Edna G Tugboat Relocation

Two Harbors, MN

July 29, 2019

Presentation Overview

- AMI Consulting Engineers – Scope of Work
  - Feasibility of Removing the Tugboat from the Water
  - Determine Regulatory Process
  - Determine Schedule for Removal
  - Assess Need for Additional Consultants
  - Explore Options for Removing and Supporting Tugboat on Land
  - Cost Estimate for Each Option
- Questions
- Stantec – Scope of Work
  - Explore 2 Concepts for Waterfront Park with Different Edna G Locations
  - Illustrate some Examples of Design Elements that could be Incorporated
  - Funding Alternatives
- Summary & Recommendations

AMI Consulting Engineers, PA (AMI) – Scope of Work

- Determine the Feasibility of Removing the Tugboat from the Water
- Determine what Regulatory Agencies would be involved to Remove Tugboat from the Water
- Determine Estimated Schedule to Remove Tugboat from the Water.
- Determine if and what type of additional Consultants are Required
- Provide Cost Estimations for the Removal and Support of Tugboat on Land

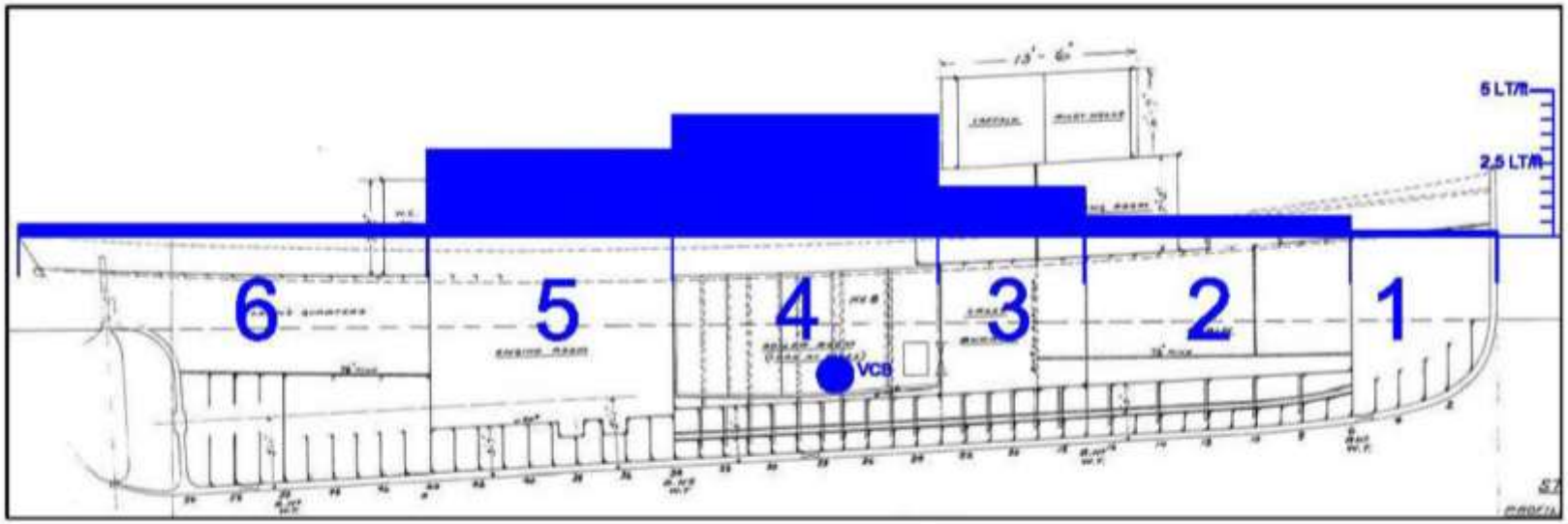
Feasibility of Removing Tugboat From Water

- AMI performed Site Inspections to Document the Current Condition of the Tugboat.
  - Non-Destructive Testing (NDT) performed including Ultrasonic Thickness (UT) readings and Pit Gage Readings to Determine Remaining Steel Thickness

Feasibility of Removing Tugboat From Water

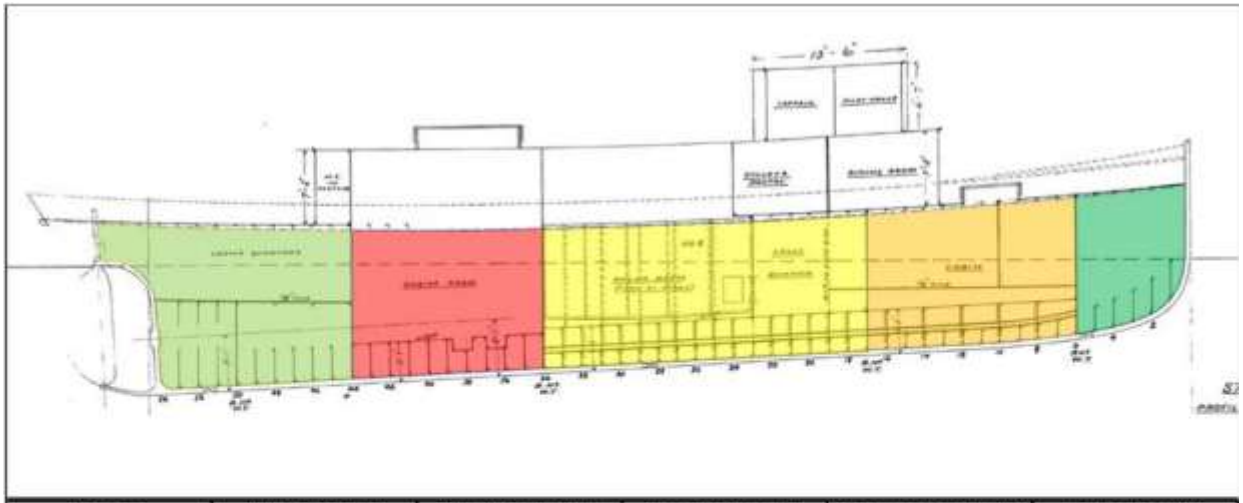
- AMI Utilized Fraser Shipyards to Determine Longitudinal Weight Distribution.
  - Inspection Notes & Weight Distribution summarized in Report to AMI
  - Weight Distribution necessary for rigging and lifting.

