



**US Army Corps
of Engineers**®
Detroit District

HARBOR INFRASTRUCTURE INVENTORIES Duluth-Superior Harbor, Minnesota/Wisconsin



Harbor Location: Duluth-Superior Harbor is located at the westernmost tip of Lake Superior.

Authority: River & Harbor Act of 3 June 1896

Project Description: Duluth-Superior Harbor was originally authorized as a deep draft commercial harbor. The project depths are 28 to 32 feet in the entrance; 27 feet deep in the iron-ore route channels, and 20 to 23 feet in the inner channels. There are two piers at the Duluth Entry and there are four piers at the Superior Entry.

The Duluth Entry north pier consists of four sections and is partially SSP in nature. The south pier at the Duluth Entry also consists of four sections. Section M, 104.25 feet long, is a double wall SSP structure containing a wale and tie-rod system with a concrete cap including a stairway, parapet walls and base for the entry front range light. Section N, 980.0 feet long, is a double wall SSP structure similar to Section M. This section contains a walkway, parapet walls and is 30.0 feet wide. Section N-1, 65.0 feet in length, is partially a double SSP wall tie-rod system and a single SSP front wall with earth anchor tie backs. Section O, 583.0 feet long contains the curved portion of the harbor entrance, is a single SSP front wall.

The Superior Entry north breakwater consists of five sections. Sections T and U are rock-filled timber cribs with concrete caps, 52.0 feet and 400.0 feet long, respectively; Section W, 3,189.0 feet long, is a rubble mound structure constructed of core stone covered with armor stone; Section V, 496.0 feet in length, is a concrete cap resting on two parallel rows of piling. A Wakefield wall, two Geo tubes on the landward side and two riprap groins on the lakeside were added in 2002. Section X, 530.0 feet long is a rubble mound structure containing an internal sheet piling driven to 16.0 feet below LWD. The south breakwater at the Superior Entry also consists of four sections. Sections T and U, the pier head and breakwater head, are rock-filled timber cribs resting on a submerged pile foundation, 100.0 feet and 352.0 feet long, respectively. Section W, 1,014 feet long is a rubble mound structure comprised of core stone covered with armor stone resting on the lakebed. Section V, 400.0 feet long, is a concrete cap resting on two parallel rows of piling.

The Superior Entry north entrance pier consists of two sections. Section P, the pierhead, is 19.0 feet long and is a concrete structure resting on a submerged pile foundation and the lakebed. Section R, 2,077 feet long is the transition section to land and is a concrete structure resting on a submerged pile foundation and the lakebed. The south entrance pier at the Superior Entry is composed of four sections. Section P-1, 30.0 feet long, is a SSP wall capped with concrete. Section Q and a portion of Section R-1, 480.0 feet long is a SSP structure capped with concrete. Sections R-1, R-2, R-3, R-4, S-1 and S-2, totaling 1,096 feet are SSP walls with tie backs.

