CONSERVATION PLAN

Application for a 10-Year Incidental Take Authorization

Federally and State-Endangered Species:

- Spectaclecase Mussel (*Cumberlandia monodonta*)
- Sheepnose Mussel (*Plethobasus cyphyus*)
- Higgins Eye Pearly Mussel (*Lampsilis higginsii*)

State-Endangered Species:

- Ebonyshell Mussel (*Fusconaia ebena*)

State-Threatened Species:

- Purple Wartyback Mussel (*Cyclonaias tuberculata*)
- Butterfly Mussel (*Ellipsaria lineolata*)
- Spike Mussel (*Elliptio dilatata*)
- Black Sandshell Mussel (*Ligumia recta*)

Submitted To: Illinois Department of Natural Resources
Project Applicant: Consolidated Grain & Barge Co.
Project Name: Gladstone Terminal Alteration – New Mooring Dolphin Installations, New Pipe Pile Cluster Installations, Future Dolphin/Pile Cluster Removals/Replacements, Future Sheet Pile Wall Removals/Replacements/ Repairs, and Future River Bank Stabilization
County: Henderson (IL)
Impact Area: Mississippi River Mile 409.6

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TABLE OF CONTENTS

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Application for a 10-Year Incidental Take Authorization

Consolidated Grain & Barge Co. – Gladstone, IL Terminal

PREPARED BY: Mainstream Commercial Divers, Inc., Murray, Kentucky

PROJECT APPLICANT: Consolidated Grain & Barge Co.
PROJECT NAME: Gladstone Terminal Alteration

Current Project: New Mooring Dolphin and Pipe Pile Cluster Installations (Take of all eight mussel species is sought)

Future Potential Projects: Dolphin/Pile Cluster Removals/Replacements, Sheet Pile Wall Removals/Replacements/Repairs, and Future River Bank Stabilization (Take of the five solely state listed species is sought)

COUNTY: Henderson (IL)
AMOUNT OF IMPACT AREA: Mississippi River Mile 409.6

1. Description of the Project Impact

A. Legal Description of the Project Area

Consolidated Grain & Barge Co. (CGB) owns and operates a river terminal near Gladstone, Illinois along the Mississippi River at approximate river mile 409.6 in Henderson County, Illinois (Figure 1). The physical address of the terminal is 838 TWP Road 840 East, Gladstone, IL 61437. The Mississippi River, at this location, is an Illinois Natural Areas Inventory Site (INAI #1439), known as Mississippi River-Drew Chute INAI site, and is designated as such due to the presence of specific suitable habitat occupied by endangered and/or threatened species.

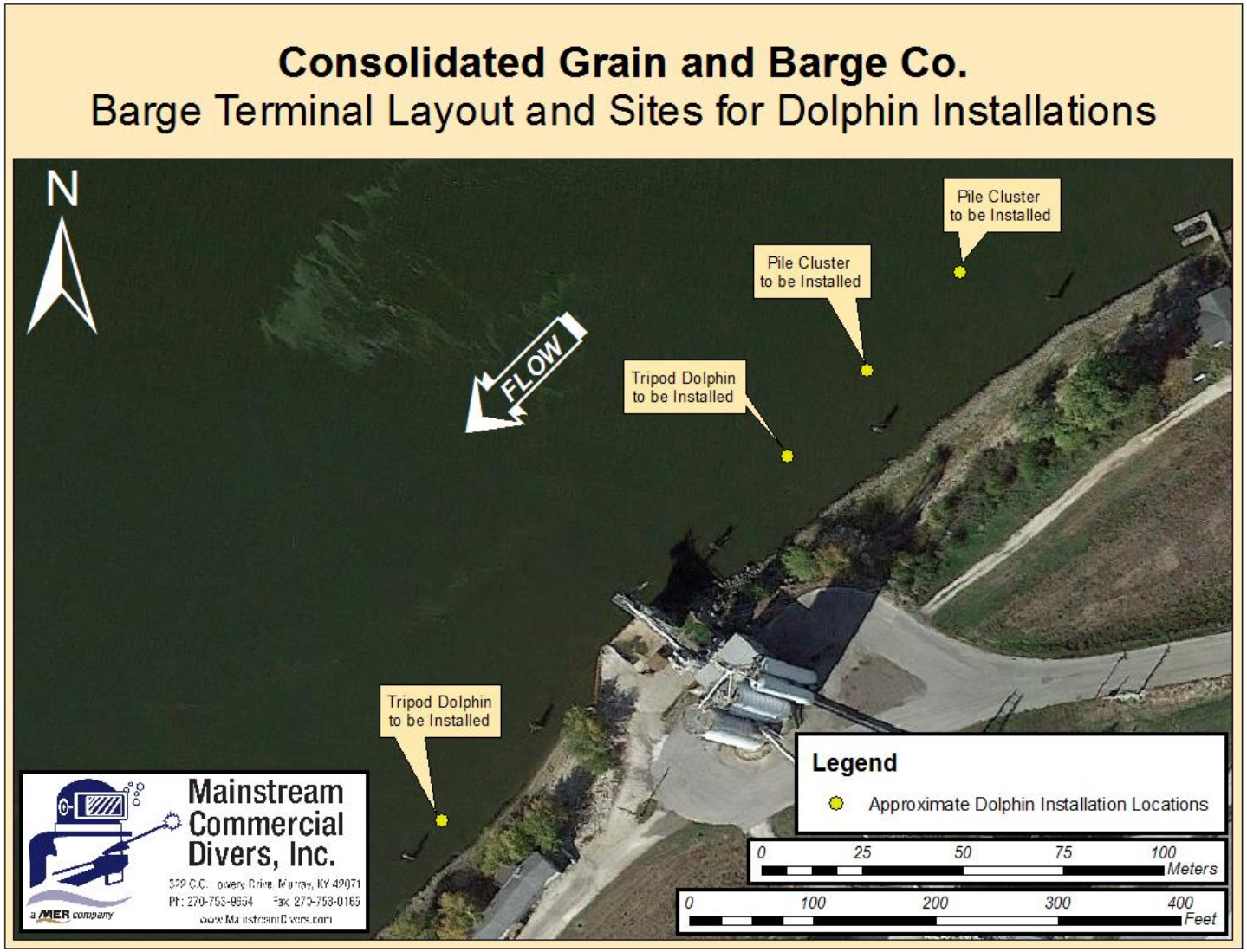

Figure 1. Site location and positions of proposed new tripod and pile clusters to be installed at the CGB Gladstone terminal

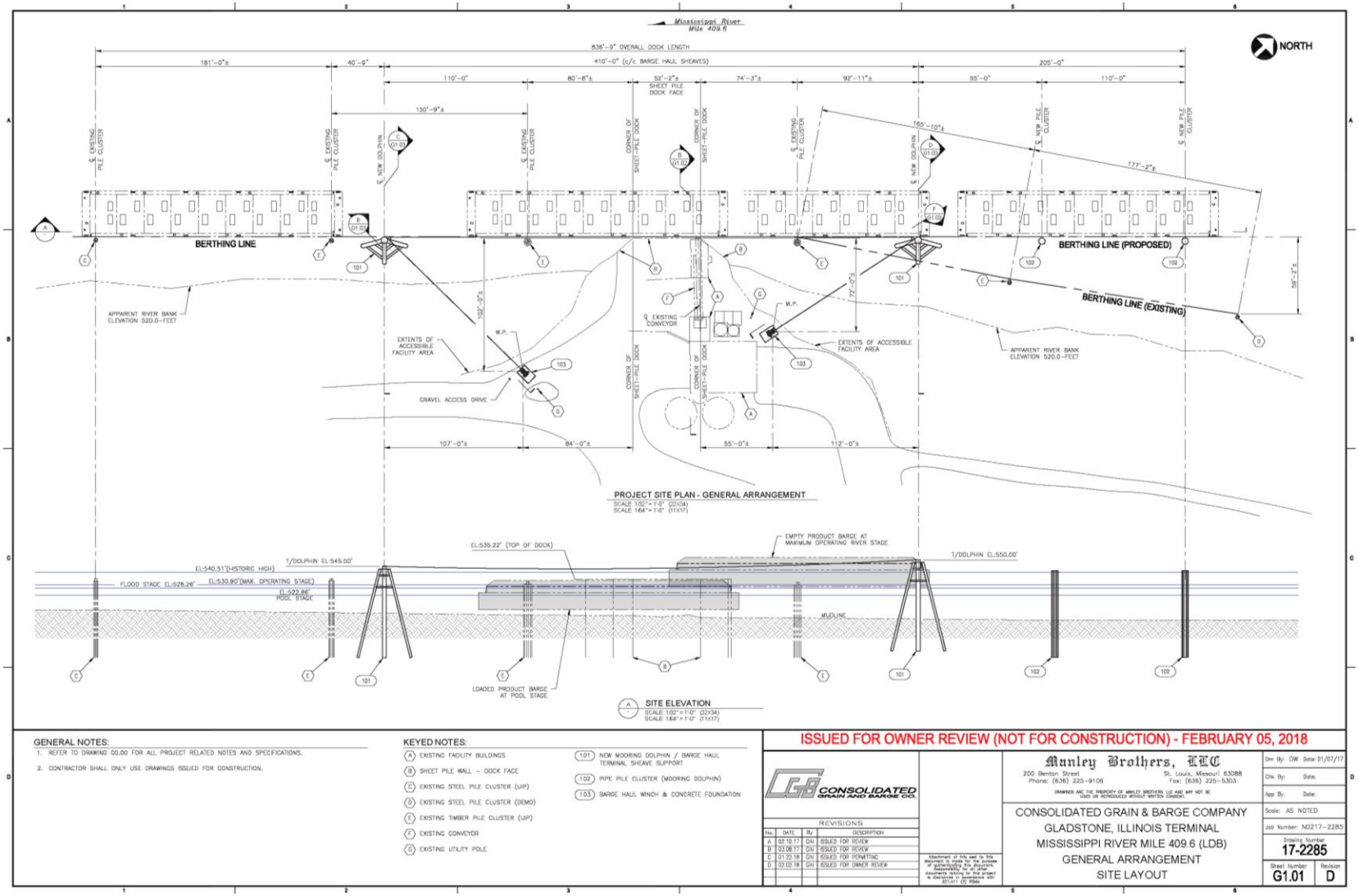

Figure 2. Drawing of proposed facility layout

Existing Facility and Proposed Project

This terminal functions as a barge loading facility used to offload grain onto barges. The current barge haul system has been a reliable system for the past several decades but it is undersized, outdated, and showing signs of wear. To update the barge haul system, CGB is proposing to add two new mooring dolphins (tripod dolphins) which will be located just upriver and downriver from the closest wood pilings to the existing dock (Figures 1 and 2). The new dolphins will be placed and engineered to handle the pulling load from the continuous loop system. In an effort to straighten the berthing line and align the barges with the barge spout and downstream dolphins, CGB is proposing to install two new pipe pile cluster dolphins a short distance upstream of the terminal to align with the facility's existing dolphins downstream of the terminal and the new proposed tri-pod dolphins (Figure 2). For this current project, CGB is seeking take for all eight mussel species, both federally and state listed, as per the statement issued by the US Army Corps of Engineers on November 9, 2017 (USACE, Appendix B)

In addition to the aforementioned project that is being immediately proposed, CGB also desires to include potential future terminal alterations, including future dolphin/pile cluster removal/ replacements, future sheet pile wall repair/replacements, and future river bank stabilization. For these projects, CGB is only seeking take for the five solely state listed species. Additionally, if or when any of these projects becomes necessary to undertake, CGB will provide proposals for each of these projects to the USFWS and the IDNR for review, as the proposals are developed.

Action Area

The action area for the immediate proposed project consists of areas (directly or indirectly) affected by the project elements. The action area includes the following:

- the 16-foot by 16-foot footprint of each of the two tripod dolphins
- a 10-foot buffer around each of the two tripod dolphin footprints
- the footprints of each of the two new 72-inch diameter pipe pile cluster dolphins
- a 10-foot buffer around each of the two pipe pile cluster dolphins
- the footprints of each of the approximately 36-inch diameter barge spuds (anticipated maximum of sixteen) used during each of the four dolphin installation operations
- a 5-foot buffer around each of the barge spud locations for each of the four dolphin installation areas

In addition to the immediate proposed project, additional work that is possible to be performed in the future within the requested duration of the facility's permit includes the following action areas:

- the footprints of each of the two currently existing 72-inch diameter pile cluster dolphins, part of the original berthing line upstream of the terminal, proposed to be removed
- a 10-foot buffer around each of the two pile cluster dolphins proposed to be removed
- a 5-foot buffer around each of the barge spud locations used during pile cluster dolphin removals

- the footprints of each of the currently existing 72-inch diameter pile cluster dolphins proposed to be replaced along the berthing line, as needed
- a 10-foot buffer around each of the pile cluster dolphins proposed to be replaced
- the footprints of each of the barge spuds used during pile cluster dolphin replacements
- a 5-foot buffer around each of the barge spud locations used during pile cluster dolphin replacements
- the footprints of each sheet pile segment proposed to be removed/replaced or repaired, as needed
- a 33-foot (10 meter) upstream buffer, a 33-foot (10 meter) lateral buffer, and a 33-foot (10-meter) downstream buffer around sheet pile segment(s) proposed to be removed/ replaced or repaired
- the footprints of each of the barge spuds used during sheet pile segment removal/ replacement
- a 5-foot buffer around each of the barge spud locations used during sheet pile segment removal/replacements
- a 33-foot (10 meter) upstream buffer, a 33-foot (10 meter) lateral buffer, and a 33-foot (10-meter) downstream buffer around areas of shoreline stabilization

The action area of the immediate proposed projects (two tripod dolphin installations, two pipe pile cluster installations, all associated spud pole impact areas, and buffer areas around all areas of direct impact) is projected to encompass approximately 5,777 square feet, or 536.7 square meters.

The action area of the future possible projects, should they be needed for the continued operation of the barge terminal (sheet pile wall segment repair/replacement, existing cluster pile dolphin removal/replacement, shoreline stabilization, and buffer areas around all areas of direct impact) is difficult to define at this time, as some of these actions have not been required in the past and may not in the future, while some may not be required unless unforeseen occurrences transpire that necessitate action on one or several of these proposed activities; however, if every project would be undertaken, the sheet pile wall segment repair/replacement actions would impact a potential maximum of approximately 45 square meters, the existing dolphin removal/ replacements would impact a potential maximum of approximately 528 square meters, and the shoreline stabilization would impact a potential maximum of approximate 45 square meters. Regardless of the chance these actions will ever be required, reasonable precautions to mitigate damage to listed species and their habitat due to these activities will be carried out.

B. Biological Description of Affected Species

According to information provided by the Illinois Department of Natural Resources, individuals of the federal and state endangered *Lampsilis higginsii* (Higgins eye mussel), the federal and state endangered *Cumberlandia monodonta* (spectaclecase mussel) have been encountered within two miles downstream of the CGB river terminal, and the state threatened *Ellipsaria lineolata* (butterfly mussel) has been encountered within four miles upstream and two miles

downstream of the terminal. Due to the two state threatened species encountered at the terminal during the survey, those being *Ligumia recta* (black sandshell mussel) and *Elliptio dilatata* (spike mussel) and the three additional aforementioned listed species encountered nearby, it was believed that three other additional state listed mussels, those being the state endangered *Fusconaia ebena* (ebonyshell mussel), the federal and state endangered *Plethobasus cyphyus* (sheepnose mussel), and the state threatened *Cyclonaias tuberculata* (purple wartyback mussel), may have the possibility to also reside near the area, although as of yet undetected, and will also be included for consideration within this conservation plan.

Spectaclecase

The spectaclecase (*Cumberlandia monodonta*) has been listed as endangered by the state of Illinois since March 17, 1989 due to restricted habitats or low populations within the state, and has been listed as a federally endangered species since March 13, 2012 (Mankowski, 2012). Their historical range was throughout much of the Mississippi River system, the upper Ohio River system, the Cumberland and Tennessee River systems and, in some tributaries of the lower Mississippi in Arkansas (NatureServe, 2017). According to NatureServe (2017), extant populations are known from 20 streams in 10 states.