	Distance Aft Frame 0 (ft)	Air Draft Reading (in)	Bulwark (in)	Draft (in)
STBD	43.3	71	29.5	102.5
	62.5	60.5	28.5	112
	96.9	55	28.5	117.5
PORT	43.3	70	29.5	103.5
	62.5	60	28.5	112.5
	96.9	56	28.5	116.5



Feasibility of Removing Tugboat From Water/Cont..

- Steel Hull Thickness measurements made by UT Gage and Pit depth & Concentration information from Pipe Pit Gage combined to determine “Global” Steel Thickness.
  - “Global” Steel Thickness Compared to Minimum Steel Thickness Required based on American Bureau or Shipping (ABS) Standards.
  - Minimum Steel Thickness Per ABS < Minimum “Global” Steel Thickness. Large Steel Reinforcing Not Required to Remove Tugboat.
  - Steel Perforated at Pit Locations but Entire Steel Surface Pitted. Localized Locations Only.



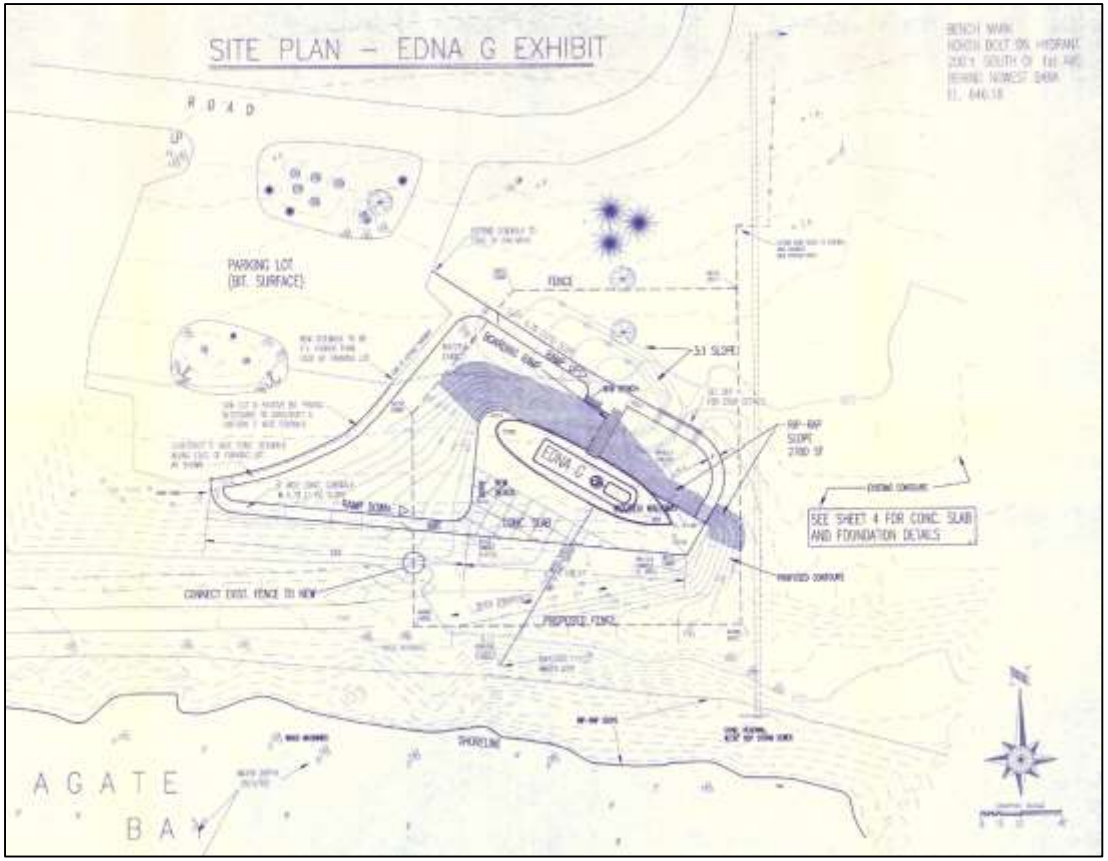
Test Area	Avg. Pit Depth (in)	Avg. UT Thickness (in)	Design Thickness (in)	Deteriorated Thickness (in)	Est. Steel Loss (%)
Crew's Quarters	0.103	0.392	0.375	0.351	10.493
Engine Room	0.105	0.400	0.375	0.306	23.597
Boiler Room	0.170	0.384	0.375	0.333	13.265
Cabin	0.140	0.391	0.375	0.335	14.337
Chain Locker	0.057	0.386	0.375	0.369	4.409
Bulkhead @ Rib 50	0.060	0.354	0.375	0.339	4.241
Bulkhead @ Rib 44	0.098	0.207	0.190	0.178	14.245
Bulkhead @ Rib 34	0.000	0.193	0.190	0.193	0.000
Bulkhead @ Rib 19	0.000	0.173	0.190	0.173	0.000
Bulkhead @ Rib 17	0.000	0.173	0.190	0.173	0.000
Bulkhead @ Rib 6	0.057	0.263	0.250	0.248	5.397