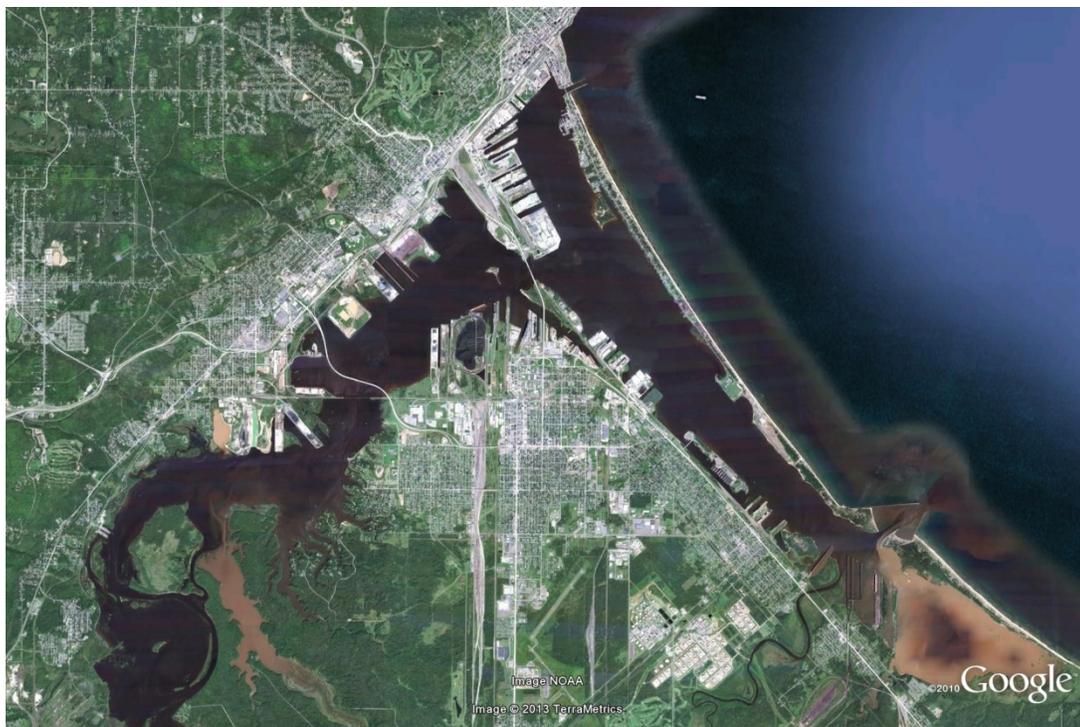
Traffic: Five year average (2006-2010) tonnage is 41.1M tons of material shipped and received

Transportation Importance: Duluth-Superior Harbor is a major international receiving and shipping port on the Great Lakes. This project serves as an important Harbor of Refuge and \$2 Billion worth of cargo is shipped via the Duluth-Superior docks annually. It is also the home port of U.S. Coast Guard's 225 foot long cutter Alder and home to U.S. Coast Guard auxiliary station and a Marine Safety Unit, responsible for port safety and security, marine environmental protection, and commercial vessel safety missions under the auspices of the Dept. of Homeland Security.

Congressional Interest:

- Representative Rick Nolan D-MN-8
- Representative Sean Duffy R-WI-7
- Senator Al Franken D-MN
- Senator Amy Klobuchar D-MN
- Senator Ron Johnson R-WI
- Senator Tammy Baldwin D-WI

Current Condition Assessment: **B/C**



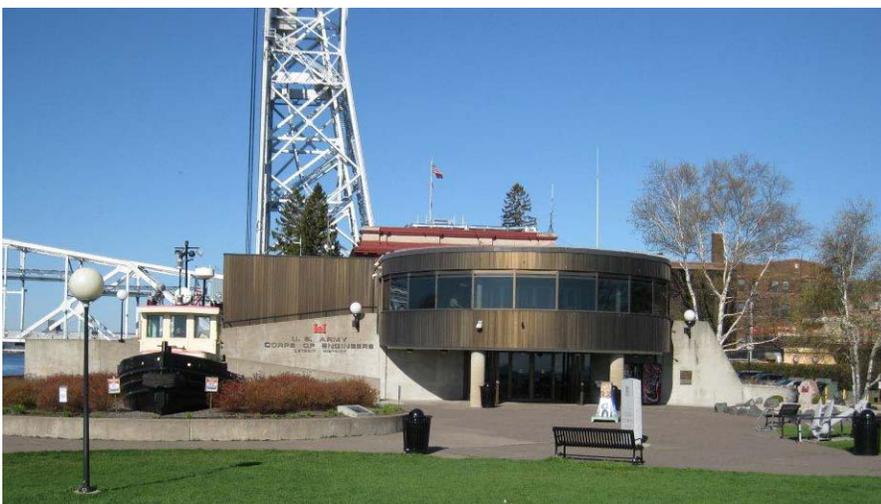
Date of Site Visit: 15 September 2010

Summary of Impact: Prevailing waves come from the north direction. Overtopping waves could have an immediate impact on the docks in Superior Bay located inside the piers. Any significant wave activity within the bay could damage vessels moored at the docks. Presently, over 20 docks within the bay are sufficiently protected, but could be exposed to greater wave heights under the right conditions. In both cases, an increased wave climate would result in damage to docked vessels and the docks themselves. Other federal and commercial businesses subject to inundation are the Canal Park Visitor Center and Museum, USACE Duluth Area Office Building and Vessel Yard, the Duluth Aerial Lift Bridge, Paulucci Professional Building, Duluth Entertainment Convention Center, Great Lakes Aquarium and the South Pier Inn.