The habitat preference for the spectaclecase is large rivers in areas sheltered from the main current. NatureServe states that the spectaclecase mussel is usually found in firm mud between large rocks in quiet water very near the interface with swift currents (2017). No fish hosts are known (Watters, 1994 in Parmalee and Bogan, 1998). Reported potential fish hosts for *Cumberlandia monodonta* include shorthead redhorse (*Moxostoma macrolepidotum*) and bigeye chub (*Hybopsis amblops*) (Watters, Hoggarth, Stansbery, 2009)

Cummings and Mayer (1992) describe the exterior of the shell as follows:

> Shell oblong, elongate, and compressed. Anterior and posterior ends rounded. Ventral margin usually arched or pinched, occasionally straight. Shell thin in young, becoming thicker in older individuals. Umbos only slightly elevated above the hinge line. Beak sculpture, when visible, of three or four heavy ridges. Surface of shell smooth to somewhat rough, brown in young shells, becoming dark brown to black and rayless with age. Length to 8 inches (20.3 cm).

During the 2017 survey (Mainstream, 2017; Appendix A), performed at the CGB river terminal, no *Cumberlandia monodonta* were found. Based on the historical and recent distribution records of the spectaclecase mussel provided by the IDNR, the spectaclecase mussel has been found between two to six miles downstream of the CGB river terminal as recently as August 28, 2015. (IDNR, personal communication). The federal register listing *Cumberlandia monodonta* with its endangered status states, for the upper Mississippi River system, "In general, spectaclecase population levels in the upper Mississippi River appear to have always been fairly small and difficult to locate, and are now of questionable long-term persistence" (USFWS, 2012) Given the occurrence of *Cumberlandia monodonta* within two to six miles downstream of the river

terminal, it is possible that *Cumberlandia monodonta* may be present at the action area and may be affected by the proposed projects at the site.

Ebonyshell

The ebonyshell (*Fusconaia ebena*) was listed as threatened by the state of Illinois on January 18, 1994 and was uplisted as endangered on February 21, 2014 (Mankowski, 2012). Historically, in the upper Mississippi River, the ebonyshell was a dominant species, representing as much as 75% of pre-historic shell middens and 80% of the late 19th and early 20th Century mussel beds but populations were decimated by unregulated harvest, pollution, and construction of dams to the point where the ebonyshell is now rare and distributed disproportionately among reaches (Kelner and Sietman, 2003 in NatureServe, 2017).

The most suitable habitat of the ebonyshell is large rivers with swift water and stable sandy or gravely shoals, although this species also thrives in rivers composed of sand, silt, and mud (NatureServe, 2017). Cummings and Mayer state that for the Midwest, the ebonyshell's habitat are large rivers in sand and gravel (1992). Reported potential host fish for *Fusconsia ebena* include skipjack herring (*Alosa chrysochloris*), largemouth bass (*Micropterus salmoides*), white crappie (*Pomoxis annularis*), and black crappie (*Pomoxis nigromaculatus*) (Watters, Hoggarth, Stansbery, 2009).

Cummings and Mayer (1992) describe the exterior of the shell as follows:

> Shell solid, heavy, rounded or oval, and inflated. Anterior end rounded, posterior end rounded or bluntly pointed. Dorsal margin slightly rounded, ventral margin curved, occasionally straight. Umbos low, inflated, about even with hinge line and curved downward. Beak sculpture consists of a few very weak ridges, apparent only in extremely small shells. Shell smooth with slightly elevated ridges indicating periods of growth. Periostracum rayless, light brown in young shells, becoming dark brown to black in older individuals. Length to 4 inches (10.2 cm).

During the 2017 survey (Mainstream, 2017; Appendix A), performed at the CGB river terminal, no *Fusconaia ebena* were found. Based on the historical and recent distribution records of the ebonyshell mussel provided by the IDNR, the ebonyshell mussel has been found in Adams County, Illinois, located two counties downstream of the CGB river terminal as recently as 2016 (IDNR, personal communication). Given the recent occurrence of *Fusconaia ebena* within at least 80 river miles downstream of the river terminal, it is possible that *Fusconaia ebena* may be present at the action area now or sometime in the near future and may be affected by the proposed projects at the site.

Higgins Eye

The Higgins eye (*Lampsilis higginsii*) has been listed as federally endangered since June 14, 1976, and has been listed as endangered by the state of Illinois since July 25, 1984 (Mankowski,

2012). A recovery plan for the species was approved on July 29, 1983 and revised on May 12, 2004 (USFWS, 2004). According to the revised recovery plan, the historic distribution for the Higgins eye prior to 1965 was the main stem of the Mississippi River from just north of St. Louis, Missouri, to just south of St. Paul, Minnesota; in the Illinois, Sangamon, and Rock Rivers in Illinois; in the Iowa, Cedar, and Wapsipinicon Rivers in Iowa, in the Wisconsin and St. Croix rivers in Wisconsin; and, in the Minnesota River in Minnesota (2004). Accounts of the current distribution of the Higgins eye in the upper Mississippi River show that it resides between La Crosse, Wisconsin and Muscatine, Iowa, as well as in the St. Croix and Wisconsin Rivers (Miller and Payne, 2007 in NatureServe, 2017).

The *Lampsilis higginsii* mussel is characterized as a large river species occupying stable substrates that vary from sand to boulders, but not firmly packed clay, flocculent silt, organic material, bedrock, concrete, or unstable sand (NatureServe, 2017). Cummings and Mayer state that for the Midwest, the Higgins eye's habitat is the Mississippi River, and some of its larger northern tributaries, in gravel or sand (1992). The known fish hosts for *Lampsilis higginsii* are sauger (*Stizostedion canadense*), freshwater drum (*Aplodinotus grunniens*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), walleye (*Stizostedion vitreum vitreum*), yellow perch (*Perca flavescens*), northern pike (*Esox lucius*), and black crappie (*Pomoxis nigromaculatus*) (USFWS, 2004).

Cummings and Mayer (1992) describe the exterior of the shell as follows:

> Shell rounded to slightly elongate, solid, and inflated. Anterior end rounded, posterior end bluntly pointed (males) or truncated (females). Dorsal margin straight, ventral margin straight to slightly curved. Umbos turned forward and elevated above the hinge line. Beak sculpture, if visible, of three or four double-looped ridges. Shell smooth, yellow, yellowish green, or brown with green rays, obscure on some individuals. Length of 4 inches (10.2 cm).

During the 2017 survey (Mainstream, 2017; Appendix A), performed at the CGB river terminal, no *Lampsilis higginsii* were found. Based on the historical and recent distribution records of the Higgins eye mussel provided by the IDNR, the Higgins eye mussel has been found within two miles downstream of the CGB river terminal in 1984 (IDNR, personal communication), but has been found within Henderson County as recently as August 2015 (IDNR, 2016). Given the recent occurrence of *Lampsilis higginsii* within the same county as the CGB river terminal, it is possible that *Lampsilis higginsii* may be present at the action area in low numbers and may be affected by the proposed projects at the site.

Sheepnose

The sheepnose (*Plethobasus cyphyus*) has been listed as threatened by the state of Illinois since March 17, 1989, and was uplisted to endangered on January 18, 1994 (Mankowski, 2012). It was listed as federally endangered since March 13, 2012 (USFWS, 2012). Historically, the sheepnose was known from 77 streams in 15 states. The streams included the main stem Mississippi River, Ohio River, Cumberland River, and Tennessee River, as well as many of their

tributaries. According to the U.S. Fish and Wildlife Service (2012), current known distribution consists of the following extant populations from twenty-six streams in fourteen states:

> Alabama (Tennessee River), Illinois (Mississippi, Kankakee, Ohio [*contra* Cummings and Mayer 1997], Wabash Rivers), Indiana (Ohio, Wabash, Tippecanoe, Eel Rivers), Iowa (Mississippi River), Kentucky (Ohio, Licking, Kentucky, Green, Cumberland Rivers), Minnesota (Mississippi, St. Croix Rivers), Mississippi (Big Sunflower River), Missouri (Mississippi, Meramec, Bourbeuse, Osage Fork Gasconade Rivers), Ohio (Ohio, Muskingum Rivers), Pennsylvania (Allegheny River, Tionesta Creek), Tennessee (Duck, Tennessee, Holston, Clinch, Powell Rivers), Virginia (Clinch, Powell Rivers), West Virginia (Ohio, Kanawha Rivers), and Wisconsin (Mississippi, St. Croix, Chippewa, Flambeau, Wisconsin Rivers).

The habitat preference for the sheepnose is larger streams where it is frequently found in shallow shoal habitats that have moderate to swift currents and coarse sand and gravel. The only confirmed host fish is the central stoneroller (*Campostoma anomalum*) (Watters, Hoggarth, and Stansbery, 2009), although Parmalee and Bogan (1998) state, "based on data from Surber (1913) and Wilson (1916), Fuller (1974) lists the Sauger (*Stizostedion canadense)* as the fish host for glochidia of the sheepnose".

Cummings and Mayer (1992) describe the exterior of the shell as follows:

> Shell thick, oval, or oblong, somewhat elongate, and slightly inflated. Anterior end rounded, posterior end bluntly pointed. Dorsal margin straight, ventral margin curved anteriorly, straight posteriorly. Umbos slightly elevated above the hinge line. Beak sculpture of two heavy ridges, visible only in young shells. Shell smooth, except for a row of knobs or tubercles on the center of the valve, running from the umbo to the ventral margin (sometimes obscure). A shallow sulcus or furrow present between the row of tubercles and the posterior ridge. Periostracum yellow or light brown in juveniles, becoming chestnut to dark brown in adults. Length to 5 inches (12.7 cm).

During the 2017 survey (Mainstream, 2017; Appendix A), performed at the CGB river terminal, no *Plethobasus cyphyus* were found. Based on the historical and recent distribution records of the sheepnose mussel provided by the IDNR, the sheepnose mussel has been found in Rock Island County, Illinois, located two counties upstream of the CGB river terminal as recently as 2015 (IDNR, 2016). Given the recent occurrence of *Plethobasus cyphyus* within at least 40 river miles upstream of the river terminal, it is possible that *Plethobasus cyphyus* may be present at the action area now or sometime in the near future and may be affected by the proposed projects at the site.

Purple Wartyback

The purple wartyback (*Cyclonaias tuberculata*) has been listed as threatened by the state of Illinois since April 26, 1999 (Mankowski, 2012). The general distribution of *Cyclonaias tuberculata* is, according to Parmalee and Bogan (1998):

> Upper Mississippi River drainage generally; Lake St. Clair drainage, and from Pennsylvania northwest to southern Michigan and northwestern Wisconsin (Mathiak, 1979), south to Iowa, Missouri, and Arkansas. In Canada, Lake Erie and the Sydenham River in southern Ontario (Clarke, 1981a). It occurs throughout the Tennessee and Cumberland river drainages"

The habitat that the purple wartyback typically inhabits is a gravel/mud bottom, usually in areas of current at depths of less than two to up to 20 feet (NatureServe, 2017). Reported fish hosts for *Cyclonaias tuberculata* are black bullhead (*Ameiurus melas*), yellow bullhead (*Ameiurus natalis*), channel catfish (*Ictalurus punctatus*), and flathead catfish (*Pylodictus olivaris*) (Watters, Hoggarth, and Stansbery, 2009).

Cummings and Mayer (1992) describe the exterior of the shell as follows:

> Shell round, moderately thick, and compressed to moderately inflated (large rivers). Anterior end rounded, posterior end somewhat squared off. Dorsal margin straight, a wing present behind the umbo; ventral margin curved. Umbos low, even with, or barely rising above the hinge line. Beak sculpture of numerous wavy ridges covering the surface of the umbo. Shell surface, except the anterior fourth, covered with tubercles, forming small ridges on the dorsal wing. Periostracum yellowish brown or greenish brown in young shells (rarely rayed), becoming dark brown in older shells. Length to 5 inches (12.7 cm).

During the 2017 survey (Mainstream, 2017; Appendix A), performed at the CGB river terminal, no *Cyclonaias tuberculata* were found. Based on the historical and recent distribution records of the purple wartyback mussel provided by the IDNR, the purple wartyback mussel has been found in Rock Island County, Illinois, located two counties upstream of the CGB river terminal as recently as September 2016 (IDNR, 2016). Given the recent occurrence of *Cyclonaias tuberculata* within at least 40 river miles upstream of the river terminal, it is possible that *Cyclonaias tuberculata* may be present at the action area now or sometime in the near future and may be affected by the proposed projects at the site.

Butterfly

The butterfly (*Ellipsaria lineolata*) has been listed as threatened by the state of Illinois since January 18, 1994 (Mankowski, 2012). The general distribution of *Ellipsaria lineolata* is the Mississippi River drainage from western Pennsylvania west to Minnesota, south to eastern Iowa, Kansas, Arkansas, and Oklahoma (Parmalee and Bogan, 1998).

The habitat that this species reaches its greatest abundance is in large rivers in stretches with pronounced current and a substrate of coarse sand and gravel (NatureServe, 2017). Reported fish hosts for *Ellipsaria lineolata* are freshwater drum (*Aplodinotus grunniens*), green sunfish (*Lepomis cyanellus*), and sauger (*Sander canadensis*) (Watters, Hoggarth, and Stansbery, 2009).

Cummings and Mayer (1992) describe the exterior of the shell as follows:

> Shell somewhat triangular, thick, solid, and compressed. Anterior end broadly rounded, posterior end pointed. Umbos compressed, directed forward, and not elevated above the hinge line. Posterior ridge sharply defined. Lateral surfaces broadly flattened, less so in older females. Beak sculpture, if visible, of a few fine, double-looped ridges. Shell smooth, yellow or yellowish green, with scattered brown rays that are usually broken into V-shaped or irregular rectangular blotches. Old shells with faint brown rays or rayless. Length of 4 inches (10.2 cm).

During the 2017 survey (Mainstream, 2017; Appendix A), performed at the CGB river terminal, no *Ellipsaria lineolata* were found. Based on the historical and recent distribution records of the butterfly mussel provided by the IDNR, butterfly mussel has been found within four miles upstream and two miles downstream of the CGB river terminal as recently as September 2006 and August 2015, respectively (IDNR, personal communication). Given the recent occurrence of *Ellipsaria lineolata* within two to four miles of the CGB river terminal, it is possible that *Ellipsaria lineolata* may be present at the action area and may be affected by the proposed projects at the site.

Spike

The spike (*Elliptio dilatata*) has been listed as threatened by the state of Illinois since January 18, 1994 (Mankowski, 2012). The general distribution of *Elliptio dilatata* is the entire Mississippi River drainage from the St. Lawrence River and its tributaries south to northern Louisiana and west to the tributaries of the Red River, Oklahoma (Parmalee and Bogan, 1998).

According to NatureServe (2017), the spike mussel occurs in medium streams to large rivers primarily in shoal habitat of unimpounded streams and rivers but can occasionally be found in tailwaters of dams, particularly of the Tennessee River, in water 4 to 8 meters deep and can even be found in lakes under some conditions. Reported potential fish hosts for *Elliptio dilatata* include rock bass (*Ambloplites rupestris*), banded sculpin (*Cottus carolinae*), gizzard shad (*Dorosoma cepedianum*), rainbow darter (*Etheostoma caeruleum*), yellow perch (*Perca flavescens*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), flathead catfish (*Pylodictis olivaris*), and sauger (*Sander canadensis*) (Watters, Hoggarth, and Stansbery, 2009).

Cummings and Mayer (1992) describe the exterior of the shell as follows:

> Shell solid, elongate, elliptical, and compressed to moderately inflated. Anterior end rounded, posterior end rounded to slightly pointed. Dorsal margin straight to slightly curved, ventral margin straight to curved in young shells, becoming arched in older shells. Umbos low, usually not elevated above the hinge line. Beak sculpture, if visible, of three or four heavy loops. Surface smooth, greenish brown with faint green rays visible on small shells, becoming dark brown to black in adults. Length to 5 inches (12.7 cm).

During the 2017 survey (Mainstream, 2017; Appendix A), performed at the CGB river terminal, two individuals of *Elliptio dilatata* were found. Given the presence of *Elliptio dilatata* within the proposed area of direct impact, it is possible that *Elliptio dilatata* occurs elsewhere within the action area and may be affected by the proposed projects at the site.

Black Sandshell

The black sandshell (*Ligumia recta*) has been listed as threatened by the state of Illinois since April 26, 1999 (Mankowski, 2012). The black sandshell is widely distributed throughout the Mississippi River Basin from Minnesota to western New York and Pennsylvania southwest to Oklahoma and east to the Alabama River Basin, the Red River of the North, and the St. Lawrence River Basin (Parmalee and Bogan, 1998).