Feasibility of Removing Tugboat From Water/Cont..

- Information from Site Inspections Utilized to Determine Size of Keel Blocks & Number of Side Blocks Based on United States (US) Navy Stand Specifications for Dry-Docking
  - Keel Blocks Support the Self-weight of the Tugboat
  - Side Blocks Provide Lateral Stability Based on Vessel Size and Design Wind Speeds
  - Minimum of (4) Concrete Cradles Required with Continuous Keel Support

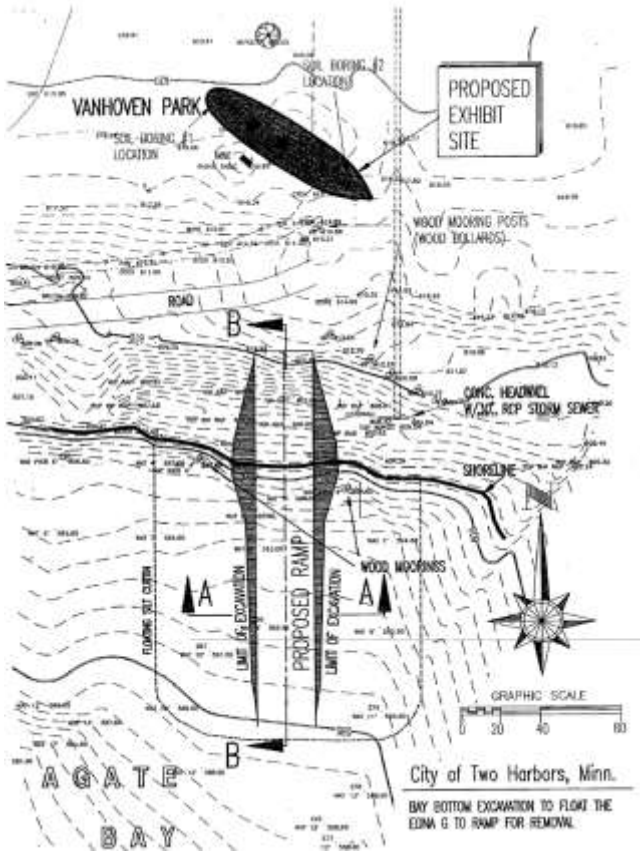
Feasibility of Removing Tugboat From Water/Cont..

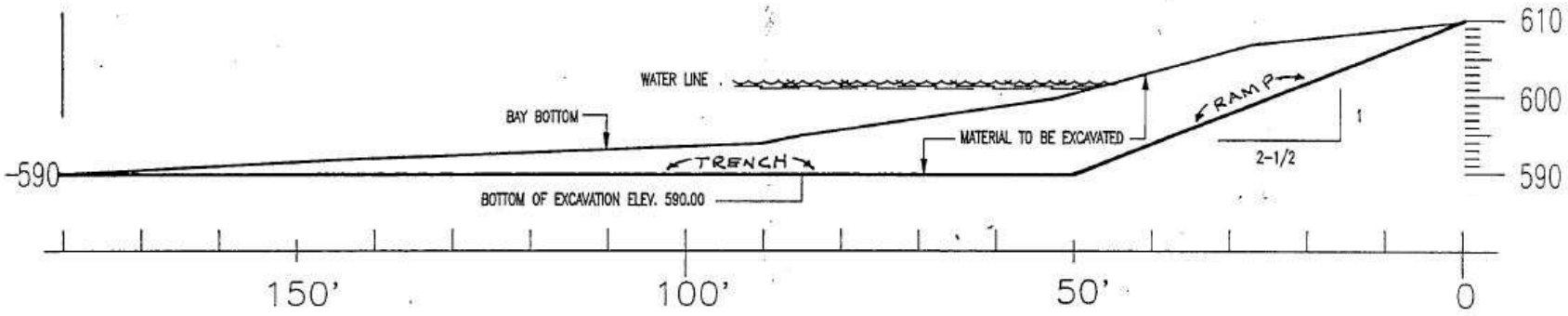
- Historical Information at Two Harbors City Hall.
  - Earliest Discussions on Removing Vessel From Water in 1978
  - RREM Consulting Engineers, Inc. – 1992 Removal Plans
  - Bid Out In June/July of 1992 with Proposed Method to Remove Tug to be Determined by Contractor.



Feasibility of Removing Tugboat From Water/Cont..

