NPS Form 10-900
(Expires 5/31/2012)
Wisconsin Word Processing Format (Approved 1/92)

OMB No. 10024-0018

United States Department of Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900A). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name *Milwaukee* Shipwreck (Steam Screw)
other names/site number *Manistique Marquette and Northern No. 1*/ 47 MI-0443

2. Location

street & number	Lake Michigan, 3 miles east of Fox Point						N/A	**not for publication**	
city or town	Fox Point						N/A	**vicinity**	
state	Wisconsin	**code**	WI	**county**	Milwaukee	**code**	079	**zip code**	53217

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this X nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property X meets _ does not meet the National Register criteria. I recommend that this property be considered significant _ nationally X statewide _ locally. (_ See continuation sheet for additional comments.)

Signature of certifying official/Title Date

Deputy State Historic Preservation Officer – Wisconsin

State or Federal agency and bureau

In my opinion, the property _ meets _ does not meet the National Register criteria.
(_ See continuation sheet for additional comments.)

Signature of commenting official/Title Date

State or Federal agency and bureau

Milwaukee Shipwreck (Steam Screw)	Milwaukee	Wisconsin
Name of Property	County and State	

4. National Park Service Certification

I hereby certify that the property is:

__ entered in the National Register.
___ See continuation sheet.
__ determined eligible for the National Register.
___ See continuation sheet.
__ determined not eligible for the National Register.
___ See continuation sheet.
__ removed from the National Register.
__ other, (explain:)

	Signature of the Keeper	Date of Action

5. Classification

Ownership of Property
(check as many boxes as as apply)

	private
	public-local
X	public-State
	public-Federal

Category of Property
(Check only one box)

	building(s)
	district
	structure
X	site
	object

Number of Resources within Property
(Do not include previously listed resources in the count)

contributing	noncontributing	
		buildings
1		sites
		structures
		objects
1		total

Name of related multiple property listing:
(Enter "N/A" if property not part of a multiple property listing.)
Great Lakes Shipwrecks of Wisconsin

Number of contributing resources previously listed in the National Register
0

6. Function or Use

Historic Functions (Enter categories from instructions)	**Current Functions** (Enter categories from instructions)
Transportation/Water related	Landscape/Underwater

7. Description

Architectural Classification (Enter categories from instructions)	**Materials** (Enter categories from instructions)
OTHER: Steel-hulled Steam Screw	foundation N/A
	walls N/A
	roof N/A
	other N/A

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for the National Register listing.)

_ A Property is associated with events that have made a significant contribution to the broad patterns of our history.

_ B Property is associated with the lives of persons significant in our past.

_ C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

X D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

_ A owned by a religious institution or used for religious purposes.

_ B removed from its original location.

_ C a birthplace or grave.

_ D a cemetery.

_ E a reconstructed building, object, or structure.

_ F a commemorative property.

_ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

ARCHAEOLOGY/ HISTORIC, NON-ABORINGAL
MARITIME HISTORY
COMMERCE
TRANSPORTATION

Period of Significance

1903-1929

Significant Dates

1903

Significant Person
(Complete if Criterion B is marked)

N/A

Cultural Affiliation

Euro-American

Architect/Builder

American Shipbuilding Company

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographic References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous Documentation on File (National Park Service):
- preliminary determination of individual listing (36 CFR 67) has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic landmark
- recorded by Historic American Buildings Survey #
- recorded by Historic American Engineering Record #

Primary location of additional data:
X State Historic Preservation Office
- Other State Agency
- Federal Agency
- Local government
- University

Other
Name of repository:

10. Geographical Data

Acreage of Property 22.96 acres

UTM References (Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing
1	16	432,162	4,776,443
2	16	432,468	4,776,437
3	16	432,462	4,776,132
4	16	432,157	4,776,138

☐ See Continuation Sheet

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet)

Boundary Justification (Explain why the boundaries were selected on a continuation sheet)

11. Form Prepared By

name/title	Caitlin Zant, Tamara Thomsen, Paul Reckner, and Mackenzie Stout				
organization	Wisconsin Historical Society			**date**	
street & number	816 State Street			**telephone**	(608) 221-5909
city or town	Madison	**state**	WI	**zip code**	53706

Summary

Located three miles east of Fox Point, Wisconsin, the *Milwaukee* wreck site (47-MI-443) lies in 120 feet of water on the bottom of Lake Michigan. The steam-powered rail car ferry *Milwaukee* was launched in late 1902 at Cleveland, Ohio, and entered service as the *Manistique Marquette and Northern I* in early 1903. The vessel foundered during a brutal storm on the night of 22 October 1929. She went down with a crew of approximately 47 men and a cargo of 28 loaded rail cars in her hold. None of her crew survived and the precise cause and location of her sinking remained unknown for over half a century. The foundering of the *Milwaukee* remains the worst car ferry disaster in Great Lakes history. The wreck site was discovered in 1972 and has drawn a steady stream of recreational divers. The vessel was documented by the Wisconsin Historical Society in 2013-2014. The ship's unique combination of maritime and railroad history, as well as the mystery and tragedy surrounding her loss, continues to fascinate both professional and avocational historians alike.

Site Description

The *Milwaukee* is representative of a subclass of steam-propulsion ferry ships which transported bulk cargo and general merchandise within railroad cars. As an integral part of the railroad transportation system, many features of this vessel type were common to all railroad car ferries on the Great Lakes. Railroad car ferries possessed a large, open, central raildeck where the railroad cars were rolled aboard on tracks from the open stern, aligned in several rows, and locked down to the deck for sailing. Once the railroad cars were loaded aboard, a seagate was lowered across the vessel's stern, and secured to keep water from boarding waves from washing the deck. Under the raildeck were areas for crew's quarters, coal bunkers, boilers and engines. Above the raildeck would have been cabins, officer's quarters, wheelhouse and chartroom.

At the time of her registration, the *Milwaukee* was described as a steel hulled, twin screw car ferry with two decks and two masts, a gross tonnage of 2,933 tons, a net tonnage of 1,755 tons, length of 338 feet, breadth of 56 feet, and depth of 19.5 feet (Bureau of Navigation 1903a). The vessel was assigned the official number of 93363 (Bureau of Navigation 1903a). Two triple expansion steam engines provided the boat with an impressive 3,000 indicated horsepower, and her car deck was equipped with four sets of tracks accommodating 30-32 cars (*Kalamazoo Gazette-News* 1903; Hornstein 2005:24). AMSHIP first formally enrolled the vessel on 30 March 1903 with Cleveland, Ohio, as her homeport and R.C. Wetmore as Master (Bureau of Navigation 1903b). An Indorsement [sic] of Change of Master was added to the enrollment a week later, registering W.P. Robertson as the ship's new Master (Bureau of Navigation 1903b). In mid-April of 1903, the vessel was re-enrolled in Cleveland with legal ownership listed as the MM&N Railroad (part of the joint TCL&M line) (Bureau of Navigation 1903c). The latter enrollment was probably filed shortly before she set sail on her maiden voyage to

her new homeport of Manistique, Michigan, with William P. Robertson as Master (Bureau of Navigation 1903c).

Current Site

The car ferry *Milwaukee* lies 8.07 miles north-northeast of the Milwaukee Breakwater Lighthouse, and is 3.5 miles off shore, in the waters of Lake Michigan (43° 08.179' N, 87° 49.937' W). The hull sits on the lakebed in 85-125 feet of water on a heading of 240 degrees. From this heading, it is evident that the *Milwaukee* had turned around and was making for Milwaukee Harbor as she finally succumbed to the storm. The vessel sits upright, with the stern listing 5 degrees to port. While the bow and stern of the ship remain mostly intact, the midsection of the ship has collapsed considerably, with the hull plating on both the port and starboard sides now lying on top of the *Milwaukee*'s cargo of railcars. Pieces of the upper deck works, including the vessel's chart room, are disarticulated and lie 91 feet from the stempost off the port side of the wreck on a 120-degree heading at its closest point.

During the summer of 2014, the Wisconsin Historical Society conducted a Phase II archaeological survey of the *Milwaukee* to augment extensive photography and videography used to document the site during the field seasons of 2012-13. The site is divided into two main sections. The first section is comprised of the main body of the ship and its associated cargo, while the second section includes the pilot house and upper deck works of the vessel. The two sections are separated by a distance of 91 feet, measured from the portside stempost. Because of this distance, each section was documented separately. No formal baseline was used during the survey of this wreck, but some measurements were taken relative to their distance from the vessel's bow.

The *Milwaukee* measures 338.5 feet in overall length, and 56.5 feet in beam, measured at the vessel's widest point, 260 feet aft of the stempost. The upper deck works measured 320.6 feet in length, with the open raildeck measuring 17.9 feet long and 31.1 feet wide. The vessel's bow is buried slightly in the sand, rising 37.0 feet with a rake of 1.5 degrees forward. The *Milwaukee*'s stempost is extant, measuring 0.6 feet wide and 1.0 feet long. The stempost rises 0.5 feet above the gunwale, and extends 37.5 feet down and into the sand, at a depth of 123 feet. The gunwale rises 3.5 feet above the deck, and extends 23.3 feet from the stempost to the edge of the forecastle deck. Frames measuring 0.2 feet wide and 3.0 feet in height, with a space of 7.2 feet, support the gunwale. These frames are reinforced by iron rising knees measuring 1.5 feet tall, 1.3 feet wide at the base, and 0.2 feet thick.

On the exterior of the hull, a rubbing strake is extant running along the length of the ship. The strake is located 1.2 feet below the gunwale and measures 0.2 feet molded and 0.3 feet sided, extending 23.3 feet to the edge of the forecastle deck. The *Milwaukee*'s hawse pipes are also extant, located 17.1 feet below the top of the gunwale and 4.7 feet aft of the stempost, on both the port and starboard sides. The vessel's anchors and anchor chains are no longer extant. The hawse pipes are oval and measure 4.0 feet

by 2.5 feet in diameter. A ring, measuring 0.65 feet thick and extruding 0.3 feet out, lines the hawse pipes. There is an inset of 1.0 feet into the hull of the ship where the anchor would have sat, nearly flush with the exterior hull plating. Scuttles are also extant in the hull, each with a valve still attached. These are located 1.0 feet aft and 1.3 feet toward the centerline of the ship. The scuttles measure 0.7 feet in exterior diameter and 0.4 feet in interior diameter, narrowing to 0.15 feet in diameter on the interior of the hull plating.

Two line holes are extant in the gunwale as well, located 6.6 feet aft of the stempost. These are located 0.6 feet from the deck, and measure 0.8 feet wide and 0.5 feet tall. On the ship's exterior, the line holes are indented 0.2 feet into the hull.

The exterior hull plating consists of a series of steel plates measuring 4.1 feet and 6.2 feet tall, and measuring over 60.0 feet long and 0.1 feet thick. Due to the amount of muscles now growing on the wreck, as well as the multiple fractures in the upper deck hull structure, it is not possible to discern the exact length of each plate. The plates of different sizes are alternated, beginning above the whale strake and extending to the top of the raildeck. The plates are held together with 0.1 foot rivets on 0.3-foot centers. Each seam is covered by a seam plate measuring 0.4 feet in height and 0.1 feet thick, welded to the exterior of the hull plating.

The hull plating below the whale strake differs significantly from the plating of the rail and upper decks. The hull is composed of steel plates measuring 0.2 feet thick, and measuring 2.4 feet in height and 26.2 feet long, significantly smaller than the hull plates used for the upper decks. These plates are held together by a combination of welding and rivets, with the welding evident on the interior of the ship reinforced by rivets extant on the hull's exterior. Near the bow, just beneath the whale strake, dark green paint overlaying a layer of white paint is extant along vertical plate seams, indicating the lower hull was painted a dark green color when the vessel sank.

Evidence of the *Milwaukee*'s bilge overboard discharge pipes remain extant 1.0 feet beneath the whale strake on the starboard side of the vessel, 245.0 feet from the stempost. The discharge is a recessed square measuring 1.3 feet tall and 0.8 feet wide, set into the hull 0.3 feet. Within this square, a pipe, measuring 0.6 feet in diameter, remains extant, extending further into the ship's hull. This would have been where the *Milwaukee*'s bilge water would have been discharged while in port. Due to a collapsed section of outer hull plating on the port side, a second bilge overboard discharge was not located, though it likely remains extant.

On the forecastle deck, 6.6 feet aft of the stempost, the vessel's capstan remains extant, measuring 3.0 feet tall, 1.83 feet in diameter at its crown, and 3.0 feet in diameter at its base. The capstan sits on a stepped base measuring 4.0 feet in diameter at the forecastle deck. The base consists of three steps, the first measuring 0.2 feet high and 0.1 feet wide, the second measuring 0.1 feet high and 0.2 feet wide, and the third measuring 0.3 feet high and 0.3 feet wide. The capstan itself sits 0.5 feet above this final

step. At 3.6 feet along the baseline, just forward of the capstan, two bits are extant, measuring 2.0 feet tall, and 1.1 feet in diameter, with a 0.8-foot space between. The bits sit on a rectangular iron base measuring 3.6 feet wide, 1.6 feet long, and 0.25 feet thick. Two deck scuttles are extant on the forecastle and are located 4.0 feet on center from the capstan on both the port and starboard side. These scuttles measure 1.55 feet in diameter and have a ring around the edge measuring 0.25 feet wide and 0.05 feet thick.

Near the aft edge of the forecastle deck, 25.0 feet from the stempost, a stairwell cowl remains extant, hanging over the, now open, raildeck, attached to the deck only at its forward end. Although the stair steps are no longer extant, the railings still line the interior of the cowl. The doorway of the cowl measures 3.8 feet wide and 6.8 feet tall, and is composed of iron 0.1 feet thick. The entire cowl extends 7.7 feet from forward end to the door way, but its height decreases to 4.0 feet tall, 3.2 feet from its aft facing edge. Due to the collapse of the hull plating covering the raildeck, the lower section of the cowl, that originally extended into the deck below, can be seen from the forecastle deck. This section measures 8.0 feet tall at its forward end, and rises at an angle to the level of the forecastle deck. This stairway would have allowed quick access to the windless and storage area located just below.

A single deck winch remains extant on the port side, just aft of the forecastle structure, and measures 4.0 feet in diameter at its base, and 3.5 feet in height from the top of the wheel. The width of the wheel itself is 0.6 feet, and it has a diameter of 3.0 feet. The deck winch is located 47.0 feet aft of the stempost on the port side of the vessel, and was used to haul light cargo up onto her deck.

An additional two decks are located beneath the forecastle deck. Lying at 99 feet deep is the windless room, a room reserved for housing the *Milwaukee*'s windless and various supplies. The windless was used to raise and lower the vessel's two anchors as she was getting ready to make way. The *Milwaukee*'s windless measures 4.3 feet in height and 7.2 feet wide. On either side of the windless are two gypsies painted mint green, measuring 1.5 feet wide and 0.83 feet in diameter, resting 2.7 feet above the deck. This was used to chain as the anchor was being pulled in. Two sets of hooks, extending out 1.5 feet, remain fastened to the hull of the ship, 5.8 feet above the floor. The starboard side hooks still have braided rope wound around them, while the port side hooks remain empty. The doors to this room are no longer extant, nor are the panes of glass or porthole covers for the six portholes located within the room.

Below this deck is another room level with the cargo deck, located 5 feet forward of the coupling blocks used to fasten the vessel's railcar cargo. The area is divided into two rooms separated by a wall containing a window with no glass, measuring 2.4 feet wide and 2.8 feet tall, and a door measuring 2.0 feet wide and 5.8 feet tall. In each room, a set of bunks, 5.1 feet in height, remains extant along the aft bulkhead. Each bunk contained two beds, 2.6 feet wide and 6.0 feet long. The framing for the upper bed is extant 2.4 feet above the silt. Against the hull on the starboard side, one sink measuring 3.0 feet long and 1.0 feet wide, remains extant. Another sink is located in the portside room, although it

remains buried in silt. The doors to this room are extant, located 3.5 feet from the outer hull and measuring 2.0 feet wide, and 5.8 feet tall. A water guard, measuring 0.9 feet tall, is extant at the base of each door. Only two portholes are located in the room, though the glass and porthole covers are no longer extant. Just aft of the main bulkhead for these rooms, two additional rooms remain extant along the starboard and port hull. The forward most room on the starboard side contains one porcelain toilet, while the other room remains empty. While the main crews quarters were located beneath the raildeck near the ship's stern, these forward quarters were likely added as a result of the increase in the vessel's crewmembers following a railroad union strike.

At the aft edge of the forecastle deck, a set of stairs, measuring 3.0 feet wide, leads down to the main raildeck, allowing access to the forward decks from the cargo decks. The staircase raises 8.4 feet, with eight steps, from the raildeck to the windless deck. Each step measures 1.0 feet tall and 0.25 feet wide, and has a run of 9.0 feet from bottom to top.

Although much of the *Milwaukee*'s hull remains intact, the upper decks now lay crushed and twisted on top of the railcars still located within the hull. Sections of the upper deck walls remain extant scattered across the top of the wreck, measuring 7.05 feet tall, and featuring windows measuring 2.1 feet wide and 3.5 feet tall. Three major sections of steel walled cabin structure are extant lying flat on the collapsed wreckage below, one on the port side, and two on the starboard side. The port side section, located 68.1 feet aft of the stempost, measures 26.9 feet long with 6 windows, while the starboard sections, resting at 210.9 feet and 266.2 feet from the stempost, measure 17.0 feet and 21.7 feet long respectively with 4 and 5 windows. Glass no longer remains extant in any of the windows. Frames are extant on the exterior of these sections, measuring 0.3 feet wide and 0.2 feet out from the steel plating, with a space of 3.4 feet.

The port side section of the upper deck has an additional piece of the upper deck plating, measuring 3.0 feet tall. A porthole remains extant 1.9 feet from the top of this section, and measures 1.3 in diameter. The porthole extends 0.5 feet out from the hull and is crafted out of steel 0.2 feet thick. No glass or porthole cover remains extant.

Although collapsed and tilted inward, the walkway that extended around the upper deck structure remains extant lying on top of the port side section of upper cabin structure. The walkway measures 3.2 feet wide, with the chain rail posts still extant in some areas. Two lifeboat davits are also extant, connected to this portside section of upper cabin structure. The davits, measure 0.5 feet thick, extending 5.3 feet above the upper edge of the cabin wall and lean 2.8 feet over the edge of the wall. Measuring 4.5 feet apart, the davits held one of the ship's lifeboats on a steel platform during voyages and were used to deploy the lifeboat in an emergency. The steel platform on which the lifeboat rested, as well as the lifeboat, are not extant on the site. From the lack of lifeboat wreckage extant on the site, it is evident that all the boats were either deployed prior to sinking, or they were destroyed by the waves upon the *Milwaukee*'s sinking.

The *Milwaukee*'s main cargo deck held space for up to 28 railcars. These cars were attached to coupling blocks located just aft of her forecastle decks. Her four coupling blocks remain extant on the raildeck at a depth of 101 feet, the center two located 26.0 feet aft of the stempost. The port and starboard coupling blocks were located further aft, 38.0 feet from the stempost. Each block was made of wood with an iron coupling, 1.0 feet thick, located on the aft facing side, 3.0 feet from the deck. The couplers on each railcar measure the same dimensions. The coupling blocks measure 4.0 feet wide, 4.7 feet long, and stand 6.0 feet above the deck, consisting of four posts measuring 1.0 feet square and a board measuring 0.8 feet thick. On the forward facing side, 2.0 foot thick reinforcing blocks were attached for support. Beneath the wooden board, the coupling blocks are open.