NatureServe (2017) states that the *Ligumia recta* is typically found in medium-sized to large rivers in locations with strong current and substrates of coarse sand and gravel with cobbles in water depths from several inches to six feet or more, and may be found in silt. Reported potential fish hosts for *Ligumia recta* are many, and include rock bass (*Ambloplites rupestris*), redbreast sunfish (*Lepomis auritus*), central stoneroller (*Campostoma anomalum*), American eel (*Anguilla rostrata*), convict cichlid (*Cichlasoma nigrofasciatum*), common carp (*Cyprinus carpio*), banded killifish (*Fundulus diaphanus*), green sunfish (*Lepomis cyyanellus*), pumpkinseed (*Lepomis gibbosus*), orangespotted sunfish (*Lepomis humilis*), bluegill (*Lepomis macrochirus*), longear sunfish (*Lepomis megalotis*), largemouth bass (*Micropterus salmoides*), white perch (*Morone americana*), rosyface shiner (*Notropis rubellus*), yellow perch (*Perca flavescens*), white crappie (*Pomoxis annularis*), black crappie (*Pomoxis nigromaculatus*), roach (*Rutilus rutilus*), sauger (*Sander canadensis*), walleye (*Sander vitreus*), and southern platyfish (*Xiphophorus maculatus*) (Watters, Hoggarth, and Stansbery, 2009).

Cummings and Mayer (1992) describe the exterior of the shell as follows:

> Shell elongate, solid, and moderately compressed. Anterior end rounded, posterior end pointed in males, saber-shaped in females. Dorsal margin straight, ventral margin straight to curved. Umbos low, only slightly elevated above the hinge line. Beak sculpture, if visible, of two or three indistinct, double-looped bars. Shell smooth and shiny, dark green, brown, or black, with green rays visible on some individuals. Length to 8 inches (20.3 cm).

During the 2017 survey (Mainstream, 2017; Appendix A), performed at the CGB river terminal, one individual of *Ligumia recta* was found. Given the presence of *Ligumia recta* within the

proposed area of direct impact, it is possible that *Ligumia recta* occurs elsewhere within the action area and may be affected by the proposed projects at the site.

Initial Mussel Survey: Aquatic Habitat and Ecology

The surveyed aquatic habitat of the action area, as examined by the mussel survey performed by Mainstream Commercial Divers, Inc. on October 3, 2017, includes an area off the left descending shore near Mississippi River mile 409.6. The area was surveyed using two semi-quantitative searches (commonly referred to as transect searches), each measuring 100 meters and 30 meters in length, and six timed qualitative searches, two of which were twenty minutes each in duration (each performed around the pile cluster dolphins, originally proposed to be removed) and the remaining four were ten minutes each in duration, in and around the areas estimated to be impacted by the proposed two tri-pod dolphin and two pipe pile cluster dolphin installations. The 100-meter long transect was placed along the proposed berthing line over the three new dolphins proposed to be installed upstream of the river dock, extending approximately 10 meters upstream of the furthest proposed upstream dolphin to serve as the upstream buffer, and approximately 25 meters downstream of the furthest proposed downstream dolphin of the three to serve as a downstream buffer. The 30-meter long transect was placed along the current berthing line, downstream of the river dock over the absolute furthest downstream new proposed dolphin, extending from 10 meters upstream to serve as an upstream buffer to 20 meters downstream to serve as a downstream buffer. Each transect line was divided into 10-meter sections and each section was searched for mussels and suitable mussel habitat. The report of this mussel survey may be found included in this Conservation Plan as Appendix A.

Riverbed substrate composition within the survey area consisted of a pattern of primarily sand in most of the areas of transect searches. The upstream transect search exhibited gravel in many of the 10-meter sections, growing increasingly more prevalent in occurrence and diameter, transitioning into cobble, the further upstream along the transect. Along the downstream transect, the substrate was noted to be comprised of predominantly sand with a minority component of stones ranging from gravel to boulder-sized grains. Water depths at the site (at average pool elevation of 520.16 feet above mean sea level) varied from approximately 14 feet at the downstream end of Transect 2, to approximately 26 feet near the upstream end of Transect 1.

During the mussel survey, 91 live mussels representing 17 species (family *Unionidae*) were encountered, with at least 29 individual juvenile mussels (<5 years old) collected. The mussel species located at the site include: threeridge (*Amblema plicata*), spike (*Elliptio dilatata*), Wabash pigtoe (*Fusconaia flava*), plain pocketbook (*Lampsilis cardium*), white heelsplitter (*Lasmigona complanata*), fragile papershell (*Leptodea fragilis*), black sandshell (*Ligumia recta*), threehorn wartyback (*Obliquaria reflexa*), hickorynut (*Obovaria olivaria*), pink heelsplitter (*Potamilus alatus*), pink papershell (*Potamilus ohiensis*), giant floater (*Pyganodon grandis*), wartyback (*Quadrula nodulata*), pimpleback (*Quadrula pustulosa*), mapleleaf (*Quadrula quadrula*), fawnsfoot (*Truncilla donaciformis*), and deertoe (*Truncilla truncata*).

No federally listed species were encountered during the survey; however, two individuals of the state listed as threatened species *Elliptio dilatata* (spike mussel) and one individual of the state listed as threatened species *Ligumia recta* (black sandshell mussel) were encountered during the survey. One of the individuals of *Elliptio dilatata* was found within the first 10-meter section of Transect 1 and the second individual was found during Qualitative Search 4, at the proposed installation site of one of the two new pipe pile cluster dolphins. The single individual of *Ligumia recta* was found during Qualitative Search 6, at the proposed installation site of the downstream tri-pod dolphin. Overall, the most common species in the sampled mussel community was *Quadrula quadrula* at 24.18% of the observed population. Other mussel species that constituted a significant portion of the sampled community included *Amblema plicata* at 17.58% and *Obliquaria reflexa* at 14.29%. The remaining 14 mussel species each constituted less than 8% of the surveyed mussel population with four of those species being represented by only a single individual mussel. Of the sampled mussel community at the river terminal, *Elliptio dilatata* comprised 2.20%, while *Ligumia recta* comprised 1.10% (Mainstream 2017; Appendix A).

The mussel densities per total transect area were 0.37 mussels/m^2 (Transect 1) and 0.07 mussels/m^2 (Transect 2) (Mainstream, 2017; Appendix A). Based upon mussel densities per each 10-meter section, with ten sections comprising Transect 1 and three sections comprising Transect 2, and with each section approximately 10 square meters in area, the transect with the densest mussel assemblages is Transect 1, with an approximate maximum mussel density per 10-meter section of 1.7 mussels/m^2 between 20 and 30 meters from the downstream end of the transect search. The Draft Protocol for Mussel Surveys in the Ohio River Where Dredging/Disposal/ Development Activity Is Proposed, developed by the Ohio River Valley Ecosystem Mollusk Subgroup (April 2004), defines significant mussel concentrations (beds) as areas with densities $\geq$0.5 mussels/m^2. Based on this definition, neither of the two transect lines searched would be considered at or above the minimum threshold of containing a mussel concentration or mussel bed based upon the mussel concentrations of each transect's 100 or 30 square meter search areas (Tables 3 and 4 in Mainstream, 2017; Appendix A). Based upon the individual 10m^2 sections of each of the transect searches, only two of the ten total 10m^2 sections within Transect 1 would be considered at or above the minimum threshold of containing a mussel bed, with the numbers of encountered mussels in the remaining eleven sections of both transect searches falling below that threshold (Table 4 in Mainstream, 2017; Appendix A).

According to information provided by the Illinois Department of Natural Resources, individuals of the federal and state endangered *Lampsilis higginsii* (Higgin's eye mussel) and the federal and state endangered *Cumberlandia monodonta* (spectaclecase mussel) have been encountered within two miles downstream of the CGB river terminal, and the state threatened *Ellipsaria lineolata* (butterfly mussel) has been encountered within four miles upstream and two miles downstream of the terminal. Due to the two state threatened species encountered at the terminal during the survey and the three additional listed species encountered nearby, it was believed that three other additional state listed mussels, including the federally and state listed species *Plethobasus cyphyus*, may have the possibility to also reside near the area, although as of yet undetected, and will also be included for consideration within this conservation plan.

C. Description of Project Activities

Current Proposed Tripod and Pipe Pile Cluster Dolphins

The immediate proposed action at this river terminal involves the installation of two tripod dolphins and two pipe pile cluster dolphins. Each tripod dolphin will be composed of a single pile, measuring 30-inches in diameter and installed vertically, and two batter piles, each measuring 20-inches in diameter and installed at an angle to the single pile. At the mudline, these piles will be installed to measure approximately 14 feet from each other, measuring center to center. Each of the piles are approximately 75 feet in length, embedded into the river bed between approximately 25 and 30 feet, and will stand approximately 22 feet above the normal pool surface elevation for the downstream tripod dolphin and 27 feet above normal pool surface elevation for the upstream dolphin.

Each pipe pile cluster dolphin will be composed of a cluster of pipe piles that, when installed, will measure approximately 72-inches in diameter. They are planned to have a similar total length, depth of embedment, and height above the normal pool surface elevation as the tripod dolphins.

All three piles of each tripod dolphin, as well as all the piles in both of the pipe pile cluster dolphins, are expected to be driven into the river bed primarily using a vibratory hammer, with an impact hammer potentially used to finish driving the piles. The time expected to fully drive the piles for each dolphin is approximately two days, for a total of eight days for all proposed dolphin installations. Following the driving of the piles, additional time of approximately two weeks per tripod dolphin will be required to complete the necessary welded connections, with no more than two weeks per dolphin for the two pipe pile cluster dolphins. Two barges, one crane barge and one material staging barge, are expected to be used during the dolphin installation process. Each barge will be secured via a maximum of two spud poles, each 36-inches in diameter, and will spud down at each location of dolphin installation, yielding a maximum total of 16 spud pole locations for the entirety of the dolphin installation procedure.

The dolphin installation project is anticipated to begin in the late summer to early autumn 2018. The first action to be taken will be to identify a suitable relocation area, ideally a location proximately upstream of the extent of work at the terminal, for the mussels that will be removed from the action area. Identification of a release area is expected to take no more than one day, the results of which will be provided to the IDNR and the USFWS. Once the release site has been approved by the IDNR and the USFWS, relocation actions will commence. The relocation is expected to take between three to five days. A report of the relocation effort will be submitted to the IDNR and the USFWS within the completion of the relocation efforts. Construction of the two proposed tripod dolphins and the two proposed pipe pile cluster dolphins is expected to take about eight weeks.

Potential Future Existing Dolphin Removal/Replacement

Of the terminal's six existing dolphins, three lie downstream of the terminal along the berthing line, one lies upstream of the terminal along the new proposed berthing line, and two lie upstream of the terminal along the old berthing line. Each existing dolphin measures approximately 72-inches in diameter. The four dolphins that sit along the new proposed berthing line may be removed and replaced in the future, while the two dolphins upstream of the terminal not part of the new proposed berthing line may be removed with no replacements. The removal of each of these dolphins will require at least a crane barge secured with at least two spud poles, each approximately 36-inches in diameter. The footprints of the existing dolphins, the footprints of the spud poles to be used, and the buffer areas around the dolphins and spud poles, are estimated to constitute a maximum total area of approximately 528 square meters.

Should any of the four existing dolphins along the new berthing line need to be removed, they will each be replaced with a similarly sized dolphin. The installation procedure of each one of these dolphins is expected to involve the use of a vibratory hammer, with an impact hammer potentially used to finish driving the dolphin into the river bottom. The time expected to fully install each dolphin is approximately two days, for a total of eight days for all proposed dolphin installations, should they all be installed at the same time. Following the driving of the dolphin replacements, additional time of approximately two weeks per dolphin will be required to complete the necessary finishing work. Two barges, one crane barge and one material staging barge, are expected to be used during the dolphin installation process. Each barge will be secured via a maximum of two spud poles, each approximately 36-inches in diameter, and will spud down at each location of dolphin installation, yielding a maximum total of 16 spud pole locations for the entirety of the dolphin installation procedure, should all four dolphins be replaced at the same time.

None of these six dolphin removals, nor the replacements of four of them, are currently planned; however, should the need arise to remove and/or replace the dolphins, as a whole or in part, CGB would like to include the potential to do so within the proposed 10-year Incidental Take Authorization.

Potential Future Sheet Pile Removal, Replacement, and/or Repair

Through the continued use of the barge terminal, all or part of the sheet pile wall may become damaged and need to be removed, replaced, or repaired, or some combination of the three. In the process of removing a sheet pile and replacing it with a new one, a work barge may be utilized. Any work barge so utilized will likely secure itself to the face of the sheet pile wall adjacent to the section to be removed/replaced and any use of barge spuds will be unlikely. Removal and replacement actions to the sheet pile wall are expected to be performed on an as-needed basis and will likely only involve small portions of the overall wall at any one time. Repair actions are expected to be less extensive and will likely not require the use of a work barge. Such actions are anticipated to be performed in localized areas on the wall on an as-needed basis. The estimated

maximum length of sheet pile wall removal/replacement/repair that may be required is approximately 150 feet, or approximately 45 meters.

No part of the sheet pile wall is currently planned to be removed, replaced, or repaired; however, should the need arise to perform any or all of these actions, CGB would like to include the potential to do so within the proposed 10-year Incidental Take Authorization.

Potential Future Shoreline Stabilization

Through the course of time, the shoreline at the terminal may become eroded by natural weather phenomena and the ground may settle in certain places, making this erosion more prevalent. In such cases, shoreline stabilization actions may need to be taken. Should such actions become necessary, CGB has proposed to possibly stabilize appropriate areas of shoreline through the application of "riprap" or similar material armoring stone. The maximum extent of this shoreline stabilization is outlined in red on Figure 3. Much of the linear length of shoreline that may potentially be stabilized either lies behind the sheet pile wall or extends around the terrestrial footprint of the terminal further up on land, with a small area that will interface with the edge of the river at normal pool conditions. The maximum estimated length of river/riprap interface is approximately 150 feet, or approximately 45 meters. Since all areas that may be potentially required to be stabilized are anticipated to be accessible by terrestrial vehicles, armoring actions via work barge is not expected; however, should certain areas of prospective shoreline stabilization be impossible to access by terrestrial vehicles, a work barge may be required to deposit the riprap armoring stone and would require the use of spud poles to hold the barge in place during shoreline stabilization procedures. The duration of such actions is entirely dependent on the extent of stabilization that may be needed.

No part of the shoreside perimeter of the terminal's footprint is currently planned to be stabilized through the application of armoring stone; however, should the need arise to stabilize all or portions of the perimeter, CGB would like to include the potential to do so within the proposed 10-year Incidental Take Authorization.

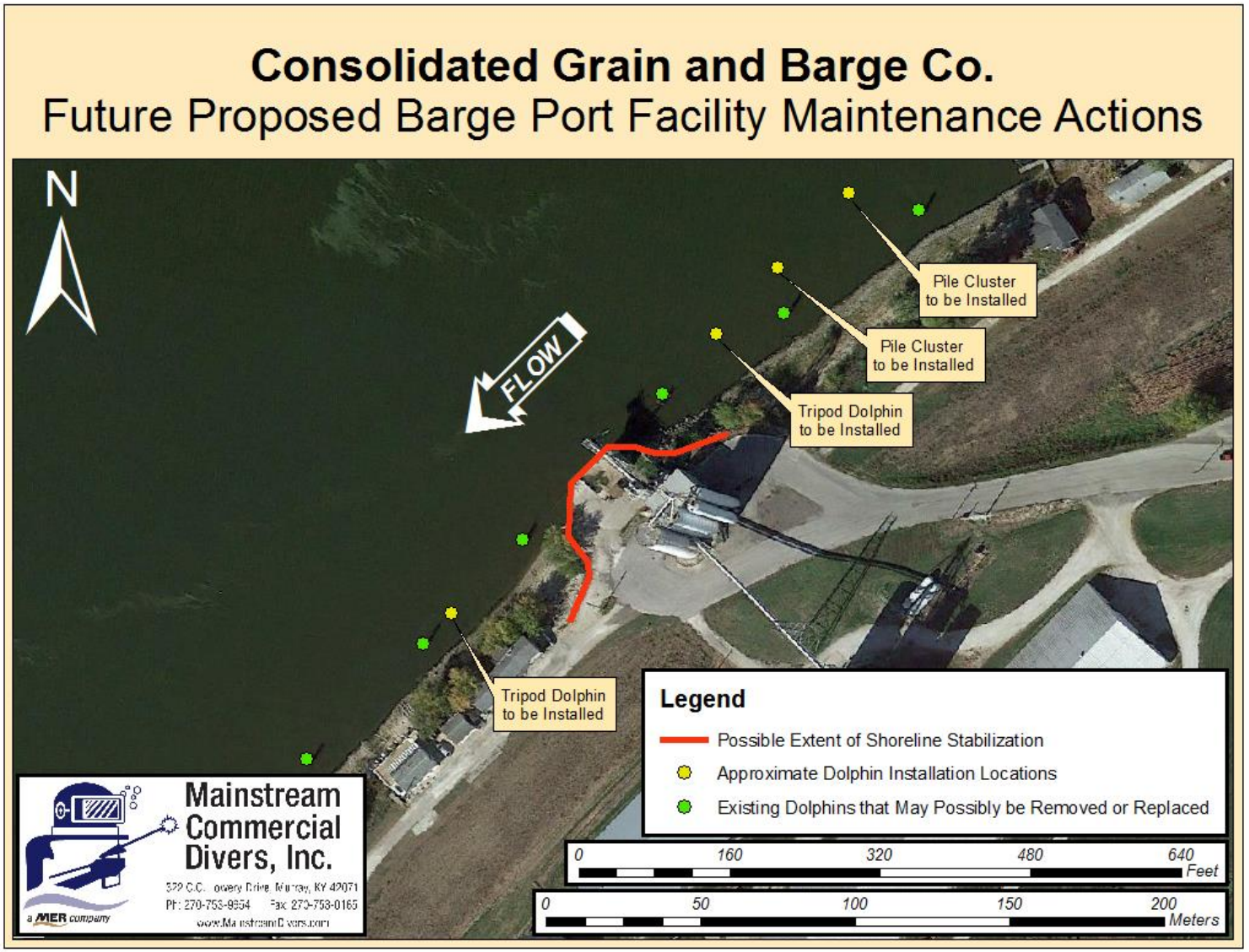

Figure 3. Work proposed to be performed at the CGB Gladstone terminal, including immediate and potential future activities.