Examples of Protected Infrastructure:



1. Duluth Canal Park Visitor Center and Historical Museum: The museum, operated by the U.S. Army Corps of Engineers is located along the Duluth ship canal at the Aerial Lift Bridge. It provides displays, historic artifacts and programs that explain the roles of Duluth and Superior in Great Lakes shipping and the U.S. Army Corps of Engineers in maintaining the nation's waterways. There is no admission charge to the Visitor Center or any of its programs. The center is open year-round and operation hours vary with the seasons.



2. USACE Duluth Area Office: The Area Office, located on the westernmost end of the Great Lakes, is responsible for the dredging of federal harbors and the repair of breakwaters and piers on Lake Superior. The Duluth Area office is also responsible for the operation of the Canal Park and Canal Park Visitor Center. Canal Park is located along the Duluth ship canal.



3. Duluth Aerial Lift Bridge: Is a major landmark in the port city of Duluth and is one of the most popular tourist attractions in Minnesota. The bridge was constructed in 1904-1905 as the Aerial Ferry Bridge which ferried people across the canal in a gondola. The lift span was added in 1929-1930 to handle increased traffic. Today, the Aerial Bridge lifts an average of 5,500 times a year, and over forty times a day during the summer months. It is owned and operated by the City of Duluth.



4. Paulucci Professional Building: Built in 1878, is a four story structure overlooking the Duluth ship canal and Aerial Lift Bridge. The Paulucci Building is a mixed-use commercial property with over 140,000 square feet of commercial offices and retail shops.



5. Duluth Entertainment Convention Center: The complex is located adjacent to the Duluth ship canal. The center is a 250,000 square foot multi-function facility and offers meeting, exhibit, sporting and special event space.



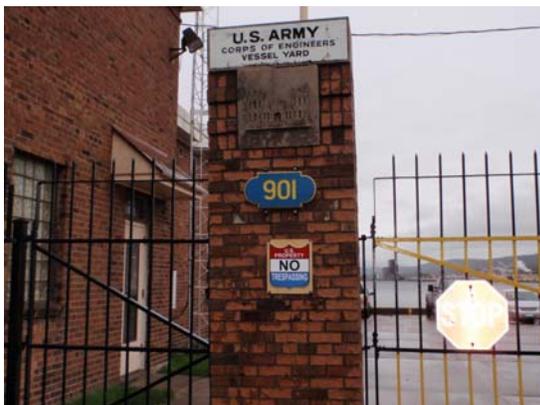
6. Great Lakes Aquarium: Is one of a few aquariums in the United States that focuses on freshwater exhibits. All the exhibits of the 62,000 square foot complex are based upon actual habitats in the Lake Superior basin. The Great Lakes Aquarium provides on-site and outreach educational programs to learners of all ages. The aquarium is open every day except Christmas from 10am to 6pm.



7. South Pier Inn: The Inn is located at the foot of the Aerial Lift Bridge and situated on 400 feet of private shoreline. Suites at the Inn feature whirlpools, fireplaces and private balconies with a spectacular view of the Aerial Lift Bridge and Lake Superior.



8. USACE Duluth Vessel Yard: The complex houses the Duluth Area Office warehouse. In addition, the vessel yard is a work area for the Duluth Area Office field personnel as well as a docking area for their survey vessels, crane barges and tugs. The Vessel Yard also provide mooring facilities for the EPA and the University of Minnesota Duluth research vessels.



9. General Mills Duluth Grain Elevator A: The General Mills Duluth facility has a 3.5 million bushel storage capacity. This is one of the city's oldest grain elevators still in operation (built in 1908). Some of the grain received by rail or water is shipped by rail to General Mills' plants. Combined capacity of the company's Duluth and Superior elevators is 16.2 million bushels.