Four tracks run along the *Milwaukee*'s raildeck, two on the port side and two on the starboard side, with rails measuring 0.22 feet wide and 0.2 feet thick. The tracks are 3.0 feet apart, measured on center, with 5.4 feet separating the starboard-side tracks from the port-side tracks. At the stern, the four tracks are spaced close together, with a distance of 3.4 feet between the outer tracks and the outer hull. Located 1.0 feet from the stern edge of the raildeck is a small iron eye, measuring 1.2 feet long, 0.6 feet wide, and standing 0.7 feet above the deck. It was likely associated with the locking mechanism for the sea gate. Another implement associated with the locking mechanism is located 11.0 feet from the aft edge of the raildeck. This square bit measures 0.6 feet square and 0.8 feet tall, with a base 1.0 foot in diameter. This sits on a larger base rising 0.2 feet above the deck and measuring 2.0 feet wide and 2.7 feet long.

Deck beams extend across the top of the raildeck. These beams measure 0.6 feet wide and extend 0.5 feet from the floor of the upper deck. These are spaced 4.7 feet on center and extend the width of the raildeck, though they are now only extant near the stern.

Throughout the raildeck, all 28 railcars remain extant, indicating that the *Milwaukee* had a full cargo of railcars when she sank. Each car measures 13.0 feet tall, 9.0 feet wide, and 38.2 feet long. These cars rest on two trucks, measuring 2.0 feet in diameter. The cars were made of steel framing lined with wood planking. Both ends of the cars were also made of corrugated steel. This was a common design for railcars during the 1920s and a signature feature of the Grand Trunk Railroad's cars. While most of the cars have been crushed to a considerable extent, some of the steel framing remains extant upright, though the wood planking has since detached, now lying in piles on the floor of the cars.

Evidence of considerable car displacement is evident within the raildeck. Only a few of the railcars remain on their trucks centered on the rail tracks. In some cases, the trucks remain on the tracks, but the cars have been lifted off and now lay crushed on the deck, though in relatively the same location as where they were originally loaded. At this time, railcars were attached to their trucks by a single pin, with the rest relying on gravity and the weight of the cargo. These cars were likely lifted off their trucks by the waves washing over the raildeck just before her sinking.

Although all 28 of the cars still remain on the deck, many have been significantly dislodged. Significant effort was made to identify each of the railcars, their location on the raildeck, their integrity, and their cargo. The forward most car no longer remains on a track and is empty. Most of the railcars on the vessel remain empty, indicative of their perishable cargos of corn, seed, feed, cheese, butter, and malt. Just to the starboard side of the ship, a car filled with sheets of wood veneer stacked vertically still sits on the tracks. Each car was equipped with a hand break that could be turned by a crewmember walking along the roof of the cars rather than between them to engage the breaks. One handbrake is extant on the forward most car, 35.1 feet aft of the stempost, with a wheel made of steel 0.2 feet thick, and measuring 1.5 feet in diameter on a rod measuring 0.3 feet in diameter.

On the starboard side of the ship, 263.5 feet aft of the stempost, the third railcar from the stern now lays diagonally across the tracks with its forward end hanging over the edge of the ship, where a 58.9 foot long starboard section of the outer hull has fallen outward, as opposed to inward as in the rest of the ship. In the same row of cars, the starboard most railcar is wedged against a structural frame that is bent at an almost 90-degree angle around the frame of the railcar. From the force required to damage the frame to this extent, it is evident that this occurred before the vessel's sinking. The uncoupled railcars likely came loose during the storm and shifted considerably. Paired with the waves washing over the deck, this car was lifted off its trucks and slammed into the starboard framing, causing a tear in the outer hull. Just forward of this fissure, a 58.7 foot piece of the portside hull now remains extant on the sand having fallen outward. This tear would have allowed a considerable amount of water to enter the hull, augmenting the flooding of the rail, and lower decks. Just forward of this, an additional piece of outer hull on the port side has detached at the raildeck and extends 64.8 feet diagonally from the hull into the sand.

At the stern, two railcars remain extant perpendicular to the rail tracks on which they were loaded. One car from the interior starboard track and another from the outbound port track rests further aft and rotated 90-degrees from their original locations, effectively blocking any of the other railcars from sliding backwards along the tracks and off the end of the ship. Evidence of this sliding can be seen on the outbound port track, where the entire line of cars shifted toward the stern before being blocked by the rotated stern car. Both of these cars were identified as "reefer" cars, or refrigerated cars used for carrying vegetables. These were specialized cars that allowed goods to be transported further across the country while maintaining their freshness. Evidence of the cars grated compartments remain extant in these cars, though much of their structure is crushed by the collapsed decks above. A compartment near both ends of the car was used to house ice blocks used to keep the cars cool during transport. These compartments can still be seen near the port and starboard ends of each respective car. The "reefer" car's trucks no longer remain extant beneath the railcars. One wheel truck remains extant beneath the starboard side prop shaft. With no railcar bow debris extant, this was likely one of the trucks from the aft "reefer" cars.

In addition to the car filled with wood veneer near the bow of the ship, more nonperishable cargo remains extant in the railcars. Near the stern, two cars filled with Kohler fixtures remain extant on the inner starboard track near the entrance to the flicker. The stern-most car contains a collection of sinks, and bathtubs. The port side wall of this car has collapsed outward, and the sinks and toilets now spill out of the car and on to the deck. The railcar just forward of this contains more Kohler sinks, along with toilet cisterns and bowls. While the cisterns and a few of the sinks now spill out of the collapsed sides of the car, the forward end of the railcar remains intact, and the rest of the sinks are extant, neatly stacked in rows as they were when they were loaded onto the *Milwaukee* more than 80 years ago. This car contains two sizes of sinks. The sinks near the forward end of the car are small, measuring only 2.0 feet wide, while the sinks near the aft end of the car are larger, measuring 3.0 feet wide.

One additional railcar near the stern on the port side remains extant with its cargo of Nash automobiles. Although the automobiles have been damaged significantly by the collapse of the upper deck and railcar, identifiable components of at least three automobiles remain extant, including two engine blocks, a steering wheel still attached to the drive shaft, axels, and shreds of multiple tires. This railcar is located on the outbound portside track near the last row of cars.

Although coupling blocks were located near the vessel's bow, none of the railcars are currently connected to the blocks or to one another. Used as a method of securing the railcars, these steel couplers measured 1.0 feet thick and would have been attached to one another. Each coupler was also equipped with a rubber hose used to apply hydraulic pressure to the coupling, keeping it secure. Multiple examples of these hoses remain extant on the railcar bases, and measure 1.6 feet long with a diameter of 0.15 feet. Without a power source, these hydraulics released, allowing the couplers to separate and the cars to be easily shifted by waves washing over the raildeck. Additional methods of fastening are evident from chain stoppers and tensioners that remain extant on the floor of the raildeck. The chain stopper measures 3.7 feet long and the tensioner measures 2.0 feet in length and is attached to an oxidized pile of chains. These were used to attach each railcar to the rails to prevent them from rolling or heaving during the voyage across the lake. Chain would have run over the tops of the cars to keep them in place on the trucks. Although these chain stoppers remain extant, none remain attached to the rails, and lengths of chain are not extant across the tops of the railcars.

Along the centerline of the ship, four conduits used to direct pipes and wiring from the lower decks to the upper decks remain extant on the raildeck, measuring 8.0 feet in length, 2.0 feet wide, and standing 4.0 to 7.0 feet above the collapsed wreckage of the upper deck. Although four are extant, only two remain in an upright position, located 204.3 feet and 244.9 feet aft of the bow. The other two conduits now lie on the starboard side of the ship due to the collapse of the upper decks, and are located 137.3 feet and 165.7 feet aft of the stempost. Along with pipes and wiring, these conduits also contain access ladders used for accessing the pipes and wiring in case of failure or emergency.

Throughout the raildeck, iron grating remains extant in some locations beneath the railcars. These grates, which measure 3.8 feet wide and 5.1 feet long, are interspersed with sections of solid steel plating. The bars of the grates measure 0.05 feet in diameter and are spaced 0.2 feet on center. Beneath these grates are the open coal bunkers. Though the *Milwaukee* was stocked for its 68 mile trip across Lake Michigan, there is very little coal that remains extant in the bunkers. On the starboard side of the vessel, a hatchway leading from the coal bunker into the boiler room remains open with coal lying in a pile just inside.

The boiler room contains the *Milwaukee*'s four large boilers, measuring12.0 feet in diameter and 15.0 feet in length. In the 10.0-foot wide space between the four boilers runs an athwartship catwalk, measuring 2.0 feet wide. Each boiler contains three furnace tubes that face this central athwartship catwalk. The tubes measure 4.0 feet in diameter and each contain a coal hatch measuring 1.5 feet wide and 1.0 feet in height. All of these remain open. Above each tube is a smoke box door attached to the boiler flue. The two outer doors measure 4.0 feet wide and 5.0 feet tall, while the center door measures 5.0 feet wide and 5.0 feet tall. In the center of this catwalk is a stairway leading down to the floor of the boiler room. Along the port and starboard boiler room bulkheads run two additional catwalks, measuring 3.0 feet wide. To the outside of these catwalks, the coal bunkers can be seen extending to the outer hull of the ship, with a 5.0 foot gap running between each. The boiler room catwalks are made of steel, cut with diamond-shaped grating. An additional athwartship catwalk, measuring 2.0 feet wide, runs between the aft-most boilers and two large tanks used for storing water. Near the aft bulkhead, large steam pipes can be seen extending through the bulkhead into the engine room. Thick silt has collected throughout the floor of the boiler room, covering many of the tools and cultural material extant in the room. Evidence of human remains were found extant.

The deck beams extant in the boiler room are C-channel beams, measuring 0.25 feet wide, extend 0.5 feet from the bottom of the raildeck, and are spaced 2.0 feet apart. Multiple deck stations remain extant as well, measuring 0.8 feet wide and 1.5 feet thick. Each of these has buckled slightly due to the weight of the railcars on the deck above coupled with the downward force of the vessel's impact with the lakebed. Stanchions of the same measure are also extant running along the center of the engine room. A single I-beam runs athwartship along the forward bulkhead, which has bowed outward. This I-beam measures 1.0 feet wide and 0.25 feet thick.

The *Milwaukee*'s engine room is extant just aft of the aft boiler room bulkhead, and occupies the entire width of the vessel. The vessel's two triple expansion engines remain extant near the forward end of the engine room, one located to port and one to starboard, measuring 18.0 feet in overall length and 5.0 feet in width. A red and black star is painted on the aft facing side of the cylinder casing of each engine. Numerous steam pipes and exhaust pipes extend outward from the engines. Beneath the engines, the propeller shafts can be seen extending aft, but there is no access to them aft of the engines themselves. A central catwalk runs between the engines, measuring 2.0 feet wide, and consists of square steel grating, the cuts measuring 0.1 feet square. In the center of this catwalk, a narrow ladder

extends upwards and down to the floor of the engine room, for prop shaft access. The ladder extends up into one of the remaining standing conduits visible on the raildeck. Just aft of this, another stairway leads upwards to the raildeck. An electronic control panel remains extant hanging from a deck beam near this access way. A catwalk of the same measurements runs around the exterior of the engine casing. Additional catwalks run along the outer hull, measuring 3.0 feet thick.

Near the aft end of the room, wooden planking replaces the catwalks, and extends beneath a thick layer of silt to the aft engine room bulkhead. Along the aft bulkhead are two rooms each measuring 15.0 feet wide by 6.0 feet long. The starboard side enclosure is divided into two rooms, a head, containing a sink and a toilet, and a storage closet. Within the storage closet, sight glasses measuring 2.0 feet long and 0.2 feet in diameter are extant along with a stack of plugs used for plugging steam pipes, measuring 0.6 feet in diameter with a 0.1-foot diameter hole in the center. The port side room walls have collapsed and a thick layer of silt now covers the materials within. White paint remains extant on the wood paneling of the walls. Between these two rooms, two fly wheels are extant extending above the silt. These wheels are a part of the vessel's non-pressure oil circulating system, which would have supplied oil to the external moving parts of the two triple expansion engines. A supply tank and oil pump are extant on each machine. Evidence of red paint remains on the machinery. Additionally, two ceiling fans and a barrel measuring 1.0 feet in diameter and 2.5 feet tall remain extant above the silt. A single porthole is located in the aft bulkhead, opening into the flicker located just beyond. No glass or porthole frame remains extant.

The entrance to the flicker is located 263.1 feet aft of the stempost, along the centerline of the ship between two railcars. The entrance is a rectangular hatchway measuring 2.6 feet wide and 3.0 feet long. A steep set of stairs extends down into the lower deck, extending beneath a coaming running along the sides of the opening, measuring 0.15 feet wide.

Nine intact cabins remain extant in the flicker running along the centerline of the vessel, five on the starboard side, and four on the port side. Additional cabins remained further aft but the walls and wooden floor structure have collapsed into the bilge below. Each cabin measures 7.0 feet wide and 7.9 feet deep. The doors to the two forward most cabins face forward, while the other cabin's doors face the port and starboard sides of the vessel. Each cabin was also equipped with a window, located 3.0 feet aft of the doorway, measuring 1.5 feet wide and 2.0 feet tall. The glass in the windows along the starboard hallway remain extant, though the window frame of the furthest aft cabin on the starboard side lies on the deck. The doors of each cabin measure 2.0 feet wide and 5.8 feet tall. These are five-paneled doors with all brass doorknobs and hinges extant. Six of the cabin doors remain extant.

In seven of the cabins, bunk beds remain extant, measuring 6.0 feet long and 2.6 feet wide. Although the iron framing is all that remains extant in most of the rooms, the fourth room, going aft, on the starboard side contains a bunk on which wooden paneling, painted white, remains extant. Shoes, suitcases, clothing material, and overturned chairs remain extant in most of the cabins, extending

slightly above the thick layer of silt now covering the floor. Light sockets remain extant along the back wall of all of the cabins, though no light bulbs remain. Each of the cabins contains a small closet measuring 2.0 feet wide, most of which have closed doors.

Much of the port side of the flicker is damaged, with most of the aft cabins collapsed. The starboard cabins retain much of their structural integrity, save for the aft most cabin which is missing its aft wall. White paint remains extant on the wood paneling in abundance, and all of the cabin doors and window glass remain. Outside the cabin, just aft of the forward most cabin, a small unpainted square is extant where a sign was once attached.

A narrow hallway, measuring 3.0 feet wide, extends the length of the flicker on both the port and starboard side. The opposite wall of the hallways, on both the port and starboard side, are no longer extant save for a small section of wall, still painted white, near the aft end of the starboard hallway. Only the wall supports and radial heating pipes remain, marking the existence of the wall. A single light socket hangs near the ceiling on the port side, floating upright, with a light bulb still in the socket. On the opposite side of this partition, two large open rooms are extant. On the port side, overturned tables, chairs, and benches are extant, extending from beneath the silt. Some of the floor planking has collapsed into the bilge below. Near the aft end of the room, a pile of various tools remain extant. On the starboard side, two large cylindrical holding tanks are stacked on top of one another across the forward wall. The aft wall of this room remains extant, though it has fallen forward, revealing the rooms behind. Connected to this wall are four sinks with faucets. In the room behind this wall, a single toilet remains extant, with a wooden seat cover, marking the crew's head. A few artifacts remain extant in the hallway near the foot of the stairs leading to the raildeck. A ceiling fan is located on the starboard side of the stairway, while an intact glass jar is located on the port side of the stairway. A saw tooth gear, measuring 6.0 feet long, 0.2 feet wide, with 0.2 foot wide teeth, is also located on the port side, near a stairway leading down into the bilge allowing for prop shaft access.

The vessel's aft mast remains extant within the debris of the raildeck, located 234 feet from the stempost, just to port of the entrance to the flicker. The mast extends 41 feet before it descends beneath the collapsed debris. The forward extent of the mast measures 2.5 feet in diameter. A steel plate is still connected to the mast's base, measuring 2.5 feet square.

The *Milwaukee*'s stern sits on a 5-degree list to port. Two bit sets are located port and starboard, 14.0 feet forward of the stern and 1.8 feet in from the outer hull plating. These bits rise 1.8 feet above the deck and measure 1.0 feet in diameter, with a space of 0.7 feet between the bits. Each bit set sits on an steel base, measuring 3.6 feet long and 1.7 feet wide.

Along the open raildeck, the frames measure 0.4 feet wide, with a space of 2.8 feet between each frame. The frames themselves extend 4.9 feet from the raildeck to the upper rail, while the overall

height of the rail is 5.5 feet above the deck. The frames are made of metal that has a thickness of 0.1 feet.

The *Milwaukee*'s sea gate measures 5.0 feet in height, and is made of steel 0.1 feet thick at the top edge and 0.6 feet thick at the bottom edge, with a lip measuring 0.1 feet thick. The gate is bent and twisted in multiple directions and is detached on the starboard side. The gate is bowed outward 23.4 feet for a span of 26.5 feet. Here, the gate is bowed sharply inward 37.6 feet and extends another 45.5 feet outward again before hanging over the starboard edge of the deck. In the center of the sea gate, a small diamond-shaped steel piece, measuring 0.5 feet square, is attached to the inner side of the gate. It is possible that this piece was a part of the gate's locking mechanism. The sea gate was lifted using two davits located on the upper deck, measuring 5.4 feet tall and 0.85 feet square. A 10.0-foot long, 0.2-foot thick diagonal support extends from the top of the davit to the upper deck. Attached to the main upright structure is a wheel measuring 2.0 feet in diameter and 1.2 feet thick. The chain for lifting the sea gate still remains extant wrapped around this wheel. The chains are extant in both davits and extend to the raildeck. The port side chain is still attached to the sea gate while the starboard side chain remains extant lying on the raildeck, detached from the edge of the gate. Through careful examination, no evidence of impact damage from a railcar can be found on the sea gate.

The *Milwaukee*'s stern sits in 125 feet of water at the sand. Her rudder is in the position of hard over to port. It measures 9.0 feet tall, 8.0 feet wide, and 0.4 feet thick with a shaft measuring 0.85 feet in diameter. The vessel is equipped with two forged 4-bladed propellers. Each blade measures 5.2 feet long, 3.8 feet wide measured at the tip of the blade, and 0.15 feet thick. Each propeller is connected to a propeller shaft measuring 2.3 feet in diameter. The propeller nut measures 1.2 feet in diameter and the hub measures 2.0 feet in diameter, both of which are located 10.0 feet aft of the bottom of the hull. The propellers remain entirely intact, with three of its four blades rising above the sand. From the intact propellers, and lack of a gash in the sand beneath them, it is evident that the *Milwaukee*'s propellers had stopped turning long before the hull hit the bottom. Also, due to the lack of an impact crater, it is evident that the *Milwaukee* made a relatively slow descent, coming to rest straight down.

The *Milwaukee*'s disarticulated chartroom and cabin structure are located 91 feet away from the main body of the wreck on a 120-degree heading. The chartroom is a semi-circle, measuring 12.0 feet from the captain's cabin at its apex, and measures 15.0 feet wide. The roof of the chart room is 9.3 feet from the sand and is covered with fore and aft running planks still caulked. These planks measure 0.25 feet wide and 0.05 feet thick. Remnants of a burlap cloth cover used for waterproofing still cling to the roof. A small square casing lined with metal, measuring 1.3 feet square, with a round hole is extant in the roof 5.5 feet forward of the captain's cabin and 4.95 feet from the starboard edge of the chartroom.

The *Milwaukee*'s chartroom has two steel grey painted doors on either side, measuring 2.1 feet wide, and 5.8 feet tall, with a 0.9-foot water guard at their base. The port side door has a window measuring 1.8 feet square. Five sash windows are located across the front of the chartroom, each with glass no

longer extant. The windows measure 2.4 feet wide and 2.85 feet tall. Beneath these windows, radial heating tubes are extant, hugging the curved wall. A single empty light socket remains extant, hanging in the center of the room, while a small bell remains extant on the curved wall, 0.15 feet from the center window on the port side. Remnants of red paint are extant inside the chartroom, while white paint remains extant on the exterior. This provides contrast for the bright yellow wording "MILWAUKEE" painted on the side of the chartroom. The vessel's pilothouse, which would have sat on top of the chart room, is not extant.

