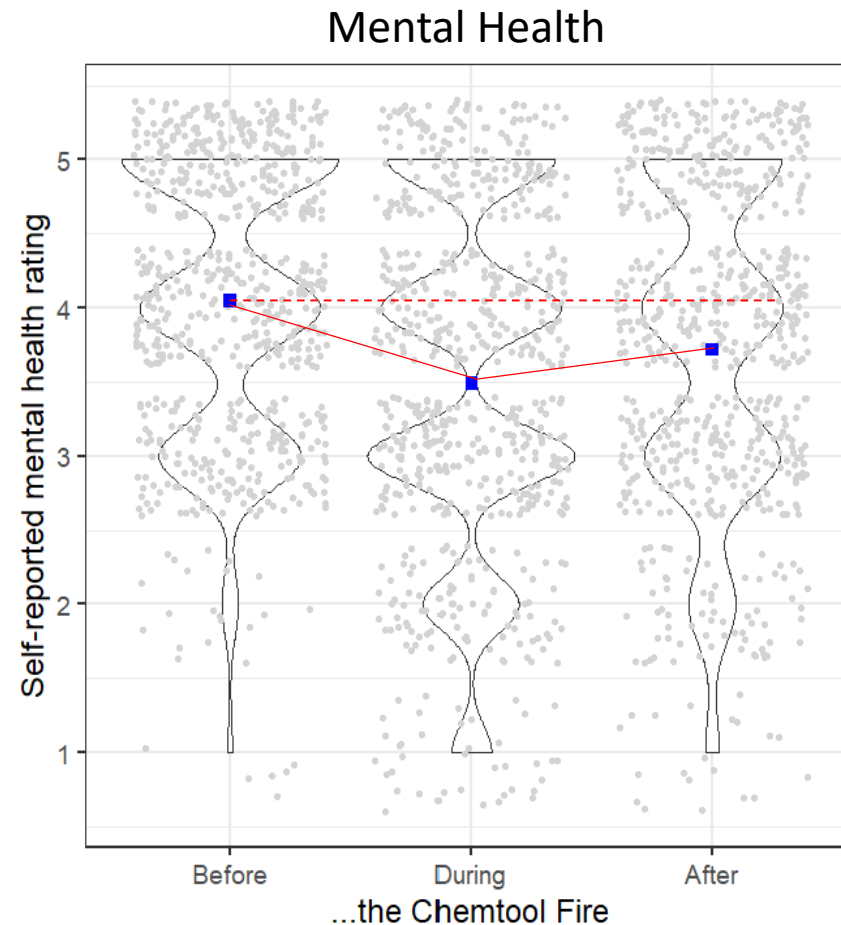
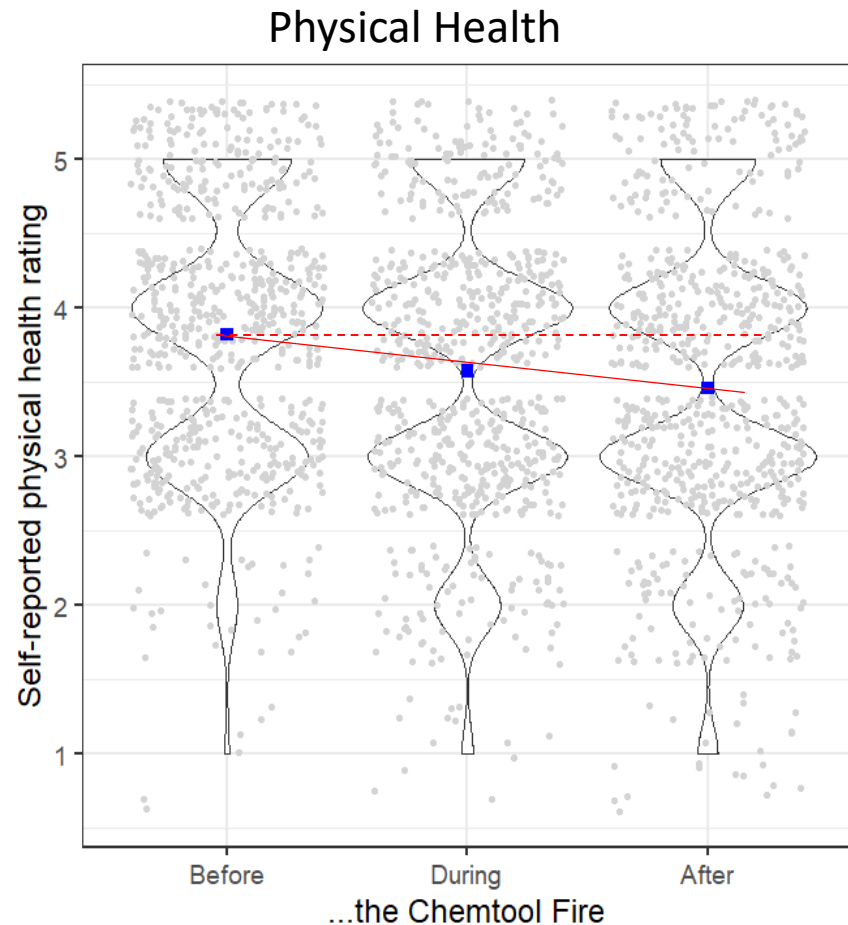
Top 3 reported mental health impacts: fatigue, difficulty sleeping or staying asleep, anxiety