D. Anticipated Adverse Effects on Listed Species

Current Proposed Tripod and Pipe Pile Cluster Dolphins

The installation of the four dolphin structures will result in a permanent loss of a small area of habitat for the mussels equal to the footprint of the three separate piles of each tripod dolphin (approximately 18.5 square feet for both tripod dolphins) and the footprint of each of the two 72-inch diameter pipe pile cluster dolphins (approximately 56.5 square feet for both pile cluster dolphins). There will also be temporary effects from the construction including vibration and sediment disturbances that could affect mussels and their fish hosts. Indirect effects of short-term changes in water quality and substrate are not expected to significantly alter these affected species. The vibrations during dolphin installation can cause increased stress for certain fish species, as areas subjected to persistent noise and vibration, primarily through commercial navigation, have seen reduced fish abundance and stressed fish populations in certain fish species (Gutreuter et al., 2006), and this may affect the mussel species of which they act as hosts; however, the phase of construction using the vibratory hammer is only expected to last a maximum of eight days. The vibrations during this time may still cause temporary stress on potential fish hosts to mussels, but the effects should not be significant given the short duration of expected vibratory construction methods.

If the individual mussels, particularly those of the eight previously discussed state listed species, within the areas of direct impact are not removed and relocated prior to construction, the mussels in those areas could be crushed, buried, or killed by the installation of the dolphin piles and the use of barge spuds. The proposed installation of the two tripod dolphins and the two pipe pile cluster dolphins are not expected to have an adverse impact on the listed species continued use of the area. Mussels will recolonize the areas from around the dolphin piles and spud locations where they have been removed. For this current project, a determination of “no effect” to federally listed mussels was issued by the US Army Corps of Engineers (Appendix B).

Potential Future Existing Dolphin Removal/Replacement

The possible removal and/or replacement of current dolphins is expected to pose less of an impact to the existing mussel community, since the areas where the dolphins to be replaced currently stand will be reutilized, and the areas where the dolphins that will be removed and not replaced will become available for mussel colonization. The only area around each existing dolphin, beyond that dolphin’s surrounding buffer area, that may be affected will be the direct impact of the barge spuds on the river bottom. Existing dolphins measure approximately 72-inches in diameter and potential replacements will remain approximately the same size. As such, effects from the installation procedure for replacement dolphins will be closely similar, if not identical, to the methods used for the new pipe pile cluster dolphins described earlier, and as such are not expected to present only temporary stresses to the local fish community given the short duration of the expected vibratory construction methods.

If the individual mussels, particularly those of the eight previously discussed state listed species, within the areas of direct impact are not removed and relocated prior to construction, the mussels in those areas could be crushed, buried, or killed through the use of barge spuds in the removal and installation operations. If the mussels within the buffer areas around the dolphins that may potentially be replaced are not relocated, those near the installation location of the replacement dolphin may also be crushed, buried, or killed by the dolphin installation procedure. The possible removal and replacement of the four existing dolphins along the new proposed berthing line are not expected to have an adverse impact on the listed species continued use of the area, since no area is proposed to be removed that is not already utilized. Mussels will recolonize the areas from around the replaced dolphin piles and spud pole locations where they have been removed. The possible removal of the two existing dolphins along the old berthing line are not expected to have an adverse impact on the listed species continued use of the area, since river bottom area that was once utilized will become available for mussel colonization.

CGB understands that any take authorization for this potential project will only cover the five solely state listed species, excluding the federally listed species, and that if this potential project becomes necessary to undertake, a project proposal will be provided to the USFWS and the IDNR for review.

Potential Future Sheet Pile Removal, Replacement, and/or Repair

The possible action of removing, replacing, and/or repairing sheet piles in the sheet pile wall is expected to present minimal adverse effects to the local mussel community. The possible maintenance actions on the wall will likely only involve the replacement of sheet piles with new ones, using the same river bottom footprint as the sheet pile to be removed. A work barge may be utilized in these actions, but since removal/replacement operations are expected to be performed on an as-needed basis and will likely only involve small portions of the overall wall at any one time, it is anticipated that a work barge will be secured to the sheet pile wall adjacent to the section being removed and replaced. Simple repairs to the sheet pile wall will likely not require a work barge and thus will not result in spud poles striking the river bottom, or involve other disturbances to the riverbed.

If the individual mussels, particularly those of the eight previously discussed state listed species, within and immediately around the areas of sheet pile replacement, are not removed and relocated prior to potential sheet pile removal and replacement actions, the mussels in that area could be crushed or killed by the sheet pile installation procedure. The potential future removal, replacement, and repair actions to the sheet pile wall is not expected to have an adverse impact on the listed species continued use of the area, as mussels will recolonize the areas from which they have been removed.

CGB understands that any take authorization for this potential project will only cover the five solely state listed species, excluding the federally listed species, and that if this potential project becomes necessary to undertake, a project proposal will be provided to the USFWS and the IDNR for review.

Potential Future Shoreline Stabilization

The proposed action to possibly stabilize the shoreside perimeter of the terminal's footprint is anticipated to pose a minor adverse impact to the listed species. Much of the linear length of shoreline that may potentially be stabilized either lies behind the sheet pile wall or extends around the terrestrial footprint of the terminal further up on land, with a small area that will interface with the edge of the river at normal pool conditions. Since all areas that may be potentially required to be stabilized are anticipated to be accessible by terrestrial vehicles, armoring actions via work barge is not expected, and thus direct impacts via spud poles is not expected; however, should a work barge be required to apply armoring stone, an anticipated number of two spud poles per barge will be used during shoreline stabilization operations.

If the individual mussels, particularly those of the eight previously discussed state listed species, at the river shore areas where armoring stone could enter the water or in locations where barge spud poles may be used are not removed and relocated prior to the stabilization procedure, the mussels in those areas could be crushed, buried, or killed. The potential future shoreline stabilization is not expected to have an adverse impact on the listed species continued use of the area, since mussels will recolonize the area around the locations of riprap placement or from potential barge spud pole locations and buffer areas from which they have been removed.

CGB understands that any take authorization for this potential project will only cover the five solely state listed species, excluding the federally listed species, and that if this potential project becomes necessary to undertake, a project proposal will be provided to the USFWS and the IDNR for review.

2. Mitigation/Minimization Measures

A. Plans to Minimize the Areas Affected

To minimize the effects of the currently proposed new dolphin installations on the listed species, CGB will require that the contractor performing the work will only conduct construction activities within the defined action area. In addition, CGB will also require that a mussel relocation effort is performed for all of the project's direct impact areas and associated buffer areas, and mussels will be relocated to the placement site previously approved by the IDNR and the USFWS. CGB will also require that the mussel relocation will be performed as soon as possible prior to the construction in an effort to reduce the amount of time for mussels to recolonize the depopulated action areas and their respective buffers. The relocation work will be performed by divers trained in handling mussels, and all associated work will be managed and supervised by a qualified malacologist.

To minimize the effects of the potential future removal of any of the six existing dolphins, and the subsequent replacement of the four dolphins aligned along the proposed new berthing line,

on the listed species, CGB will require that the contractor performing the work will only conduct construction activities within the defined action areas. In addition, CGB will also require that a mussel relocation effort is performed for all direct impact areas of the barge spud poles as well as all associated buffer areas, and mussels will be relocated to the placement site previously approved by the IDNR and the USFWS. CGB will also require that the mussel relocation will be performed as soon as possible prior to the removal and/or replacement activities in an effort to reduce the amount of time for mussels to recolonize the depopulated action areas and their respective buffers. The relocation work will be performed by divers trained in handling mussels, and all associated work will be managed and supervised by a qualified malacologist. Furthermore, the removal of the two dolphins along the old berthing line will create more open area, approximately 56 square feet, on the river bottom for mussel recolonization.

To minimize the effects of potential future sheet pile removals, replacements, and repairs on listed mussels, CGB will require that a mussel relocation will be performed for the buffer area around sheet pile cells that are expected to be removed and replaced, as well as for the direct impact area and associated buffer areas for spud poles, if they are needed during the removal/replacement actions. The mussels removed from the buffer area, and potential spud pole impact areas, will be relocated to the placement site previously approved by the IDNR and the USFWS. CGB will also require that the mussel relocation will be performed as soon as possible prior to the removal and replacement activities in an effort to reduce the amount of time for mussel to recolonize the depopulated buffer area. The relocation work will be performed by divers trained in handling mussels, and all associated work will be managed and supervised by a qualified malacologist. No effect to the river bottom, and thus to listed mussels, is expected for repairs to the sheet pile wall that do not include removal and replacement of sheet piles.

To minimize the effects of potential future shoreline stabilization actions on listed mussels, CGB will require that mussels within the buffer area of the shore or sheet pile wall where riprap stone may interact with the river bottom, as well as within the footprint and respective buffer area of barge spuds should a work barge be needed, will be relocated to the placement site previously approved by the IDNR and the USFWS. CGB will also require that the mussel relocation will be performed as soon as possible prior to the shoreline stabilization actions in an effort to reduce the amount of time for mussels to recolonize the depopulated areas. The relocation work will be performed by divers trained in handling mussels, and all associated work will be managed and supervised by a qualified malacologist. If CGB is able to perform shoreline stabilization measures in such a way where no armor stone interacts with the water or river bottom, such as during low river pool conditions, then no mussel relocation will be required.

Potential future projects will require pre-construction surveys and if federally listed species are found, then a revision to this Conservation Plan will require a Public Notice.

B. Number of Individual Mussels That Will be Taken

Based on the findings of the semi-quantitative searches during the mussel survey performed at the CGB terminal in October 2017, thirty-nine live mussels from twelve species were located

within approximately 130 square meters (Mainstream 2017; Appendix A). This results in an estimated mussel community density of 0.3 mussels/m^2 at the survey site.

Current Proposed Tripod and Pipe Pile Cluster Dolphins

When the density of 0.3 mussels/m^2 is multiplied by the total area of direct impact areas and all associated buffer areas for the two new tripod dolphins and the two new pipe pile cluster dolphins, approximately 536.7 square meters, the number of mussels estimated to be taken is approximately 161 mussels. Since spike mussels comprised 2.2% of the sampled mussel community, an estimated number of approximately four *Elliptio dilatata* are expected to be relocated. Additionally, since black sandshell mussels comprised 1.1% of the sampled mussel community, an estimated number of two *Ligumia recta* are expected to be taken. Since no individuals of the remaining six mussel species were encountered at the site during the 2017 survey efforts, it is assumed that they reside here at concentrations equal to or below that of *Ligumia recta*. As such, an estimated range of one to two individuals of each of the remaining six species, those being *Cumberlandia monodonta*, *Fusconaia ebena, Lampsilis higginsii, Plethobasus cyphyus, Cyclonaias tuberculata,* and *Ellipsaria lineolata,* are expected to be taken.

Potential Future Existing Dolphin Removal/Replacement

The possible removal of the each of the six existing dolphins, involving a 10-foot wide circular buffer area around the dolphin as well as the estimated use of two 36-inch diameter barge spud poles for the crane barge and their 5-foot wide circular buffer area, is anticipated to impact approximately 71.4 square meters. If the dolphin will then be replaced, and assuming that the replacement will occur immediately following the dolphin removal, two additional spud poles will be required for an accompanying material barge, supplying an additional 25 square meters of impact and buffer area. This yields approximately 96.4 square meters of mussel relocation area for an existing dolphin that may need to be removed and replaced. Each dolphin proposed to only be removed would require approximately 22 mussels to be taken, and each dolphin proposed to be removed and replaced would require approximately 29 mussels to be taken. Since spike mussels and black sandshell mussels comprised 2.2% and 1.1%, respectively, of the sampled mussel community, an estimated number of mussels to be taken would be no more than one for each of the two species. Since the remaining three solely state listed species are assumed to reside there at concentrations equal to or below that of *Ligumia recta*, no more than one individual of each species is expected to be taken for each dolphin removal. The estimated mussel occurrences are similarly low for each dolphin removal and subsequent replacement.

Assuming all six dolphins are needed to be removed at the same time and the four along the proposed new berthing line were immediately replaced with similar dolphins, a grand total of 528.4 square meters of river bottom would be searched for mussels and relocated. Using the 0.3 mussels/m^2 density determined from the October 2017 mussel survey, the number of mussels estimated to be taken for all six dolphin removals and four dolphin replacements is approximately 159 mussels. If all six dolphins were removed and the four were subsequently

replaced, then no more than four individuals of *Elliptio dilatata*, no more than two individuals of *Ligumia recta*, and no more than one to two individuals of the remaining three solely state listed species, would be expected to be taken.

Potential Future Sheet Pile Removal, Replacement, and/or Repair

Ascertaining a mussel take for any potential sheet pile removal and replacement operation is difficult to determine, since no definite area of the sheet pile wall is currently proposed to be removed and replaced, and it is uncertain as to whether a work barge will require the use of spud poles. Should removal and replacement of sheet piles be required in the future, the 0.3 mussels/m^2 concentration will be multiplied by the proposed operation footprint's area, tentatively estimated to measure a maximum of 45 square meters, resulting in a take of approximately 14 mussels. Since spike mussels and black sandshell mussels comprised 2.2% and 1.1%, respectively, of the sampled mussel community, an estimated number of mussels to be taken would be no more than one for each of the two species. Since the remaining three solely state listed species are assumed to reside there at concentrations equal to or below that of *Ligumia recta*, no more than one individual of each species is expected to be taken for the entire future proposed project.

Potential Future Shoreline Stabilization

Ascertaining a mussel take for any potential shoreline stabilization operations is impossible to determine, since no definitive area of the terminal's shoreside perimeter is proposed to be stabilized through the application of armoring stone, and that interaction between the armoring stone and the river bottom may be avoided altogether, should appropriate conditions arise. Should shoreline stabilization be required in the future and should the work entail that armoring stone will interact with the river bottom, the 0.3 mussels/m^2 concentration will be multiplied by the proposed stabilization activity's direct impact area, tentatively estimated to measure a maximum of 45 square meters, resulting in a take of approximately 14 mussels. Since spike mussels and black sandshell mussels comprised 2.2% and 1.1%, respectively, of the sampled mussel community, an estimated number of mussels to be taken would be no more than one for each of the two species. Since the remaining three solely state listed species are assumed to reside there at concentrations equal to or below that of *Ligumia recta*, no more than one individual of each species is expected to be taken for the entire future proposed project.

C. Plans for Management of the Area

The proposed installation of the two tripod dolphins and the two pipe pile cluster dolphins is not expected to have an impact on the listed species continued use of the area. At this time, there are no planned maintenance activities. Of the activities that may be performed in the future, the replacement actions for existing dolphins will be very similar to the new proposed tripod and pipe pile cluster dolphin installation actions and are likewise not expected to have an impact on the listed species continued use of the area, whether one existing dolphin or all four are replaced.

Figure 3 highlights the maximum extent of shoreline and terrestrial stabilization, which also includes the linear stretch of the sheet pile wall at the interface with the river. Although no stabilization of the shoreline or repair/ replacement of the sheet pile wall is currently planned, much of the work of shoreline stabilization will be performed on land and is not expected to have an impact on the listed species continued use of the area. Proposed replacement or repair work on the sheet pile wall will likewise be performed on discrete, localized portions and is not expected to have an impact on the listed species continued use of the area.