Aft of the chartroom, the captain's cabin remains extant. The roof no longer remains, allowing a clear view of the materials inside. Though more materials are extant beneath the silt, a single bed frame remains visible above the silt, along with a round metal cylinder, measuring 2.5 feet in diameter. The cabin itself measures 16.8 feet in length, and 26.6 feet wide. The top of the cabin walls sit 6.0 feet above the sand and have a small molding 0.6 feet wide along the upper edge of the exterior walls. The aft wall of the cabin contains three doors and two windows. The doors each measure 2.0 feet wide and 5.8 feet tall, while the windows measure 1.8 feet square. From the port side, the first door is located 2.0 feet from the corner, with the second door located 4.3 feet toward starboard. The two windows are located 1.5 feet starboard and are separated by a space of 5.9 feet. The starboard door is located 2.0 feet from the starboard corner and 1.5 feet starboard of the windows. On each of the aft-most corners of the cabin, lights remain extant, 1.0 feet from the top of the walls.

The *Milwaukee*'s forward mast remains extant 20.0 feet off the port side of the stempost. The hollow steel mast measures 57.0 feet in length, and has a diameter of 1.2 feet. A lightning rod of 0.2 feet in diameter extends 5.0 feet off the top. Numerous fasteners and instruments remain extant along the length of the fallen mast. Located 2.4 feet from the bottom of the lightening rod is an iron knob. Additionally, a small iron eye measuring 0.2 feet long is located 20.0 feet from the rod, and an A-frame is located 10.0 feet further down the mast. About 35.5 feet from the end of the lightning rod, a square iron fastener, measuring 0.4 feet long, is attached to the mast, and 42.0 feet from the rod, an iron spike protrudes from the side of the mast. Due to the torqued nature of many of these implements, it is unclear what each piece was specifically. Although many vessels of this time period had communication instruments on their forward masts, the *Milwaukee* was not outfit with a radio at the time of its sinking.

The main debris field associated with the wreck site extends between the main wreckage and the disarticulated chartroom on the vessel's port side. The field is mainly comprised of sections of metal railing from the ship's bridge. While most of the sections are very small, two larger sections of railing are extant. One, located almost beneath the hull at 72.9 feet from the stempost, is a U-shaped section that would have comprised the port extent of the open bridge. This section measures 4.5 feet in width and 3.0 feet tall, consisting of three rails measuring 0.2 feet in diameter. The space between each rail measures 1.5 feet. The other section measures 4.0 feet in length and sticks upright out of the lakebed,

upside down. Circular wooden bases, measuring 0.5 feet in diameter, remain extant on the rail supports where the railing attached to the deck. Iron fasteners remain extant, protruding through the wood.

Three of the vessel's large air scoops remain extant in the associated debris field as well, two located in the main debris field, and one located on the starboard side near the section of hull that has collapsed outward. This scoop, located 263.5 feet from the stempost, lies scoop down and measures 9.1 feet in height, and is 1.4 feet in diameter at its base. The other two scoops are located off the portside in the main concentration of debris. The first scoop remains extant on its side 104.1 feet from the stempost, and measures 8.5 feet tall with a diameter of 2.2 feet. It is evident that this scoop has sustained considerable damage and has broken in various places. The second portside scoop is located 132.8 feet from the stempost and measures 9.1 feet in height and 1.4 feet in diameter at its base. Like the starboard side scoop, this air scoop lies with its ventilation shaft embedded in the lakebed.

One of the *Milwaukee*'s smokestacks also remains extant in the debris field between the main wreckage and the chartroom. Lying in the sand alongside the vessel's port side, 49.1 feet from the stempost, the smokestack measures 21.7 feet long and has an outer diameter of 10.0 feet. The *Milwaukee*'s smokestacks were jacketed, with an external casing and an interior casing measuring 0.5 feet thick. Between these two layers, water or cooled air could be pumped so as to keep the smokestack cool during use. The space between the inner and outer casings measure 1.0 feet. The smokestack has collapsed on itself nearly 1.0 feet due to its impact with the lakebed. Though the *Milwaukee* had two smokestacks, only one remains extant on the site.

Other smaller artifacts remain scattered throughout the debris field, including a toilet bowl and two sinks. Although the *Milwaukee* was carrying both of these items in railcars when it sank, the location of these indicate that they were associated with the captain's cabin. The toilet remains nearly 20.0 feet from the hull, while the two sinks rest closer to the remains of the chartroom and captain's cabin. While one of the sinks is of a regular, square design, the second sink is a corner sink that would have been fastened in the corner of the captain's cabin.

Significance

The *Milwaukee* meets the registration requirements for Criterion D at the state level as a good example of the steam screw vessel property type in the area of Transportation for its role in the distinctive Great Lakes railcar ferry system, as discussed in the Multiple Property Documentation *Great Lakes Shipwrecks of Wisconsin* (Cooper and Kriesa 1992). Railroad transportation was a critical factor in the development of extractive industries and the expansion of agricultural production in "Northern Tier" territories and states west of the Great Lakes. It also made possible the massive expansion of the region's industrial base, which later came to define the cities of the Great Lakes region during the middle decades of the twentieth century. The lakes themselves were barriers to direct rail access. Cross-lake railcar ferries, like the *Milwaukee,* allowed railroad companies to effectively "bridge" the lakes, speeding the flow of raw materials, manufactured goods, and passengers through the Great Lakes region. The cross-lake railcar ferry system that was pioneered on the Great Lakes (Lake Michigan in particular) represents a unique chapter in U.S. maritime and railroad transportation. In no other part of the country was the railcar ferry system so critical to the railroad network, and nowhere else did the cross-lake ferry fleet play such a prominent role in maritime life. The *Milwaukee* site has the potential to provide direct insight into the technical development of railcar ferry vessels, day-to-day operations, and the working lives of ferry crews.

The *Milwaukee* also meets the registration requirements for Criterion D at the state level as an example of a steam screw vessel in the area of Commerce for its role in the grain transport trade and its role in the industrial products transport trade, as described in the Multiple Property Documentation *Great Lakes Shipwrecks of Wisconsin* (Cooper and Kriesa 1992). Records of the vessel's cargoes spanning its 26 year career offer evidence of long-term trends in the agricultural economy of the Great Lakes region and its integration into national and international markets. Freight manifests reveal trends in the region's burgeoning industrial economy and the emergence, in Wisconsin, of producers of nationally-distributed consumer goods, such as the Kohler Company and the Nash Motor Company. The presence of actual shipments from these firms within the wreck of the *Milwaukee* could reveal important details about product distribution and shipment methods.

The *Milwaukee* site has already generated significant information regarding the design and operation of steam-powered, cross-lake rail car ferries, and it has the potential to produce further insights into this unique vessel type in the future.

Period of Significance
The period of significance for the *Milwaukee* site is 1903-1929. This period begins with the year of construction of the vessel and ends with the year of its loss.

Vessel History

Context: The Railroad Car Ferries of the Great Lakes

The cross-lake railcar ferry system that operated on the Great Lakes (primarily Lake Michigan) between 1892 and 1992 represents a unique chapter in the history of U.S. maritime and railroad history. The transportation of loaded railcars by boat across large bodies of open water was pioneered on Lake Michigan in the late nineteenth century, and nowhere else in the U.S. did the practice develop to the extent that it did on the Great Lakes. It was not a coincidence that this innovative transportation system emerged and evolved on the Great Lakes rather than some other part of the country. The development of the railcar ferry system was driven by inter-related factors of geography, economics, and transportation technology. The distinctive geography of the lakes themselves and the barrier they posed to railroads – then the dominant mode of long-distance overland transportation – triggered ambitious plans to connect rail lines on opposite shores of the lake. In this era of accelerating technological change and rapid expansion of industry and commerce, the goal was to create a shorter, faster connection between the growing, resource-rich settlements of the "new" Northwest Territories (Minnesota, the Dakotas, Montana, and Idaho) and the commercial and industrial centers of the Atlantic Seaboard (Boston, New York, Philadelphia, and Baltimore). For 100 years, the cross-lake railcar ferries drove economic development in many Great Lakes port towns. They also shaped both the material and the social landscapes of communities along America's "Third Coast." Although they were eventually eclipsed by further development of the U.S. transportation system in the second half of the twentieth century, they still hold a prominent place in the historical memory of life on the Great Lakes.

The National Register of Historic Places Multiple Property Documentation *Great Lakes Shipwrecks of Wisconsin* notes that "the development of railroad ferry links on Lake Michigan" constitutes an important aspect of Great Lakes maritime history (Cooper and Kriesa 1992:E-3) The formulation of a specific context for railroad ferries, however, was to "be developed as additional research is completed" (Cooper and Kriesa 1992:E-3). The following section provides an overview of the historical trajectory of the Lake Michigan railcar ferry system as it took shape in the late nineteenth century, expanded during the first half of the twentieth century, and declined into obsolescence in the latter half of the twentieth century. For additional historical background on the Great Lakes railcar ferry system see Worden's (2011) National Historic Landmark nomination form for the *S.S. Badger* (also see Worden 2009).

During the second half of the nineteenth century, Euro-American development of the Northwestern United States accelerated at a rapid rate. As settlement pushed west beyond the Great Lakes, a critical challenge arose in linking these regions to the great centers of population and industry along the

Atlantic Seaboard. Railroad lines had been flung out across the country from Boston, New York, Philadelphia, and Baltimore, but the vast unbridgeable waters of the Great Lakes stood in the way of direct rail service to the young states and territories of the "new" Northwest: Minnesota, the Dakotas, Montana, and Idaho.

As demand for freight and passenger service to the Northwest grew, the city of Chicago at the southern tip of Lake Michigan became a major hub for the northern U.S. rail system. Despite its sprawling railroad yards, the sheer volume of traffic into and out of the city caused long delays in shipping times. Prior to the development of the railroad car ferry system, railroaders had only one other option for moving freight through the Great Lakes region; unloading their railcars at a pier on one shore of Lake Michigan and transferring the cargo to a freighter, which would then carry it across the lake to the opposite shore where it would be off-loaded into waiting railcars to continue on to its destination. This transshipment, or break-bulk method, avoided the delays caused by the Chicago-area bottle-neck, but incurred delays and costs of its own through additional freight handling. The difficulties of navigating Lake Michigan during the winter months meant that lake transshipment could only be relied upon for a portion of each year. This seasonal limitation was not compatible with the rigid, year-round timetables of the railroad industry.

Specially-designed ferries had been used to carry railroad cars over river crossings since the early 1850s in England (Hilton 1962:1-2). These vessels typically had low-slung decks with one or more sets of rails embedded in their decks, allowing groups of railroad cars (called "cuts") to be rolled directly onto the ferries via a matching set of tracks that ran up to the end of piers on either end of the ferry route. Loaded railroad cars were rolled out to the end of the railroad tracks on one side of the crossing and then carefully transferred onto the ferry using a small steam engine. The cars were anchored in various ways for the short crossing, and when the ferry reached the far side, they were rolled off of the boat onto a continuation of the railroad line. For wider river crossings that were not easily bridged, a railroad car ferry was considerably more efficient than conventional transshipment methods. The ferries allowed rail freight to make the journey without the added time and expense of being unloaded from a railcar, loaded onto a bulk or package freight vessel, transported across the river, unloaded from the freight vessel, and replaced on another waiting railcar in order to continue on its way.

The first river ferry specifically built to carry rail cars on the Great Lakes system was the *International,* built for the Buffalo and Lake Huron Railroad in 1857 (Hilton 1962:2). She carried passenger railcars across the Niagara River until a trestle bridge was completed there in 1873 (Hilton 1962:2-3). The Great Western Railway commissioned an iron-hulled, side-wheel railroad car ferry from a Scottish shipbuilder in the mid-1860s (Hilton 1962:6). The vessel's hull was built in Glasgow, disassembled, and shipped in pieces to Windsor, Ontario. Once at Windsor, it was reassembled and fitted with

boilers and engines. The *Great Western*, as the boat was christened, was launched in 1866 and transported railroad cars across the Detroit River at Detroit, Michigan (Hilton 1962:6). Car ferry service at Detroit expanded steadily, and the same company established another ferry transit at Port Huron, Michigan (Hilton 1962:7). Even in the sheltered waters of the Detroit River, however, winter ice posed a challenge to year-round operation of these early ferries (Hilton 1962:7).

James M. Ashley pioneered the development of cross-lake railcar ferry service on Lake Michigan. In the 1870s and 1880s, Ashley built a sizable regional railroad running between Toledo, Ohio, Ann Arbor, Michigan, and points north. He saw even greater opportunity in linking the expanding settled regions west of the Great Lakes with the cities of the Eastern Seaboard, and identified a way to avoid the delays and damaged cargos resulting from routing his trains through the snarled, over-taxed rail yards of Chicago (Brown 2008:14-15). Ashley envisioned a rail and ferry system running directly across Lake Michigan to Minneapolis, making his modest section of track through Michigan and Ohio a critical link between the rail lines of the Northwest and the vast markets of the East (Brown 2008:14-15).

The obstacles to running a year-round, cross-lake railroad car ferry service on Lake Michigan were generally considered insurmountable, even in the face of rapidly advancing technology and the hubris of late-nineteenth-century industrial America (Brown 2008:18). The designs used for river ferries were totally unsuited to the open waters of the big lakes. The open deck, bow loading style, and low freeboard of most river ferries were inadequate to the large swells and waves that Lake Michigan was capable of generating. The restraints used to hold the railcars in place on the river ferries were also considered insufficient given the jostling that a cross-lake ferry would experience. It was speculated, and rightly so, that if railcars were to break free of their restraints on the deck of a ferry during a rough crossing, they would cause immense damage to each other and the vessel itself, perhaps even sinking the ship. And finally, there was Lake Michigan's relentless winter ice. Very few vessels in this era braved the lakes during the winter months because of the delays and flat-out risks posed by ice. To be effective, a cross-lake railroad car ferry system would not only have to survive Lake Michigan's unpredictable winter ice; it would have to be capable of maintaining a reliable, on-time schedule in all weather conditions.

Since ice posed the greatest obstacle to the cross-lake portion of Ashley's route, he turned to maritime engineer Frank E. Kirby, who had recently designed the *Saint Ignace*, an innovative icebreaking river ferry then in use on the Straits of Mackinac (Brown 2008:19). Kirby was a highly regarded engineer. A young Henry Ford worked as an apprentice machinist under Kirby at the Detroit Dry Dock Company from 1880-1882. Kirby had considerable influence on Ford during this period, and in 1918 Ford hired Kirby to work for him at Ford's Dearborn Engineering Laboratory. Ford held Kirby in such high esteem that he had the name "KIRBY" engraved above the doors to the engineering lab for

inspiration, alongside the names of great scientists such as Galileo, Copernicus, Newton and Edison (Olson 1963).

Kirby designed two cross-lake railcar ferries for Ashley, drawing on some of the technical innovations he had developed for the *Saint Ignace*. First and foremost, the hulls of these first generation cross-lake ferries, dubbed the *Ann Arbor No. 1* and *Ann Arbor No. 2*, were built to break ice. The hulls were of heavy oak with steel sheathing on the lower portions. The shape of the bow allowed the boats to actually ride up on top of an ice formation and break through it with the full weight of the vessel. Both boats were extremely powerful, again with the goal of allowing them to push through heavy ice. Each carried three 610 horsepower steam engines.

Like the early river ferries, their holds (or "car decks") had sets of railroad tracks embedded in their floors on which the railcars would travel. Unlike the river ferries, however, the new cross-lake boats were fully enclosed and were loaded from the stern. While the enclosed, stern-loaded car deck was a vast improvement over the river ferries, it still left Kirby's cross-lake boats vulnerable to taking on water in a "following sea" (waves running up on the vessel from behind and crashing over the stern). The boats' captains were directed to run into the wind during high seas in order to try to avoid such a scenario, but this was not always effective and the open stern design caused difficulties on a number of occasions (Brown 2008:21).

They were also equipped with two stern propellers for maneuverability during docking. The large boats would be required to back into their slips and precisely align their sterns, and the sets of rails on their car decks, with those of the receiving loading aprons. To make this critical task easier, they were also built with rear-facing wheel houses from which their captains could directly oversee docking maneuvers. The first two *Ann Arbor* boats also sported a novel third propeller in the bow primarily for use in breaking up ice (Brown 2008:20-21). These vessels were thus the first triple screw boats in the U.S. (Brown 2008:20).

The first two *Ann Arbor* ferries were each capable of transporting up to 24 loaded railroad cars at a time (Brown 2008:21). To address the very real danger of railcars shifting on the car deck during rough weather, an innovative system of restraints was developed based on rail clamps, screw jacks, and turnbuckles and chains (Brown 2008:21). These systems effectively anchored the cars to the car deck and prevented them from moving independently of the vessel. The loading and unloading of fully-laden railcars required the construction of specialized dock facilities that included slips and aprons with embedded sets of rails that would match those on the ferries' car decks. "Cuts" of railcars were moved onto and off of the ferries with small switching locomotives. The actual loading process required a great deal of care to avoid uneven weight distributions that caused the vessel to list. In an extreme case, a crews' failure to follow proper loading procedures led to the disastrous 1909 capsizing

of the *Ann Arbor No. 4* in its slip at Manistique, Michigan (Brown 2001:73-74).

The *Ann Arbor No. 1* was completed in Toledo in June of 1892 and steamed her way upbound to Manistique where the company's new slip and apron had been completed. When the crew tried to load her first cargo, however, it was discovered that additional clearance was needed on her car deck (Hilton 1962:71). The necessary modifications were made and she departed on her first working voyage from Frankfort, Michigan, to Kewaunee, Wisconsin, in late-November (Brown 2008:9). In her hold were four railcars of coal; the first loaded railcars ever to be ferried across Lake Michigan (Brown 2008:9). The maiden voyage was not without mishaps – she ran aground near Kewaunee and was hung up for two days – but her cargo was eventually delivered safely to the docks at Kewaunee. A return load of 22 railcars of flour was taken onboard, bound from the Pillsbury Mills in Minneapolis, Minnesota, to various ports in the United Kingdom (Hilton 19632:71; Brown 2008:24).

The *Ann Arbor No. 2* entered service later in the year, and despite extraordinary difficulties with ice during their first season – the record-setting winter of 1892-93 – Ashley's ferries provided proof of concept; a reliable, year-round, cross-lake railcar ferry service was both feasible and efficient. In March of 1893, a load of Minneapolis flour reached the Port of New York in only five days via Ashley's cross-lake route and his Toledo, Ann Arbor, and North Michigan railway (Brown 2008:29). This pioneering effort spurred the development of multiple, competing railcar ferry lines in later years, and initiated nearly a century of cross-lake railcar ferry service on Lake Michigan (Brown 2008:24-42).

The steel-hulled railcar ferry *Pere Marquette* entered service in 1897 under the flag of the Flint and Pere Marquette Railroad. The vessel was designed by maritime engineer Robert Logan of Clevelend, Ohio, and built by F.W. Wheeler and Company of West Bay City, Michigan (Worden 2011: 12). This vessel followed many of the design principles introduced by Kirby on the first *Ann Arbor* boats. It also established the basic characteristics of the generation of steel-hulled, cross-lake railcar ferries, approximately thirty boats in total, that followed (Worden 2011: 12). As with other vessel types, the railcar ferries grew progressively larger and more powerful over time, cargo capacities increased, and more accommodations for passengers were provided. Importantly, the size and weight of railcars themselves grew over time, necessitating corresponding enlargement of the ferries intended to transport them. In spite of these trends and other technological changes in the maritime and railroading industry (e.g., conversion to turbo-electric propulsion), the core engineering of later car ferries remained much the same as the early boats. The bow propeller that made the first two *Ann Arbor* boats so unusual rapidly fell out of use.

