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Reuse and the Benefit to Community
State Marine of Port Arthur/Palmer Barge Line Superfund Sites

Introduction

From the 1970s until the 1990s, marine industrial activities took place at both the State Marine of Port Arthur (State Marine) and Palmer Barge Line (Palmer Barge) Superfund sites, which are adjacent Superfund sites located in Port Arthur, Texas. Improper waste disposal practices contaminated soil and sediment with metals and hazardous chemicals at both sites. Cooperation among EPA, the Texas Commission on Environmental Quality (TCEQ), the cleanup parties and current property owners resulted in the sites' successful cleanup. After cleanup, the sites sat idle for a period before beneficial reuse took place.

Superfund site restoration and reuse can revitalize a local economy with jobs, new businesses, tax revenues and spending. Cleanup may also take place while there are active land uses on site. Today, site reuses include industrial barge cleaning and repair operations and office space. This case study explores the Palmer Barge Line and State Marine of Port Arthur area's cleanup and reuse, illustrating the beneficial effects of Superfund redevelopment initiatives.

Beneficial Effects

- **Three subsidiaries of Tubal-Cain Marine Services operate on site. These industrial barge cleaning and repair businesses generate tens of millions of dollars in annual sales and contribute millions of dollars in estimated annual employee income.**
- **Reuse also allowed a subsidiary headquarters to be relocated on site. Tubal-Cain Marine Services designed and constructed the building in a way that it would not impact landfill wastes below the ground surface.**
- **In 2017, site properties had a total property value in the hundreds of thousands of dollars and contributed thousands of dollars in annual property taxes to Jefferson County.**

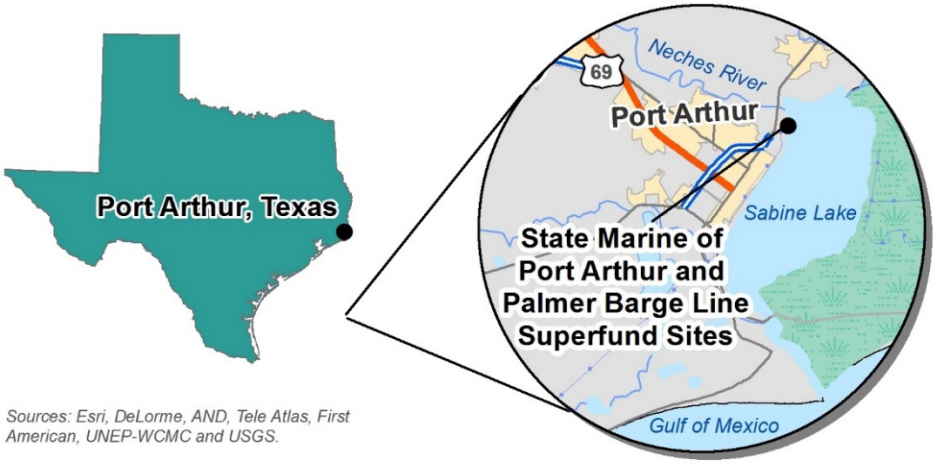

Figure 1. The sites' location in Port Arthur, Jefferson County, Texas.

Site History

The 34-acre area is located in Port Arthur in Jefferson County, Texas. The redeveloped sites include barge-docking areas, cranes, storage areas for barge materials, infrastructure for barge cleaning activities, a tool shop and a headquarters building. According to the U.S. Census Bureau, about 255,000 people live in Jefferson County.[1] Over 55,000 people live in Port Arthur.[2] From the 1950s until the 1970s, the City of Port Arthur operated a municipal landfill at both sites. In late 1974, the City of Port Arthur closed the landfill in accordance with Texas Department of Health regulations, which required covering the landfill with two feet of fine-grained fill material. Afterwards, different marine companies operated on both sites. From 1982 until 1997, a facility for servicing and maintaining barges and marine vessels operated on the Palmer Barge site. From the mid-1970s until the late 1980s, companies performed marine salvage and repair and waste oil storage and processing activities at the State Marine site.