10. Duluth Storage: This remains the Twin Ports' most automated grain facility. Cargill had moved its historic grain export operations into what was, in 1978, a state-of-the-art facility on Duluth's waterfront. The next year, the company expanded its "Elevator B" with the addition of concrete silos. Efficiency and technology expedited grain handling, utilizing a rail horseshoe to accommodate 220 hopper cars. The company was acquired by Whitebox Advisors in 2008 and began operating as W.B. Duluth Storage, LLC. This facility was sold to Ceres Global Ag Corp. in 2010, along with 11 other grain-handling facilities in North America.



11. Holcim Inc.: Holcim (US) Inc. (formerly St. Lawrence Cement) is one of the nation's largest manufacturers and suppliers of cement and mineral components. The Duluth facility handles Portland Type I cement in bulk that comes by ship from Mississauga, Ontario, and leaves the plant in rail cars or trucks. The facility, built in 1980, measures 284 feet from the ground to the top of the superstructure - the tallest building in Duluth/Superior and surrounding area. There are four silos, each with 10,000-ton capacity and interstices with the capacity of another 3,000 tons. The facility handles about 20 ships per year.



12. Duluth-Seaway Port Authority: The Duluth Seaway Port Authority (DSPA) is an independent, public agency created by the Minnesota State Legislature to foster regional maritime commerce, promote trade development, facilitate industrial development, and serve as an advocate for port interests here and around the world. The Port Authority also owns/manages multiple waterfront properties, including the 120-acre Clure Public Marine Terminal (the port's only general cargo facility), Garfield Pier, Erie Pier, and an industrial park near the Duluth International Airport. DSPA also operates Foreign Trade Zone #51.



13. Fraser Shipyards: one of the largest U.S. owned ship repair facilities on the Great Lakes, as well as the only U.S. owned ship repair facility on Lake Superior. The facility includes two graving docks and shops for all types of ship repair and renovation. Although not presently building any vessels, it is keeping busy with ship renovation, repair and conversion work.



14. Gavilon Grain, LLC: Gavilon Grain LLC (formerly Peavey Company-Connors Point) has a long history in Duluth-Superior dating back to 1898, when the former Continental Grain Co. was located in Duluth. Today, the Superior facility can hold eight million bushels of grain.



15. Lafarge Corporation: The Superior Terminal has 8500 NT of storage in the silos, with two dock faces at 90 degrees to each other - 900 feet and 400 feet at full depth. Lafarge employs over 70,000 people worldwide. This facility has truck and rail loading and rail unloading capability. (Note: The Duluth facility was permanently closed in 2008).