Mental Health Impacts Persist



Vast majority (97.7%) reported that they were still experiencing the mental health condition at the time of the survey.

Summary – Reported Physical and Mental Health



- Average physical and mental health decreased during the Chemtool Fire.
- Average physical health continued to decline after the Chemtool Fire.
- Average mental health rebounded after Chemtool fire but not to the level before the fire.



Healthcare Use

Highest level of healthcare received (among those with reported physical health condition, N = 429)	Number	Percent
I was hospitalized	7	1.6
I was seen in an emergency department, urgent care, or outpatient clinic	41	9.6
I consulted a healthcare provider over the phone or via videoconferencing	40	9.3
I self-treated	119	27.7
I did not need healthcare for the Chemtool Fire	222	51.7

Majority of respondents (79.4%) did not need healthcare or self-treated.

Note: A total of 7 respondents indicated that they had been hospitalized. Since the data was not linked to the previous survey database, it cannot be determined if the 7 includes the 4 who reported hospitalization in the 2021 survey.



Winnebago County

Health Department

Pregnancy Data

- Pregnancy-related questions were added to the 2022 survey.
- 22.1% of respondents were women of reproductive age (15 – 44 years) = 153 women
 - 6 women were pregnant or became pregnant since the Chemtool Fire
 - 3 infants have been born among these women in the year
 - 1 woman reported difficulty becoming pregnant since the Chemtool Fire



Health Impacts – Qualitative Data

Physical and Mental Health

Purpose of Qualitative Interviews

- Provide an opportunity for community to offer additional contextual information
 - How are residents feeling in the year since the Chemtool Fire?
 - How did residents feel about the overall response?



Method

- 50 respondents (7.8%) who completed the second on-line survey were interested in being contacted further
 - 15 respondents were interviewed
- 25 homes (Watts Avenue in Rockton IL) were visited.
 - 9 residents were interviewed
- Same questions were asked of both groups



Questions Posed to Residents

1. Were you living here at this address during last June 14 – 18?
2. What do you remember most about the explosion and Fire last year at the Chemtool facility?
3. How did you first hear about the explosion and fire at the Chemtool facility?
4. Based on your experiences and observations, how has the Chemtool fire situation been handled so far?
5. What should public health, county leadership, municipal leaders, the Chemtool facility owners, and other decision makers know about your experience since the fire last year?
6. Is there anything else you would like to tell us today?



