

Tragedy in a Texas Town: The Texas City Disaster of 1947

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"To live in Texas, it seems, is to live with fire."

-Patsy Sims, *Texas Observer* Writer

Our group became interested in industrial history after one of our group members visited an oil refinery this past summer. We began our research by reading the article *West Fertilizer Plant Explosion: Five Years Later* in which we learned about the "explosion at the West Fertilizer Company [storing 40 to 60 tons of fertilizer grade ammonium nitrate] in the small town of West, TX." This article drew us to search for similar accidents, and we discovered the Texas City Disaster of 1947, the deadliest industrial accident in U.S. history killing over 570 people and injuring thousands. The tragic event destroyed homes, businesses, and crippled the economy of the rapidly growing city. The remaining members of the community and people from across the country would come together in a triumphant effort to rebuild the destroyed city.

We began our research on the Texas City Disaster by reading the book *We Were There*. This book is a compilation of hundreds of stories from survivors of the disaster published by elected leaders on its 50th anniversary. "Looking toward the docks, I saw black, ragged things flying in the sky like buzzards. Then I realized they were parts of the ship..." wrote a survivor, William Hadley. To strengthen our project, we obtained primary photos and documents from the Moore Memorial Public Library in Texas City. We then traveled to the Fondren Library at Rice University where we were able to gather primary newspapers, magazines, and journal articles that proved invaluable to our project. We were also able to visit Texas City and obtain sources from the Texas City Museum, such as newspaper articles, photographs, and an interview with the curator. To further our knowledge of the triumphs and changes to the way aid is provided to those in an emergency we contacted Thomas Munoz, the Emergency Manager for Texas City, who spoke of "having those mutual aid agreements what it means is

you recognize... you're going to run out of resources so surrounding cities come and start helping out. That's one of the big things now, so things have changed."

Our group's interest and skills with technology led us to create a website. Using Weebly, we were able to compile newspaper headlines, archival footage, primary photographs, and documents to create our interactive site.

Our project best fits the theme *Triumph and Tragedy*, because the death and destruction caused by the explosion of the *SS Grandcamp*, after tons of ammonium nitrate in the cargo hold caught fire, resulted in aid from all over the country to assist the people of Texas City with their undying will to rebuild, despite suffering a tragedy. The initial blast sparked a series of explosions and fires in nearby chemical plants, ships, and oil storage facilities and resulted in over 570 deaths and thousands more injured. "The high school gymnasium... was serving as a morgue. My mother and I waited in the car as Daddy walked up and down the rows of unidentified bodies..." wrote Patsy Sims, a witness to the destruction that occurred in what would be known as the Texas City Disaster, the deadliest industrial accident in our nation's history. This tragedy garnered national attention. "I have asked every Government agency to cooperate in relief activity. My heart and the heart of the nation go out in deepest sympathy to the suffering people of Texas City," wrote President Harry Truman in a letter to Mayor Curtis Trahan. Aid poured in locally and from all over the country in the form of volunteer relief workers, nurses, and fundraising. "The accident also resulted in new regulations for the manufacturing and shipping of chemicals," as stated by journalist Susan Carroll. The people of Texas City experienced a tragedy in 1947 that changed disaster planning and prevention, and with help from across the nation they were able to rebuild and emerge triumphantly.

Selected Bibliography

Primary Sources

Selected Bibliography
Primary Sources
Interviews by Others

Arnold, Martha Gooch. "We Were There." *Moore Memorial Public Library*.

"I poured myself another cup of coffee, and my world erupted into fire and smoke, sound and confusion." Martha Arnold, a survivor of the Texas City Disaster, describes the moment when the explosion occurred. "Our house rose in the air and settled back down on its foundation with a bone jarring crash. Windows imploded, doors blew off hinges, furniture crash in wild disorder. Wallpaper hung in shreds, and pictures smashed on the floor." This interview was useful as it described in great detail the damage that the explosions caused to homes in Texas City.

Babin, J.D. "We Were There." *Moore Memorial Public Library*.

"The sky lit up like high noon, and I saw steel bigger than cars flying through the air." J.D. Babin worked as an oiler and was on his way to Texas City when the Grandcamp exploded. "Told about it over our two-way radio, we continued on over and rescued three survivors from the ship channel, one badly injured. Many dead bodies floated in the water with them." Babin further described his efforts to rescue men and take them to receive medical help. This interview provided us with primary information on how volunteers and workers helped to rescue survivors from the all the chaos and destruction.

Baumgartner, Harold J. "We Were There." *Moore Memorial Public Library*.

"The Grandcamp's whistle sounded several short blasts, and the crew placed large timbers over the hatch emitting orange smoke, hold #4, to introduce live steam into the hold to smother the fire... Seven minutes later city sirens sounded, and fire trucks soon arrived." Harold Baumgartner described the rescue efforts of firefighters and many other officials during the disaster. The following interview provided us with information and details on the efforts that were made to handle the fire that had ignited on the SS Grandcamp.

Bell, Jim. "Personal experience of Jim Bell, Patrolman, Texas City Police Dept." *Moore Memorial Public Library*. 16 April 1947.

"I received a call from the dispatcher to go to 3rd St. and 4th Ave. and direct traffic. About that time Officer W. A. Reeves came up and said he would stay there and that was the last time I saw Officer Reeves until I found him lying across the railroad tracks," Officer Bill recounts the horror of the ship explosion. All day, he went through the city searching for survivors, helping the injured, and delivering bodies to the morgue. This interview allowed us to understand the severity of the tragedy.

Bertolino, Eddie. "We Were There." *Moore Memorial Public Library*.

"It was a terrible time. I'll never forget it for lots of reasons but mostly because of the way everybody pitched in to help each other in lots of way – not just locals, but people from other towns and even across the country." Eddie Bertolino recounts how people from all over the country came together, all doing what they could to help. Money was raised for the Texas City Relief Fund, individuals donated blood, and many great artists performed in fundraising campaigns. This interview provided us with an insight into the support that was received after the disaster.

Forest, Walker A. "Remembering the Texas City Disaster." *American Heritage*, vol. 47, no. 4, 1996.

"April 16, 1947, in Texas City, Texas, started out as a beautiful spring day. I was in my last year of high school." The morning of the explosion started as an average day for many Texas City Residents. However, it soon became a day of tragedy. "About twelve minutes after the class started, I glimpsed a sudden flash outside the windows that seemed to be lightning. In a second or two a deafening boom shook the building, and about two or three seconds later I heard another ear-splitting blast. I expected the ceiling to fall but, in a few seconds, realized the building wouldn't collapse." This interview provided us with primary insight of the Texas City Explosion.