The element of Kirby's original cross-lake ferry design that saw continual evolution in later generations of vessels was the open stern of the car deck. The threat posed by the open stern,

particularly in a following sea, quickly became apparent to the Lake Michigan ferry operators; however, solutions to this weakness were slow in being formally adopted. After several vessels of the Pere Marquette line experienced close calls as a result of waves overcresting the stern and flooding the car deck, the line's Marine Superintendent, W. L. Mercereau, met with the fleet's Chief Carpenter (Herman Smith) and Chief Engineer (Finlay MacLaren) to address the problem (*Evening Wisconsin* 1906). The method they devised was referred to in the press as a "shutter back"; a removable wooden barrier supported by three slotted steel posts bolted to the floor of the car deck (*Evening Wisconsin* 1906; Chavez 2014e:pers. comm.). The posts were hinged at the base, and when raised into position they held in place a series of heavy timbers that slid into the slotted posts. The resulting breakwater was shaped like a "V" oriented toward the ship's stern. The shutter back system was installed on several of the Pere Marquette boats in 1906. They followed this initial effort with an improved wooden gate design. These "breakwater boards" were hinged to the sides of the boat and swung open horizontally to allow cars to be moved on and off the vessel. The Ann Arbor ferry line equipped some of its vessels with similar stern barriers, but it appears that none of these solutions were entirely satisfactory and many vessels continued to operate with no stern protection. For this reason, the company ordered the installation of "shutter backs" to protect the vessels' open sterns.

It was not until after the 1910 foundering of the *Pere Marquette No. 18* that the U.S. Steamboat Inspection Service recommended the installation of a heavy steel "hood" at the stern of the car deck, and water tight hatch covers on all openings on the floor of the car deck (Chavez 2014e:pers. comm.). It is unclear whether these standards were merely advisory, or if they had the force of official statutory requirements as adoption of the recommendations was rather slow and piecemeal. The *Ann Arbor No. 5*, built in 1910, was the first vessel to be constructed with a five-foot high metal, clam-shell stern door referred to as a "sea gate", and this design eventually became standard equipment on cross-lake railcar ferries (Hilton 1962:87). In the years that followed, most of the older vessels in the Lake Michigan ferry fleet were retrofitted with similar gates. The *Manistique Marquette and Northern I* (later the *Milwaukee*) was one of those vessels that continued to operate without a sea gate until one was finally installed in 1913 (Chavez and Strauss 2011:33).

With the rapid expansion of the Lake Michigan car ferry system in the early decades of the twentieth century, these boats became an integral part of Great Lakes maritime culture and economy. Because of the regularity of their railroad-like schedules, the comings and goings of the ferries established a daily rhythm that residents of the ferry port towns became attuned to. The unique whistles that each ship sounded as they arrived and departed over the course of the day marked out time in these port communities (Brown 2008:163-175). In most ferry port towns, the railroads and ferry companies also offered the best-paying and most prestigious employment opportunities that a young man of average means and educational attainment could hope to find (Brown 2008:163). In the years just prior to World War II, the Pere Marquette (PM) Railroad employed approximately 600 men through its

railroad and port operations at Ludington, Michigan, as well as another 400 sailors on the company's Ludington ferries (*Ludington Daily News* 1998:26). Railcar ferry captains and crews quickly gained a reputation within the Great Lakes maritime community as tough, skilled, and daring sailors (Hilton 1962; Brown 2008). The railroads' timetables demanded that their ferries sail in all types of weather, and the ferrymen took great professional pride in their ability to bring their cargoes across the lake in even the worst conditions. The unique demands and rigors of car ferry work contributed to what Boyer (1968:82) described as an "esprit de corps that sets the car-ferry men apart".

The Lake Michigan ferries were affected by the same order that nationalized American railroad companies following U.S. entry into World War I in 1917 (*Ludington Daily News* 1998:26). During this period, the car ferry system provided a faster route for critical military materials bound for Europe, including food, fuel, and munitions, that bypassed the Chicago rail yard bottleneck. At their peak, military shipments through Ludington alone accounted for 11,367 railcars carried via ferry in just the month of December 1918 (*Ludington Daily News* 1998:15).

The year-round, near clockwork schedules of the car ferries also meant that they logged many hours at sea and moved an enormous volume of passengers and freight during their heyday. In the 1931 season, for example, the new car ferry *City of Flint* crossed Lake Michigan 1,010 times (averaging three trips a day, every day, for an entire year) and set a world record for greatest distance sailed during a vessel's first year of service, racking up an annual total of 101,000 miles (*Ludington Daily News* 1998:5). With the expansion of personal automobile ownership and the growth of freight transport via truck following World War I, the ferries began to accommodate cars and trucks as well their traditional cargo of loaded railcars. This adaptation to changes in the American transportation system brought the ferries additional traffic. In 1937 alone, the ferries of the PM Railroad moved 110,000 railcars, 66,000 passengers, and 18,500 autos through the port at Ludington (*Ludington Daily News* 1998:24). The ferries also played an important role in the wartime transportation network during World War II, although there was no effort to nationalize ferry lines as had been done during World War I (*Ludington Daily News* 1998:26). By 1961, the PM Railroad's Ludington ferries were carrying 132,000 railcars, 54,000 autos, and 153,000 passengers (*Ludington Daily News* 1998:30). Five years later, in 1966, Ludington's PM Railroad boats transported 136,004 railcars, 60,842 autos, and 181,648 passengers (*Ludington Daily News* 1998:32).

Despite the growth of the PM Railroad's Ludington lines through the mid-1960s, railcar ferry service lake-wide peaked in the years immediately following World War II. By this time the Lake Michigan railcar ferry fleet was also aging out of service. The last new railcar ferries built for cross-lake traffic were the sister ships *Spartan* and *Badger*, which entered service in 1952 (*Ludington Daily News* 1997a*:* 5). Reflecting shifts in the cross-lake ferry business, these two massive boats (410 feet in length) were designed with extensive passenger accommodations (*Ludington Daily News* 1997a*:* 27).

In the 1960s, the railroad industry made important changes in the way trains were routed and handled at interchanges such as the Chicago gateway (Brown 2008:193). These changes reduced transit times through the Chicago rail yards, cutting over-land transit times around Lake Michigan and eroding the time savings that the cross-lake ferries could offer shippers (Brown 2008:193). As a result, railcar volumes on the cross-lake routes went into steady decline.

The Grand Trunk Railway's Lake Michigan ferry lines were terminated in 1978 (Worden 2011:14). The Chesapeake and Ohio Railroad, successor to the Pere Marquette Railroad, shuttered its ferry operations in stages between 1970 and 1983 (*Ludington Daily News* 1997a:37-38; Worden 2011:14). The Ann Arbor Railroad's ferry service shut down in 1982 after decades of financial troubles and failed efforts to reorganize and revitalize the company (Brown 2008:242). The Ann Arbor's three remaining railcar ferries were laid up, and the firm went into final bankruptcy the following year (Brown 2008:243; Zimmerman 1993:7). The Michigan-Wisconsin Transportation Company (MWTC) purchased the three former Chesapeake and Ohio Railroad boats, the *Spartan*, *Badger*, and *Midland*, in July of 1983 and resumed service (*Ludington Daily News* 1997a:38). The MWTC continued to make cross-lake runs until 1990, when the last load of railcars to be shipped across Lake Michigan by ferry left the Port of Kewaunee, Wisconsin, aboard the *Badger* bound for Ludington, Michigan (*Ludington Daily News* 1997a:40). Thus ended nearly 100 years of cross-lake railcar ferry service on the lake, although several of the ferry vessels continued to operate in other capacities.

In 1992, a wealthy resident of Ludington purchased the idle boats *Spartan*, *Badger*, and *Midland*, along with associated waterfront facilities and resumed service between Ludington and Manitowoc, Wisconsin (*Ludington Daily News* 1997a:40). As of 2013, the last of the once great fleet, the *Badger*, still ran twice daily between Manitowoc and Ludington (*Ludington Daily News 1997a)* . The *Badger* is the last coal burning, steam powered boat on the Great Lakes. She received state-level recognition by both the Michigan Historical Commission and the Wisconsin Historical Commission in 1997, and was listed in the National Register of Historic Places in 2009 (Worden 2011). The *Badger* no longer operates year-round, as the original rail car ferries did, and rail cars are no longer part of her service; she carries only passengers, automobiles and trucks. The *Badger* is currently under consideration at the National Park Service for National Historic Landmark designation.

During the heyday of the Lake Michigan railcar ferry system, ca. 1900-1960, the "Big Three" ferry operators – the Ann Arbor Railroad Company, Pere Marquette/Chesapeake and Ohio Railroad Company, and the Grand Trunk Western Railroad Company – drove economic growth in port cities on both the Wisconsin and Michigan shorelines of Lake Michigan (Brown 2008:163-175). As an interesting side-note, because of the *Milwaukee's* unusually tumultuous financial history and the bankruptcies and receiverships that plagued her early years of service, the *Milwaukee* has the dubious distinction of being the only Lake Michigan railcar ferry to have sailed under the flag of all three of the

lake's major ferry operators (Chavez 2014d:pers. comm.). The eventual decline of the "Big Three" wreaked financial havoc on coastal communities in the latter decades of the twentieth century (*Ludington Daily News* 1997a:40; Brown 2008:242-244). Because the ferries also provided regular passenger service, they drew the communities of the two shores of the lake closer together, socially and culturally (Brown 2008:163-175). For both these reasons, many port towns mounted forceful local campaigns to try to save, and later to restore, cross-lake ferry service. The majority of these efforts could not overcome the profound transformations in the U.S.'s industrial economy and transportation system that had begun in the 1970s and eventually doomed the ferries (Brown 2008:227-228). The ongoing popularity of the *Badger* as a historical excursion tour is just one indication of the powerful sense of nostalgia that the railcar ferry era continues to evoke among Great Lakes maritime enthusiasts, and it is the subject of ongoing research by professional historians of the region (e.g., Hornstein 2005; Brown 2008).

Vessel History: Building a State-of-the-Art Railcar Ferry for an Upstart Railroad

The Manistique and Northwestern (M&NW) Railroad's operations were restricted to the Upper Peninsula (U.P.) of Michigan during its formative years, ca. 1896-1901. The line primarily operated as a freight carrier (with limited passenger service) between Manistique, Michigan, and Shingleton, Michigan (Hornstein 2005:1-5). After five years of operation, it maintained approximately 45 miles of main line track, 12 miles of branch line, seven miles of sidings, 12 stations, and just over 100 employees (Hornstein 2005:6). In 1901, the company's rolling stock included several locomotives and cabooses, only a handful of passenger cars, and over 100 platform and lumber cars (Hornstein 2005:5). Lumber was the line's bread-and-butter; in 1901 the line carried 315,024 tons of freight, generating $124,941.72 in revenue, and all but 3,164 tons of this freight consisted of forest products (Hornstein 2005:7). The line was linked to more northern reaches of the U.P. via connections with the Duluth, South Shore and Atlantic Railroad, and the Lake Superior and Ishpeming Railroad (Hornstein 2005:5-6).

In 1902, the M&NW was purchased lock, stock, and barrel by interests associated with the Grand Rapids and Indiana Railroad, and its name was changed to the Manistique, Marquette, and Northern Railroad (MM&N) (Hornstein 2005:8). The new owners also controlled the Traverse City, Lelenau and Northwestern Railroad, which they proposed to link with the MM&N, creating a joint company that was referred to in the press as the Traverse City, Lelenau and Manistique (TCL&M) Railroad (*Evening Press* 1903a; Hornstein 2005:11). Together, these lines included stations on the U.P. and the Lelenau Peninsula on Lake Michigan's eastern shore. With the success of cross-lake service on Ashley's Ann Arbor Railroad already well established, the new owners of the TCL&M wished to open up a more northerly route directly linking the towns of the central U.P. to Michigan's Lower Peninsula. The ports of Manistique and Northport, Michigan (the TCL&M's ferry port on the Lower Peninsula)

were both naturally protected from the winter ice closures that plagued most Lake Michigan ports, especially those on the eastern shore. They were thus ideal entrepots for a year-round, cross-lake ferry route.

In July of 1902, the firm placed orders with the American Shipbuilding Company of Cleveland, Ohio, for two railroad car ferries. The company's first boat, with a capacity of 30 or 32 cars and a projected cost of $500,000.00, was expected to enter service by April 1903 (*Evening Press* 1902; *Kalamazoo Gazette-News* 1903; Hornstein 2005:25). The TCL&M's looming financial problems probably led to the cancellation of the contract for the second vessel which was never constructed.

The first of the two proposed vessels ordered by the TCL&M began as Hull Number 413 in the Cleveland, Ohio, shipyards of the American Shipbuilding Co. (AMSHIP). AMSHIP traces its origins back to 1869 when Henry Coffinberry, Robert Wallace and John Pankhurst purchased the Sanderson and Company foundry, itself dating back to 1853. In 1880, the three partners started a new shipyard to build steel ships, and this company was originally named the Globe Shipbuilding Company. Later, the firm was renamed the Globe Iron Works (GIW). The GIW was at the forefront of Great Lakes' marine engineering, launching its first iron-hulled bulk freighter, the *Onoko*, in 1882 (Lake Carriers' Assoc. 1911:109). Four years later, in 1886, GIW launched the first steel-hulled bulk freighter to ply the Great Lakes, the *Spokane* (Lake Carriers' Assoc. 1911:109). In 1887 GIW launched the freighter *Cambria*, the first Great Lakes vessel powered by a triple expansion steam engine. By the close of the century, GIW was recognized as one of the foremost shipyards on the Great Lakes:

> In amount of high class tonnage already turned out the Globe Iron Works of Cleveland undoubtedly leads all the lake shipyards. Among the first class steel vessels turned out by this company are the six boats of the Menominee Transit Company, the three boats of the Mutual Transportation Company [including the *Cambria*], the six boats of the Northern Steamship Company, the five new steel steamers of the Lehigh Valley Transportation Company, four large freighters for the Minnesota Steamship Company, and the $300,000 twin screw passenger steamer Virginia owned by the Goodrich Transportation Company. During 1890 the Globe Company turned out a first class steel freighter every month and their aggregate value was $2,500,000.
>
> (U.S. Congress 1892:49)

In 1899, GIW's Old River yards became part of AMSHIP. The upstart TCL&M's choice of the renowned American Shipbuilding Co. to build their ferry fleet was probably influenced by the fact that they had recently finished a boat for the successful Pere Marquette line. The TCL&M's first vessel

was to be essentially identical to the just-launched *Pere Marquette No. 18*, designed by Robert Logan (*Ludington Daily News* 1997b). Logan's work on the *Pere Marquette No. 18* defined the second generation of Great Lakes railcar ferries.

The partially completed Hull No. 413, christened the *Manistique Marquette and Northern I*, was floated in December of 1902. The vessel was ready to sail in late March of the following year. In the application filed by her builder for an official U.S. ship registry number, the formal vessel name was recorded as *Manistique Marquette and Northern I* (Bureau of Navigation 1903a).

The Manistique Years: Plagued by Bankruptcy and Receivership

The early service history of the *Manistique Marquette and Northern I* (often referred to simply as the *Manistique*) reflected the extraordinary financial volatility that characterized the early-twentieth-century railroad industry. The vessel frequently changed ownership and/or management during this period due to corporate takeovers, bankruptcies, and administrative receiverships (legal arrangements for resolving the debts of financially troubled companies). When she first steamed into the harbor at Manistique, Michigan, in April of 1903, she drew large crowds (*Evening Press* 1903a; Hornstein 2005:23). Her striking colors – green hull, white cabins, and red stacks with black tops and white bands decorated with blue stars – had their intended effect, turning heads in her home port (*Evening Press* 1903a; Hornstein 2005:23). The new boat made an exhibition trip from Manistique to Northport later in the month (*Evening Press* 1903a). The reason for the voyage was probably as much about generating publicity about the new service as it was about actually testing the vessel's performance. "Thousands" reportedly came down to the docks at Northport to inspect the new vessel when it arrived (*Evening Press* 1903a). The only passengers on this inaugural run were Daniel W. Kaufman, President of the MM&N, and his newly wedded wife (*Evening Press* 1903a). Kaufman apparently took the opportunity of this promotional voyage to offer his bride a honeymoon tour on Lake Michigan (*Evening Press* 1903a).

Even as Kaufman and his wife enjoyed their wedding tour, clouds were gathering on the company's financial horizon. The TCL&M and its backers had apparently over-extended themselves in their aggressive expansion plan. Construction on the company's line on the Lelenau Peninsula, as well as their railcar ferry slip at Northport, had also been seriously delayed (*Evening Press* 1903a; Hornstein 2005:11). Neither was ready for operation when the *Manistique Marquette and Northern I* came on-line, but in July, company officials assured the local press that the ferry would be making regular trips between Manistique and Northport by early fall (Hornstein 2005:11). Optimism for the line's future was still running high, however. A newspaper article on the growing summer resort business along Michigan's shoreline featured the "up-and-coming" destination of Northport where:

> The big new hotel, Northport Beach, is beautifully located…only a short distance from the dock at which the immense car ferry Manistique, the largest and most palatial ferry on the lakes, will land its passengers.
>
> (*Evening Press* 1903b).

Because of construction delays on the Michigan side, the *Manistique Marquette and Northern I* had been loaned out to the Ann Arbor Railroad on a short-term charter since shortly after the boat had arrived in April (*Evening Press* 1903a; Hornstein 2005:11). The vessel had been sailing under the Ann Arbor flag on the route between Manitowoc, Wisconsin, and Frankfort, Michigan (*Evening Press* 1903a; note that Hornstein 2005:11 describes the route as "Manistique to Elberta [Frankfort]"). On its first call at Menominee, Michigan, while chartered to the Ann Arbor Railroad, it was discovered that the boat was too wide to dock at the company's slip there (*Kalamazoo Gazette-News* 1903). A work crew hurriedly dug out the banks of the slip in order to allow the vessel to approach the apron and unload its cargo of 30 railcars (*Kalamazoo Gazette-News* 1903). The *Manistique Marquette and Northern I* received its first permanent enrollment during the period when it was chartered to the Ann Arbor Railroad, but the MM&N Railroad was still listed as the boat's legal owner (Bureau of Navigation 1903d). William P. Robertson remained captain, and no other changes were noted on the new enrollment (Bureau of Navigation 1903).

The struggling company experienced further setbacks as the year 1903 waned, but in mid-September the slip and apron at Northport were finally completed (*Evening Press* 1903c; Hornstein 2005:12). The TCL&M re-called the *Manistique Marquette and Northern I* from her stint with the Ann Arbor Railroad, and the vessel set off on her first working voyage under her owner's flag in late-September 1903 (Hornstein 2005:12). She was scheduled to make the 75-mile run between Manistique and Northport once weekly, with the promise of up to three weekly trips if business warranted during the summer, and irregular crossings during the off season (*Evening Press* 1903c; Hornstein 2005:24). On 30 September, she left Northport bound for Manistique on the return leg of her first trip with 30 railcars in her car deck, several loaded with coal bound for the U.P. (*Evening Press* 1903d). Also aboard were a number of the TCL&M's corporate officers and major investors (*Evening Press* 1903d). The *Manistique Marquette and Northern I* only sailed for the TCL&M for a total of two weeks, however, when the MM&N (her legal owner) defaulted on an interest payment on its substantial debt. As a result, the MM&N's rail and ferry operations were taken over by the Pere Marquette (PM) Railroad (Hornstein 2005:24). No new enrollment was filed in the wake of this bankruptcy-related takeover.

Traffic on the Manistique to Northport route had been disappointing, and the new management shifted the vessel to the Manistique to Ludington route in June of 1904 (*Advocate* 1904; Hornstein 2005:24).