D. Description of Avoidance, Minimization, and Mitigation Measures

Prior to construction activities, mussels will be collected by hand from within the project's direct impact areas and their respective buffer areas and relocated to a site previously approved by the USFWS and the IDNR. The relocation area will be one with comparable conditions to the area from which the mussels were removed. The relocation will occur as soon as possible prior to the start of construction activities in an effort to reduce the amount of time for mussels to recolonize the depopulated areas.

During relocation activities, mussels will be temporarily held in containers, such as mesh bags suspended in river water, designed to maintain adequate moisture and temperatures similar to the natural conditions to which the mussels are accustomed, until they can be deposited at the placement area. Mussel relocation protocols will be followed, and to avoid adverse water and air temperature stresses to the mussels, the relocation will be performed between May 1 and October 31. If relocation actions are required outside of this timeframe, due to a delayed construction schedule or some other reason, approval from the IDNR and the USFWS will be sought to perform the mussel relocation outside the standard surveying window. A report of the relocation effort will be submitted to the USFWS and the IDNR in a timely manner following the completion of the relocation.

Contractors performing the dolphin installations, and other described work that may occur, will conduct construction activities within each project's action area and not beyond. The vibratory hammer is planned to be used for installation of the new dolphins for the duration of approximately two days per dolphin, for an anticipated duration of eight days. Construction of the proposed new tripod and pipe pile cluster dolphins is expected to begin late summer to early autumn 2018 and is anticipated to last for a duration of eight weeks.

The IDNR, in their conservation plan guidelines, requires that applicants provide mitigation measures that must be 5.5 times larger than the adverse impacts from the applicant's proposed activities. In other conservation plans, the IDNR uses an aquatic scaling tool that takes into account the status and population trends of the relevant mussel species, the project footprint size, the degree of impact, and the estimated take for each project to determine an appropriate mitigation measure. For the immediate and potential future projects outlined above, and for the relevant mussel species that the IDNR has decided to likely be impacted, the IDNR has returned the mitigation value of $22,321. In addition to the measures that CBG will employ to avoid and/or minimize the effects of their proposed actions on endangered or threatened species, CGB will also provide the full amount of the $22,321 mitigation. CGB understands that the mitigation

value took into consideration potential impacts to the five solely state listed species for any of the potential future projects. Additionally, the State of Illinois is not considering what the USFWS may impose at a later date, if any federally listed species are located within the action area of these proposed projects.

E. Plans for Monitoring the Effects of the Implemented Measures

Monitoring of the survey site and the relocation area will be performed in years 1 and 3 (2019 and 2021) following the proposed installation of the two new tripod dolphins and the two new pipe pile cluster dolphins, which is anticipated to occur in 2018.

It is proposed that monitoring efforts include the areas that were surveyed in October 2017 by Mainstream Commercial Divers, Inc. This survey included a semi-quantitative search over the locations of the proposed upstream tripod dolphin and both proposed pipe pile cluster dolphin, as well as another semi-quantitative search over the location of the proposed downstream tripod dolphin. Additionally, the survey included timed qualitative searches at and around the locations of all four proposed new dolphins. By using this approach, the initial survey becomes a baseline that can be compared to the future monitoring efforts. Monitoring efforts will include the relocation area to assess survival of the transplanted mussels and to help determine if there is a change in the mussel resource in the area that is unrelated to the project site.

Additionally, following potential relocation activities prior to the possible future maintenance actions at the Gladstone terminal, monitoring efforts at the potential action areas and the relocation area will be performed in years 1 and 3 following those possible maintenance actions.

Results of the monitoring surveys will be coordinated with the USFWS and the IDNR. Reports of the monitoring surveys will be completed in a timely manner following the survey efforts and will be submitted to the USFWS and the IDNR.

F. Adaptive Management Practices to Deal with Changed or Unforeseen Circumstances

Potential mussel relocation areas will be carefully assessed to assure that habitat is suitable for transfer of mussels and that risks of external threats to the relocation area, such as siltation, chemical spills, or significant disturbance, are minimized. Ideally, the relocation area will be located immediately upstream of the extent of activities at the terminal and a suitable location will be searched for at and nearby this area. The relocation will be performed according to accepted standards to minimize mussel mortality.

In the event that one or more live individuals of any species that is listed with the state of Illinois other than *Cumberlandia monodonta*, *Fusconaia ebena, Lampsilis higginsii*, *Plethobasus cyphyus*, *Cyclonaias tuberculata*, *Ellipsaria lineolata*, *Elliptio dilatata,* or *Ligumia recta* is encountered during the relocation effort, the Incidental Take Authorization Coordinator with the IDNR and the Resource Planner of the Impact Assessment Section with the IDNR will be notified immediately. If a federally listed species other than *Cumberlandia monodonta*,

Lampsilis higginsii, or *Plethobasus cyphyus* is encountered, the appropriate agents within the USFWS will be notified immediately.

G. Verification that Funding Exists to Support Proposed Mitigation Activities

CGB, as this project's sponsor, is responsible for the implementation and operation of this grain barge terminal. CGB funded the mussel survey of 2017, and CGB is committed to protecting listed mussel species in accordance with federal and state regulations. CGB will fund mussel relocation and mitigation efforts, pertaining to project construction in accordance with their permits, and subsequent monitoring surveys.

3. Alternative Actions that Would Not Result in Take

An alternative to the immediate proposed new dolphin installations and resulting take would be to not install the dolphins, which are intended to provide the framework for a straightened berthing line and support for the facility's continuous loop system for moored barge movement. With this approach (to not install the dolphins), there would be no need to relocate the mussels from the action areas. However, this "no-action" alternative would leave the terminal in its current undersized state where barges must be maneuvered around the angled berthing line or out to the river in order to fill more than a single barge. Furthermore, the barge loading facility has been in operation for over 40 years and the current barge haul system has been a reliable system during that time; however, in addition to being undersized, a "no-action" alternative results in a terminal that is outdated and will continue to show ever increasing signs of wear. As such, no other alternative action exists.

4. Data to Assure the Proposed Take Will Not Reduce the Survival of Species

According to species-by-county records provided by the IDNR (2016), *Cumberlandia monodonta* occurs in nine Illinois counties, including an encounter in 2015 from Henderson County, approximately two miles downstream of the CGB project area. *Fusconaia ebena* occurs in twenty Illinois counties, primarily from the Ohio River and its tributaries, although recent encounters with it have occurred within the Mississippi River in Adams County. *Lampsilis higginsii* occurs in five Illinois counties, including two encounters within Henderson County. *Plethobasus cyphyus* occurs in eleven Illinois counties, including seven recent encounters evenly distributed in the Mississippi River between Hannibal, Missouri and the Quad Cities (IDNR; personal communication). *Cyclonaias tuberculata* occurs in fifteen Illinois counties, primarily in the headwaters of the Illinois and Wabash Rivers, although recent encounters with it have occurred within the Mississippi River in Rock Island County. *Ellipsaria lineolata* occurs in fourteen Illinois counties, including four encounters within Henderson County, the most recent of which occurred in 2015 approximately two to five miles downstream of the CGB project area. *Elliptio dilatata* has been encountered in twenty-seven Illinois counties, including a 2016

encounter in Rock Island County. *Ligumia recta* has been encountered in thirty-two Illinois counties, with several recent encounters along the Mississippi River and many of its tributaries.

Due to the small area expected to be affected by the installation of the four new dolphins, the barge spuds used during their installation, and the mussel relocation from areas of impact from construction activities, it is expected that these eight species will continue to exist in this area of the Mississippi River. Additionally, the small area estimated to be affected by facility maintenance actions that may occur, those being the replacement of four existing dolphins, replacement/repair of the sheet pile wall, shoreline stabilization actions, the barge spuds that may be used during these actions, as well as the mussel relocation from areas of construction impact, it is expected that these eight species will likewise continue to exist in this area of the Mississippi River and the proposed projects will not reduce the survivability of the aforementioned eight state listed species within the State of Illinois.

5. Implementing Agreement

A. Names and Signatures of all Participants in the Execution of the Conservation Plan

Please see the following page for the names and signatures of participants in the execution of this conservation plan.

Participants in the Execution of the Conservation Plan:

Consolidated Grain & Barge Co.

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Mainstream Commercial Divers, Inc.

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B. The Obligations and Responsibilities of Each of the Identified Participants

The Illinois Department of Natural Resources is responsible for the review of the conservation plan and for the subsequent issuance of the Incidental Take Authorization.

Consolidated Grain & Barge Co. is responsible for securing authorization for the Incidental Take Authorization and for implementing the proposed Conservation Plan, which will include hiring a qualified contractor to conduct the mussel relocation and subsequent monitoring surveys. CGB is also responsible for securing all necessary permits and authorizations to execute this Conservation Plan.

Mainstream Commercial Divers, Inc. (MCDI) is the consulting company retained by CGB to assist with the preparation of the Incidental Take Application. MCDI conducted the initial mussel survey for this project in October 2017 and will likely be responsible for the identification of a suitable release area, mussel relocation work, and subsequent monitoring surveys.

Project construction is anticipated to begin in late summer or early autumn 2018, or once the ITA has been issued and mussel relocation is complete. It is expected to be completed by autumn 2018. Relocation efforts will be conducted as soon as possible prior to the installation of the four new dolphins and the temporary use of necessary barge spuds.

In accordance with Administrative Code 1080.10(a)(5)(B), a report will be provided to the IDNR within 90 days after the installation of the four new mooring dolphins is complete, an annual report will be provided each January to detail what has occurred under the authority of the ITA each year, and that a completion report will be provided to the IDNR within 90 days after any future projects.

C. Certification of Each Participant's Legal Authority

By their signature, participants listed on the previous page certify that prior to starting work on the project, their respective organizations will obtain the necessary permits, authorizations, and permissions to carry out their respective obligations and responsibilities under the Conservation Plan.

D. Assurance of Compliance with all Pertinent Regulations

CGB and its contractors will comply with all applicable federal, state, and local regulations. CGB and its contractors will also comply with all conditions and requirements associated with the authorizations and permits obtained to execute this project and this Conservation Plan.

E. Copies of any Final Federal Authorizations, if any

An initial site survey was conducted in October 2017 by Mainstream Commercial Divers, Inc. The mussel survey recovered two state threatened spike mussels and one state threatened black

sandshell mussel. No other state listed species were encountered, and no federally listed species were encountered. CGB has received a letter from the US Army Corps of Engineers, Rock Island District (dated November 9, 2017; CEMVR-OD-P-2017-423), stating that "*based on the mussel survey conducted on October 3, 2017, there are no federally endangered mussels in the project area; therefore, the Corps has made a determination of no effect on federally threatened and endangered species or critical habitat.*" This letter may be found included in this Conservation Plan as Appendix B.

In communication with IDNR regarding the aforementioned statement of "no effect" from the US Army Corps of Engineers, Rock Island District, it was made clear that this statement of "no effect" only applies to the action proposed and reviewed by the federal government, namely the installation of the four new mooring dolphins, and nothing more. The IDNR stated that they cannot include the three federally listed species listed in this Conservation Plan (*Cumberlandia monodonta, Lampsilis higginsii,* and *Plethobasus cyphyus*) in the permit for any potential future actions. The USFWS Illinois-Iowa Field Office and the IDNR must review any of the potential future actions that are included in this Conservation Plan as they are proposed in order to make a ruling as to whether the proposed action or actions will have an effect or no effect on federally listed mussel species.

LITERATURE CITED

Cummings, Kevin S, and Christine A. Mayer. 1992. Field Guide to Freshwater Mussels of the Midwest. Champaign: Illinois Natural History Survey. Print.

Gutreuter, S., J. M. Vallazza, and B. C. Knights. 2006. Persistent Disturbance by Commercial Navigation Alters the Relative Abundance of Channel-Dwelling Fishes in a Large River. Canadian Journal of Fisheries and Aquatic Sciences 63:2418-2433

Illinois Department of Natural Resources. 2016. Citing Websites. In: Illinois Threatened and Endangered Species by County, Illinois Natural Heritage Database as of October 6, 2016. 79 pp. Published online at https://www.dnr.illinois.gov/ESPB/Documents/ET_by_County.pdf

Mainstream Commercial Divers, Inc. 2017. A Mussel Survey for New Dolphin Installations and Old Pile Cluster Removals near Upper Mississippi River Mile 409.6, along the Left Descending Bank. Prepared for Consolidated Grain & Barge Co. 17 pp.

Mankowski, A. 2012. The Illinois Endangered Species Protection Act at Forty: A Review of the Act's Provisions and the Illinois List of Endangered and Threatened Species. Illinois Endangered Species Protection Board, Springfield, Illinois. 152 pp. Published online at http://www.dnr.illinois.gov/ESPB/Pages/default.aspx.

NatureServe. 2017. Citing Website. NatureServe Explorer: An online encyclopedia of life [web application] Version 7.1. Retrieved February 2018 from http://explorer.natureserve.org Date of last data update: November 2016.

Parmalee, Paul Woodburn, and Arthur E. Bogan. 1998. The Freshwater Mussels of Tennessee. Knoxville: University of Tennessee. Print.

Southwick, R. I., and A. J. Loftus, editors. 2017. Investigation and Monetary Values of Fish and Freshwater Mollusk Kills. American Fisheries Society, Special Publication 35, Bethesda, Maryland

U.S. Fish and Wildlife Service (USFWS), 2004. Citing Websites. In: U.S. Fish and Wildlife Higgins Eye Pearlymussel (Lampsilis higginsii) Recovery Plan: First Revision. Retrieved 2018 from https://ecos.fws.gov/docs/recovery_plan/040714.pdf

U.S. Fish and Wildlife Service (USFWS). 2012. Citing Websites. In: USFWS Endangered Species, Midwest Region. Retrieved 2017 from http://www.fws.gov/midwest/endangered/clams/sheepnose/pdf/FRFinalListRuleSheepnoseSpecMarch2012.pdf

Watters, G. Thomas., Michael A. Hoggarth, and David H. Stansbery. 2009. The Freshwater Mussels of Ohio. Columbus: Ohio State UP. Print.

APPENDIX A:
Mainstream Commercial Divers, Inc.
Mussel Survey Report, 2017
Mississippi River Mile 409.6

A MUSSEL SURVEY FOR NEW DOLPHIN INSTALLATIONS AND OLD PILE CLUSTER REMOVALS NEAR UPPER MISSISSIPPI RIVER MILE 409.6, ALONG THE LEFT DESCENDING BANK

Performed for:

Consolidated Grain and Barge Co.

Mainstream Commercial Divers, Inc.
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Report Prepared by:

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October 2017

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOS

A Mussel Survey for New Dolphin Installations and Old Pile Cluster Removals Near Upper Mississippi River Mile 409.6, Along the Left Descending Bank

ABSTRACT

Mainstream Commercial Divers, Inc. (MCDI) conducted a mussel survey at approximate Upper Mississippi River Mile (UMRM) 409.6 for Consolidated Grain and Barge Co. (CGB). The mussel survey was performed at CGB's river dock at areas where four new mooring dolphins are proposed to be installed and two currently existing pile clusters are proposed to be removed. To assess the mussel community within and around the areas of construction and demolition, a mussel survey was performed to search these areas using semi-quantitative (transect) and qualitative methods. The survey was designed to assess the current mussel fauna in an effort to determine if concentrations of mussels exist and if the potential exists for listed endangered or threatened mussel species to be present in the areas expected to be impacted by the construction and demolition activities.

On October 3rd, 2017, divers having experience in mussel collection conducted a systematic search of the area in an effort to retrieve as many native mussels (via hand digging in the substrate) as possible. The mussel survey consisted of two transect searches. The first transect search measured 100 meters in length and was placed along the proposed berthing line over the locations of the three new dolphins proposed to be installed upstream of the river dock, extending approximately 10 meters upstream of the furthest proposed upstream dolphin to serve as the upstream buffer, and approximately 25 meters downstream of the furthest proposed downstream dolphin of the three to serve as a downstream buffer. The second transect search measured 30 meters in length and was placed along the current berthing line, downstream of the river dock over the absolute furthest downstream new proposed dolphin, extending from 10 meters upstream to serve as an upstream buffer to 20 meters downstream to serve as a downstream buffer. Each of the transect lines were divided into 10-meter sections, and the mussels from each section were recorded separately. The divers searched an area one meter wide along the length of each transect line and spent a minimum of five minutes searching each 10-meter section to locate mussels or suitable mussel habitat. Timed qualitative searches, six in total, were also performed in areas where the four new dolphins are proposed to be installed and around the two pile clusters proposed to be removed. The mussels from each section of each transect search and from each timed qualitative search were recorded separately for species and approximate age.