Hagerty, Michael, and Robert Roten. "Witness Recalls Texas City Disaster and How It Shaped Thinking on Safety." 1 Feb. 2018.

Many years after the disaster, Roten would become chief operating officer of the Monsanto Corporation. He says the events of that day in 1947 were never far from his mind, and they changed how everyone thought of safety. "It was much more important, much more professional, much more organized," Roten said. "Your safety director was key to your management team." Bob Roten is a survivor of the Texas City Disaster. In this interview he discusses the change that was brought after the explosions. This quote from Roten gave our group a greater understanding of the impact that the Texas City disaster had on industrial safety.

Minutaglio, Bill. Interview by David Brown. "Before the West Explosion, There Was Texas City". 2014.

"No one really knows how many people died—the official estimate is close to 600 folks, but there's an assumption that many more people died because they were simply never identified—they just vanished—absolutely vanished," Bill said. "Refineries were set on fire, chemical plants were set on fire, there was just a constant series of one explosion leading to another. "In the following interview, Bill Minutaglio provides insight into the horrific events of The Texas City Disaster and helped us understand the magnitude of the event.

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Primary Sources

Court Cases

Reed, Stanley Forman, and Supreme Court of the United States. *U.S. Reports: Dalehite v. United States*, 346 U.S. 15. 1952. Periodical. Retrieved from the Library of Congress.

The Dalehite, et al. v. United States case was the first class action lawsuit against the government under the new Federal Tort Claims Act. It is the combination of 300 lawsuits filed after the Texas City Disaster alleging negligence on the part of the Government. "The acts of 'negligence' found by the District Court do not subject the Government to liability, because the decisions found culpable were all responsibly made in the exercise of judgment at a planning rather than an operational level and involved considerations more or less important to the practicability of the Government's fertilizer program."

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Primary Sources

Reports

United States, Congress, Bureau of Mines. "Explosions of Ammonium Nitrate Fertilizer On Board The S.S. Grandcamp and S.S. Highflyer At Texas City, Tex. April 16,17,1947." *Explosions of Ammonium Nitrate Fertilizer On Board The S.S. Grandcamp and S.S. Highflyer At Texas City, Tex. April 16,17,1947*, pp. 46–49.

This report was published in February 1948, less than one year after the disaster. Within the report there are new procedures for how ammonium nitrate fertilizer must be stored and maintained aboard a vessel. There are also strict rules, such as no smoking. The boilers are not allowed to be cleaned while the cargo is on the ship. In the event of a fire involving the fertilizer, the local fire department must be notified, water must be applied immediately, and the ship must be evacuated. From this report we were able to learn about the new regulations and the strict rules that were put in place after the Texas City explosions.

United States, Congress, Treasury Department. "Record of Proceedings of Board of Investigation Inquiring Into Losses By Fires and Explosions of the French Steamship Grandcamp and U.S. Steamships Highflyer and Wilson B. Keene at Texas City, Texas 16 and 17 April 1947." *Record of Proceedings of Board of Investigation Inquiring Into Losses By Fires and Explosions of the French Steamship Grandcamp and U.S. Steamships Highflyer and Wilson B. Keene at Texas City, Texas 16 and 17 April 1947*, 1947, pp. 549–550.

Five months after the explosions in Texas City there were revisions made to the handling of ammonium nitrate fertilizer. Instead of being transported in wooden barrels, the fertilizer would now have to be placed within special containers and have a label placed on the container. There would also have to be no smoking signs placed aboard ships that were transporting this cargo. After reading this report, our group better understood the impact of the Texas City disaster.

Selected Bibliography

Primary Sources

Journal Articles

Blocker, Virginia, and T.G Blocker. "The Texas City Disaster." *The American Journal of Surgery*, vol. 78, no. 5, Nov. 1949.

"Damage to buildings in the area resulted from the combined effects of the blast, missiles, and fires. In other warehouses roofs were caved in and there was considerable damage from flying debris." The author of the article gave us a greater overview of the aftermath and damage that was left behind after the tragic explosion. After reading this article, our group was able to understand the effects of the blasts in greater detail and the contents that were held in the Grandcamp.

Lippincott Williams and Wilkins. "The Red Cross at the Texas City Disaster: American Red Cross Nurses Served with Other Disaster Workers in Caring for Victims of the Texas City Disaster, in Which More than 500 Persons Were Killed and Countless More Injured." *The American Journal of Nursing*, vol. 47, no. 6, June 1947, pp. 400–401.

Within this article are various statistics and images showing volunteers who aided patients. Within an hour after the initial explosion on April 16, local Red Cross chapter disaster committees were on the job. Over 500 nurses, mostly volunteers, served with the Red Cross in caring for the 3,000 injured. This article provides information about the thousands of Red Cross volunteers who helped victims of the two explosions.

Molsbee, Allie Fay. "Students Give Disaster Service in Galveston: A Student Describes Her Part in the Emergency Following the Texas City Disaster." *The American Journal of Nursing*, vol. 47, no. 6, June 1947, p. 414.

From this article we were able to read a first hand account of the Texas City Disaster. Allie Fay Molsbee was a nurse who helped patients during the incident, she recalls, "Calls for doctors and nurses to go to Texas City began immediately. Then the work began-shifting beds, preparing emergency supplies, and getting ready to receive patients." This information helped us in depicting the disaster and the work that was done to rebuild Texas City.

Selected Bibliography

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Archival Footage

“The SS Grandcamp Explodes.” *The History Channel*. 16 Apr. 1947. Courtesy of Darlyne E. Knappenberger.

This home video taken by Darlyne E. Knappenberger captured the moment when the ammonium nitrate on fire in the cargo hold of the Grandcamp exploded. The very surreal scene was beneficial to our group because it showed us the instance that tragedy had struck in Texas City at 9: 12 AM on April 16, 1947.

“Texas Disaster.” *British Movietone News*, story no. 48464, AP Archive, 24 Apr. 1947.

“Blasts from the explosion touched off of big chemical works built during the war for the production of styrene used in making synthetic rubber. Other explosions and other fires followed involving several ships and a number of oil storage tanks.” This archival footage contains a description of the damage the explosion of the SS Grandcamp caused. This newsreel was beneficial to us because it provided us with footage of the fires raging on chemical factories and storage tanks that we incorporated into our website.

“The Texas City Disaster (1947).” *Texas Archive of the Moving Image*. Web.