Information Sources

Email

Local News

Mail or Flyer

Phone Alert

Word of Mouth

Social Media

Information Inaccessibility

Lack of information

Uninterpretable Information

Information Enmity

Rumors and Misinformation

Lack of Transparency

Untrustworthy Information

Intentional "cover-up" or Disinformation

Response Issues

Accountability & Responsibility

Bad Smells

Delayed Response

Lack of Preparation

Poor Clean-up Efforts

Mental Health

Abandonment

Anxiety

Chronic Stress

Confusion

Fear

Frustration

Resignation

Resilience

Primary Concern

Air Quality

Animals & Pets

Children

Neighbors & Community

Financial Impact

Long-term Effects

Physical Environment

Physical Health

Water Quality

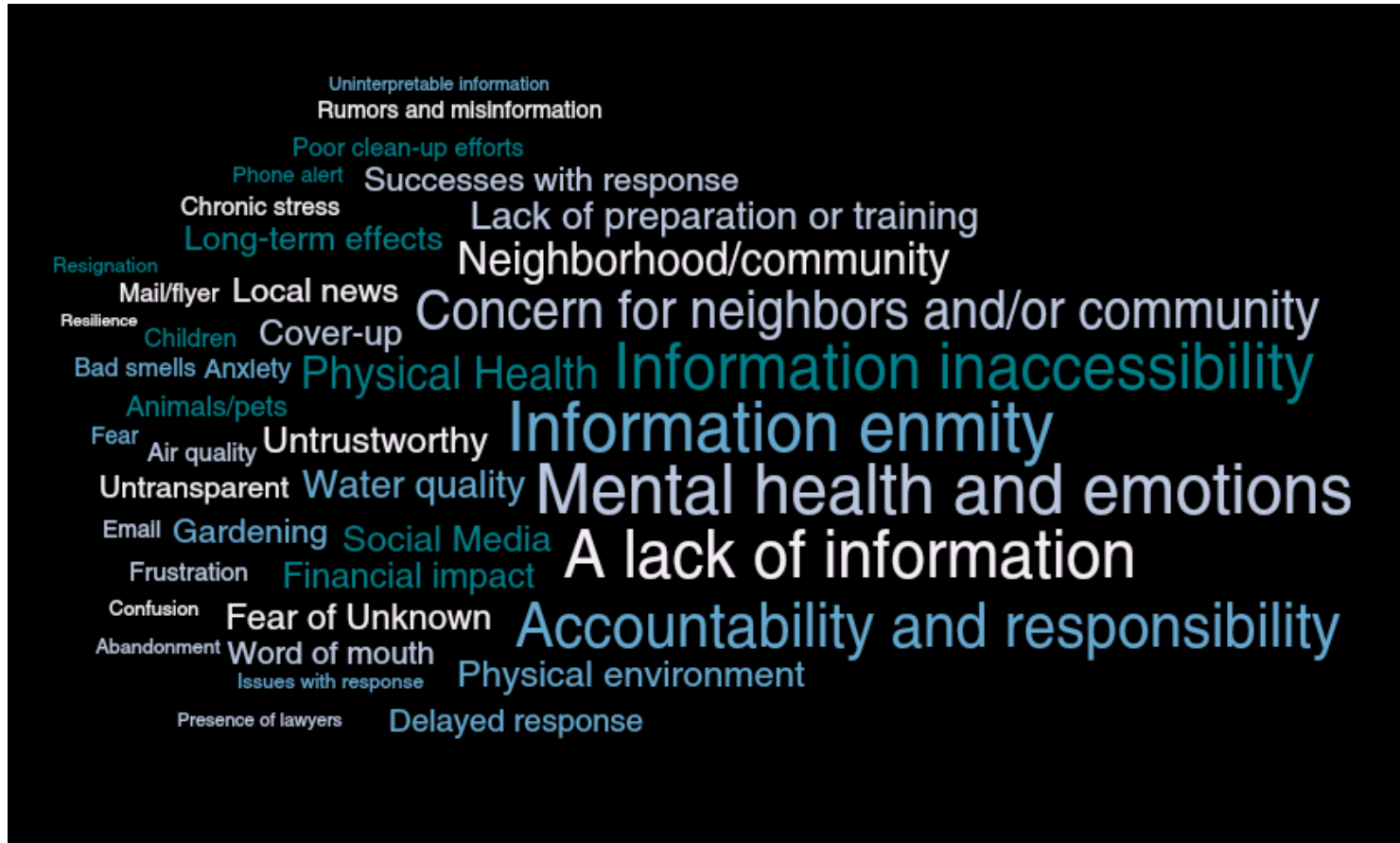
Sources of Pride

Gardening

Sense of Community

Success with Response

Major Themes



- Mental health and emotions
- Lack of information
- Information enmity
- Information inaccessibility
- Accountability and responsibility