During the survey, 91 live mussels from 17 species were encountered. The mussel species found at the site were *Amblema plicata, Elliptio dilatata, Fusconaia flava, Lampsilis cardium, Lasmigona complanata, Leptodea fragilis, Ligumia recta, Obliquaria reflexa, Obovaria olivaria, Potamilus alatus, Potamilus ohiensis, Pyganodon grandis, Quadrula nodulata, Quadrula pustulosa, Quadrula quadrula, Truncilla donaciformis,* and *Truncilla truncata.* At least 29 juvenile mussels (<5 years old) were encountered during the survey. No federally listed mussel species were encountered, however two species listed as threatened by the state of Illinois were encountered during the survey. These two species are *Elliptio dilatata*, the spike mussel, of which two were found, one within the first 10-meter section of Transect 1 and one during Qualitative Search 4, and *Ligumia recta,* the black sandshell mussel, of which one was found during Qualitative Search 6.

INTRODUCTION

At approximate Upper Mississippi River Mile (UMRM) 409.6, Consolidated Grain and Barge Co. (CGB) is proposing to modify their river dock by installing four new mooring dolphins and removing two currently existing pile clusters. To assess the mussel community within and around the areas of construction and demolition, a mussel survey was performed to search these areas using semi-quantitative and qualitative methods (Figure 1).

On the date of October 3rd, 2017, a mussel survey was conducted by Mainstream Commercial Divers, Inc. (MCDI) at and around CGB's river dock near UMRM 409.6, along the left descending bank.

The survey was designed to assess the current mussel fauna in an effort to determine if concentrations of mussels exist and if the potential exists for listed endangered or threatened mussel species to be present in the areas expected to be impacted by the proposed dolphin installations and the proposed pile cluster removals.

METHODS

The mussel survey consisted of two semi-quantitative searches (commonly referred to as transect searches), measuring 100 meters and 30 meters in length, and six timed qualitative searches, two of which were twenty minutes each in duration and the remaining four were ten minutes each in duration, in and around the area estimated to be impacted by the proposed dolphin installations and pile cluster removals.

The 100-meter long transect was placed along the proposed berthing line over the three new dolphins proposed to be installed upstream of the river dock, extending approximately 10 meters upstream of the furthest proposed upstream dolphin to serve as the upstream buffer, and approximately 25 meters downstream of the furthest proposed downstream dolphin of the three to serve as a downstream buffer. The 30-meter long transect was placed along the current berthing line, downstream of the river dock over the absolute furthest downstream new proposed dolphin, extending from 10 meters upstream to serve as an upstream buffer to 20 meters downstream to serve as a downstream buffer (Figure 1). Each transect line was divided into 10-meter sections and

each section was searched for mussels and suitable mussel habitat.

Additionally, six timed qualitative searches were performed at the site, with four performed within and around the four areas where the dolphins are proposed to be installed and two performed around the two pile clusters proposed to be removed. In accordance with the recommendations from the Illinois Department of Natural Resources, the search area around the two pile clusters measured approximately 15 feet from the outer edge of the approximately 5-foot wide clusters to achieve the suggested buffer area of three times the impact area. A similar search area was applied to the four qualitative searches at the proposed dolphin installation locations. Each of the two searches around the pile clusters lasted a duration of 20 minutes each, and the four searches areas at the locations of the dolphin installations lasted a duration of 10 minutes each. (Figure 1).

Transect search positions and the placements of the approximate centers of the timed qualitative search areas were located in the field using ArcPad GIS software connected to a Trimble AG332 DGPS, giving sub-meter position accuracy (Table 1).

Mussels were collected by a professional dive crew having considerable experience in mussel survey techniques and certified to meet all Association of Diving Contractors International (ADCI) and Occupational Safety and Health Administration (OSHA) diving requirements. The divers searched an area one meter wide along one side of each transect line and all mussels located within each 10-meter long section were sent to the surface for identification. The entire length of each transect line was surveyed. Substrate information and depths were recorded at the ends of each 10-meter section. Substrate information was based on the Wentworth Scale from a visual description of the surface material provided by the diver. Depth readings were obtained from the diver's pneumofathometer (accuracy ±6").

During processing, all live mussels were identified by species and approximate age and recorded on a data sheet by MCDI's malacologist. The out-of-water processing time for each mussel was less than five minutes and exposure to extreme temperature changes was avoided. After

processing, all non-federally listed mussels were returned, live, a short distance upstream, just off the left descending bank and at similar depths in which they were found, in order to remove them from the areas of direct impact.

RESULTS AND DISCUSSION

The Upper Mississippi River was surveyed for freshwater mussels and mussel habitat at approximate UMRM 409.6 on October 3rd, 2017. According to the river gauge managed by the US Army Corps of Engineers, Rock Island District, at Burlington, Iowa, the river elevation was an approximate average of 520.16 feet above mean sea level during the survey. Divers had low visibility of approximately six inches.

During the survey, 91 live mussels from 17 species were encountered. The mussel species found at the site were *Amblema plicata, Elliptio dilatata, Fusconaia flava, Lampsilis cardium, Lasmigona complanata, Leptodea fragilis, Ligumia recta, Obliquaria reflexa, Obovaria olivaria, Potamilus alatus, Potamilus ohiensis, Pyganodon grandis, Quadrula nodulata, Quadrula pustulosa, Quadrula quadrula, Truncilla donaciformis*, and *Truncilla truncata.* The most common species in the sampled mussel community was *Quadrula quadrula* at 24.18% of the observed population. Other mussel species that constituted a significant portion of the sampled community included *Amblema plicata* at 17.58% and *Obliquaria reflexa* at 14.29%. The remaining 14 mussel species each constituted less than 8% of the surveyed mussel population with four of those species being represented by only a single individual mussel (Table 2). At least 29 juvenile mussels (<5 years old) were encountered during the survey.

No federally listed mussel species were encountered, however two species listed as threatened by the state of Illinois were encountered during the survey. These two species are *Elliptio dilatata*, the spike mussel, of which two were found, one within the first 10-meter section of Transect 1 and one during Qualitative Search 4, and *Ligumia recta*, the black sandshell mussel, of which one was found during Qualitative Search 6.

During the survey of the transect lines, 39 live mussels from 12 unionid species were encountered (Table 3). The divers found the majority of the mussels on Transect 1 near the downstream end in the first 30 meters,

with only a few mussels found along the rest of the line (Figure 2, Table 4). Transect 2 was similarly sparse with only two mussels found throughout the entire transect line (Figure 2, Table 4).

The estimated mussel density along the transects, based on the entirety of each transect length surveyed, ranged from 0.07 to 0.37 mussels per square meter (Table 3). Estimated maximum density along the transects, based solely on the individual 10-meter sections, ranged from 0 to 1.7 mussels per square meter (Table 3). The Draft Protocol for Mussel Surveys in the Ohio River Where Dredging/ Disposal/ Development Activity Is Proposed (Draft Ohio River Protocol), developed by the Ohio River Valley Ecosystem Mollusk Subgroup (April 2004), designates that five or greater observed mussels (by surface search) within a 10-meter section (= 0.5/m^2) represent a mussel concentration (bed). Based on this definition, only two of the thirteen total 10-meter sections surveyed would be considered above the minimum threshold of containing a mussel bed, and both were located within 30 meters of the beginning (downstream end) of Transect 1 (Tables 3 and 4).

The substrate along the transects was varied, with Transect 1 being comprised of gravel and sand with some cobble near the downstream end, transitioning to a patch of mostly sand and clay in the middle of the line, to primarily sand with timber debris in the upstream end, and Transect 2 being comprised of a range of stone sizes, between boulder to gravel, with sand (Figure 2, Table 5).

In an effort to locate additional species, six timed qualitative searches, two of which were 20 minutes in duration and four of which were 10 minutes in duration, were performed within proposed construction/ demolition areas for the new mooring dolphins and existing pile clusters, respectively (Figure 1). The six qualitative searches in total produced 52 live mussels from 14 unionid species (Table 6).

CONCLUSIONS

During the transect searches, 39 live mussels from 12 unionid species were collected, recorded, and returned live a short distance upstream from their original position, out of the area of direct impact (Table 3). During the timed qualitative searches, 52 live mussels from 14 unionid species were collected, recorded, and returned, live, a

short distance upstream, just off the left descending bank and at similar depths in which they were found, in order to remove them from the areas of direct impact (Table 6). The entire survey, transect and qualitative searches combined, yielded 91 live mussels from 17 unionid species (Table 2). Within the survey area near approximate UMRM 409.6, at least 29 juvenile mussels (<5 years old) were found.

No federally listed mussel species were encountered, however two species listed as threatened by the state of Illinois were encountered during the survey. These two species are *Elliptio dilatata*, the spike mussel, of which two were found, one within the first 10-meter section of Transect 1 and one during Qualitative Search 4, and *Ligumia recta*, the black sandshell mussel, of which one was found during Qualitative Search 6.

The survey area near approximate UMRM 409.6 appears to have a very low density mussel community. Based on the Draft Ohio River Protocol (2004), only two of the thirteen total 10-meter sections surveyed would be considered above the minimum threshold of containing a mussel bed, and both were located within 30 meters of the beginning (downstream end) of Transect 1 (Tables 3 and 4). Of the remaining eleven 10-meter transect sections, four contained fewer than five mussels and in seven were found no mussels at all.

ACKNOWLEDGMENTS

We would like to thank the divers from Mainstream Commercial Divers, Inc. for conducting a professional survey.

Disclaimer:

Depth measurements are approximate and sediment types are subjective and are neither intended nor provided for engineering purposes. They are intended only to provide a description of mussel habitat.

LITERATURE CITED

Ohio River Valley Ecosystem Mollusk Subgroup. 2004. Draft Protocol For Mussel Surveys in the Ohio River Where Dredging/Disposal/Development Activity is Proposed. Unpublished. 5pp

Table 1. Site coordinates for the ends of the transect lines (Transects 1 and 2) at approximate Upper Mississippi River Mile 409.6, as well as the approximate center points of the timed qualitative searches (Qualitative Search 1 through 6). Coordinates are provided in Illinois State Plane West (Feet) NAD83 and Geographic (Decimal Degrees) NAD83.

	Illinois State Plane West (feet)		Geographic (Decimal Degrees)	
	Easting	Northing	Latitude	Longitude
Transect 1 - Upstream End	2056420.38	1533335.55	40.87368	-91.03511
Transect 1 - Downstream End	2056197.35	1533096.45	40.87302	-91.03590
Transect 2 - Upstream End	2055997.43	1532888.49	40.87244	-91.03662
Transect 2 - Downstream End	2055929.66	1532814.96	40.87224	-91.03686
Qualitative Search 1	2056472.19	1533290.07	40.87356	-91.03492
Qualitative Search 2	2056330.12	1533183.20	40.87325	-91.03543
Qualitative Search 3	2056397.52	1533309.93	40.87361	-91.03519
Qualitative Search 4	2056321.42	1533230.06	40.87339	-91.03546
Qualitative Search 5	2056256.62	1533160.18	40.87320	-91.03569
Qualitative Search 6	2055975.13	1532863.39	40.87238	-91.03670

Table 2. Total number of mussels collected and species' percent abundance for the entire survey at approximate Upper Mississippi River Mile 409.6.

Scientific Name	Common Name	Totals	Percent Abundance
Amblema plicata (Say, 1817)	Threeridge	16	17.58%
Elliptio dilatata (Rafinesque, 1820)	Spike	2	2.20%
Fusconaia flava (Rafinesque, 1820)	Wabash Pigtoe	1	1.10%
Lampsilis cardium (Rafinesque, 1820)	Plain Pocketbook	4	4.40%
Lasmigona complanata (Barnes, 1823)	White Heelsplitter	2	2.20%
Leptodea fragilis (Rafinesque, 1820)	Fragile Papershell	7	7.69%
Ligumia recta (Lamarck, 1819)	Black Sandshell	1	1.10%
Obliquaria reflexa (Rafinesque, 1820)	Threehorn Wartyback	13	14.29%
Obovaria olivaria (Rafinesque, 1820)	Hickorynut	3	3.30%
Potamilus alatus (Say, 1817)	Pink Heelsplitter	5	5.49%
Potamilus ohiensis (Rafinesque, 1820)	Pink Papershell	1	1.10%
Pyganodon grandis (Say, 1829)	Giant Floater	2	2.20%
Quadrula nodulata (Rafinesque, 1820)	Wartyback	2	2.20%
Quadrula pustulosa (Lea, 1831)	Pimpleback	7	7.69%
Quadrula quadrula (Rafinesque, 1820)	Mapleleaf	22	24.18%
Truncilla donaciformis (Lea, 1828)	Fawnsfoot	2	2.20%
Truncilla truncata (Rafinesque, 1820)	Deertoe	1	1.10%
	Total Number of Mussels	91	100.00%
	Total Species of Mussels	17	

Table 3. Number of mussels of each species collected alive and species' percent abundance for the transect searches at approximate Upper Mississippi River Mile 409.6.

		Transects			
Scientific Name	**Common Name**	T-1	T-2	**Total**	**Percent Abundance**
Amblema plicata (Say, 1817)	Threeridge	2	2	4	10.26%
Elliptio dilatata (Rafinesque, 1820)	Spike	1		1	2.56%
Lampsilis cardium (Rafinesque, 1820)	Plain Pocketbook	1		1	2.56%
Lasmigona complanata (Barnes, 1823)	White Heelsplitter	2		2	5.13%
Leptodea fragilis (Rafinesque, 1820)	Fragile Papershell	3		3	7.69%
Obliquaria reflexa (Rafinesque, 1820)	Threehorn Wartyback	6		6	15.38%
Obovaria olivaria (Rafinesque, 1820)	Hickorynut	2		2	5.13%
Pyganodon grandis (Say, 1829)	Giant Floater	1		1	2.56%
Quadrula pustulosa (Lea, 1831)	Pimpleback	5		5	12.82%
Quadrula quadrula (Rafinesque, 1820)	Mapleleaf	11		11	28.21%
Truncilla donaciformis (Lea, 1828)	Fawnsfoot	2		2	5.13%
Truncilla truncata (Rafinesque, 1820)	Deertoe	1		1	2.56%
Number of Mussels Collected		37	2	39	100.00%
Number of Species Collected		12	1	12	
Estimated Area Sampled (m²)		100	30		
Estimated Density per Total Transect Area (#/m²)		0.37	0.07		
Maximum Density per 10-Meter Section (#/m²)		1.7	0.2		

Table 4. Distribution of mussels in each section of the transects at approximate Upper Mississippi River Mile 409.6.

	Mussels		
	Transect 1	**Transect 2**	**Total**
0 (downstream ends) -10m	12	0	12
10-20m	4	2	6
20-30m	17	0	17
30-40m	0		0
40-50m	2		2
50-60m	0		0
60-70m	0		0
70-80m	0		0
80-90m	0		0
90-100m	2		2
Total	37	2	39

Table 5. Upper Mississippi River transects, approximate bottom elevations, approximate water depths at average pool elevation on 10-03-17 (520.16 feet), and type of surface sediment recorded at each section of each transect. (Elevations and depths are only approximate and should not be used for engineering or navigational purposes. Depth and substrate are only intended to describe mussel habitat.)