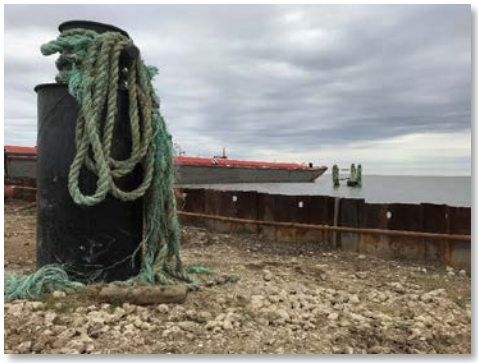

Figure 2. Industrial barge operations on the Palmer Barge Superfund site.

These operations and improper waste disposal practices contaminated site soil and sediment with metals and hazardous chemicals. It should be noted that prior landfill operations are not considered part of the sites, as they were considered remediated through the landfill closure requirements. During an inspection in July 1983, Texas Department of Water Resources personnel witnessed the discharge of hazardous materials directly into Sabine Lake from a barge docked at the site. This prompted the Texas Natural Resources Commission (now TCEQ) to conduct an expanded site inspection to develop an understanding of possible contamination at both sites. The inspection discovered volatile organic compounds, semi-volatile organic compounds, pesticides, polychlorinated biphenyls and metals in the soil at both sites. The inspection also found semi-volatile organic compounds and metals in sediment and surface water at the State Marine site. Following additional investigations at both sites, EPA added the State Marine site to the National Priorities List in July 1998 and the Palmer Barge site in July 2000.

Figure 3. Historical photo showing the State Marine site before cleanup.

Site Cleanup

State Marine of Port Arthur

In 2001, EPA completed a time-critical removal action to address immediate threats to human health and ecological receptors posed by the site. Cleanup included the removal and off-site disposal of waste materials, water treatment, oil/water separation and stabilization and off-site disposal of sludge materials. Following the removal action, EPA conducted additional site investigations. EPA selected the site's final remedy in the 2007

[1] https://www.census.gov/quickfacts/fact/table/jeffersoncountytexas/AGE295216.
[2] https://www.census.gov/quickfacts/fact/map/portarthurcitytexas/PST045216#viewtop.

record of decision. The major components of the selected remedy included implementation of institutional controls and no further action based on an anticipated future industrial/commercial land use. The additional site investigations showed that the time-critical removal action adequately addressed site contamination and confirmed that no further action was needed. Current institutional controls include two restrictive covenants, which restrict future site use to industrial or commercial uses only. Previous property owners filed and recorded the two restrictive covenants with the Jefferson County Clerk's Office in 2011.

Palmer Barge Line

In August 2000, EPA completed a removal action to remove source material stored on site. Cleanup included waste removal, water treatment, oil/water separation and sludge stabilization. EPA selected the site's final remedy in the 2005 record of decision. The selected remedy included excavation and off-site disposal of contaminated soil, confirmation sampling, backfilling of excavated areas, removal and decontamination of wastewater sludge, and implementation of institutional controls. The cleanup parties began cleanup activities on September 5, 2007, and completed them on September 28, 2007. The previous property owners implemented institutional controls in the form of three restrictive covenants, which restrict future land use to industrial/commercial purposes. The restrictive covenants were filed and recorded with the Jefferson County Clerk's office in March 2011.

Figure 4. Cleanup actions at the Palmer Barge site.

Beneficial Effects

Following the completion of cleanup actions at both sites, the sites are now in reuse providing valuable marine services in the area. Without EPA and the cleanup parties' dedication in identifying site contamination, supervising cleanup and completing cleanup actions, beneficial reuse would not have been possible. The section below describes the beneficial effects of redevelopment at both sites.

Following the completion of cleanup activities in 2007, the sites sat idle with no reuse plans. The prior site owners eventually began planning to use the sites as a bulk-loading terminal for ships, but these plans never materialized. The sites are ideally located – they have direct access to the Port of Port Arthur, are spacious and could accommodate a variety of industrial operations. Recognizing this, Tubal-Cain, a marine steel fabrication and vessel-cleaning company, approached the prior site owners about leasing both sites. Tubal-Cain specializes in a variety of industrial marine operations and operates under different entities (all under one holding company), and the location of the two sites was perfect for expanding their Gas Free subsidiary. These Gas Free operations entail

flare, boiler and steaming services for cleaning industrial barges. As the fourth busiest port for oil import and export in the world, the Port of Port Arthur constantly had barges that needed cleaning and service after completing their deliveries. After negotiations with the prior site owners, Tubal-Cain began leasing the two sites in 2009.