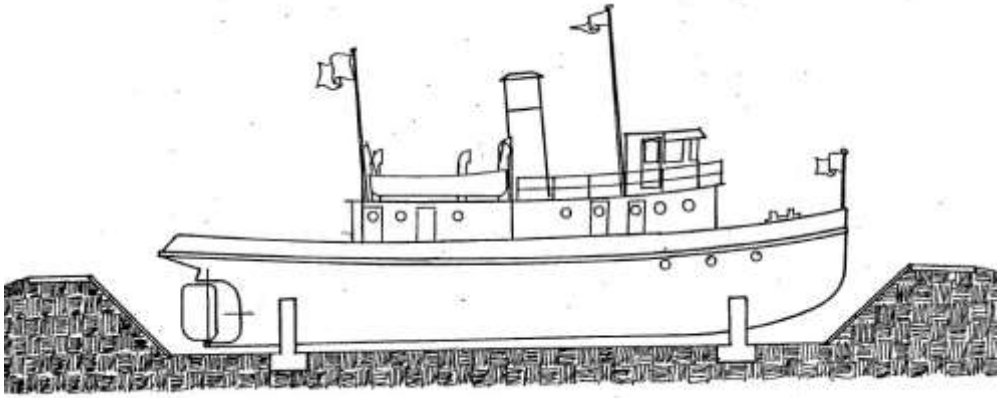
- Historical Information at Two Harbors City Hall.
  - United States Army Corp of Engineers (USACE) Permit for Dredging Ramp – Expired December 31st, 1995
  - Removal of Approximately 1,050 Cubic Yards of Rock and Granular Material from Lake Bead
  - After Removal of Tugboat, Material would be place back in Excavated Area and Site Restored to Original Condition.
  - Proposed Procedure By Johnson Brothers Corporation Contractor (Litchfield, MN) – Bid Price Unknown
    1. Move Tugboat into Position via Temporary Excavated Canal
    2. Drive Temporary Piling Adjacent to Lifting Bulkheads
    3. Install Jacking Supports on Temporary Piling
    4. Lift Tugboat into Position by Jacking System
    5. Backfill Temporary Canal
    6. Install Additional Piling to Support Concrete Support Structure & Minimize Risk of Settlement
    7. Install Concrete Support Structure
    8. Remove Temporary Piling & Jacking System





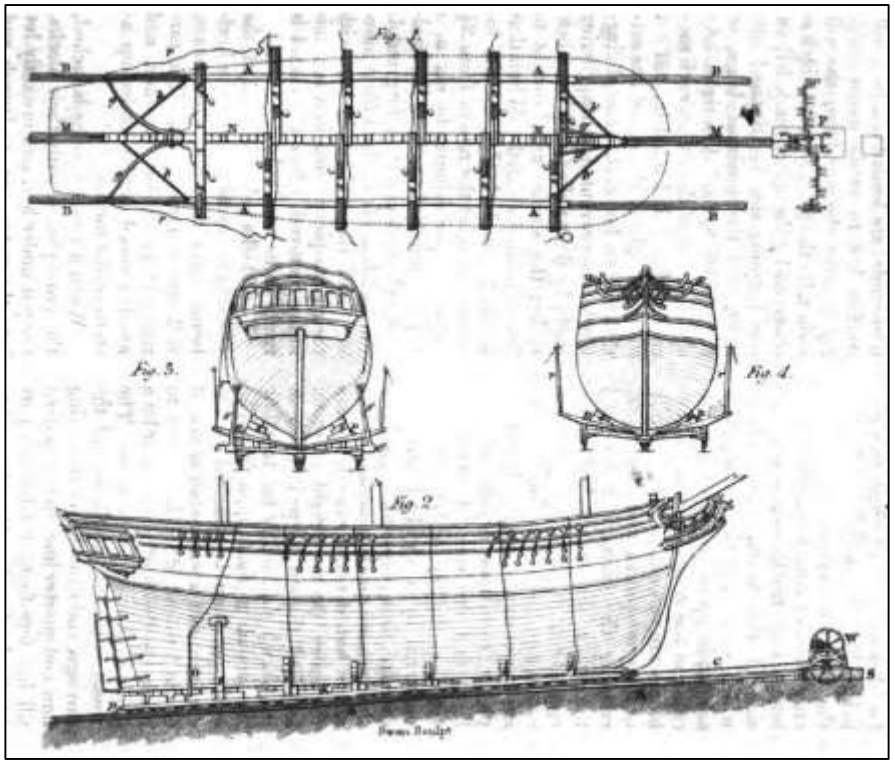
Options to Remove Vessel From Water

- Option #1: Removal Onsite via Cranes & Jack system
- Option #2: Removal Onsite via Trucking System
- Option #3: Install Sheet Pile Cofferdam around Current Location of Tug
- Option #4: Excavate Shoreline and Install Sheet Pile Cofferdam
- Option #5: Tow to Fraser Shipyard and Re-Plate Hull



Options to Remove Vessel From Water/Cont.:

- Option #1: Removal Onsite via Cranes & Jack system
  - Rail & Jack System
    - Install rails on MnDNR boat ramp
    - Attached temporary steel cradle system to hull of vessel
    - Use jack system + rail system to remove vessel from water
  - Crane lifts cradle system and sets tug in final location
    - (1) Pick versus (2) picks or (1) crane vs (2) cranes
  - Concrete slab and foundation already constructed
    - Cradles constructed once tug in position.