Transect 1				
Transect Mark	**Bottom Elev. (Ft)**	**Depth (Ft)**	**Sediment**	**Compactness and Notes**
0 (downstream end)	499.16	21	50% Sand, 50% Other	Hard Packed; Timber Debris
10 m	499.16	21	100% Sand	Hard Packed
20 m	495.16	25	10% Gravel, 90% Sand	Hard Packed
30 m	496.16	24	30% Sand, 70% Other	Hard Packed; Timber Debris
40 m	499.16	21	50% Sand, 50% Other	Hard Packed; Timber Debris
50 m	495.16	25	5% Gravel, 45% Sand, 50% Clay	Hard Packed
60 m	495.16	25	5% Gravel, 95% Sand	Hard Packed
70 m	494.16	26	10% Gravel, 80% Sand, 10% Other	Hard Packed; Timber Debris
80 m	494.16	26	40% Gravel, 50% Sand, 10% Other	Hard Packed; Timber Debris
90 m	495.16	25	40% Gravel, 40% Sand, 20% Other	Hard Packed; Timber Debris
100 m	500.16	20	50% Cobble, 40% Gravel, 10% Sand	Hard Packed

Transect 2				
Transect Mark	**Bottom Elev. (Ft)**	**Depth (Ft)**	**Sediment**	**Compactness and Notes**
0 (downstream end)	506.16	14	20% Cobble, 30% Gravel, 50% Sand	Hard Packed
10 m	505.16	15	40% Gravel, 60% Sand	Hard Packed
20 m	504.16	16	35% Boulder, 5% Cobble, 60% Sand	Hard Packed
30 m	504.16	16	5% Boulder, 5% Cobble, 10% Gravel, 80% Sand	Hard Packed

Table 6. Number of mussels of each species collected alive during the timed qualitative searches during the survey

		Qualitative Searches							
Scientific Name	**Common Name**	Q-1	Q-2	Q-3	Q-4	Q-5	Q-6	**Total**	**Percent Abundance**
Amblema plicata (Say, 1817)	Threeridge	1	2	1	1	2	5	12	23.08%
Elliptio dilatata (Rafinesque, 1820)	Spike				1			1	1.92%
Fusconaia flava (Rafinesque, 1820)	Wabash Pigtoe						1	1	1.92%
Lampsilis cardium (Rafinesque, 1820)	Plain Pocketbook	2	1					3	5.77%
Leptodea fragilis (Rafinesque, 1820)	Fragile Papershell	2		1	1			4	7.69%
Ligumia recta (Lamarck, 1819)	Black Sandshell						1	1	1.92%
Obliquaria reflexa (Rafinesque, 1820)	Threehorn Wartyback		3		1	1	2	7	13.46%
Obovaria olivaria (Rafinesque, 1820)	Hickorynut						1	1	1.92%
Potamilus alatus (Say, 1817)	Pink Heelsplitter		3	1			1	5	9.62%
Potamilus ohiensis (Rafinesque, 1820)	Pink Papershell			1				1	1.92%
Pyganodon grandis (Say, 1829)	Giant Floater	1						1	1.92%
Quadrula nodulata (Rafinesque, 1820)	Wartyback					1	1	2	3.85%
Quadrula pustulosa (Lea, 1831)	Pimpleback					2		2	3.85%
Quadrula quadrula (Rafinesque, 1820)	Mapleleaf		7			3	1	11	21.15%
Number of Mussels Collected		6	16	4	4	9	13	52	100.00%
Number of Species Collected		4	5	4	4	5	8	14	
Collection Time (minutes)		20	20	10	10	10	10	Total Time = 80 minutes	
CPUE (# mussels per man hour)		18	48	24	24	54	78	Mean CPUE = 39.0	

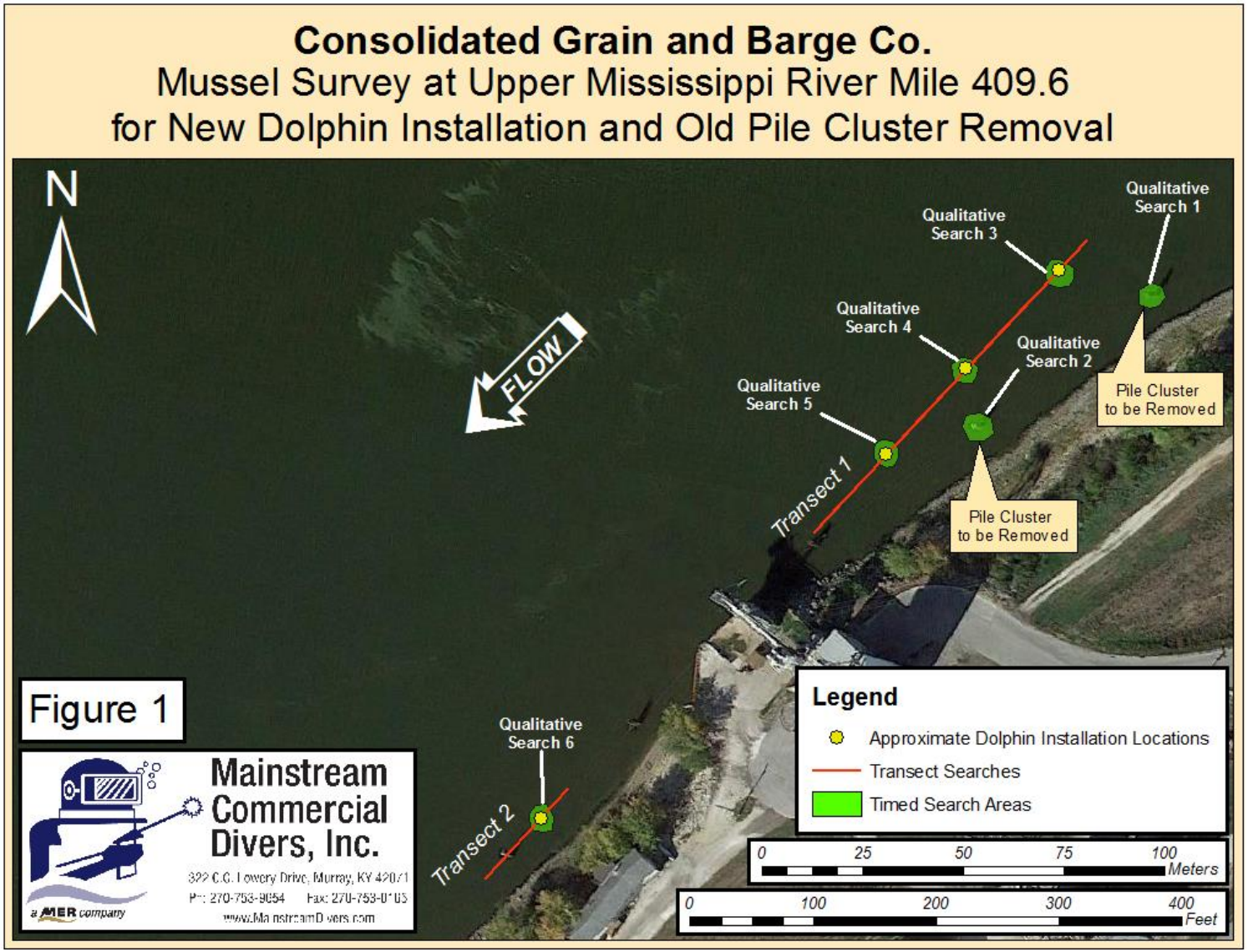

Figure 1. Mussel survey transect and qualitative search areas at Upper Mississippi River Miles 409.6.

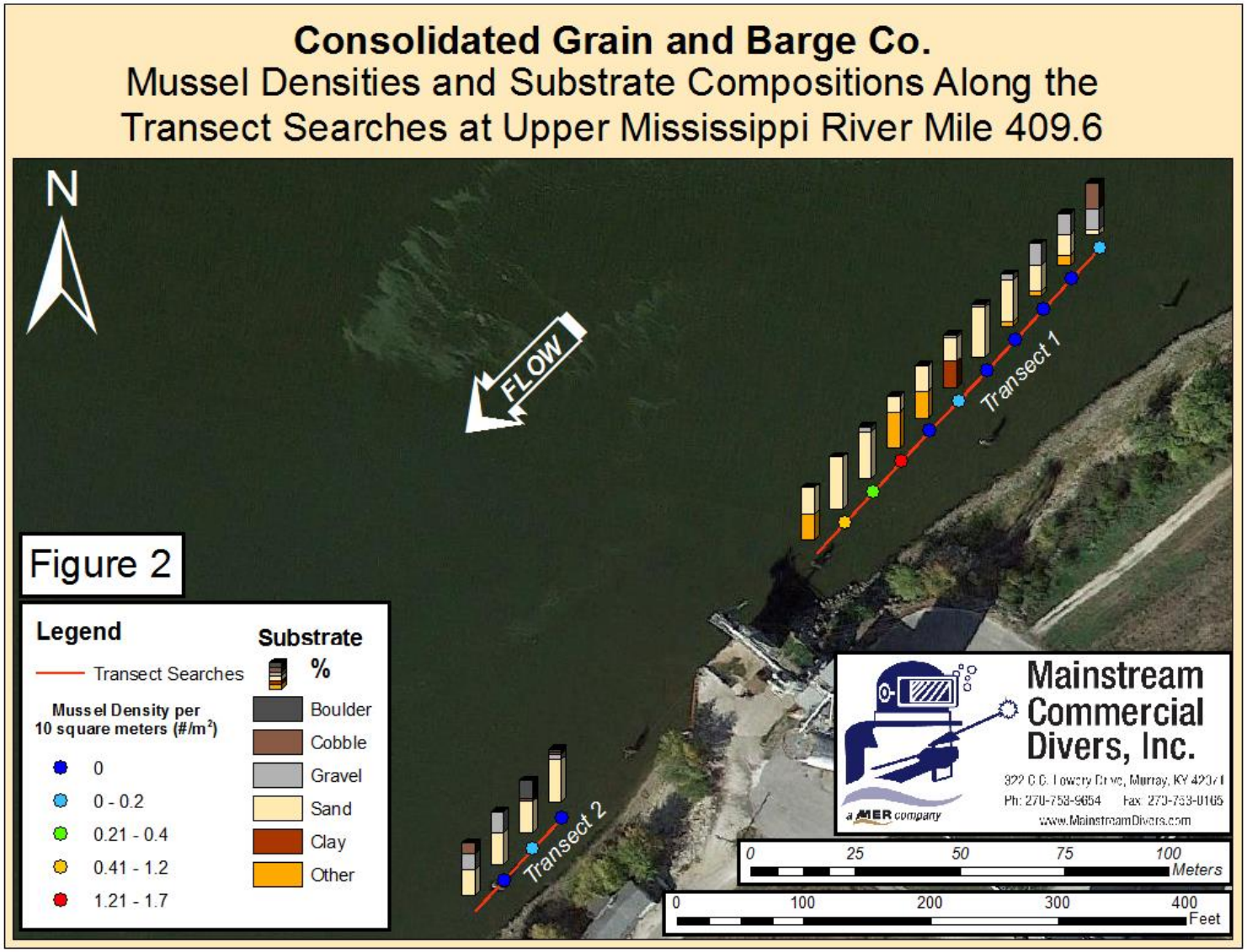

Figure 2. Transect search substrate compositions and 10-meter section mussel densities.

Photo 1. Mussels encountered between 10-20 meters from the beginning of Transect 2.

Photo 2. Mussels encountered during Qualitative Search 6.

APPENDIX B:
US Army Corps of Engineers, Rock Island District
Letter: CEMVR-OD-P-2017-423
November 9, 2017

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ROCK ISLAND DISTRICT
P.O. BOX 2004 CLOCK TOWER BUILDING
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

November 9, 2017

Operations Division

SUBJECT: CEMVR-OD-P-2017-423: Consolidated Grain & Barge

TO ALL INTERESTED PARTIES:

Enclosed are copies of an application, plans, and related material from an applicant requesting Department of the Army (DA) authorization under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) to install two new mooring dolphins and to remove two existing dolphins and replace with two new dolphins in a new alignment, in the Mississippi River, RM 409.6, along the left (east) descending bank. This project is located at the CGB grain elevator near Gladstone, Section 12, Township 10 North, Range 6 West, Henderson County, Illinois. It is the opinion of the District there will be no historic properties affected. There are no prairies in the project area, no trees will be removed from the project area, and based on the mussel survey conducted on October 3, 2017, there are no federally endangered mussels in the project area; therefore, the Corps has made a determination of no effect on federally threatened and endangered species or critical habitat.

Please review the enclosed material and provide us with any comments you may have pertaining to the project. If you do not respond within 15 days from the date of this letter, we will assume you have no objections to the work, and we will proceed with finalizing our public interest decision for this application.

Should you have any questions, please contact our Regulatory Branch by letter, telephone or email Mrs. Kirsten Brown at 309/794-5104 or Kirsten.L.Brown@usace.army.mil.

Sincerely,

Donna M. Jones, P.E.
Chief, Illinois/Missouri Section
Regulatory Branch

Enclosures

SUBJECT: CEMVR-OD-P-2017-423 **Distribution List:**

Federal

X Mr. Peter Swenson, Chief
WW-16J
ATTN: Wendy Melgin
Melgin.Wendy@epa.gov

X Mr. Kraig McPeek, Field Supervisor
U.S. Department of the Interior
Fish and Wildlife Service
Rock Island field Office (ES)
4469 48th Avenue
Rock Island, Illinois 61201
Kraig_McPeek@fws.gov
Sara_Schmuecker@fws.gov

Other (Mississippi etc.)

X Ms. Lynn Muench
American Waterways Operation
lmuench@vesselalliance.com

X Captain Ed Henleben
River Industry Action Committee
Ingram Barge Company
Ed.Henleben@ingrambarge.com

Adjacent Landowners and/or Interested Parties

X Mr. Mark Torrance
Torrance John F. Estates
RR1 Box 202
Gladstone, Illinois 61437

State of Illinois

X Rachel Leibowitz, Ph.D.
IL Department of Natural Resources
IL State Historic Preservation Office
Attn: Review & Compliance
1 Natural Resources Way
Springfield, Illinois 62702

X Mr. Steve Altman, P.E.
Office of Water Resources
IL Department of Natural Resources
One Natural Resources Way
Springfield, Illinois 62702-1271
Steve.Altman@Illinois.gov

Illinois Environmental Protection Agency
Watershed Management Section
Permit Sec. 15
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
epa.401.bow@illinois.gov (email)
(404 component only)

State of Illinois (contd.)

X Mr. Keith Shank, Biologist
Impact Assessment Section
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702
keith.shank@illinois.gov

Other (Illinois River)

Mr. Darren Melvin
Illinois River Carriers Association
darren.melvin@hanson.biz

David Goin
Illinois River Carriers Association
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David.goin@fmtdry.com

Mr. Terry Wiltz
Captain's Committee
Illinois River Carriers
9725 W. Vista
Hillsboro, Missouri 63050

US Coast Guard

X Commander (oan)
Eighth Coast Guard District
500 Poydras Street
New Orleans, Louisiana 70130
William.j.Campbell@uscg.mil

X Commander, U.S. Coast Guard Group
Sector Upper Mississippi River
1222 Spruce Street, Suite 7103 E
St. Louis, Missouri 63102
STL-SG-SECUMR-Waterways@uscg.mil

Internal

X PD-E (Environmental Analysis):
James.S.Ross@usace.army.mil
X EM (Emergency Management):
Paul.F.St.Louis@usace.army.mil
X RE-F (Real Estate):
Jeffrey.P.Nelson@usace.army.mil
X OD-T (Technical Support):
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Jon.A.Klingman@usace.army.mil
X OD-MN (Mississippi River):
Joseph.S.Lundh@usace.army.mil
OD-I (Illinois Waterway):
Mark.W.Burton@usace.army.mil

JOINT APPLICATION FORM FOR ILLINOIS

ITEMS 1 AND 2 FOR AGENCY USE

1. Application Number	2. Date Received
2017-423	MAR 17 2017

3. and 4. (SEE SPECIAL INSTRUCTIONS) NAME, MAILING ADDRESS AND TELEPHONE NUMBERS

3a. Applicant's Name:	3b. Co-Applicant/Property Owner Name (if needed or if different from applicant):	4. Authorized Agent (an agent is not required):
Nick DawTyne Company Name (if any) : Consolidated Grain & Barge Co. Address: PO Box 150 Gladstone, IL 61437 Email Address: Nick.Dawtyne@cgb.com	N/A Company Name (if any): Address: Email Address:	N/A Company Name (if any): Address: Email Address:
Applicant's Phone Nos. w/area code Business: (309) 457-4817 Residence: Cell: (815) 291-6425 Fax:	Applicant's Phone Nos. w/area code Business: N/A Residence: Cell: Fax:	Agent's Phone Nos. w/area code Business: N/A Residence: Cell: Fax:

STATEMENT OF AUTHORIZATION

I hereby authorize, Nick DawTyne to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

Applicant's Signature — Date: 3/14/2017

5. ADJOINING PROPERTY OWNERS (Upstream and Downstream of the water body and within Visual Reach of Project)

Name	Mailing Address	Phone No. w/area code
a. Mark Torrance - Torrance John F. Estate.	RR1 Box 202 Gladstone, IL 61437	(309) 627-2407
b.		
c.		
d.		

6. PROJECT TITLE:
Gladstone River Dolphin Removal & Installation

7. PROJECT LOCATION:

LATITUDE: 40.87278 °N	UTMs Northing: 4526491 Easting: 665484				
LONGITUDE: 91.03616 °W	STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION	LEGAL DESCRIPT	QUARTER	SECTION	TOWNSHIP NO. / RANGE
	CGB Grain Elevator outside Gladstone, IL along Mississippi River			12	10 N / 6 W

☐ IN OR ☒ NEAR CITY OF TOWN (check appropriate box)
Municipality Name: Gladstone

COUNTY	STATE	ZIP CODE	WATERWAY	RIVER MILE (if applicable)
Henderson	IL	61437	Mississippi River	409.6

Revised 2010

☐ Corps of Engineers ☐ IL Dep't of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

8. PROJECT DESCRIPTION (Include all features):

To update the barge haul system, CGB is proposing to add two new mooring dolphins (tri-pod) dolphins which will be placed just upriver and downriver from the closest wood pilings to the existing dock. In addition, in an effort to straighten the berthing line and align the barges with the barge spout and downriver dolphins, CGB is proposing to remove two existing dolphins and replace them with two dolphins (pipe pile clusters).