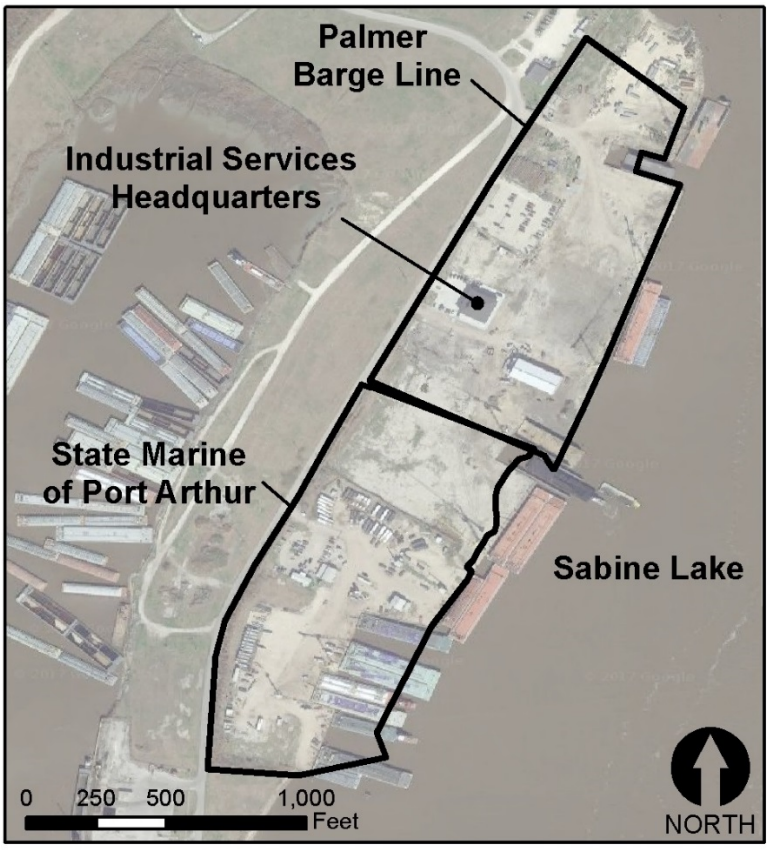

Figure 5. Site features of the Palmer Barge Line and State Marine of Port Arthur Superfund sites.

From 2009 until 2015, Tubal-Cain leased the site. In the beginning of their lease, Tubal-Cain operated a smaller version of their Gas Free services facility and only performed smaller vessel cleanings. Over time, and with the addition of a flare system, they expanded their Gas Free facility and began cleaning larger vessels. Tubal-Cain also began to move their Industrial Services subsidiary on site, which specializes in Industrial tank cleaning inside the refineries. In late 2014, the prior site owners approached Tubal-Cain about purchasing the two site properties. Tubal-Cain had been considering renewing their lease at the off-site location of their Marine Services Division, but now they began to consider purchasing the site properties. By purchasing the properties, Tubal-Cain could move their Marine Services entity and associated headquarters to the Palmer Barge property and would be able to operate their three business entities near one another. In mid-2015, Tubal-Cain purchased the two site properties and began construction of their Marine Services facility and headquarters.

Figure 6. The completed Tubal-Caine headquarters. *Image from Randy Cooper with permission of Tubal-Cain Marine Services.*

However, prior landfill operations and closure complicated new construction on the property. Texas Municipal Solid Waste Regulations prohibit activities that could affect the integrity of the landfill cover. There was also a concern about landfill gas contamination. Working with TCEQ, Tubal-Cain constructed their headquarters building so that it was raised one story above ground level. Preventing disturbance of the cover and possible landfill gas contamination, the elevation of the building also prevents damage during hurricanes and flooding events. Tubal-Cain also worked with TCEQ on construction of the new tool shed. With approval from TCEQ, Tubal-Cain constructed the shed so that it contained open windows, thereby preventing potential trapped landfill gas

"We knew the environmental history of this property and the costs we would incur to develop it, but we had a vision of what the sites could become and we are seeing it become reality."