Options to Remove Vessel From Water/Cont.:

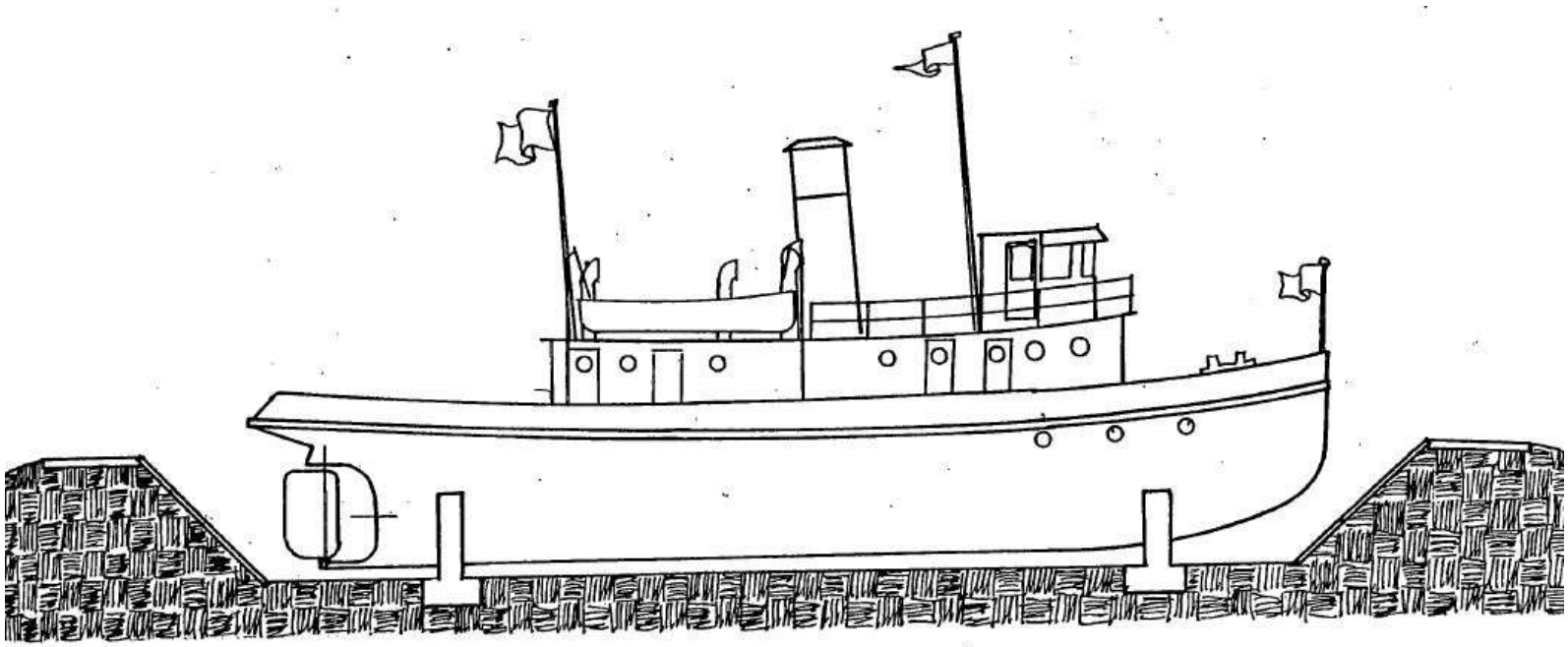
- Option #2: Removal Onsite via Trucking System
  - Attached Temporary Steel Cradle System to Hull of Vessel
  - Trucks with Specialized Trailers Backed down Boat Ramp
  - Vessel Loaded onto Specialized Trailer
  - Truck Moves Tugboat into Position
  - Tugboat Removed From Trailer Via Jacks into Final Position
  - Concrete slab and foundation already constructed
    - Cradles constructed once tug in position

Options to Remove Vessel From Water/Cont.:

- Option #3: Install Steel Sheet Pile (SSP) Cofferdam around Current Location of Tug
  - Drive SSP Cell Around Tug in its Current Locations
  - Tugboat would be Temporarily Support from Additional Steel pilling or SSP
  - Cofferdam Would then be Filled and Permanently Supports Installed
    - Concrete Slab and Cradle
  - Temporary Pilling or Support Possible Removed
  - Does Not Include Upgrades to Current Walkway