9. PURPOSE AND NEED OF PROJECT:

The work described above is needed to update the existing barge loading facility at the CGB Gladstone River facility.

COMPLETE THE FOLLOWING FOUR BLOCKS IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

10. REASON(S) FOR DISCHARGE:

The project will consist of installing new dolphins and the discharge is required to update the existing barge loading facility.

11. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS FOR WATERWAYS:

TYPE: Two dolphins will consist of approximately 6-foot diameter pipe pile clusters. Two dolphins will consist of a 48-inch main pile with two 24-inch batter piles (tri-pod dolphins).

AMOUNT IN CUBIC YARDS:

12. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (See Instructions)

N/A - The project will consist of installing two approximately 6-foot diameter pipe pile clusters and two tri-pod dolphins which will consist of a 48-inch main pile with two 24-inch batter piles into the bed of the Mississippi River.

13. DESCRIPTION OF AVOIDANCE, MINIMIZATION AND COMPENSATION (See instructions)

N/A

14. Date activity is proposed to commence: August 2017

Date activity is expected to be completed: October 2017

15. Is any portion of the activity for which authorization is sought now complete? Yes [ ] No [X]

NOTE: If answer is "YES" give reasons in the Project Description and Remarks section. Indicate the existing work on drawings.

Month and Year the activity was completed

16. List all approvals or certification and denials received from other Federal, interstate, state, or local agencies for structures, construction, discharges or other activities described in this application.

Issuing Agency	Type of Approval	Identification No.	Date of Application	Date of Approval	Date of Denial

17. CONSENT TO ENTER PROPERTY LISTED IN PART 7 ABOVE IS HEREBY GRANTED. Yes [X] No

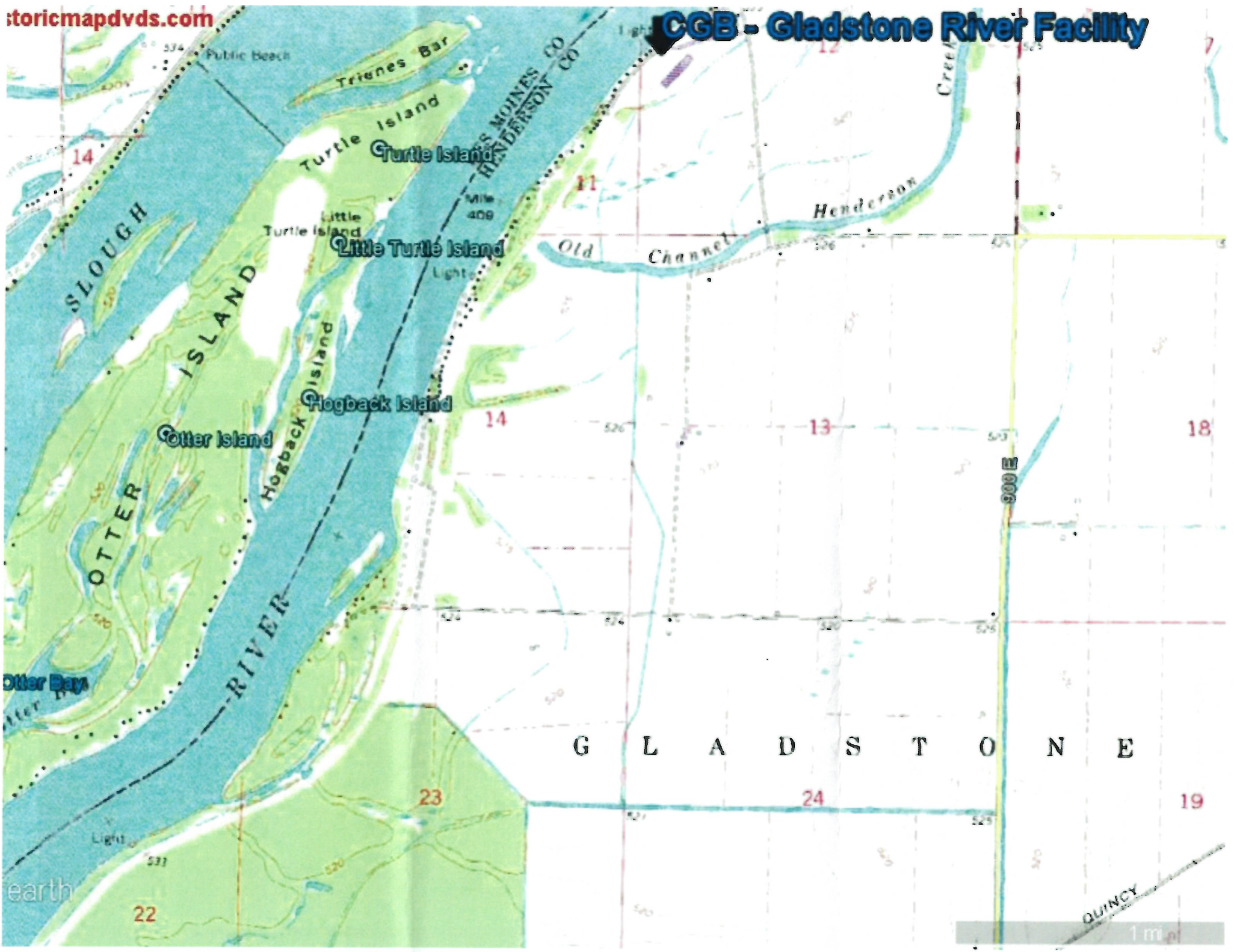
18. APPLICATION VERIFICATION (SEE SPECIAL INSTRUCTIONS)

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

Signature of Applicant or Authorized Agent	Date
[signature]	3/14/2017

[ ] Corps of Engineers Revised 2010 [ ] IL Dep't of Natural Resources [ ] IL Environmental Protection Agency [ ] Applicant's Copy

SEE INSTRUCTIONS FOR ADDRESS


storicmapdvds.com
CGB - Gladstone River Facility
Public Beach
Triunes Bar
Turtle Island
Turtle Island
Little Turtle Island
Little Turtle Island
Mile 409
SLOUGH
OTTER ISLAND
Hogback Island
Hogback Island
Otter Island
RIVER
DES MOINES CO
HENDERSON CO
Old Channel
Henderson
900 E
GLADSTONE
QUINCY
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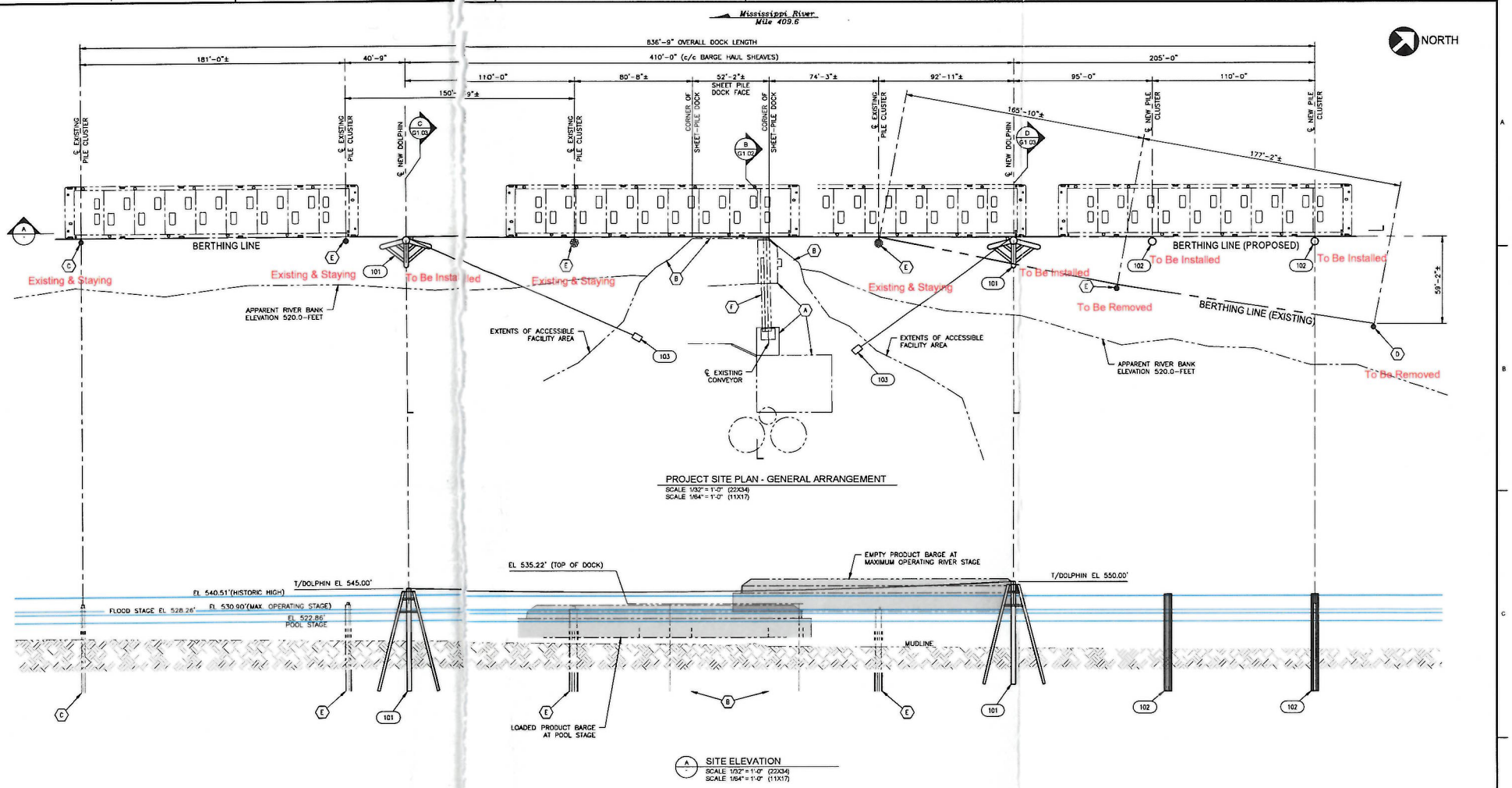


GENERAL NOTES:

1. REFER TO DRAWING C0.00 FOR ALL PROJECT RELATED NOTES AND SPECIFICATIONS.

KEYED NOTES:

- (A) EXISTING FACILITY BUILDINGS
- (B) SHEET PILE WALL - DOCK FACE
- (C) EXISTING STEEL PILE CLUSTER (UIP)
- (D) EXISTING STEEL PILE CLUSTER (DEMO)
- (E) EXISTING TIMBER PILE CLUSTER (UIP)
- (F) EXISTING CONVEYOR
- (101) NEW MOORING DOLPHIN / BARGE HAUL TERMINAL SHEAVE SUPPORT
- (102) PIPE PILE CLUSTER (MOORING DOLPHIN)
- (103) BARGE HAUL WINCH & CONCRETE FOUNDATION

ISSUED FOR REVIEW (NOT FOR CONSTRUCTION) - MARCH 08, 2017

CONSOLIDATED GRAIN AND BARGE CO.

REVISIONS

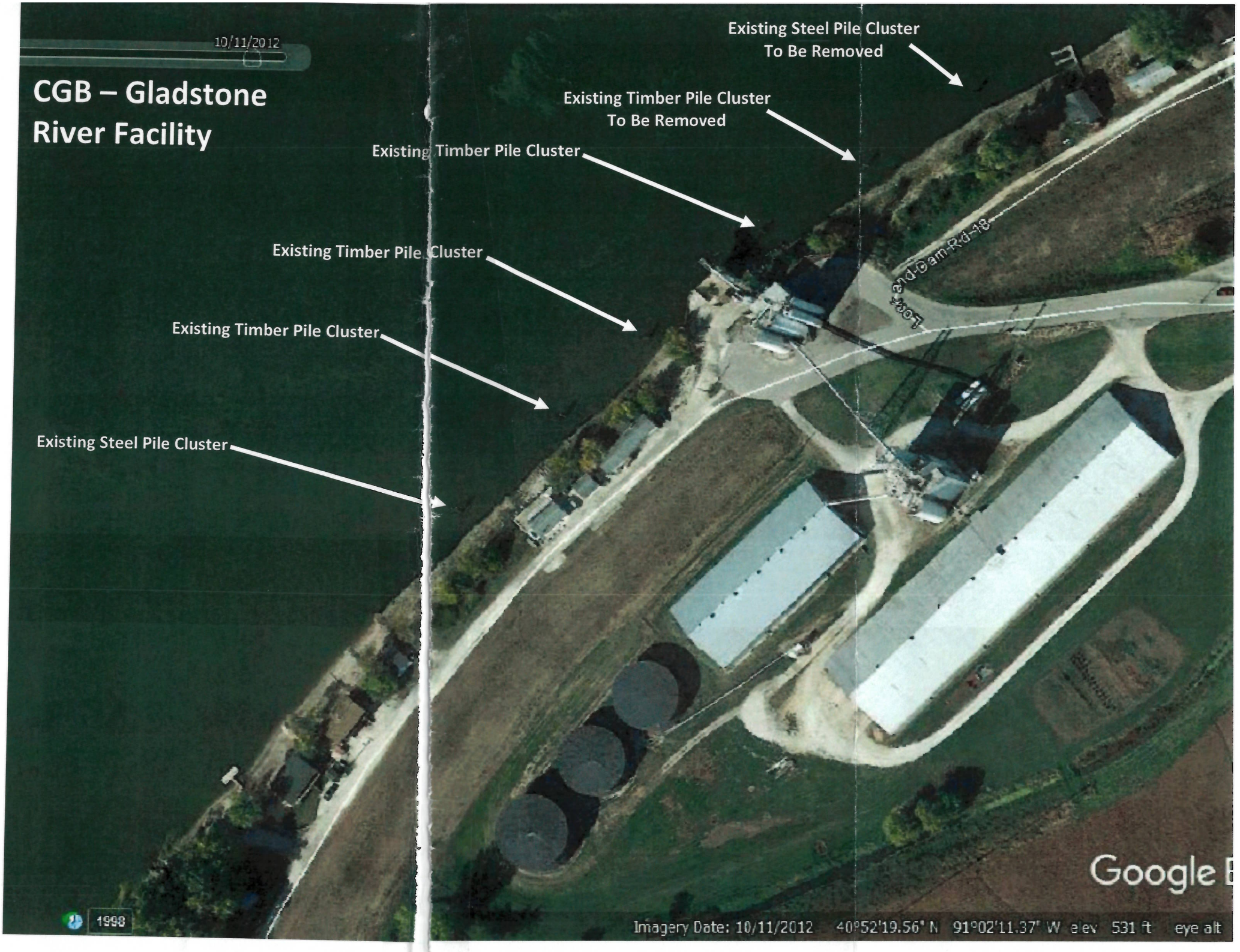
No.	DATE	By	DESCRIPTION
A	02.10.17	GN	ISSUED FOR REVIEW
B	03.08.17	GN	ISSUED FOR REVIEW

Attachment of this seal to this document is made for the purpose of authenticating this document. Responsibility for all other documents relating to this project is disclaimed. Reference 6th 327.411 (2) RSMo

Manley Brothers, LLC
200 Benton Street
St. Louis, Missouri 63088
Phone: (636) 225-9106
Fax: (636) 225-5303

CONSOLIDATED GRAIN & BARGE COMPANY
GLADSTONE, ILLINOIS TERMINAL
MISSISSIPPI RIVER MILE 409.6 (LDB)
GENERAL ARRANGEMENT
SITE LAYOUT

Drn By: DW	Date: 01/07/17
Chk By:	Date:
App By:	Date:
Scale: AS NOTED	
Job Number: N0217-2285	
Drawing Number: 17-2285	
Sheet Number: G1.01	Revision: B


10/11/2012
CGB – Gladstone River Facility
Existing Steel Pile Cluster To Be Removed
Existing Timber Pile Cluster To Be Removed
Existing Timber Pile Cluster
Existing Timber Pile Cluster
Existing Timber Pile Cluster
Existing Steel Pile Cluster
Lock and Dam Rd 18
1998
Imagery Date: 10/11/2012 40°52'19.56" N 91°02'11.37" W elev 531 ft eye alt
Google