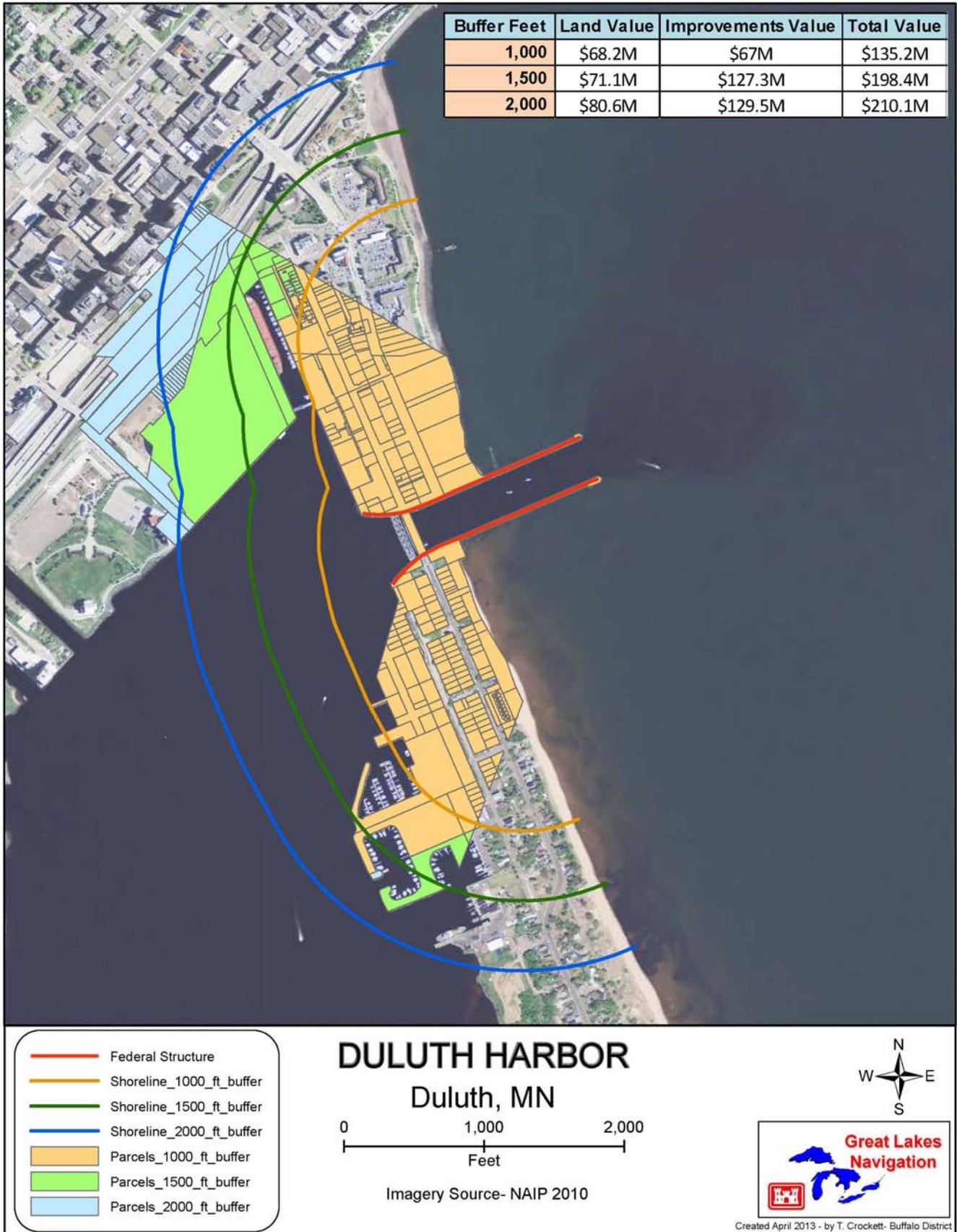
16. Hansen-Mueller - Superior, WI Elevators: Former ConAgra elevators in Superior were acquired in 2008 by Hansen-Mueller Co., a respected leader in the grain industry. Headquartered in Omaha, Nebraska, Hansen-Mueller provides an individualized approach to grain merchandising through price discovery, marketing, transportation and logistics throughout the world. Rapid growth has allowed the company to strategically place multiple grain elevators throughout the U.S. to move commodities quickly and efficiently utilizing rail, barge, truck and/or ship for on-time delivery.