“It was the damage that was done to the residential section that turned many out homeless and which created a definite problem of rehabilitation”. The following archival footage provides a description of the aftermath that was left behind after the various explosions had occurred. This footage was beneficial to us because it provided us with footage of the damage that was done to houses, factories, and other various buildings which helped us understand the severity of the disaster.

Selected Bibliography

Primary Sources

Newspaper Articles

"302 Still Missing in Texas City Blast." *The Tuscaloosa News*. 28, April 1947. Print.

The Texas City Disaster is the deadliest industrial accident to happen in history. At the time, "the toll of the dead and missing in the Texas disaster stood at 733." Only 431 bodies were able to be identified. At the time there was not a stable procedure to identify bodies in mass tragedies. We were able to implement the information from this article into our website.

Barnard, William C. "'City Where Dead Uncounted, Living Are Too Dazed to Cry'." *The Austin American*, 17 Apr. 1947.

"Our neighboring cities have been wonderful. We are sending the wounded and the homeless to a dozen different communities and they are receiving them with open arms," said Mayor J. C Trahan. In this article, written by William Barnard, Mayor Trahan describes the immense support that Texas City received. "In my office I have seen hundreds of persons, all of who came to me with just one sentence: 'Just tell me what I can do, and I'll do it'." This newspaper article helped understand how giving and supportive people and neighboring cities of Texas City were.

"Blasts and Fires Wreck Texas City of 15,000; 300 to 1,200 Dead; Thousands Hurt, Homeless; Wide Coast Area Rocked, Damage in Millions" *The New York Times*, 17 Apr. 1947.

This newspaper article summarizes the tragedy of Texas City from the moment of the first explosion to the chain of another explosion that followed. "It is such a terrific tragedy that the people have not been able to realize what happened", said Mayor Trahan. The Monsanto Plant was completely destroyed as well as buildings and houses surrounding Texas City."It blew out windows of every home in town he declared. "It blew in ceilings in business buildings. It cracked new buildings from end to end. Doors were blown from their hinges", declared W. H. Sanberg, vice president of the Texas City Terminal Railway Company. This article gave us more information on the damage that the Monsanto Plant suffered, as well more insight into the tragic event that destroyed Texas City but didn't stop it from emerging again in a triumphant effort to rebuild.

“Cries of Injured, Dying Heard Above Roaring Fire” *The Wilmington Morning Star*, 17 Apr. 1947.
Library of Congress.

“It’s hard to walk in Texas City. All the plate glass is gone, scattered in the streets. Bloody trails made by the injured are everywhere.” This newspaper article gave us more information on the rescue efforts of doctors, nurses, and volunteers who walked through the streets of Texas City in order to help the injured. “Calls of the injured and dying could be heard faintly through the roar of flames.” This article provided us with more insight on the amount of people that came together to help the injured during the disaster.

“Placid Waters...A Burning Ship...A Strolling Photographer...Then Hell.” *The Galveston News*, 20 Apr. 1947, p. 18.

This newspaper article contains photographs taken by Engineer Chester W. Merritt. These photographs depict the burning *SS Grandcamp* and *SS High Flyer* moments before the explosion occurred and Merritt was “hurled across his ship, all his clothes blown off, and a shattered camera sent spinning.” This article provided us with photographs that gave us a better view of the burning *Grandcamp* and of the firemen who were battling the fires that had consumed both ships.

“Residents Evacuating Blast Stricken Town: Further Texas City Explosions Feared.” *Galveston Tribune*, 16 Apr. 1947.

From this newspaper article, we gained more information on the efforts that were made by The National Guard to evacuate citizens “of the south end of town, scene of the damage, to the north side, which was believed to be out of danger. We also gained a deeper understanding of the difficulties that Texas City faced when trying to put out the fires that engulfed Texas City. The blasts left them without water, power, and telephone communications which made it more difficult to handle the situation. The article also included a list of all the victims who were injured during this disaster and of all the buildings that were destroyed by the fires.

Sims, Patsy. "The Day the Windows Shook." *Texas Observer*, 23 July 2018, pp. 36–37.

In this article, Patsy Sims recalls the day the Texas City disaster happened and its effect on her family. Sims writes "My cousin worked the night shift at the Monsanto Chemical Company. He was installing siding on a neighbor's house that morning when the alarm sounded for him and the city's 26 other volunteer firefighters to head to the dock." Searching for her cousin, she accompanied her parents at a local high school that had been transformed into a temporary morgue. Sims' description provided us with a primary perspective of the aftermath.

"Texas City Fires Peril High-Octane Gas." *The Evening Star*, 17 Apr. 1947. *Library of Congress*.

This newspaper article was very beneficial to us because it provided us with more in-depth information on the relief efforts that Texas City received from the Red Cross. The Red Cross had declared that "in addition to the \$250,000 immediately set aside for relief at the Texas tragedy yesterday, more will be available if it is, needed." This article helped us understand better how Texas City was able to emerge triumphant with the help of others after the terrible tragedy that occurred.

"Texas City Fires Under Control." *The Mexia Weekly Herald*, 18 Apr. 1947, p. 3.

"There were an estimated 3,500 people in the blast area and that rescue parties reported one of every three had been killed," mentions Lipscomb, who oversaw emergency highway crews in Texas City. This newspaper article helped our group understand how massive the explosions were, essentially leaving everyone in the wreckage dead. We also saw how hundreds of gas masks were distributed among the community of Texas City because of gas fumes in the air that were believed to be poisonous.

Tyron, George H. "Expert's Report on Texas City Disaster." *The Morning Bulletin*, 26 June 1947, p. 10.

In this newspaper article published by The Morning Bulletin, George H. Tyron gives a summary of the rescue work involved in the disaster. He describes how difficult and virtually impossible it was for firefighters to help after the initial explosion, and how their own acts of heroism were what contributed to the rescue efforts of the injured. This newspaper article gave us an insight into the difficulties that were faced by firefighters, but how they managed to overcome them.

A.A.P., Staff correspondent. "From the Archives: 500 Bodies Recovered in Texas City." *The Sydney Morning Herald*, The Sydney Morning Herald, 18 Apr. 1947.

"Embalmers are at work in the garage and when each body has been identified - and embalmed a numbered ticket is attached to it. It is then wrapped in a blanket and taken to the gymnasium." This newspaper article is an archive and was first published on April 18, 1947. It provided our group with more information on the process that embalmers followed when identifying the bodies of victims and how they were transported to the gymnasium afterward to be stacked.

Selected Bibliography

Primary Sources

Magazine Articles

"Texas City Blows Up." *LIFE*, 28 Apr. 1947. Courtesy of Texas City Museum.