Mental Health

- 58.3% of respondents reported feelings/concerns with their mental health
 - Abandonment (3/24 = 12.5%)
 - Anxiety (5/24 = 20.8%)
 - Chronic stress (5/24 = 20.8%)
 - Fear of the unknown (10/24 = 41.7%)



Frustrations with Overall Response

- Lack of accountability/responsibility (58.3%) from Chemtool
- Lack of preparedness or training (41.7%)
 - Fire Department resources to respond
 - Community preparedness given the proximity
- Delayed clean-up efforts (33.3%)
 - Facility was still standing at time of interviews



Communication Concerns

- Lack of information (54.2%)
 - Related to clean-up
 - Evacuation follow-up
- Lack of understandable information (8.7%)
- Information Enmity
 - Untrustworthy (54.2%)
 - Cover-up (50.0%)
 - Lack of transparency (37.5%)



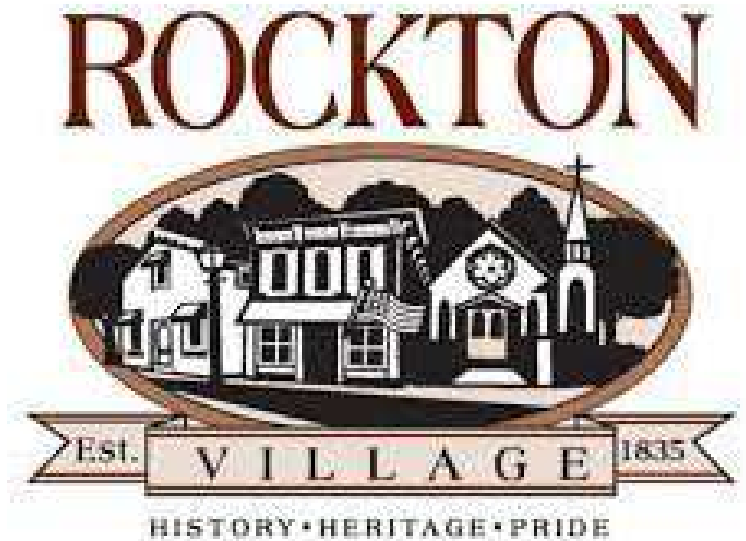
Overarching Concerns

- Environment
 - Physical Environment (41.7%)
 - Water (37.5%)
 - Air (25.0%)
- Concern for neighbors and community members (41.7%)
- Financial impact (41.7%)
- Long-term effects (37.5%)
- Physical health effects (45.8%)



Sources of Community Pride

- Neighborhood and community (45.8%)
- Gardening (33.3%)
- Successes with response (25.0%)



Summary

Lessons Learned

Lessons Learned from the Rockton Community

- Individuals and communities demonstrate resiliency following a large environmental catastrophic event.
 - Need to address “fear of the unknown”
- Physical health impacts take longer to recover and may persist longer.
 - Physical health impacts were consistent with reported exposures and data obtained from first survey
- Improve communication on complex issues – make it understandable.
 - Simplify messages especially around large quantities of technical data
 - Provide follow-up information at regular intervals throughout the process
 - Admit the limitations of knowledge and science



Lessons Learned from the Rockton Community

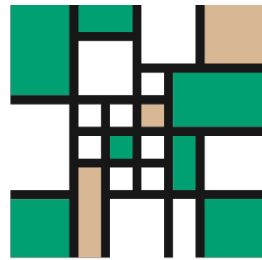
- Public Health needs to step up its efforts to prepare communities for environmental events including industrial accidents with other first responders and elected officials.
- Directions and guidance during active response *and* recovery need to be clear and consistent.
 - When can communities resume activities safely such as gardening.





Thank You!

By participating in the surveys, you are helping advance the understanding of the impact of chemical fires on communities.



W C H D

Winnebago County Health Department



Serving Our Whole Community

Dr. Sandra Martell
Public Health Administrator
815-720-4200

PublicHealth.wincoil.gov

 @WinnCoHealth

 @WinnebagoCountyHealth

 Winncohealth