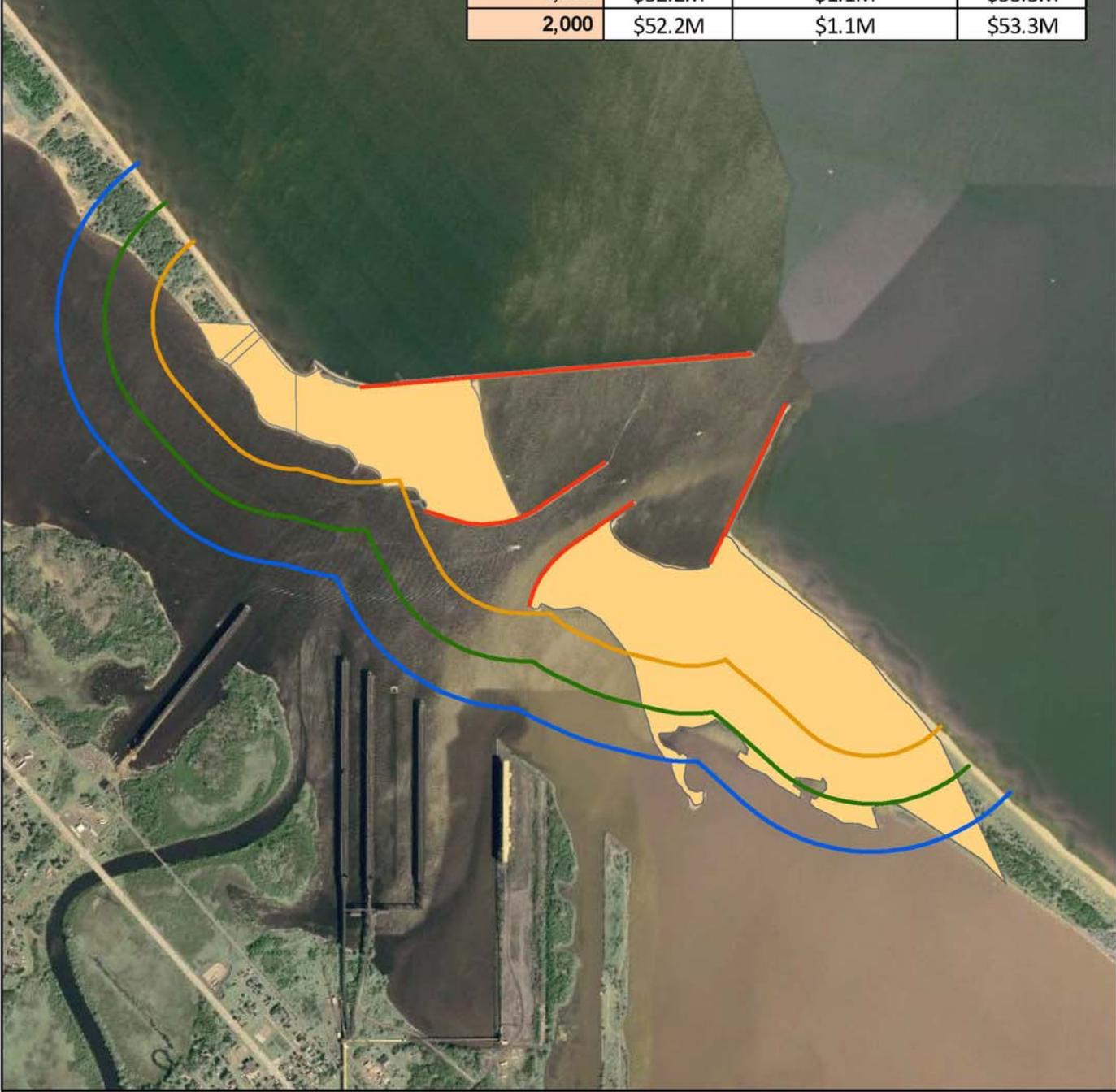
17. Burlington Northern Sante Fe (BNSF) Ore Dock #5: Despite its massive size, it has been a somewhat reclusive resident of Superior's Belgian neighborhood of Allouez since 1892. The Twin Ports largest taconite transshipment facility, it has a total dock capacity of 73,156 tons of iron ore, but stockpile capacity (5.2 million tons) in its Allouez yard is far higher. The pellets are moved by conveyor belt up and over the town to the dock.



Potential Impact Area: The following graphic displays property parcels that could be impacted within various zones defined by different setbacks from the shoreline behind existing Federal coastal structures. Values are based on real property tax assessments from these parcels, and don't reflect any detailed coastal zone damage assessments. Figures simply reflect property values at various setbacks.

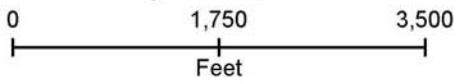


Buffer Feet	Land Value	Improvements Value	Total Value
1,000	\$52.2M	\$1.1M	\$53.3M
1,500	\$52.2M	\$1.1M	\$53.3M
2,000	\$52.2M	\$1.1M	\$53.3M



SUPERIOR HARBOR

Superior, WI



Imagery Source- NAIP 2010

- Federal Structure
- Shoreline_1000_ft_buffer
- Shoreline_1500_ft_buffer
- Shoreline_2000_ft_buffer
- Parcels_1000_ft_buffer



Created April 2013 - by T. Crockett- Buffalo District