Also known as "The Port of Opportunity," Texas City was home to an abundance of industrial refineries. In the early morning, volunteer firefighters set out to extinguish a "routine blaze" aboard the *Grandcamp*. The ship was carrying "...ammonium nitrate, a cheap usually stable chemical, yet can be exploded with the force of nitroglycerin by a sudden change in temperature." This article provided a timeline of the chain reactions that occurred after the first explosion as well as primary photographs for our website.

Selected Bibliography

Primary Sources

Letters

Eckert, H.K. "Monsanto Chemical Company." Received by Mr. Fred Dowdy, Chief Texas City Volunteer Fire Department, Texas Division, 20 June 1947, Texas City, Texas.

H.K. Eckert was the plant manager at the Monsanto Plant when it exploded in 1947. In this letter to Fred Dowdy, the lone survivor of the Texas City Volunteer Fire Department, Eckert extends his condolences. "Several of these men [lost] were Monsanto employees and very good friends of mine so I realize how much this loss means to you and your group," wrote Eckert. This primary letter gave us insight on how tragic the disaster in Texas City was for the fire department.

Queeney, Edgar M. "Letter from Edgar M. Queeney to Monsanto Stockholders: The Texas City Disaster." 30 Apr. 1947, Texas City, Texas.

"Attempts to assuage the grief of the victims of such a disaster are ineffective, this being within the province of time alone. But Mr. Rand and I believed that our stockholders would approve alleviating the financial problems attending the changed circumstances of so many of our employees." This letter from the chairman of the Monsanto Corporation, Edgar M. Queeney, written to stockholders and employees of Monsanto addressed the deaths, financial losses, and employee benefits that would be provided by Monsanto. Queeney also talks of the various donations from multiple divisions and employees of Monsanto. This letter provided us with a perspective of Monsanto's goal to rebuild from the head of the corporation.

Selected Bibliography

Primary Sources

Photographs

SS Highflyer. 23 Feb. 1944.

This photograph of the *SS Highflyer*, a French cargo ship, depicts details of the ship not able to be seen in photographs after the explosion. In 1947, the *Highflyer* was caught on fire by the nearby explosion of the *SS Grandcamp* after its own cargo of ammonium nitrate was caught on fire and exploded with tremendous force. The *Highflyer* eventually exploded as well and caused more devastation.

Aerial View of the Port after the 1947 Texas City Disaster. Texas City, 17 Apr. 1947.

The aerial photo of the Texas City Port shows some of the destruction caused by the explosion. It provides context to the many stories and accounts provided by the survivors. The photo not only shows a part of the destruction but also shows the reach the explosion had.

The Galveston Daily News. Texas City, 17 Apr. 1947.

After the disaster, many newspapers wrote about the explosion the next day. This photo of the Galveston Daily News shows what some of the public believed to have happen. Some things that were speculated were the death toll and the cause of the explosion.

Selected Bibliography

Secondary Sources

Selected Bibliography
Secondary Sources
Interviews

Munoz, Thomas. "Interview with Thomas Munoz, Emergency Manager of Texas City." Telephone Interview. 27 Nov. 2018.

Thomas Munoz, the Emergency Manager in Texas City, oversees responding to and managing the effects of disasters and emergencies in Texas City with the county's resources as well as with the help of mutual aid agreements with surrounding cities when the need arises. "Having those mutual aid agreements what it means is you recognize real quick that you're going to run out of resources so surrounding cities come and start helping out. That's one of the big things now, so things have changed." This interview was beneficial to our group because it provided insight on how the disaster brought about change to the way products are handled and disasters are managed.

Urbanic, Frank. "Interview with Frank Urbanic, author of, *We Were Prepared*." Personal Correspondence. 18 Mar. 2019.

Frank Urbanic is the author of *We Were Prepared*, a book that documents the role that the Boy and Girls Scouts of America had in aiding the victims of the explosions in Texas City. Urbanic writes, "Scouts were more involved in assisting the Red Cross, hospitals, law enforcement agencies in a support role." Within this book there are also personal accounts of the Texas City disaster, and how horrific the event truly was. From this interview we learned how the author compiled his book, and how the impact of the disaster can still be felt in the city. After our interview, Urbanic was happy to provide our group with a signed copy of his book.

Vance, Amanda. "Interview with Amanda Vance, Texas City Museum Curator." Personal Correspondence. 11 Jan. 2019.

Amanda Vance is the curator at the Texas City Museum and was able to help us with our research. She was able to provide us with information that we were not aware of, such as early history about Texas City. "The growth of Texas City during the 40's was attributed to the importance of the City's port and industrial complex to the Allied war effort during World War II." Vance also gave us direct contact with other historians and people that she believed could help our group.

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Secondary Sources
Government Publications

United States, Congress, EPA, et al. "Chemical Advisory - Solid Ammonium Nitrate (AN) Storage, Handling and Management." *Chemical Advisory - Solid Ammonium Nitrate (AN) Storage, Handling and Management*, Environmental Protection Agency, June 2015.
www.epa.gov/sites/production/files/2015-06/documents/an_advisory_6-5-15.pdf.

Two cargo ships carrying ammonium nitrate (AN) in Texas City caught fire and exploded on the morning of April 16, 1947. The *SS Grandcamp*, the first ship to explode, was storing AN that had been manufactured with a wax coating in paper bags. The wax is believed to be a source of fuel that reacted with the AN causing the ship to explode, and thus created a regulation to "avoid contamination of AN with combustible materials or organic substances such as packing materials, dust, seed, oils, and waxes." This source provided us with insight on the regulations caused to be put in place because of the Texas City Disaster.

Selected Bibliography
Secondary Sources
Journals

Cornitius, Tim. "50th Anniversary Marks Progress: Texas City Explosion of the French Freighter *SS Grandcamp*." *Chemical Week*, 30 Apr. 1997, p. 64.

"It was from that tragic event that marine cargo-handling rules evolved." After the catastrophic explosions that destroyed Texas City, there were new rules set in place to prevent another disaster. On the *Grandcamp*, ammonium nitrate bags were stacked on top of each other and left out in the open. Today, that same cargo must be carried in independent tanks within a ship. United States Coast Guard officials say that it is very unlikely that another incident could happen again. This source provided us with information about the impact that this event had on marine regulations.

Pusey, Allen. "April 16, 1947: Deadly Ship Explosions Lead to First Class Action." *ABA Journal*, Apr. 2016, pp. 1–2.