She made the 276-mile round trip at least three times weekly; one of the longest ferry transits on the lakes (Hornstein 2005:24). At one point during the summer of 1904 she was making the round trip every 24 hours, clocking an average of 14 miles per hour and setting a speed record for the Lake Michigan ferry fleet (*Advocate* 1904). The route included both railcar transport and passenger service. The PM must have restored the *Manistique Marquette and Northern I* to her original route during the difficult winter of 1904-05, however, because she was reported battling the ice between Manistique and Northport in February of 1905 (Hornstein 2005:25). On 14 February she left Northport working her way "through thirty inches [of ice] near the harbor", and after three days spent steaming to within 15 miles of Manistique (normally a seven hour crossing) she encountered a heavy windrow of ice. Unable to break through the windrow, she was forced to retrace her course back to Northport with her coal stores nearly exhausted (Hornstein 2005:25). The ice was so pervasive during the month of February that the *Manistique Marquette and Northern I* was not able to attempt the run from Northport to Manistique again until March.

The PM itself encountered financial trouble in 1904-05. They returned control of the former MM&N line to Kaufman and his associates, but apparently retained ownership of the company's property (Evening Press 1904). When the PM actually fell into bankruptcy in 1905, the former MM&N line, along with the ferry boat, were included in an arrangement that established the Union Trust Company of Detroit, Michigan, as the receiving entity for the company's remaining assets. A new enrollment formally establishing the Union Trust Company as the ship's owner was not issued until March of 1907, however (Bureau of Navigation 1907). No other changes to the vessel were noted on this document. Throughout this period of management by the Union Trust Co., the *Manistique Marquette and Northern I* continued to ply the Manistique to Northport route, scheduled for three trips each week (NRPC 1907:546; Hilton 1962:167; Hornstein 2005:25). A 1907 advertisement for the company's freight and passenger service appeared under the name Manistique, Marquette and Northern Railroad, with the Union Trust Company listed as "trustees" (NRPC 1907:546). The ad also listed the company's officers as; J.A. Robinson (manager), J.B. Howard (cashier), W.C.J. Bienemann (auditor), and J.H.P. Hughart (personal representative) (546). Passenger fares were $2.50 one way or $4.50 round trip; a berth cost an additional $.75 and meals were $.50 (NRPC 1907:546; Hilton 1962:167).

In September of 1907 the *Manistique Marquette and Northern I* was involved in a minor collision with an unnamed vessel off the Port of Manistique, resulting in a three foot hole in her starboard side near the stern (*Plain Dealer* 1907). The winter of 1908 exacted a more serious toll, however. In January of that year, while working through heavy ice just outside the breakwater at the Port of Manistique, she sprung leaks around two hull plates near the boiler room. She took on water rapidly and barely made it into the harbor before going down in shallow water at the Chicago Lumber Company dock (*Advocate* 1908; Hilton 1962:167). Four days later she was successfully refloated and her hull temporarily patched. The damaged vessel was towed to South Chicago (possibly the AMSHIP yards) where she

underwent several months of repairs in drydock (Hilton 1962:167). Almost twenty-three years later, ca. 1931, after repeated reports of a submerged obstacle in the Manistique harbor finally triggered an investigation, a large propeller and broken prop shaft were raised from the bottom. Local lore held that the prop had fallen off of the *Manistique Marquette and Northern I* when she went down in 1908, but this was never independently verified.

The Union Trust Company, still operating the MM&N line as receiver, chartered the *Ann Arbor No. 1* as a temporary replacement for the out of commission *Manistique Marquette and Northern I* (Hilton 1962:167). The *Ann Arbor No. 1* restored ferry service between Manistique and Northport, and at one point was itself replaced by the *Ann Arbor No. 2*, allowing the elder vessel to go in for service at Frankfort, Michigan (Hilton 1962:167).

In 1908, the newly formed Manistique and Northern (M&N) Railroad acquired the property of the former MM&N line from the Union Trust Co., including the ferry *Manistique Marquette and Northern I* fresh out of drydock in Chicago. A new enrollment was recorded on 28 April 1908, listing Gerald J. McMechan, secretary of the M&N Railroad, as the vessel's new owner (Bureau of Navigation 1908a). No other changes to the vessel were noted in this document. During the 1908 season, Captain W.P. Robertson served as ship's Master and Joseph Taylor was the vessel's Engineer (*American Marine Engineer* 1908:23; *Marine Review* 1908:55). In October, the vessel was re-enrolled with Strathearn Hendric, president of the M&N Railroad, as her owner, and Charles A. Lyman as her new Master (Bureau of Navigation 1908b).

The M&N apparently saw no future for the Manistique to Northport line, however, and put an end to ferry service between Manistique and Northport (Hilton 1962:167; Hornstein 2005:26). The former MM&N dock and loading apron at Northport was sold to the Ann Arbor Railroad and they re-installed it at Frankfort, Michigan (Hilton 1962:167). The *Manistique Marquette and Northern I* itself was also sold to a subsidiary of the massive, Canadian-owned Grand Trunk Railroad. The vessel's new homeport was Milwaukee, Wisconsin, and she was to share her new name with that city (Bureau of Navigation 1908c). For the rest of her days she sailed under the name *Milwaukee*.

The Grand Trunk Years: Foreign Ownership and Cabotage

Cross-lake passenger and freight service between Grand Haven, Michigan, and Milwaukee, Wisconsin, was established in 1849 (Hilton 1962:169). The Detroit and Milwaukee Railroad began a transshipment or break-bulk route in 1858 (Hilton 1962:169). Coincidentally, one of the premiere break-bulk vessels making the run from Grand Haven to Milwaukee for the Detroit and Milwaukee line was the steamer *Milwaukee* (*Milwaukee Daily Sentinel* 1866). This earlier name-sake of the later railcar ferry *Milwaukee* was built for the Detroit and Milwaukee Railroad in 1859 and was wrecked in

1868 (*Milwaukee Daily Sentinel* 1859, 1868). The cross-lake line was operated by several companies over the course of the nineteenth century (Hilton 1962:169). In 1896, the Crosby Transportation Company of Milwaukee, Wisconsin, took control of the over-night passenger and break-bulk service between the two cities in connection with the railroad using two vessels; the *Naomi* (also known as the *Wisconsin*) and the *Nyack* (Hilton 1962:169). Even after railcar ferry lines began to ply the route in 1903, the Crosby Line boats continued to sail on a regular schedule.

Actual railcar ferry service between the two ports commenced in 1903 when the Grand Trunk Western (GTW) Railroad, part of the vast Canadian-owned Grand Trunk Railroad system operated out of Montreal, Quebec, completed ferry dock facilities at Grand Haven, Michigan, and Milwaukee, Wisconsin (Hilton 1962:169-170). The GTW formed the Grand Trunk Car Ferry Line and contracted with the Crosby Line, with which they already had a working relationship, to manage their car ferry operations (Hilton 1962:170). The first ship of the line was the *Grand Haven*, built at Toledo in 1903 (Hilton 1962:170).

The Crosby-managed Grand Trunk Car Ferry Line (GTF) defaulted on its bonds and went into receivership in 1905 and GTF's business relationship with the Crosby lines came to an end (Hilton 1962:170). The GTW created a new company, the Grand Trunk Milwaukee Car Ferry Company (GTMCFC), and re-acquired the *Grand Haven* through a liquidation auction (Hilton 1962:170). In order to expand their Grand Haven to Milwaukee car ferry service, the GTMCFC purchased the *Manistique Marquette and Northern I* in late-1908, renaming her the *Milwaukee* (Bureau of Navigation 1908c). When she was re-enrolled on 12 November 1908 under ownership of the Grand Trunk Milwaukee Car Ferry Company, Charles A. Lyman remained as her Captain with a crew of approximately 36 men (Bureau of Navigation 1908c).

The newly acquired vessel was well suited to the GTMCFC line because like their other ferry, the *Grand Haven*, the *Milwaukee* could accommodate a relatively large number of passengers (Hilton 1962:170). In April of 1909, the *Milwaukee* was re-enrolled with the GTMCFC's Director, Elias H. Bottum, listed as ship's owner (Bureau of Navigation 1909). Captain Charles A. Lyman continued to serve as Master, and he in fact remained Captain of the vessel (with periodic reliefs for holidays) until December of 1917 (Bureau of Navigation 1909, 1914). When relieved for the last time on 27 December 1917, he ended a nine year stint as the vessel's skipper.

The *Milwaukee* and the *Grand Haven* remained the mainstays of the GTMCFC line's Grand Haven to Milwaukee route until the mid-1920s, although other boats were occasionally chartered during particularly busy periods (Hilton 1962:170). These vessels operated year-round and often ran afoul of winter ice, but they consistently proved to be rugged and capable ice breakers. In January of 1910, both vessels were able to plough through heavy ice that immobilized another boat for more than a day

off Grand Haven (*Evening Press* 1910). Later that same year, the *Pere Marquette No. 18*, bound for Milwaukee out of Ludington, Michigan, sank in a storm and 28 of her 62 passengers and crew perished. This tragic loss brought the problem of the railcar ferries' open stern design – some considered it their Achilles heel – into sharp focus. From this point onward, all new ferries were equipped with a sea gate; a clam-shell door at the ship's stern which could be raised to allow railcars to be loaded and then lowered to partially close off the car deck, providing some protection against "following seas". During the years that followed the sinking of the *Pere Marquette No. 18*, all older railcar ferries were eventually retrofitted with sea gates.

The *Milwaukee* received her sea gate in 1913 (Chavez and Strauss 2011:33). The gate was reportedly fabricated at the Craig Shipbuilding Company of Toledo, Ohio, and then loaded aboard the *Grand Haven*, which had just been overhauled by the same company and was returning to service in Grand Haven (*Grand Haven Tribune* 1913). The *Milwaukee*'s sea gate was installed during her summer lay-up and inspection period at Grand Haven (Chavez 2014a:pers. comm.). Vessel enrollment documents from this period do not specifically mention this upgrade, but the technical specifications of the *Milwaukee*'s sea gate were discussed in U.S. Steamboat Inspection Service documents (USDC-SIS 1930a). The gate was 63 inches in height above the car deck at the stern; 5/16 inch thick steel plate reinforced and stiffened at the corners with ½ inch steel plates; additional braces bolted to the car deck one third of the distance between the "inside of the [deck] house" and the stern of the boat; the arms on either side of the gate (used to raise and lower the structure) were 1/3 inch channel steel; the arms were 3 ½ inch forged steel bearing pins mounted on the sides of the deck house (USDC-SIS 1930a).

The *Milwaukee* was re-enrolled in 1914, receiving for the first time a one year permit to operate in the coasting and foreign trade, and her crew also grew to 38 men (Bureau of Navigation 1914). Based on datable photographs of the vessel from this period, the *Milwaukee's* original "monkey island" (flying bridge) was enclosed sometime between 1909 and 1916 (Anon. n.d.b; Nelson Photo Studio 1916). The ship's pilot house was moved up into the newly enclosed cabin, and the old pilot house, immediately below, was probably converted into a chart house. Visually, this alteration raised the vessel's profile considerably. Enrollment records make no mention of this change to her upper works, however.

Between 1917 and 1922, the captain's position was held by the following men, most serving short stints of a year or less: Jens M. Vevang, J.F. Cavanaugh, F.A. Dority, Con McCauley, William H. Vaxter, and O.D. Gallagher (Bureau of Navigation 1914). Captain Cavanaugh was the only one among this list of Ship's Masters who served for any extended length of time on the *Milwaukee*. This probably reflects the vessel's entry into wartime service for the U.S. government as part of the blanket nationalization of American railroads in 1918. The GTMCFC's ferries came under the management of the United States Railroad Administration's Lake Michigan Carferry Association (LMCA), as did the boats of the Pere Marquette and Ann Arbor lines (Hilton 1962:136). All of the Indorsements [sic] of

Change of Master for this period were recorded at the ports of Milwaukee or Grand Haven, indicating that the vessel remained on its regular route throughout its wartime service (Bureau of Navigation 1914). Early in her stint with the LMCA, the *Milwaukee* spent ten days locked in ice off of Grand Haven in early February of 1918 (*Sturgeon Bay Advocate* 1918).

The first official reference to the *Milwaukee's* most famous Master, Captain Robert "Bad Weather" McKay, appeared in an Indorsement [sic] of Change of Master dated 15 June 1922 (Bureau of Navigation 1914). Captain McKay may not have acquired his ominous nickname by this point in time, but he certainly earned it over the following seven years piloting the *Milwaukee* through some of her toughest winters. Like many Great Lakes captains, McKay was a unique character. When he was ashore and off duty he was known as a companionable spinner of tales and yarns, but at his post aboard ship he was, in the words of a former ship-mate, "rough, tough, and gruff" (Boyer 1968:83).

McKay was a sailor of great experience, and he had survived many dangerous voyages on the Great Lakes. When serving as First Mate on the Crosby Line's vessel *Naomi*, operating between Milwaukee and Grand Haven, he even played a hero's role. On 14 May 1907, a fire broke out on the *Naomi* while in the middle of Lake Michigan. The fire started in the freight hold below the main deck, just forward of amidships, and spread rapidly from there. Incredibly, the fire was not discovered by anyone aboard the *Naomi*, but by a lookout on the passing steamer *Kansas* who was running the opposite route from Milwaukee to Grand Haven. The *Kansas* brought the fire to the attention of the *Naomi*'s crew, but it had grown out of control and could not be extinguished. The seventy-five people aboard the *Naomi* were aroused by Steward Phillip Rossbach and Purser William Hanrahan and ordered to the life boats (*Manitowoc Citizen* 1907; *Evening Herald* 1907). First Mate McKay's commanding presence helped maintain order among the *Naomi's* panicking passengers as they boarded the life boats (Boyer 1968:83). The captain of the *W. H. Kerr* responded to a distress call from the burning vessel, and brought his boat's bow up to the *Naomi*'s stern to allow the remaining passengers and crew to jump aboard his vessel.

The fire quickly swept the *Naomi*, but all of the passengers and all but four of the thirty-five man crew were able to escape. Four coal passers who were working below deck were trapped by the flames and unable to escape. Those who had escaped the vessel, as well as those on responding rescue vessels, watched in horror as the four crewmen made desperate, but ultimately unsuccessful, attempts to squeeze through the port holes as all other means of escape had been blocked by flames. The *Naomi's* life boats were picked up by the *Saxonia* and the *Kansas*, and were taken to Grand Haven and Saint Joseph, Michigan. The *Naomi* was allowed to drift until the fire burned itself out and was then towed into Grand Haven by the *Kansas* (Milwaukee Public Library 1959).

Captain J.F. Cavanaugh served alternately with McKay as Master of the *Milwaukee* through at least

1927 (Bureau of Navigation 1925; 1927). It is likely that one of these two men was in the pilot house on 5 Dec 1922 when the vessel was driven into the south pier at the entrance to Grand Haven harbor in a heavy sea, tearing a 28-foot long hole in her port bow (Door County Advocate 1922). This was just one of many incidents that plagued the boats of the GTMCFC line on the eastern end of their route (USDC-SIS 1923:1). Either McKay or Cavanaugh was also at the helm of the *Milwaukee* in late-December 1924 when she attempted to come to the aid of the *Pere Marquette No. 19*. The latter vessel had been locked in ice off of Grand Haven for several days, but when the *Milwaukee* tried to pull the *Pere Marquette No. 19* free of the ice, the stout tow rope broke (*Appleton Post-Crescent* 1924).

The *Milwaukee* received a new enrollment in April of 1925 renewing her coasting and foreign trade permit and noting for the first time that she was a "coal burner" (Bureau of Navigation 1925). This was also the first enrolment specifying the *Milwaukee's* service as "freight" (Bureau of Navigation 1925). The document added that the GTMCFC "is seventy-five percent American owned within the meaning of Section 38 of the Merchant Marine Act [of] 1920" (Bureau of Navigation 1925). This claim was probably added in anticipation of legal troubles that came to a head in 1926, discussed below. The vessel's crew roster expanded from 38 on her previous enrollment of 1914 to 52 sailors in 1925 (Bureau of Navigation 1925). This significant increase probably reflects the 1916 passage of the Adamson Act that established an eight hour work day for railroad employees. Railcar ferry crews, who also technically worked for the railroads, likely benefited from the Adamson Act as well. The new limits would have required an increase in total crew sizes to keep all necessary posts manned during each eight hour shift of a voyage.

The latter-1920s marked an exciting and difficult period for the GTMCFC and for the company's fleet. In 1926, the GTW moved to expand its cross-lake service, adding a second, larger slip to its Milwaukee facilities (Hilton 1962:172). The company also ordered two new ferries from the Manitowoc Shipbuilding Company of Manitowoc, Wisconsin. The first of these, the *Grand Rapids*, sailed in December of 1926, and her sister ship, the *Madison*, entered service in March of the following year (Hilton 1962:172). Both vessels became part of the GTMCFC's fleet. Despite the company's modern and seaworthy fleet, their eastern terminus at Grand Haven continued to pose challenges to regular service. Between December of 1927 and February of 1929, GTMCFC's ferries logged 801 hours of delays caused by icy conditions, and another 1,184 hours of detention due to other weather conditions at Grand Haven (Hilton 1962:173).

All four of the company's boats continued to report mishaps of varying severity while entering or leaving Grand Haven, a notoriously difficult harbor to navigate. The *Milwaukee* suffered minor damage there in 1926 when the strong current in the harbor caused another vessel to swing out of her berth, striking the *Milwaukee* while she lay in her own slip nearby (Hilton 1962:174). She also collided with the steamer *Cacique* on 30 July 1926 (USDC-SIS 1926b:1). Her prop was damaged

twice that same year; once on 6 April when she struck a sunken obstruction 15 miles west of Grand Haven, and again on 22 December while maneuvering in ice off of Grand Haven (USDC-SIS 1926a:1, 1926c:1). Due to these incidents and regular maintenance, the *Milwaukee* spent all of twenty days in drydock at Manitowoc between June of 1926 and November of 1928 (USDC-SIS 1930a:9). A total of $33,500.00 worth of repairs to her "hull, rudder, steering gear, propeller wheels, etc." were completed at Manitowoc during this period (USDC-SIS 1930a:9).

Finally, on 5 April 1928, while steaming toward Grand Haven from Milwaukee in a heavy fog, the *Milwaukee* allegedly passed dangerously close to a small fishing tug (USDC-SIS 1928a:1). The captain of the tug filed a formal complaint, and after an investigation by the United States Steamboat Inspection Service, Caption McKay and First Mate Malm both had their licenses suspended for 30 days (USDC-SIS 1928a:1, 1928b:1). In June, after the men appealed their suspension, Captain McKay's license was restored (USDC-SIS 1928c). First Mate Malm, who was actually at the helm when the near-collision took place, still had to serve his 30 day suspension, however (USDC-SIS 1928c).

The "perils of the sea" aside, the GTMCFC faced an even more serious threat to its Milwaukee to Grand Haven line in the late-1920s. In 1926, the Wisconsin and Michigan Transportation Company (WMTC, formerly the Crosby Line) brought legal action against a rival company, the Canadian-controlled Peninsula and Northern Navigation Company, that had recently opened a competing service between Milwaukee, Muskegon, and Grand Haven (Hilton 1962:175-176). Section 27 of the 1920 Merchant Marine Act prohibited vessels which were more than 25% owned by non-U.S. interests from operating between American ports; a so-called cabotage restriction (Hilton 1962:176). The WMTC filed suit challenging the right of their competitor to operate port-to-port in U.S. territory, and the Canadian company was forced to cease all service on their Milwaukee, Muskegon, and Grand Haven route (Hilton 1962:176). One of their boats was then seized by the U.S. Coast Guard as it attempted to flee to Canadian territory (Hilton 1962:176).