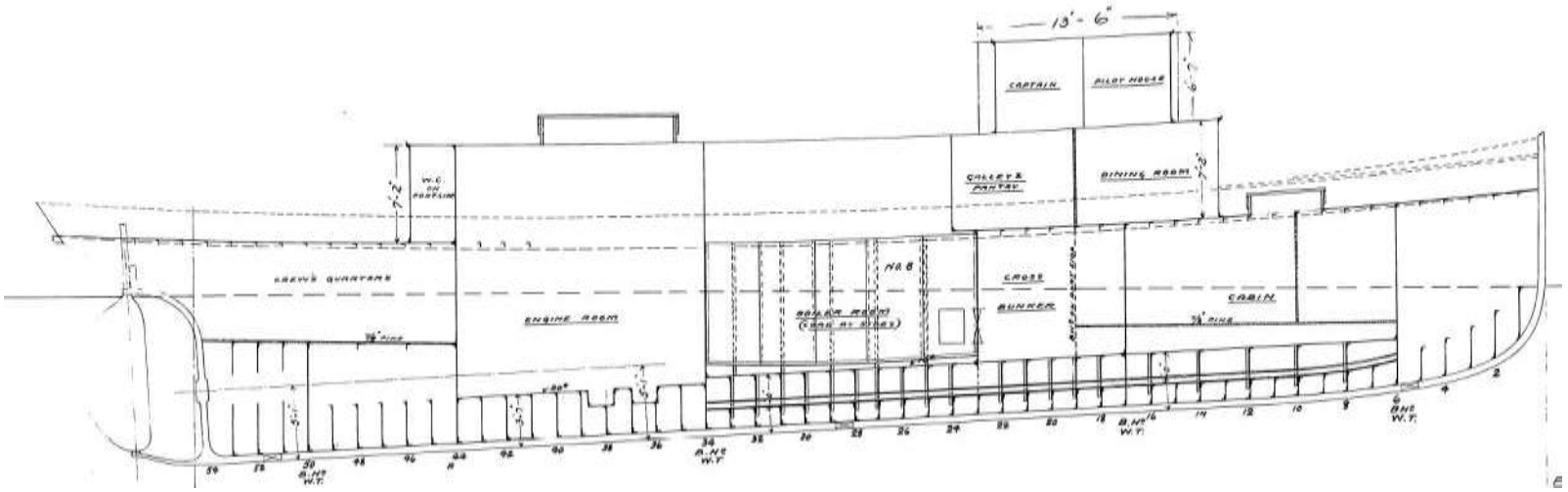
Options to Remove Vessel From Water/Cont.:

- Option #4: Excavate Shoreline and Install Sheet Pile Cofferdam
  - Install Steel Sheet Pile (SSP) Cofferdam Along Shoreline
  - Excavate Shoreline Within Limits of Driven SSP
    - Similar to 1992 Removal Plans
  - Tugboat Floated into Position
  - Tugboat would be Temporarily Support from Additional Steel pilling or SSP
  - Cofferdam Would then be Filled and Permanently Supports Installed
    - Concrete Slab and Cradle
  - Temporary Pilling or Support Possible Removed



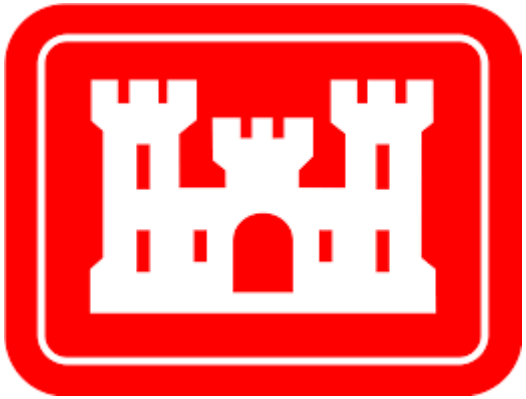
Options to Remove Vessel From Water/Cont.:

- Option #5: Tow to Fraser Shipyard and Re-Plate Hull
  - Vessel Prepared for Tow down to Fraser Shipyards in Superior, WI
    - Lock Rudder, Prop, Hatches, White Line on Hull, etc.
  - Entire Hull of Vessel Rebuilt on Dry-dock due to the Age of Vessel Including Main Support Members & Ribs.
    - Riveted Hull Construction to Maintain Historic Value
  - New Hull Blasted & Coating for Corrosion Protection
  - Vessel Moved Back to Current Location Via Tow

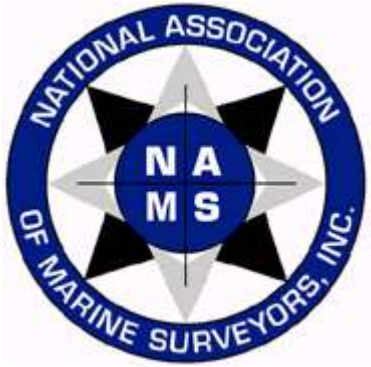


Regulatory Agencies & Consultants

- United States Coast Guard (USGC)
  - Safety Inspections & Vessel Traffic
  - Movement & Preparation of Vessel Movement
  - Pollution Control
- United States Army Corp of Engineers (USACE)
  - Interferences with Navigable Waterways (In Water Structures)
- Minnesota State Historic Preservation Office (SHPO)
  - Tugboat on Listed on National Register of Historic Structures
- Minnesota Department of Natural Resources (MnDNR)
  - Final Site Preparations
  - Utilization and possibly Alterations to Public Boat launch
  - In water Structures
  - Period of Work to be Completed In (Fish Window)
- Society of Accredited Marine Surveyors (SAMS) / National Association of Marine Surveyors (NAMS)
  - Inspections Prior to Movement of Vessel (Required by Some Insurance Companies)