The end of World War II brought about the mass repurposing of wartime manufacturing. "Post-war food shortages in Europe created a sense of urgency, so government officials continued their wartime supervision of private manufacturers to create fertilizer-grade ammonium nitrate." Longshoremen spotted smoke emitting from the hold of the *SS Grandcamp*, one of two ships being loaded with ammonium nitrate. They directed steam into the hold which seemed to exacerbate the situation. This journal article gave us insight as to why the ships were at the port terminal.

Robinson, Kathleen. "Fire Down in Texas." *NFPA*, vol. 106, no. 3, 2012, p. 112.

Kathleen Robinson writes about the contents of the *SS Grandcamp* and the fire that ignited its cargo and led to the explosion which destroyed a nearby Monsanto plant and oil and chemical storage tanks. "The explosion also set fire to the *SS High Flyer*, which carried 2,000 tons (1,814 metric tons) of sulfur and 961 (872 metric tons) tons of ammonium nitrate... At 10 or 11 PM they finally freed the ship pulling it about 100 feet (31 meters) away before it, too, exploded... Property losses were estimated at \$67 million, and thousands of people were injured. Although the exact number of people killed will never be known, a monument to the victims notes that 576 people, 398 of whom could be identified, died." These writings help provide preliminary information on the Texas City explosion and insight on the events that took place.

Selected Bibliography

Secondary Sources

Documentaries

"1947: Texas City Disaster." Texas DPS Museum.

From this three-part documentary we were able to learn more about the Texas City disaster and how it helped the Texas Department of Public safety learn about mass casualty identification. This video also showed the volunteer workers that were helping the injured people after the explosions. Parts from this video will be used to show the tragedy that occurred on April 16, 1947.

“The Texas City Disaster, April 16, 1947.” The Dept.

This short film depicts the devastation of the explosions in Texas City that were caused by the two ships that were caught on fire. In the film, a description of the collaborative effort of the many nearby police forces and other organizations that came to Texas City in order to help rebuild. This will help show the social impact of the disaster and how it brought together people who helped save many lives that might have been lost otherwise.

Selected Bibliography
Secondary Sources
Television Broadcasts

“Explosion in Texas City, 1947.” *ABC 13 Eyewitness News*, 16 Apr. 2017.

This broadcast from a local news station contains footage of the massive explosions that took place during the disaster of 1947. This rare colored video provided us with excellent footage, which helped us understand the damage caused by the disaster. We will use parts from this video throughout the website to better present the Texas City Disaster.

Selected Bibliography
Secondary Sources
Reports

White, C.S. *BIOLOGICAL BLAST EFFECTS*. United States: N. p., 1959. Print.

The following report discusses the consequences and effects that large-scale explosions such as The Texas City Disaster have on urban and suburban areas. Furthermore, this report also provided us with photos and descriptions that illustrated the various types of injuries suffered by victims, as well as the damage that was caused to surrounding structures and chemical plants. It was useful in better understanding the scope of the damage suffered in Texas City.

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Secondary Sources
Newspaper Articles

"April 16, 1947: Fire Causes Huge Explosion in Texas City." *The New York Times*. The New York Times, Print.

"The mushrooming cloud of smoke that arose was described as resembling the aftermath of the atom bombing of Hiroshima." The explosion of the *Grandcamp* occurred when a fire broke out on the ship and became worse when the captain ordered for the ship's hatches to be shut in an attempt to protect the cargo. The blast resulted in over 500 deaths and caused millions of dollars in damage. This newspaper article helped us understand the severity of the damage as well as the factors that led to the explosion of the *Grandcamp*.

Associated Press. "A Survivor Recalls the 1947 Horror of Texas City and the Worst Industrial Disaster in U.S. History." *Akron Beacon Journal (OH)*, 13 Apr. 1987. Print.

This newspaper article provides the memories of Fred Grimson, a survivor of the series of explosions that occurred on April 16, 1947. "It was so violent. I have a recollection of a flash of light, then a shock wave. Then everything caved in. The walls collapsed," said Grimson as he recalled the sight of the first explosion. Grimson also described the following explosions that affected him, and injuries suffered by his co-workers in vivid detail.

Bassing, Tom. "The Texas City Disaster." *The Daily News*, 16 July 2017.

"Suddenly, I looked up and noticed what appeared to be a floating rainbow rising gently into the black, smoke filled skies above," mentions Roy E. Hanna, a reporter for The Daily News, who was at the scene of the explosion. "At first I thought it was a butane tank at Monsanto, but after an investigation found it to be another ship." This newspaper article written by Tom Bassing provided us with a first-person account of the second explosion that occurred in Texas City and the effects of it.

Carroll, Susan. "Texas City Disaster Devastated Community, Changed Way Industry Was Regulated." *Houston Chronicle*, 19 June 2016. Print.

"The explosion sent a fireball into the sky, shrapnel across town and damaged or destroyed more than 1,000 buildings." This article provided us with personal stories of victims who were affected by the disaster, as well as a better understanding of the mass damage that the explosion caused. Furthermore, it also provided us with more information on the impact that the disaster had on safety regulations, as well as how it led to improvement in the way that chemicals were handled and shipped to prevent the recurrence of a similar event. This article was useful because it gave us a clearer understanding of how the disaster impacted safety regulations and the damage that the explosion caused.

Crumbaker, Marge. "The Day Terror Struck Texas City." *The Houston Post*, 16 Apr. 1967.

"His words were punctuated with the crushing sound made when the pressure that had built up inside the hold blew up the hatch covers." This newspaper article retells the moments leading up to the first explosion when firefighters of the *SS Grandcamp* first discovered the fire inside of the ship's hatch. "The firefighters didn't take time to admire the view. They saw a sight that struck fear into them." This article also provided us with the recollections of some reporters who were present the day of the Texas City explosion and witnessed the terrifying fires that engulfed the city and ended up destroying it.

Evans, Thayer. "Former Texas City Mayor Dead at 89; Trahan Led City Past 1947 Disaster and Helped Rebuild the Community." *Houston Chronicle*, 19 Nov. 2004, p. 9. Print.

"It takes a great amount of fortitude to be able to handle what he did. Literally, his city was blown apart and lives were changed forever. He took control of the situation and led the city out of that," Mayor of Texas City, Matt Doyle, said when speaking about former Mayor Curtis Trahan. The following article discusses the death of Curtis Trahan, who served as mayor during the Texas City Disaster, and his triumph in leadership as he guided Texas City through the aftermath of the deadly explosion that occurred in 1947.

MackKaye, Milton. "Death on the Waterfront." *The Saturday Evening Post*, 26 Oct. 1957. Print.