In the wake of the seizure of the Peninsula & Northern Navigation Company's vessel for violation of the cabotage restriction, the GTMCFC, also majority-owned by Canadian interests, ordered its freight managers at Milwaukee and Grand Haven to refuse any loads originating in either port and bound for the other; so-called port-to-port cargos (Hilton 1962:176). They also ceased offering passenger and auto service between the two ports (Hilton 1962:176). Beginning in 1927, they only transported through-freight that had originated or was bound elsewhere on the GTW line (Hilton 1962:176). Not coincidentally, the *Milwaukee* received a new enrollment in May of 1927 listing a new legal owner; Charles E. McLaren, *resident* [emphasis added] Manager of the Grand Trunk – Milwaukee Car Ferry Co. of Wisconsin (U.S. Bureau of Navigation 1927). This subtle change was probably another attempt to deflect claims that the vessel was majority foreign-owned, along with the statement that the

company was "seventy-five percent American owned" repeated from the previous enrollment (U.S. Bureau of Navigation 1927). No actual change in the ownership of either the company or the boat had occurred, however, and the GTMCFC remained a subsidiary of the Canadian GTW Railroad. It is also worth noting that the vessels' service was listed only as "ferry", and J.F. Cavanaugh continued in his post as Master of the *Milwaukee* (U.S. Bureau of Navigation 1927).

Since the cabotage restriction cut into the line's profits, the GTW sought a means to either comply with or legally circumvent the regulations. They eventually struck a tentative deal with the Pennsylvania Railroad in 1931 through which the latter company would assumed a 75% interest in the ferry operation (Hilton 1962:176). The arrangement would have allowed the company to reinstate port-to-port freight, passenger, and auto service between Milwaukee and Grand Haven, but because of the deepening economic depression following the U.S. stock market crash of 1929 the deal was never finalized.

"Seas are tremendous. Things look bad.": The Sinking of the *Milwaukee*

As 1929 dawned and the exuberance of the Roaring Twenties neared its temporal and economic limits, the GTMCFC was still prevented from offering port-to-port service due to U.S. cabotage restrictions. The company's ferries continued to ply their route between the ports of Milwaukee and Grand Haven, however, sustained solely by through-freight carried along the GTW line. The early part of the year was troublesome as usual, with delays caused by ice and winter weather at Grand Haven (Hilton 1962:173). The *Milwaukee* was locked in ice off of Grand Haven's harbor for eight days in early February, and was only freed by the joint efforts of the ferries *Grand Haven* and *Grand Rapids* (*Ludington Daily News* 1929a).

On 22 October, just two days before Black Thursday set off the U.S. stock market crash and the Great Depression, a powerful storm blew into the Great Lakes region with northeast gales that topped 35 miles per hour (Hilton 1962:177). The sustained winds whipped Lake Michigan into a fury, and U.S. Coast Guard Stations on the lake began flying storm warning flags as early at 8:30AM. The GTMCFC ferry *Grand Haven* left the Port of Milwaukee at 2:00AM that morning sailing east for Grand Haven. She was due in Grand Haven at 8:00AM, but did not arrive until 5:00PM that night. Her captain reported a very difficult passage with tremendous seas that continued to build throughout the morning as the gale winds remained steady out of the north. The *Grand Haven's* First Mate, Roland J. Martin, later recalled that several railcars broke loose during that arduous crossing, damaging the vessel (Wilson n.d.).

The *Milwaukee* departed Grand Haven early that morning as well, with Captain Robert McKay in the pilot house rather than Captain J.F. Cavanaugh (listed as Ship's Master on the *Milwaukee's* most

recent enrollment). After what was undoubtedly a rough crossing – "Bad Weather" McKay reportedly described it as "fairly good, in consideration of the weather" – she pulled into the GTMCFC slip at Milwaukee around 12:00PM (Hilton 1962:177). Her cargo was unloaded and 25 east-bound railcars were rolled onto her car deck by about 2:30PM. The cars contained over one million pounds of freight (USDC 1930a:4). With the weight of the railcars themselves included, the *Milwaukee* was laden with nearly 2.5 million pounds of cargo (USDC 1930a:4).

The cars carried a variety of goods: wood veneer, vegetables, cheese, butter, bath tubs and other bathroom fixtures, corn, feed, seed, malt, and automobiles (USDC 1930a:3-4). The tubs and bathroom fixtures were from the Kohler Company, based in Kohler, Wisconsin at the time. This internationally recognized company was founded in 1873 when German immigrant John Michael Kohler purchased the Union Iron and Steel Foundry in Sheboygan, Wisconsin. Ten years later he developed a method for enameling the metal products his company had been manufacturing. His initial commercial use of the new enamel finish was a bathtub – actually an enameled horse watering trough. The company grew rapidly and transitioned to household and bathroom fixtures, eventually relocating its primary production facilities to the Town of Kohler in 1899. The origin of the autos aboard the *Milwaukee* was not identified in available primary documents. Later inspection of the sunken vessel revealed that at least some of the vehicles are Nash automobiles (Dworschack 2014:pers. comm.). The Nash Motor Company was established when Charlie Nash, former president of General Motors, left that company and purchased the Jeffery Motor Company of Kenosha, Wisconsin (Quandt 1998:41). By 1924, the Nash Motor Co. maintained factories in both Kenosha and Milwaukee, Wisconsin, and later became the American Motors Corporation (Quandt 1998:41-49).

Three of the *Milwaukee's* crew were so convinced that the return trip to Grand Haven would be postponed until the storm abated that they hopped a streetcar into downtown Milwaukee, allegedly to attend a movie (Boyer 1968:85). Perhaps they had talked with the crews of the two PM Railroad ferries docked nearby, both of which had also fought their way into Milwaukee that morning and had since been directed by their fleet manager to "take no chances"; they planned to wait out the rest of the storm in port (USDC-SIS 1929b:4; Hilton 1962:177). Several other regular crewmen were not aboard the *Milwaukee* that afternoon for different reasons. Harry Moss, a watertender, was sent into Milwaukee to deliver a message and did not return in time (*Wisconsin News* 1929c). One of the ship's oilers did not report for duty at Grand Haven when the vessel departed that morning. The Second Mate was getting married that day in Milwaukee, and one of the assistant engineers was also in Milwaukee at Saint Mary's Hospital. Out of a crew roster of between 52 and 59, the crew that afternoon was probably composed of 46 or 47 men (sources disagree). Many sources, both primary and secondary, would later erroneously report the loss of 52 lives on the *Milwaukee*, but this number is incorrect and fails to account for the five or six members of the ship's regular crew who were not aboard when she sailed out of Milwaukee on 22 October (USDC 1930a). In any event, the

Milwaukee's east-bound cargo was secured and the stern sea gate was closed around 3:00PM (USDT-CG 1929; USDC-SIS 1929b).

All afternoon, as the *Milwaukee* lay in her slip, the gale continued to whip up the seas outside the harbor. The storm would eventually break local records for continuity and velocity of wind, and since it was generally blowing out of the north, the wind-blown waves were able to build across the entire length of Lake Michigan (USDC-SIS 1930a:4). Captain McKay's 3:00PM signal to the engine room that he was preparing to get under way probably took the ship's engineers by surprise. It was later reported that some of Captain McKay's colleagues watched the vessel departing the harbor that afternoon from windows of the Elk's Club on Milwaukee's lake shore (*Manitowoc Herald-News* 1929). They only gave their friend McKay a "fifty-fifty chance" of surviving the storm, and several placed morbid wagers on the outcome of the voyage (*Manitowoc Herald-News* 1929).

The *Milwaukee* passed by the Coast Guard tower where the U.S. Weather Bureau's storm warning flags were taut in the stiff wind (Boyer 1968:86). The captain of the *U.S. Lightship 95*, anchored three miles out in the lake off Milwaukee, recorded the vessel's passing at 3:45PM. In his log he noted that she was "rolling and pitching heavily" and was on an easterly bearing, heading directly across the lake rather than steering a more northerly course that would have kept her out of the troughs of the immense waves rolling down the lake from the north (Hilton 1962:177). This was the last reported sighting of the vessel. The intensity of the storm peaked during the night of 22 October as the *Milwaukee* struggled across the lake. Reports of damage to vessels, piers, breakwaters, and waterfront structures began to roll in to Coast Guard Stations all around the Great Lakes. Captains caught out in the lake described waves of tremendous size and reported extensive damage to their vessels from the pounding (*Ludington Daily News* 1929b; Lighthouse Service 1929). When he put in at Ludington on 23 October after a 31 hour battle, the captain of the steamer *Puritan* said that it had been the "worst storm [he'd] seen in 30 years" (*Ludington Daily News* 1929b). Superintendent C.H. Hubbard of the U.S. Lighthouse Service's Twelfth District out of Milwaukee compiled an extensive list of damages resulting from the storm (USDC-LS 1929). The list included reports from eight vessels that required substantial repair of storm-related damage (USDC-LS 1929). The Superintendent's list did not include the *Milwaukee*, however, which was still unaccounted for as he mailed off his report.

Concern over the fate of the past-due *Milwaukee* was slow to build, because it was not uncommon for the open-stern ferries to veer far from their destinations during the course of a powerful storm in order to keep their bows headed into waves. The *Milwaukee* had not been equipped with a wireless transmitter, so the fact that no distress signal had been received during the storm was irrelevant. In its 23 October edition, the *Ludington Daily News* (1929b) began its first report on the aftermath of the storm with the worried announcement that the "Carferry Milwaukee [was] Missing on Lake Michigan; More Than 12 Hours Overdue." On the afternoon of 24 October, the steamer *Steel Chemist* sent out a

wireless message announcing that they had picked up two bodies with lifejackets marked "S.S. Milwaukee" off of Kenosha, Wisconsin (*Ludington Daily News* 1929c; *Escanaba Daily Press* 1929a). One of the men had been wearing a wrist watch which had ominously stopped at 9:35 (*Escanaba Daily Press* 1929a).

Another vessel encountered a debris field about 10 miles northeast of Racine, Wisconsin, including mattresses, empty life boats, and fragments of a wooden cabin structure painted white (*Ludington Daily News* 1929c). The captain was unable to positively identify the source of the wreckage, but taken together the two discoveries pointed to a total loss (*Ludington Daily News* 1929c). Investigators presumed that the watch on one of the first two bodies marked the approximate time when the vessel went down. Later in the day on 24 October, two more bodies were recovered by a U.S. Coast Guard detachment off of Racine (*Escanaba Daily Press* 1929a; *Wisconsin News* 1929a). One of the bodies was firmly identified as that of the *Milwuakee's* purser, A.R. Sadon, while the other was mistakenly believed to be that of Captain McKay (*Escanaba Daily Press* 1929a). Yet another body was found in the same vicinity (*Wisconsin News* 1929a).

In the wake of these first grim discoveries, the search for survivors intensified (*Ludington Daily News* 1929e). The GTW's Marine Superintendent, Captain Charles McLaren, appealed to the Kohler Aviation Corporation to dispatch one of their aircraft to the reported location of the debris field to look for survivors and to determine whether or not it was in fact the wreckage of the missing vessel (USDC-SIS 1929b:2; Boyer 1968:89). The pilots were not able to find the wreckage, but they flew a wide search pattern north and east of Milwaukee in the hope that Captain McKay had turned north into the storm.

Boats also swept the lower lake for signs of the lost vessel. Coast Guard searchers spotted a drifting life boat on 25 October and discovered four bodies which were later identified by a former crewman as members of the *Milwaukee's* crew (*Ludington Daily News* 1929e). The men appeared to have died of exposure. The fact that some of the crew had been able to launch a life boat suggested that whatever disaster befell the vessel, it was not a sudden, catastrophic event. While it was clear by this time that the *Milwaukee* had in fact gone down, the precise cause and location remained a mystery. Speculation in maritime circles among those familiar with railcar ferries focused on the boats' Achilles heel; the sea gate. The suspicion was that the rough seas had tossed the boat about so badly that one or more of the railcars had been torn loose from their moorings within the *Milwaukee's* car deck and had wreaked havoc within the hold, possibly breaking through the stern sea gate. Once the gate had been compromised, the storm's huge waves would have had unfettered access to the car deck.

Another of the *Milwaukee's* life boats was found on 26 October off of Holland, Michigan (Boyer 1968:90). Its canvas tarpaulin was still secured, indicating that it had not been occupied. Some

sources report that a third life boat, also unoccupied, came ashore the next day near South Haven, Michigan, along with more wreckage (Boyer 1968:90). In later court hearings on the incident, however, only two life boats were reported recovered (*Sheboygan Press* 1930a). While picking through the debris that accompanied the life boat, which included a pike pole and several life preservers, one of the Coast Guard searchers spotted a ship's message case (USDC-USSIS 1929a; *Wisconsin News* 1929b). These watertight metal cases were carried on some Great Lakes vessels as a means of preserving messages from the boat's crew in the event of a catastrophe. Inside the case was a hand-written message on the stationary of the Grand Trunk Railway. The message read:

> S.S. Milwaukee, Oct. 22/29, 8:30 PM.
> The ship is making water fast. We have turned around and headed for Milwaukee.
> Pumps are working but sea gate is bent in and can't keep the water out.
> Flicker is flooded. Seas are tremendous. Things look bad.
> Our roll is about the same as on last pay day.
>
> (USDC-SIS 1929a)

The note, signed "AR Sadon, Purser", cast away all doubt regarding the *Milwaukee's* fate (USDC-SIS 1929a). Local inspectors from the U.S. Steamboat Inspection Service confirmed the identity of the letter's author by comparing the handwriting with that on an examination Sadon had taken in 1926 still on file in the local office (USDC-SIS 1929a). The handwriting matched. Based on the stopped wrist watch that read 9:35PM, found on one of the bodies recovered from the lake, the vessel had gone down only a short time after Purser Sadon had written the note. This would be the first and only time in Great Lakes history that a ship's message case containing an authentic message from a lost vessel would be recovered. A glass bottle containing a second note signed by Captain McKay was found several days later, but it could not be authenticated and was generally considered a hoax. In late-November, log books thought to have come from the *Milwaukee* were found on the shore near Grand Haven (*Escanaba Daily Press* 1929b). One book appeared to have contained the ship's log, but was nearly undecipherable. An "indelible pencil" had been left between its pages and remained lodged there when the book went overboard, eventually bleeding through the pages and obscuring the writing. The date on the last entry was still readable, however; 20 October, just two days before the *Milwaukee* was lost (*Escanaba Daily Press* 1929b). The other book contained the ship's beacon log that was still legible.

The dreadful roll call of victims continued over the next several weeks, as more bodies were discovered. Three corpses washed ashore on the Michigan side of the lake on 6 November (*Ludington Daily News* 1929d). Two still wore "life belts" while a third, identified as Captain McKay, had no life preserver (*Ludington Daily News* 1929d; *Milwaukee Sentinel* 1929). Adding to the tragedy, Captain

McKay had been only two months from retirement when he went down with the *Milwaukee* (*Milwaukee Journal* 1929). The next day, another victim wearing a life preserver was retrieved from the lake off of Glenn, Michigan (*Ludington Daily News* 1929f). Wreckage thought to be from the *Milwaukee* was reported washing up along a four mile stretch of shoreline near Port Sheldon, Michigan (*Ludington Daily News* 1929d). In mid-November the body of yet another *Milwaukee* crewman was found floating amid a large debris field off of Saugatuck, Michigan (*Ludington Daily News* 1929g).

Even as the collapse of the U.S. stock market that began on Black Thursday (24 October 1929) spread and deepened, residents of the port towns of Lake Michigan faced more immediate worries closer to home. The ferry company eventually provided the following roll of officers and crew based on the ship's previous payroll:

McKay, Robt.	Captain
Vaxter, Wm. M.	1st Mate
Malm, Helmer	2nd Mater (Extra man) Absent on shore leave
Pett, J.T.	3rd Mate
Moran, A.	Wheelman
Iverson, M.	Wheelman
Kiss, A.	Wheelman
Jackson, O.E.	Lookout
O'Brien, J.	Lookout
Smith, C.	Lookout
Widing, A.	Watchman
Nelson, E.	Watchman
Welter, F.	Watchman
Jarvi, S.	Deckhand
Schoblocki, J.	Deckhand
Bugalecki, E.	Deckhand
Dalke, Ray	Deckhand
Dickey, Ray	Chief Engineer
Owens, H.E.	1st Asst. Engr.
Shunteck, J.	2nd Asst. Engr. (Extra Man – Absent on shore leave.)
Martin, K.	3rd Asst. Engr.
Krouse, E.	Oiler
Johnson, C.	Oiler
McNello, T.	Oiler (Failed to report for duty – not discovered until after disaster.)
Nicklass, J.	Watertender
McCarthy, C.	Watertender

Moss, Harry	Watertender
Hunt, A.	Fireman
Tieme, J.	Fireman
Roberts, G.	Fireman
Johnson, J.	Fireman
Leahy, W.	Fireman
Pokorsky, J.	Fireman
O'Neil, F.	Fireman
Hanratty, Mike	Fireman
Manthey, John	Fireman
Lawrence, C.	Coalpasser
Roddy, J.	Coalpasser
Tyran, Z.	Coalpasser
McNello, P.	Coalpasser
Hessenger, C.	Coalpasser
Powell, W.	Coalpasser
Sadon, A.R.	Purser
Rotta, Tom	Chef
Starastu, Stanley	2nd Cook
Fox, Sam	1st Porter
Barnes, Carl	2nd Porter
Gilbert, Art	1st Waiter
Malusky, Tony	2nd Waiter
Elsaesser, Otto	Cabinwatch
O'Leary, Joe	3rd Porter
Unidentified Man	Pantryman – New man – Unable to list name as same was not shown on previous payroll

(USDC 1930a:2-3)

At least four other men, in addition to those listed by the company as absent, left the ship on the afternoon of 22 October and were not aboard when she sailed (Wisconsin News 1929c). Harry Moss and Joseph Radda (aka J. Raddy) appeared on the final crew list, but were actually ashore when the ship left Milwaukee. Two other men, Carl Sjoholm and Steve "Jappy" Wakanewski, also stayed in Milwaukee on 22 October and do not appear on the company's crew roster (Wisconsin News 1929c). Adding to the confusion, the *Grand Haven Daily Tribune* (1929) published a crew roster shortly after the ship was lost that was significantly different from that provided by the GTMCFC for the trial in 1930 (see above). As a result of these ambiguities, it is still difficult to reconstruct an accurate list of

the victims of the sinking of the *Milwaukee*. Of the 46 or 47 men who were probably aboard the *Milwaukee* when she went down, only 21 were ever found (USDT-CG 1929; USDC-SIS 1929b).

While many among the crew hailed from Milwaukee or Grand Haven, the sinking of the *Milwaukee* struck families and communities across the Great Lakes; from Washington Island, Wisconsin, to Detroit to the smaller port towns of Michigan's Lower Peninsula. The families of crewmembers who remained unaccounted-for sought out their lost loved ones among the unidentified bodies that were being brought to shore at distant ports around the lake (*Ironwood Daily Globe* 1929). Officials in Grand Haven designated 27 October 1929 as an official day of mourning for the lost crew (*Ludington Daily News* 1929e; *Manitowoc Herald-News* 1929). This port town was no stranger to such losses, but 1929 had already been unusually harsh. Two tragedies earlier that year, the drowning of ten beach swimmers by powerful undertows and the sinking of the vessel *Andaste*, had involved the deaths of local residents (*Manitowoc Herald-News* 1929; *Milwaukee Journal* 1929).