MINNESOTA HISTORICAL SOCIETY



Cost Estimations Summary

- Option #1: Removal Onsite via Cranes & Jack system
  - Approximate Cost = ***$955,000.00***
- Option #2: Removal Onsite via Trucking System
  - Approximate Cost = ***$860,000.00***
- Option #3: Install Sheet Pile Cofferdam around Current Location of Tug
  - Approximate Cost = ***$1.14 Million Dollars***
- Option #4: Excavate Shoreline and Install Sheet Pile Cofferdam
  - Approximate Cost = ***$775,000.00***
- Option #5: Tow to Fraser Shipyard and Re-Plate Hull
  - Approximate Cost = ***$1.3 Million Dollars***

Tentative Schedule

- Tentative Timeline:
  - Funding Acquisition = 6 Months to 1 Year
  - Management & Coordination with Regulatory Agencies = 1 Year
  - Construction Plans Development = 4 Months
  - Bidding Project = 1 to 2 Months
  - Site Construction & Project Management = 2 to 3 Months
- Grant Funding Acquisition, Management & Coordination with Regulatory Agencies and Construction Plans can Occur Concurrently
- Total Tentative Timeline = ***1 year to 1.5 Years***

Questions for AMI?

- Stantec – Scope of Work

Site Options for Tugboat Relocation to Land

EDNA G TUGBOAT RELOCATION
TWO HARBORS, MN

Edna G Relocation Areas

Site A


Waterfront Drive
EXISTING PARKING
MARITIME MUSEUM/
INTERPRETIVE CENTER
INTERPRETIVE
SIGNAGE
GARDEN
AREA
WATER
FEATURE
PLAZA
PLAYGROUND
INTERPRETIVE
SIGNAGE
RESTROOM/
CONCESSIONS
BOARDWALK/SEATING AREA
GARDEN
AREA
PICNIC AREA
GATHERING
AREA
PERFORMANCE
STAGE/OVERLOOK
OVERLOOK
WATER SCULPTURE/
ROCK SEATING AREA
AGATE BAY

Gathering Spaces

Overlook Areas

- Utilize existing parking
- Incorporate existing rock shoreline into boardwalk
- Utilize existing structure for stage/overlook
- Integrate existing trail system
- Utilize plaza area for gathering areas, exhibit & festival space
- Provide interpretive signage to include history of tugboat & map of it's travels

Site B


DULUTH & IRON RANGE DEPOT MUSEUM
PARKING
PARKING
AMPHITHEATRE
INTERPRETIVE SIGNAGE
MARITIME MUSEUM/ INTERPRETIVE CENTER
PICNIC AREA
RESTROOM/ CONCESSIONS
EDNA G
GAZEBO
PICNIC AREA
PLAYGROUND
PLAZA
PLAZA
GARDEN AREA
BOARDWALK/ OVERLOOK & SEATING AREAS
WATER SCULPTURE/ ROCK SEATING AREA
OVERLOOK
BEACH ACCESS
AGATE BAY BEACH
AGATE BAY
OVERLOOK
TO THE BREAKWATER & LIGHTHOUSE

Waterfront Boardwalk
& Fishing Areas

- Incorporate existing rock shoreline
- Provide gathering and performance areas
- Utilize existing structure for boardwalk
- Incorporate existing trail system
- Utilize plaza & amphitheater areas for performance, exhibit & festival space
- Provide interpretive signage to include history of tugboat & map of it’s travels
- Anchor is concrete sidewalk area with seating