A decade after the Texas City Disaster, residents could still feel the impact left behind by the massive destruction. An estimated 570 people were killed, and about 3,000 were injured. In this article there were various photographs, it provided us with first-hand accounts of the explosion.

"Nurse Who Aided Rescue Efforts in Texas Disaster." *The Washington Post*. WP Company, 25 May 1980. Print.

The following newspaper article describes the experience of a nurse, Margaret I. Levee, who aided and took part in emergency rescue efforts during the Texas City Disaster. When the ships loaded with ammonium nitrate fertilizer caught on fire causing fires and blasts, Mrs. Levee was teaching nursing at a Galveston Texas hospital. Mrs. Levee who was fluent in French, helped ship survivors from the French cargo ship by writing names and addresses on her white nurse's uniform using lipstick. This article was useful as it allowed to read about a personal experience of a nurse and how she contributed to the rescue efforts during the explosion.

Parker, Dan. "Disaster, Destruction and Death." *Corpus Christi Caller-Times*, 14 Apr. 1997. Print.

"Everywhere you turned, there was nothing but fire." Gordon Holt, now 70 and a survivor of the Texas City explosion, describes the aftermath of the first explosion. Dan Parker writes about the events that took place that day and the stories of the survivors and their perspective. These depictions of the disaster provide necessary information on the scope of the explosion and the thoughts of those affected and involved.

“Texas City Disaster Monument to Include Ship’s Propeller, A Park Also Will Be Dedicated in the Area Where Gigantic Ship Explosions Killed More than 500 People in 1947.” *Fort Worth Star-Telegram*, 16 Apr. 1991, p. 2. Print.

“A monument dedicated to the memory of one of the worst industrial accidents in U.S. history will include... the *SS High Flyer’s* 18-foot-tall, 29,500-pound brass propeller, which was found in a Louisiana scrap yard and returned to Texas City.” On the forty-fourth anniversary of the tragic event, the Mikeska-Sandberg Park was opened near the site where over 500 people were killed and thousands more injured when the *SS Grandcamp* exploded in the Texas City Port, and a monument was dedicated to those affected. With the information in this article we learned about how the city memorialized those that were lost in the tragic accident.

Trevizo, Perla. “Month after ITC Explosion at Deer Park Plant, Fire Investigators Enter Tank Farm.” *Houston Chronicle*, 9 Apr. 2019.

On March 17, the Intercontinental Terminals Co. plant in Deer Park, Texas ignited and sent with it plumes of smoke towards Houston. The fire lasted for nearly a week and caused a temporary shelter-in-place warning for residents of Deer Park due to the discovery of high levels of the benzene in the air. The site has since been in remediation and after an investigation one month later, “Authorities said in a press conference Tuesday that they had secured 11 tanks and the tank farm itself, which lowers the risk for re-ignition and escaping vapors.” Air monitoring found no risk of elevated benzene levels. This article provided us with information on the remediation effort of the ITC facility, and the effective response from emergency crews.

Stevens, Matt. “Deer Park Fire: Benzene in Texas City's Air Briefly Forces Everyone Inside.” *The New York Times*, The New York Times, 21 Mar. 2019.

On March 21, “Texas city ordered residents to take shelter indoors for several hours on Thursday morning for what was the second time in a week as the air quality there worsened after a fire at a petrochemical storage facility.” The fire was caused by elevated levels of Benzene in the air which is a flammable liquid known to cause cancer. A statement was released by the United States Chemical Safety Board stating that an investigation would begin into the blaze the following week. This article provided us with information over how the fire was handled.

Selected Bibliography

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Magazine Articles

Gyenes, Dr. Zsuzsanna, and Nicolas Dechy. "Risk and Safety Management of Ammonium Nitrate Fertilizer: Keeping the Memory of Disasters Alive." *Institution of Chemical Engineers*, Oct. 2016. Print.

In this article, the author provides a summary of different tragic events that have occurred in the ammonium fertilizer industry. Furthermore, the author also discusses and analyzes factors that led to the Texas City Disaster. From this source, we were able to go more in depth into the causes that led to the disaster as well as learn more about similar events that were tragic as well.

Lyons, Chuck. "THE 1947 TEXAS CITY EXPLOSION (Cover Story)." *History Magazine*, vol. 17, no. 5, 2016, pp. 8–11. Print.

In this article, Chuck Lyons gives background information on Texas City during World War II and describes how the city experienced a boom that continued long after the war had stopped. Furthermore, Lyons describes the events that occurred on the day of the disaster and the failed attempts that were made to prevent it. Support was received from many organizations during the mass explosions that helped with assisting the injured and fighting the fires. The disaster drew attention to the way ammonium nitrate was transported and packaged. This article was very useful to us as it provided an in-depth description of the events that occurred that day, how different cities and locals assisted during the chaos, and background information on Texas City.

Ross, Cheryl Lauersdorf. "The 1947 Texas City Disaster: Changing Lives in a Heartbeat." *Houston History*, 14 Nov. 2017, pp. 8–12. Print.

The author begins this article by providing a deep dive into the history of Texas City; at the time of the Disaster it was the fourth largest port in Texas. She then begins to describe the moments before the first explosion went off. "The Texas City Volunteer Fire Department (TCVFD) of twenty-six men and four trucks arrived on the scene[...]" She quotes various sources, and survivors of the disaster. From this source we obtained photographs and quotes that will be used throughout the website. We also learned about the Red Cross, and their role in helping the injured.

Wade, Jared. "The Lives of Workers." *Risk Management (00355593)*, vol. 58, no. 5, June 2011, pp. 14–15. Print.

The Texas City Disaster was one of the deadliest industrial accidents that occurred in history and resulted in the loss of many workers. This article discusses the disaster that occurred in Texas City as well as the first-ever class action lawsuit that survivors filed against the U.S. government under the Federal Tort Claims Act. The case reached the Supreme Court and although the plaintiffs lost, the case was a wake-up call to all potential defendants risking the lives of workers.

Selected Bibliography
Secondary Sources
Online Exhibits

Pandanell, Mark. "The Texas City Disaster: April 16, 1947." *1947 Texas City Disaster*, IAFF Local 1259, www.local1259iaff.org/disaster.html.

Mark Pandanell's online exhibit compiles many primary photographs of the Texas City Disaster that occurred on April 16, 1947, along with informative descriptions of what is happening in them. From this source we gained knowledge of the events that played out on and after that fateful day, and we were able to incorporate some of the images into our website.