Of Sea Gates and Scuttle Hatches: The Steamboat Inspection Service Investigates

The U.S. Steamboat Inspection Service (USSIS) would have investigated the loss of a vessel like the *Milwaukee* no matter what the circumstances of the incident. With over 40 men dead at sea and an estimated financial loss of $720,000, the *Milwaukee* tragedy demanded explanation (USDC-SIS 1930a:2). But 1929 was no ordinary year on the Great Lakes, and the *Milwaukee* was subject to more than the usual degree of scrutiny. The year 1929 had reaped a grim toll on the lakes. Over 100 people on four vessels – the *Andaste*, *Milwaukee*, *Senator*, and *Wisconsin* – lost their lives to the lake in that year (*Benton Harbor News-Palladium* 1929). The *Senator* and *Wisconsin* sank within a week of the loss of the *Milwaukee*, and all three sank in the vicinity of the City of Milwaukee. The impact of these three disasters on Milwaukee's maritime community and economy was significant.

With each loss, the stakes for the USSIS's reputation grew higher. As a result, the USSIS offices in Milwaukee were swamped (Boyer 1968:80-81). Captains William A. Collins and T.W. Van Patten, local inspectors for the USSIS's Milwaukee office, were assigned to the *Milwaukee* case (*Manitowoc Herald-News* 1929; USDC-SIS 1930a). Captain Fred Meno of the USSIS's Washington D.C. office was also dispatched to take charge of the investigations into the mounting casualties (*Manitowoc Herald-News* 1929; *Times Herald* 1929).

The *Milwaukee* had last been inspected on 14 August 1929, and with the exception of one broken deadlight glass on the starboard side of the flicker (crew quarters below the car deck and just aft of the engine room) she was deemed seaworthy (Boyle 1968). Captain McKay later reported to the inspectors that the broken deadlight glass had been repaired as per their orders (Boyle 1968). The inspectors also believed that:

> At the time of leaving the dock on the afternoon of October 22nd, the [*Milwaukee's* rail] cars had all been made properly fast with rail clamps, jacks, and chains, as is customary on car ferries before leaving port, and the sea gate, to protect to stern from the sea, had been lowered.
>
> (USDC-SIS 1929b:1)

Given that the vessel itself was lost to further examination, the inspectors of the USSIS had to look elsewhere to explain the tragic sinking.

One of the inspectors' primary avenues of inquiry involved Captain "Bad Weather" McKay's decision to sail on the afternoon of 22 October in spite of the storm warnings and his own first-hand experience of crossing the lake earlier that day (USDC-SIS 1929b). They had observed that only the boats of the GTMCFC had gone out that afternoon, while the ferries of the Pere Marquette line had stayed in the harbor. There was a suspicion that the GTMCFC's management pressured the line's captains to sail in dangerous weather in order to keep to their rigorous schedule (USDC-SIS 1929b:4). Interviews with the other Grant Trunk – Milwaukee captains revealed an "indirect desire on the part of their Manager to have them go out in all kinds of weather" (USDC-SIS 1929b:4). Captain McLaren, the GTMCFC's Marine Superintendent, denied that he over-ruled individual captains on this matter, and asserted that all of the line's pilots retained "their own judgment and power whether to go out or not." (USDC-SIS 1929b:4). The inspectors remained dubious, but in the end found no direct evidence that the company's manager coerced the captains (USDC-SIS 1930a). They opined, however, that if the GTMCFC's superintendent had wired his captains to "take no chances", as the chief of one of the other ferry lines had done, Captain McKay may not have sailed into the storm (USDC-SIS 1929b:4). In the final analysis, they found that Captain McKay exercised poor judgment in ordering the *Milwaukee* out of port on 22 October (USDC-SIS 1929b:4). There were also rumors that Captain McKay was overly fond of alcohol, but the USSIS's investigation disproved allegations that McKay was a "drinking man" (USDC-SIS 1930a).

Purser A.R. Sadon's chilling note from the night of the sinking, and his statement that the "sea gate is bent in and can't keep the water out", drew inspectors' attention to the weakest part of the car ferries' otherwise solidly-built hulls (USDC-SIS 1929a). From the first moment when the ferry was thought lost, suspicions focused on the sea gate as a likely culprit. Most of the theorizing, however, involved the gate being damaged from within by a railcar that had been torn loose from its restraints by the constant pitching and rolling of the sea. Sadon's description of the sea gate being "bent in" pointed to a simpler and more worrisome proposition for the inspectors; perhaps the raging sea itself had battered in the stern gate. If so, this had implications for the safety of the entire Great Lakes railcar ferry fleet.

When the inspectors interviewed Captain Owen Gallagher of the car ferry *Grand Haven*, also of the GTMCFC line, he offered the following scenario that was all too plausible to the USSIS inspectors:

> Well, of course, my opinion is that, heading into that awful sea, she was filling herself over the stern. Captain McKay, probably knowing that he had to do something to avoid this, ventured to turn around. The stern swinging around against a heavy sea probably carried the sea gate away.
>
> (quoted in Boyer 1968:94)

It had not gone unnoticed in maritime circles that the *Milwaukee* was built on virtually the same plan as the *Pere Marquette No. 18*, which had gone down with considerable loss of life in 1910 as a result of flooding from the stern in rough seas (USDC-SIS 1929b:6; Boyer 1968:96). The *Pere Marquette No. 18* lacked a sea gate altogether, but if the *Milwaukee's* retrofitted sea gate had been damaged, it may have been vulnerable to the same forces that took her sister ship down 19 years earlier. Unfortunately, neither survivors of nor witnesses to the sinking of the *Pere Marquette No. 18* were ever able to explain why the vessel began taking on water aft (Boyer 1968:96). In the case of the *Milwaukee*, inspectors hypothesized that her stern might have suffered further damage when the gate was compromised, opening up a gap in the hull that allowed water to rush into the lower decks (USDC-SIS 1929b:3). Alternatively, the powerful waves crashing onto the car deck may have loosened the aft scuttle hatches in the floor of the car deck, leaving the flicker vulnerable to flooding (USDC-SIS 1929b:3).

Several USSIS inspectors had harbored concerns about the car ferries' open stern design for some time before the loss of the *Milwaukee*, although the criticisms were not universal within the agency (USDC-SIS 1929b:5, 1929c). In the process of conducting their investigation, they collected a number of accounts of ferries taking on water from the stern. Captain Kasperson of the *Pere Marquette No. 15* reported that the boat's after peak (compartment at the extreme stern of the boat) filled with water that leaked in around the rudder post during the 22 October storm (USDC-SIS n.d.b [1929]:3). Captain Martin of the *Madison* testified that he had water coming over the sea gate and running "clear to the engine hatch" (amid-ship) on the same night (USDC-SIS n.d.b [1929]:4). Captain Cavanaugh of the *Grand Rapids* stated that "we all take water over the stern in a head sea; it runs clear up to the engine room (USDC-SIS n.d.b [1929]:4). Two former crewmen on the *Milwaukee* had seen water coming over the sea gate on previous voyages (USDC-SIS n.d.a[1929]:1). One of these men, who was serving on the car ferry *Madison* at the time of the interview, claimed that the *Milwaukee's* sea gate was a full four feet lower than that of the *Madison* (USDC-SIS n.d.a[1929]:2; Hilton 1962:179). He estimated that the top edge of the *Madison's* sea gate was 10 feet above the water when the boat was fully loaded (USDC-SIS n.d.a[1929]:2). By his calculations, the top of the *Milwaukee's* gate would have been

only six feet above the water line on the loaded vessel.

The inspectors were unable to determine how water might have entered the lower decks once the *Milwaukee's* sea gate was damaged, but they collected some intriguing testimony that pointed to a possible explanation. Thomas McNello, one of the *Milwaukee's* oilers who was not aboard on 22 October, stated that he never saw the hatch between the car deck and the flicker closed during his time on the boat (USDC-SIS n.d.b [1929]:3). An earlier inspection report also noted that certain of the vessel's hatches lacked fasteners to close them securely (USDC-SIS n.d.b [1929]:4). Interestingly, these details regarding the ship's hatches were not specifically mentioned as possible causes of the sinking in the USSIS's final report (USDC-SIS 1930a). They must have caught the inspectors' attention, however, because re-inspection of exiting car ferry hatches figured prominently in the final report's recommendations (USDC-SIS 1930a). These troublesome details became more compelling in light of claims made by victims' families in court filings that followed.

In his final report on the incident, Dickerson N. Hoover, Supervising Inspector General for the USSIS, stood by the agency's claim that their inspections had been thorough and the *Milwaukee* had in fact been seaworthy when she set out on the afternoon of 22 October (USDC-SIS 1930a). The exact cause of the vessel's foundering remained a mystery, according to the report (USDC-SIS 1930a). Hoover offered a series of recommendations in light of the gleanings of the *Milwaukee* investigations, however (USDC-SIS 1930a). While the final report makes no specific reference to evidence that hatches in the floor of the *Milwaukee's* car deck were not properly secured, the report's first directive was for local inspectors at Milwaukee and Grand Haven to re-inspect all railcar ferries in their jurisdictions (USDC-SIS 1930a:11). The local inspectors were advised to pay particular attention "to the openings in the car deck and means for closing and securely fastening the covers of such openings" (USDC-SIS 1930a:11). He also reiterated a recommendation made earlier in relation to the sinking of the *Andaste*; that all lake vessels over 100 gross tons carry a life raft that would automatically deploy and float clear if a vessel went down (USDC-SIS 1930a:11-12). The USSIS also identified the *Milwaukee's* lack of a wireless radio as a contributing factor to the heavy loss of life, as well as the agency's inability to determine the causes of the sinking. Hoover recommended that "consideration be given…to the requirement of the Wireless Ship Act of 1910 as amended in 1912 (USDC-SIS 1930a:12-13).

The final report also indicated that there was not a strong consensus among USSIS inspectors regarding the safety of the railcar ferries' stern sea gate. Early in the document, it was observed that:

> we do not believe that…there should be any criticism of this type of steamer…with the open stern…for in 40 years of service…there have been only two of this type of steamer lost, inclusive of the *Milwaukee*.

(USDC-SIS 1930a:8)

In opposition to this view, Hoover focused on the apparent failure of the *Milwaukee's* sea gate in the closing section of the report entitled "Lessons To Be Learned" (USDC-SIS 1930a:12-13). While he offered no specific recommendation on this issue, he argued at length that "the design of the car ferry stern and the present arrangement of [sic] sea gate may be effective in keeping out water but there is some question about it" (USDC-SIS 1930a:12-13). His belief was that the sea gates on the current fleet of ferries were too low and insubstantial, and located too far aft to effectively protect the car deck (USDC-SIS 1930a:12-13). Hoover asserted that "safer results could be obtained" with a "full gate of strength equal to the ship's superstructure" located "farther inboard" of the stern with "no openings in the car deck aft of this enclosure" (USDC-SIS 1930a:12-13). In support of his position, he pointed out that at the time of the sinking of the *Milwaukee*, car ferries were "probably being loaded more deeply than years ago when they first came out due to the fact that railroad cars are heavier than they were years ago" (USDC-SIS 1930a:12-13). As a result, they maintained less "freeboard" (distance from the water line to open deck) than originally intended. He notes, however, that the agency had no authority to regulate the minimum freeboard on Great Lakes vessels.

It is unclear whether or not Hoover's report resulted in any regulatory changes in the height or structure of railcar ferry sea gates. The annual report of the Steamboat Inspection Service for that year, also written by Hoover, stated that:

> The supervising inspectors of the eighth and ninth districts are conducting a special investigation to assist in determining to what extent there should be a change in the construction of car ferries on the Great Lakes.
>
> (Hoover 1930:3)

Hoover's annual report for the following year noted that:

> In the case of disasters to the car ferries on the Great Lakes, it was found desirable to raise the height of the sea gates, and this has been and is being done. Weekly examinations of these car ferries have indicated that there has been a material improvement in the conditions.
>
> (Hoover 1931:3)

The language of Hoover's report remained ambiguous regarding his agency's official stance on the issue. An article announcing the completion of the *City of Milwaukee*, which replaced the *Milwaukee* in GTMCFC's fleet, asserted that:

> One of the new features of the *City of Milwaukee* will be her high sea gate to keep out the seas. The government regulations, presumably made as a result of the loss of the ferry *Milwaukee* in 1929, call for a sea gate eight feet and a half high now instead of the former five foot sea gate. The other ferries of the Grand Trunk fleet are to be fitted with the sea gates in the near future.
>
> (*Muskegon Chronicle* 1931b)

While the above quoted newspaper report suggests that the USSIS did in fact act decisively with statutory changes to the height of sea gates, some evidence has also been found suggesting that the three major Lake Michigan car ferry companies – the GTMCFC, the Pere Marquette line and the Ann Arbor line – met in Milwaukee following the sinking of the *Milwaukee* to discuss the sea gate issue (Chavez 2014b:pers. comm.). The companies apparently voluntarily agreed to increase the height of sea gates on their vessels, but documentation of the precise stipulations of the companies' agreement has proved elusive (Chavez 2014b:pers. comm.).

"Unseaworthy for the venture": Families of Victims Sue for Compensation

Suits were filed on 4 March 1930 on behalf of the families of 18 sailors who perished on the *Milwaukee* (sources disagree on the precise number, see *Ludington Daily News* 1930; USSIS 1930b; USDC 1929:1-2). The legal claim, brought forward in Milwaukee before the U.S. District Court for the Eastern District of Wisconsin, was that the boat was "unseaworthy for the venture" and the GTMCFC's operating officers knew as much when they permitted the vessel to sail into the storm of 22 October 1929 (USDC 1930b:4). The combined claims of the 18 families added up to $390,149.50 (newspapers of the time reported lower numbers but see USDC 1929:2-3). Their case revolved around the following assertions:

> In that the seagate of said car ferry was weak and insufficient.
>
> In that the cover to the companionway to the after flicker was not tight and sufficient.
>
> In that no radio sending apparatus was installed on a voyage where seaworthiness required the presence of a working radio sending set.
>
> In that there was no life raft aboard at a season when seaworthiness required the presence of a life raft.

> In that the ventilator from the after firehold contained an opening permitting water from the car deck to enter the firehold.
>
> In that the covers to the coal bunker hatches were without means of fastening securely.
> (USDC 1930b:2-3)

Many of the points brought forward by the families' lawyers contradicted the USSIS's finding that the vessel had been properly inspected and had in fact been seaworthy (USDC-SIS 1930a). The most damning of these were the claims regarding the sea gate and the absence of fasteners for, or the failure to make fast, various hatches between the car deck and the lower decks.

As the case progressed, the GTMCFC sought to limit its liability for loss of life by invoking an old statute of maritime law (*Sheboygan Press* 1930a). Their attorneys argued that all claims for injury or death could only be made against the total value of the vessel at the end of its voyage (*Sheboygan Press* 1930a). Since the *Milwaukee* was on the bottom of Lake Michigan it was essentially worthless except for the few fragments of the ship that had been found by searchers (*Sheboygan Press* 1930a). The value of the recovered life boats (only two mentioned in court) was set at $200, and to this was added another $296.55 in freight charges owed to the company for the boat's last voyage (*Sheboygan Press* 1930a). Thus, the total amount that the families could receive as compensation could not exceed $496.55, according to the GTMCFC's lawyers. It is unclear how Federal Judge F.A. Geiger ruled on this point, but there is some evidence that he concurred (*Milwaukee Sentinel* 1931).

The ruling limiting the company's liability was rendered moot, however, when on 18 December 1930 Judge Geiger declared that the ferry company was not at fault because the sinking of the vessel "was due neither to unseaworthiness of the craft nor to any negligence on the part of the company" (*Ironwood Daily Globe* 1930). Lawyers for the victims' families countered that the GTMCFC was owned by the Grand Trunk Western Railroad of Canada, and the latter company was the legal owner of the *Milwaukee* at the time of her sinking, and was thus the liable party in the case (*Ironwood Daily Globe* 1930). It appears that the legal case was eventually dropped when, in late-March of 1931, the Grand Trunk Western (GTW) Railroad "voluntarily" offered a settlement to the heirs of those lost on the boat (*Milwaukee Sentinel* 1931; *Muskegon Chronicle* 1931a). The offer consisted of $75,000.00 to be divided among the families of the lost sailors (*Milwaukee Sentinel* 1931). By the time the agreement was finalized, the value of individual payments varied considerably, ranging from $2,000.00 to as much as $9,500.00 (*Muskegon Chronicle* 1931a). Eight families residing in Grand Haven received a total of $30,000.00, while the estates of seven crewmen from Manistee, Michigan, received $18,312.00 (*Muskegon Chronicle* 1931a). Nine families in Milwaukee also received an undisclosed amount of money as a result of the settlement (*Milwaukee Sentinel* 1931).

In a bizarre twist, the GTW Railroad later filed suit against one of the families who received a payment as part of the settlement (*Sheboygan Press* 1931; *Ironwood Daily Globe* 1935). Seven months after disbursing the funds, the GTW received a claim from a woman in Ireland claiming to be the wife of William Leahy, one of the *Milwaukee's* firemen (*Ironwood Daily Globe* 1935). The company had already paid $4,000.00 to Selma Lahiff of Sturgeon Bay, Wisconsin, who had previously identified herself as the widow of William Leahy. In her original claim she stated that her husband, whose legal surname was Lahiff but sometimes worked under the name Leahy, had left home 12 years prior and she had not heard from him since. These competing claims from the "two wives of William Leahy" set off wild speculations in the press. The case resolved itself into a question of mistaken identity, however, when reliable witnesses testified that they had seen Mr. Lahiff alive and well after the sinking of the *Milwaukee*, and a surviving crewman from the *Milwaukee* identified a photo of the real William Leahy provided by his wife in Ireland. After four years and two lower court trials, the case was finally decided by the Supreme Court of the State of Wisconsin in favor of Mrs. Nellie Leahy of Cork, Ireland (*Sheboygan Press* 1935). The court also noted that there was no evidence that Mrs. Lahiff of Sturgeon Bay had acted in bad faith by claiming the original settlement (*Sheboygan Press* 1935).

New Evidence: The Wreck of the *Milwaukee* Discovered

The foundering of the *Milwaukee* remains the worst car ferry disaster in Great Lakes history. For this reason, along with her colorful captain, association with the legendary storm of 22 October 1929, and the unresolved mystery of how and where she had gone down, the *Milwaukee* remained a popular subject of conjecture and research within Great Lakes maritime history circles. Some of that mystery was swept away in 1972 when the location of the wreck was accidentally discovered. Earlier that year, local fishermen reported snagging their nets on an obstruction on the bottom of Lake Michigan approximately 7 miles northeast of Milwaukee (*Door County Advocate* 1988; Richter 2013). Following this lead, divers Kent Bellrichard and John Steele investigated and discovered the vessel lying in 122 feet of water (*Milwaukee Journal* 1972; *Door County Advocate* 1988; Richter 2013). With the wreck site found, it became tragically evident that when Captain McKay had turned back toward Milwaukee on the night of the storm, he made it to within three miles of the lake's west shore before the *Milwaukee* succumbed to the storm (Richter 2013).

The site's unique combination of maritime and railroad history, as well as the mystery and tragedy surrounding its loss, has drawn a steady stream of recreational divers. The wreck was been subjected to ongoing collection by sport divers and at least one larger salvage effort. The whereabouts of some of these items are known, while others remain uncatalogued in private collections. There are also a number of *Milwaukee*-related artifacts that were recovered during the initial search for the missing vessel and crew in 1929, and have been curated (privately or publicly) down to the present day.

Bellrichard and Steele, who first found the site in 1972, collected a number of objects from the wreck. There is limited documentation of this collection, that included the ship's bell, ship's wheel, and part of the engine order telegraph (Anon. n.d.a). The ship's bell which bears the vessel's original name, *Manistique, Marquette, and Northern No. 1*, is on loan to North Point Lighthouse Museum (NPLM) in Milwaukee. The engine order telegraph is also in the NPLM collection, and it is possible that more material from Bellrichard and Steele's dives on the *Milwaukee* are also held there. A nearly complete cast metal toy train set and a cabin key, both brought up from the site by staff from the Wisconsin Historical Society, are on loan to the NPLM.