Examples of Waterfront Design Elements

Boardwalks

Year Round

Sitting Areas

Sitting Areas

Picnic
Shelters

Restroom
Facilities

Amphitheatre

Observation Areas

Special Event Areas

Waterfront
Trails

Play Areas

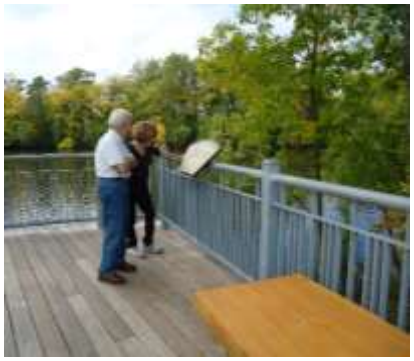
Mari-time Playground Equipment

Water Features

Stormwater Features

Natural Areas

Special Event Banners



Wayfinding/Historical Interpretive Signage

Site Furniture

Potential Funding Alternatives

POTENTIAL FUNDING SOURCES FOR RELOCATION OF THE EDNA G TUGBOAT								
Agency	Program Name	Project Type	Type of Assistance	Eligible Applicants	$'s Available	Use of Funds	Restrictions/ Requirements	Application Deadline
Minnesota Legislature	Minnesota Capital Bonding Bill	Predesign/design expenses, construction, acquisition or improvement of specific tangible long-lived fixed assets. Operating expenses such as services, programs, planning, and moving or relocation costs are not bond-eligible expenses. Expenses that are not bond-eligible can be submitted as part of the request but should request cash appropriations from the general fund or other state fund	Grant	Public bodies (city, township, county or special district), Indian tribes	Up to 50% of capital project costs	Must be publicly owned and serve a public purpose. Strongly urge regional or state significance	Need to be publicly owned; state wages rates applied	June in odd numbered years for the even numbered year bonding cycle.
Minnesota Historical Society	Minnesota Historical and Cultural Heritage Grant - Large Grants	Community history projects, Interpretive Programs & Public Education, HVAC Upgrade Requirements and Historic Preservation projects	Grant	501(c)(3) non-profits, units of state and local government, federally-recognized tribes, and educational institutions.	No maximum amount; historically, however, the awards are less than $100,000 No match required, but encouraged	Exterior building preservation work; Interior systems work; ADA accessibility standards upgrades; Restoration of a historic landscape on a National Register–listed property; Conservation and/or stabilization for a compromised or damaged structure; Construction administration fees (during construction phase only); Acquisition of a National Register–listed historic property threatened by imminent loss or destruction. **Specifically excludes "cost of moving a building, structure, or monument" but may be room to argue in the case of Edna G Tugboat**	All work must conform to and be approved by the Secretary of the Interior's Standards for the Treatment of Historic Properties due to the historical designation	Pre-application due July 26, 2019; Full Application, if invited, due September 13, 2019
Minnesota Department of Employment & Economic Development	Redevelopment Grant Program	Redevelopment associated with the new location of the Tugboat	Grant	Statutory or home rule charter cities, economic development authorities, housing and redevelopment authorities, counties, or port authorities	50% of eligible costs	Land acquisition, demolition, infrastructure improvements, soil stabilization when in-fill is required, ponding or other environmental infrastructure and adaptive reuse of buildings, including remedial activities at sites	Must be part of putting blighted sites back to use; project must meet current tax increment financing requirements for a redevelopment district and tax increments will contribute to the project.	Semi-annual grant rounds, Feb. 1 and Aug. 1
US EPA	Brownfields Site Assessment Program	Inventory, characterize, assess, and conduct planning (including cleanup planning) and community involvement related to brownfield sites - sites with known or suspected contamination by hazardous substances, petroleum or petroleum products, or mine-scarred lands	Grant	Local Governments, Tribes, States, Redevelopment Agencies, Non-Profits, Others	Up to $600,000 for a coalition* grant, $300,000 for community wide grant, $200,000 for site-specific grant; no match required	Phase 1 & Phase 2, Hazardous Building Materials Surveys, Analysis of Brownfield Cleanup Alternative, Response Action Plans	One 'lead' eligible entity to partner with two or more eligible entities that have limited capacity to manage their own EPA cooperative agreement; priority sites must be identified in the application, but the funding can be used anywhere in the Coalition's region	Annual program; anticipate the next round to be late 2019
Minnesota Department of Natural Resources	Outdoor Recreation Grant	Could be used for outdoor activities / amenities associated with the relocation, if any	Grant	Counties, cities and townships	50% up to $250,000	Park acquisition and/or development/ redevelopment including, Boat/Canoe Access Sites, Campgrounds, Fishing Piers/Shore Fishing Areas, Skating Rinks/Parks, Nature Study/Observation Areas, Picnic Shelters, Playgrounds, Sports Fields and Courts, Swimming Beaches and Outdoor Pools, Splash Parks, Internal Park Trails (non-motorized)	Project proposals must include at least one of the eligible primary outdoor rec facilities in the Program Manual and have a total project cost of at least $20,000. Support facilities such as restrooms and parking lots can only be funded as part of a larger project that includes a primary rec facility. Land proposed for development or redevelopment must be owned by the applicant or be part of an acquisition project. Must meet requirements for perpetual outdoor rec use	Annually, March 29

The above list is a draft list of potential funding sources for the Edna G Tugboat project, ranked in order of applicability. The last three sources may or may not be relevant, depending on the full scope of the relocation activities - the site that is ultimately chosen and other activities that could be planned for the site. This list can and will likely evolve as as more information becomes available and additional phases are undertaken.

* This funding source is listed in the event that the site selected is a part of the assessment area. Coalition grants are for three or more eligible entities who will perform Assessment Grant activities on at least five brownfield sites within their communities. ARDC applied for an EPA Assessment Grant in January 2019 but was not awarded. The intention is to resubmit in the next round, after a debrief with EPA.

Summary

- There are four viable options for relocating the Edna G on land.
- They vary in cost and each presents different challenges and opportunities.
- To leave the boat in the water will require the hull to be replated.
- There are viable funding sources, a plan will require multiple sources.

Summary (cont)

- The EPA Brownfield grant remains a viable option. No new Minnesota grants were awarded this year.
- A percentage of EPA grants can be spent to fund project planning

Summary (cont.)

- The North Shore is a World-class Minnesota asset.
- Its' value is increasing and continued tourism and recreational spending are a virtual certainty.
- Adding destination features and programming activities along the waterfront are winning strategies

Recommendations:

- Edna G Commission and City leadership should digest this information.
- Edna G Commission serves in an advisory role, so they should make a recommendation to the City Council
- The Edna G is an iconic feature and the City should move forward with a plan to maximize its value.

Recommendations (cont.)

- The Council needs input from the broader community, so opportunities for community engagement and input should be provided and encouraged.
- Once the boat is safely and securely relocated, the implementation of the waterfront park can be staged over time.

Recommendations:

- After receiving community input and the Edna G Commission recommendation, the City Council should choose an option.
- Once the option has been selected, the information provided by AMI should be incorporated into funding applications.

Recommendations:

- Work with Arrowhead Regional Development Agency to resubmit EPA Brownfield grant application.
- Work with local legislators to promote the project with the Bonding Bill
- Contact the historical society and position the project for a grant application

Thank you

Questions?