Stuart, Daniel, et al. "1947 Texas City Disaster Online Exhibit." *Moore Memorial Public Library*, Moore Memorial Public Library, www.texascity-library.org/page/history.1947.home.

The Moore Memorial Public Library's online exhibit on the Texas City Disaster contains a brief history on Texas City and a detailed overview of the Disaster of 1947 and the triumphant recovery that took place with support coming from across the country. This exhibit proved invaluable to our project due to the extensive research done to create it and the primary photographs included in it. This resource provided us with a strong basis of information on the disaster.

Selected Bibliography
Secondary Sources
Books

Benham, Priscilla Myers. *Texas City: Port of Industrial Opportunity*. University of Houston-University Park, 1987.

In this book we were able to read about the history of Texas City. The author gave a detailed look into how the city was built, and how it became a leader in multiple industrial fields. This book helped us in writing about the historical context of Texas City. Specifically, the author wrote about Texas City during World War II. "Before the war's end, the Longhorn Tin smelter was refining 44 percent of the world's supply of tin." This quote shows how important the factories in Texas City were in helping the Allied forces.

Minutaglio, Bill. *City on Fire: The Explosion That Devastated a Texas Town and Ignited a Historic Legal Battle*. University of Texas Press, 2014.

"Before Timothy McVeigh's 1995 ammonium nitrate bombing of a federal building in Oklahoma... there was a far deadlier explosion in a small American city. It was also an ammonium nitrate explosion, but it was three hundred times more powerful than the one unleashed by McVeigh. It claimed more lives on American soil than any other man-made disaster in the twentieth century. It was the greatest industrial tragedy in the history of the most industrialized country in the world." Bill Minutaglio writes about the events leading to the Texas City Disaster, and the actions taken after to assure something like it never happens again. Minutaglio provides diagrams and photographs to convey the size of the explosion and the impact left behind not only literally, but by the changes to regulations and standards on the handling of dangerous materials.

Stephens, Hugh W. *The Texas City Disaster, 1947*. University of Texas Press, 1997.

"Many agonizing hours were to pass before a semblance of order began to replace the shock and confusion caused by this totally unexpected and devastating event." Hugh Stevens details the events that took place on April 16, 1947. Stephens explains how the lack of any precautions led to the catastrophe. At the time there was no plan in place for an industrial emergency of this magnitude. The Texas City Fire Department was made up of twenty-six men, and four fire trucks. They alone could not stop the massive fire that would erupt aboard the *Grandcamp*. This book gave us valuable information that we incorporated into the historical context portion of our website.

Urbanic, Frank A. *We Were Prepared*. AFMC Press, 2015.

“Scouts as young as twelve years old were involved in rescue efforts while braving choking fumes and dodging hot shrapnel from exploding fuel storage tanks.” From this book we were able to learn about the role that the Boy Scouts and Girls Scouts had in aiding victims of the disaster. The scouts worked alongside the Red Cross, hospital staff, and law enforcement agents to help those in need. We were able to use this book to strengthen the tragedy and triumph portion of our project.

We Were There: A Collection of the Personal Stories of Survivors of the 1947 Ship Explosions in Texas City, Texas, Commonly Referred to as the Texas City Disaster. [Texas City, Tex.]: [Mainland Museum of Texas City], 1997.

“Looking towards the docks, I saw black, ragged things flying through the air like buzzards. Then I realized they were parts of the ship and debris, deadly shrapnel of various sizes.” The stories of survivors in this collection describe their experiences in vivid detail which allowed us to picture the Texas City Disaster and gave us a sense of how severe it was. The survivors also described the conditions in the clinics and hospitals that they visited to receive medical attention and how they were overflowing with casualties. With this book, we were able to read the personal stories of various survivors of the ship explosions that occurred in Texas City.

Wheaton, Elizabeth Lee. *Texas City Remembers*. The Naylor Company, 1948.

“Published in the interest and for the benefit of a Texas City Memorial Library.” This book contains information about the Texas City disaster and serves as a reminder about the people who lost their lives in the explosions. There are also stories from survivors of the disaster and how the event impacted their life. We used information from this book in the conclusion section of the website.

Texas City Explosion April 16, 1947. The American National Red Cross.

“On behalf of The University of Texas I wish to express to the American Red Cross our deep appreciation of all that was done in aiding the Medical Branch to meet the emergency created by the Texas City disaster.” This quote from the president of the University of Texas tells the reader the role that the Red Cross had in aiding the victims of the disaster. From this book we were able to gather numerical data such as the number of people injured, the supplies used, and the number of volunteer staff. The information gathered will be used in the triumph and tragedy section of our website.

A Pictorial History Texas City Explosion 1947. 1997.

“Remembering keeps us grateful to our fellow human beings and above all to God. My compassion and appreciation to those who suffered and endured the 1947 explosion and the days that followed.” This book was compiled to remember the events of 1947 and the people that lost their lives. The entire list of the deceased is included in the book, as well as the political leaders who worked to rebuild the crippled city. We were given this book during our visit to the Texas City Museum by the museum staff.

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Secondary Sources

Online Articles

“66 Years Ago in April...The 1947 Texas City Disaster...TDEM Newsletter Vol.60 No.4 - Article 2.”
TxDPS - Texas Department of Public Safety.

This article from the Texas Department of Public Safety provided us with more information on the impact that the Texas City Disaster had on future regulations, standards, and disaster planning that were put in place as a result of the disaster. “In addition to cool temperatures, new regulations required specialized containers for storage and prohibited ammonium nitrate from being stored near other reactive materials. Travel over long distances was discouraged, and overseas transfer of the substance was highly restricted.” In addition to these regulations, new systems and agencies were also created, such as the Industrial Mutual Aid System (IMAS) and the Federal Emergency Management Agency (FEMA). This article gave us a greater understanding of the mark that the disaster left on Texas City.

Adams, Stephen, et al. "West Fertilizer Plant Explosion: Five Years Later." *KCEN*, KCEN, 16 Apr. 2018.

"An explosion at the West Fertilizer Company in the small town of West, TX [...] destroyed two schools, a 22-unit apartment complex and a 145-bed nursing home." An intentionally set fire caused the plant, which was storing between 40 to 60 tons of fertilizer grade ammonium nitrate, to explode in April 2013. This disaster killed fifteen people and injured over 260. This article is what led us to research similar industrial disasters in our local area which resulted in the discovery of our topic, the 1947 Texas City Disaster.

Barker, Aaron. "Small Fire Reported at ITC Facility in Deer Park." *KPRC*, Click2Houston, 14 May 2019, www.click2houston.com/news/small-fire-reported-at-itc-facility-in-deer-park.