Other pieces of Bellrichard and Steele's collection are thought to be privately owned by the South Shore Yacht Club in Milwaukee, and it is likely that more material remains in unknown private collections. The Milwaukee Public Library's Great Lakes Marine Collection includes several fragments of the vessel thought to have been raised from the site since its discovery.

One of the *Milwaukee's* large anchors was salvaged by Roger Chapman in 1973 (Richter 2013). Chapman donated it to the City of Milwaukee and it is on public display at the Henry J. Meyer Festival Grounds along the city's lakefront. The anchor is accompanied by a Wisconsin Maritime Trails marker and a small information plaque.

A life boat from the *Milwaukee*, allegedly the boat that was discovered in 1929 with the bodies of four crewmen, is on display at the 1860 Light Station and Museum in Port Washington, Wisconsin. It was reportedly donated to the museum by Robert Manglitz, Chief Executive Officer of the Lake Michigan Carferry Company, that presently operates the car ferry *S.S. Badger* (Richter 2013). Avocational maritime historian and railcar ferry expert Arthur Chavez examined the life boat in the company of former car ferry crewmen, and he is not convinced that this boat could have come from the *Milwaukee* (Chavez 2014c:pers. comm.). Two life preservers marked S.S. Milwaukee, probably those found on the bodies of Purser A.R. Sadon and another unidentified crewman on 24 October 1929, are held by the Wisconsin Maritime Museum in Manitowoc, Wisconsin. The original note penned by Sadon just before the boat sank on the night of 22 October 1929 has also been preserved at the National Archives and Records Administration's regional facility in Chicago, Illinois. It was rediscovered by maritime historian Art Chavez in ca. 2006.

Several surviving fragments of the ship have less clear proveniences. They may be objects picked up by searches in 1929 and preserved through various means, or they may have been removed from the wreck site more recently. These include a complete set of brass letters that appear to be from the ship's name board (*Milwaukee* era) were sold via an internet auction on Ebay in 2004 (Richter 2013). If they are authentic, it is likely that they were the letters that spelled out the ship's name on the front

of the chart house just below the band of windows. They were offered as part of an estate sale of a private (and anonymous) collection in McKinney, Texas, and were purchased by another private party. Their present whereabouts are unknown.

The mystery of the *Milwaukee* came to the attention of the producers of the television series "Deep Sea Detectives" ca. 2005 (*Ludington Daily News* 2005). In March and April of that year, the production crew filmed footage on location in Milwaukee, Manitowoc, Grand Haven, and Ludington (*Ludington Daily News* 2005). They also filmed several investigative dives on the wreck of the *Milwaukee* with local divers as guides (*Ludington Daily News* 2005). The resulting episode, entitled "Train Wreck in Lake Michigan", aired on the History Channel in March of 2006 (Deep Sea Detectives 2006). Their investigation focused on the damaged sea gate and the absence of hatch covers on several openings in the floor of the car deck used to dump coal into the coal bunker (Deep Sea Detectives 2006). Most significant to the "Deep Sea Detectives" was the fact that not only did these hatch covers appear to be missing, but there was also no evidence of the "dogs" or coamings that would have secured the hatch covers to the car deck floor (History Channel 2006). This evidence seemed to support the claims of former *Milwaukee* crew members, and those made in the lawsuit filed by victims' families. It also contradicted USSIS inspection reports on the seaworthiness of the vessel.

Integrity and Archaeological Significance (Site # 47-MI-443)

All of the *Milwaukee's* hull components are represented within the wreck site, the site retains excellent archaeological integrity, and sites such as the *Milwaukee* present a rare opportunity to study and learn about historic steel-hull ship construction and how these vessels were used in the railcar service. Although discovered and explored by sport divers as early as the 1970s, the structural integrity of the vessel discourages many recreational divers from penetrating deep into the interior of the vessel and these areas remain lightly visited by divers.

The *Milwaukee* meets the registration requirements for Criterion D at the state level as a good example of the steam screw vessel property in the area of Transportation for its role in the distinctive Great Lakes railcar ferry system as mentioned in the Multiple Property Documentation *Great Lakes Shipwrecks of Wisconsin* (Cooper and Kriesa 1992). The *Milwaukee* also meets the registration requirements for Criterion D at the state level as an example of a steam screw vessel in the area of Commerce for its role in the grain transport trade and its role in the industrial products transport trade as described in the Multiple Property Documentation (Cooper and Kriesa 1992).

Many opportunities remain for future archaeological research at the *Milwaukee* site as diving and archaeological recording methods advance. Additional information from the site may significantly add to our understanding of Great Lakes steam-screw technology. The *Milwaukee* is the only

archaeologically investigated steel-hulled, railcar ferry in the Wisconsin waters of Lake Michigan and one of only three steel-hulled vessels investigated on all of Wisconsin's bottomlands. Data gathered about the *Milwaukee* from the site has significantly increased our understanding of rail ferry construction and early steam screw technology and, through additional archaeological investigation, holds the potential to yield additional information essential to understanding of late nineteenth, and early twentieth century maritime commerce.

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2014c Personal communication regarding his examination of the life boat on display at the 1860 Light Station and Museum in Port Washington, Wisconsin, accompanied by former car ferry crewmen, and his questions about whether or not this boat could have come from the *Milwaukee*.
2014d Personal communication pointing out that the *Milwaukee* was the only Lake Michigan railcar ferry that had sailed under the flags of all three major Lake Michigan car ferry companies.
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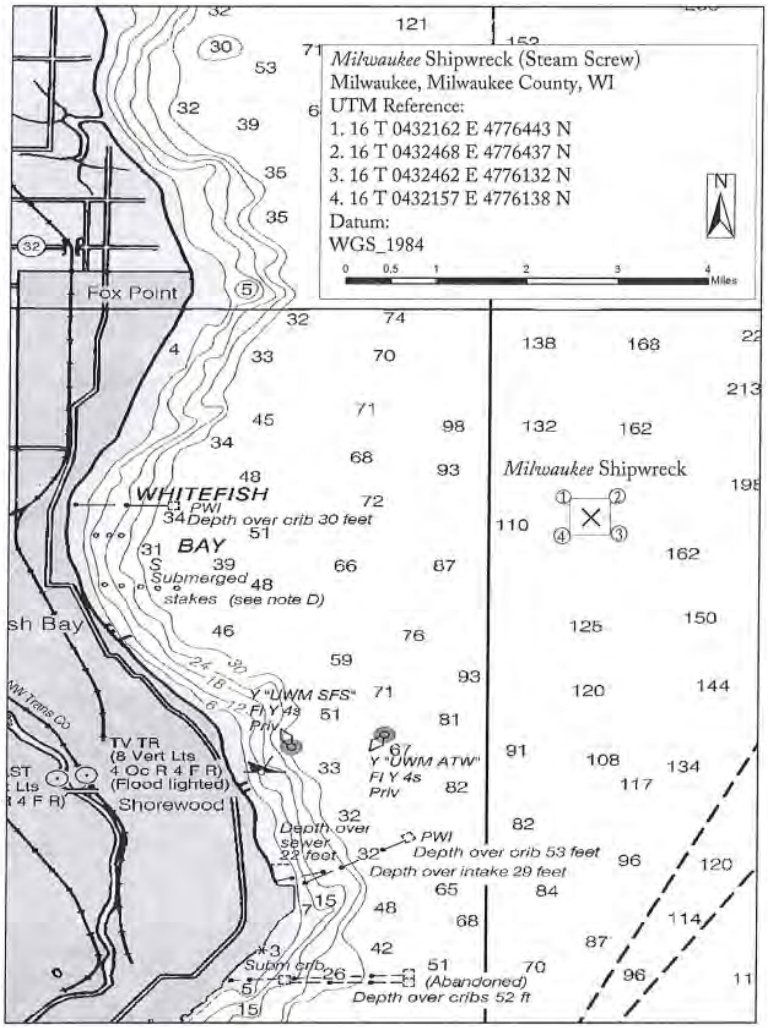
United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Verbal Boundary Description:
The boundary for the *Milwaukee* site is marked by a square with sides measuring 1,000 feet, with its corners located at UTM coordinates:

1. 16 432,162E 4,776,443N
2. 16 432,468E 4,776,437N
3. 16 432,462E 4,776,132N
4. 16 432,157E 4,776,138N

Boundary Justification:
This site boundary was chosen to encompass the wreck site and its associated debris field.



United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Location of original photographs:
Wisconsin Historical Society, Historic Preservation Division
816 State Street, Madison, WI 53706

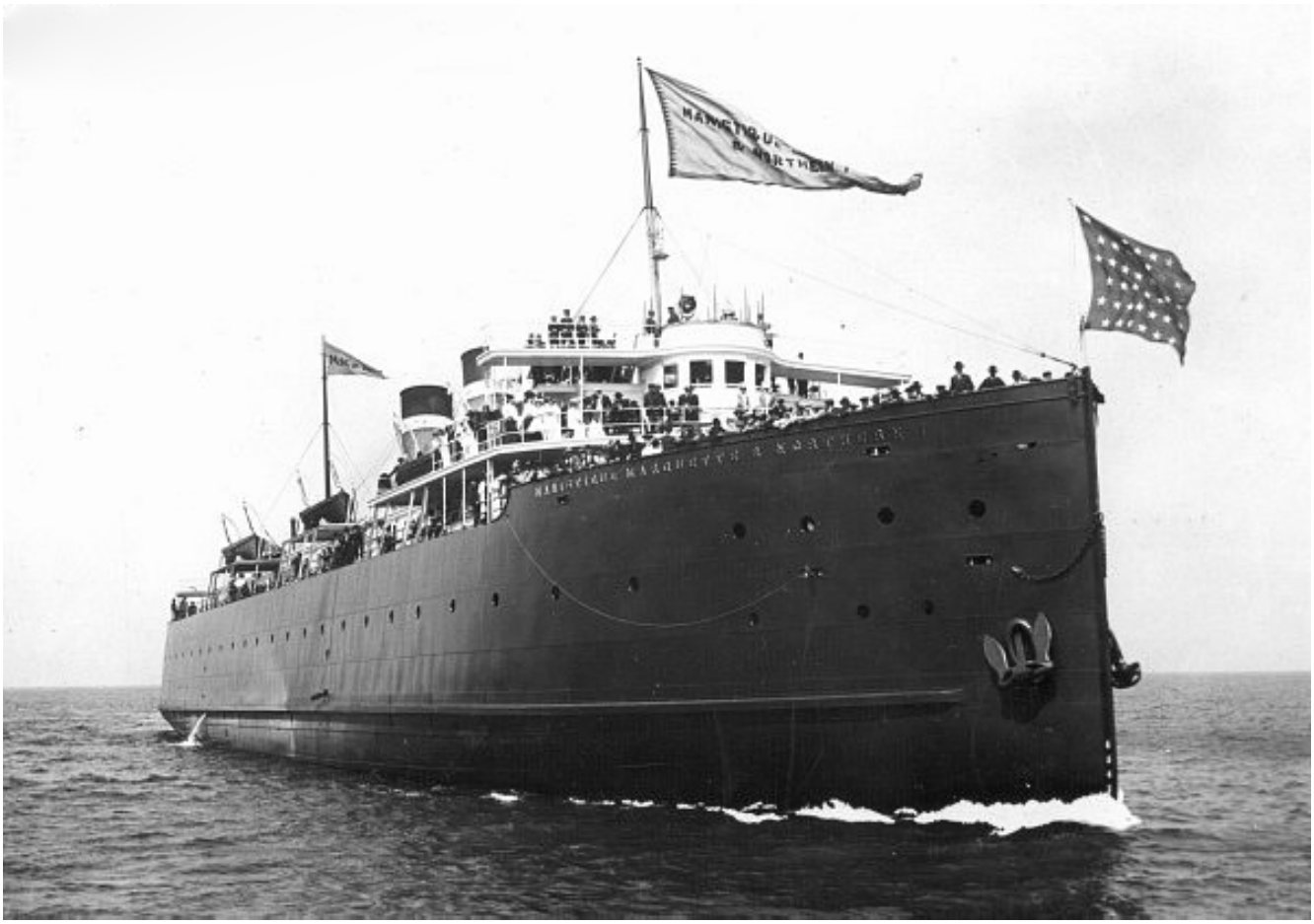
Photo #1 of 2
Milwaukee Shipwreck (Steam screw)
Lake Michigan, approximately 3 miles east of Fox Point, Wisconsin
Photographer Tamara Thomsen
August 2006
Pilothouse of the *Milwaukee* resting on the port side of the main wreckage in the sand

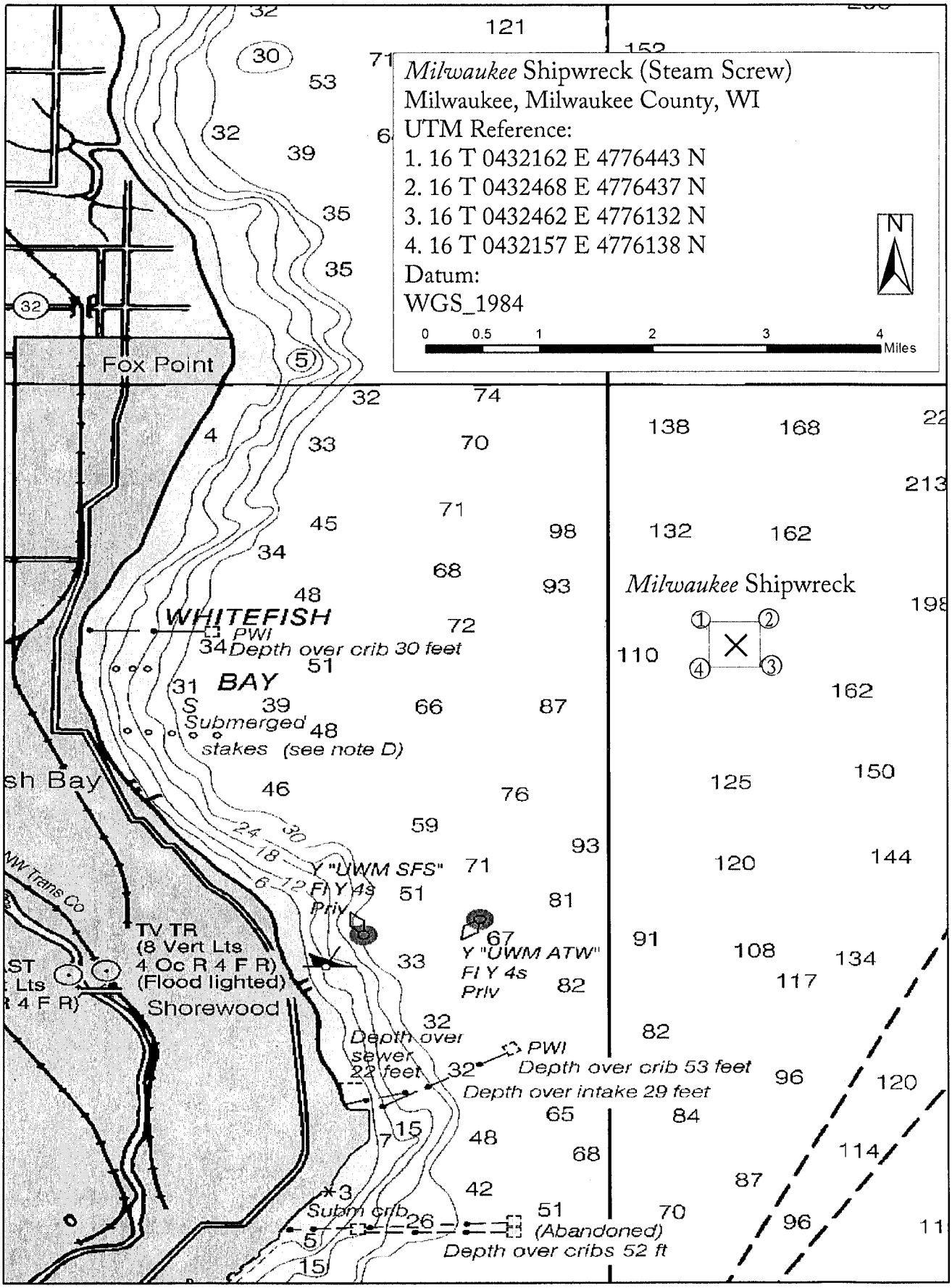
Photo #2 of 2
Milwaukee Shipwreck (Steam screw)
Lake Michigan, approximately 3 miles east of Fox Point, Wisconsin
Photographer Tamara Thomsen
August 2006
Boxcar filled with Kohler bathtubs aboard the car ferry

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Figure #1 of 1
Milwaukee Shipwreck (Steam screw)
Great Lakes (Location Unknown)
Photographer Unknown
Circa 1903
Starboard side of the *Milwaukee* when it was known as the *Manistique, Marquette, & Northern No. 1*




Milwaukee Shipwreck (Steam Screw)
Milwaukee, Milwaukee County, WI
UTM Reference:
1. 16 T 0432162 E 4776443 N
2. 16 T 0432468 E 4776437 N
3. 16 T 0432462 E 4776132 N
4. 16 T 0432157 E 4776138 N
Datum:
WGS_1984
0 0.5 1 2 3 4 Miles
N
Fox Point
WHITEFISH BAY
PWI
Depth over crib 30 feet
Submerged stakes (see note D)
Milwaukee Shipwreck
Y "UWM SFS" Fl Y 4s Priv
Y "UWM ATW" Fl Y 4s Priv
TV TR (8 Vert Lts 4 Oc R 4 F R) (Flood lighted)
Shorewood
Depth over sewer 22 feet
PWI
Depth over crib 53 feet
Depth over intake 29 feet
Subm crib
(Abandoned)
Depth over cribs 52 ft

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: MILWAUKEE (steam screw) Shipwreck

MULTIPLE NAME: Great Lakes Shipwreck Sites of Wisconsin MPS

STATE & COUNTY: WISCONSIN, Milwaukee

DATE RECEIVED: 6/12/15 DATE OF PENDING LIST: 7/07/15
DATE OF 16TH DAY: 7/22/15 DATE OF 45TH DAY: 7/28/15
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 15000479

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	N	LESS THAN 50 YEARS:	N
OTHER:	N	PDIL:	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	N	SAMPLE:	N	SLR DRAFT:	N	NATIONAL:	N

COMMENT WAIVER: N

__✓__ACCEPT ___RETURN ___REJECT 7.27.15 DATE

ABSTRACT/SUMMARY COMMENTS:

Entered in
The National Register
of
Historic Places

RECOM./CRITERIA_____

REVIEWER_____ DISCIPLINE_____

TELEPHONE_____ DATE_____

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.

WISCONSIN HISTORICAL SOCIETY

RECEIVED 2280
JUN 12 2015
Nat. Register of Historic Places
National Park Service

TO: Keeper
National Register of Historic Places

FROM: Peggy Veregin

SUBJECT: National Register Nomination

The following materials are submitted on this 10th day of June 2015, for the nomination of the *Milwaukee* Shipwreck (Steam Screw) to the National Register of Historic Places:

_1_ **Original National Register of Historic Places Nomination Form**

_1_ **CD with NRHP Nomination Form Word Document**

_____ **Multiple Property Nomination form**

_2_ **Photograph(s)**

_1_ **CD with electronic images**

_1_ **USGS map(s)**

_1_ **Sketch map(s)/figure(s)/exhibit(s)**

_____ **Piece(s) of correspondence**

_____ **Other** _____

COMMENTS:

_____ **Please insure that this nomination is reviewed**

_____ **This property has been certified under 36 CFR 67**
_____ **The enclosed owner objection(s) do_____ do not_____ constitute a majority of property owners.**
_____ **Other:** _____
_____