-Randy Cooper, Operations Manager for Tubal-Cain

contamination. Through working with TCEQ, Tubal-Cain ensured construction met solid waste regulations, ensured worker safety and maintained the integrity of the landfill cover.

In early 2017, Tubal-Cain completed construction of the Marine Services facility and accompanying headquarters on the Palmer Barge site property. Currently, Tubal-Cain Industrial Services employs 30 people and generates a few million dollars in estimated annual revenue. The Industrial Services subsidiary specializes in industrial refinery tank cleaning and tank trailer washouts. Tubal-Cain Marine Services operates on the former State Marine property and employs 90 people and generates millions of dollars in estimated annual revenue. Tubal-Cain Gas Free, which also operates on the State Marine property, employs 80 people and generates millions of dollars in estimated annual revenue. In total, the three on-site subsidiaries employ 200 people and generate tens of millions of dollars in estimated annual revenue.

Figure 7. View of Tubal-Cain Marine Services and Tubal-Cain Gas Free services. *Image from Randy Cooper with permission of Tubal-Cain Marine Services.*

Tubal-Cain generates additional profits through their barge cleaning operations. Upon arrival at the facility, each vessel contains anywhere from 200 to 5,000 gallons of residual petroleum product because refinery operators are unable to remove all of the product from the vessels when they transfer the contents of the barge to the refineries. Using their facilities and machinery, Tubal-Cain extracts this residual virgin product and stores it on site until it is sold.

Green Business Practices

The previously mentioned product recycling practice prevents the residual petroleum product from being thrown away and sent to a hazardous waste facility. Because Tubal-Cain cannot recover 100% of this petroleum product for resale, the company uses proprietary cleaning techniques that minimize the amount of recovered product that has to leave the facility as hazardous waste. During the barge repair process, all steel removed from vessels is sent to a recycling facility as opposed to a landfill. Recently, Tubal-Cain has instituted a "Waste Minimization Program" that keeps the company moving forward in finding new ways to minimize all wastes, especially hazardous waste.

Enhancing Protectiveness Through Business Operations

When Tubal-Cain began leasing the sites in 2009, they recognized that the site properties would have some environmental challenges. First and foremost, to expand their Gas Free subsidiary and start cleaning larger vessels, they needed to deepen the shoreline so larger vessels would be able to dock. To do this, Tubal-Cain excavated and dredged sediment along the shoreline, putting the dredged sediments in piles on the site properties. Tubal-Cain sampled the dredged sediment and determined that there was some material that was contaminated above Texas regulatory standards. At their own expense, Tubal-Cain disposed of all dredged sediment above regulatory standards at an approved off-site facility in August 2016.

Figure 8. Barge docked at Tubal-Cain Gas Free Services.

Tubal-Cain has continually worked to spread clean fill material across the surface of both sites. This served two purposes – the material provided a base prior to laying asphalt at both sites and added additional protection to the existing landfill cap. Through constant compaction by heavy machinery during everyday operations, this material is continually hardened and further prevents water infiltration into the landfill cap, while also making it easier for machinery to move around the site properties. Tubal-Cain also bulk headed the shoreline of the site properties. The bulk heading makes is easier for vessels to dock and prevents erosion into Sabine Lake.

Figure 9. View of the barge docking area for Tubal-Cain Gas Free Services.

Property Values and Property Tax Revenues

Properties cleaned up under the Superfund program and kept in use provide tax revenues for local municipalities, providing funding for schools, local government operations and transit. The 2017 thousands of dollars in annual property taxes. On-site businesses that produce retail sales and services also generate tax revenues through the collection of sales taxes, which support state and local governments.[3]

Conclusion

Collaboration and cooperation among EPA, TCEQ, the cleanup parties and the current site owners has been instrumental to the successful cleanup and reuse of the State Marine of Port Arthur and Palmer Barge Line Superfund sites. EPA's carefully designed cleanup protects public health and the environment while

[3] The Texas sales tax rate is 6.25% and the Jefferson County tax rate is 0.5%, for a combined sales tax rate of 6.75%. For more information, see http://www.taxrates.com/state-rates/texas/counties/jefferson-county/.

simultaneously supporting the beneficial reuse of the sites. The sites' reuse as industrial barge cleaning and repair facilities provides much-needed services for the port industry, employment for local residents and ensures the site continues to have stewards committing to ensuring the sites remain protective of human health and the environment. Today, these site businesses generate tens of millions of dollars in annual sales, while providing millions of dollars in estimated annual employee income. On-site properties were valued in the hundreds of thousands of dollars in 2017.