A fire at the ITC facility in Deer Park, Texas was reported on the morning of May 14, 2019 at 11:45 AM. "Officials said a flash fire happened while crews were working to deconstruct tank 80-15, which was one of the tanks that burned during a blaze at one of the facility's tank farms nearly two months ago." No injuries were reported, and fire crews were at the scene to extinguish the flames promptly. No spikes in benzene levels were found which was of high concern during the initial fire that started on March 17. With this article we gained an understanding on the current situation of the remediation at taking place at the plant in Deer Park.

Baumann, Michael. "How a Fertilizer Accident Led to the Deadliest Industrial Disaster in American History." *The Ringer*, 24 Aug. 2017.

"We went outside and watched an ominous cloud raining tar, oil, and soot on us." Frank Urbanic, a junior high student who witnessed the explosions. From this website we were able to read first-hand accounts of the Texas City disaster. This gave us a greater understanding of the tragedy that occurred in 1947. We also gathered quotes, and sources that will be used throughout the website.

“BP America Refinery Explosion.” *Chemical Safety and Hazard Investigation Board*, 20 Mar. 2007, www.csb.gov/bp-america-refinery-explosion/.

This website provided us with information on the BP America Refinery Explosion that occurred in Texas City on March 23, 2005. It helped us learn about how this disaster was handled and the effects that it had. As a result of this accident “Fifteen workers were killed, and 180 others were injured.” We were able to compare this accident to the Texas City Disaster and compare the way this explosion was handled to the disaster that occurred in Texas City in 1945.

Brown, David. “Before the West Explosion, There Was Texas City.” *KUT*.

“It was an apocalyptic moment, people who were there described it as nuclear—atomic attack,” Bill said. The following article was useful when creating our website because it provided our group with various quotes, as well as a clearer understanding of the disaster that affected Texas City. In addition, this article also provided our group with an interview with Bill Minutaglio who is the author of *City on Fire*, a book about the Texas City Disaster.

Hagerty, Michael. “Witness Recalls Texas City Disaster and How it Shaped Thinking on Safety.” *Houston Public Media*, 1 Feb. 2018.

“I was blown to the ground, shoved about ten feet in the air,” Bob Roten said. “And before I could get up — and about the time I was on my feet again — the second blast happened. And that was the Monsanto plant, and it was almost as severe as the first one. And shrapnel falling around me.” Roten, witness to the tragic Texas City explosion. This website gave us access to photographs, quotes, and an interview with Mr. Roten. This source proved useful in creating our website.

“Hundreds Killed, Thousands Injured in Texas City Disaster of 1947.” *ABC13 Houston*, 16 Apr. 2019.

This article from a local channel news station provided us with more information on the Texas City Disaster and the events of that day. This article also mentions how according to an editorial run by the Texas City Sun, the victims of this terrible disaster were "bound together by a great and common tragedy for which there is no ready word of solace." As a result of reading this article, we were able to understand how the disaster of Texas City was able to further bring the community of Texas City closer together.

Leighton, Heather, and Craig Hlavaty. “See Historic, Rare Footage of the Aftermath of the Deadly 1947 Explosion in Texas City.” *Houston Chronicle*, Houston Chronicle, 28 Sept. 2018,

This article not only provided background information on the disaster, but several photographs taken after the explosions and while the fires were burning. Some of these photos include the destroyed buildings, shrapnel, debris, and volunteers searching for the deceased and recovering their bodies. These photographs will help depict the magnitude of destruction caused by the explosions and the fires the soon followed and spread throughout the city.

Leinfelder, Andrea. “Tight Squeeze: Supersized Crude Carrier Calls on Texas City Port.” *Houston Chronicle*, Houston Chronicle, 23 June 2018,

“A Very Large Crude Carrier, the aptly named ship that’s nearly too large for the Texas City turning basin, made history this week as the first of its kind to dock and take on crude oil in Texas City.” This article describes a large ship in the Texas City Port and the procedures that are taken place to ensure that everything go as planned. Photographs of the large ship, as well as, the new and improved Texas City Port are shown. These pictures reinforce the incredible reconstruction of the once devastated port to once again a hub of trade.

Reimann, Matt. "The Largest Non-Nuclear Explosion in U.S. History Destroyed Most of a Texas Town, Killing Hundreds." *Timeline*, 2 June 2017.

"It was like night for a minute or more," recalled Ben Lapham, a sailor on the Highflyer at the time of the blast. This newspaper article provided us with more information on the aftermath of the explosion and of the first class-action lawsuit that was filed against the United States. Through this article we were able to gain a deeper understanding of the legacy that the Texas City Disaster had and its impact.

"The Port Then and Now." *Port of Montreal*, Montreal Port Authority, 2018,

This website timeline provided an in-depth history of ports and the improvements they have gone through. Not only does this help with preliminary information but also gives historical context to ports. The illustrations and photographs helped display the advancements made to reach our modern-day ports.

"Texas City Refinery (Now Marathon Galveston Bay Refinery)." *The Center for Land Use Interpretation*, CLUI.

This website depicted several modern pictures of Texas City refineries as well as memorials for the disaster that happened decades ago. These photographs show how changes made benefitted Texas City greatly and allowed them to rebuild.

Yan, Holly, and Rebekah Riess. "Chemical Plant Fire near Houston Kills 1." *CNN*, Cable News Network, 2 Apr. 2019, www.cnn.com/2019/04/02/us/texas-harris-county-chemical-plant-fire/index.html.

A chemical plant near the Houston area caught fire on Tuesday, April 2, just three weeks after the fire in Deer Park. The fire at the KMCO chemical plant in Crosby, Texas "likely started when a transfer line ignited in the area of a tank holding isobutylene, according to the sheriff." The fire killed 1 and injured two more, and an order to shelter in place was put out to residents within a mile radius but was lifted only hours later. Matt Loesel, a coordinator with the US Environmental Protection Agency on the scene of the plant, said about any hazardous chemicals in the air, "We have not seen any detections at action levels." This article provided us with insight on how the response time and protective actions have changed since 1947 and how a plant fire is handled today.

Selected Bibliography
Secondary Sources
Monuments

“Volunteer Firemen Monument”. Texas State Preservation Board. Visited 14 Mar. 2019.

One of our group members traveled to the Texas State Capitol which has a monument on its grounds erected by the State Firemen's Association of Texas in 1896 as a memorial to volunteer firemen in Texas who died during service. The monument was modified to include the 28 volunteer firefighters that lost their lives in the Texas City Disaster.