Figure 10. View of Tubal-Cain tool shop on the Palmer Barge site. *Image from Randy Cooper with permission of Tubal-Cain Marine Services.*

For more information about EPA's Superfund Redevelopment Initiative (SRI), visit: https://www.epa.gov/superfund-redevelopment-initiative.

Technical Appendix

Employment Information for On-Site Jobs

EPA obtained the data included in this appendix directly from reputable sources and reported the data as presented by those sources. Information on the number of employees and sales volume for on-site businesses came from an onsite business representative. EPA also gathered information on businesses and corporations from the Hoovers/Dun & Bradstreet (D&B) database.[1] D&B maintains a database of over 225 million active and inactive businesses worldwide.

Wage and Income Information for On-Site Jobs

EPA obtained wage and income information from the U.S. Bureau of Labor Statistics (BLS). Part of the U.S. Department of Labor, the BLS is the principal federal agency responsible for measuring labor market activity, working conditions and price changes in the economy. All BLS data meet high standards of accuracy, statistical quality and impartiality.

EPA used the BLS Quarterly Census of Employment and Wages database to obtain average weekly wage data for businesses at the State Marine of Port Arthur and Palmer Barge Line Superfund sites. Average weekly wage data were identified by matching the North American Industry Classification System (NAICS) codes for each type of business with weekly wage data for corresponding businesses in Jefferson County. If weekly wage data were not available at the county level, EPA sought wage data by state or national level, respectively. In cases where wage data were not available for the six-digit NAICS code, EPA used higher-level (less-detailed) NAICS codes to obtain the wage data.

To determine the annual wages (mean annual) earned from jobs generated by each of the selected businesses at the State Marine of Port Arthur and Palmer Barge Line Superfund sites, EPA multiplied the average weekly wage figure by the number of weeks in a year (52) and by the number of jobs (employees) for each business.

[1] http://www.dnb.com/

Table 1. State Marine of Port Arthur and Palmer Barge Line Superfund Sites: Information for On-site Businesses

On-site Business	NAICS Code[a]	NAICS Title	Number of Employees[b]	Average Weekly Wage (2015)[c]	Annual Wage (Mean Annual) per Employee	Total Annual Income[d]	Annual Sales (2016)[b]
Tubal-Cain Marine Services	336611	Ship Building and Repair	90	$1,112	$57,824	N/D[e]	N/D
Tubal-Cain Gas Free Services	488390	Other Support Activities for Water Transportation	80	$1,408	$73,216	N/D	N/D
Tubal-Cain Industrial Services	332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	30	$1,046	$54,392	N/D	N/D
Total			**200**			**N/D**	**N/D**

[a] NAICS code assumed based on individual industrial activities for each subsidiary.
[b] Data provided by Randy Cooper, Tubal-Cain Marine Services Operation Manager.
[c] Average weekly wage per employee based on BLS 2015 Average Weekly Wage data.
[d] Total annual income figures derived by multiplying "Number of Employees" by "Annual Wage (Mean Annual) per Employee."
[e] Not disclosable.

Property Values and Local Tax Revenue Generated from Property Taxes

EPA obtained data on the most recently assessed values for property parcels at the State Marine of Port Arthur and Palmer Barge Line Superfund sites in June 2017 through property records accessible through Jefferson County's online property appraisal database.[2] EPA also obtained 2017 property tax information for the site parcels.

Table 2. Property Value and Tax Summary for Taxes Payable in 2017

Parcel ID No.	Parcel Address	Total Market Value of Land and Improvements (2017)	Total Property Tax (2017)
143306	8737 Old Yacht Club Road	N/D[a]	N/D
253250	8737 Old Yacht Club Road	N/D	N/D
		N/D	**N/D**

[a] Not disclosable.

[2] http://propaccess.jcad.org/clientdb/?cid=1